Project No. 127516
April 2008

FINAL COPY

Standard Solid Waste Permit Modification Application
Fluorogypsum Stacking Facility
Existing and Stack 7A/7B
Volume 2 of 2

Honeywell International Inc.
Specialty Materials
Geismar, Ascension Parish, Louisiana

Standard Solid Waste Permit Number: P-0216R1
Agency Interest No. 2082
GD-005-0313/P-0216R1

Prepared for:

Honeywell International Inc.
Specialty Materials
PO Box 226
Geismar, Louisiana 70734

Honeywell

Prepared by:

Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, Louisiana 70809

Shaw® Shaw Environmental, Inc.

FINAL COPY

FINAL COPY, HONEYWELL, AI # 2082
Fluorogypsum Stacking Facility, P-0216R1 Mod#1
SUBMITTED 12/14/2007, UPDATED 4/10/2008
READY FOR PUBLIC REVIEW

ATTACHMENT 7
Monitoring Well Construction Details and Boring Logs

MW-F17, MW-F18, MW-F19, MW-F20, MW-F21, MW-F22, MW-F23, MW-F-24

TABLE 1
Fluorogypsum Stacking Facility
Groundwater Monitoring Well Construction Details
Honeywell International, Inc.
Speciality Materials
Geismar, Louisiana

Well I.D.	LDOTD Registration Number	Unit Monitored	Groundwater Monitoring Zone	Gradient Position	Installation Date	Casing Material Size	Sampling Equipment	Casing Elevation (ft MSL)	Well Drilled Depth (ft bgs)	Well Depth (ft MSL)	Ground Surface Elevation (ft MSL)	Screen Interval From (Elevation, ft MSL)	Screen Interval To (Elevation, ft MSL)	Top of Screen Interval (ft bgs)	Bottom of Screen Interval (ft bgs)	Screen Slot Size (in)	Type of Grout	Latitude	Longitude
MW-F3	(a)	Impoundment	Zone 1	down	1982	4" PVC	Submrs Pump	23.67	20	-0.3	19.7	7.70	2.7	12.0	17.0	0.010	5% Cement-bentonite mix	30° 13' 43.6"N	91° 02' 49.1"W
MW-F4	(a)	Impoundment	Zone 1	down	1982	4" PVC	Submrs Pump	23.61	22	-2.3	19.7	5.70	0.7	14.0	19.0	0.010	5% Cement-bentonite mix	30° 13' 31.0"N	91° 03' 01.6"W
MW-F5	9952Z	Impoundment	Zone 1	down	1986	4" PVC	Submrs Pump	20.83	20	-2.1	17.9	5.90	0.9	12.0	17.0	0.010	5% Cement-bentonite mix	30° 13' 41.9"N	91° 02' 41.3"W
MW-F6	9953Z	Impoundment	Zone 1	down	1986	4" PVC	Submrs Pump	21.49	27	-8.1	18.9	-0.10	-5.1	19.0	24.0	0.010	5% Cement-bentonite mix	30° 13' 39.4"N	91° 02' 33.4"W
MW-F8	9954Z	Impoundment	Zone 1	down	1986	4" PVC	Submrs Pump	21.46	27	-8.2	18.8	-0.20	-5.2	19.0	24.0	0.010	5% Cement-bentonite mix	30° 13' 28.2"N	91° 02' 41.0"W
MW-F8B	10184Z	Impoundment	Zone 2	down	2006	4" PVC	Submrs Pump	21.26	42	-23.9	18.1	-13.40	-23.4	31.5	41.5	0.010	5% Cement-bentonite mix	30° 13' 28.2"N	91° 02' 41.1"W
MW-F9	9955Z	Impoundment	Zone 1	down	1986	4" PVC	Submrs Pump	23.19	26.5	-6.2	20.3	1.80	-3.2	18.5	23.5	0.010	5% Cement-bentonite mix	30° 13' 26.8"N	91° 02' 46.0"W
MW-F9B	10185Z	Impoundment	Zone 2	down	2006	4" PVC	Submrs Pump	23.04	41	-20.7	20.3	-10.20	-20.2	30.5	40.5	0.010	5% Cement-bentonite mix	30° 13' 26.7"N	91° 02' 46.1"W
MW-F10	9956Z	Impoundment	Zone 1	down	1986	4" PVC	Submrs Pump	24.18	21	0.3	21.3	8.30	3.3	13.0	18.0	0.010	5% Cement-bentonite mix	30° 13' 24.4"N	91° 02' 56.4"W
MW-F10B	8635Z	Impoundment	Zone 2	down	1998	4" PVC	Submrs Pump	24.18	48	-26.7	21.3	-19.20	-24.2	40.5	45.5	0.010	5% Cement-bentonite mix	30° 13' 24.5"N	91° 02' 56.5"W
MW-F11	9640Z	Impoundment	Zone 1	down	2002	4" PVC	Submrs Pump	21.57	25	-6	19	1.50	-3.5	17.5	22.5	0.010	5% Cement-bentonite mix	30° 13' 35.3"N	91° 02' 26.2"W
MW-F12B	9635Z	Impoundment	Zone 1	down	2002	4" PVC	Submrs Pump	20.2	25	-7	18	0.50	-4.5	17.5	22.5	0.010	5% Cement-bentonite mix	30° 13' 29.0"N	91° 02' 31.1"W
MW-F12C	10183Z	Impoundment	Zone 2	down	2006	4"PVC	Submrs Pump	20.4	40	-22.2	17.8	-11.70	-21.7	29.5	39.5	0.010	5% Cement-bentonite mix	30° 13' 29.0"N	91° 02' 31.1"W
MW-F13	9644Z	Impoundment	Zone 1	down	2002	4" PVC	Submrs Pump	20.57	25	-7	18	0.50	-4.5	17.5	22.5	0.010	5% Cement-bentonite mix	30° 13' 27.7"N	91° 02' 36.4"W
MW-F13B	9643Z	Impoundment	Zone 2	down	2002	4" PVC	Submrs Pump	20.67	40	-22	18	-14.50	-19.5	32.5	37.5	0.010	5% Cement-bentonite mix	30° 13' 27.7"N	91° 02' 36.6"W
MW-F14	9917Z	Impoundment	Zone 1	down	2004	4" PVC	Submrs Pump	19.82	25	-5.2	19.8	-0.20	-5.2	20.0	25.0	0.010	5% Cement-bentonite mix	30° 13' 34.7"N	91° 02' 59.7"W
MW-F15	9918Z	Impoundment	Zone 1	down	2004	4" PVC	Submrs Pump	24.14	30	-5.7	24.3	-1.70	-6.7	26.0	31.0	0.010	5% Cement-bentonite mix	30° 13' 42.8"N	91° 02' 57.4"W
MW-F16	9919Z	Impoundment	Zone 2	down	2004	4" PVC	Submrs Pump	21.7	51	-31.7	19.3	-26.70	-31.7	46.0	51.0	0.010	5% Cement-bentonite mix	30° 13' 35.4"N	91° 02' 26.2"W
MW-FB1	9916Z	Impoundment	Zone 1	down	2004	4" PVC	Submrs Pump	19.61	31	-14.5	16.5	-9.50	-14.5	26.0	31.0	0.010	5% Cement-bentonite mix	30° 13' 54.7"N	91° 02' 58.1"W
MW-FB2	10182Z	Impoundment	Zone 2	down	2006	4" PVC	Submrs Pump	19.46	45	-28.4	16.6	-18.34	-28.34	35.0	45.0	0.010	5% Cement-bentonite mix	30° 13' 54.6"N	91° 02' 58.2"W
MW-FB3	10274Z	Impoundment	Zone 1	down	2006	4" PVC	Submrs Pump	20.97	25	-7.47	17.53	5.97	-4.03	11.6	21.6	0.010	5% Cement-bentonite mix	30° 13' 43"N	91° 02' 49"W
MW-FB4	10273Z	Impoundment	Zone 2	down	2006	4" PVC	Submrs Pump	20.62	45	-27.59	17.41	-14.38	-24.38	31.8	41.8	0.010	5% Cement-bentonite mix	30° 13' 31"N	91° 03' 01"W
MW-F17	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	19.38	16	-15.79	16.21	7.71	2.71	8.5	13.5	0.010	5% Cement-bentonite mix	30° 13' 51"N	91° 02' 40"W
MW-F18	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	18.83	17	-1.41	15.59	6.09	1.09	9.5	14.5	0.010	5% Cement-bentonite mix	30° 13' 57"N	91° 02' 36"W
MW-F19	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	18.99	17	-0.98	16.02	6.52	1.52	9.5	14.5	0.010	5% Cement-bentonite mix	30° 13' 59"N	91° 02' 30"W
MW-F20	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	20.06	16	0.94	16.94	8.44	3.44	8.5	13.5	0.010	5% Cement-bentonite mix	30° 13' 56"N	91° 02' 22"W
MW-F21	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	20.72	20	-2.51	17.49	4.99	-0.01	12.5	17.5	0.010	5% Cement-bentonite mix	30° 13' 51"N	91° 02' 20"W
MW-F22	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	21.90	18	0.13	18.13	7.63	2.63	10.5	15.5	0.010	5% Cement-bentonite mix	30° 13' 45"N	91° 02' 23"W
MW-F23	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	21.82	17	1.80	18.80	9.30	4.30	9.5	14.5	0.010	5% Cement-bentonite mix	30° 13' 42"N	91° 02' 30"W
MW-F24	(b)	Impoundment	Zone 1	down	2007	4" PVC	Submrs Pump	22.30	20	-0.81	19.19	6.69	1.69	12.5	17.5	0.010	5% Cement-bentonite mix	30° 13' 45"N	91° 02' 38"W

Notes:
(a) Wells were installed pre-registration requirements
(b) LDOTD Water Well Registration submitted on 10-15-2007
MSL = Mean Sea Level
bgs = below ground surface
ft = feet
in = inches

CARL L. MISTRIC, P.R.L.S.
CHAIRMAN
RUSSEL L. MISTRIC, P.R.L.S.
PRESIDENT
JOSHUA W. EBARB
OFFICE MANAGER

C. MISTRIC SURVEYORS, INC.

11841 COURSEY BLVD
BATON ROUGE, LA 70816

TELEPHONE: (225) 292-3953
FACSIMILIE: (225) 293-8503
E-MAIL: cmistric@cmistric.com

Monitor Well As-built Report
HONEYWELL – Geismar Plant
Ascension Parish, La.
STACK 7-A MONITORING WELLS

Client: **HONEYWELL**
Job No: **6113**
Date: **10-24-2007**

MW NO.	PLANT COORDINATES		ELEVATIONS			GEOGRAPHIC COORDINATES	
	NORTH	EAST	GND.	TOP CON.	TOP PVC	LATITUDE	LONGITUDE
F-17	6795.54	3150.91	16.21	16.47	19.38	30°13'51.1438"N	91°02'40.1580"W
F-18	7473.21	3223.40	15.59	15.97	18.83	30°13'57.3242"N	91°02'36.9529"W
F-19	7766.81	3746.54	16.02	16.40	18.99	30°13'58.4710"N	91°02'30.2424"W
F-20	7701.96	4462.58	16.94	17.33	20.06	30°13'55.6508"N	91°02'22.7171"W
F-21	7292.94	4812.12	17.49	17.83	20.72	30°13'50.7249"N	91°02'20.3851"W
F-22	6649.08	4788.79	18.13	18.69	21.90	30°13'44.7411"N	91°02'22.9266"W
F-23	6175.71	4296.63	18.80	19.17	21.82	30°13'41.8082"N	91°02'29.9399"W
F-24	6233.21	3573.54	19.19	19.31	22.30	30°13'44.5809"N	91°02'37.5673"W

NOTES:

1) GEOGRAPHIC COORDINATES SHOWN ARE BASED ON NAD 1983 DATUM.
2) ELEVATIONS SHOWN ARE BASED ON HONEYWELL PLANT SYSTEM.

Ardaman & Associates, Inc.
Formerly STE
Geotechnical, Environmental and
Materials Consultants

October 16, 2007

Mr. Byron Braud
Honeywell International
5525 Hwy 3115
Geismar, Louisiana 70734

Re: Monitor Well Installation
Geismar, Facility
AAI File: 07-L1165

Dear Mr. Braud,

We have completed the installation of 8 monitor wells as requested. Enclosed are the LDOTD Well Registrations, Well Diagrams, and the Soil Boring Logs.

We appreciate the opportunity to serve you on this project. Please contact us if you have any questions or require additional information.

Sincerely,
Ardaman & Associates, Inc.

Keith J. Spampneto, P.E.
Assistant Branch Manager

Jim Porter, CET
Drilling Manager

JJP/jjp

316 Highlandia Drive 70810, Post Office Box 83710, Baton Rouge, Louisiana 70884 Phone (225) 752-4790 FAX (225) 752-4878
Offices in: Bartow, Baton Rouge, Cocoa, Fort Myers, Miami, New Orleans, Orlando, Port Charlotte, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (if any) MW-F17

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 16 FT. DEPTH OF WELL 16 FT.

6. STATIC WATER LEVEL 12 FT. BELOW GROUND SURFACE MEASURED ON 9/18/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 11 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 5 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	7	Gray clay			
7	12	Gray silty sand			
12	16	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 30 13 52 LONGITUDE 91 02 40

SECTION 04 2 TOWNSHIP 9 S RANGE 02 E

ELEV. 0013 QUAD NO. 18 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (if any) MW-F18

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 18 FT. DEPTH OF WELL 17 FT.

6. STATIC WATER LEVEL 7.5 FT. BELOW GROUND SURFACE MEASURED ON 9/18/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 12 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 6 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Gray clay			
8	10	Grayish Brown silt			
10	18	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 30 13 58 LONGITUDE 91 02 37

SECTION 042 TOWNSHIP 9S RANGE 02E

ELEV. 0013 QUAD NO. 18 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (if any) MW-F19

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 20 FT. DEPTH OF WELL 17 FT.

6. STATIC WATER LEVEL 9.5 FT. BELOW GROUND SURFACE MEASURED ON 9/10/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 12 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 6 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Gray clay			
8	15	Gray silty sand			
15	20	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 30 13 58 LONGITUDE 91 02 30

SECTION 04 2 TOWNSHIP 9 S RANGE 02 E

ELEV. 0013 QUAD NO. 18 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (If any) MW-F20

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 16 FT. DEPTH OF WELL 16 FT.

6. STATIC WATER LEVEL 7.5 FT. BELOW GROUND SURFACE MEASURED ON 9/11/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 11 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 4 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	8	Gray clay			
8	14	Gray silty sand			
14	16	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
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BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 3 0 1 3 5 6 LONGITUDE 9 1 0 2 2 4

SECTION 0 4 2 TOWNSHIP 9 S RANGE 0 2 E

ELEV. 0 0 1 3 QUAD NO. 1 8 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME. (if any) MW-F21

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 20 FT. DEPTH OF WELL 20 FT.

6. STATIC WATER LEVEL 12 FT. BELOW GROUND SURFACE MEASURED ON 9/11/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 15 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 9 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	10	Gray clay			
10	20	Grayish brown silty sand			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF -WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 301351 LONGITUDE 910220

SECTION 042 TOWNSHIP 9S RANGE 02E

ELEV. 0013 QUAD NO. 186B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (if any) MW-F22

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 18 FT. DEPTH OF WELL 18 FT.

6. STATIC WATER LEVEL 8 FT. BELOW GROUND SURFACE MEASURED ON 9/12/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 13 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 7 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	2	Brown clay			
2	4	Brownish-gray silty sand			
4	12	Gray clay			
12	16	Grayish-brown silty sand			
16	18	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 3 0 1 3 4 4 LONGITUDE 9 1 0 2 2 3

SECTION 0 4 2 TOWNSHIP 9 S RANGE 0 2 E

ELEV. 0 0 1 3 QUAD NO. 1 8 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

2. WELL OWNER Honeywell International PHONE (225) 642-2758

3. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

4. OWNER'S WELL NUMBER OR NAME (if any) MW-F23

5. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 20 FT. DEPTH OF WELL 17 FT.

6. STATIC WATER LEVEL 4 FT. BELOW GROUND SURFACE MEASURED ON 9/17/2007

7. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 12 FT.

8. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

9. CEMENTED FROM 6 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

11. REMARKS:

12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	10	Brownish-gray and gray clay			
10	12	Gray silty sand			
12	14	Gray sand			
14	16	Gray silty sand			
16	20	Gray clay			

13. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

14. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

15. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF -WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 30 13 42 LONGITUDE 91 02 30

SECTION 04 2 TOWNSHIP 9 S RANGE 02 E

ELEV. 0013 QUAD NO. 186B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD - GW - 1S)

EASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

. USE OF WELL (CHECK APPROPRIATE BOX)

☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY

☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____

. WELL OWNER Honeywell International PHONE (225) 642-2758

. WELL OWNER'S ADDRESS 5525 Hwy 3115 Geismar, La 70734

. OWNER'S WELL NUMBER OR NAME (If any) MW-F24

. DATE COMPLETED 10/1/2007 DEPTH OF HOLE 20 FT. DEPTH OF WELL 20 FT.

. STATIC WATER LEVEL 13 FT. BELOW GROUND SURFACE MEASURED ON 9/17/2007

. CASING 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 15 FT.

. SCREEN 4 IN. ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .010 LENGTH 5 FT.

. CEMENTED FROM 9 FT. BELOW GROUND SURFACE, USING ☒ PUMP DOWN METHOD ☐ GRAVITY METHOD

0. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, LA (Town or city)

APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, railroad, any landmark, etc.)

(Please draw sketch on back of Original)

1. REMARKS:

2. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO		FROM	TO	
0	4	Gypsum			
4	10	Gray clay			
10	12	Gray silt			
12	20	Gray silty sand			

3. FOR HEAT PUMP ONLY: AVG. DEPTH _____ FT. NUMBER OF HOLES _____

4. ABANDONMENT INFORMATION: DOES THE WELL REPLACE AN EXISTING WELL ? YES ☐ NO ☒

5. NAME OF PERSON WHO DRILLED THE WELL: M. McKinney

OWNER'S COPY

Soil Testing Engineers, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC - 212

Authorized Signature 10-15-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF
TRANSPORTATION AND DEVELOPEMENT
ATTN.: CHIEF - WATER RESOURCES SECTION
P. O. BOX 94245
BATON ROUGE LA. 70804-9245
(504) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.

IDENTIFICATION NUMBER 0

REVISED COORDINATES

Geologic Unit Use of well

SECTION TOWNSHIP RANGE

ELEV. QUAD NO.

INPUT BY: DATE:

INSPECTED BY: DATE:

REMARKS:

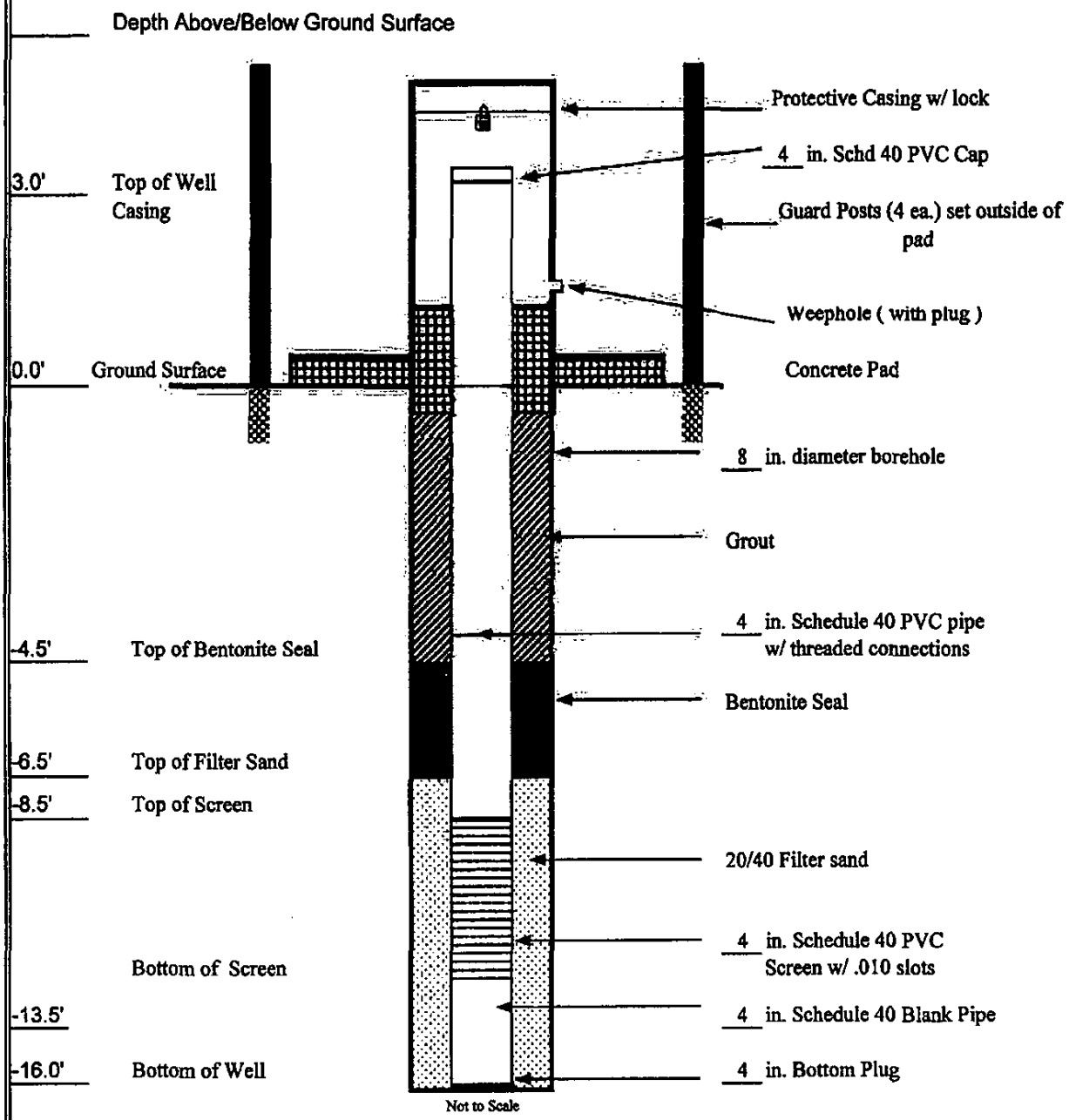
FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 3 0 1 3 4 5 LONGITUDE 9 1 0 2 3 8

SECTION 0 4 2 TOWNSHIP 9 S RANGE 0 2 E

ELEV. 0 0 1 6 QUAD NO. 1 8 6 B

SITE ADDRESS: 5535 Hwy 3115
Geismar, La 70734



MW-F17

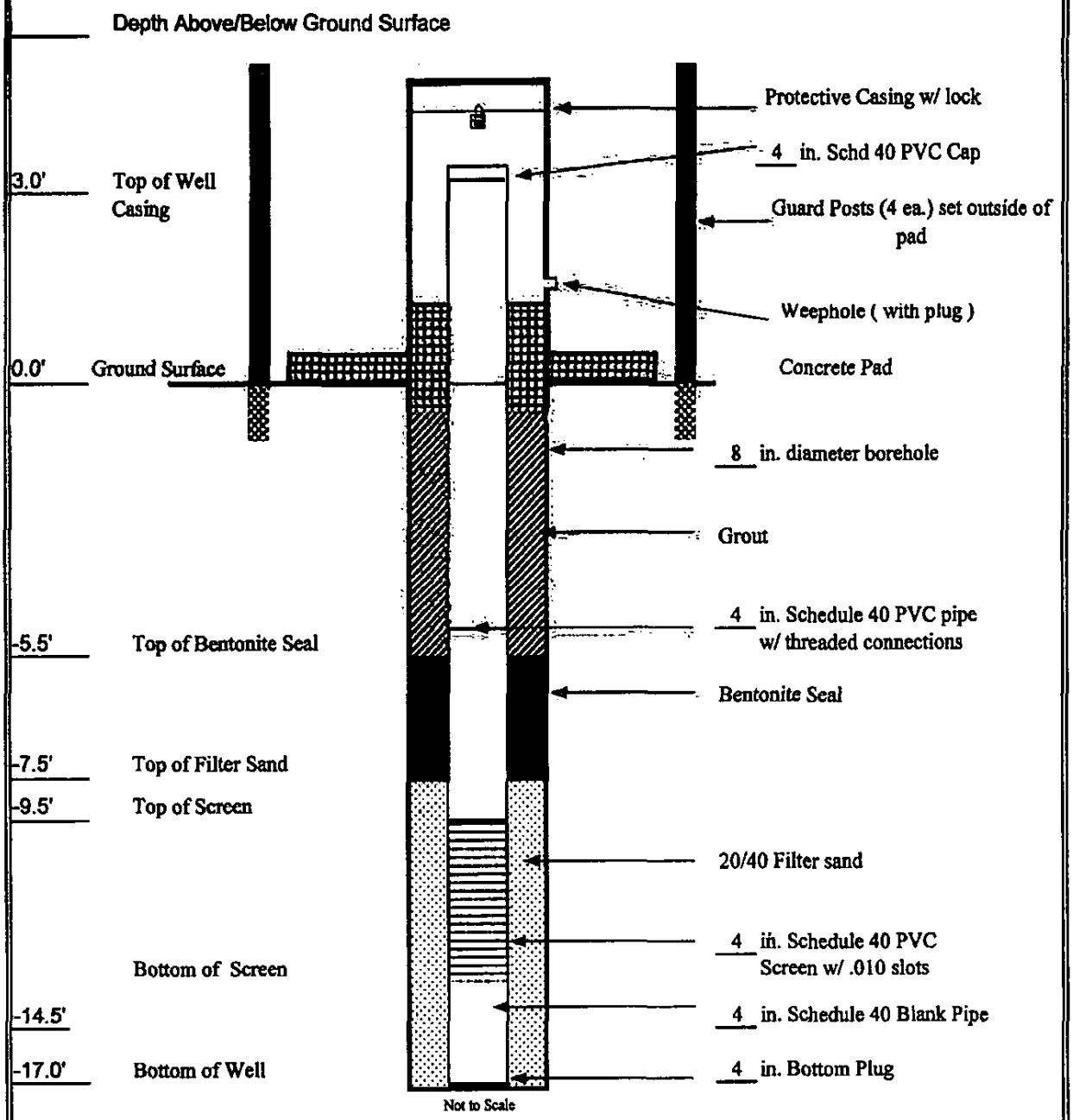
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

STE PROJECT NO. **07-L1165**



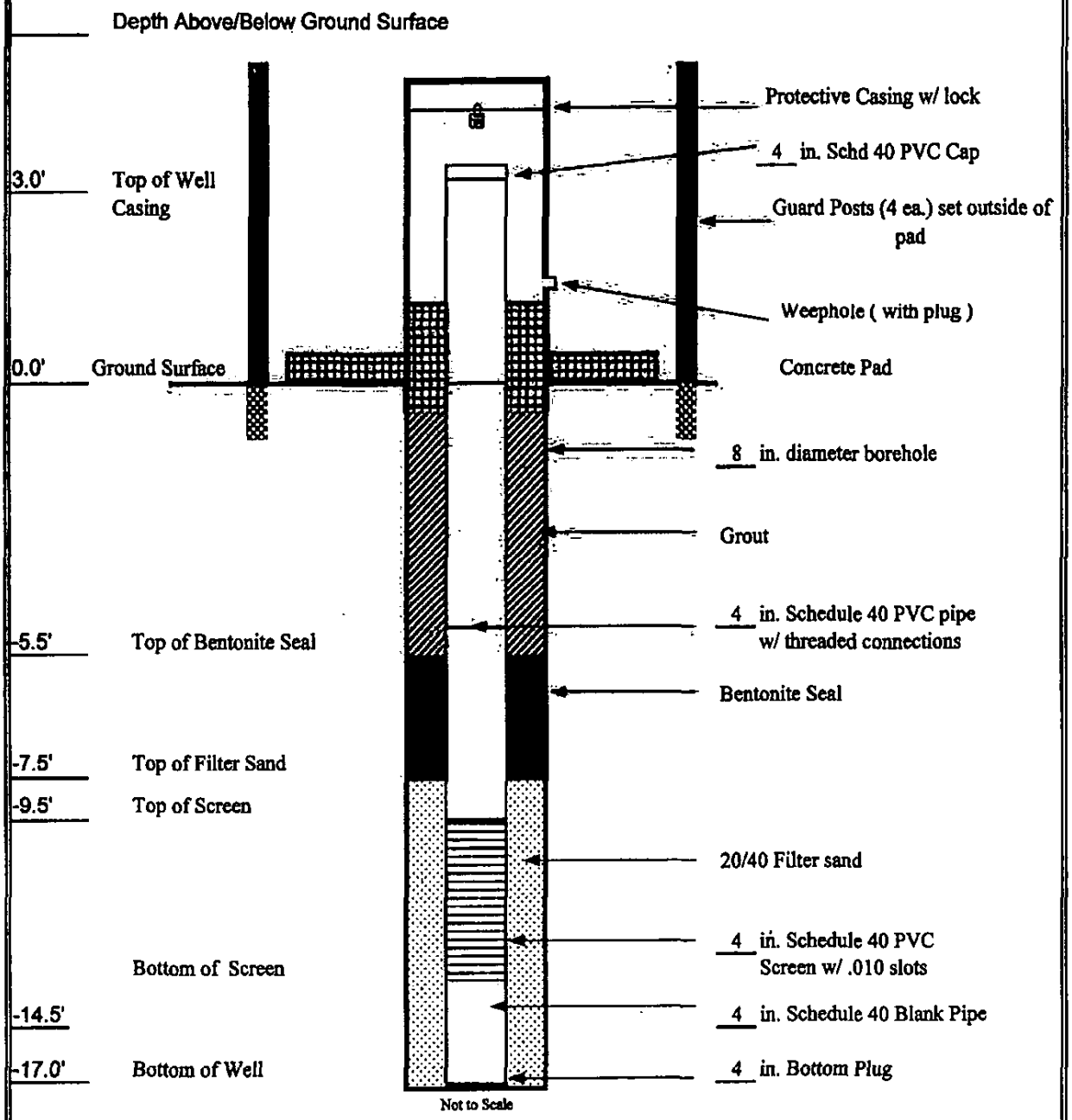
MW-F18
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

STE PROJECT NO. **07-L1165**



MW-F19

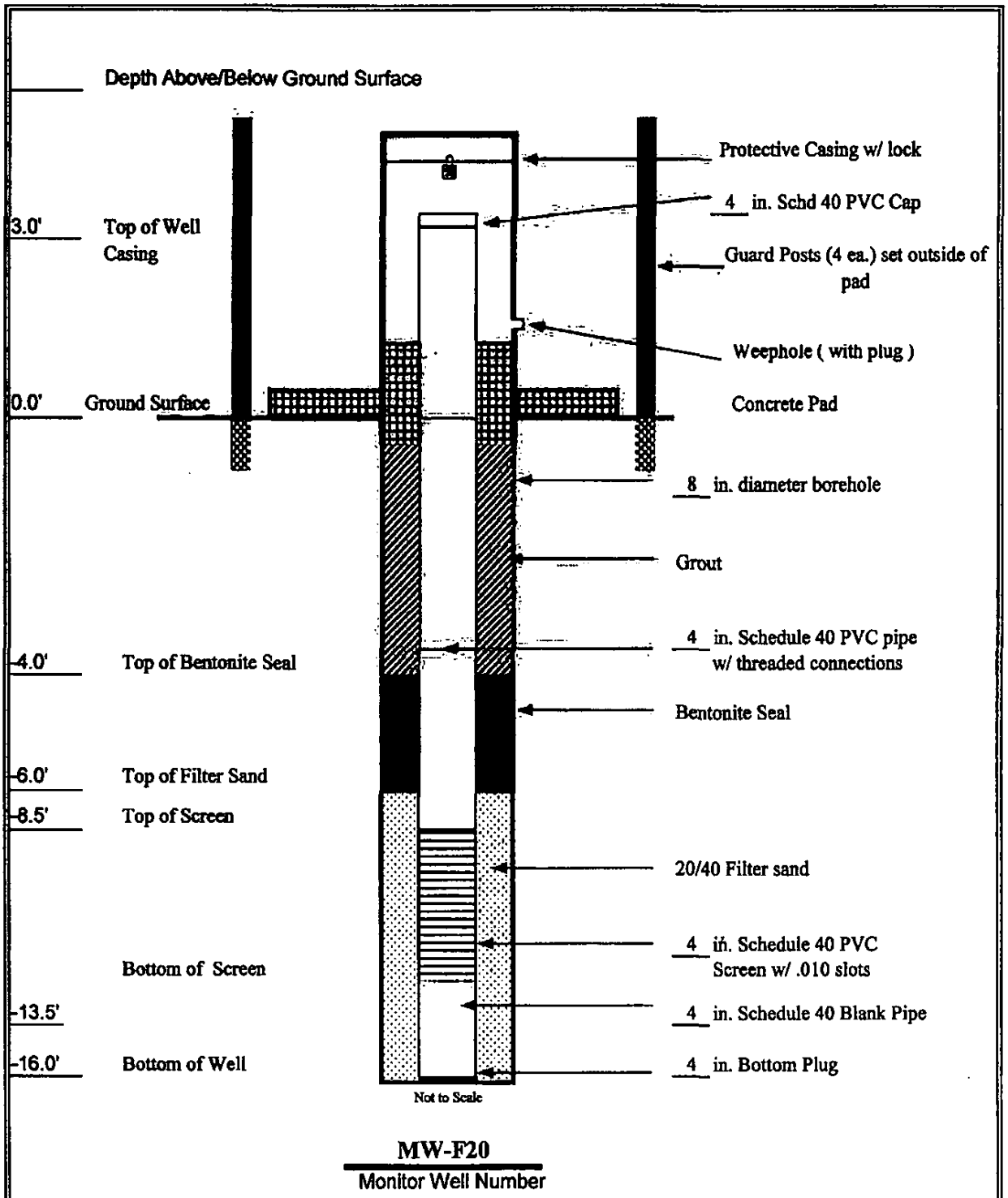
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

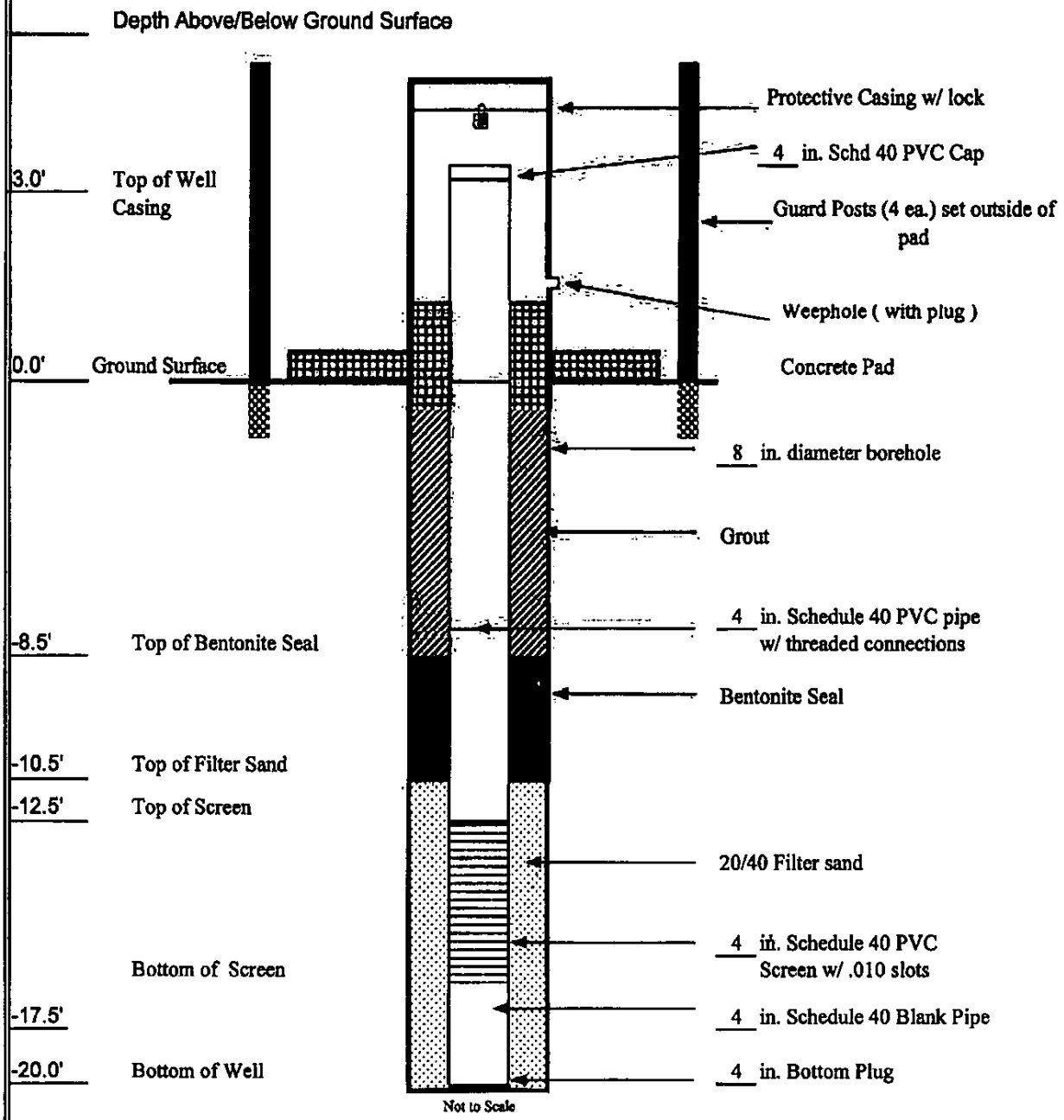
STE PROJECT NO. **07-L1165**



MW-F20
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION** CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY** STE PROJECT NO. **07-L1165**



MW-F21

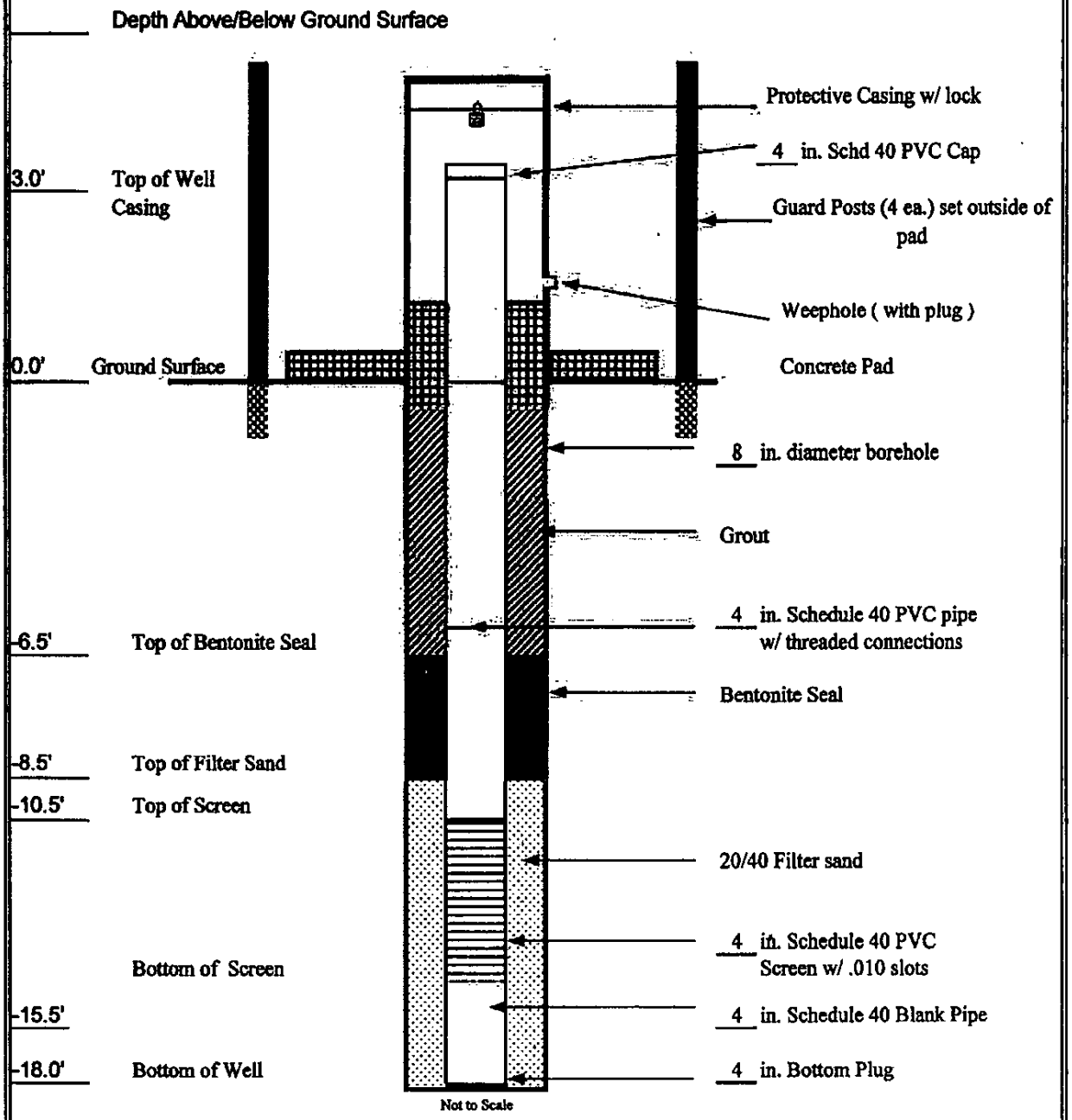
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

STE PROJECT NO. **07-L1165**



MW-F22

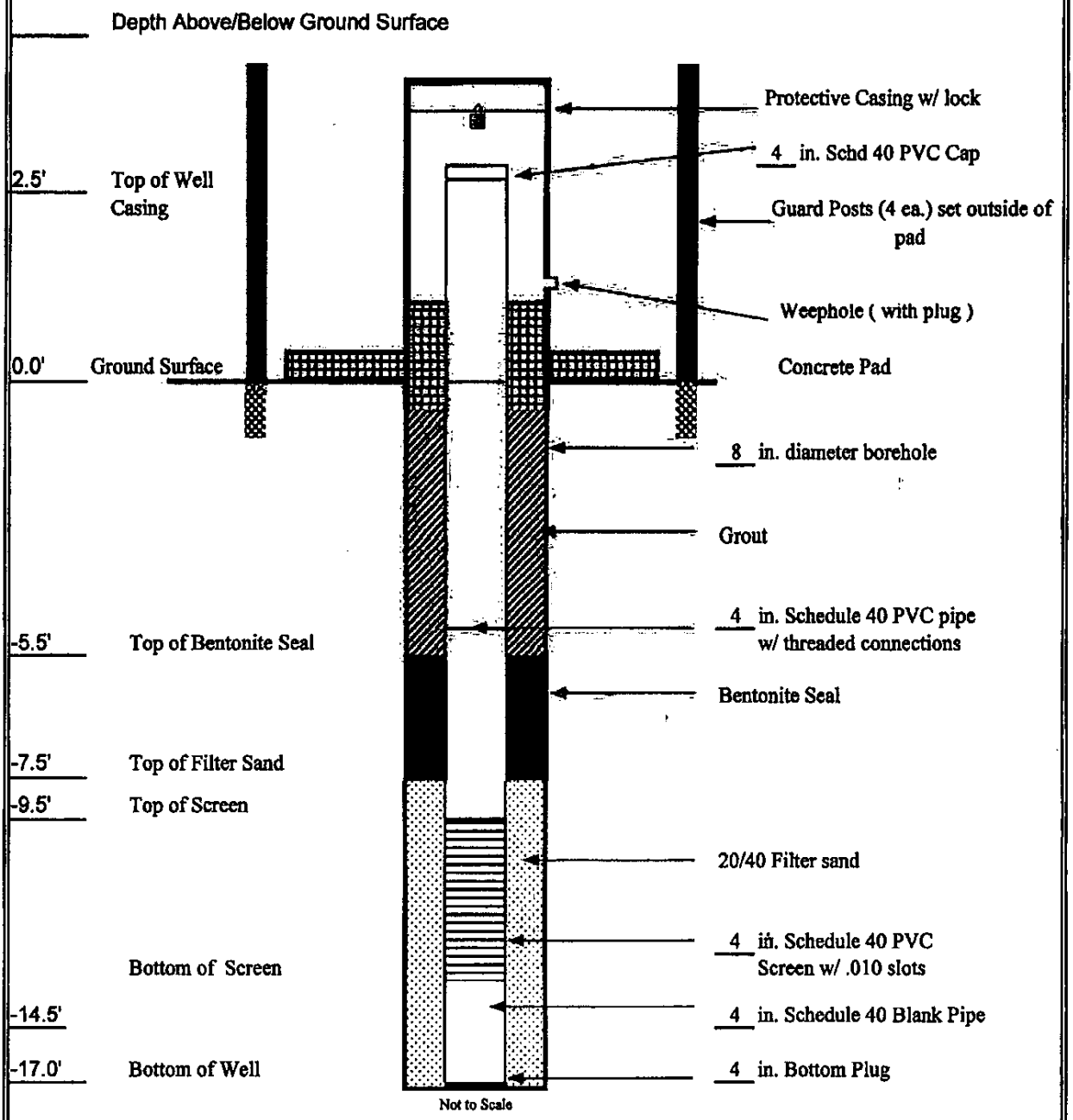
Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

STE PROJECT NO. **07-L1165**

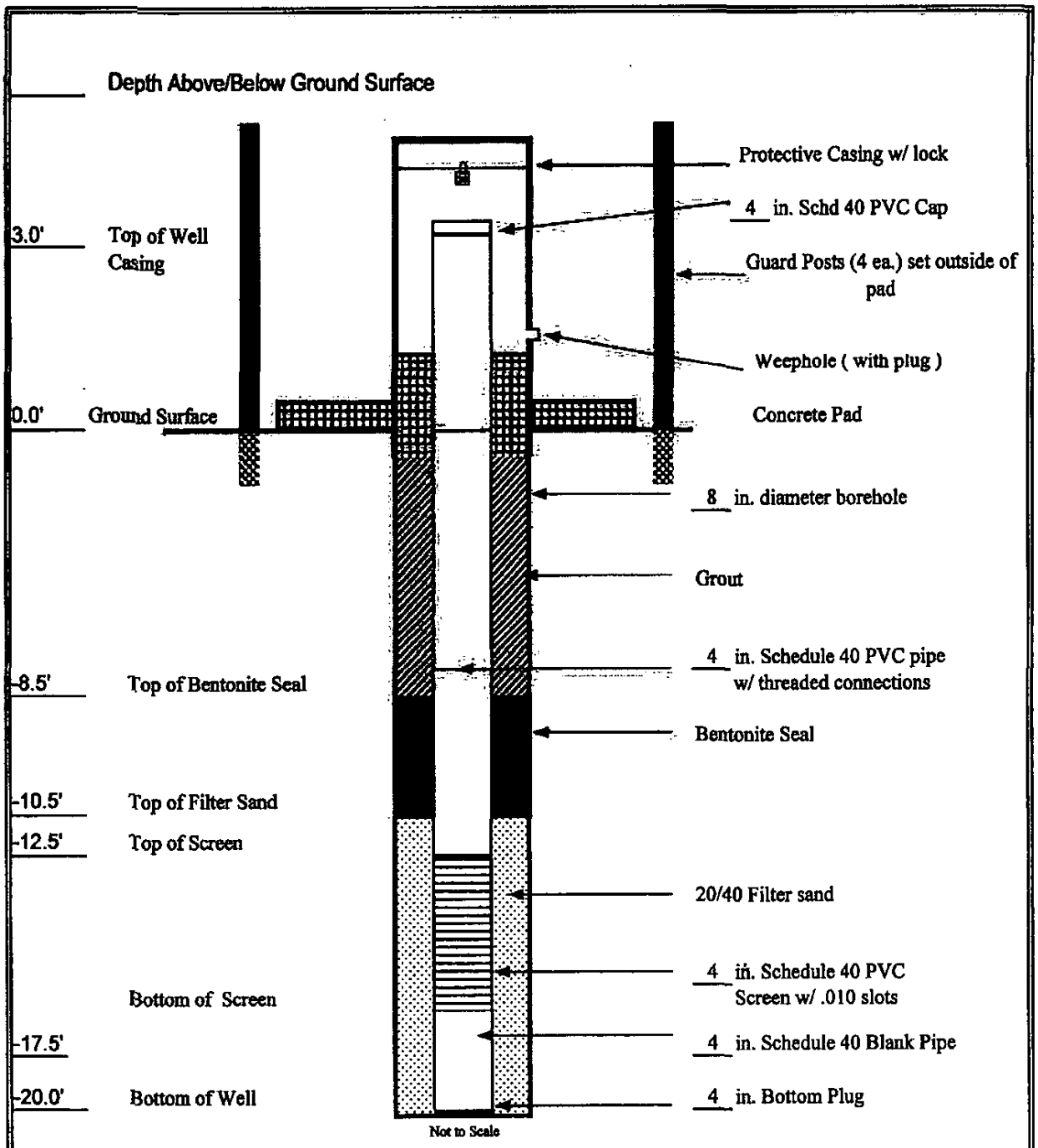


MW-F23

Monitor Well Number

PROJECT NAME : **WELL INSTALLATION** CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY** STE PROJECT NO. **07-L1165**



MW-F24

Monitor Well Number

PROJECT NAME : **WELL INSTALLATION**

CLIENT : **HONEYWELL INTERNATIONAL**

PROJECT LOCATION : **HONEYWELL FACILITY**

STE PROJECT NO. **07-L1165**

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F17

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/18/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 51.5"
Long. 91° 2' 40.3"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	Description
			2.75 (P)		Stiff to very stiff gray CLAY w/organic traces and oxidized traces
			3.0 (P)		– w/slickensides
	5		1.5 (P)		– w/silt traces
			1.25 (P)		Medium gray CLAY w/silt traces, organics, and oxidized traces
			No (P)		Loose gray SILTY SAND w/organic traces and oxidized traces
	10		No (P)		Very soft brownish-gray SILTY SAND w/organic traces and oxidized traces
▽			0.5 (P)		Soft gray CLAY w/silt and organic traces
	15		0.75 (P)		Soft gray LEAN CLAY w/organic traces
					Boring completed at 16 ft.
	20				
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered; borehole caved in to 9 ft. after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 12 ft. 4" Dia. Rotary Wash: 12 to 16 ft.	
	Boring Abandonment Method	
	Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F18

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/18/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 57.5"
Long. 91° 2' 36.7"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	Description
			2.25 (P)		Stiff brownish-gray CLAY w/organic traces and oxidized traces
			2.5 (P)		– becoming gray w/slickensides
	5		2.5 (P)		
▽			1.5 (P)		Stiff gray LEAN CLAY w/organic traces and oxidized traces
			0.75 (P)		Soft grayish-brown SILT w/clay traces, oxidized traces, and organic traces
▽	10		1.5 (P)		Stiff grayish-brown LEAN CLAY w/oxidized traces and organic traces
			0.75 (P)		Soft gray LEAN CLAY w/organic traces
	15		0.75 (P)		Soft gray CLAY w/silt traces and organic traces
			0.5 (P)		Very soft gray LEAN CLAY w/organic traces
					Boring completed at 18 ft.
	20				
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▼ Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 10 ft. 4" Dia. Rotary Wash: 10 to 18 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGFm 07-L1165.GPJ LOG001.GDT 10/24/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F19

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/10/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 58.1"
Long. 91° 2' 30.3"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	Description
			2.25 (P)		Stiff gray CLAY w/organic traces
			2.25 (P)		– w/oxidized traces and slickensides traces
	5		2.5 (P)		– w/ferrous nodules and oxidized traces
			1.0 (P)		Medium gray CLAY w/silt traces, organics, and oxidized traces
▽			1.0 (P)		Medium to soft brownish-gray SILTY SAND
	10				– w/oxidized traces
▽			0.75 (P)		– w/organic traces
			0.75 (P)		– w/clay traces and organic traces
	15		0.75 (P)		
			0.75 (P)		Soft gray CLAY w/silt traces and organic traces
			1.0 (P)		Medium gray LEAN CLAY w/organic traces
	20				Boring completed at 20 ft.
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▼ Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 12 ft. 4" Dia. Rotary Wash: 12 to 20 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F20

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/11/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 55.9"
Long. 91° 2' 24.4"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					Description
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	
			3.5 (P)		Very stiff to stiff gray CLAY w/oxidized traces
					– w/organic traces
			3.25 (P)		– w/organic traces
	5		1.75 (P)		– w/ferrous nodules traces
▼			1.25 (P)		Medium grayish-brown LEAN CLAY w/sand traces, organic traces, and oxidized traces
			1.0 (P)		Medium gray SILTY SAND
▽	10				– w/clay
			1.25 (P)		– w/organic traces
			1.0 (P)		– w/organic traces
	15		1.0 (P)		Medium gray CLAY w/organic traces
					Boring completed at 16 ft.
	20				
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▼ Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 16 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F21

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/11/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 50.6"
Long. 91° 2' 20.4"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					Description
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	
			2.0 (P)		Stiff grayish-brown CLAY w/organic traces
					-- w/oxidized traces
			1.75 (P)		-- w/silt traces and oxidized traces
	5		1.5 (P)		-- becoming gray w/silt traces and oxidized traces
			1.25 (P)		Medium gray CLAY w/silt traces, oxidized traces, and organic traces
			1.25 (P)		
	10				
▽			0.5 (P)		Soft to very soft grayish-brown SILTY SAND w/oxidized traces
					-- w/clay and organic traces
			1.5 (P)		-- w/clay traces
	15		No (P)		
			No (P)		-- w/organic traces
			No (P)		-- w/clay traces
	20				Boring completed at 20 ft.
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered	4" Nom. Dia. Short Flight Auger: 0 to 18 ft. 4" Dia. Rotary Wash: 18 to 20 ft.	
	Boring Abandonment Method: Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F22

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/12/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 44.3"
Long. 91° 2' 22.8"

Surface Elevation: N/A (ft., NGVD)

Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	Description
			4.5 (P)		Very stiff brown and light brown CLAY w/organic traces and oxidized traces
			1.75 (P)		Stiff brownish-gray SILTY SAND w/clay traces, organic traces, and oxidized traces
	5		1.75 (P)		Stiff grayish-brown CLAY w/organic traces and oxidized traces
▼			1.5 (P)		
			1.0 (P)		Medium to soft gray CLAY w/organics and oxidized traces
	10		0.5 (P)		– becoming grayish-brown w/silty sand
			No (P)		Very loose grayish-brown SILTY SAND w/oxidized traces – w/organic traces
▽	15		No (P)		– becoming gray w/clay traces
			1.0 (P)		Medium gray CLAY w/silty sand traces
					Boring completed at 18 ft.
	20				
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▼ Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 16 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F23

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/17/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 41.9"
Long. 91° 2' 30.3"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					
Ground Water Level	Depth (feet)	Samples	Field Test Results	Soil Type	Description
			2.0 (P)		Stiff brownish-gray CLAY w/organic traces and oxidized traces
▽			1.5 (P)		Stiff brownish-gray LEAN CLAY w/organic traces and oxidized traces
	5		1.5 (P)		Stiff gray CLAY w/organic traces and oxidized traces
▽			0.75 (P)		Soft gray CLAY w/silt traces, organic traces and oxidized traces
			0.75 (P)		
	10		0.75 (P)		Soft gray SILTY SAND w/clay traces, organic traces, and oxidized traces
			1.0 (P)		Medium gray SAND w/clay traces, organic traces, and oxidized traces
	15		0.75 (P)		Soft gray SILTY SAND w/clay traces, organic traces, and oxidized traces
			1.0 (P)		Medium gray LEAN CLAY
			1.0 (P)		-- w/organic traces
	20				Boring completed at 20 ft.
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered ▼ Water level after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 10 ft. 4" Dia. Rotary Wash: 10 to 20 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

Well Installation
Stack 7A
Honeywell Facility
Geismar, LA

FIELD LOG OF SOIL BORING MW-F24

Ardaman & Associates, Inc.

File: 07-L1165
Date: 09/17/07
Logged by: J. Lavergne
Driller: M. McKinney
Rig: CME 75

Honeywell International, Inc.
Geismar, LA

Sheet 1 of 1
LELAP Certificate No. 02052

Location: Lat. 30° 13' 44.5"
Long. 91° 2' 37.5"

Surface Elevation: N/A (ft., NGVD)

FIELD DATA					Description
Ground Water Level	Depth (feet)	Sampler	Field Test Results	Soil Type	
			No (P)		GYPSUM
			No (P)		
	5		2.0 (P)		Stiff gray CLAY w/organic traces and oxidized traces
			1.75 (P)		
			0.75 (P)		
	10		0.5 (P)		Soft gray SILT w/clay traces, oxidized traces, and organic traces
▽			1.25 (P)		Medium gray SILTY SAND w/clay traces – w/oxidized traces
	15		1.0 (P)		– w/organic traces
			1.0 (P)		– w/organic traces
			1.0 (P)		– w/organic traces
	20				Boring completed at 20 ft.
	25				
	30				
	35				
	40				

Ground Water Level Data	Boring Advancement Method	Notes
▽ Free water first encountered; borehole caved in to 10 ft. after 15 mins.	4" Nom. Dia. Short Flight Auger: 0 to 14 ft. 4" Dia. Rotary Wash: 14 to 20 ft.	
	Boring Abandonment Method Monitor Well Installed	Soil descriptions are based primarily upon visual classifications.

ARD LOGF01 07-L1165.GPJ LOG01.GDT 10/03/07

MW-FB3 and M2-FB4

Honeywell

Specialty Materials
Honeywell
P.O. Box 226
Geismar, LA 70734

March 27, 2007

Certified Mail Receipt: 7004 1160 0003 2917 1156

Bijan Sharafkhani, Administrator
Waste Permits Division
P.O. Box 4313
Baton Rouge, LA 70821-4313

RE: Groundwater Monitoring Well Completion Details, Fluorogypsum Stacking Facility, Agency Interest No. 2082, Permit P-0216R1, PER 20060002, GD-005-0313, Honeywell International Inc., Geismar, LA

Dear Mr. Sharafkhani:

In an accordance with LAC 33:VII.709.E.1.d, Honeywell Geismar Facility is submitting groundwater monitoring well completion detail report for the two recently installed monitoring wells at the Fluorogypsum Stacking Facility. The two wells: MW-FB3 and MW-FB4 were installed in accordance with LaDOTD and LDEQ's "CONSTRUCTION OF GEOTECHNICAL BOREHOLES AND GROUNDWATER MONITORING SYSTEMS HANDBOOK" (December 2003).

In an ongoing effort to further define Honeywell's groundwater monitoring network, Honeywell installed one 4-inch diameter Zone I potential background monitoring well (MW-FB3) and one 4-inch diameter Zone II potentially background monitoring well (MW-FB4). MW-FB3 and MW-FB4 will be statistically analyzed using the ANOVA analysis in future semi-annual reports to determine the validity of the existing background monitoring wells MW-FB1 and MW-FB2.

This submittal includes: a revised Table 1 -Well Construction Details, LDOTD Water Well Registration Short Forms (DOTD-GW-1S), as-built diagrams, and scaled plot plans identifying the locations of the groundwater monitoring wells. If you have any questions regarding this submittal, please contact Byron Braud at (225) 642-2792.

Respectfully,

Byron Braud
Environmental Engineer

cc: Mr. Drukell Trahan, LDEQ Technology Division

1-8-07

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER Honeywell (Geismar) PHONE 225-642-2758
3. WELL OWNER'S ADDRESS 5525 Hwy 3315, Geismar, La. 70734
4. OWNER'S WELL NUMBER OR NAME (if any) MW-B3
5. DATE COMPLETED 11/21/06 DEPTH OF HOLE 25 FT. DEPTH OF WELL 25 FT.
6. STATIC WATER LEVEL 7.17 FT. BELOW GROUND SURFACE MEASURED ON 11.21.06 (Date)
7. CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 18 FT
8. SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .01 LENGTH 10 FT.
9. CEMENTED FROM 11 FT. TO GROUND SURFACE, USING [X] PUMP-DOWN METHOD OR [ ] GRAVITY METHOD
10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Geismar, La (Town or City)
    APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, Railroad, Any Landmark, etc.)
    (Please draw sketch on back of Original)
11. REMARKS: 3 ft of stick up
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	15	Firm brown clay			
15	16	Soft, brn, clayey silt			
16	17	Frm brown clay			
17	18	Soft Grey clayey silt			
18	19	Firm Grey clay			
19	24	Soft, grey, clayey silt			

13. FOR HEAT PUMP ONLY: AVG. DEPTH Not Applicable FT. NUMBER OF HOLES Not Applicable
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: Professional Technical Support Services, Inc.

(REV. 7/93)

DOTD'S COPY

Professional Technical Support Services, Inc.
Name of Water Well Contractor
LICENSE NUMBER WWG-0394
Authorized Signature 1-7-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN: CHIEF – WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(225) 379-1434

FOR OFFICE USE ONLY
PARISH WELL NO.
IDENTIFICATION NUMBER 0
REVISED COORDINATES
Geologic Unit
Use of Well
SECTION TOWNSHIP RANGE
ELEV. QUAD. NO.
INPUT BY: DATE:
INSPECTED BY: DATE:
REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY
LATITUDE 3 1 1 3 4 3 LONGITUDE 9 1 0 2 4 9
SECTION 0 4 2 TOWNSHIP 0 9 S RANGE 0 2 E
ELEV. 0 0 2 0 QUAD. NO. 1 8 6 B
SITE ADDRESS:

Submitted to DOTD on 1-8-07

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL REGISTRATION SHORT FORM (DOTD-GW-1S)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

1. USE OF WELL (Check Appropriate Box)
   ☐ DOMESTIC ☐ RIG SUPPLY ☒ MONITORING ☐ PIEZOMETER ☐ RECOVERY
   ☐ HEAT PUMP HOLE ☐ HEAT PUMP SUPPLY ☐ ABANDONED PILOT HOLE ☐ OTHER _____ (Please Specify)
2. WELL OWNER Honeywell (Gelsmar) PHONE 225-642-2758
3. WELL OWNER'S ADDRESS 5525 Hwy 3315, Gelsmar, La. 70734
4. OWNER'S WELL NUMBER OR NAME (if any) MW-B4
5. DATE COMPLETED 11/21/06 DEPTH OF HOLE 48 FT. DEPTH OF WELL 45 FT.
6. STATIC WATER LEVEL 12.79 FT. BELOW GROUND SURFACE MEASURED ON 11.21.06 (Date)
7. CASING 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER LENGTH 38 FT
8. SCREEN 4 IN ☐ METAL ☒ PLASTIC ☐ OTHER SLOT SIZE .01 LENGTH 10 FT.
9. CEMENTED FROM 31 FT. TO GROUND SURFACE, USING [X] PUMP DOWN METHOD OR [ ] GRAVITY METHOD
10. LOCATION OF WELL: PARISH Ascension WELL IS NEAR, Gelsmar, La (Town or City)
    APPROXIMATELY 1.1 MILES FROM Hwy 75 north on Hwy 3115 (Crossroads, Railroad, Any Landmark, etc.)
    (Please draw sketch on back of Original)
11. REMARKS: 3 ft of stick up
12. DRILLER'S LOG (Description and color of cuttings, such as shale, sand, etc. in feet)

FROM	TO	DESCRIPTION	FROM	TO	DESCRIPTION
0	15	Firm brown clay	25	32	Soft, grey clay
15	16	Soft, brn, clayey silt	32	44	Soft, grey clay
16	17	Frm brown clay	44	48	Soft, grey clayey silt
17	18	Soft Grey clayey silt			
18	19	Firm Grey clay			
19	24	Soft, grey, clayey silt			

13. FOR HEAT PUMP ONLY: AVG. DEPTH Not Applicable FT. NUMBER OF HOLES Not Applicable
14. ABANDONMENT INFORMATION: DOES THE NEW WELL REPLACE AN EXISTING WELL? YES ☐ NO ☒
15. NAME OF PERSON WHO DRILLED THE WELL: Professional Technical Support Services, Inc.

(REV. 7/93)

DOTD'S COPY

Professional Technical Support Services, Inc.
Name of Water Well Contractor

LICENSE NUMBER WWC-0394

Authorized Signature 1-7-07 Date

MAIL ORIGINAL TO:
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ATTN: CHIEF – WATER RESOURCES SECTION
P.O. BOX 94245
BATON ROUGE, LA 70804-9245
(225) 379-1434

FOR OFFICE USE ONLY

PARISH WELL NO.
IDENTIFICATION NUMBER 0
REVISED COORDINATES
Geologic Unit
Use of Well
SECTION TOWNSHIP RANGE
ELEV. QUAD. NO.
INPUT BY: DATE:
INSPECTED BY: DATE:
REMARKS:

FOR MONITOR/PIEZO/RECOVERY WELLS ONLY

LATITUDE 3 0 1 3 3 1 LONGITUDE 9 1 0 3 0 1
SECTION 0 4 2 TOWNSHIP 0 9 S RANGE 0 2 E
ELEV. 0 0 2 0 QUAD. NO. 1 8 6 B
SITE ADDRESS:

Shaw Environmental, Inc.

Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, LA 70809

BORING LOG - MW-B3

Honewell Geismar
5525 Hwy. 3315
Geismar, LA. 70734

Date of installation	: 11/21/06	Logged By	: P. Mickal
Borehole Diameter	: 10"	Lattitude	: 30 13' 47.4142" N
Drilling Method	Hollow Stem Auger	Longitude	: 91 02' 42.4835" W
Sampling Method	: 4' Macro Core Sampler	Well Diameter	: 4"
Drilling Agency	: Pro-Tech	Well Total Depth-BGS	: 25'

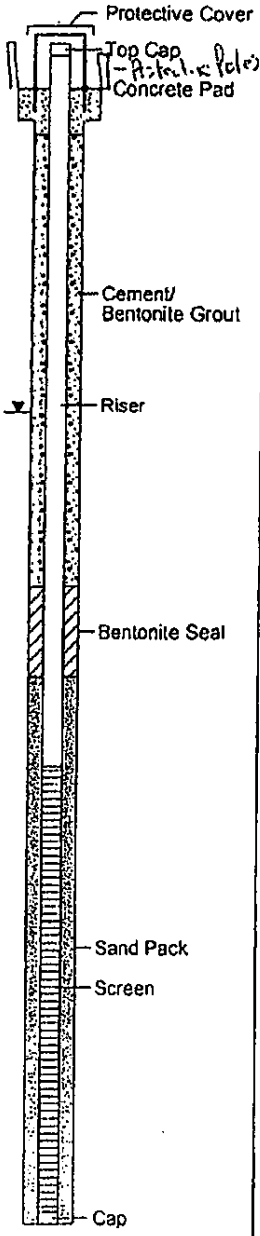
Sample Condition: Undisturbed; No Recovery

Water Levels: Static; Initial

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	Sample	PID	Sample ID	Time
0–4	CH		firm, brown CLAY, moist				1330
4–10	CL		firm, brown and grey silty CLAY, moist				1335, 1345
10–16	CH		firm, brown CLAY, moist				1345
14–16	ML		soft, brown clayey SILT, wet				
16–18	CH		firm, brown CLAY, moist				1405
16–18	ML		soft, grey clayey SILT, wet				
18–20	CH		firm, grey CLAY, moist				
20–22	ML		soft, grey clayey SILT, wet				
22–24	CL		soft, grey silty CLAY, wet				

Boring was terminated at 24 ft-bgs. A 4" PVC well was then installed using hollow stem augers to a depth of 25 ft-bgs and completed as background monitor well B3.

Well ID: MW-B3
TOC Elev: 20.97



01-08-2007 N:\CLIENT\Honeywell\238581\Working\Boring Logs\MW-B3.bor

Shaw Environmental, Inc.

Shaw Environmental, Inc.
4171 Essen Lane
Baton Rouge, LA 70809

BORING LOG - MW-B4

Honewell Geismar
5525 Hwy. 3315
Geismar, LA. 70734

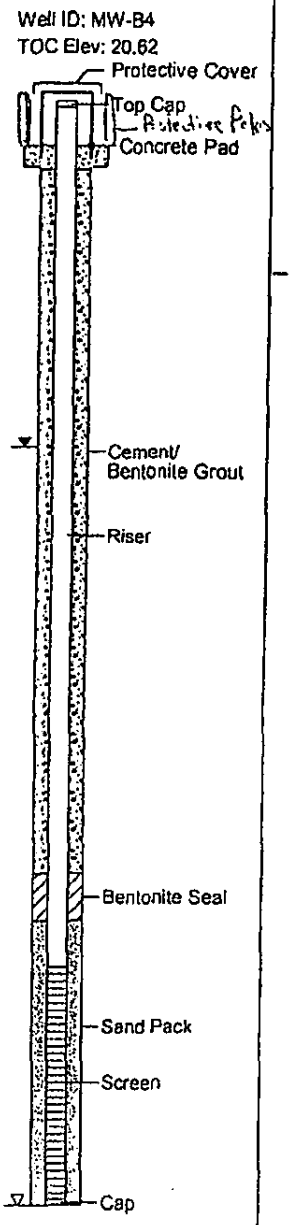
Date of Installation	: 11/21/06	Logged By	: P. Mickal
Borehole Diameter	: 10"	Latitude	: 30 13' 47.3190" N
Drilling Method	: Hollow Stem Auger	Longitude	: 91 02' 42.7899" W
Sampling Method	: 4' Macro Core Sampler	Well Diameter	: 4"
Drilling Agency	: Pro-Tech	Well Total Depth-BGS	: 45'

Sample Condition: Undisturbed; No Recovery

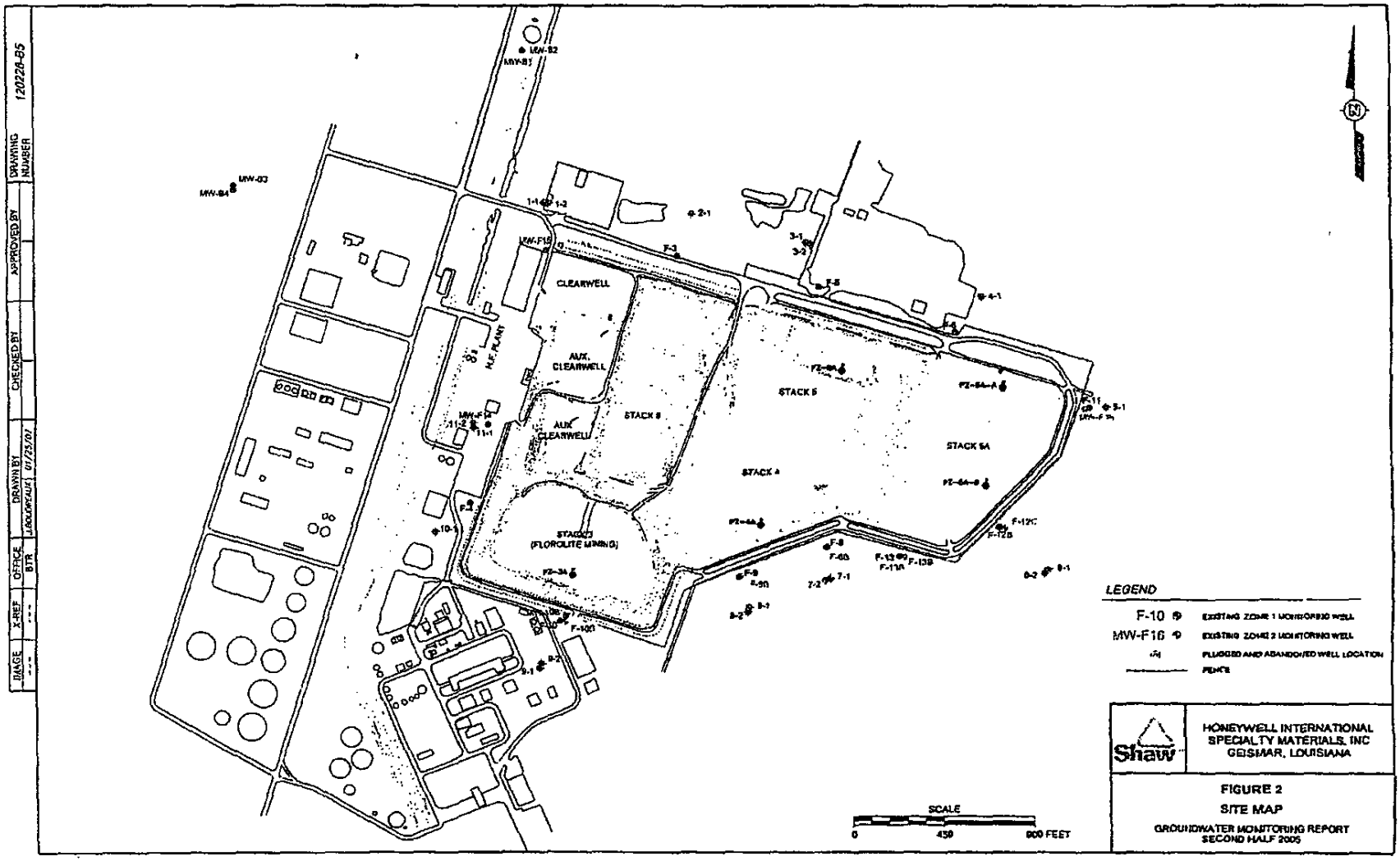
Water Levels: Static; Initial

Depth in Feet	USCS	DESCRIPTION	Sample	PID	Sample ID	Time
0–4	CH	firm, brown CLAY, moist				1352
4–14	CL	firm, brown and grey silty CLAY, moist				1556, 1559
12–14	CH	firm, brown CLAY, moist				1606
16	ML	soft, brown clayey SILT, wet				
16	CH	firm, brown CLAY, moist			MW-B4 (16-18)	1613
18	ML	soft, grey clayey SILT, wet				
18	CH	firm, grey CLAY, moist				
20–22	ML	soft, grey clayey SILT, wet				1621
22–24	CL	soft, grey silty CLAY, wet				
24–28	CH	soft, grey CLAY, moist; firm				1628
28–30					MW-B4 (28-30)	1638
30–32	CH	firm, dark grey CLAY, moist, organic debris				
32	CL	soft, grey silty CLAY, moist				1648
32–40	CH	soft, grey CLAY, moist; firm				1659, 1718
40–42		no recovery				
42–48	ML	soft, grey clayey SILT, wet, some sand			MW-B4 (46-48)	1730

Boring was terminated at 48 ft-bgs. A 4" PVC well was then installed using hollow stem augers to a depth of 45 ft-bgs and completed as background monitor well B4.



01-08-2007 N:\CLIENT\Honeywell\123858\Working\Boring Logs\MW-B4.bor



CLEARWELL
AUX. CLEARWELL
AUX. CLEARWELL
H.F. PLANT
STACK 8
STACK 5
STACK 5A
STACK 4
STACK 3 (FLOROLITE MINING)
MW-F15
MW-F14
MW-F16
MW-B1
MW-B2
MW-B3
MW-B4
LEGEND
F-10 EXISTING ZONE 1 MONITORING WELL
MW-F16 EXISTING ZONE 2 MONITORING WELL
PLUGGED AND ABANDONED WELL LOCATION
FENCE
SCALE
0
450
900 FEET
Shaw
HONEYWELL INTERNATIONAL SPECIALTY MATERIALS, INC
GEISMAR, LOUISIANA
FIGURE 2
SITE MAP
GROUNDWATER MONITORING REPORT
SECOND HALF 2005
DRAWING NUMBER 120226-B5
APPROVED BY
CHECKED BY
DRAWN BY J.BOUDREAUX 01/25/07
OFFICE BTR
X-REF
IMAGE

7004 1160 0003 2917 1156

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Street, Apt. No.; or PO Box No.: Waste Permits Division, P.O. Box 4313
City, State, ZIP+4: Baton Rouge, LA 70821-4313

PS Form 3800

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Bijan Sharafkhani, Administrator
Waste Permits Division
P.O. Box 4313
Baton Rouge, LA 70821-4313

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Torrie Lucas ☒ Agent ☐ Addressee

B. Received by (Printed Name) TORRIE LUCAS C. Date of Delivery MAR 30 2011

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7004 1160 0003 2917 1156

PS Form 3811, February 2004 Domestic Return Receipt Well Completion Details 102595-02-M-1540

Fluorogypsum Stacking Facility
Groundwater Monitoring Well Construction Details

WELL NUMBER	LDOTD REGISTRATION NUMBER	UNIT MONITORED	GROUNDWATER MONITORING ZONE	CASING MATERIAL SIZE	SAMPLING EQUIPMENT	CASING ELEVATION FEET M.S.L.	WELL DEPTH, FEET	WELL DEPTH M.S.L.	GROUND SURFACE ELEV. FEET M.S.L.	INSTALLATION DATE	SCREEN INTERVAL, FROM ELEVATION, FEET, M.S.L.	SCREEN INTERVAL, TO ELEV. FEET, M.S.L.	LATITUDE	LONGITUDE
F3	(a)	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	23.67	20	-0.3	19.7	1982	7.7	2.7	30° 13' 43.6" N	91° 02' 49.1" W
F3B	8633Z	IMPOUNDMENT	ZONE 2	4" PVC	Piezometer	23.41	43	-24.1	18.9	1996	-16.6	-21.6	30° 13' 43.7" N	91° 02' 49.2" W
F4	(a)	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	23.61	22	-2.3	19.7	1982	5.7	0.7	30° 13' 31.0" N	91° 03' 01.6" W
F5	9952Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	20.83	20	-2.1	17.9	1986	5.9	0.9	30° 13' 41.9" N	91° 02' 41.3" W
F6	9953Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	21.49	27	-5.1	18.9	1986	-0.1	-5.1	30° 13' 39.4" N	91° 02' 33.4" W
F8	9954Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	21.46	27	-5.2	18.8	1986	-0.2	-5.2	30° 13' 28.2" N	91° 02' 41.0" W
F9	9955Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	23.19	26.5	-6.2	20.3	1986	1.8	-3.2	30° 13' 26.8" N	91° 02' 46.0" W
F10	9956Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	24.16	21	0.3	21.3	1986	8.3	3.3	30° 13' 24.4" N	91° 02' 56.4" W
F10B	8635Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	24.18	48	-26.7	21.3	1996	-19.2	-24.2	30° 13' 24.5" N	91° 02' 56.5" W
F10C	9639Z	IMPOUNDMENT	ZONE 3	4" PVC	Piezometer	23.74	55	-33.8	21.2	1996	-26.3	-31.3	30° 13' 24.4" N	91° 02' 56.5" W
F11	9640Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	21.57	25	-6	19	2002	1.5	-3.5	30° 13' 35.3" N	91° 02' 26.2" W
F12B	9635Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	20.2	25	-7	18	2002	0.5	-4.5	30° 13' 29.0" N	91° 02' 31.1" W
F13	9644Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	20.57	25	-7	18	2002	0.5	-4.5	30° 13' 27.7" N	91° 02' 36.4" W
F13B	9643Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	20.67	40	-22	18	2002	-14.5	-19.5	30° 13' 27.7" N	91° 02' 36.6" W
F13C	9640Z	IMPOUNDMENT	ZONE 3	4" PVC	Piezometer	20.32	55	-37.2	17.8	2002	-29.7	-34.7	30° 13' 27.7" N	91° 02' 36.7" W
F14	9917Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	19.82	25	-5.2	19.8	2004	-0.2	-5.2	30° 13' 34.7" N	91° 02' 59.7" W
F15	9918Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	24.14	30	-5.7	24.3	2004	-1.7	-5.7	30° 13' 42.8" N	91° 02' 57.4" W
F16	9919Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	21.7	53	-31.7	19.3	2004	-22.2	-26.7	30° 13' 35.4" N	91° 02' 26.2" W
FB1	9916Z	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	19.81	31	-14.5	16.5	2006	-9.5	-14.5	30° 13' 54.7" N	91° 02' 58.1" W
FB8	10184Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	21.26	42	-23.9	18.1	2006	-13.4	-23.4	30° 13' 28.2" N	91° 02' 41.1" W
F12C	10183Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	20.4	40	-22.2	17.8	2006	-11.7	-21.7	30° 13' 29.0" N	91° 02' 31.1" W
FB2	10182Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	19.46	45	-28.4	16.6	2006	-17.9	-27.9	30° 13' 54.6" N	91° 02' 58.2" W
FB6	10185Z	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	23.04	41	-20.7	20.3	2006	-10.2	-20.2	30° 13' 26.7" N	91° 02' 46.1" W
FB3	(b)	IMPOUNDMENT	ZONE 1	4" PVC	Submrs Pump	20.97	25	-4.53	17.53	2006	5.97	-4.03	30° 13' 43" N	91° 02' 49" W
FB4	(b)	IMPOUNDMENT	ZONE 2	4" PVC	Submrs Pump	20.62	45	-24.88	17.41	2006	-14.38	-24.38	30° 13' 31" N	91° 03' 01" W

Notes:
(a) Wells were installed pre-registration requirements
(b) Honeywell has not received the owner copy of the registration from the LaDOTD

TABLE 1
WELL CONSTRUCTION DETAILS
HONEYWELL FACILITY
GEISMAR, LA.

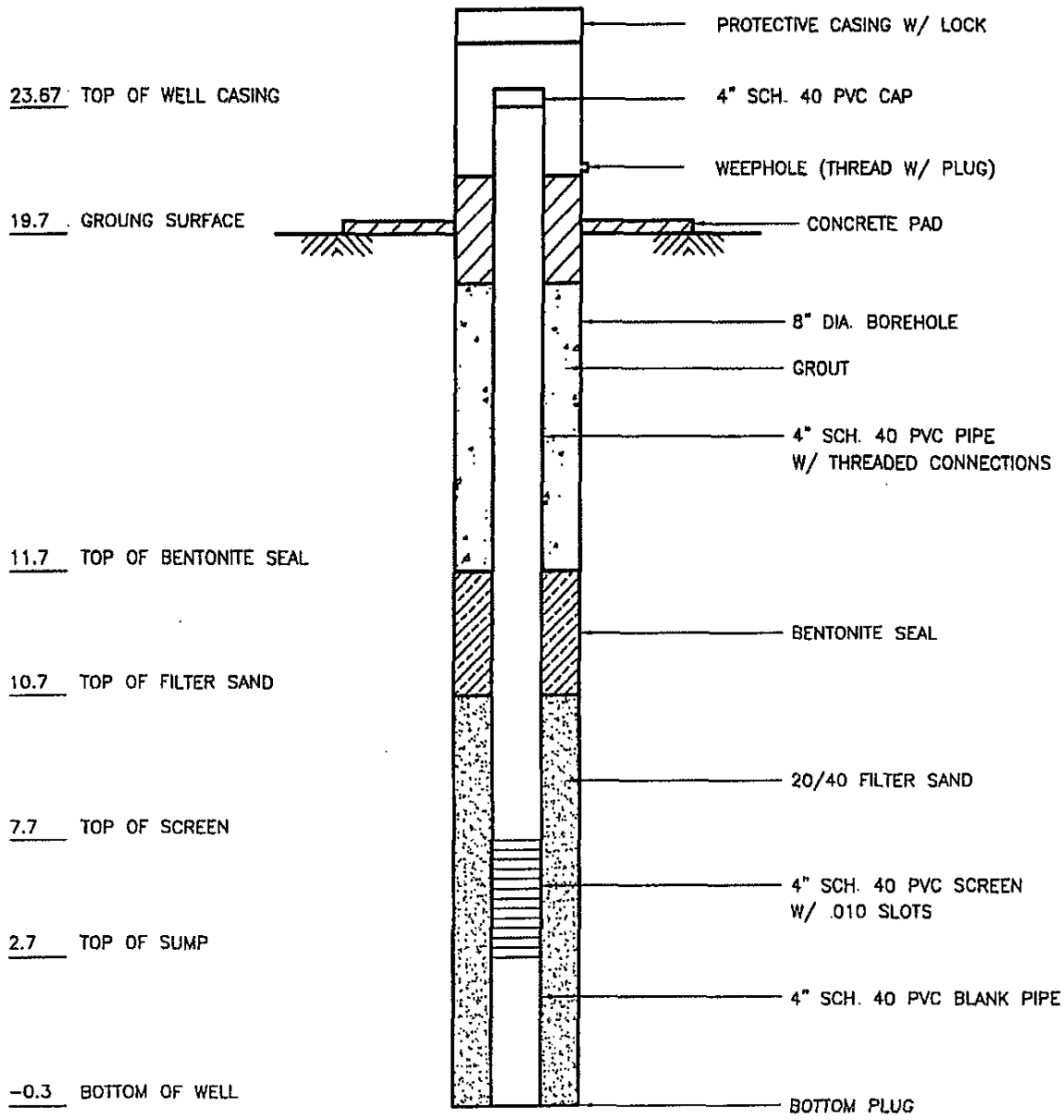
WELL NUMBER	UNIT MONITORED	CASING MATERIAL SIZE	SAMPLING EQUIPMENT	CASING ELEVATION FEET M.S.L.	WELL DEPTH	GROUND SURFACE ELEV. FEET, M.S.L.	INSTALLATION DATE	SCREEN INTERVAL, FROM ELEV. FEET, M.S.L.	SCREEN INTERVAL, TO ELEV. FEET, M.S.L.	LATITUDE	LONGITUDE
F3	Impoundment	4" PVC	Submrs Pump	23.67	20	19.7	1982	7.7	2.7	30°13'43.6"	91°02'49.1"
F3B	Impoundment	4" PVC	Piezometer	23.41	43	18.9	1998	-16.6	-21.6	30°13'43.7"	91°02'49.3"
F4	Impoundment	4" PVC	Submrs Pump	23.61	22	19.7	1982	5.7	0.7	30°13'31.0"	91°03'01.6"
F5	Impoundment	4" PVC	Submrs Pump	20.83	20	17.9	1986	5.9	0.9	30°13'41.9"	91°02'41.3"
F6	Impoundment	4" PVC	Submrs Pump	21.49	27	18.9	1986	-0.1	-5.1	30°13'43.7"	91°02'33.4"
F7	Impoundment	4" PVC	Submrs Pump	20.32	26	19.7	1986	1.7	-3.3	30°13'31.8"	91°02'34.5"
F7B	Impoundment	4" PVC	Piezometer	22.5	43	19.4	1998	-16.1	-21.1	30°13'31.7"	91°02'34.6"
F8	Impoundment	4" PVC	Submrs Pump	21.46	27	18.8	1986	-0.2	-5.2	30°13'28.2"	91°02'41.0"
F9	Impoundment	4" PVC	Submrs Pump	23.19	26.5	20.3	1986	1.8	-3.2	30°13'26.8"	91°02'46.0"
F10	Impoundment	4" PVC	Submrs Pump	24.18	21	21.3	1986	8.3	3.3	30°13'24.4"	91°02'56.4"
F10B	Impoundment	4" PVC	Piezometer	24.18	48	21.3	1998	-19.2	-24.2	30°13'24.6"	91°02'56.5"
F10C	Impoundment	4" PVC	Piezometer	23.74	55	21.2	1998	-26.3	-31.3	30°13'24.5"	91°02'56.6"
F11	Impoundment	4" PVC	Submrs Pump	21.57	25	19	2002	1.5	-3.5	30°13'35.3"	91°02'26.2"
F12B	Impoundment	4" PVC	Submrs Pump	20.2	25	18	2002	0.5	-4.5	30°13'39.0"	91°02'31.1"
F13	Impoundment	4" PVC	Submrs Pump	20.57	25	18	2002	0.5	-4.5	30°13'27.7"	91°02'36.4"
F13B	Impoundment	4" PVC	Piezometer	20.67	40	18	2002	-14.5	-19.5	30°13'27.7"	91°02'36.6"
F13C	Impoundment	4" PVC	Piezometer	20.52	55	17.8	2002	-29.7	-34.7	30°13'27.7"	91°02'36.7"

All elevations and locations were resurveyed in September, 2003.
Data from this Land Survey is included in this submittal and will be incorporated
as shown above in all future semi-annual groundwater monitoring reports.
(starting with 1st semi-annual report, 2004)
Mw-F3 , F4, F5, F6, F8, F9, F10, F11, F12B, and F13 are monitoring wells.
MW-F3B, F10B, F10C, F13B, and F13C are wells utilized as piezometers for groundwater elevation only.
MW-F7 and F7B were plugged and abandoned in May of 2002.
Note: All locations except F7 and F7B represent revised data from Land Survey performed in 2003.

MW-F3

MONITOR WELL - F3

Depth in Feet (BGS)	Lithologic Description
0-10	Clay, tan to grey, organic material
10-12	Silt, tan to grey, clayey
12-14	Silt, tan to grey, trace clay
14-17	Silt, grey, trace clay
17-20	Clay, silty, gray, plastic, soft



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F3

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C25

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C25.DWG

MW-F3B

Project: Monitor Well F-7-B, Fluorogypsum Stack No. 6
Geismar, Louisiana
For: Allied Signal
Geismar, Louisiana

Boring: F-3-B
File: 98-52
Date: 8 Jun 1998
Technician: BJB

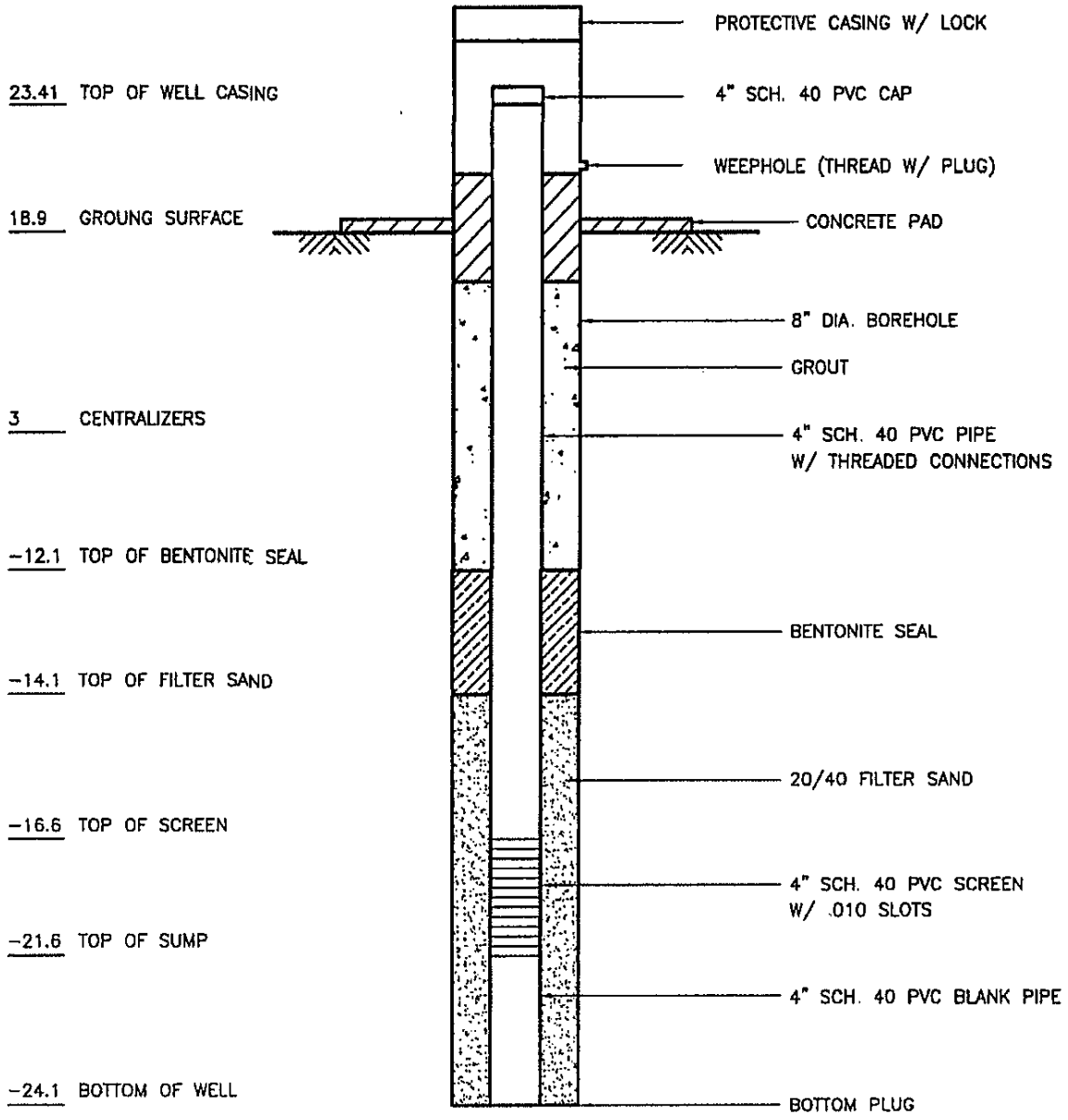
Depth Feet | Samples

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well installed in borehole

Boring Depth: 45 Feet

Depth Feet	Description
0	Medium tan and light gray clay with calcareous nodules and organic matter
	Medium tan and light gray clay with calcareous nodules
5	Medium tan and light gray clay with calcareous and ferrous nodules
	Medium tan and light gray clay with silt streaks
	Medium tan and light gray clay with silt streaks and ferrous nodules
10	Soft tan and light gray silty clay
	Soft tan and light gray silty clay
15	Soft tan and light gray silty clay
	Soft gray silty clay
	Soft gray silty clay
20	Soft gray silty clay
	Soft gray silty clay
25	Soft gray silty clay
	Soft gray silty clay
	Soft gray silty clay
30	Soft gray silty clay
	Medium gray clay with sand traces
35	Medium gray clay with sand traces
	Medium gray clay with silt traces
	Medium gray clay with silt traces
40	Medium gray clay with silt traces
	Medium gray clay with silt traces
45	



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F3B

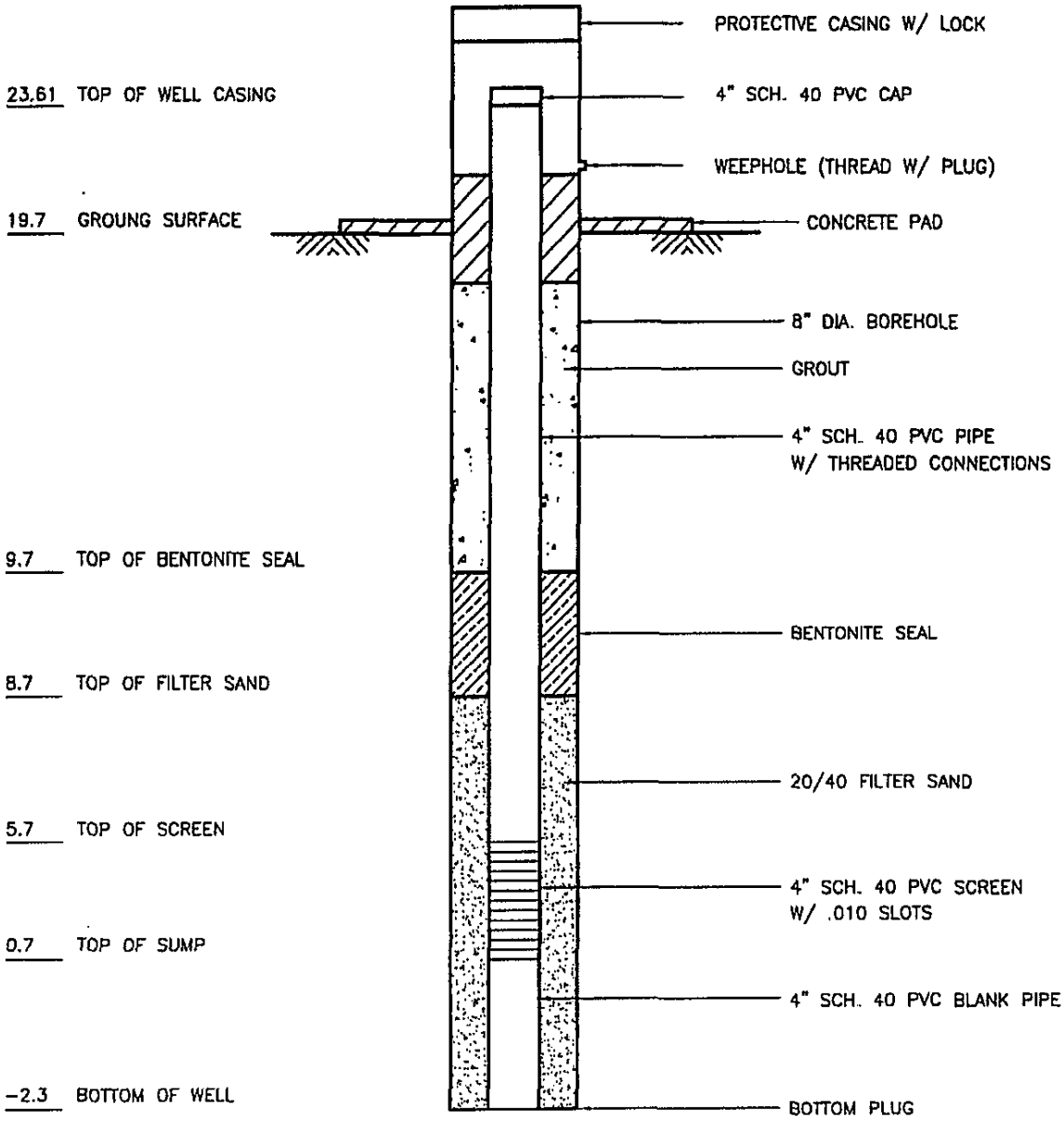
DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	28030275	C36

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C36.DWG

MW-F4

MONITOR WELL - F4

Depth in Feet (BGS)	Lithologic Description
0-2	Sand, brown, clayey, organic material
2-12	Clay, grey
12-20	Silt, grey, trace of fine grained sand, trace clay seams
20-23	Clay, silty, grey, very plastic



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F4

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C26

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C26.DWG

MW-F5

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F5

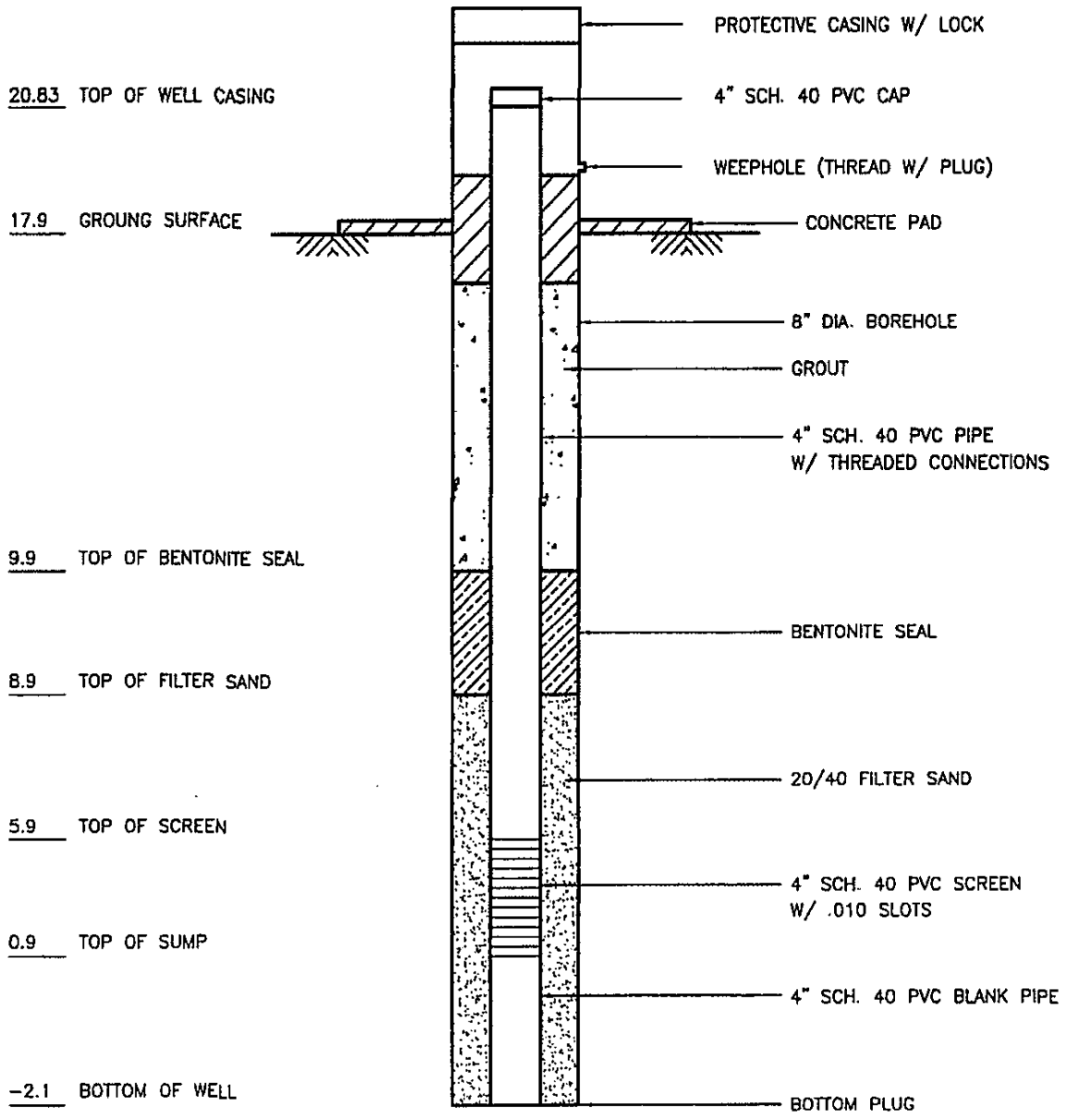
DEPTH, FT.	DESCRIPTION
0	SILTY CLAY, (CL).
5	
10	SILTY SAND, (SM).
15	
20	SILTY CLAY, (CL).
25	
30	
35	
40	

Well Screen

Bottom of Well

DATE PREPARED 12-2-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F5

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C27

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C27.DWG

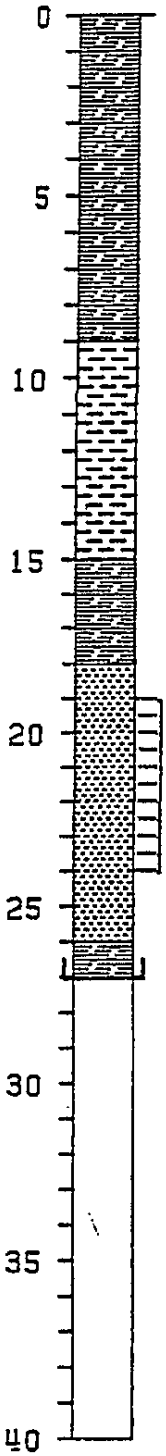
MW-F6

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F6

DEPTH, FT.	DESCRIPTION
0	
5	SILTY CLAY, (CL).
10	SILT, (ML).
15	SILTY CLAY, (CL).
20	SILTY SAND, (SM).
25	SILTY CLAY, (CL).
30	
35	
40	

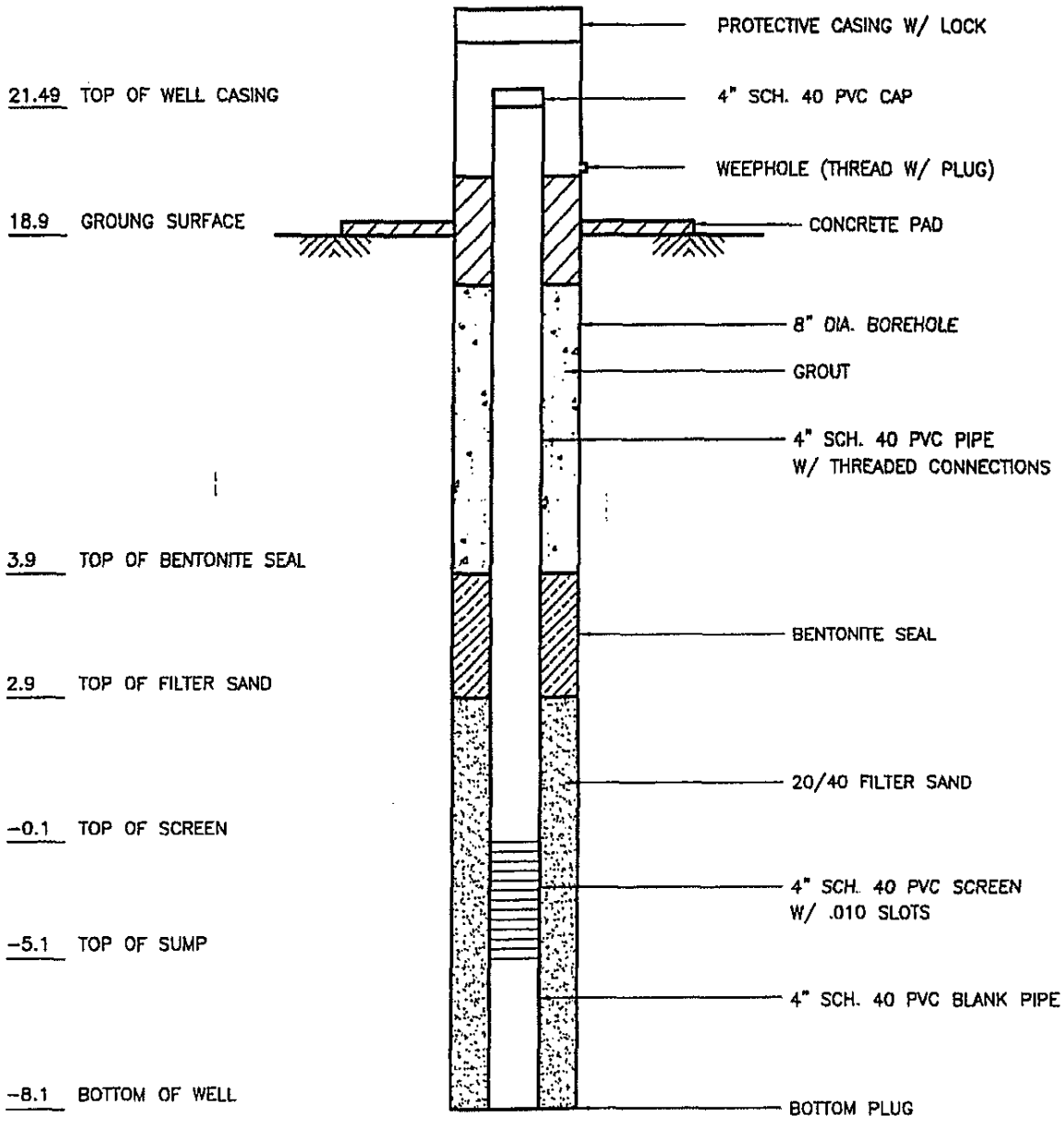


Well Screen

Bottom of Well

DATE PREPARED 12-2-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F6

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C28

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C28.DWG

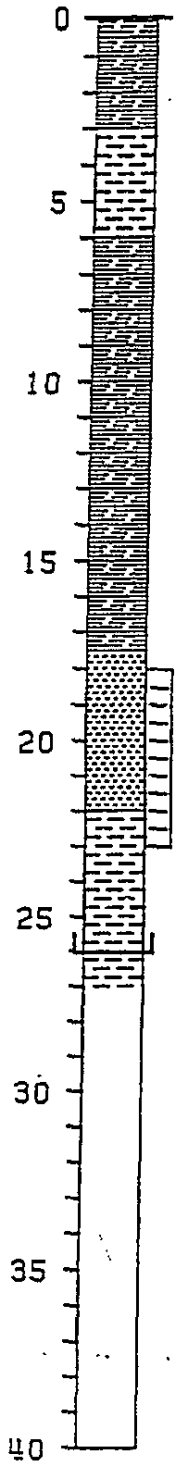
MW-F7

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F7

DEPTH, FT.	DESCRIPTION
0	SILTY CLAY, (CL).
5	SILT, (ML).
10	SILTY CLAY, (CL).
15	
20	SILTY SAND, (SM).
25	SILT, (ML).
30	
35	
40	

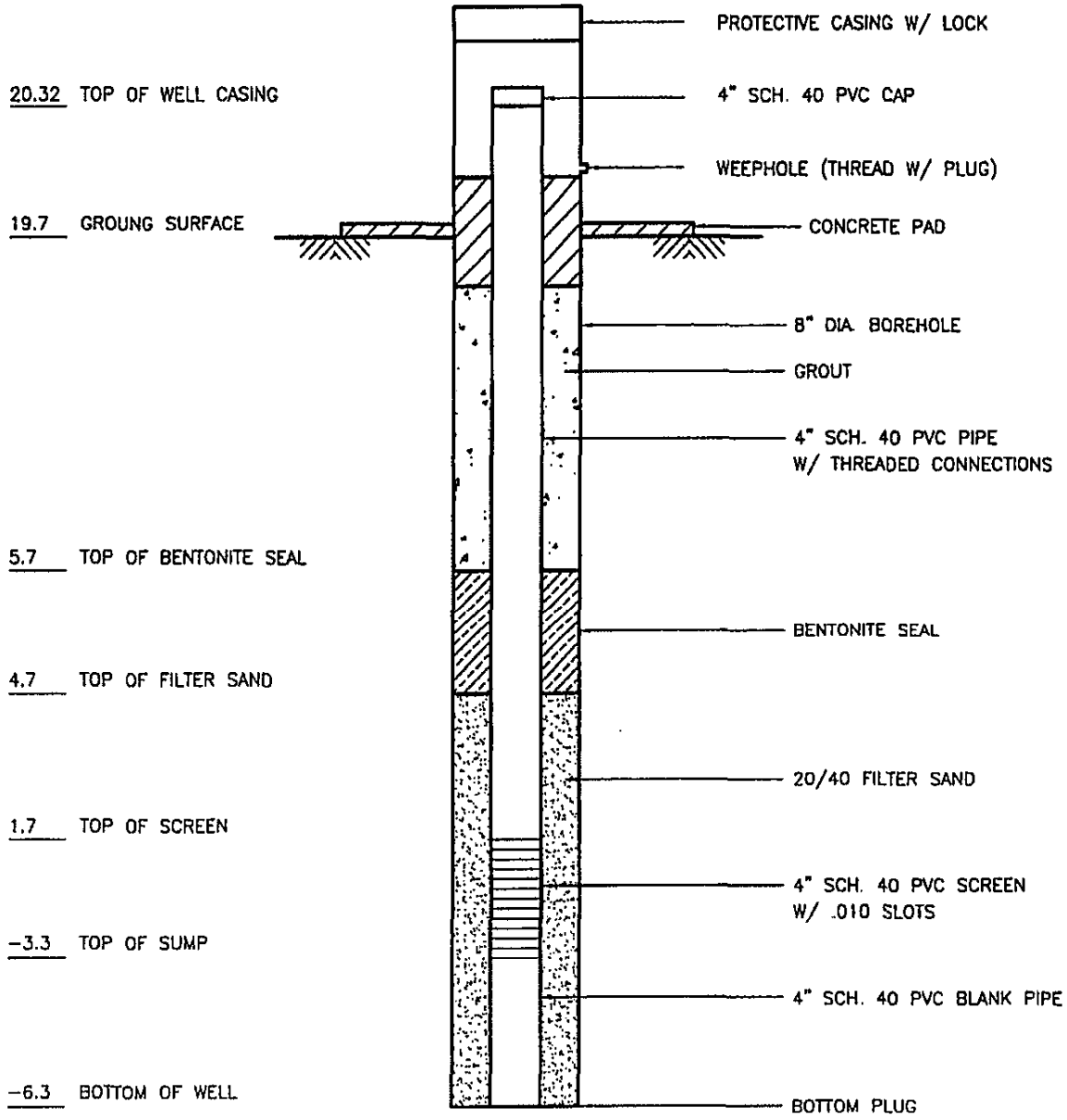


Well Screen

Bottom of Well

DATE PREPARED 12-2-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

PLUGGED AND ABANDONED IN MAY 2002

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1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F7

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C29

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C29.DWG

MW-F7B

Project: Monitor Well F-7-B, Fluorogypsum Stack No. 5
Geismar, Louisiana
For: Allied Signal
Geismar, Louisiana

Boring: F-7-B
File: 98-52
Date: 2 Jun 1998
Technician: BJB

Depth Feet | Samples

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well set in adjacent borehole

Boring Depth: 58 Feet

0 — Very stiff gray clay with organic matter

Cement-bentonite grout backfill full depth

Medium tan and light gray clay with sand traces and ferrous nodules

5 — Medium tan and light gray clay with sand traces and ferrous nodules

Medium tan and light gray clay with silt streaks and ferrous nodules

Medium tan and light gray clay with silt streaks

10 — Medium tan and light gray clay with sand traces

Free water encountered at 12 feet

Medium tan and light gray clay with sand traces

15 — Firm gray clayey sand

Medium gray clay with sand traces

Medium gray clay with sand traces

20 — Medium gray clay with sand traces

Medium gray clay

25 — Soft gray clay with silt streaks

Soft gray clay with silt streaks

Soft gray clay with silt traces

30 — Medium gray clay

Soft gray sandy clay

35 — Firm gray clayey sand

Medium gray clay with sand pockets

Medium gray clay with sand pockets and shell

40 — Medium gray clay with silt traces

Medium gray clay

45 — Medium gray clay with sand streaks

Medium dark gray clay with sand streaks

Gray clay with sand streaks

50 — Sand encountered at 50 feet

Project: Monitor Well F-7-B, Fluorogypsum Stack No. 5
Geismar, Louisiana
For: Allied Signal
Geismar, Louisiana

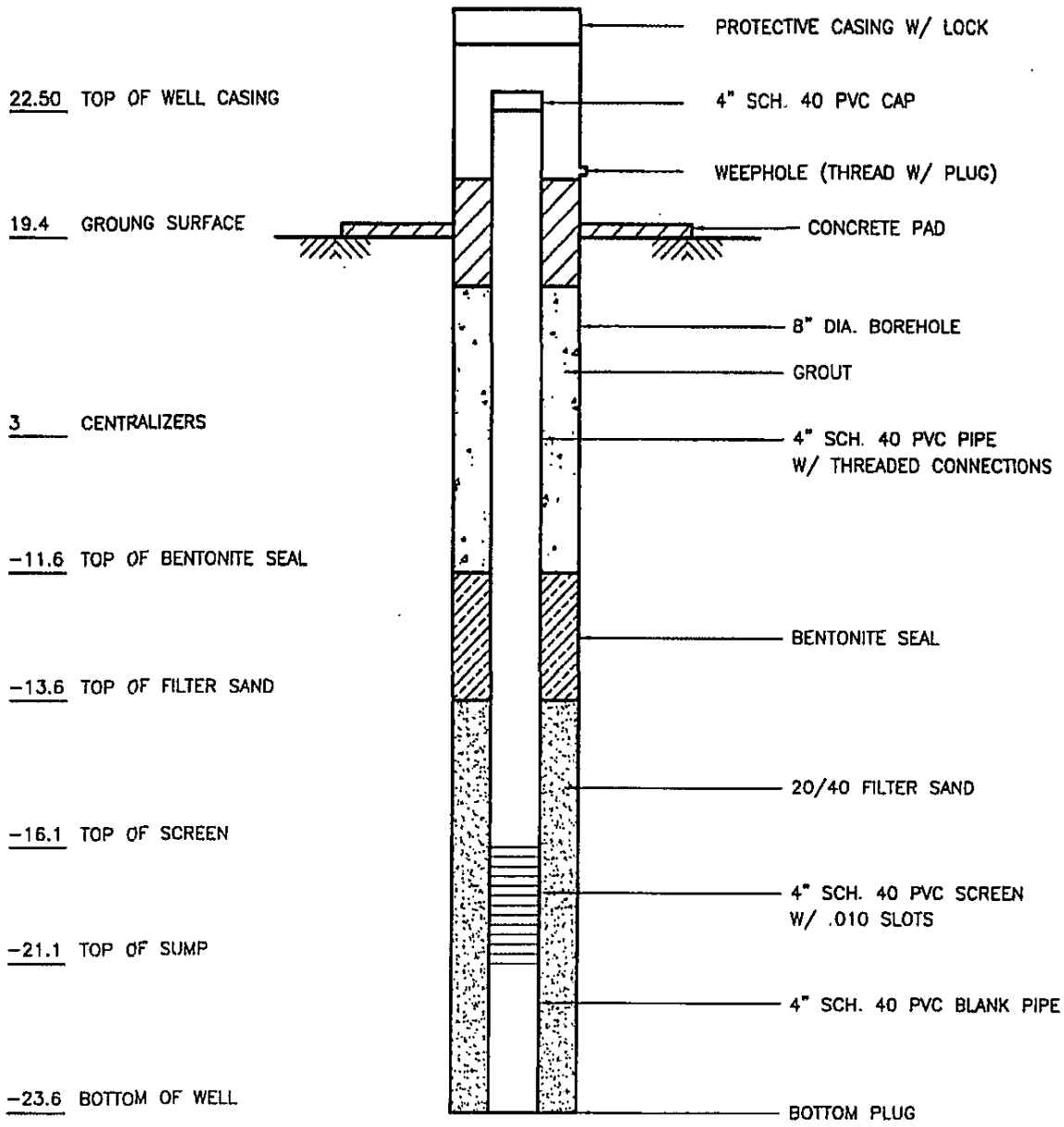
Boring: F-7-B
File: 53-52
Date: 2 Jun 1998
Technician: BJB

Depth Feet | Samples

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Boring Depth: 58 Feet

Depth Feet	Samples	Description	
50		Dense gray sand	
	☒	Penetration Resistance	48 blows per foot (17/27/21)
		Dense gray sand	
	☒	Penetration Resistance	44 blows per foot (18/26/18)
55		Dense gray sand	
	☒	Penetration Resistance	32 blows per foot (10/15/17)
		Very dense gray sand	
	☒	Penetration Resistance	51 blows per foot (15/26/25)
60			



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F7B

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C37

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C37.DWG

MW-F8

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F8

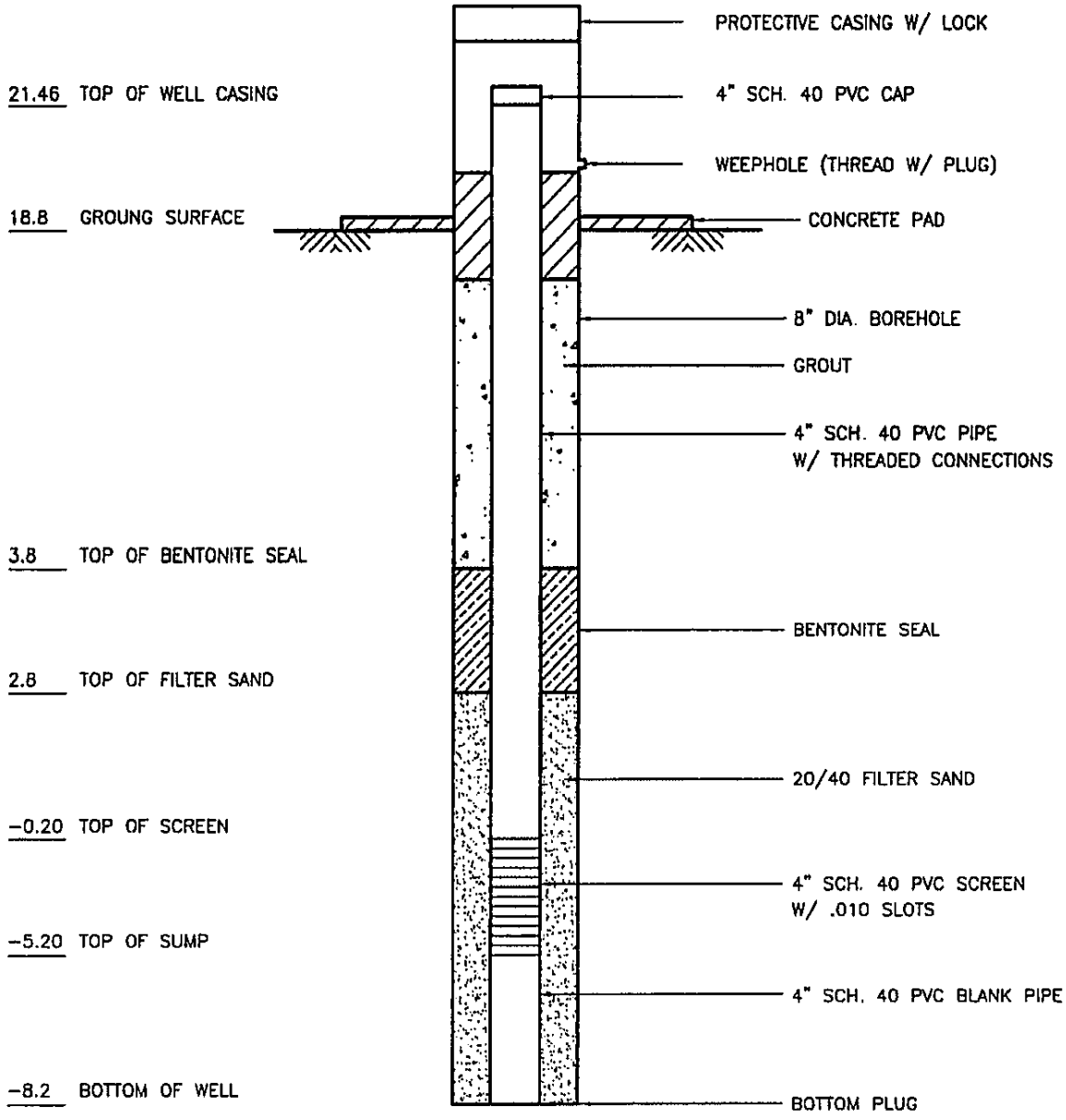
DEPTH, FT.	DESCRIPTION
0	
5	SILTY CLAY, (CL).
10	
15	
20	SILT, (ML).
25	SILTY CLAY, (CL).
30	
35	
40	

Well Screen

Bottom of Well

DATE PREPARED 12-3-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F8

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C30

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C30.DWG

MW-F9

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F9

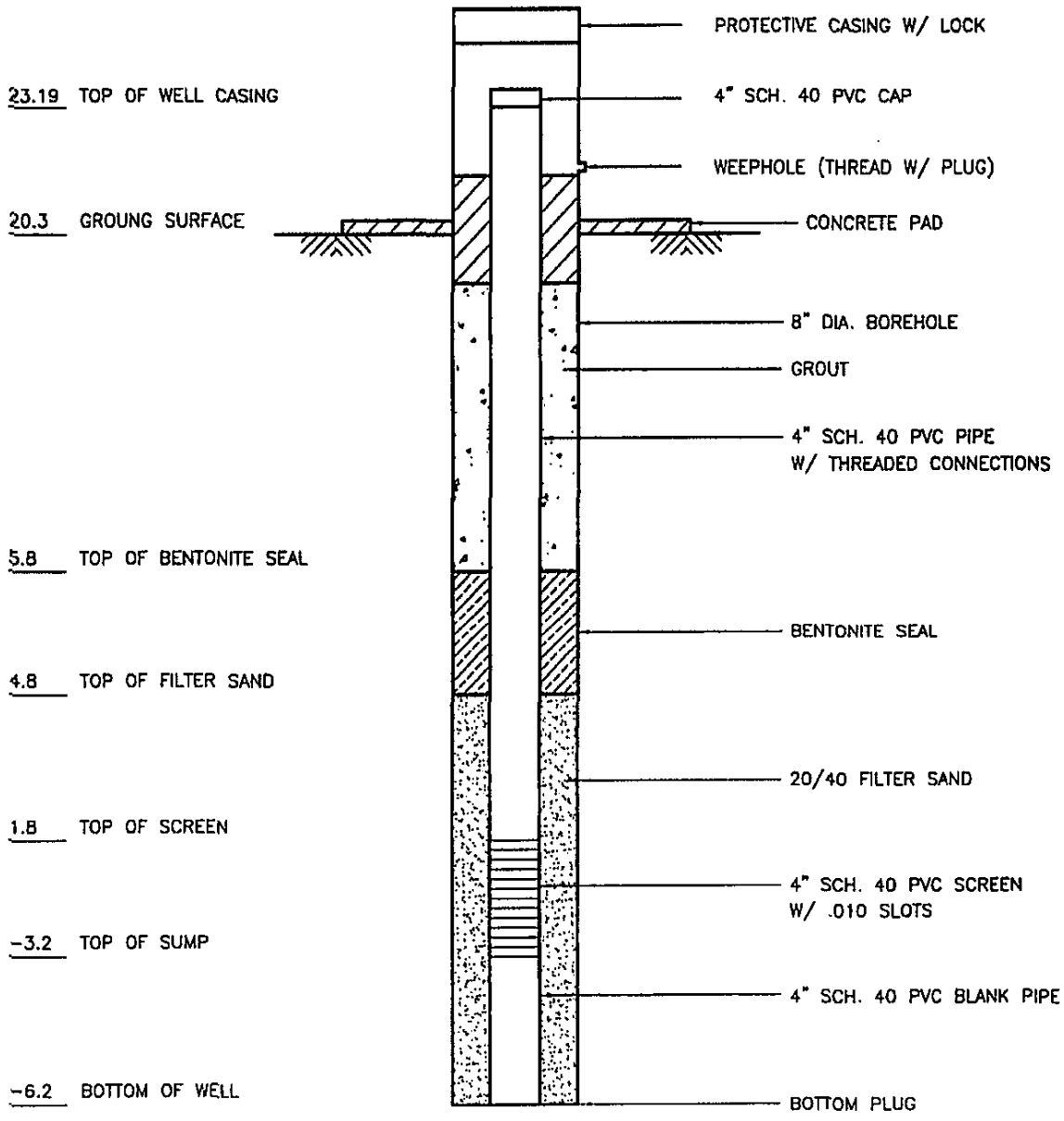
DEPTH, FT.	DESCRIPTION
0	
5	
	SILTY CLAY, (CL).
10	
15	
	SILT, (ML).
20	
	SILTY SAND, (SM).
25	
	SILTY CLAY, (CL).
30	
35	
40	

Well Screen

Bottom of Well

DATE PREPARED 12-3-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

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INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F9

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C31

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C31.DWG

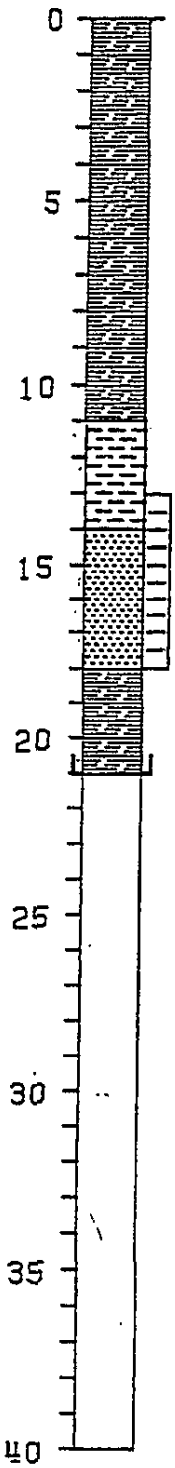
MW-F10

Geraghty & Miller, Inc.

WELL LOG

WELL NO. MW-F10

DEPTH, FT.	DESCRIPTION
0	
5	SILTY CLAY, (CL).
10	
	SILT, (ML).
15	SILTY SAND, (SM).
20	SILTY CLAY, (CL).
25	
30	
35	
40	

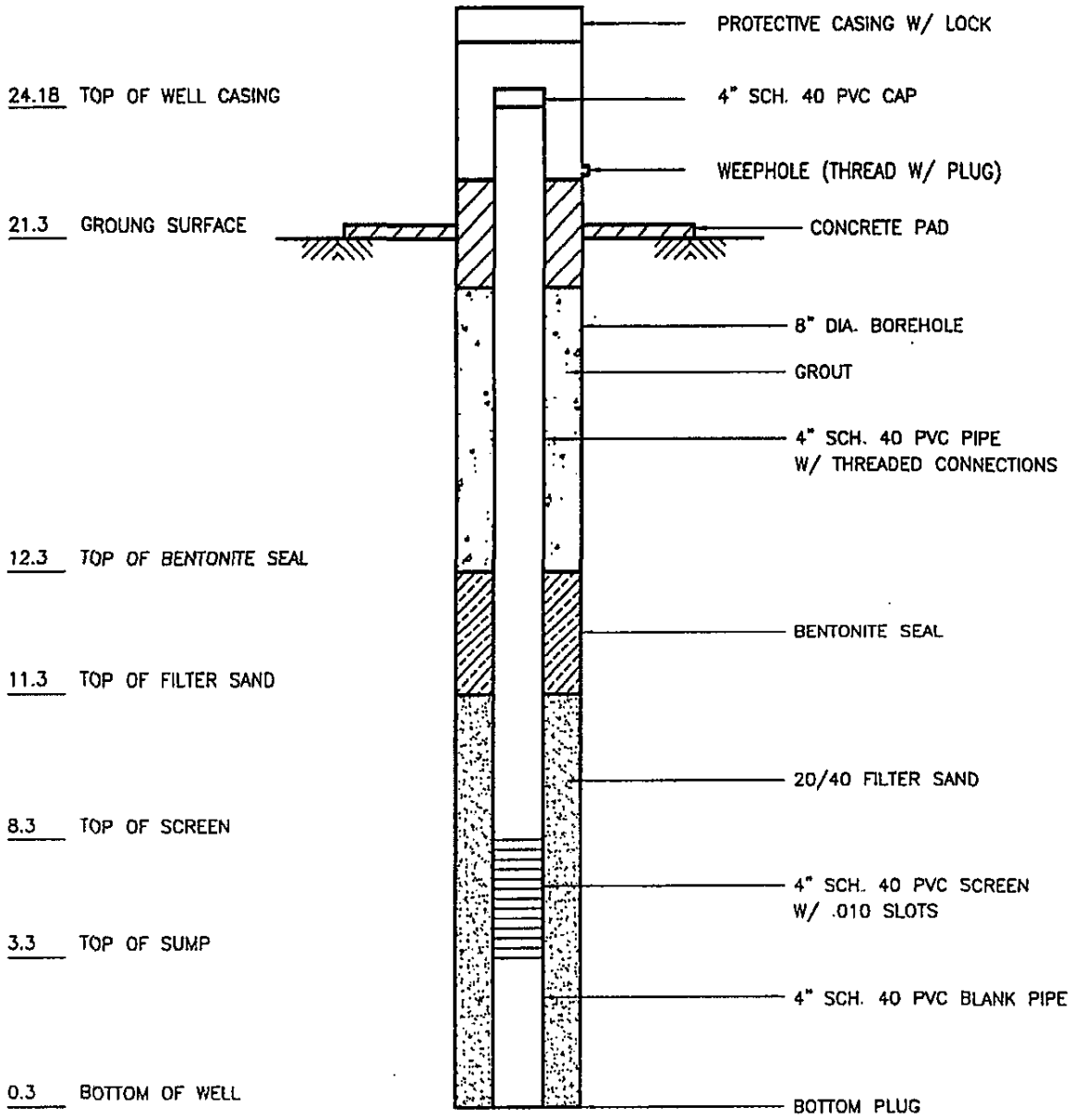


Well Screen

Bottom of Well

DATE PREPARED 12-4-86

BY ZOT



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F10

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C32

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C32.DWG

MW-F10B

LOG OF BORING

Project: Monitor Well F10B, Fluoroglypsum Stack No. 3
Geismar, Louisiana
For: Allied Signal
Geismar, Louisiana

Boring: F10-B
File: 98-52
Date: 1 Jun 1998
Technician: BJB

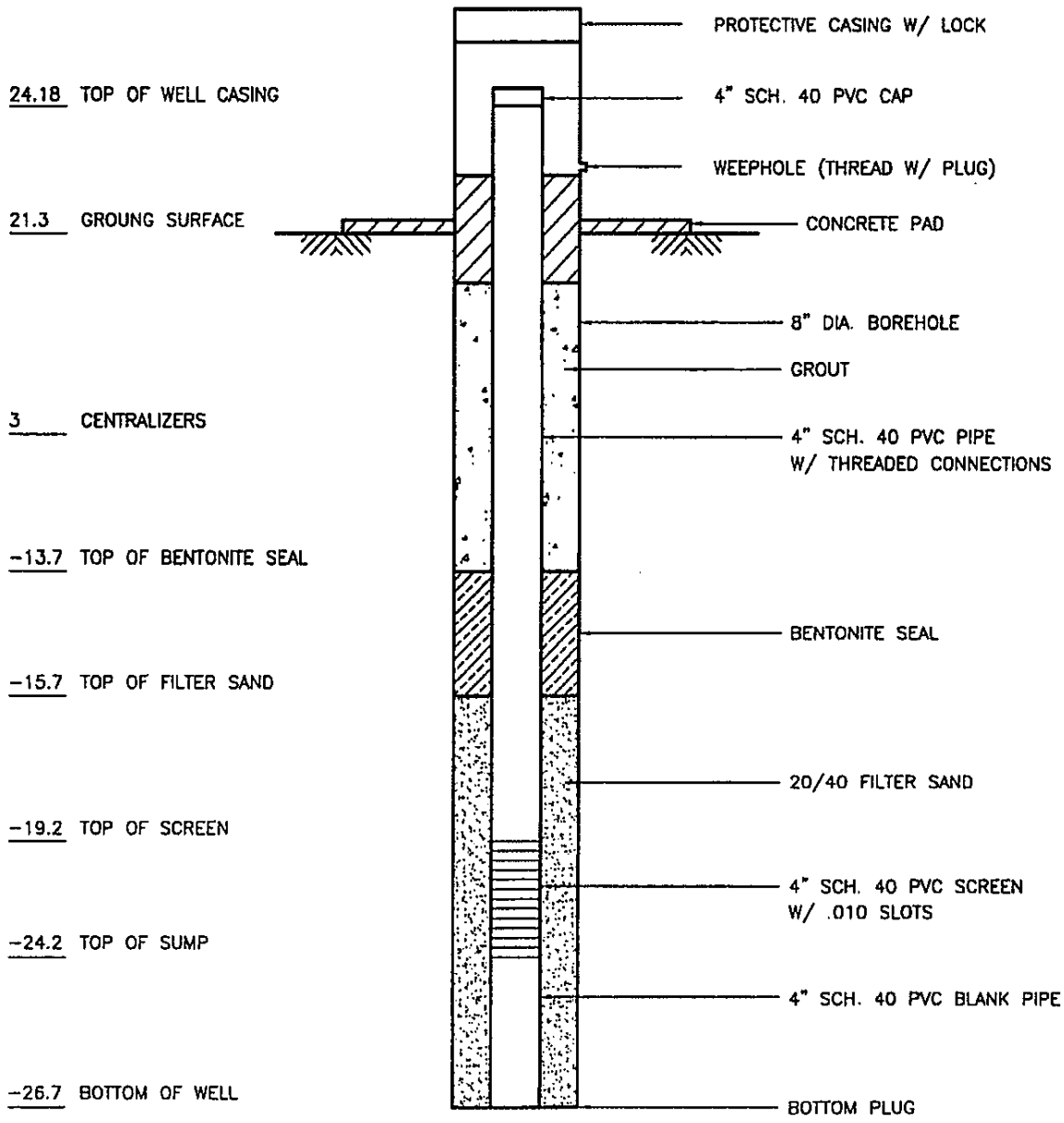
Depth Feet | Samples

- Undisturbed Sample
- Standard Penetration Test
- Classification Sample
- Slickensided

Monitor well installed in borehole

Boring Depth: 48 Feet

Depth Feet	Description
0	Stiff tan and light gray clay with silt streaks, roots and ferrous nodules
	Medium gray clay with silt pockets and ferrous nodules
5	Medium gray clay with silt pockets and ferrous nodules
	Medium tan and light gray clay with silt streaks and ferrous nodules
	Medium tan and light gray clay with silt streaks and ferrous nodules
10	← Free water encountered at 10 feet
	Firm tan clayey sand
	Firm gray clayey sand
15	Soft gray sandy clay
	Firm gray clayey sand
	Soft gray clay with silt streaks
20	Medium gray clay with sand streaks
	Medium gray clay with sand streaks
25	Firm gray clayey sand
	Medium gray clay with silt streaks
	Medium dark gray clay with organic matter
30	Medium gray clay with silt streaks
	Medium gray clay with silt streaks
35	Medium gray clay with silt traces
	Medium gray slightly sandy clay
	Soft gray clay with silt streaks
40	Firm gray clayey sand
	Soft gray sandy clay
45	Firm gray clayey sand
	Soft gray sandy clay
50	



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F10B

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C38

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C38.DWG

MW-F10C

LOG OF BORING

Project:	Monitor Well MW-F10C, Fluorogypsum Stack 5A	Boring:	MWF10-C
	Geismar, Louisiana	File:	01-100
For:	Honeywell International	Date:	27-Sep-02
	Geismar, Louisiana	Technician:	DL

Depth Feet | SAMPLES

- Undisturbed Sample
- Standard Penetration Test
- Classification Sample
- (SLS) Slickensided

Monitor well installed in borehole
Screened 47.5' - 52.5'
N 30° 13' 24.42" W 91° 02' 56.82"
Boring Depth: 56 Feet

0
5
10 ← Washing down hole; washed 0 - 42 feet
15
20
25
30
35
40
45 Firm gray silt
Medium gray clayey silt
Medium gray clayey silt
Medium gray slightly clayey silt
50

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers

LOG OF BORING

Project:	Monitor Well MW-F10C, Fluorogypsum Stack 5A	Boring:	MW-F10C
	Geismar, Louisiana	File:	01-100
For:	Honeywell International	Date:	27-Sep-02
	Geismar, Louisiana	Technician:	DL

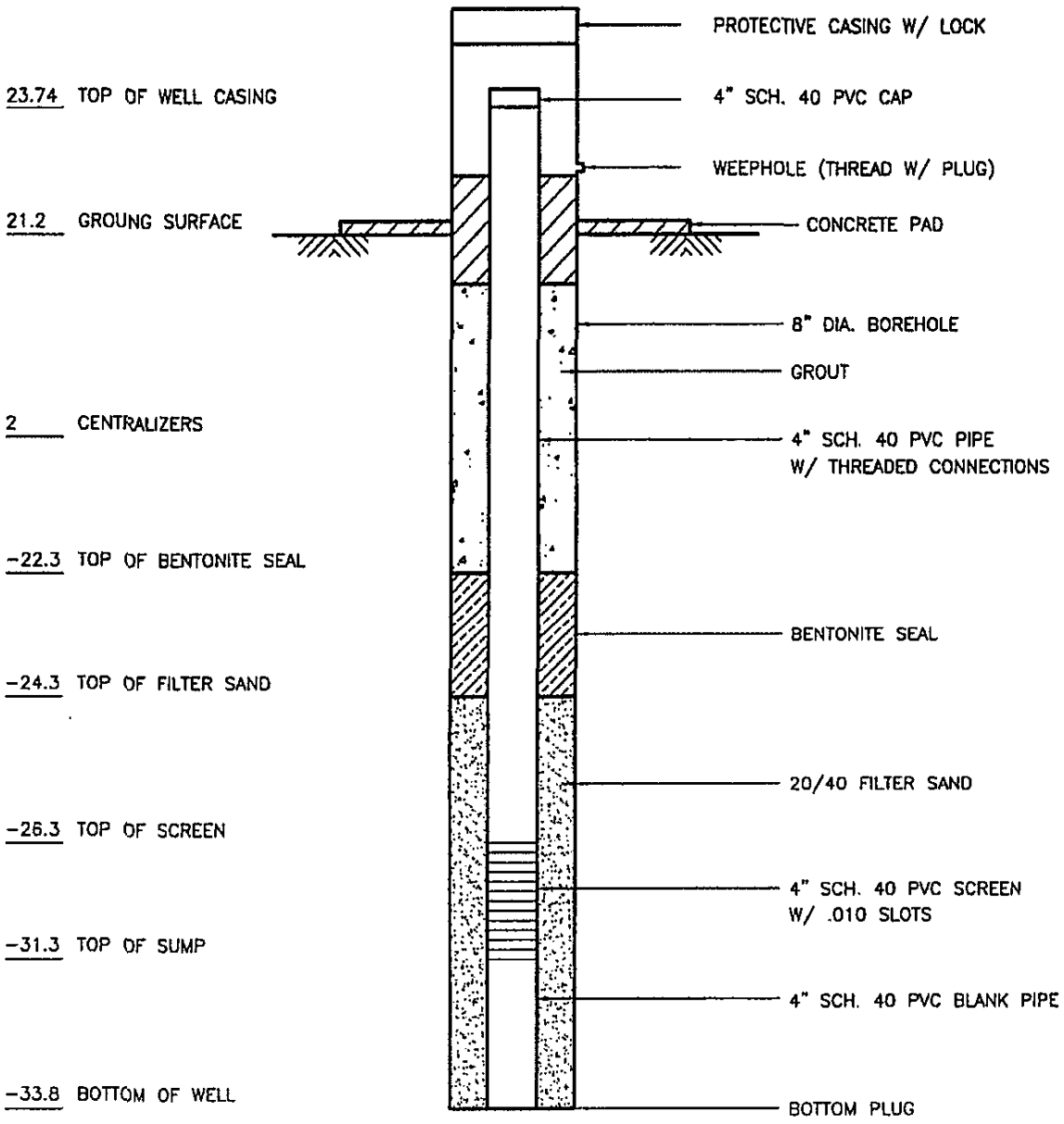
Depth Feet | SAMPLES

- Undisturbed Sample
- Standard Penetration Test
- Classification Sample
- (SLS) Slickensided

Boring Depth: 56 Feet

Depth Feet	SAMPLES	
50		Medium gray slightly clayey silt
		Medium gray slightly clayey silt
55		Medium gray slightly clayey silt

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F10C

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C39

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C39.DWG

MW-F11

LOG OF BORING

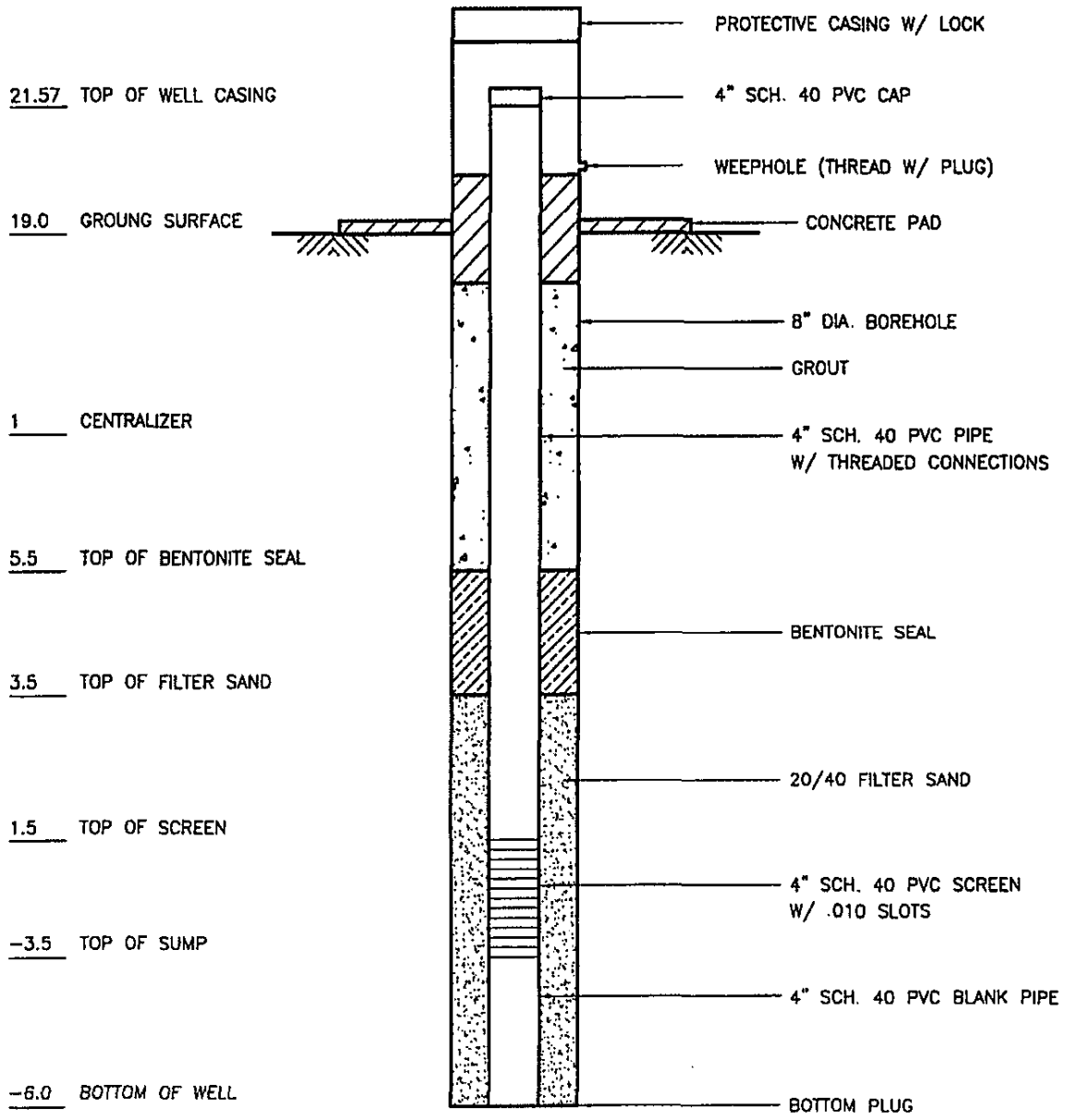
Project:	Monitor Well MW-F11, Fluorogypsum Stack 5A	Boring:	MW-F11
	Geismar, Louisiana	File:	01-100
For:	Honeywell International	Date:	23-Sep-02
	Geismar, Louisiana	Technician:	DL/JH

Depth Feet | SAMPLES

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well installed in borehole
Screened 17.5' - 22.5'
N 30° 13' 35.40" W 91° 02' 26.40"
Boring Depth: 26 Feet

Depth Feet	Description
0	Stiff brown silty clay with roots
	Stiff brown silty clay
5	Medium tan slightly silty clay
	Stiff tan slightly silty clay
	Stiff tan clay
10	Stiff tan clay
	Stiff gray clay
15	Stiff tan clay
	Stiff gray clay
	Stiff gray clay with silt traces
20	Stiff gray clay with silt streaks
	Firm gray clayey silt
25	Stiff gray slightly silty clay



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F11

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C33

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C33.DWG

MW-F12B

LOG OF BORING

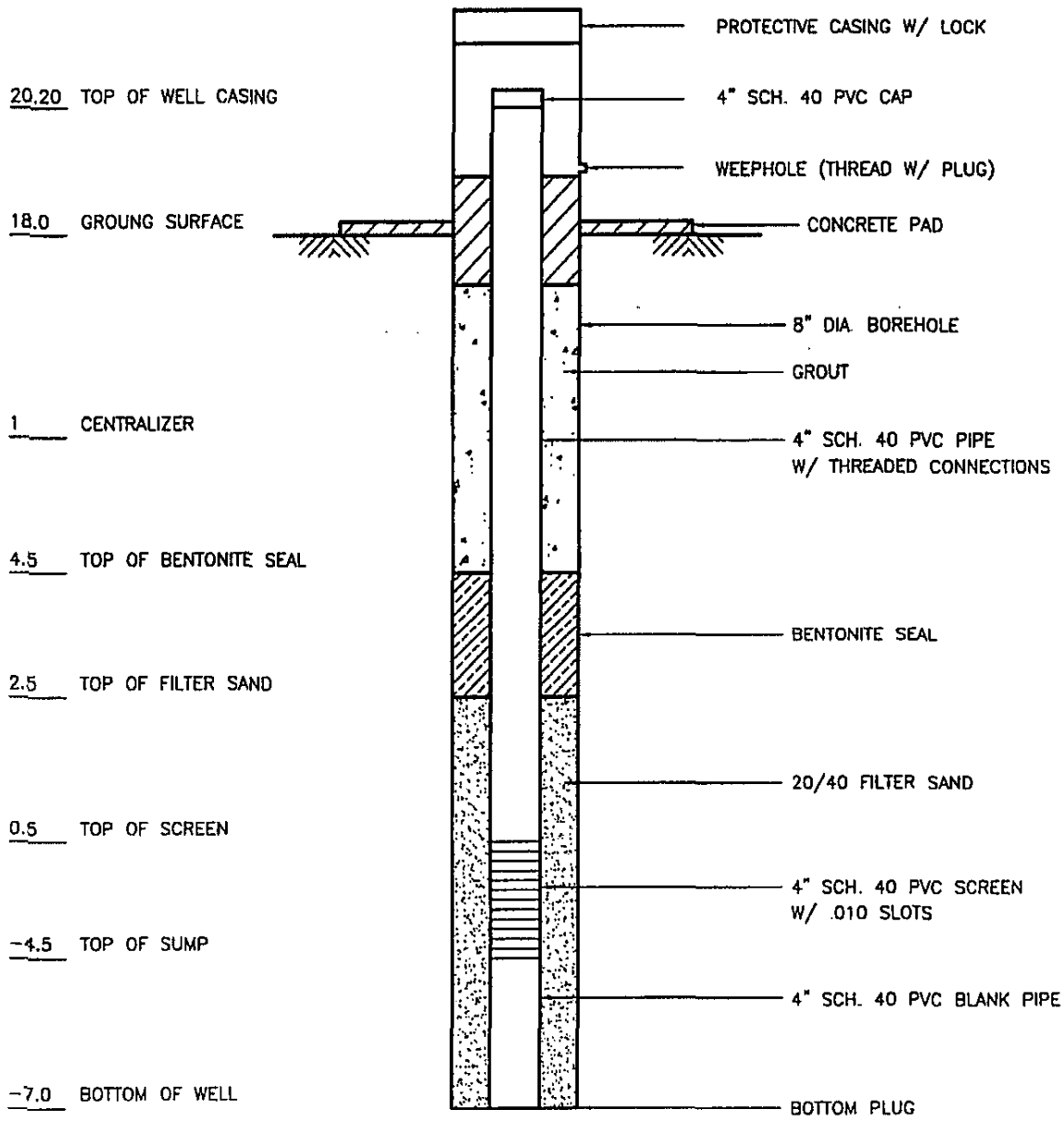
Project:	Monitor Well MW-F12, Fluorogypsum Stack 5A Geismar, Louisiana	Boring:	MW-F12 B
		File:	01-100
For:	Honeywell International Geismar, Louisiana	Date:	18 Nov 02
		Technician:	DL

Depth Feet | SAMPLES

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well installed in borehole
Screened 17.5' - 22.5'
N 30° 13' 28.98" W 91° 02' 31.14"
Boring Depth: 26 Feet

Depth Feet	Description
0	Gypsum
	Stiff brown slightly silty clay with roots
5	Stiff brown clay
	Stiff brown slightly silty clay
	Medium brown silty clay
10	Firm gray silt
	Firm gray silt
15	Firm gray silt
	Stiff gray slightly silty clay
	Firm gray silt
20	Medium gray very silty clay
	Medium gray silty clay
25	Medium gray silty clay



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F12B

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C34

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C34.DWG

MW-F13

LOG OF BORING

Project:	Monitor Well MW-F13, Fluorogypsum Stack 5A	Boring:	MW-F13
	Geismar, Louisiana	File:	01-100
For:	Honeywell International	Date:	19-Sep-02
	Geismar, Louisiana	Technician:	RP

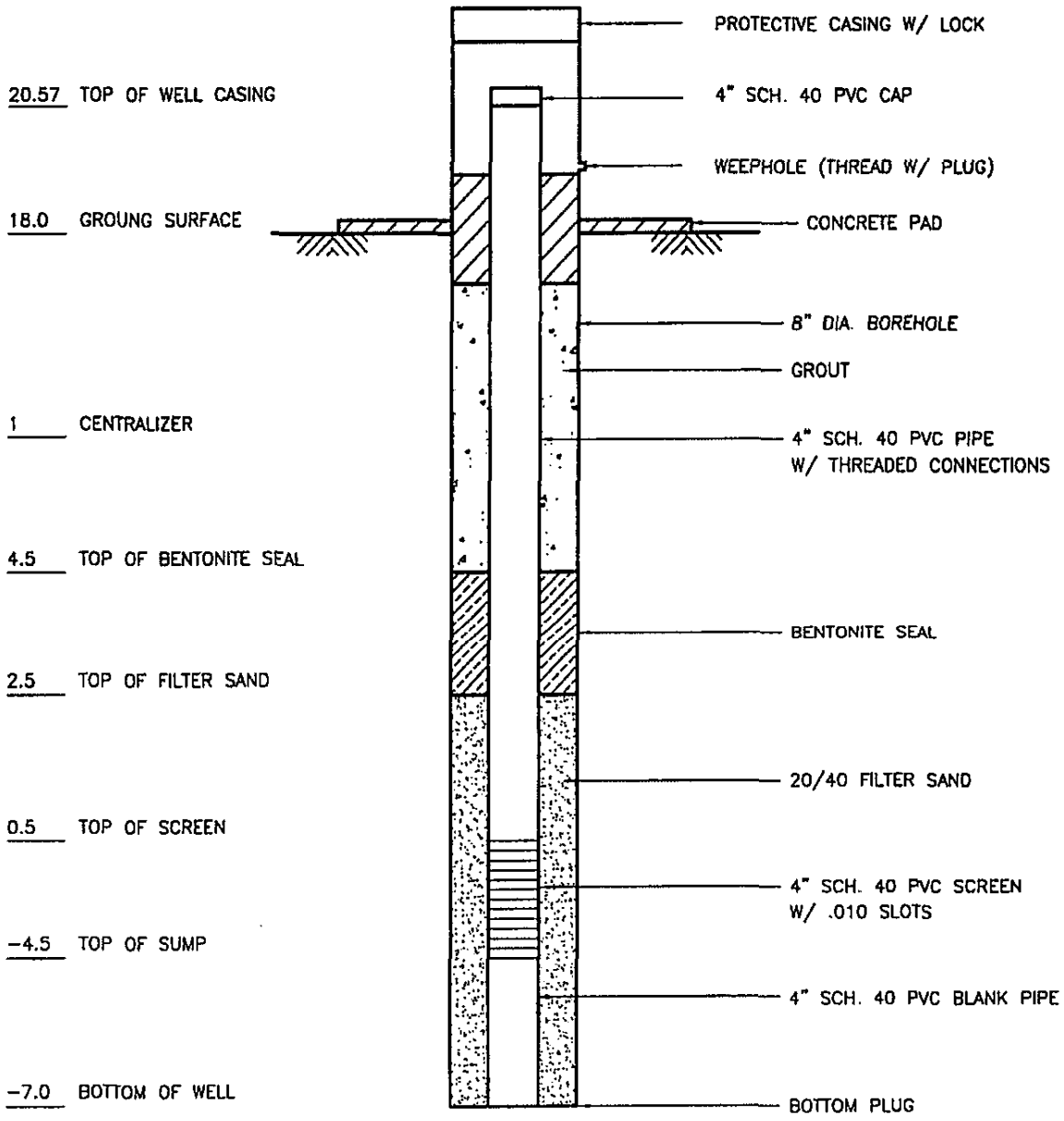
Depth Feet | SAMPLES

- Undisturbed Sample
- Standard Penetration Test
- Classification Sample
- (SLS) Slickensided

Monitor well installed in borehole
Screened 17.5' - 22.5'
N 30° 13' 28.20" W 91° 02' 36.66"
Boring Depth: 26 Feet

Depth Feet	Description
0	Stiff brown clay with roots
	Stiff tan slightly silty clay
5	Medium tan silty clay
	Medium tan slightly silty clay
	Firm gray clayey silty sand
10	Firm gray silt
	Firm gray sandy silt
15	Firm gray silt
	Firm gray silt
	Firm gray sandy silt
20	Firm gray sandy silt
	Gray sandy silt
25	Firm gray sandy silt

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F13

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C35

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C35.DWG

MW-F13B

LOG OF BORING

Project:	Monitor Well MW-F13B, Fluorogypsum Stack 5A Geismar, Louisiana	Boring:	MW-F13B
		File:	01-100
For:	Honeywell International Geismar, Louisiana	Date:	19-Sep-02
		Technician:	RP

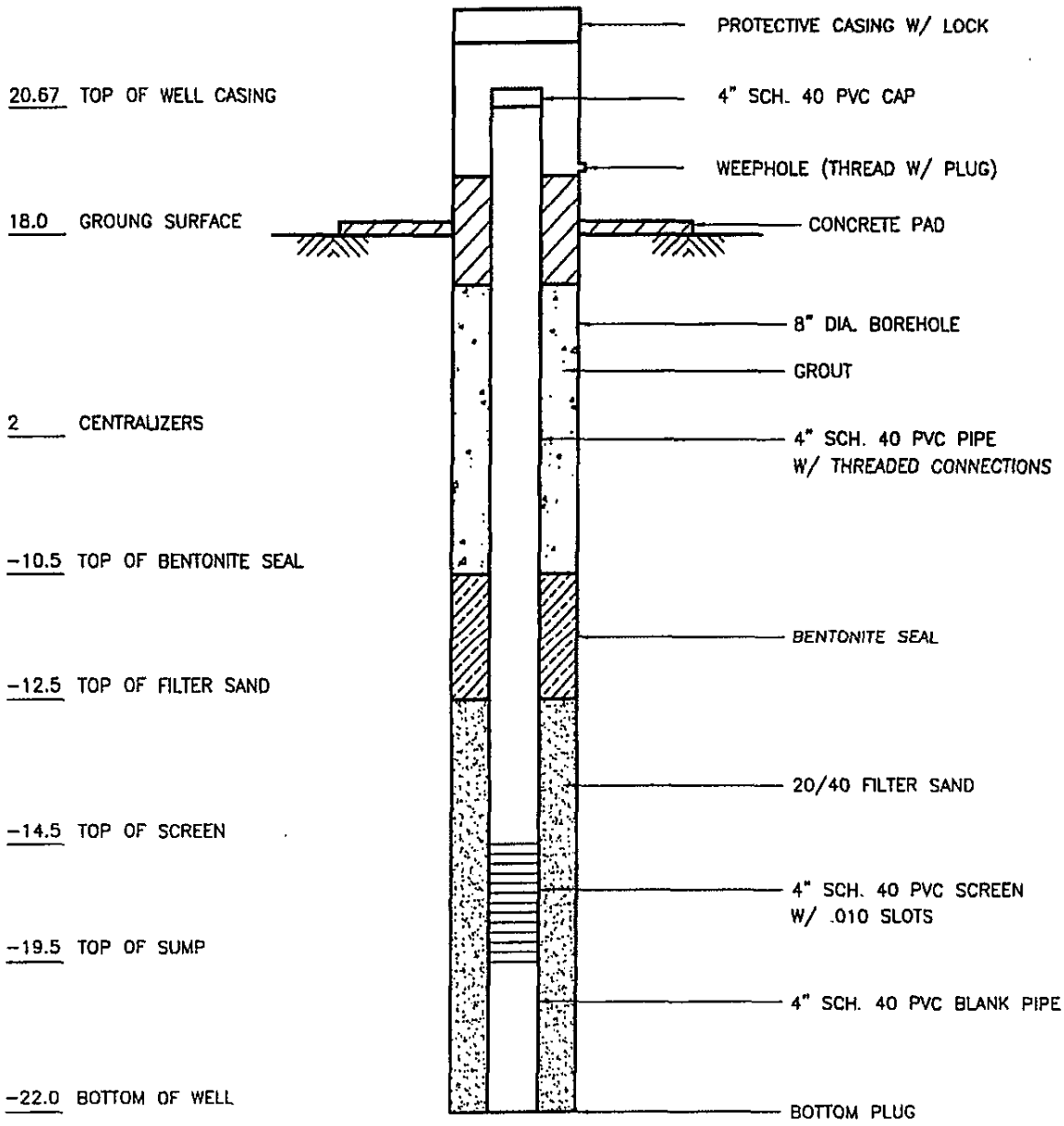
Depth Feet | SAMPLES

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well installed in borehole
Screened 32.5' - 37.5'
N 30° 13' 28.02" W 91° 02' 36.66"
Boring Depth: 44 Feet

0
5
10 ← Washing down hole; washed 0 - 26 feet
15
20
25
Firm gray clayey silt
Medium gray slightly silty clay
30
Firm gray silt
Firm gray silt
35
Firm gray clayey silt
Firm gray clayey silt
Firm gray clayey silt
40
Medium gray slightly silty clay
Firm gray slightly sandy silt
45

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F13B

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C40

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C40.DWG

MW-F13C

LOG OF BORING

Project:	Monitor Well MW-F13C, Fluorogypsum Stack 5A Geismar, Louisiana	Boring:	MW-F13C
		File:	01-100
For:	Honeywell International Geismar, Louisiana	Date:	20-Sep-02
		Technician:	DL/JH

Depth Feet | SAMPLES

Undisturbed Sample
Standard Penetration Test
Classification Sample
(SLS) Slickensided

Monitor well installed in borehole
Screened 47.5' - 52.5'
N 30° 13' 27.66" W 91° 02' 36.66"
Boring Depth: 56 Feet

0
5
10
15
20 ← Washing down hole; washed 0 - 44 feet
25
30
35
40
45 Medium gray silty clay
Medium gray silty clay
Medium gray silty clay
50

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers

LOG OF BORING

Project:	Monitor Well MW-F13C, Fluorogypsum Stack 5A	Boring:	MW-F13C
	Geismar, Louisiana	File:	01-100
For:	Honeywell International	Date:	20-Sep-02
	Geismar, Louisiana	Technician:	DL/JH

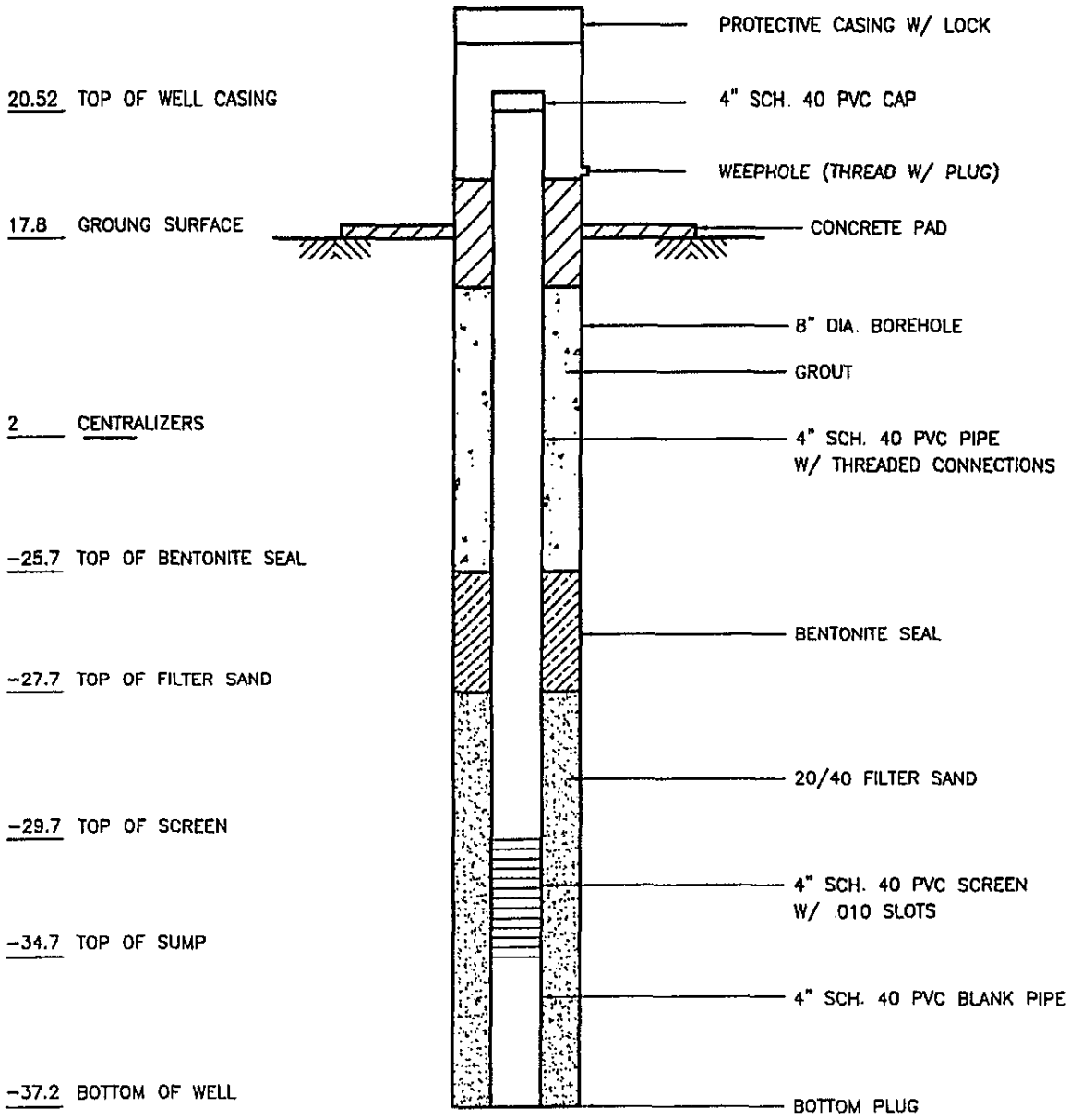
Depth Feet | SAMPLES

- Undisturbed Sample
- Standard Penetration Test
- Classification Sample
- (SLS) Slickensided

Boring Depth: 56 Feet

Depth Feet	SAMPLES	
50		Firm gray clayey silt
		Firm gray clayey silt
55		Firm gray clayey silt

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers



NOTE:
ALL ELEVATIONS ARE IN FEET (M.S.L.)

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

HONEYWELL INTERNATIONAL, INC.
MONITORING WELL MW-F13C

DATE	SCALE	JOB NO.	DRAWING NO.
3-10-04	N.T.S.	20030275	C41

PLOT DATE: 3/10/04 4:20 P.M. ACAD FILE: 20030275C41.DWG

WELL PLUGGING AND ABANDONMENT FORMS

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL PLUGGING AND ABANDONMENT FORM (DOTD-GW-2)

MAIL ORIGINAL TO
Department of Transportation and Development
Attn: Chief - Water Resources Section
P.O. BOX 94245
Baton Rouge, LA 70804-9245
(504) 379-1434

1. WELL OWNER: (If different from owner when drilled, note in Item 5)
Honeywell International
ADDRESS: P.O. Box 226 Geismar, LA 70734
OWNERS WELL NUMBER (If any) MW-F7

2. LOCATION OF WELL: Parish: Ascension, Well is Near, Geismar
Approximately 1 miles from LA 30 and LA 3115
(Crossroads, Town, City, Railroad, Any Landmark, etc.)

(Please draw sketch on back of Original)

3. WELL INFORMATION: Depth of hole, 26 ft., Diameter of casing 4 in.,
Depth of completed well, 26 ft., Date completed 12/1/86 by (Give name of water well contractor who installed well or hole): Eustis Engineering

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.)
All 26 ft. of screen and casing was pulled. Hole was then washed out to 26 ft. and grouted from phe bottom up with Type H cement and bentonite mixture, using the pump down method.

5. REMARKS: Owner was formerly known as Allied Sign
~~Unregistered: LAT 301330 LONG 910231~~

I certify that this work was done and completed in accordance with Rules and Regulations of the State on 31 April ~~xx~~ 2002 by (name and no. of contractor) Louis J. Capozzoli & Associates, Inc. ~~WWC~~ 165
Authorized Signature: [signature] Date: 7 May 2002

OFFICE USE ONLY

State	Parish	Local Well No.	Identification Number	Section	Township	Range	Quad. No.
2 2		—	0				

OWNER'S COPY

(REV. 11/85)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL PLUGGING AND ABANDONMENT FORM (DOTD-GW-2)

MAIL ORIGINAL TO
Department of
Transportation and Development
Attn: Chief - Water Resources Section
P.O. BOX 94245
Baton Rouge, LA 70804-9245
(504) 379-1434

1. WELL OWNER: (If different from owner when drilled, note in item 5) Honeywell International

ADDRESS: P.O. Box 226 Geismar, LA 70734

OWNERS WELL NUMBER (if any) MW-F7B

2. LOCATION OF WELL: Parish: Ascension, Well is Near: Geismar

Approximately 1 miles from LA 30 and LA 3115
(Crossroads, Town, City, Railroad, Any Landmark, etc.)

(Please draw sketch on back of Original)

3. WELL INFORMATION: Depth of hole, 43 ft., Diameter of casing 4 in., Depth of completed well, 43 ft., Date completed 6/9/98 by (Give name of water well contractor who installed well or hole): Louis J. Capozzoli & Associates, Inc.

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.) all 43 ft. of well screen and casing was pulled. Hole was then washed out and grouted from the bottom up with Type H cement and bentonite mixture, using the pump down method.

5. REMARKS: Owner was formerly known as Allied Signa DOTC Well # 86347

I certify that this work was done and completed in accordance with Rules and Regulations of the State on 31 April ~~xx~~2002 by (name and no. of contractor) Louis J. Capozzoli & Associates, Inc. WWC-165

Authorized Signature: [signature] Date: 7 May 2002

State	Parish	Local Well No.	Identification Number	Section	Township	Range	Quad. No.
2 2		—	0				

OFFICE USE ONLY

OWNER S COPY

(REV. 11/85)

PLEASE PRINT IN INK OR TYPE WHEN COMPLETING THIS FORM

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
WATER RESOURCES SECTION
WATER WELL PLUGGING AND ABANDONMENT FORM (DOTD-GW-2)

MAIL ORIGINAL TO
Department of Transportation and Development
Actg Chief - Water Resources Section
P.O. BOX 94245
Baton Rouge, LA 70804-9245
(504) 379-1434

1. WELL OWNER: (If different from owner when drilled, note in Item 5) Honeywell International

ADDRESS: Rt. 3115 Geismar, LA

OWNERS WELL NUMBER (If any) MW F12

2. LOCATION OF WELL: Parish: Ascension, Well is Near, Geismar, LA

Approximately .9 miles from the intersection of (Crossroads, Town, City, Railroad, Any Landmark, etc.) LA 30 & LA 3115

(Please draw sketch on back of Original)

3. WELL INFORMATION: Depth of hole, 26 ft., Diameter of casing 4 in., Depth of completed well, 25 ft., Date completed 9/24/02 by (Give name of water well contractor who installed well or hole) Louis J. Capozzoli & Associates, INc.

4. Describe in detail how well or hole was plugged: (materials used, amount of casing and/or screen removed, or left in hole, etc.)

~~All 25 feet of riser pipe and screen was pulled from the hole. Then hole was washed out and grouted with tremie pipe from 25 feet to ground surface with Type II cement.~~

5. REMARKS:

I certify that this work was done and completed in accordance with Rules and Regulations of the State on 11/18/02, 19 by (name and no. of contractor) Louis J. Capozzoli & Assoc., Inc. WWC-165

Authorized Signature: [signature] Date: 13 Dec 02

State	Parish	Local Well No.	Identification Number	Section	Township	Range	Quad. No.
2 2		—	0				

OFFICE USE ONLY

OWNER'S COPY

(REV. 1/95)

ATTACHMENT 8
Potentiometric Contour Maps

Previous Groundwater Elevation Data and Potentiometric Maps

GROUNDWATER ELEVATION DATA
HONEYWELL FACILITY, GEISMAR, LA

Date: 12/16-17/02

WELL NUMBER	WELL DEPTH FT., BGS.	SCREEN INTERVAL FT., MSL.	GROUNDWATER ELEV. FT., MSL.
MW-F3	20	7.7 to 2.7	16.88
MW-F3B	43	(-16.6) to (-21.6)	19.9
MW-F4	22	5.7 to 0.7	20.39
MW-F5	20	5.9 to 0.9	17.01
MW-F6	27	(-0.1) to (-5.1)	18.12
MW-F8	27	(-0.2) to (-5.2)	17.05
MW-F9	26.5	1.8 to (-3.2)	16.23
MW-F10	21	8.3 to 3.3	18.25
MW-F10B	48	(-19.2) to (-24.2)	15.35
MW-F10C	55	(-26.3) to (-31.3)	10.51
MW-F11	25	1.5 to (-3.5)	18.03
MW-F12B	25	0.5 to (-4.5)	14.2
MW-F13	24	0.5 to (-4.5)	15.05
MW-F13B	40	(-14.5) to (-19.5)	11.77
MW-F13C	55	(-29.7) to (-34.7)	14.02

Date: 4/14/03

WELL NUMBER	WELL DEPTH FT., BGS.	SCREEN INTERVAL FT., MSL.	GROUNDWATER ELEV. FT., MSL.
MW-F3	20	7.7 to 2.7	16.33
MW-F3B	43	(-16.6) to (-21.6)	19.65
MW-F4	22	5.7 to 0.7	20.84
MW-F5	20	5.9 to 0.9	16.51
MW-F6	27	(-0.1) to (-5.1)	17.58
MW-F8	27	(-0.2) to (-5.2)	13.05
MW-F9	26.5	1.8 to (-3.2)	17.11
MW-F10	21	8.3 to 3.3	18.09
MW-F10B	48	(-19.2) to (-24.2)	15.7
MW-F10C	55	(-26.3) to (-31.3)	15.81
MW-F11	25	1.5 to (-3.5)	17.36
MW-F12B	25	0.5 to (-4.5)	15.69
MW-F13	24	0.5 to (-4.5)	15.99
MW-F13B	40	(-14.5) to (-19.5)	14.6
MW-F13C	55	(-29.7) to (-34.7)	15.57

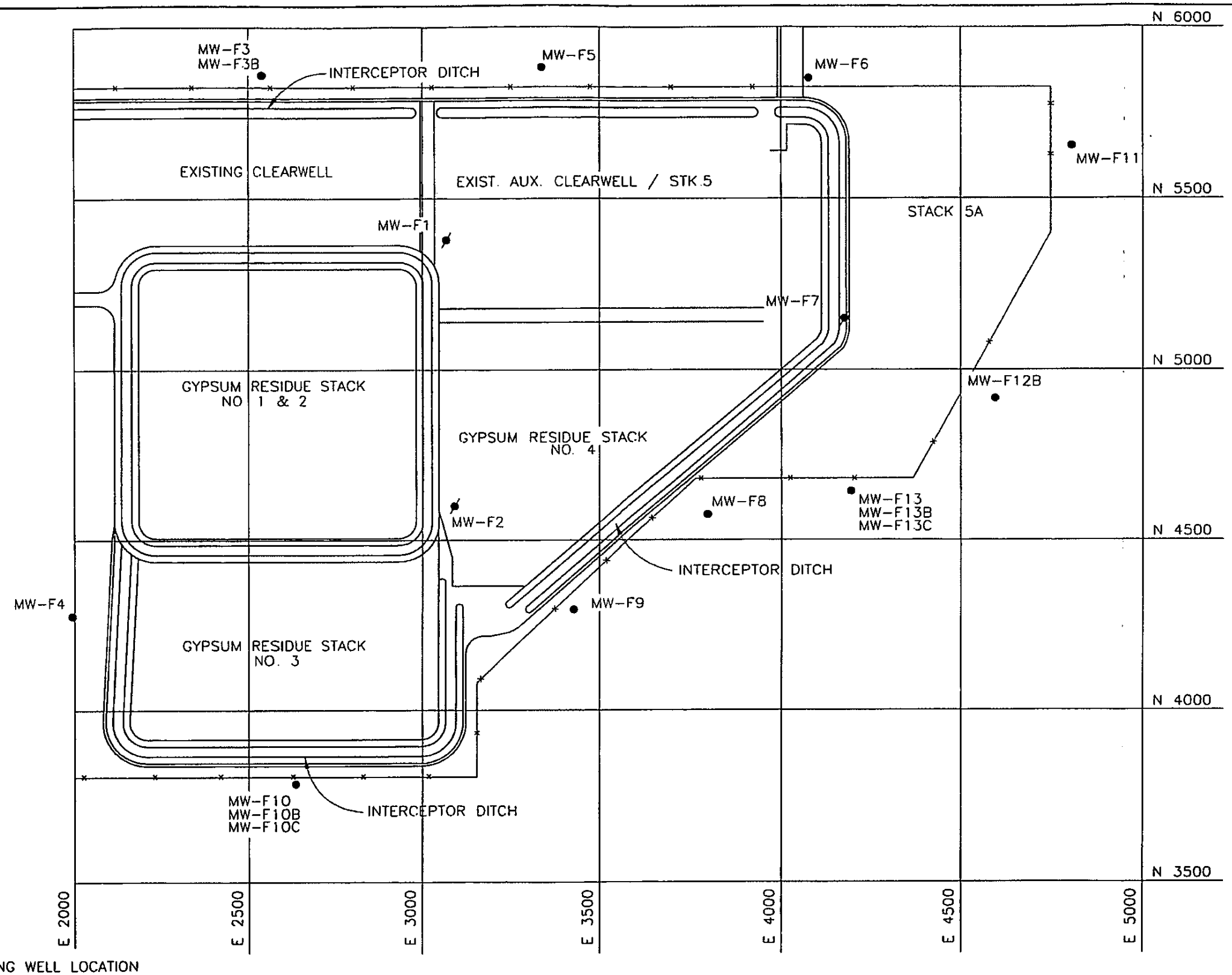
GROUNDWATER ELEVATION DATA
HONEYWELL FACILITY, GEISMAR, LA

Date: 6/10/03

WELL NUMBER	WELL DEPTH FT., BGS.	SCREEN INTERVAL FT., MSL.	GROUNDWATER ELEV. FT., MSL.
MW-F3	20	7.7 to 2.7	18.82
MW-F3B	43	(-16.6) to (-21.6)	21.11
MW-F4	22	5.7 to 0.7	19.36
MW-F5	20	5.9 to 0.9	15.55
MW-F6	27	(-0.1) to (-5.1)	15.47
MW-F8	27	(-0.2) to (-5.2)	14.73
MW-F9	26.5	1.8 to (-3.2)	15.04
MW-F10	21	8.3 to 3.3	17.28
MW-F10B	48	(-19.2) to (-24.2)	15.51
MW-F10C	55	(-26.3) to (-31.3)	17.71
MW-F11	25	1.5 to (-3.5)	13.98
MW-F12B	25	0.5 to (-4.5)	14.25
MW-F13	24	0.5 to (-4.5)	14.57
MW-F13B	40	(-14.5) to (-19.5)	16.57
MW-F13C	55	(-29.7) to (-34.7)	15.77

Date: 11/11/03

WELL NUMBER	WELL DEPTH FT., BGS.	SCREEN INTERVAL FT., MSL.	GROUNDWATER ELEV. FT., MSL.
MW-F3	20	7.7 to 2.7	16.36
MW-F3B	43	(-16.6) to (-21.6)	18.65
MW-F4	22	5.7 to 0.7	16.8
MW-F5	20	5.9 to 0.9	15.77
MW-F6	27	(-0.1) to (-5.1)	16.02
MW-F8	27	(-0.2) to (-5.2)	13.01
MW-F9	26.5	1.8 to (-3.2)	13.65
MW-F10	21	8.3 to 3.3	16.81
MW-F10B	48	(-19.2) to (-24.2)	8.9
MW-F10C	55	(-26.3) to (-31.3)	9.06
MW-F11	25	1.5 to (-3.5)	15.02
MW-F12B	25	0.5 to (-4.5)	8.81
MW-F13	24	0.5 to (-4.5)	9.86
MW-F13B	40	(-14.5) to (-19.5)	7.95
MW-F13C	55	(-29.7) to (-34.7)	10.26



● PIEZOMETER / MONITORING WELL LOCATION

PLUGGED AND ABANDONED MONITORING WELL

MW-F3B, F10B, F10C, F13B, AND F13C ARE PIEZOMETERS

300 150 0 300 600 900

SCALE 1' = 300'

EXHIBIT 1

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

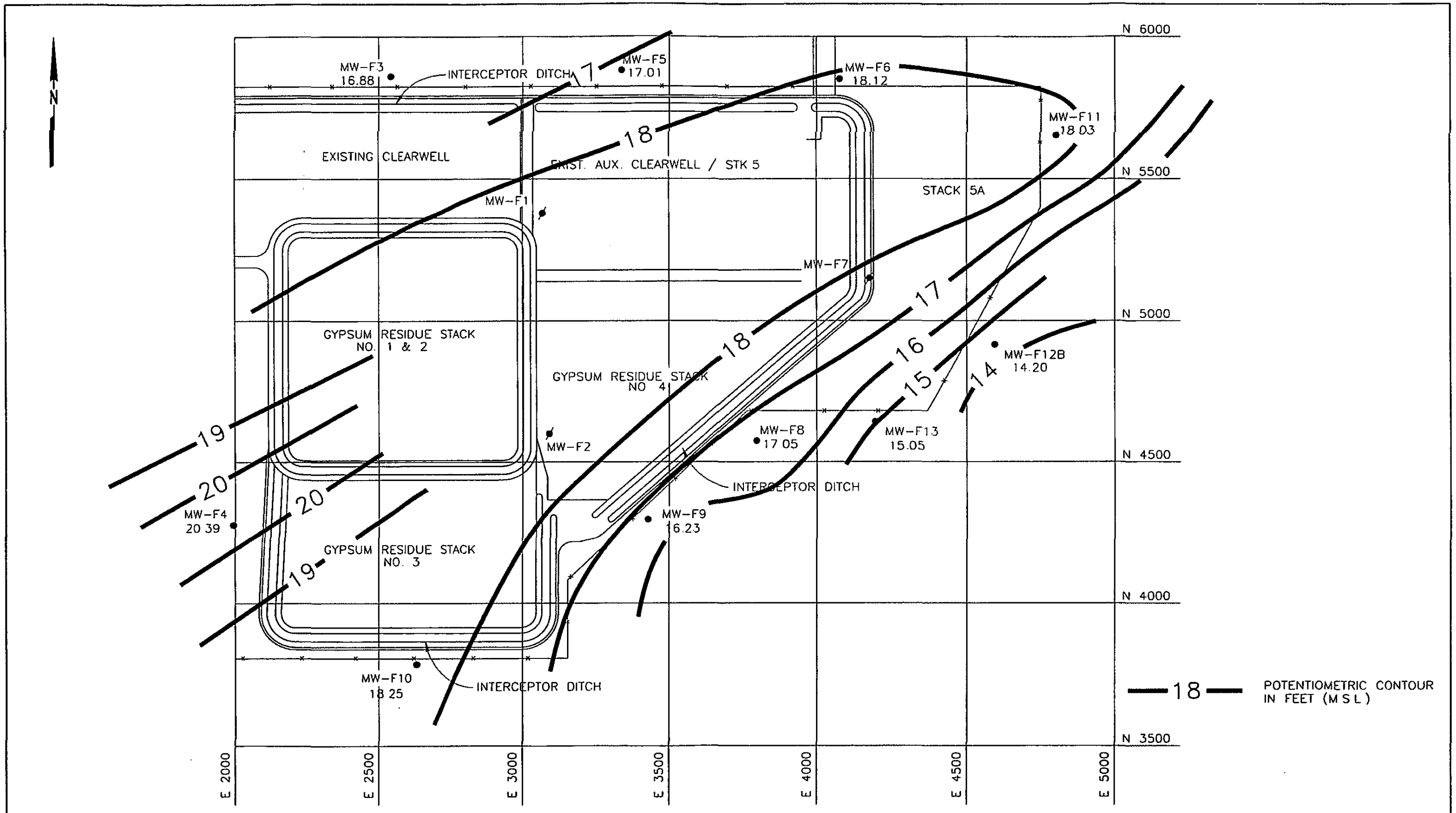
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
2-10-03	SHOWN	20020135	C3J

PLOT DATE: 2/11/03 10:39 A.M ACAD FILE: 97087C3J.DWG

GROUNDWATER ELEVATION DATA

DECEMBER 16-17, 2002



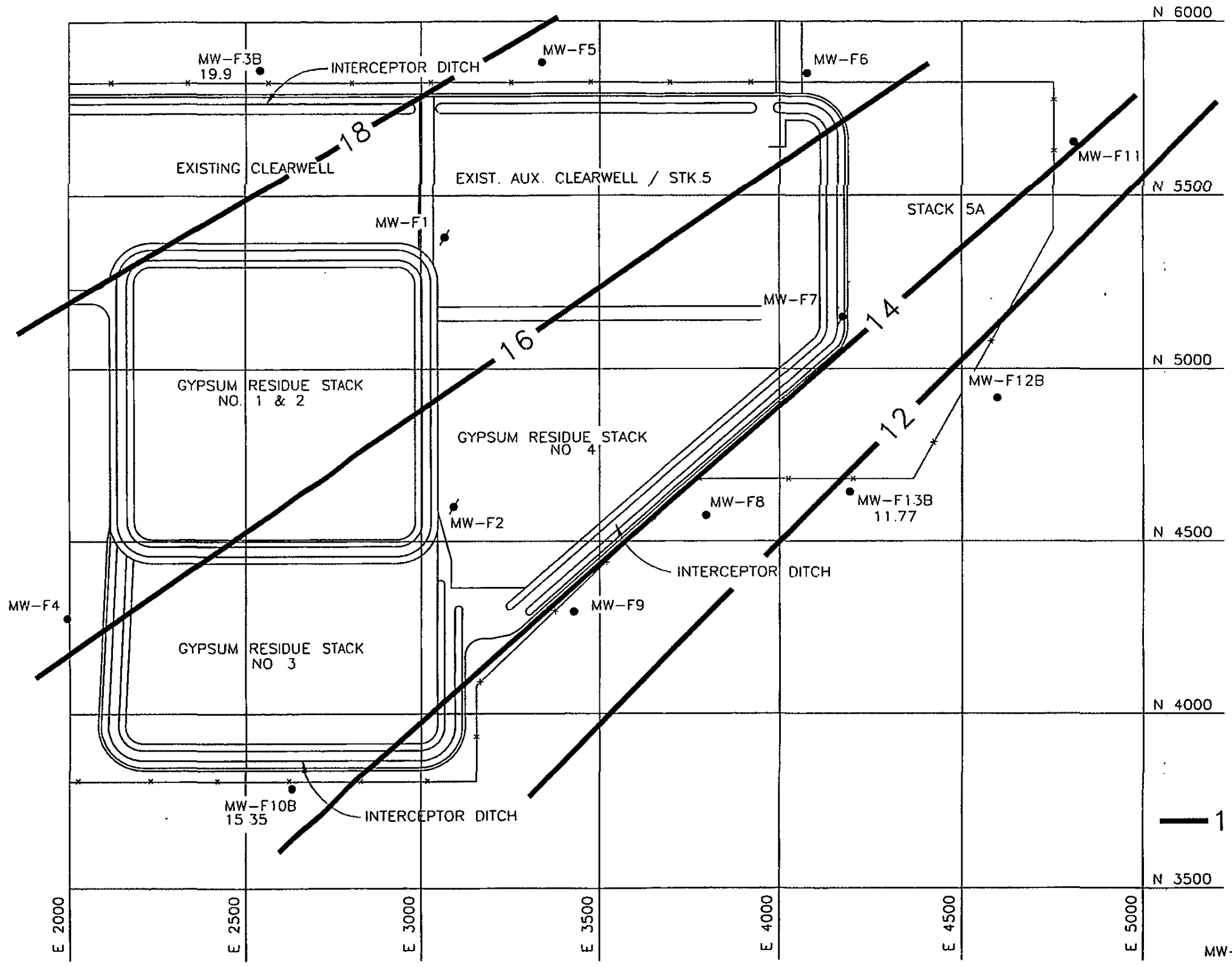
DECEMBER 16-17, 2002 EXHIBIT 2

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
2-10-03	SHOWN	20020135	C3G

PLOT DATE: 3/22/04 10:39 A.M. ACAD FILE: 97087C3G.DWG



— 18 — POTENTIOMETRIC CONTOUR IN FEET (M S.L.)

DATA FOR PIEZOMETERS
MW-F3B, MW-F10B, AND MW-F13B

DECEMBER 16-17, 2002 EXHIBIT 3

● MONITORING WELL LOCATION
ø PLUGGED AND ABANDONED MONITORING WELL

300 150 0 300 600 900
SCALE 1" = 300'

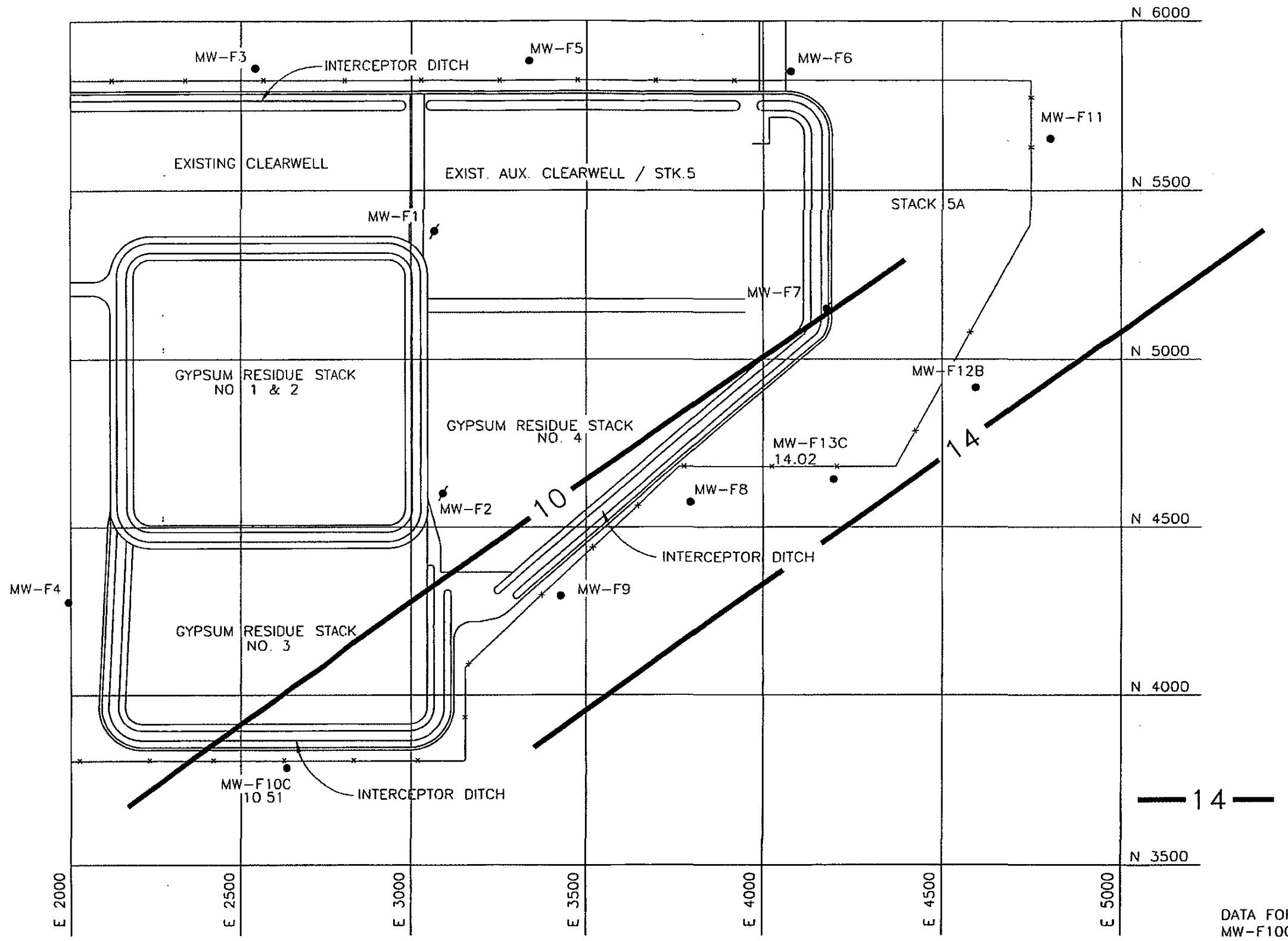
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
2-10-03	SHOWN	20020135	C31

PLOT DATE: 3/22/04 10:39 A.M. ACAD FILE: 970B7C31.DWG



DATA FOR PIEZOMETERS MW-F10C AND MW-F13C

DECEMBER 16-17, 2002

EXHIBIT 4

● MONITORING WELL LOCATION

ø PLUGGED AND ABANDONED MONITORING WELL

300 150 0 300 600 900

SCALE 1" = 300'

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

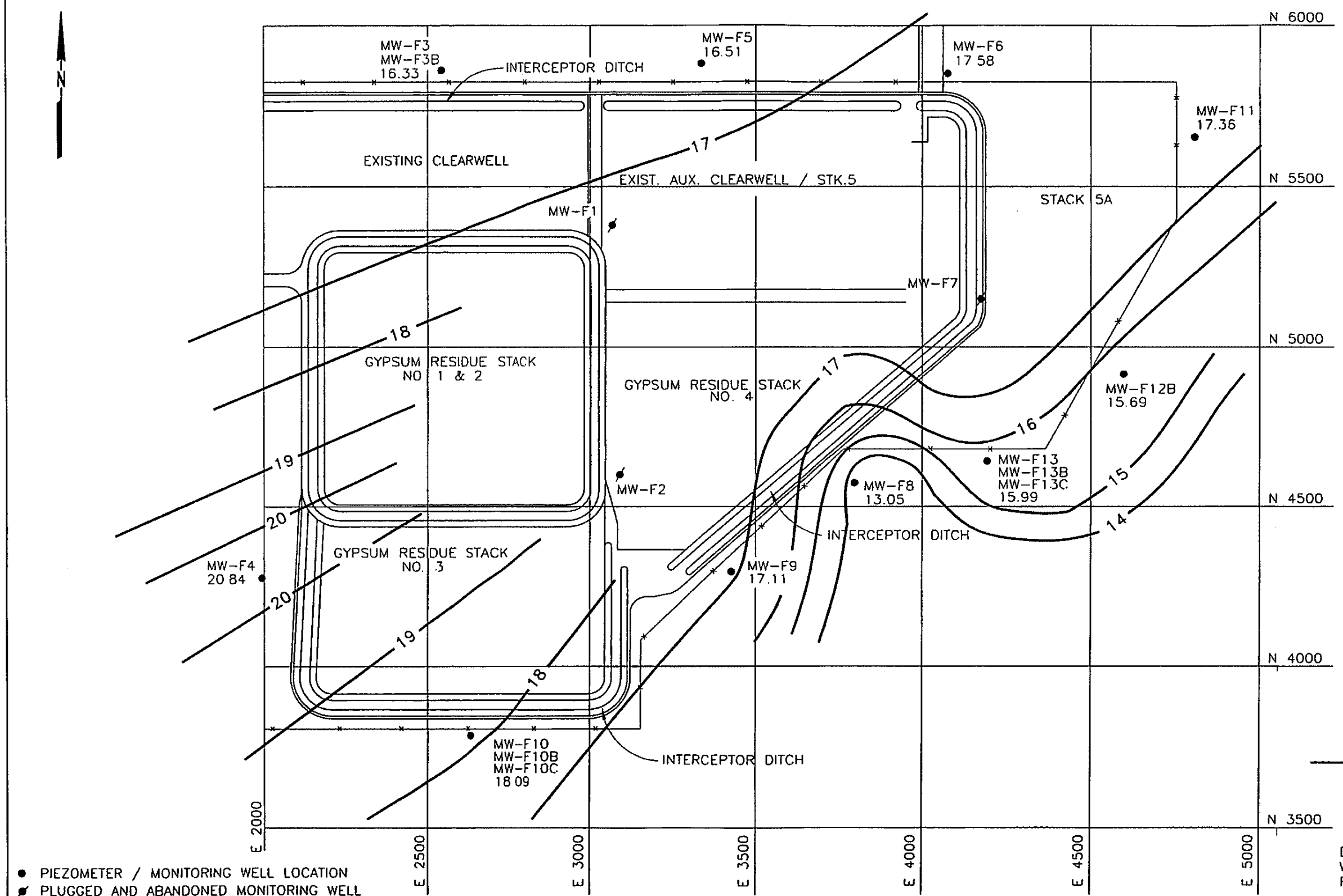
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
2-10-03	SHOWN	20020135	C3H

PLOT DATE: 2/11/03 10:39 A.M. ACAD FILE: 97087C3H.DWG

GROUNDWATER ELEVATION DATA

APRIL 14, 2003



— 18 — POTENTIOMETRIC CONTOUR IN FEET (MSL)

DATA FOR GROUNDWATER MONITORING WELLS MW-F3, F4, F5, F6, F8, F9, F10, F11, F12B, AND F13

● PIEZOMETER / MONITORING WELL LOCATION

PLUGGED AND ABANDONED MONITORING WELL

MW-F3B, F10B, F10C, F13B, AND F13C ARE PIEZOMETERS

300 150 0 300 600 900

SCALE 1" = 300'

APRIL 14, 2003 EXHIBIT 2

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST CHARLES AVE. NEW ORLEANS, LA.

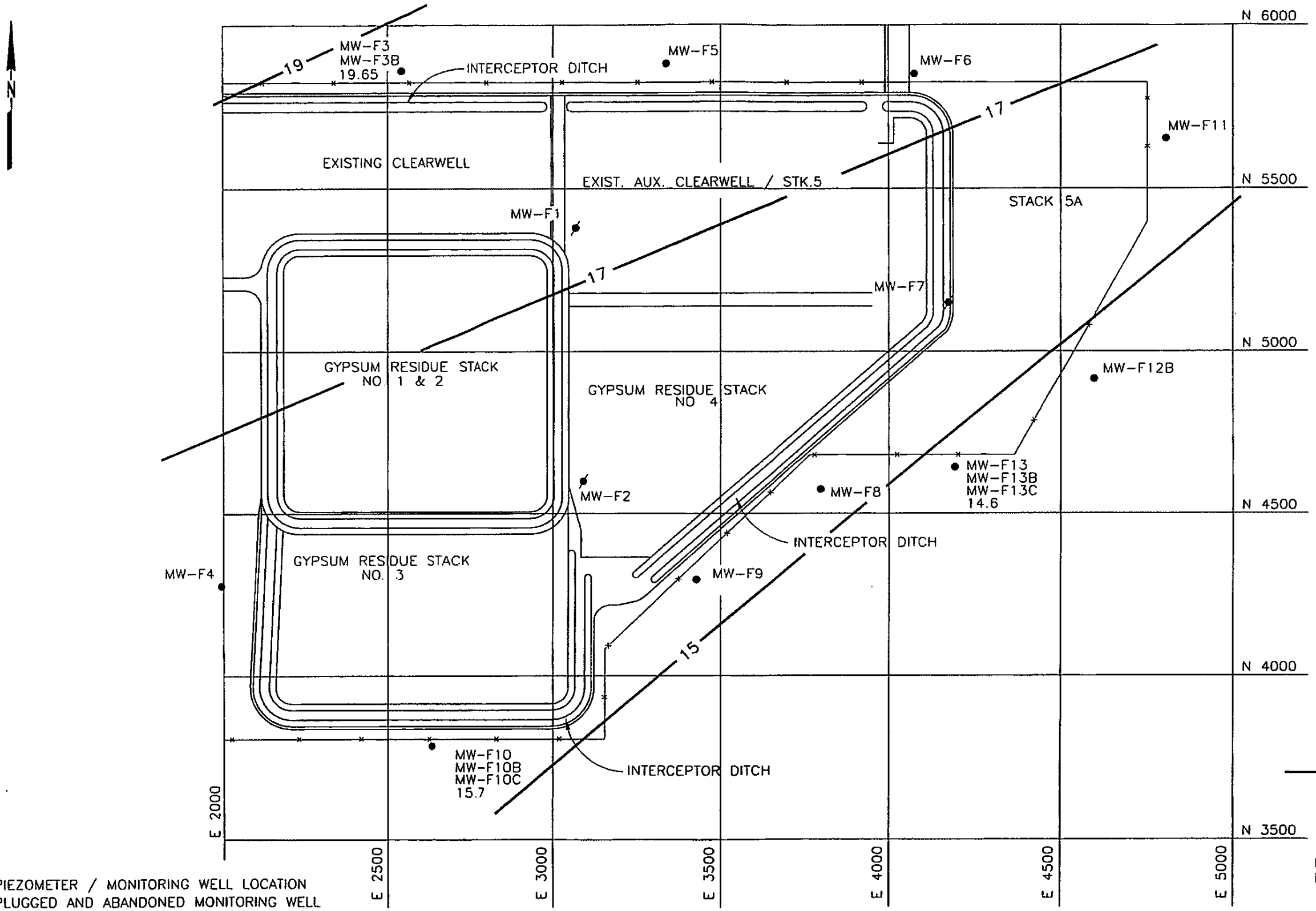
FLUOROGYPSUM STACKING FACILITY

GROUNDWATER MONITORING WELLS

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
5-8-03	SHOWN	20020135	C3K

PLOT DATE: 3/23/04 10:39 AM ACAD FILE: 97087C3K.DWG



APRIL 14, 2003 EXHIBIT 3

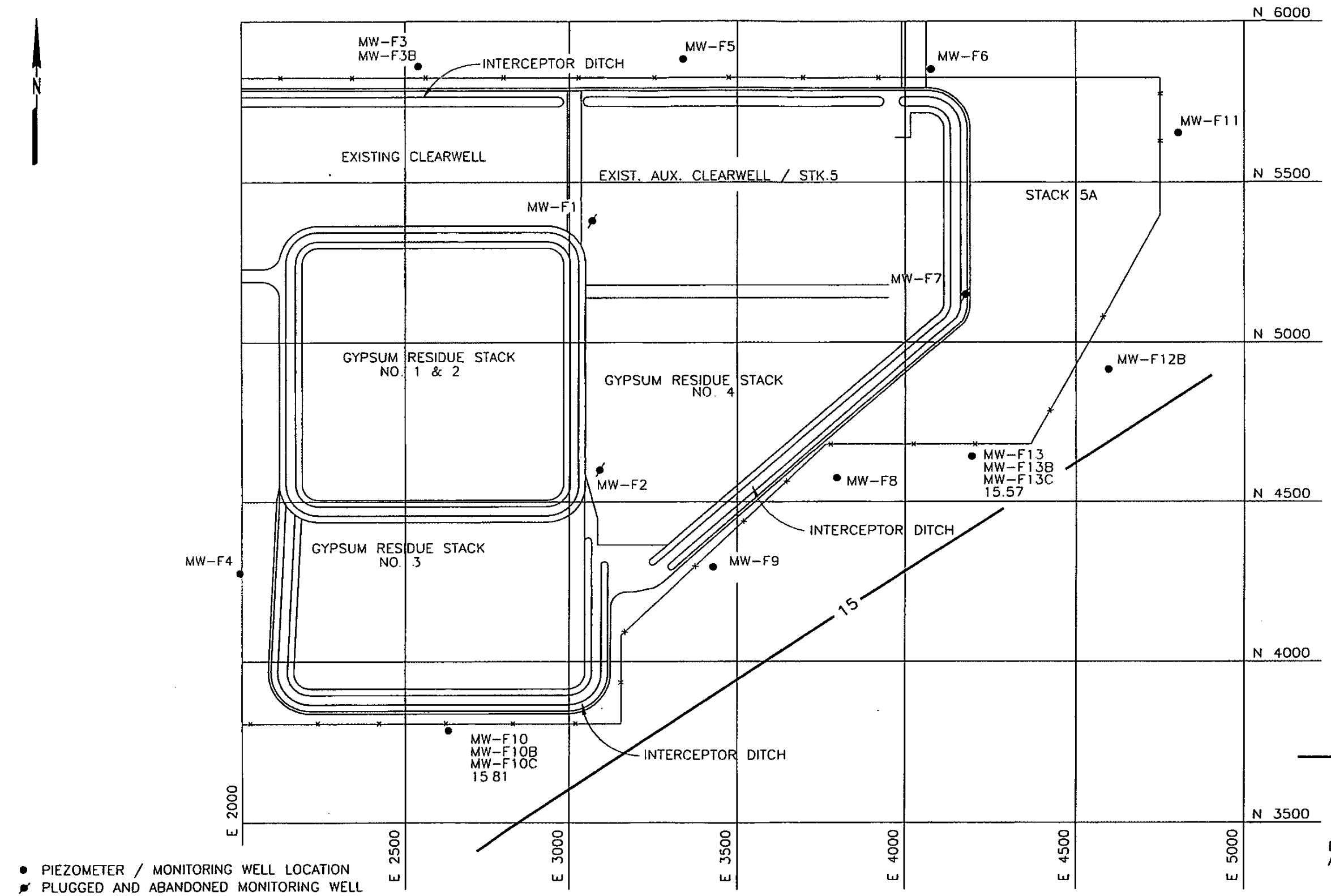
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
5-8-03	SHOWN	20020135	C3L

PLOT DATE: 5/9/03 10:39 A.M. ACAD FILE: 97087C3L.DWG



APRIL 14, 2003 EXHIBIT 4

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST CHARLES AVE NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

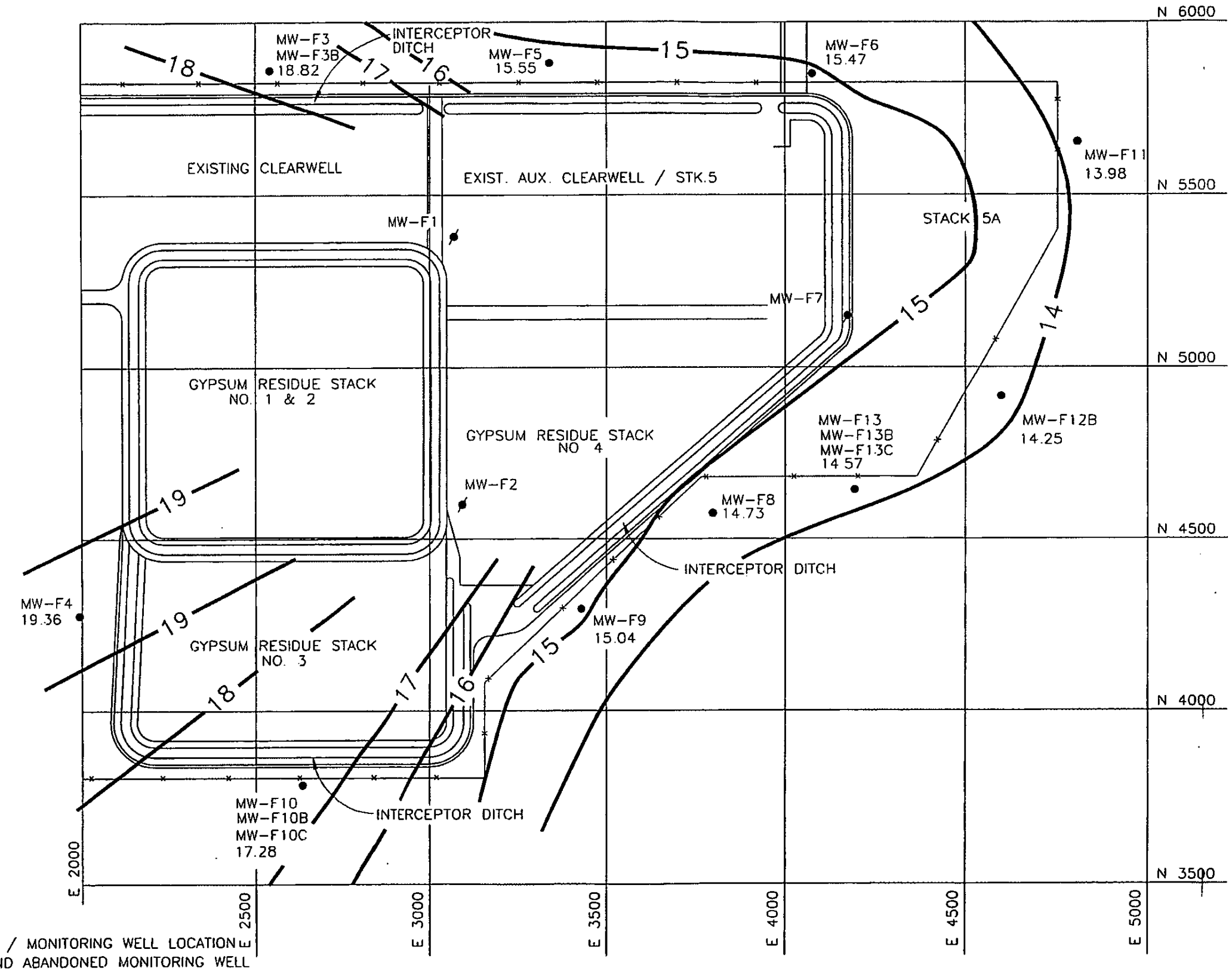
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
5-8-03	SHOWN	20020135	C3M

PLOT DATE: 5/9/03 10:39 A.M. ACAD FILE: 97087C3M.DWG

GROUNDWATER ELEVATION DATA

JUNE 10, 2003



— 16 — POTENTIOMETRIC CONTOUR IN FEET (M.S.L.)

DATA FOR EXISTING GROUNDWATER MONITORING WELLS MW-F3, MW-F4, MW-F5, MW-F6, MW-F8, MW-F9 MW-F10, MW-F11, MW-F12B, AND MW-F13

● PIEZOMETER / MONITORING WELL LOCATION

ø PLUGGED AND ABANDONED MONITORING WELL MW-F3B, F10B, F-10C, F-13B, AND F13C ARE PIEZOMETERS

300 150 0 300 600 900

SCALE 1" = 300'

JUNE 10, 2003 EXHIBIT 2

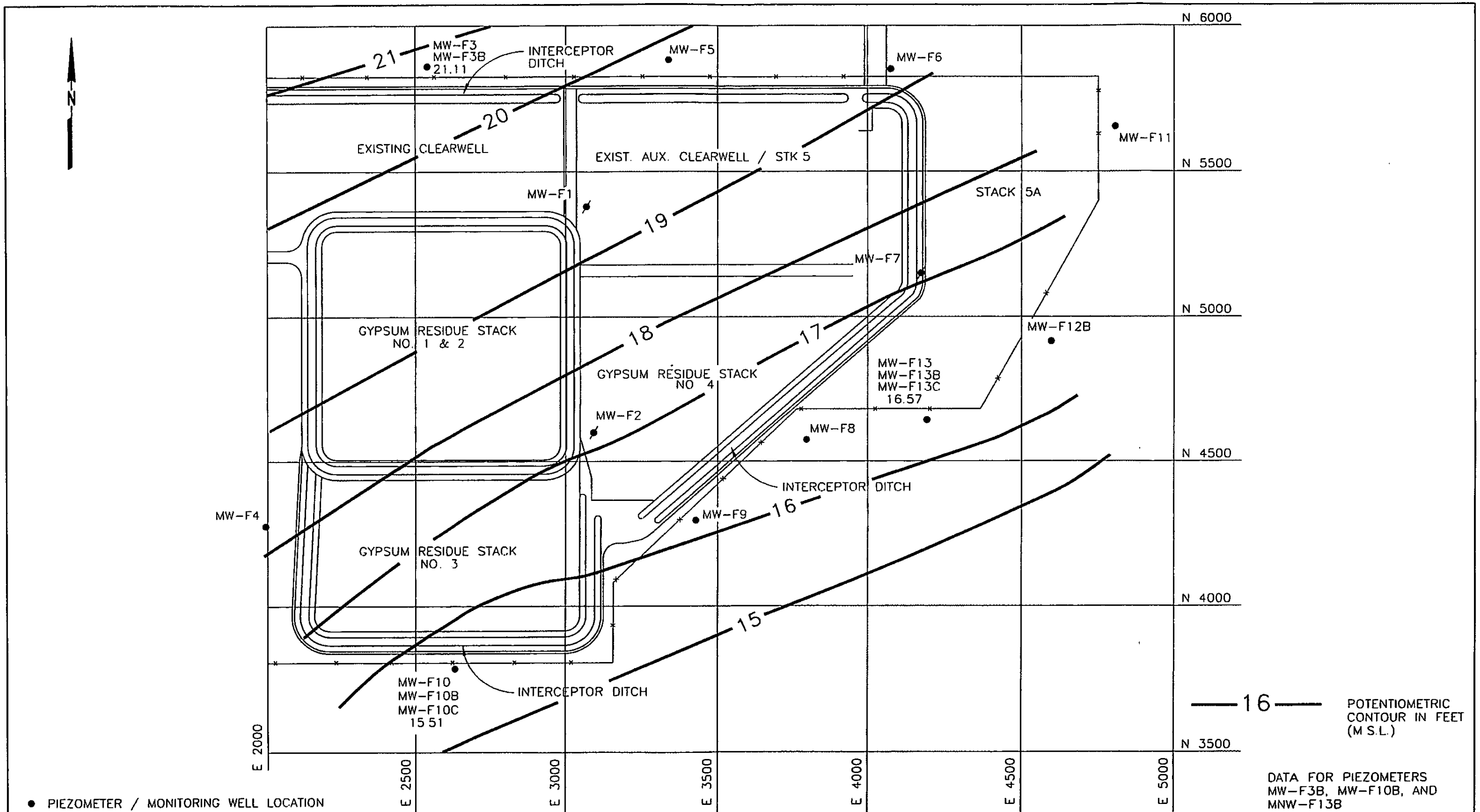
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
12-1-03	SHOWN	20030275	C2

PLOT DATE: 12/1/03 10:39 A.M. ACAD FILE: 20030275c2.dwg



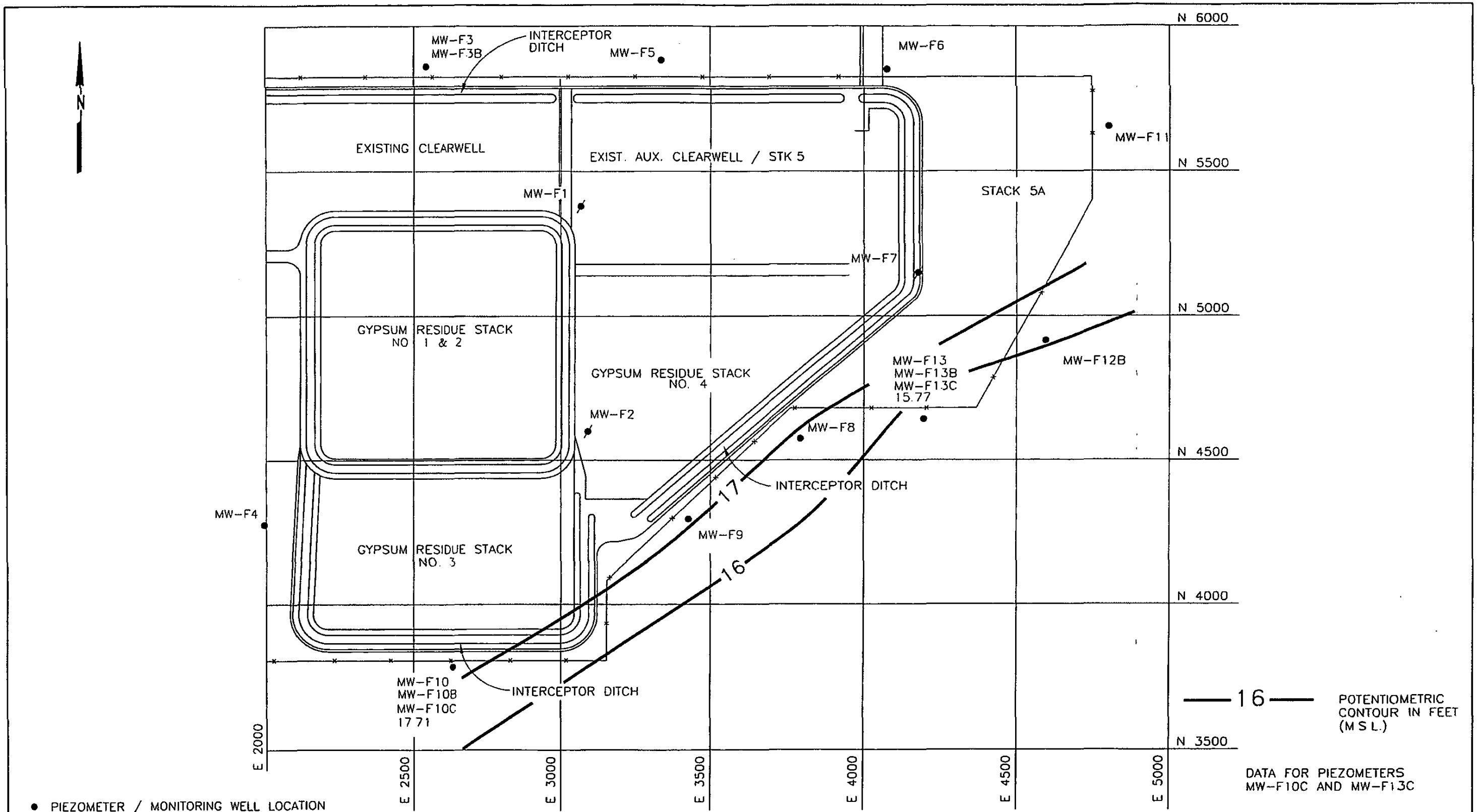
JUNE 10, 2003 EXHIBIT 3

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
12-1-03	SHOWN	20030275	C1

PLOT DATE: 12/1/03 10:39 AM ACAD FILE: 20030275c1.dwg



JUNE 10, 2003 EXHIBIT 4

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

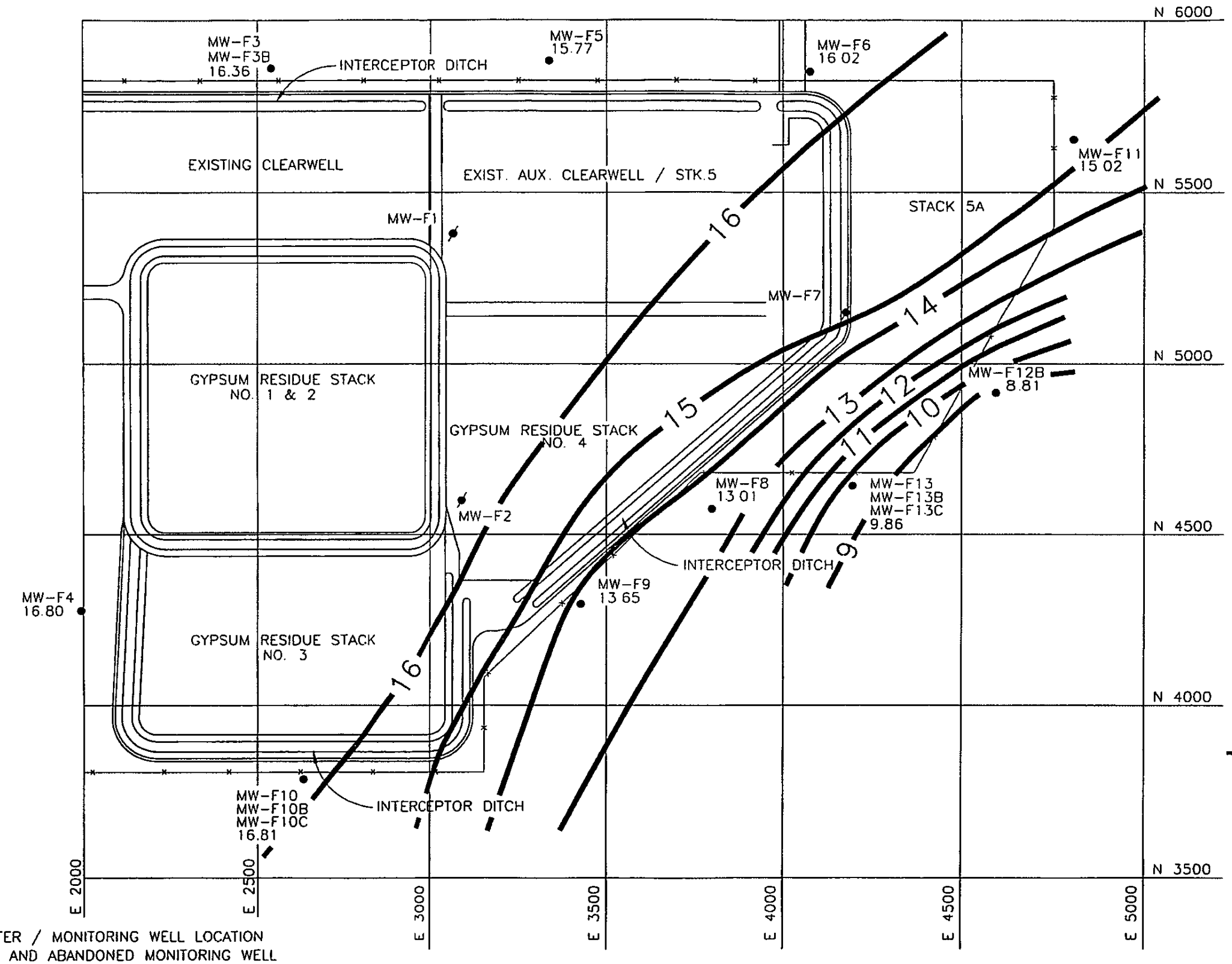
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
12-1-03	SHOWN	20030275	C3

PLOT DATE: 12/1/03 10:39 A.M. ACAD FILE: 20030275c3.dwg

GROUNDWATER ELEVATION DATA

NOVEMBER 11, 2003



— 9 — POTENTIOMETRIC CONTOUR IN FEET (M.S.L.)

DATA FOR EXISTING GROUNDWATER MONITORING WELLS MW-F3, MW-F4, MW-F5, MW-F6, MW-F8, MW-F9, MW-F10, MW-F11, MW-F12B, AND MW-F13

● PIEZOMETER / MONITORING WELL LOCATION

PLUGGED AND ABANDONED MONITORING WELL

MW-F3B, F10B, F10C, F13B, AND F13C ARE PIEZOMETERS

300 150 0 300 600 900

SCALE 1" = 300'

NOVEMBER 11, 2003

EXHIBIT 2

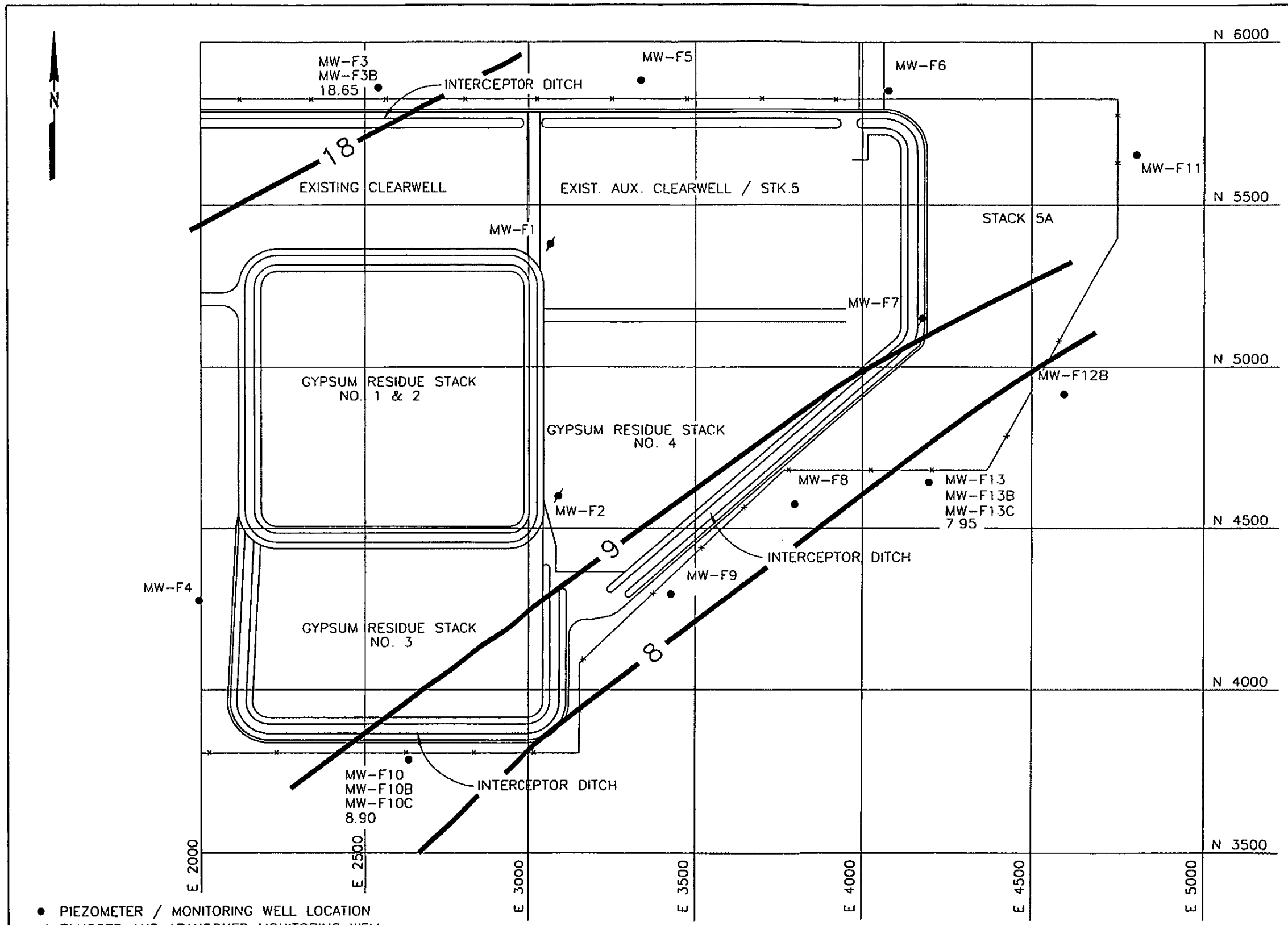
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
1-5-04	SHOWN	20020135	C2

PLOT DATE: 1/5/04 10:39 A.M. ACAD FILE: 20020135c2.dwg



DATA FOR PIEZOMETERS MW-F3B, MW-F13B, AND MW-F10B

NOVEMBER 11, 2003

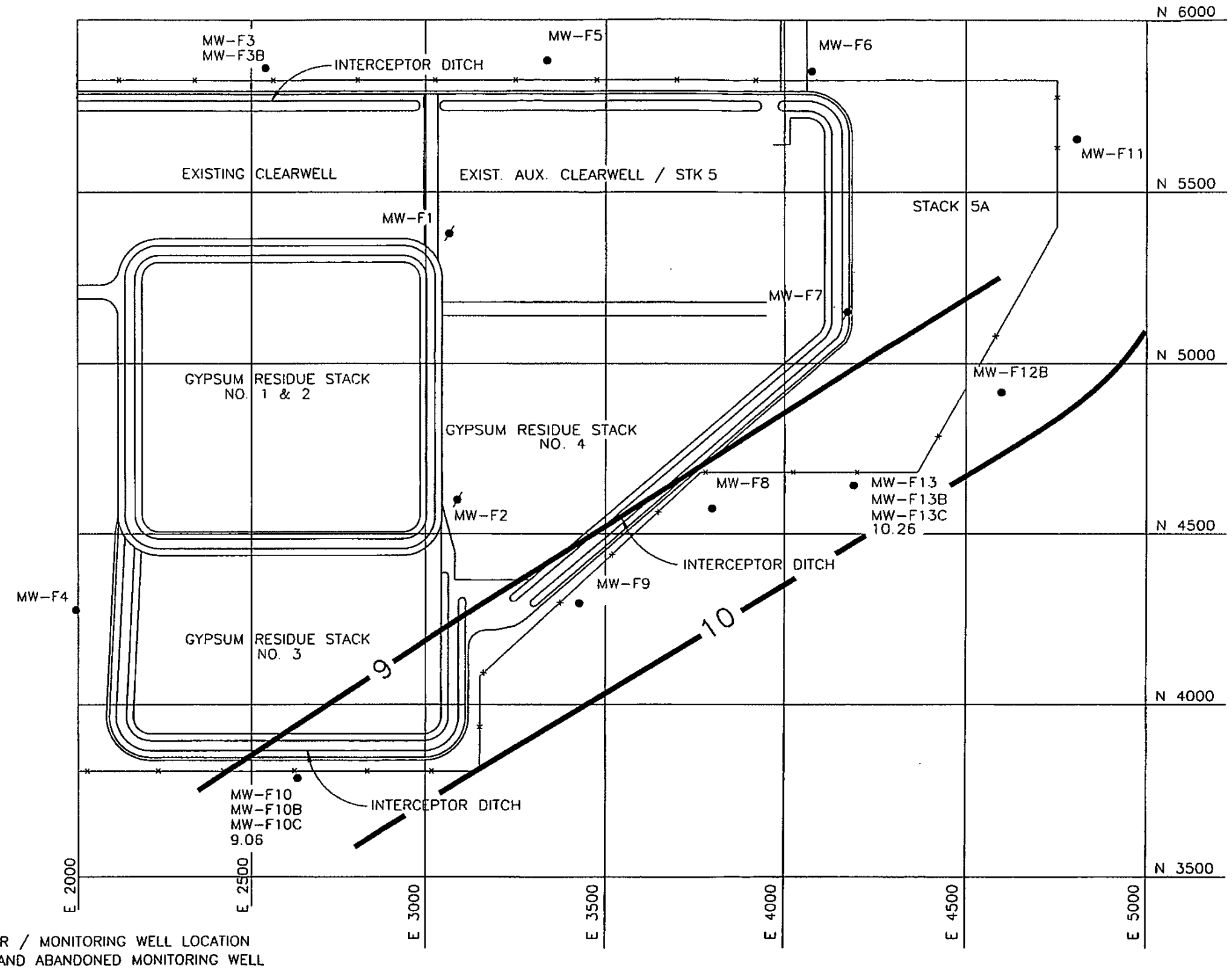
EXHIBIT 3

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
1-5-04	SHOWN	20020135	C3

PLOT DATE: 1/5/04 10:39 A.M. ACAD FILE: 20020135c3.dwg



— 9 — POTENTIOMETRIC, CONTOUR IN FEET (M.S.L.)

DATA FOR PIEZOMETERS MW-F13C AND MW-F10C

NOVEMBER 11, 2003

EXHIBIT 4

● PIEZOMETER / MONITORING WELL LOCATION

PLUGGED AND ABANDONED MONITORING WELL

MW-F3B, F10B, F10C, F13B, AND F13C ARE PIEZOMETERS

300 150 0 300 600 900

SCALE 1" = 300'

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
1-5-04	SHOWN	20020135	C4

PLOT DATE: 1/5/04 10:39 AM ACAD FILE: 20020135c4.dwg

GROUNDWATER FLOW RATE CALCULATIONS
ZONE 1 and ZONE 2

Utilizing a form of the Darcy Equation, the horizontal component of the average linear velocity of groundwater is determined.

$V_h = K_h (x) i/Ne$

Where V_h = Horizontal component of the average linear velocity
K_h = Horizontal component of hydraulic conductivity
i = Head gradient from potentiometric maps
Ne = Effective porosity

Permeable Zones 1, 2 and 3 are predominantly Silts, thus the following assumptions:
K_h = 0.1 FT/Day*
Ne = 10%*

*Source USEPA, 1989, Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities- Interim Final Guidance, EPA/530SW-89-026, NTIS, PB89-151047, February 1989.

Calculations utilizing head gradient data in the southeastern area of the facility collected in June 2003 are included on the following page.

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS

1200 ST. CHARLES AVENUE
NEW ORLEANS, LA 70130

BY _____ DATE _____ SUBJECT _____ SHEET NO _____ OF _____
CHKD. BY _____ DATE _____ JOB NO _____

FLOW RATES

JUNE 2003 GROUNDWATER ELEVATION DATA POTENTIOMETRIC MAPS FOR ZONE 1 AND ZONE 2 ARE INCLUDED IN THIS ATTACHMENT

PERMEABLE ZONE 1 $i = \Delta h / L$; 17 TO 15 FT CONTOURS
$= 2\text{ FT} / 300\text{ FT} = 0.0067$

$V_h = K_h (x)\ i / N_e$; $V_h = 0.1\text{ FT/DAY} (x)\ 0.0067 / 10\%$
$= \underline{0.0067\text{ FT/DAY}}$

PERMEABLE ZONE 2 $i = \Delta h / L$; 15 AND 17 FT CONTOURS
$= 2\text{ FT} / 720\text{ FT} = 0.0028$

$V_h = K_h (x)\ i / N_e$; $V_h = 0.1\text{ FT/DAY} (x)\ 0.0028 / 10\%$
$= \underline{0.0028\text{ FT/DAY}}$

Volume Flow Rate Calculations: Permeable Zone 1 and Permeable Zone 2 are both predominantly composed of silts. Permeability data used in these calculations for each Zone will be the same and is representative of permeability data collected in Zone 1 which typically occurs at depth of 10 to 20 feet below ground surface. Permeability data and corresponding soil boring logs are included in this Attachment.

FILE NO. 82-007 HF GYPSUM STACK EXPANSION Table 7

FALLING HEAD PERMEABILITY

BOR NO	DEPTH	PERCENT MOISTURE	DRY DEN.PCF	ATTERBERG LIMITS LL	PL	PI	PERMEABILITY CM/SEC
601	2.0- 4.0	27.4	95.9	46	21	25	0.140E-07
601	8.0- 10.0	39.4	79.0	80	33	47	0.188E-07
602	4.0- 6.0	30.0	99.3	33	22	11	0.553E-06
602	6.0- 8.0	30.3	101.7	30	22	8	0.100E-06
602	14.0- 16.0	34.6	92.3	34	26	8	0.300E-06
603	2.0- 4.0	27.8	99.9	33	21	12	0.269E-06
603	4.0- 6.0	34.0	90.3	45	18	27	0.679E-07
603	10.0- 12.0	29.0	94.7	28	22	6	0.461E-06
604	2.0- 4.0	29.0	94.6	41	23	18	0.988E-07
604	6.0- 8.0	38.5	81.9	69	29	40	0.163E-07
605	.0- 2.0	24.1	105.3	41	22	19	0.192E-07
605	8.0- 10.0	40.5	77.2	83	31	52	0.146E-07
606	4.0- 6.0	30.4	93.7	36	23	13	0.134E-06
606	6.0- 8.0	37.7	85.0	62	28	34	0.230E-07
606	12.0- 14.0	25.0	107.5	24	24	0	0.104E-04
607	2.0- 4.0	30.1	97.4	44	23	21	0.235E-07
607	6.0- 8.0	32.9	86.0	33	21	12	0.479E-06
608	6.0- 8.0	33.9	90.1	43	22	21	0.361E-06

LOG OF BORING

PROJECT New Auxiliary Clearwell

FOR Allied Signal Corporation
Geismar, Louisiana

BORING 601
FILE 82-7
DATE 24 JULY 1991
TECHNICIAN CSL

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 35 Feet

Depth (feet)	Description
0	Soft tan and gray silty clay
	Medium tan and gray slightly silty clay
5	Medium tan and gray clay with ferrous nodules
	Medium tan and gray clay with ferrous nodules
	Medium tan and gray clay with ferrous nodules
10	Medium tan and gray clay with ferrous nodules, silt streaks, and silt pockets
	Medium tan and gray silty clay with ferrous nodules
15	Firm gray sandy silt with 2" clay layer
	Very soft gray clay with 3" clayey sand layer
	Soft gray clay with silt pockets
20	Soft gray clay with silt traces
	Medium gray clay with silt traces
25	Soft gray clay with silt traces
	Soft gray clay with silt traces and organic matter
	Medium gray slightly silty clay with organic matter
30	
	Very loose gray clayey silt
35	

LOG OF BORING

PROJECT New Auxiliary Clearwell

FOR Allied Signal Corporation
Geismar, Louisiana

BORING 602
FILE 82-7
DATE 24 JULY 1991
TECHNICIAN MAB

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 100 Feet

Depth (feet)	Description	
0	Very stiff tan slightly silty clay with organic matter and silt streaks	
	Firm tan clayey silt with organic matter	
5	Firm tan clayey silt with organic matter	
	Soft tan slightly silty clay with lenses and ferrous nodules	
	Loose tan clayey silt	
10	Loose gray clayey silt	
	Firm gray clayey silt	
15	Very soft gray clay with silt pockets	
	Medium gray clay	
	Firm gray silt with 3" clay layer at top	
20	Firm gray silty sand	
	Soft gray clay with 4" sand layer	
25	Soft gray clay	(SLS)
	Firm gray silty sand	
	Very loose gray silty sand with clay pockets	
30		
	Firm gray silt with clay traces	
35		
	Very loose gray silt with large clay pockets and 2" clay layer	
40		
	Medium gray clay with sand streaks	
45		
	Firm gray sandy silt with clay traces	
50		

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

LOG OF BORING

PROJECT New Auxiliary Clearwell

FOR Allied Signal Corporation
Geismar, Louisiana

BORING 602
FILE 82-7
DATE 24 JULY 1991
TECHNICIAN MKB

DEPTH FEET | SAMPLES

No Sample Recovered
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 100 Feet

Depth (feet)	Description	Penetration Resistance
50		
55	Firm gray silt	17 blows per foot (7/8/9)
	Medium gray clay	
60		
	Firm gray clayey silt	
65		
	Stiff gray clay with silt pockets and streaks	
70		
75	Firm gray silt with clay pockets	13 blows per foot (7/6/7)
	Dense gray sandy silt	36 blows per foot (11/17/19)
80		
	Firm gray sandy silt	25 blows per 5 inches (17/25 for 5 inches)
85		
	Dense gray sandy silt	41 blows per foot (14/16/25)
90		
	Very dense gray silty fine sand	43 blows per 10½ inches (15/18/25 for 4½ inches)
95		
	Very dense gray sand	44 blows per 10 inches (17/19/25 for 4 inches
100		

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FP18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, Louisiana

BORING 603
FILE 82-7
DATE 23 JULY 1991
TECHNICIAN MAB

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 100 Feet

Depth (feet)	Description
0	Very stiff tan and gray silty clay with organic matter
	Firm tan clayey silt
5	Soft tan and gray silty clay
	Firm tan and gray silt with ¼" clay layers and clay streaks
	Firm gray sandy silt with clay traces
10	Firm gray sandy silt
	Firm gray silt with clay pockets
15	Firm gray silt
	Loose gray silt with sand traces
	Soft gray silty clay with silt streaks
20	Firm gray silt with sand traces
	Loose gray silt with clay pockets
25	Firm gray silty sand with clay pockets
	Loose gray silt with clay traces
	Very loose gray silt
30	
	Medium gray clay with 1" silt layer and silt lenses
35	
	Loose gray silt with sand traces
40	
	Very loose gray silt
45	
	Medium gray clay with 2½" clayey sand layer
50	

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FF18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR. Allied Signal Corporation
Geismar, Louisiana

BORING 603
FILE 82-7
DATE 23 JULY 199
TECHNICIAN MAB

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 100 Feet

50

55 Very loose gray silt with sand traces

60 Medium gray very sandy clay

65 Medium gray silty clay

70 Medium gray clay with silt lenses and streaks

75 Medium gray silty clay with 4" silt layer

80 Soft gray clay with 3" sand layer and sand streaks
Firm gray clayey sand
Penetration Resistance 15 blows per foot (7/6/8)

85 Medium gray clay with silt streaks

90 Dense gray silty fine sand
Penetration Resistance 45 blows per foot (17/24/21)

95 Very dense gray silty fine sand
Penetration Resistance 25 blows per 2 inches (18/25 for 2 inches)

100 Very dense gray silty fine sand
Penetration Resistance 25 blows per 3½ inches (27/25 for 3½ inches)

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers

Fr18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR Allied Signal Corporation
Geismar, Louisiana

BORING 604
FILE 82-7
DATE 24 JULY 1991
TECHNICIAN CSL

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 35 Feet

DEPTH FEET	
0	Soft tan very silty clay
	Medium tan silty clay
5	Soft tan and gray silty clay
	Medium tan and gray clay with silt pockets
	Medium tan clay with silt streaks
10	Stiff tan and gray clay with silt pockets
	Stiff tan and gray clay with silt pockets
15	Loose tan and gray clayey silt
	Firm tan clayey sandy silt
	Medium gray clay with 3" silty clay layer at top
20	Medium gray clay
	Medium gray clay with silt pockets
25	Medium gray clay with silt pockets
	Medium gray clay with silt pockets
	Medium gray clay with silt pockets
30	
	Medium gray slightly silty clay with organic matter
35	

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

F718125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, Louisiana

BORING 605
FILE 82-7
DATE 22 JULY 1991
TECHNICIAN MKA

DEPTH FEET | SAMPLES

No Sample Recovered
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 100 Feet

DEPTH FEET	DESCRIPTION	
0	Stiff tan silty clay with organic matter	
	Very soft tan very silty clay	
5	Soft tan clay with 2" clayey silt layer at top, silt pockets and streaks	
	Medium tan clay with silt pockets and ferrous nodules	
	Medium tan and gray clay with silt pockets and ferrous nodules	
10	Medium tan and gray clay with silt pockets and 2" silty sand layer at bottom	
	Medium tan and gray clay with silt pockets	
15	Medium tan and gray clay with silt pockets and streaks	
	Medium gray clay with 2" silt layer	
	Soft gray clay with 3" silt layer	
20	Soft gray clay with 1" and 2" silt layers and silt pockets	
	Soft gray clay with 4" silt layer at top	(SLS)
25	Very loose gray clayey silt	
	Soft gray clay with streaks	
	Soft gray clay with silt traces	
30		
	Medium gray clay	
35		
	Soft gray clay with silt pockets and streaks	
40		
	Medium gray clay with organic matter	
45		
	Stiff gray slightly organic clay	
50		

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

77-18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, Louisiana

BORING 605
FILE 82-7
DATE 19 JULY 1991
TECHNICIAN MKA

DEPTH FEET | SAMPLES | UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 100 Feet

Depth (feet)	Description	Penetration Resistance
50		
	Very loose gray sandy silt	
55		
60	Firm gray silt	20 blows per foot (12/12/8)
65	Very dense gray silty fine sand	51 blows per foot (12/21/30)
70	Firm gray silty fine sand	19 blows per foot (13/9/10)
75	Firm gray silty fine sand	16 blows per foot (11/7/9)
80	Very dense gray sand	30 blows per 6 inches (30)
85	Hard gray slightly silty clay with sand traces	33 blows per foot (14/13/20)
90	Dense gray silty fine sand	36 blows per foot (14/20/16)
95	Dense gray silty fine sand	31 blows per foot (13/16/15)
100	Very stiff gray clay	20 blows per foot (12/12/8)

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

PF18325

LOG OF BORING

PROJECT. New Auxiliary Clearwell

FOR. Allied Signal Corporation
Geismar, Louisiana

BORING 606
FILE 82-7
DATE 18 JULY 1991
TECHNICIAN MKA

DEPTH FEET | SAMPLES

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 35 Feet

Depth (feet)	Description
0	Soft tan silty clay with ferrous nodules and organic matter
	Soft tan very silty clay with ferrous nodules
5	Soft tan very silty clay
	Medium tan and gray slightly silty clay with silt pockets
	Medium tan and gray slightly silty clay with silt pockets
10	Medium tan and gray silty clay with ferrous nodules and silt lenses
	Firm tan clayey silt with 3" sand at bottom
15	Medium tan and gray silty clay
	Medium tan and gray clay with silt pockets
	Loose gray silt with clay streaks
20	Firm gray clayey silt with sand lenses
	Loose gray clayey silt with wood
25	Medium gray silty clay with silt lenses and 2" sand layer
	Soft gray clay with sand pockets and streaks
	Medium gray slightly silty clay
30	
	Soft gray slightly silty clay
35	

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, LA

BORING 607
FILE 82-7
DATE 25 JULY 1991
TECHNICIAN MAB

No Sample Recovered

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 90 Feet

DEPTH FEET	SAMPLES	
0		Stiff tan slightly silty clay with organic matter
		Soft tan slightly silty clay with organic matter
5		Firm tan clayey silt
		Firm gray clayey silt
10		Loose gray silt Penetration Resistance 7 blows per foot (3/4/3)
		Loose gray silt Penetration Resistance 7 blows per foot (3/3/4)
15		Loose gray silt with sand traces Penetration Resistance 9 blows per foot (3/5/4)
		Loose gray silt with sand traces Penetration Resistance 9 blows per foot (4/4/5)
20		Loose gray silt Penetration Resistance 8 blows per foot (3/4/4)
		Loose gray silt with clay traces Penetration Resistance 9 blows per foot (4/5/4)
		Firm gray silty sand
25		Firm gray sandy silt Penetration Resistance 11 blows per foot (3/5/6)
		Firm gray sandy silt Penetration Resistance 10 blows per foot (4/5/5)
30		Firm gray silt Penetration Resistance 11 blows per foot (3/5/6)
35		Firm gray silt with sand traces Penetration Resistance 20 blows per foot (9/9/11)
40		Very loose gray silty sand with 1½ inch very silty clay layer
45		Medium gray clay with silt lenses
50		Medium gray very silty clay

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

PF18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, LA

BORING 607
FILE 91-38
DATE 25 JULY 1991
TECHNICIAN MAB

DEPTH FEET | SAMPLES

No Sample Recovered
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 90 Feet

50

Firm gray clayey silt

55

Stiff gray clay with silt streaks

60

Medium gray silty clay with sand traces

65

70

Firm gray clayey silt
Penetration Resistance 20 blows per foot (4/5/15)

75

Very dense gray sandy silt
Penetration Resistance 25 blows per 5½ inches (11/25 for 5½ inches)

Dense gray sandy silt
Penetration Resistance 40 blows per foot (17/23/17)

80

Firm gray sandy silt with traces of clay
Penetration Resistance 25 blows per foot (7/11/12)

85

Dense gray silty sand
Penetration Resistance 47 blows per foot (8/19/28)

90

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FP18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, LA

BORING 608
FILE 82-7
DATE 22 JULY 1991
TECHNICIAN MKA

DEPTH FEET | SAMPLES

No Sample Recovered
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 100 Feet

DEPTH FEET	
0	Medium tan silty clay with organic matter
	Soft tan very silty clay
5	Very soft tan and gray silty clay with silt streaks
	Soft tan and gray slightly silty clay with silt streaks
	Very soft tan silty clay with silt streaks
10	Soft tan and gray silty clay
	Loose gray silt
15	Soft gray silty clay with 1½ inch sandy silt layer
	Firm gray silty sand
	Soft gray silty clay
20	Medium gray clay with silt streaks
	Very loose gray clayey silt with sand pockets, 1½ inch sand layer, and ½ inch clay layer
25	Firm gray clayey silt
	Soft gray very silty clay
30	Firm gray silt Penetration Resistance 11 blows per foot (6/4/7)
	Very loose gray clayey silt
35	
	Soft gray clay with sand pockets and streaks
40	
	Medium gray clay with silt lenses, sand pockets, and streaks
45	
	Medium gray clay with silt pockets and streaks
50	

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FF18125

LOG OF BORING

PROJECT: New Auxiliary Clearwell

FOR: Allied Signal Corporation
Geismar, LA

BORING 608
FILE 82-7
DATE 22 JULY 1991
TECHNICIAN MKA/MAB

DEPTH FEET | SAMPLES

No Sample Recovered
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 100 Feet

Depth (feet)	Description	Penetration Resistance
50		
55	Medium gray very silty clay with silt streaks	
60	Firm gray silt with clay traces	
65	Dense gray silty sand	38 blows per foot (16/18/20)
70	Firm gray silty sand	13 blows per foot (7/6/7)
75	Dense gray sand	33 blows per foot (15/14/19)
80	Dense gray sand	31 blows per foot (15/17/14)
85	Very dense gray sand	26 blows per 6 inches (24/26)
90	Very dense gray sand	25 blows per 6 inches (25/25)
95	Dense gray sand	32 blows per foot (13/15/17)
100	Dense gray sand	34 blows per foot (14/18/16)

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers

FF18125

Will use Darcy's law to calculate flow through the zones. (Holtz & Kovacs, 1981)

$$Q = KiA = K\frac{\Delta h}{L}A$$

K = permiability
Δh = change in water height
L = length of media
i = hydraulic gradient
A = cross sectional Area

NOTE: IF THICKNESS WAS SHOWN AS 0' ON FIGURES 2' WAS ASSUMED

ZONE 1

K = 0.0258 ft/day
Δh = 5 ft (DWG C1 EXHIBIT 2)
L = 2100 ft (DWG C1 EXHIBIT 2)
i = $\Delta h/L$ = 0.00238

ZONE THICKNESS (DWG C42)	LENGTH (FT)	AREA (SF)
2'	840	1680
3'	330	990
4'	120	480
5'	720	3600
7'	90	630
	2100	7380 SF' TOTAL AREA

$Q = KiA = (0.0258\ ft/day)(0.00238)(7380\ SF)$

$Q = 0.45\ ft^3/day$

NOTE: PERMIABILITY FORE ZONES 1 & 2 ASSUMED TO BE THE SAME SINCE THEY ARE BOTH SILTS

ZONE 2

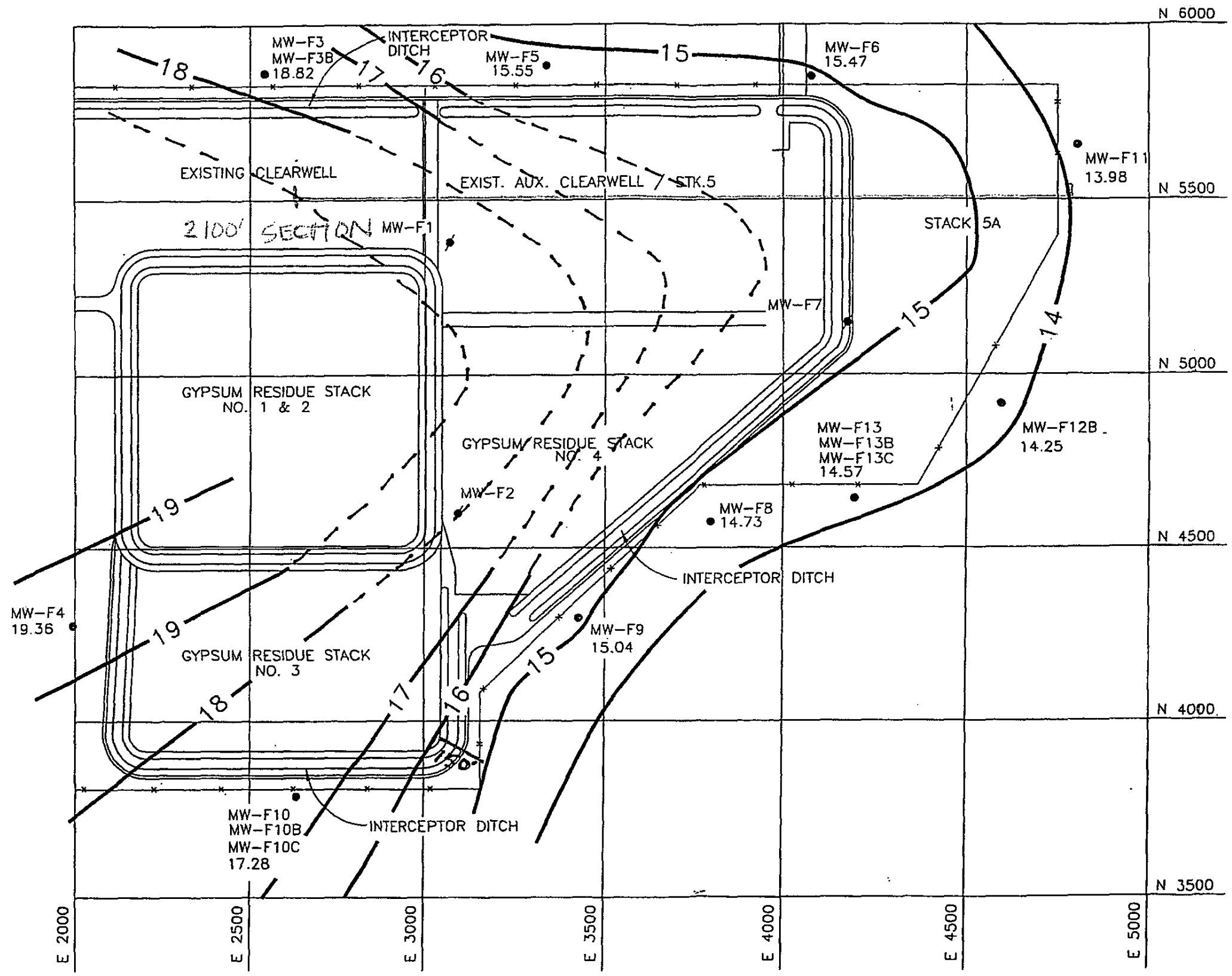
ZONE THICKNESS (DWG C44)	LENGTH (FT)	AREA (SF)
2	990	1980
3	300	900
5	60	300
7	150	1050
9	120	1080
	1620	5,310 SF TOTAL AREA

$k = 0.0258$ ft/day
$\Delta h = 4$ ft (DWG C1 EXHIBIT 3)
$L = 1620$ ft (DWG C1 EXHIBIT 3)
$i = 0.00247$

$Q = kiA = (0.0258 \text{ ft/day})(0.00247)(5{,}310 \text{ SF})$

$Q = 0.34 \text{ ft}^3/\text{day}$

ZONE 1



ASSUMED POTENTIOMETRIC CONTOUR

—16— POTENTIOMETRIC CONTOUR IN FEET (M.S.L.)

DATA FOR EXISTING GROUNDWATER MONITORING WELLS MW-F3, MW-F4, MW-F5, MW-F6, MW-F8, MW-F9, MW-F10, MW-F11, MW-F12B, AND MW-F13

JUNE 10, 2003 EXHIBIT 2

- PIEZOMETER / MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL MW-F3B, F10B, F-10C, F-13B, AND F13C ARE PIEZOMETERS

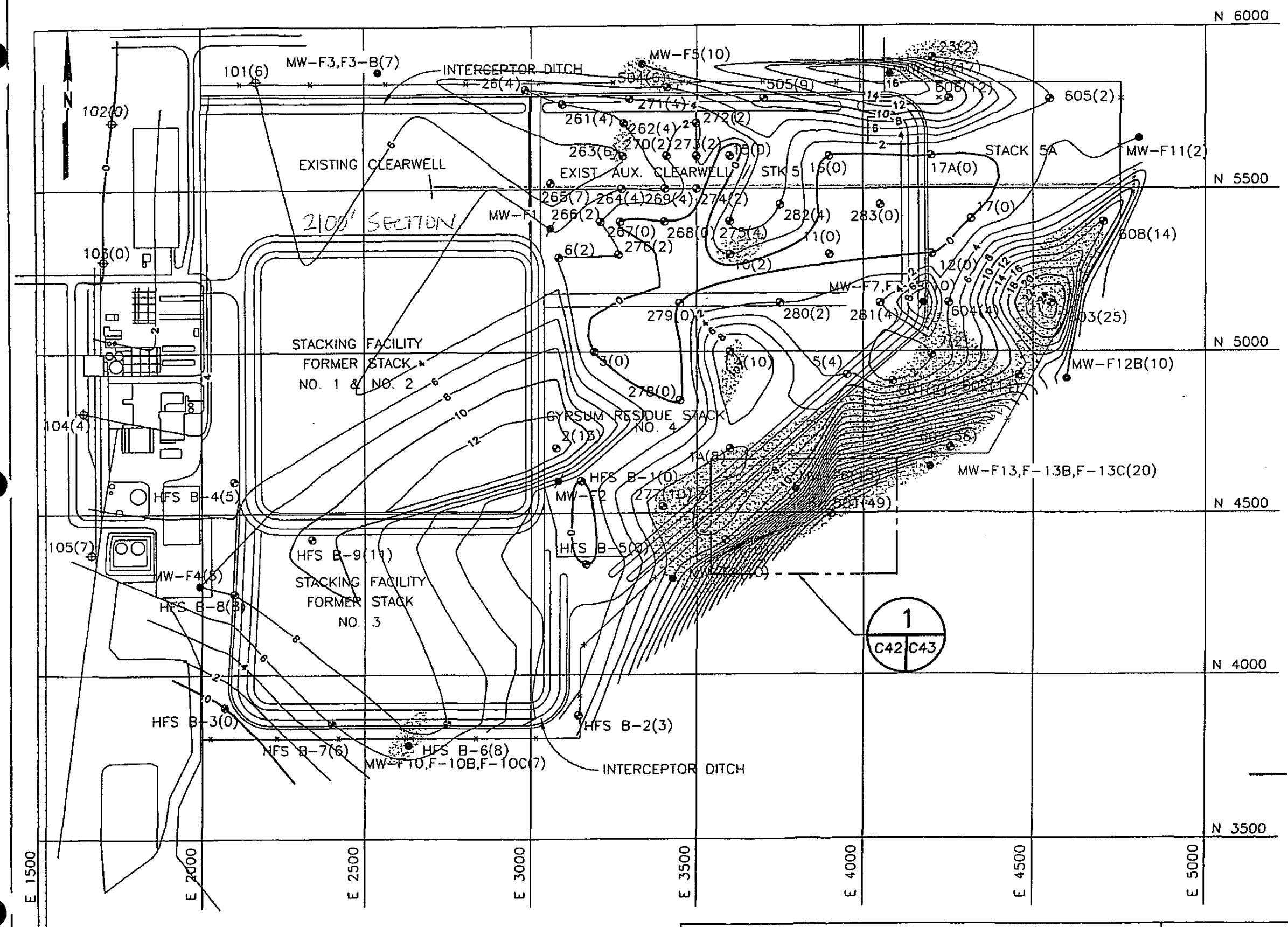
SCALE 1" = 300'

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
12-1-03	SHOWN	20030275	C1

PLOT DATE: 12/1/03 10:39 A.M. ACAD FILE: 20030275c2.dwg



NOTES:

1. AT BORING LOCATION 501, AN IMPERMEABLE UNIT IS NOT IDENTIFIED BETWEEN PERMEABLE ZONES 1, 2, AND 3, THEREFORE THE APPARENT THICKNESS OF ZONE 1 INCLUDES THE COMBINED THICKNESS OF ZONES 1, 2, AND 3.
2. AT BORNING LOCATION 607 AN IMPERMEABLE UNIT IS NOT INDENTIFIED BETWEEN PERMEABLE ZONE 1 AND 2 THEREFORE THE APPARENT THICKNESS OF ZONE 1 INCLUDES THE COMBINED THICKNESS OF ZONE 1 AND 2.
3. MW-F3, F4, F5, F6, F8, F10, F11, F12B AND F13 ARE GROUNDWATER MONITORING WELLS. MW-F3B, F10B, F10C, F13B AND F13C ARE UTILIZED AS PIEZOMETERS.

⊗( ) SOIL BORING LOCATION (ZONE THICKNESS IN FEET)
●( ) MONITORING WELL LOCATION (ZONE THICKNESS IN FEET)
PLUGGED AND ABANDONED MONITORING WELL.
—4— THICKNESS INTERNAL (FT.)
SAND

SHEET 1 OF 2 EXHIBIT 11A

ISOPACH MAP FIRST PERMEABLE ZONE

SCALE: 1" = 300'

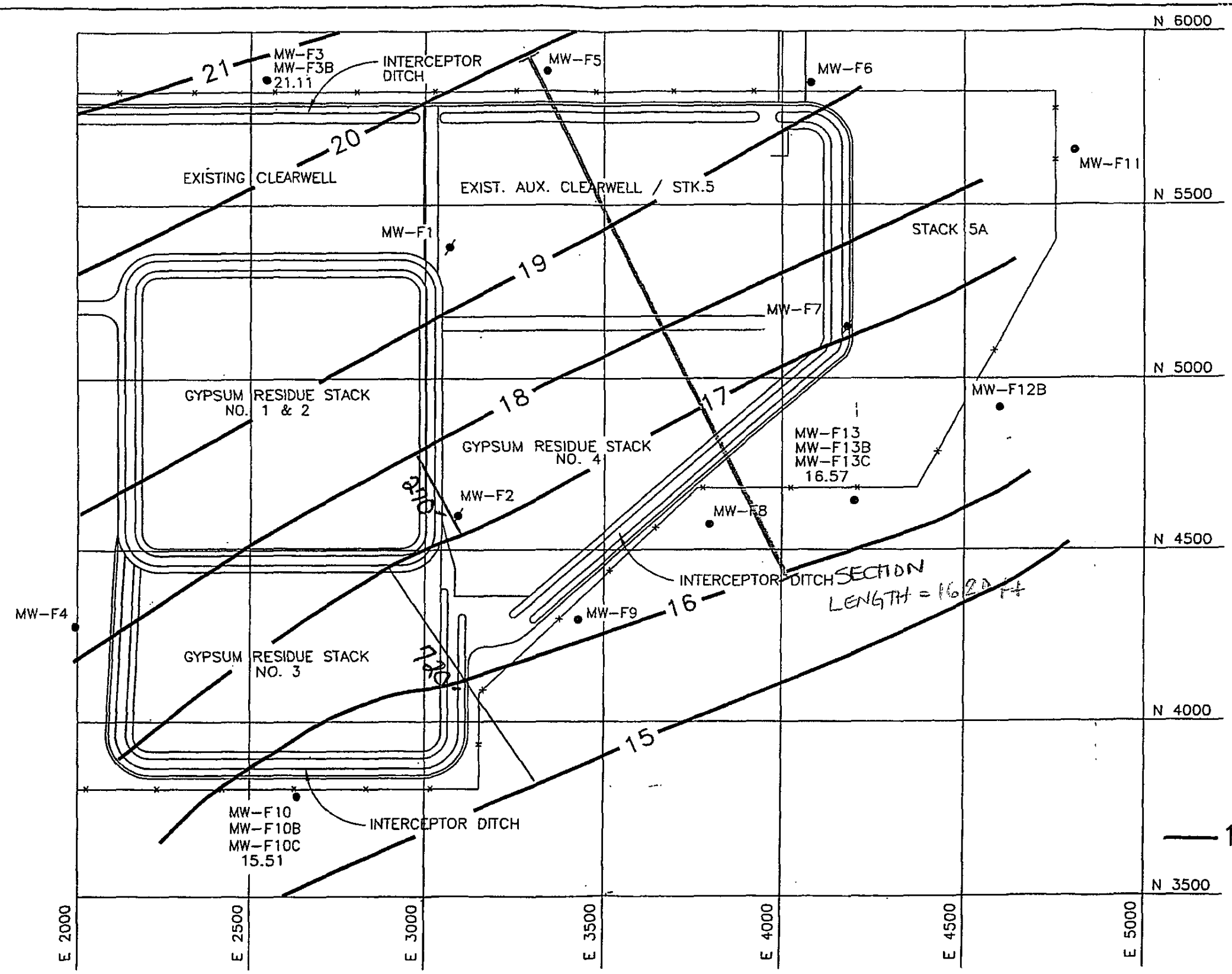
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
5/7/04	SHOWN	20030275	C42

ZONE 2



—16— POTENTIOMETRIC CONTOUR IN FEET (M.S.L.)

DATA FOR PIEZOMETERS MW-F3B, MW-F10B, AND MNW-F13B

JUNE 10, 2003 EXHIBIT 3

● PIEZOMETER / MONITORING WELL LOCATION

PLUGGED AND ABANDONED MONITORING WELL

MW- F3B, F10B, F-10C, F-13B, AND F-13C ARE PIEZOMETERS

SCALE 1" = 300'

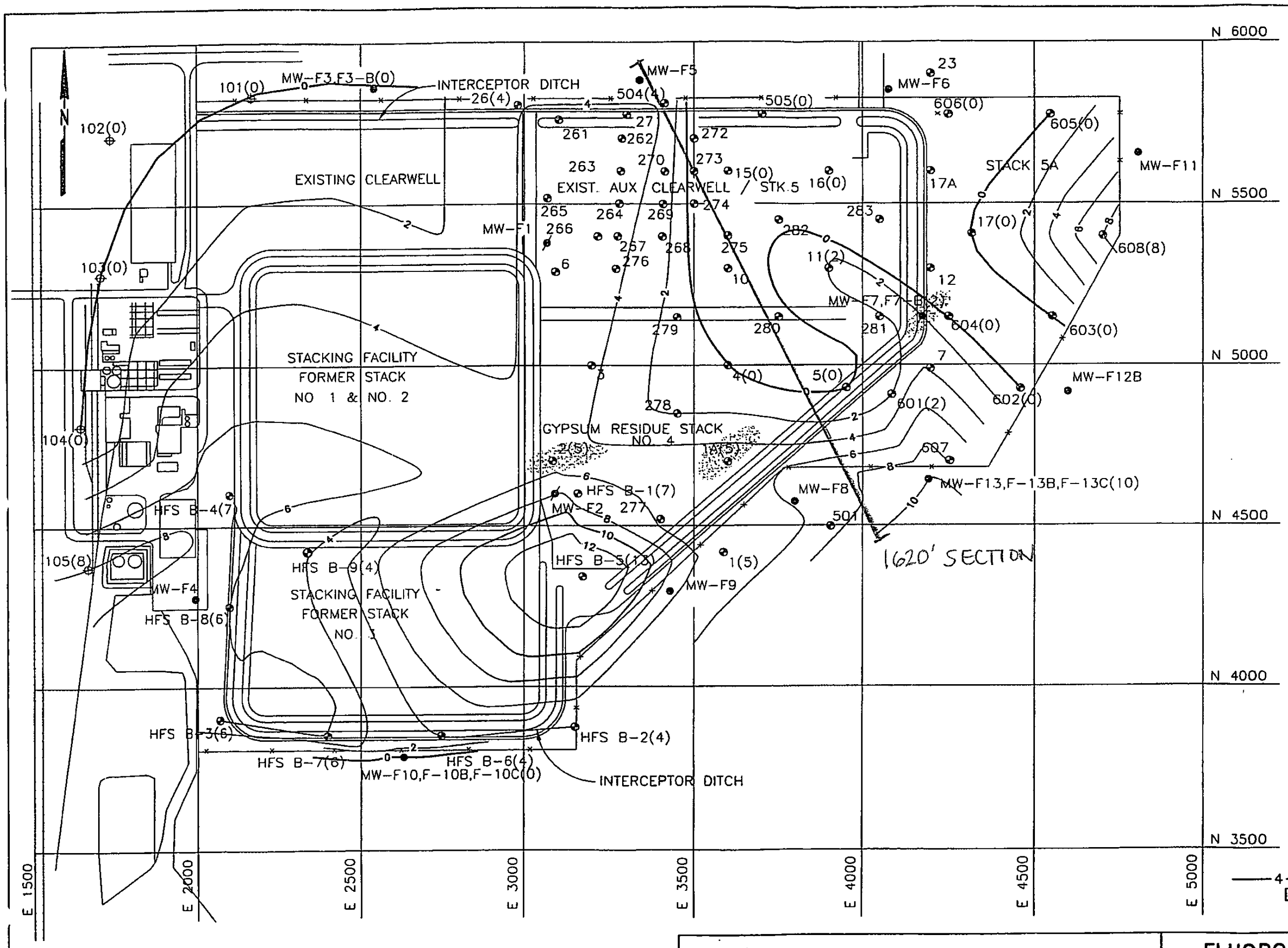
WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE. NEW ORLEANS, LA.

FLUOROGYPSUM STACKING FACILITY
GROUNDWATER MONITORING WELLS
HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
12-1-03	SHOWN	20030275	C1

PLOT DATE: 12/1/03 10:39 A.M. ACAD FILE: 20030275c1.dwg

ZONE 2



NOTES:

1. AT BORING LOCATION 501, AN IMPERMEABLE UNIT IS NOT IDENTIFIED BETWEEN PERMEABLE ZONES 1, 2, AND 3, THEREFORE THE APPARENT THICKNESS OF ZONE 1 INCLUDES THE COMBINED THICKNESS OF ZONES 1, 2, AND 3. THUS THE THICKNESS OF PERMEABLE ZONE 2 CAN NOT BE CONFIRMED AT THIS LOCATION.
2. AT BORING LOCATION 607 AN IMPERMEABLE UNIT IS NOT IDENTIFIED BETWEEN PERMEABLE ZONE 1 AND 2 THEREFORE THE APPARENT THICKNESS OF ZONE 1 INCLUDES THE COMBINED THICKNESS OF ZONE 1 AND 2. THUS THE THICKNESS OF PERMEABLE ZONE 2 CAN NOT BE CONFIRMED AT THIS LOCATION.
3. MW-F3, F4, F5, F6, F8, F10, F11, F12B AND F13 ARE GROUNDWATER MONITORING WELLS. MW-F3B, F10B, F10C, F13B AND F13C ARE UTILIZED AS PIEZOMETERS.

⊗( ) SOIL BORING LOCATION (ZONE THICKNESS IN FEET)

●( ) MONITORING WELL LOCATION (ZONE THICKNESS IN FEET) IF BORING DEPTH NOT SUFFICIENT TO CONFIRM SECOND ZONE; THICKNESS IS NOT INDICATED. TYPICALLY THE SECOND ZONE IS INITIALLY IDENTIFIED AT 0 TO -10 FT. MSL.

PLUGGED AND ABANDONED MONITORING WELL.

—4— THICKNESS INTERNAL (FT)

SAND

EXHIBIT 11B

ISOPACH MAP SECOND PERMEABLE ZONE

SCALE: 1" = 300'

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE NEW ORLEANS, LA

FLUOROGYPSUM STACKING FACILITY

HONEYWELL INTERNATIONAL, INC. GEISMER, LA.

DATE	SCALE	JOB NO.	DRAWING NO.
5/7/04	SHOWN	20030275	C44

Recent Groundwater Elevation Data and Potentiometric Maps

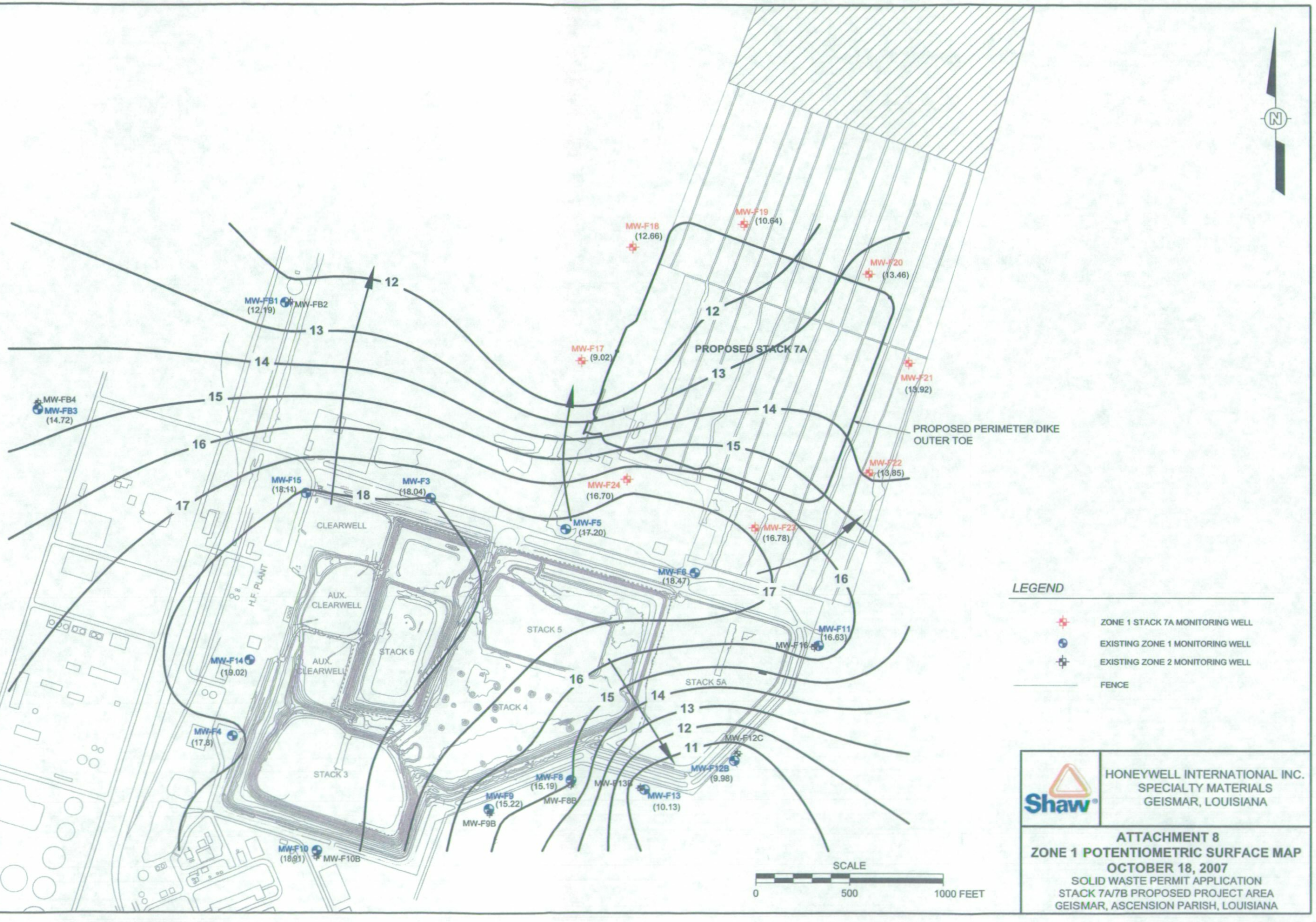
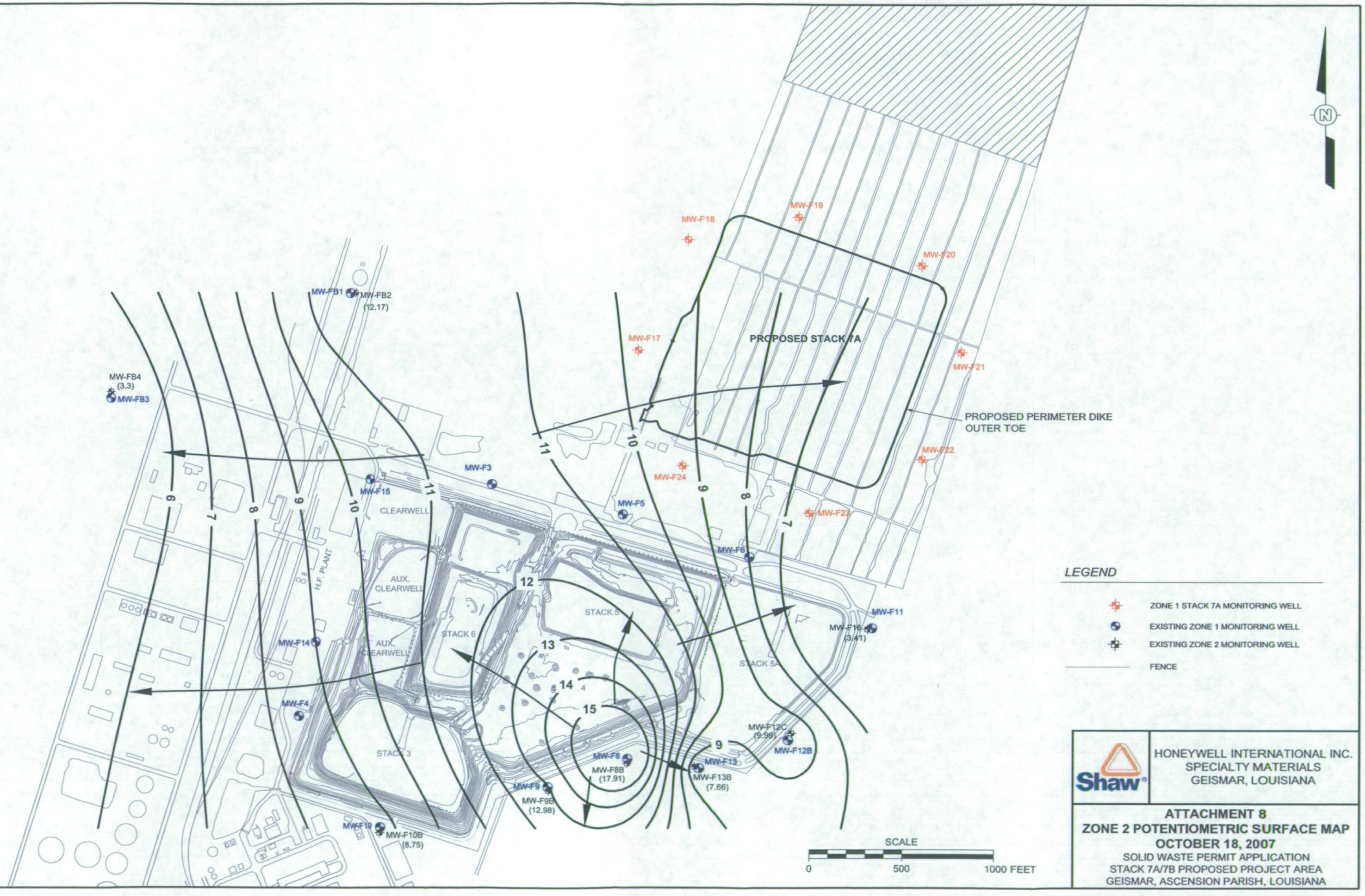

N
MW-F18
(12.66)
MW-F19
(10.64)
MW-F20
(13.46)
MW-F21
(13.92)
MW-F22
(13.85)
MW-F17
(9.02)
PROPOSED STACK 7A
PROPOSED PERIMETER DIKE
OUTER TOE
MW-FB1
(12.19)
MW-FB2
MW-FB4
MW-FB3
(14.72)
MW-F15
(18.11)
MW-F3
(18.04)
MW-F24
(16.70)
MW-F5
(17.20)
MW-F23
(16.78)
MW-F6
(18.47)
MW-F11
(16.63)
MW-F16
MW-F14
(19.02)
MW-F4
(17.8)
MW-F10
(18.91)
MW-F10B
MW-F8
(15.19)
MW-F8B
MW-F9
(15.22)
MW-F9B
MW-F13B
MW-F13
(10.13)
MW-F12C
MW-F12B
(9.98)
CLEARWELL
AUX.
CLEARWELL
AUX.
CLEARWELL
H.F. PLANT
STACK 3
STACK 4
STACK 5
STACK 5A
STACK 6
11
12
13
14
15
16
17
18
SCALE
0
500
1000 FEET
LEGEND
ZONE 1 STACK 7A MONITORING WELL
EXISTING ZONE 1 MONITORING WELL
EXISTING ZONE 2 MONITORING WELL
FENCE
Shaw
HONEYWELL INTERNATIONAL INC.
SPECIALTY MATERIALS
GEISMAR, LOUISIANA
ATTACHMENT 8
ZONE 1 POTENTIOMETRIC SURFACE MAP
OCTOBER 18, 2007
SOLID WASTE PERMIT APPLICATION
STACK 7A/7B PROPOSED PROJECT AREA
GEISMAR, ASCENSION PARISH, LOUISIANA
DRAWING NUMBER
124071-B28
APPROVED BY
CHECKED BY
DRAWN BY
D. Comeaux
12/04/07
OFFICE
BTR
X-REF
IMAGE

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	BTR	D. Comeaux 12/04/07			124071-B29

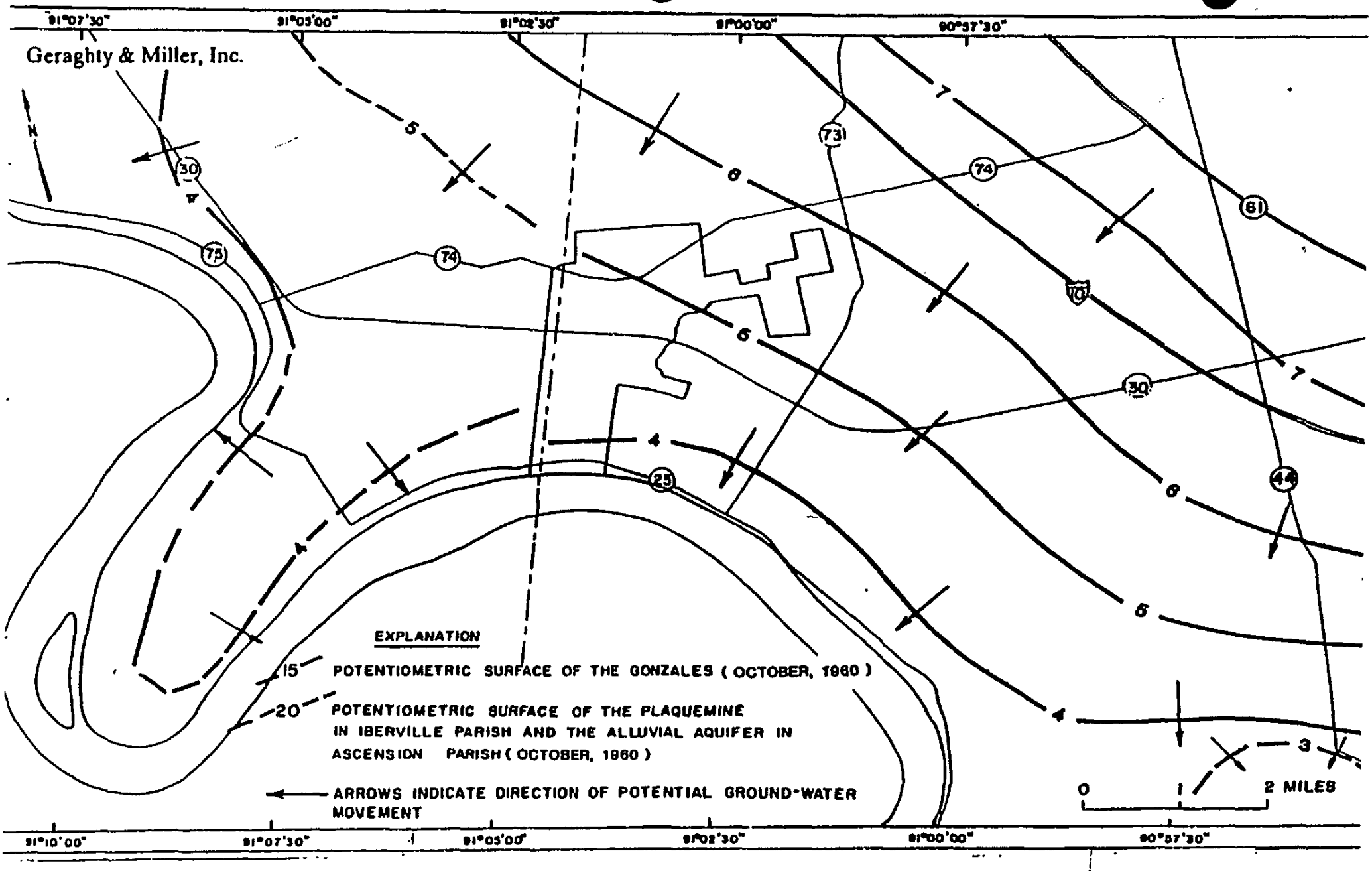


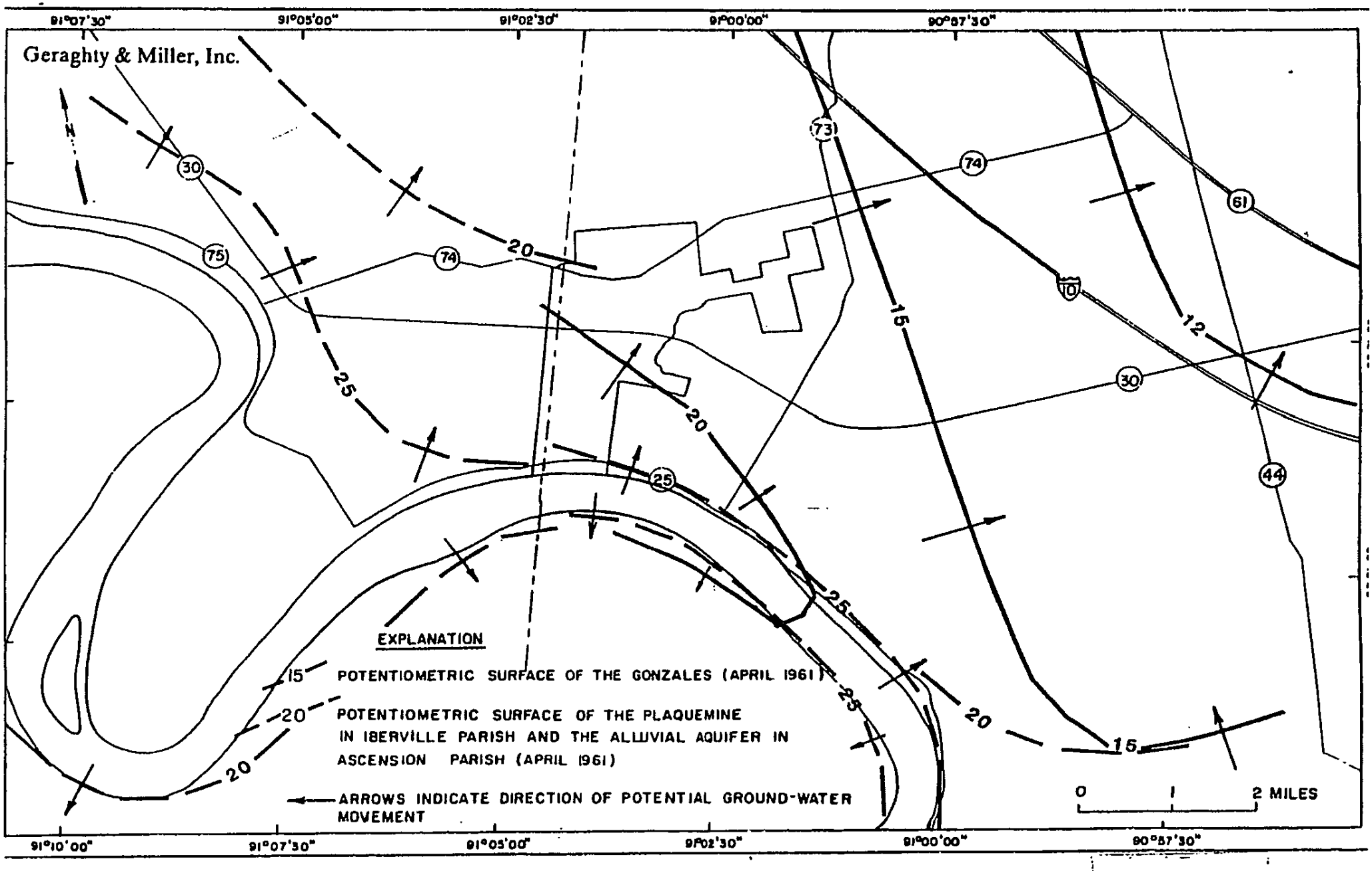
Shaw®

HONEYWELL INTERNATIONAL INC.
SPECIALTY MATERIALS
GEISMAR, LOUISIANA

ATTACHMENT 8
ZONE 2 POTENTIOMETRIC SURFACE MAP
OCTOBER 18, 2007
SOLID WASTE PERMIT APPLICATION
STACK 7A/7B PROPOSED PROJECT AREA
GEISMAR, ASCENSION PARISH, LOUISIANA

Plaquemine and Gonzales Aquifers


Geraghty & Miller, Inc.
91°07'30"
91°05'00"
91°02'30"
91°00'00"
90°57'30"
91°10'00"
30
75
74
73
61
70
25
44
5
6
7
4
3
EXPLANATION
15 POTENTIOMETRIC SURFACE OF THE GONZALES (OCTOBER, 1960)
20 POTENTIOMETRIC SURFACE OF THE PLAQUEMINE IN IBERVILLE PARISH AND THE ALLUVIAL AQUIFER IN ASCENSION PARISH (OCTOBER, 1960)
ARROWS INDICATE DIRECTION OF POTENTIAL GROUND-WATER MOVEMENT
0
1
2 MILES


Geraghty & Miller, Inc.
91°07'30"
91°05'00"
91°02'30"
91°00'00"
90°57'30"
91°10'00"
N
30
75
74
73
61
10
44
25
20
15
12
EXPLANATION
15 POTENTIOMETRIC SURFACE OF THE GONZALES (APRIL 1961)
20 POTENTIOMETRIC SURFACE OF THE PLAQUEMINE IN IBERVILLE PARISH AND THE ALLUVIAL AQUIFER IN ASCENSION PARISH (APRIL 1961)
ARROWS INDICATE DIRECTION OF POTENTIAL GROUND-WATER MOVEMENT
0 1 2 MILES

ATTACHMENT 9
Groundwater Monitoring and Sampling Procedure

1. INTRODUCTION

Groundwater monitoring is performed to identify groundwater quality impacts, track changes in the extent and magnitude of the identified impacts, to provide needed data to support groundwater remediation and to evaluate the effectiveness of any remedial activities undertaken. The objective of this sampling program is the collection of a "representative "sample of the current groundwater conditions over a known volume of aquifer. The purpose of this monitoring and sampling procedure is to provide a method that minimizes the impact the purging process has on the groundwater chemistry during collection of groundwater samples from monitoring wells at the Honeywell - Geismar Facility. This procedure provides descriptions of the equipment and field procedures necessary to collect groundwater samples from monitoring wells. This procedure was developed to eliminate cross-contamination of the samples, to ensure that the required samples are representative of the strata being monitored, to document the custody of the samples, and to ensure that the samples are uniformly obtained.

2. SCOPE

This procedure provides descriptions of the equipment and field equipment necessary to collect groundwater samples from monitoring wells and describes purging and sampling procedures necessary to ensure consistent results throughout the life of the facility. Water-quality-indicator parameters and water levels must be measured during purging and prior to sample collection. Stabilization of the water-quality-indicator parameters as well as monitoring water levels is a prerequisite to sample collection during the low flow process. The water-quality-indicator parameters include the following: specific conductance (SC), dissolved oxygen (DO), turbidity, oxidation-reduction potential (ORP), pH, and temperature.

3. EQUIPMENT REQUIRED

3.1 The following equipment may be used during well purging and sampling:

- Tool Box – all needed tools for the site equipment used (i.e., knife and screwdriver).
- Electric water level tape with marked intervals of 0.01 foot used for measuring the water level and the total depth of the well.
- Portable stainless-steel or Teflon submersible non-aerating pump with adjustable rate controls.
- Plastic tubing (dedicated to each well)
- Power source – if a Gas-powered electric generator (240 and 480 volt outlets) is used; it must be placed downwind of the sampling area.
- Flow measurement supplies – graduated cylinder and a stop watch
- Water-quality-indicator meters

- Flow-through cell –The inlet of the flow through cell must be located near the bottom and the outlet near the top. The cell must not contain any air or gas bubbles when monitoring water-quality-indicator parameters.
- Decontamination supplies – Including distilled water, chemwipes or equivalent, phosphorous-free detergent (i.e., Alconox), buckets, and brushes.
- Pre-cleaned sample bottles obtained from the laboratory
- Plastic sheeting placed on the ground around the well casing
- All personal protective equipment (PPE)
- Calculator
- 55-gallon drum(s) or holding tank for storing purged groundwater

CAUTION: SLIP HAZARD – WET PLASTIC SHEETING IS VERY SLIPPERY WHEN WET. CAUTION SHOULD BE USED TO PREVENT WATER OR MUD FROM COLLECTING ON THE SURFACE OF THE PLASTIC.

3.2 The following equipment may be required for sample labeling, packing, documentation, and performing chain-of-custody procedures:

- Sample labels
- Appropriate preservatives
- Field logbook including ground water sampling forms and daily equipment calibration forms
- Chain-of-custody forms
- Disposable latex gloves
- Black permanent markers and waterproof pens
- Clear plastic tape
- Large trash bags
- Gallon plastic freezer bags
- Cooler
- Ice
- Shipping documentation

4. GROUNDWATER MONITORING WELLS

The Fluorogypsum Stacking Facility has a total of thirty (30) groundwater monitoring wells which are strategically placed around the facility. The monitoring wells are:

MONITORING WELLS – STACKS 3, 4, 5, 5A, 6, and CLEARWELLS

Well Number	Casing Elevation, Feet	Well Depth, Feet	Ground Surface Elevation, Feet, M.S.L	Install Date	Screen Interval, From (FT MSL)	Screen Interval, To (FT MSL)
MW-F3	23.67	20	19.7	1982	7.7	2.7
MW-F4	23.61	22	19.7	1982	5.7	0.7
MW-F5	20.83	20	17.9	1986	5.9	0.9
MW-F6	21.49	27	18.9	1986	-0.1	-5.1
MW-F8	21.46	27	18.8	1986	-0.2	-5.2
MW-F8B	21.26	42	18.1	2006	-13.4	-23.4
MW-F9	23.19	26.5	20.3	1986	1.8	-3.2
MW-F9B	23.04	41	20.3	2006	-10.2	-20.2
MW-F10	24.18	21	21.3	1986	8.3	3.3
MW-F10B	24.18	48	21.3	1998	-19.2	-24.2
MW-F11	21.57	25	19	2002	1.5	-3.5
MW-F12B	20.2	25	18	2002	0.5	-4.5
MW-F12C	20.4	40	17.8	2006	-11.7	-21.7
MW-F13	20.57	25	18	2002	0.5	-4.5
MW-F13B	20.67	40	18	2002	-14.5	-19.5
MW-F14	19.82	25	19.8	2004	-.02	-5.2
MW-F15	24.14	30	24.3	2004	-1.7	-5.7
MW-F16	21.7	51	19.3	2004	-22.2	-26.7
MW-FB1	19.61	31	16.5	2004	-9.5	-14.5
MW-FB2	19.46	45	16.6	2006	-17.9	-27.9
MW-FB3	20.97	25	17.53	2006	5.97	-4.03
MW-FB4	20.62	45	17.41	2006	-14.38	-24.38

Because of the radial groundwater flow pattern centered at the fluorogypsum stacks, all of the groundwater monitoring wells listed above can be considered as downgradient wells.
Additional well construction details include 0.01-inch screen slot size on all the wells and a 5% bentonite/cement grout completion.

MONITORING WELLS – STACK 7A

Well Number	Casing Elevation, Feet	Well Depth, Feet	Ground Surface Elevation, Feet, M.S.L	Install Date	Screen Interval, From (Feet, M.S.L.)	Screen Interval, To (Feet, M.S.L.)
MW-F17	19.38	16	16.21	2007	7.71	2.71
MW-F18	18.83	17	15.59	2007	6.09	1.09
MW-F19	18.99	17	16.02	2007	6.52	1.52
MW-F20	20.06	16	16.94	2007	8.44	3.44
MW-F21	20.72	20	17.49	2007	4.99	-0.01
MW-F22	21.90	18	18.13	2007	7.63	2.63
MW-F23	21.82	17	18.80	2007	9.30	4.30
MW-F24	22.30	20	19.19	2007	6.69	1.69

5. FIELD INSTRUMENT CALIBRATION

5.1 Field instruments utilized to sample for temperature, pH, turbidity, ORP, DO and SC will be calibrated before and after each days sampling event in accordance with the manufacture's recommendations and be consistent with SW-846 (Test Methods for Evaluating Solid Waste-Physical Chemical Methods).

5.2 Calibration fluids for all instruments must be NIST-traceable and the instruments must be calibrated daily throughout the sampling event.

5.3 The results of each calibration will be documented using the groundwater equipment calibration form.

5.4 Information on the form includes:

- Equipment Type
- Model Number
- Serial Number
- Calibration Date
- Calibration and Post Calibration results
- Name of field technician

6. GROUNDWATER LEVEL MEASUREMENT

6.1 Determination of groundwater elevation is required prior to purging and sampling.

6.2 Unlock the well housing and remove the well cap.

6.3 All wells shall be measured for total depth and depth to water on the same day and just the depth to water immediately prior to purging, in order to allow adequate time for the well to recover prior to sampling activities.

6.4 Measurements shall be to the nearest 0.01 foot, and the values shall be recorded in the Groundwater Collection Report.

6.5 An electric water level tape shall be used to measure the water level.

6.6 To determine the groundwater level in each well, the following measurements shall be taken at each groundwater well.

6.6.1 To measure the total depth of each well; measure the distance from the top of casing to the bottom of the well.

6.6.2 To measure the depth to water in each well; measure the distance from the top of well casing to water surface.

6.7 Record the results in the Groundwater Collection Report.

6.8 If 10 percent of the screened interval is blocked by sediments, the well shall be redeveloped prior to the next required sampling event.

6.9 Wells with dedicated sampling devices which preclude total-depth measurement shall be measured annually.

6.10 The electric water level tape shall be decontaminated prior to use and between wells as outlined in the decontamination and cross-contamination control section of this procedure.

7. WELL PURGING

7.1 Purging and sampling must begin at the monitoring well with the least contamination and then proceed systematically to the monitoring wells with the most contamination.

7.2 Determination of groundwater elevation

7.2.1 Place plastic sheet around the well casing to minimize any spillage.

7.2.2 Unlock the well housing and remove the well cap.

7.2.3 Measure the depth to water with the water level meter and use the total depth measurement collected during the site-wide groundwater elevation determination.

7.2.4 Calculate the volume of the well prior to purging by using the following equation:

Well Volume = $V = 0.0408\ HD^2$
V = Volume of water in well, in gallons
H = Height pf water column, in feet
D = Inside diameter, in inches

Note: Well volume calculation is from USGS (U.S. Geological Survey TWRI, Book 9, General Information and Guidelines Chapter 6 – Groundwater, Published in 4/98)

7.3 Low Flow Submersible Pump Purging

7.3.1 Place plastic sheeting around well casing.

7.3.2 A low flow adjustable rate stainless steel or Teflon submersible pump may be used to purge each well.

7.3.3 Unused plastic tubing shall be dedicated to each monitoring well during each sampling event.

7.3.4 Discard the well purging tubing after four (4) uses.

7.3.5 The pump will be carefully lowered into the well, trailing a discharge hose, electrical cables, and a stainless steel security cable. Plastic ties shall be used to prevent associated cables and hoses from bundling.

7.3.6 A portable gasoline generator may be required to provide power. The portable gasoline generator will be placed downwind some distance away from the well where fumes can not affect sample quality.

7.3.7 The pump intake should be lowered to the center of the screened interval and placement should be sounded with a weighted tape and recorded on the groundwater sampling form. The same intake placement should be noted and used for each additional semi annual sampling event.

7.3.8 Measure the water level and record information on the groundwater sampling form, and leave the water level indicator probe in the monitoring well.

7.3.9 Connect the discharge line from the pump to the flow-through cell. A "T" connection is needed prior to the flow-through cell for the collection of turbidity measurements. The discharge line from the flow-through cell must be directed to a 5-gallon bucket to collect the purge water during the

the purging and sampling activities.

7.3.10 Start pumping the well at a low flow rate (0.2 to 0.5 liters per minute) and slowly increase the speed. Check the water level. Maintain a steady flow rate while maintaining a drawdown of less than 0.33 feet (Puls and Barcelona, 1996). If the drawdown is greater than 0.33 feet, lower the flow rate. 0.33 feet is a goal to help guide with the flow rate adjustment. It may be difficult to achieve this goal and variations may be necessary based on geologic conditions.

7.3.11 Record the optimal pump rate on the groundwater sampling form for future sampling events.

7.3.12 Measure the discharge rate of the pump with a graduated cylinder and a stop watch. Continue purging, monitor and record the water level, pump rate, and water-quality-indicator parameters every five minutes during pumping.

7.3.13 During purging a minimum of one tubing and cell volume must be purged prior to recording the water-quality-indicator parameters. Once the tubing and cell volume has been removed monitor and record the water-quality-indicator parameters every five minutes.

7.3.14 Stabilization criterion is based on three successive readings of the water quality indicator parameters meeting the following criteria:

Parameter	Stabilization Criteria	Reference
pH	+/- 0.1 pH units	Puls and Barcelona, 1996
SC	+/- 3% S/cm	Puls and Barcelona, 1996
ORP	+/- 10 millivolts	Puls and Barcelona, 1996
turbidity	+/- 10% NTUs	Puls and Barcelona, 1996
DO	+/- 0.3 mg/L	Wilde et al., 1998

7.3.15 Once the criteria have been successfully met indicating that the water quality parameters have stabilized, then sample collection can take place.

7.3.16 If the stabilized drawdown in the well can't be maintained at 0.33 feet and the water level is approaching the top of the screened interval, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. Begin pumping at a lower flow rate, if the water draws down to the top of the screened interval again, turn the pump off and allow for recovery. If

two tubing and cell volumes have been removed during purging, then sampling can proceed the next time the pump is turned on.

7.3.17 The pump is required to have a check valve, and under no circumstances should the well be pumped dry.

7.4 All purging equipment shall be decontaminated prior to use and between sampling points as outlined in the decontamination and cross-contamination control section of this procedure.

7.5 All purge water will be containerized in properly labeled containers (i.e. plastic totes or 55-gallon drums).

8. MONITOR WELL SAMPLING

8.1 Maintain the same pumping rate or reduce slightly for sampling (0.2 to 0.5 liters per minute) in order to minimize disturbance of the water column..

8.2 Collect the samples directly from the discharge port of the pump tubing prior to passing through the flow-through cell.

8.3 All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.

8.4 Remove and decontaminate the pump from the monitoring well.

8.5 Groundwater samples shall not be field filtered prior to laboratory analysis.

8.6 Field Blank Sample

8.6.1 One (1) field blank sample per day shall be collected during the groundwater sampling event.

8.6.2 Collect the field blank by filling the sample container in the field with deionized water obtained from the laboratory.

8.6.3 Assign the blank sample an appropriate identification number and follow the documentation, preservation, handling, packaging, and chain-of-custody procedures outlined in this procedure.

8.7 Blind Duplicate Sample

8.7.1 To check for the natural sample variance and the consistency of field techniques and laboratory analysis, one (1) blind duplicate sample per twenty monitoring wells shall be collected from a monitoring well with elevated constituents during the groundwater sampling event.

8.7.2 The duplicate sample shall be collected in the field side-by-side with primary samples.

8.7.3 Handle the duplicate sample in the same manner as the primary sample.

8.7.4 Assign the duplicate sample an appropriate identification (BD) and follow the documentation, preservation, handling, packaging, and chain-of-custody procedures outlined in this procedure.

8.8 Rinsate Sample

8.8.1 To check if decontamination procedures have been effective, one (1) equipment rinsate sample per day shall be collected during the groundwater sampling event.

8.8.2 The rinsate sample shall be collected from the decontaminated sampling equipment (i.e. pump) before it is used to obtain a primary sample.

8.8.3 Rinse deionized over the decontaminated sampling equipment and transfer the water to the sample bottles.

8.8.4 Assign the rinsate sample the appropriate identification number and follow the documentation, preservation, handling, packaging, and chain-of-custody procedures outlined in this procedure.

8.9 Matrix Spike/Matrix Spike Duplicate

8.9.1 To ensure the laboratory spike recovery is within the acceptable limits in our groundwater matrix one (1) matrix spike and matrix spike duplicate sample will be collected per twenty monitoring wells.

8.9.2 The matrix spike and matrix duplicate sample shall be collected in the field side-by-side with primary samples.

8.9.3 Handle the duplicate sample in the same manner as the primary sample.

8.9.4 Assign the duplicate sample an appropriate identification (MW-F8MS and MW-F8MSD) and follow the documentation, preservation, handling, packaging, and chain-of-custody procedures outlined in this procedure.

8.10 After collection all samples shall be placed into a cooler with ice for transportation to the laboratory.

8.11 Sampling equipment shall be decontaminated prior to use and between sampling points as outlined in the decontamination and cross-contamination control section of this procedure.

8.12 Securely replace the well cap on the well and lock the well housing.

8.13 Place plastic and associated sampling debris into a plastic bag for disposal.

9. FIELD DOCUMENTATION

9.1 The Groundwater Collection Report shall be kept, which documents for each sample the well identification number, total well depth, elevation of top of casing, water level, water color, well-purging procedures and equipment, date, time, sample identification numbers, field measurements (pH, ORP, DO, specific conductance, and temperature) and methods, name of collector, field observations, calculations of the standing water volume in the well and the total volume purged, and the ideal pumping rates.

9.2 All deviations from this procedure shall be documented as to the extent of, and reason for, the deviation. Any activity not performed in accordance with this procedure is considered a deviation. Deviations from plan may or may not affect data quality.

10. DECONTAMINATION AND CROSS-CONTAMINATION CONTROL

10.1 All equipment used to collect groundwater samples shall be decontaminated prior to use and between sampling points or discarded.

10.2 Well tubing shall be disposed of after each well. New tubing shall be used for each well purged and sampled.

10.3 Decontamination shall be performed using the following procedures:

- Wash in a phosphorous-free detergent (i.e., Alconox),
- Triple rinse with clean deionized water, and
- Air dry equipment.

10.4 In order to minimize the possibility of cross-contamination, the following procedures shall be followed

- Latex or Nitrile gloves shall be worn during all sampling activities and changed between sampling events.
- Avoid placing clean sampling equipment on the ground or on any contaminated surface.
- All purge water, decontamination water, and discarded gloves shall be containerized for disposal.

- Sample containers shall be kept in limited access areas until used.

10.5 Sampling must begin at the monitoring well with the least contamination, generally upgradient or farthest from the source and proceed systematically to the monitoring wells with the most contaminated groundwater.

11. QUALITY ASSURANCE AND QUALITY CONTROL

11.1 It is the objective of this quality assurance/quality control (QA/QC) program to ensure consistent sampling and analysis procedures that ensure monitoring results are representive groundwater quality at each well location.

11.2 Field sampling activities will be ensured through the use of standard operating procedures, chain of custody documentation, sample preservation and submission of field QA/QC samples in accordance with the specifications of the Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, as revised December 1987).

11.3 Sampling and Analysis

11.3.1 Sample preservation, handling and analysis shall meet the specifications of LAC 33:VII.805.B.2 and LAC 33:VII.3005 Appendix C.

11.3.2 The preservatives shall be supplied by the laboratory and placed into the appropriate containers by the laboratory.

11.3.3 Documentation of the preservative will be provided on the sample container labels and the chain of custody form.

11.4 Chain of Custody Form

11.4.1 A chain-of-custody form shall be employed that will allow for the possession and handling of samples to traced from the time of collection through laboratory analysis.

11.4.2 All sample containers shall be labeled to prevent misidentification, have proper seals, and indicate the test parameters required.

11.4.3 With each transfer of sample custody, the persons involved will verify sample numbers and conditions.

11.4.4 When the chain-of-custody is transferred, both the person relinquishing and receiving custody shall sign in the proper place.

11.5 Laboratory Quality Assurance and Quality Control

11.5.1 A commercial laboratory that is accredited by the Louisiana Department of Environmental Quality laboratory accreditation program will be utilized to perform the analysis on groundwater samples collected as part of this groundwater monitoring program.

11.5.2 The laboratory will have a documented QA/QC program which meets the requirements of EPA Publication Number SW-846.

11.5.3 Laboratory spike and blank samples shall be performed by the commercial laboratory performing the groundwater analysis.

11.5.4 Laboratory analytical equipment precision and accuracy controls shall be preformed by the commercial laboratory performing the analysis.

12. GROUNDWATER MONITORING PARAMETERS

Parameter	Analytical Method	Detection Limit	Sample Frequency
Temperature	170.1	N/A	Semi-Annual*
pH	9040	N/A	Semi-Annual*
Spec. Conductivity	9040	N/A	Semi-Annual*
Turbidity	9040	N/A	Semi-Annual*
Fluoride	9056	0.2 mg/L	Semi-Annual*
Total Dissolved Solids (TDS)	160.1	1.0 mg/L	Semi-Annual*
Sulfate	9056	0.4 mg/L	Semi-Annual*
Aluminum	6010B	100 ug/L	Semi-Annual*
Arsenic	6010B	10 ug/L	Semi-Annual*
Beryllium	6010B	5 ug/L	Semi-Annual*
Cadmium	6010B	5 ug/L	Semi-Annual*
Calcium	6010B	100 ug/L	Semi-Annual*
Chromium	6010B	10 ug/L	Semi-Annual*
Cobalt	6010B	10 ug/L	Semi-Annual*
Copper	6010B	10 ug/L	Semi-Annual*
Lead	6010B	5 ug/L	Semi-Annual*
Nickel	6010B	10 ug/L	Semi-Annual*
Selenium	6010B	35 ug/L	Semi-Annual*
Vanadium	6010B	50 ug/L	Semi-Annual*
Zinc	6010B	20 ug/L	Semi-Annual*

* Sampling frequency has been quarterly since the inception of groundwater monitoring under the Solid Waste permit. The frequency will remain quarterly until a sufficiently large dataset is in place for ideal statistical analyses

13. STATISTICAL METHODS

13.1 Statistical methods for evaluating groundwater data shall be in accordance with LAC33:VII:805.B.6. - Statistical Methods.

13.2 The number of samples collected to establish groundwater quality data shall be consistent with the appropriate statistical procedures used.

13.3 The selection of statistical methods used to evaluate groundwater data shall be in accordance with the flow-chart/decision-tree process outlined in LAC33:VII.3005.Appendix C (2007 Edition). Statistical Evaluation Plans (SEPs) have been incorporated into the Solid Waste Permit Modification, as follows:

Attachment 9A presents the SEP for the Stacks 3, 4, 5, 5A, 6 and Clearwells groundwater monitoring dataset. Currently, the dataset used for SEP includes the period from January 1, 2001 through December 31, 2007. If necessary, the SEP will be updated if any statistical methods change, based on the collection of additional data.

Attachment 9B presents the SEP for the Stack 7A groundwater monitoring dataset. Evaluation of the appropriate statistical methods to be utilized will be performed when 12 months of monitoring data have been accumulated. Sampling and analysis of the Stack 7A monitoring wells began in October 2007.

Attachment 9C presents the SEP for the Stacks 3, 4, 5, 5A, 6 and Clearwells groundwater monitoring dataset consisting of additional metals (beryllium, cadmium, cobalt, copper, lead, selenium, and vanadium). Evaluation of the appropriate statistical methods to be utilized will be performed when 12 months of monitoring data have been accumulated. Sampling and analysis of the additional metals began in February 2008.

14. GROUNDWATER MONITORING REPORTING

14.1 Groundwater sampling and analysis shall be conducted on a quarterly to semi-annual basis. Reporting shall be conducted semi-annually, unless other reporting requirements listed in LAC33:VII:805.D take precedence.

14.2 The groundwater monitoring program shall be conducted for the life of the facility and for the duration of the post closure care period of the facility.

14.3 The permit holder shall submit four written reports and one electronic report of all groundwater sampling results and statistical analyses to the Waste Permits Division no later than 90 days after each sampling event.

14.3.1 When it is not feasible to meet the 90 day submittal an extension letter request should be submitted to the Waste Permits Division no later than 90 days after each sampling event indicating the time remaining before submittal of the semi-annual report.

15. REFERENCES

LAC 33:VII.805. – Louisiana Solid Waste Regulations (June 2007).

Test Methods for Evaluating Solid Waste Physical/Chemical Methods, third edition (EPA Publication Number SW-846, 1986, as revised December 1987).

USGS (U.S. Geological Survey TWRI, Book 9, General Information and Guidelines Chapter 6 – Groundwater, Published in 4/98)

Puls, R.W. and M.J. Barcelona, 1996, GROUNDWATER ISSUE PAPER: Low-Flow (minimal Draw-down) Groundwater Sampling Procedure, US Environmental Protection Agency. EPA/540/S-95/504

U.S. Environmental Protection Agency Region 1, 1996, Low Stress (low flow) Purging and Sampling Procedure for the collection of Groundwater Samples From Monitoring Wells, SOP# GW0001, July 30, 1996.

D. Yeskis and B. Zavala, 2002, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, US Environmental Protection Agency. EPA/542/S-02/001.

Wilde, F.D., D.B. Radtke, J. Gibs and R.T. Iwatsubo, eds., 1998, National Field Manual for the collection of Water-Quality Data; U.S Geological Survey Handbook for Water-Resources Investigations.

16. REVISIONS

Revision 1: Revised procedure in its entirety. Training is not required on procedure revisions. Revised 06/15/05.

Revision 2: Revised procedure due to annual review. Training is not required on procedure revisions. Revised 10/19/06.

Revision 3: Revised procedure in its entirety to implement the low flow sampling technique into our semi-annual sampling program. Training is not required on procedure revisions. Revised 01/22/07.

Revision 4: Revised procedure to comply with the June 2007 Solid Waste Regulations and to include Stack 7A monitoring wells. Training is not required on procedure revisions. Revised 12/20/07.

Revision 5: Revised procedure in accordance with LDEQ comments on December 2007 Solid Waste Permit Modification submittal.

ATTACHMENT 9A

Statistical Evaluation Plan

Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells

ATTACHMENT 9A

Statistical Evaluation Plan for Groundwater Monitoring Data

Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells

January 2001 through December 2007 Dataset

This Statistical Evaluation Plan (SEP) presents the decision basis for choosing appropriate statistical methods to evaluate data collected from the groundwater monitoring well network associated with Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells at the Honeywell Specialty Materials, Inc. (Honeywell) facility in Geismar, Louisiana. The dataset to be evaluated for appropriate statistical methods is from January 2001 through December 2007. The data from permeable Zones 1 and 2 have been evaluated separately, and it should be noted that dataset from more recently installed Zone 2 wells and background wells MW-B3 and MW-B4 is significantly smaller than the dataset of the majority of the Zone 1 wells.

Prior to the development of this SEP, semiannual reporting of groundwater monitoring data from Fluorogypsum Stacks included parametric Analysis of Variation (ANOVA) statistical evaluations for all of the monitored parameters with historical detections above method detection limits. The ANOVA statistical methodology was consistent with LDEQ Solid Waste regulations until revisions to LAC 33:Part VII in June 2007 introduced the Decision-Tree/Flow-Chart process (LAC 33:VII.3005.Appendix C) for evaluating appropriate statistical methods.

The Decision-Tree/Flow-Chart process, and therefore, the appropriate statistical methodologies are primarily based on percentages of detections for each monitored parameter in the dataset. Table 1 presents applicable information from the Zone 1/Zone 2 historical groundwater monitoring dataset from January 2001 through December 2007 for Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells. As shown in Table 9A-1, three statistical method outcomes can result for each parameter, based on the percentage of detections for each parameter. The fourth possible outcome is that no statistical analyses are necessary, if nondetects equal 100%.

The parameters that fall into each statistical method (or no statistics for 100% nondetects) have been grouped together, and the Decision-Trees for the respective parameter groups/statistical methods are presented graphically in Figures 9A-1 through 9A-4 for

Zone 1, and in Figures 9A-5 through 9A-8 for Zone 2. The statistical methods resulting from these Decision-Tree evaluations are as follows:

Parametric Tests (ANOVA) will be used for parameters with nondetects that are less than 15%. As shown in Table 9A-1 and Figures 9A-1 and 9A-5, the applicable Zone 1 and Zone 2 parameters to be statistically evaluated using Parametric ANOVA tests are calcium, fluoride, pH, specific conductance, and total dissolved solids (TDS).

The general assumptions for parametric ANOVA tests are independent samples, normal population distribution (not necessarily sample) and equality of population variance (homoscedasticity). These assumptions will be tested in the analysis process, but the ANOVA procedure is fairly robust even if the strict normality and variance assumptions are not met, particularly if the sample sizes are approximately equal.

Nonparametric Tests (Kruskal-Wallis One-Way ANOVA) will be used for parameters with nondetects that are greater than or equal to 15%, and less than 50%. As shown in Table 9A-1 and Figure 9A-2, the applicable Zone 1 parameters to be statistically evaluated using nonparametric Kruskal-Wallis ANOVA tests are arsenic and sulfate. As shown in Table 9A-1 and Figure 9A-6, the applicable Zone 2 parameter to be statistically evaluated using nonparametric Kruskal-Wallis ANOVA tests is arsenic.

The Kruskal-Wallis One-Way ANOVA by ranks does not assume the data has a definitive distribution but for equivalence, this test assumes that the background and downgradient data groups have the same distribution. Differences between medians and distribution shape can result in a determination that the background and downgradient results are not equivalent, i.e. rejection of the null hypothesis of equivalence.

Proportional Nonparametric Statistics will be used for parameters with nondetects that are greater than or equal to 50%. As shown in Table 9A-1 and Figure 9A-3, the applicable Zone 1 parameters to be statistically evaluated using Proportional Nonparametric Statistics are aluminum, dissolved aluminum, dissolved arsenic, chromium, dissolved chromium, nickel, zinc, and dissolved zinc. As shown in Table 9A-1 and Figure 9A-7, the applicable Zone 2 parameters to be statistically evaluated using nonparametric Proportional Nonparametric Statistics are aluminum, dissolved aluminum, dissolved arsenic, chromium, dissolved chromium, nickel, sulfate, and zinc.

The Proportional Nonparametric Statistics method has no overriding statistical assumptions and will consist of fitting a Poisson's distribution for parameters with greater

than 90% nondetects. Nonparametric quartile prediction (tolerance) intervals of 5% to 95% will be calculated for parameters with nondetects between 50% - 90% of the results.

Unlike the preceding ANOVA tests, for interval evaluations, there is no definitive statistical test result that indicates contamination. Thus for contamination analysis, the background Poisson or tolerance interval will be compared to the respective interval from each individual downgradient well. If the upper 95% value for the downgradient interval range is greater than the background well, then the data values will be examined to determine which results are contributing to the downgradient high interval value and if the data patterns indicate that there may be contamination. If one or two data values are causing the high interval value, then contamination may not actually exist. However, if there are several recent data values greater than the background upper interval, then contamination may exist at that location. Box and quartile plots will be used in this assessment as appropriate.

It must be noted that with a high proportion of nondetects (which effectively censor the low concentrations), an interval evaluation is unlikely to result in a definitive determination of contamination. At best, these evaluations can only give an indication of contamination. As such, any dataset that has a finding of potential contamination from an interval test will likely require further analysis over time before a final determination can be made.

No Statistics are necessary for parameters with 100% nondetects. As shown in Table 9A-1 and Figure 9A-4, the applicable Zone 1 parameter is dissolved nickel. As shown in Table 9A-1 and Figure 9A-8, the applicable Zone 2 parameters are dissolved nickel and dissolved zinc.

Calculation Procedures. The calculation procedures used for the statistical evaluations will be based on the procedures defined in the USGS, Techniques of Water Resources, TWRI 4.a.3, Book, Chapter A3 (**http://pubs.usgs.gov/twri/twri4a3/html/pdf_new.html**). As appropriate, computer software, e.g. SAS, JMP, or SPSS, will be used to perform the majority of the statistical calculations and associated graphic presentations.

Performance Standards for the statistical evaluations will be in accordance with the provisions of LAC 33:VII.805.B.6.c.

TABLE 9A-1

Flow-Chart/Decision-Tree Results for Selection of Statistical Methods
Fluorogypsum Stacks 3 - 6 and Clearwells
Groundwater Monitoring Dataset
2001 through 2007

Honeywell Specialty Materials
Geismar, Louisiana

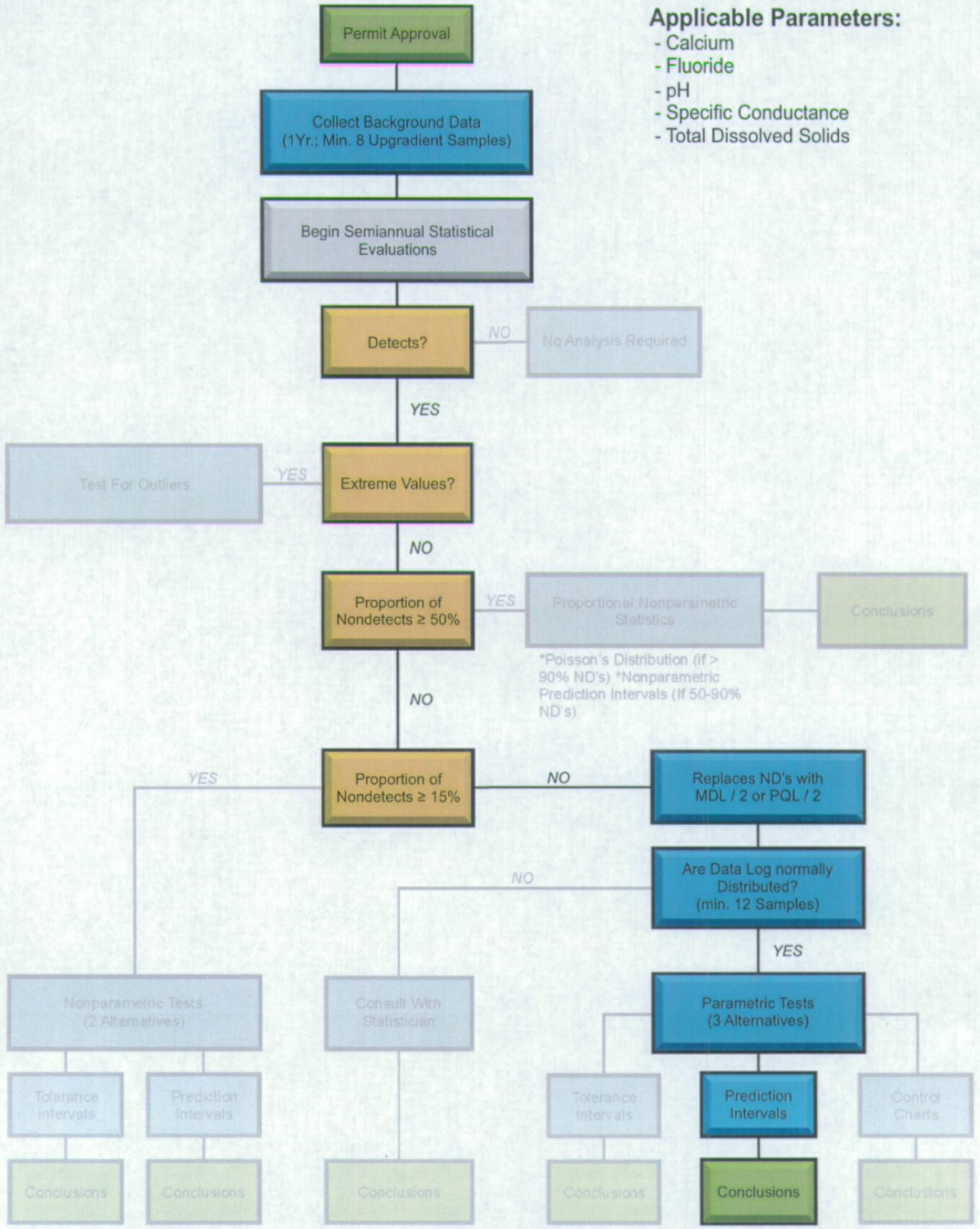
Zone 1	Result Qualifier					
Parameter	B	U	None	Grand Total	% Nondetect	Statistical Method
	Count of Result					
Aluminum	7	113	97	217	52%	Proportional Nonparametric Statistics
Aluminum, Dissolved		96	15	111	86%	Proportional Nonparametric Statistics
Arsenic	2	56	98	156	36%	Nonparametric tests (Kruskal/Wallis)
Arsenic, Dissolved		87	24	111	78%	Proportional Nonparametric Statistics
Calcium			156	156	0%	Parametric ANOVA
Chromium	17	128	11	156	82%	Proportional Nonparametric Statistics
Chromium, Dissolved		110	1	111	99%	Proportional Nonparametric Statistics
Fluoride	1	16	216	233	7%	Parametric ANOVA
Nickel	24	124	8	156	79%	Proportional Nonparametric Statistics
Nickel, Dissolved		111		111	100%	None
pH			235	235	0%	Parametric ANOVA
Specific Conductance			234	234	0%	Parametric ANOVA
Sulfate	2	54	167	223	24%	Nonparametric tests (Kruskal/Wallis)
Total Dissolved Solids		1	226	227	0%	Parametric ANOVA
Zinc	13	104	39	156	67%	Proportional Nonparametric Statistics
Zinc, Dissolved		109	2	111	98%	Proportional Nonparametric Statistics

Zone 2	Result Qualifier					
Parameter	B	U	None	Grand Total	% Nondetect	Statistical Method
	Count of Result					
Aluminum	2	44	36	82	54%	Proportional Nonparametric Statistics
Aluminum, Dissolved		62	12	74	84%	Proportional Nonparametric Statistics
Arsenic	1	27	54	82	33%	Nonparametric tests (Kruskal/Wallis)
Arsenic, Dissolved		45	29	74	61%	Proportional Nonparametric Statistics
Calcium		4	78	82	5%	Parametric ANOVA
Chromium	3	70	9	82	85%	Proportional Nonparametric Statistics
Chromium, Dissolved		73	1	74	99%	Proportional Nonparametric Statistics
Fluoride		4	71	75	5%	Parametric ANOVA
Nickel	3	72	7	82	88%	Proportional Nonparametric Statistics
Nickel, Dissolved		74		74	100%	None
pH			82	82	0%	Parametric ANOVA
Specific Conductance			82	82	0%	Parametric ANOVA
Sulfate		43	39	82	52%	Proportional Nonparametric Statistics
Total Dissolved Solids			82	82	0%	Parametric ANOVA
Zinc	1	60	21	82	73%	Proportional Nonparametric Statistics
Zinc, Dissolved		74		74	100%	None

Key	Result	Selected Statistical Method
Gray values	No detections	None
Red values	Nondetects > 50%	Proportional Nonparametric Statistics
Blue values	Nondetects > 15%	Nonparametric tests (Kruskal/Wallis)
Black values	Nondetects < 15%	Parametric Tests (ANOVA)

Zone 1 - Fluorogypsum Stacks 3 – 6 and Clearwells
Parametric Tests (ANOVA)

Figure 9A-1



Honeywell

Decision Tree Diagram

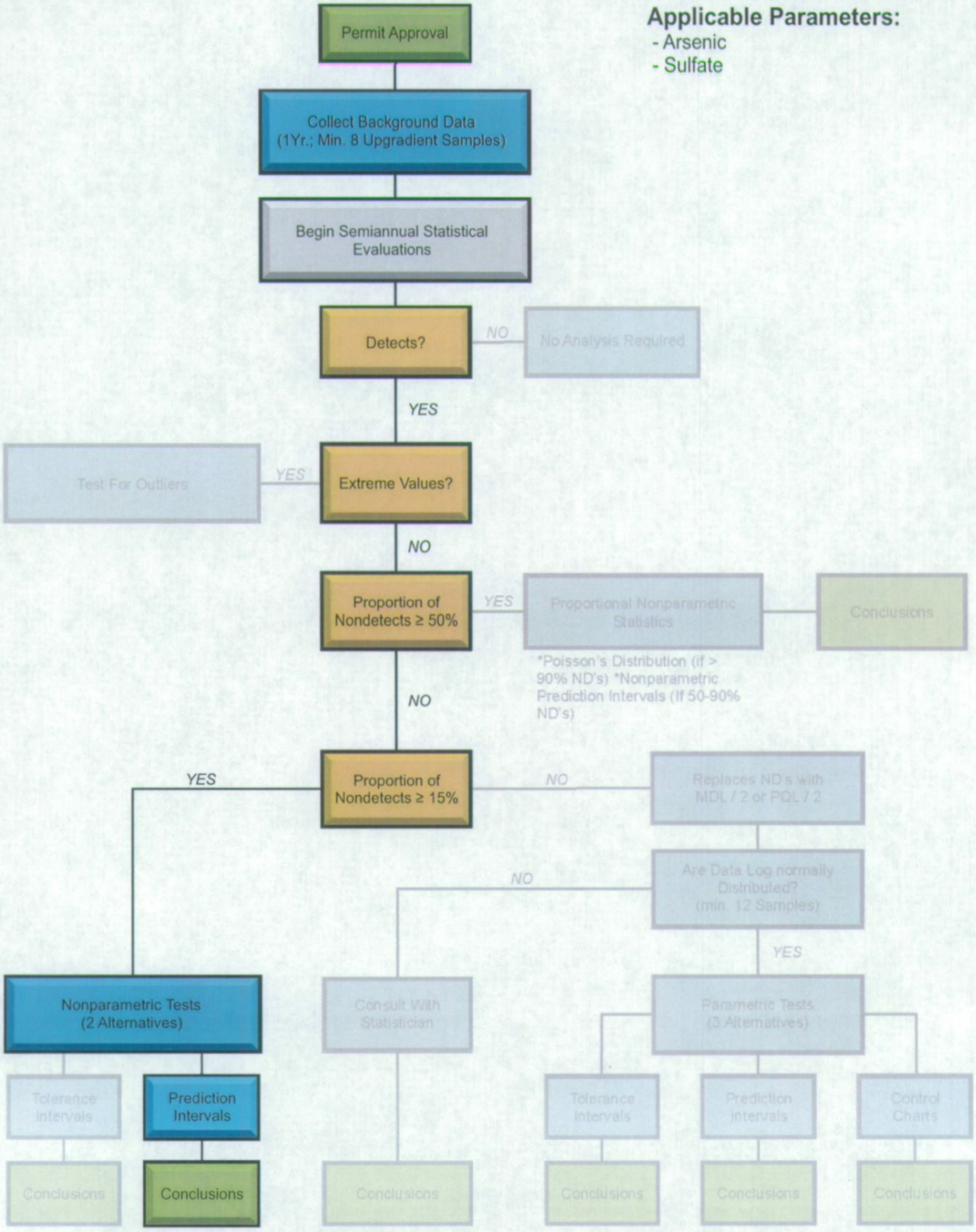
For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0006_z1_stat_anova.cdr

Zone 1 - Fluorogypsum Stacks 3 – 6 and Clearwells
Nonparametric Tests (Kruskal/Wallis One-Way ANOVA)

Figure 9A-2

Applicable Parameters:
- Arsenic
- Sulfate



Honeywell

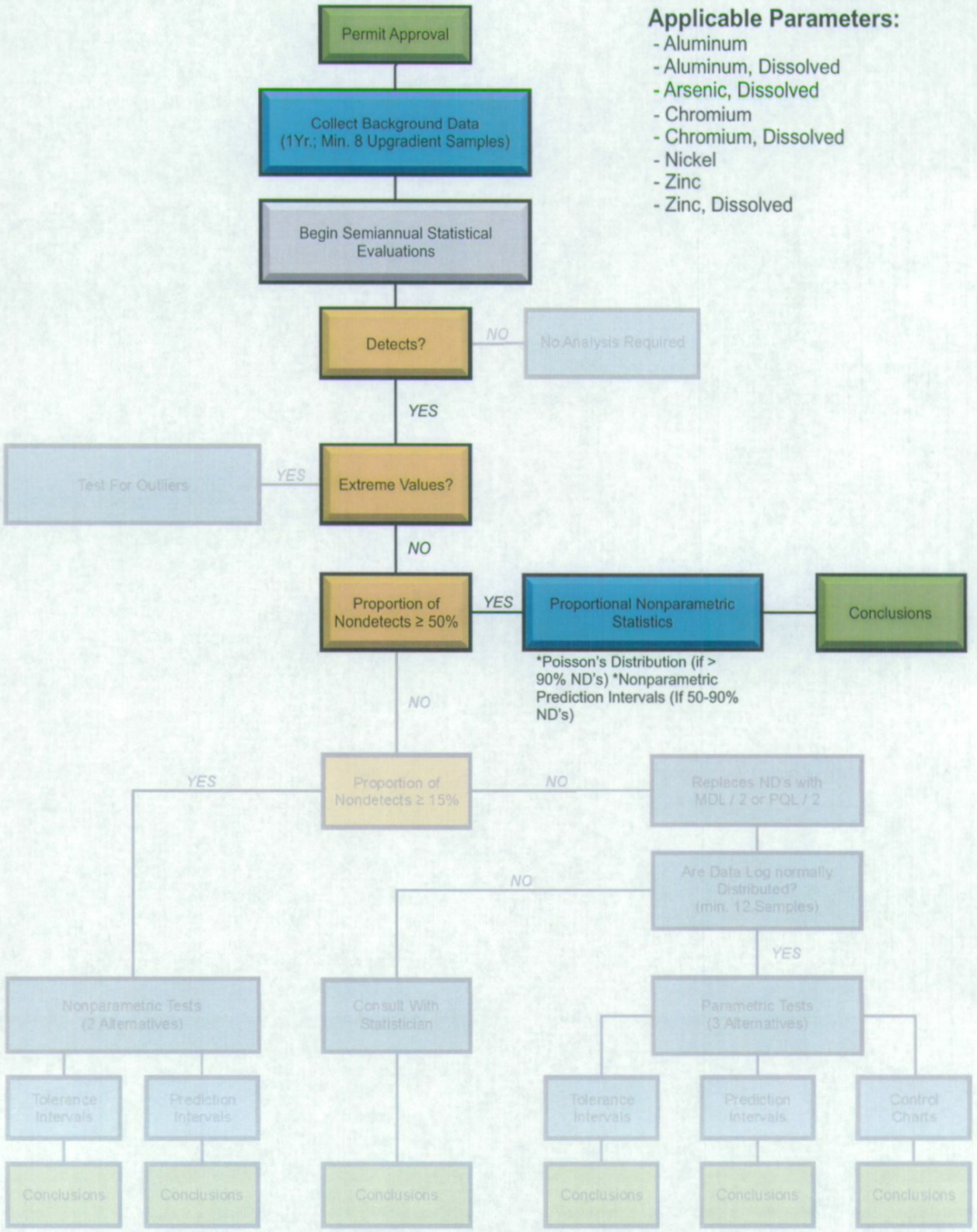
Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0008_z1_stat_ns

Zone 1 - Fluorogypsum Stacks 3 – 6 and Clearwells
Proportional Nonparametric Statistics

Figure 9A-3



Honeywell

Decision Tree Diagram

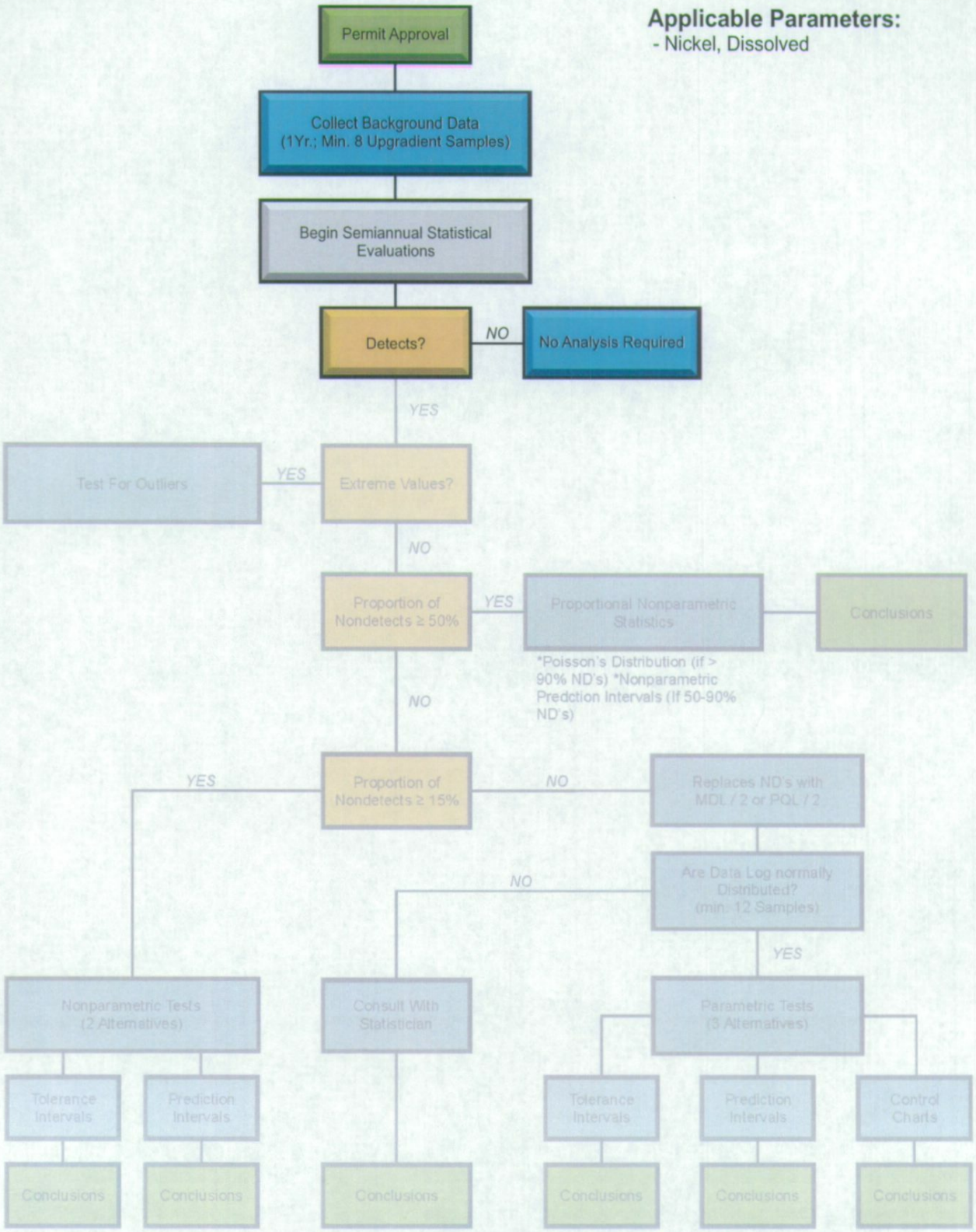
For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0007_z1_stat_pns

Zone 1 - Fluorogypsum Stacks 3 – 6 and Clearwells
No Statistical Method

Figure 9A-4

Applicable Parameters:
- Nickel, Dissolved



Honeywell

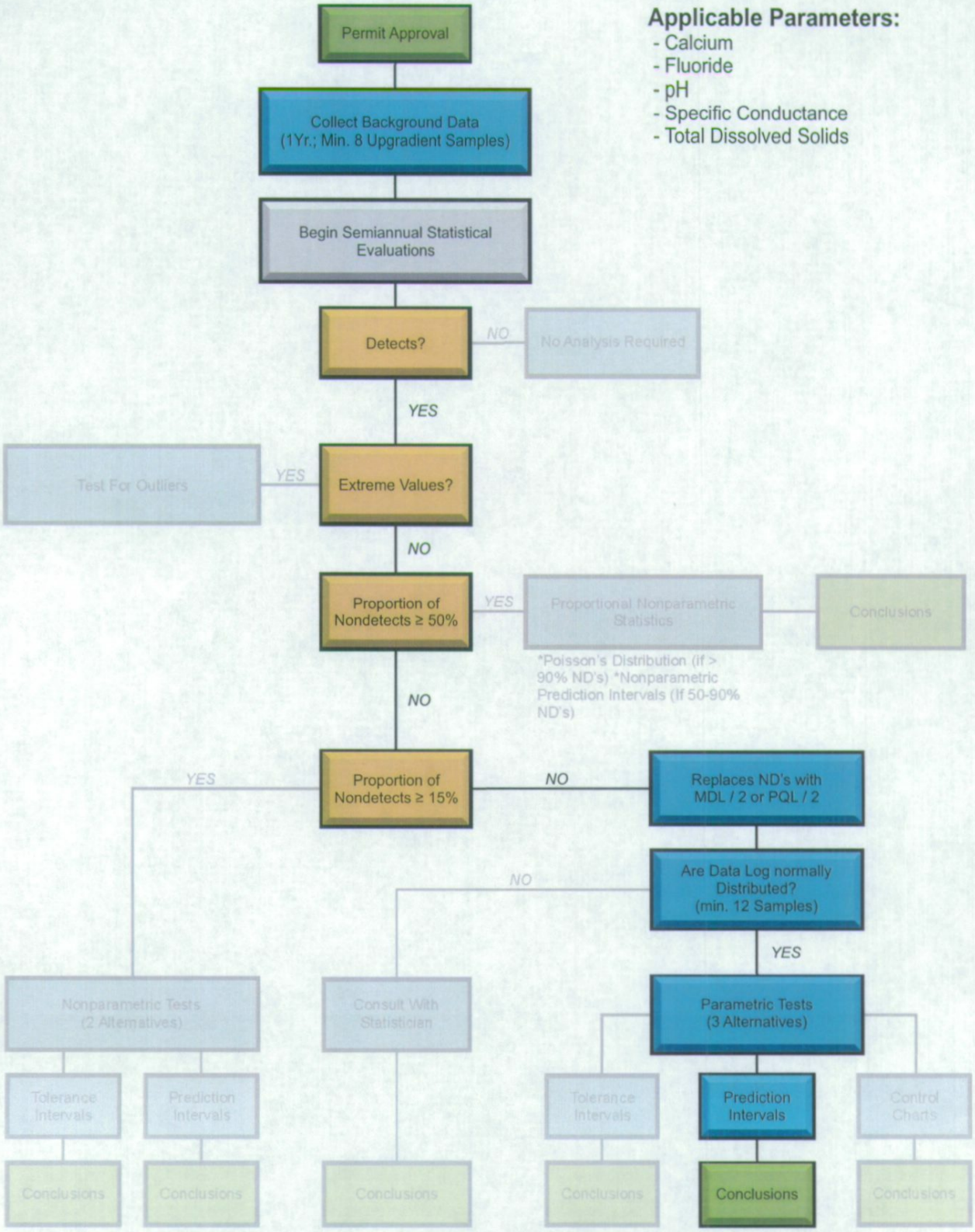
Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0005_z1_stat_none.cdr

Zone 2 - Fluorogypsum Stacks 3 – 6 and Clearwells
Parametric Tests (ANOVA)

Figure 9A-5



Honeywell

Decision Tree Diagram

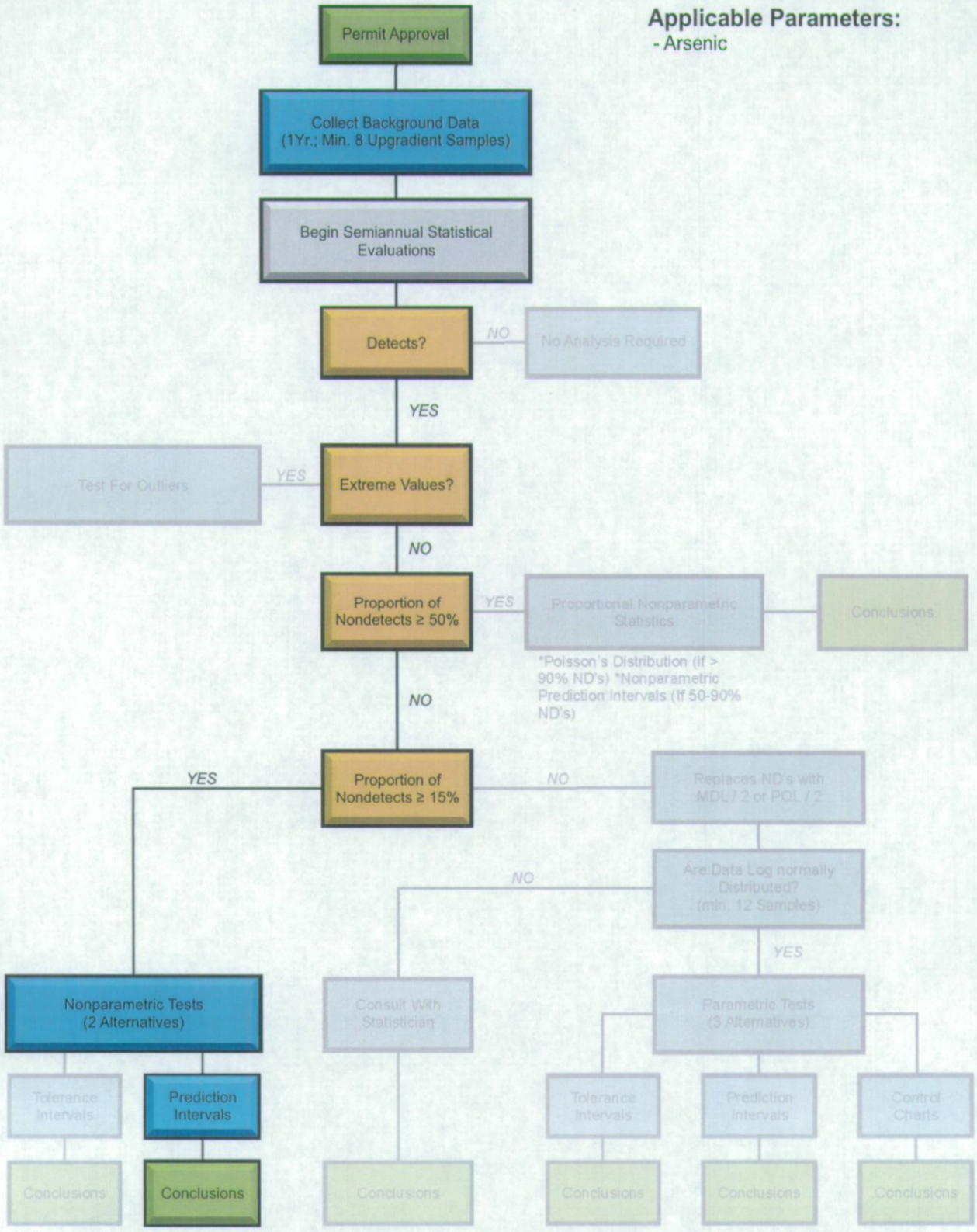
For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0010_z2_stat_anova.cdr

Zone 2 - Fluorogypsum Stacks 3 – 6 and Clearwells
Nonparametric Tests (Kruskal/Wallis One-Way ANOVA)

Figure 9A-6

Applicable Parameters:
- Arsenic



Honeywell

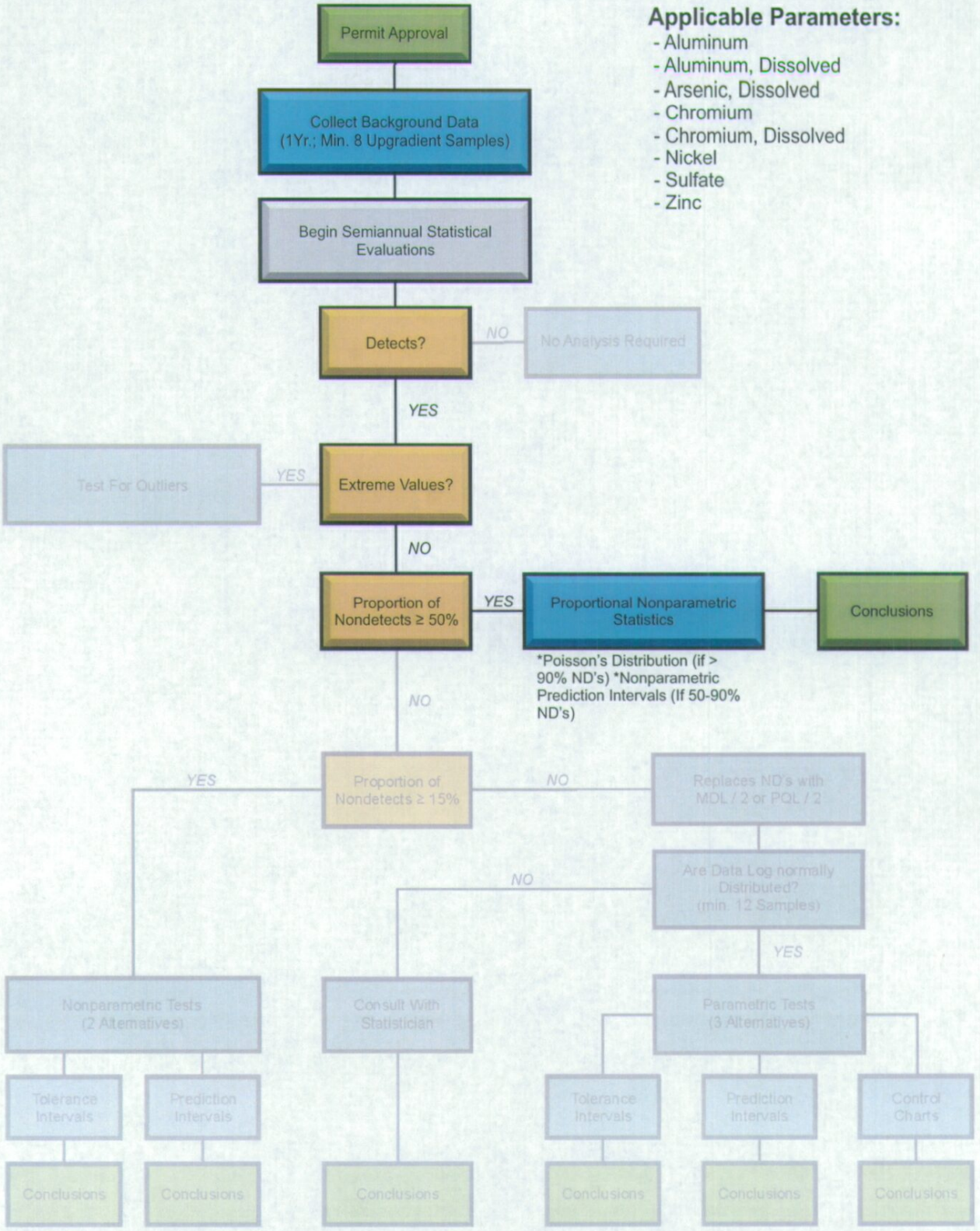
Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0012_z2_stat_ns

Zone 2 - Fluorogypsum Stacks 3 – 6 and Clearwells
Proportional Nonparametric Statistics

Figure 9A-7



Honeywell

Decision Tree Diagram

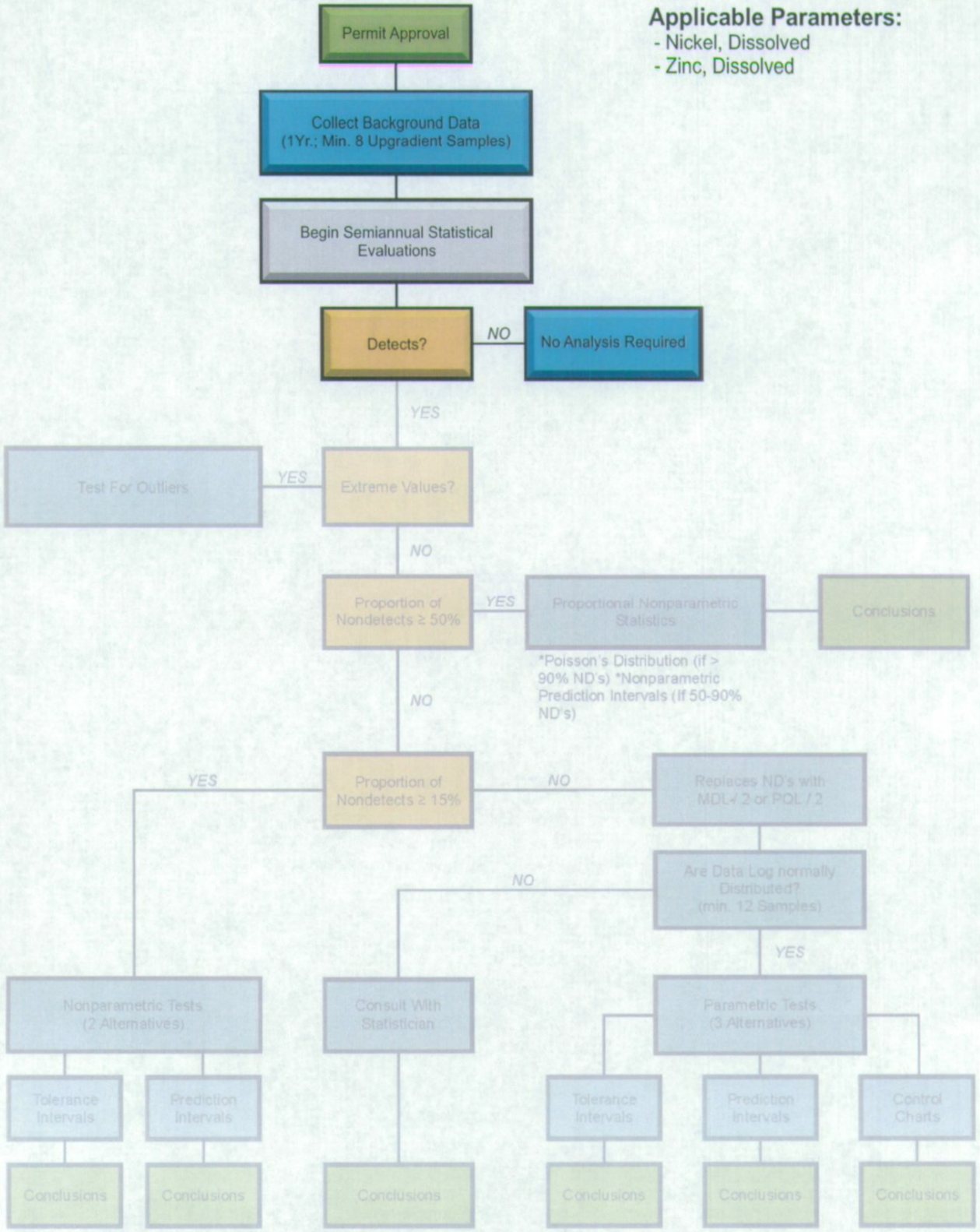
For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0011_z2_stat_pns

Zone 2 - Fluorogypsum Stacks 3 – 6 and Clearwells
No Statistical Method

Figure 9A-8

Applicable Parameters:
- Nickel, Dissolved
- Zinc, Dissolved



Honeywell

Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0009_z2_stat_none.cdr

ATTACHMENT 9B

Statistical Evaluation Plan for Stack 7A

ATTACHMENT 9B

Statistical Evaluation Plan for Groundwater Monitoring Data

Fluorogypsum Stack 7A

This Statistical Evaluation Plan (SEP) presents the decision basis for choosing appropriate statistical methods to evaluate data collected from the groundwater monitoring well network associated with Fluorogypsum Stack 7A at the Honeywell Specialty Materials, Inc. (Honeywell) facility in Geismar, Louisiana. The dataset to be evaluated for appropriate statistical methods is based on sampling and analysis of groundwater samples from eight monitoring wells installed within permeable Zone 1, around the perimeter of Stack 7A.

At the time of this submittal (February 2008), an insufficient amount of data has been collected to perform statistical evaluations. Pursuant to an agreement between Honeywell and LDEQ, monitoring of the Stack 7A well network began in October 2007, and will continue on a monthly basis for 10 to 12 months, prior to the utilization of Stack 7A for storing fluorogypsum. Once a sufficient amount of background data is collected, this SEP will be updated, and statistical analysis will begin.

The Decision-Tree/Flow-Chart process (LAC 33:VII.3005.Appendix C) will be used for evaluating appropriate statistical methods for the Stack 7A groundwater monitoring data. The Decision-Tree/Flow-Chart process, and therefore, the appropriate statistical methodologies are primarily based on percentages of detections for each monitored parameter in the dataset. Three statistical method outcomes can result for each parameter, based on the percentage of detections for each parameter. The fourth possible outcome is that no statistical analyses are necessary, if nondetects equal 100%. Figure 9B-1 illustrates the current situation (background data collection), with regard to the Decision-Tree process. Upon the collection of sufficient data, this Attachment will be updated with separate Decision-Tree diagrams that illustrate each group of parameters that are applicable for the following statistical evaluations.

Parametric Tests (ANOVA) will be used for parameters with nondetects that are less than 15%. The general assumptions for parametric ANOVA tests are independent samples, normal population distribution (not necessarily sample) and equality of population variance (homoscedasticity). These assumptions will be tested in the analysis process,

but the ANOVA procedure is fairly robust even if the strict normality and variance assumptions are not met, particularly if the sample sizes are approximately equal.

Nonparametric Tests (Kruskal-Wallis One-Way ANOVA) will be used for parameters with nondetects that are greater than or equal to 15%, and less than 50%. The Kruskal-Wallis One-Way ANOVA by ranks does not assume the data has a definitive distribution but for equivalence, this test assumes that the background and downgradient data groups have the same distribution. Differences between medians and distribution shape can result in a determination that the background and downgradient results are not equivalent, i.e. rejection of the null hypothesis of equivalence.

Proportional Nonparametric Statistics will be used for parameters with nondetects that are greater than or equal to 50%. The Proportional Nonparametric Statistics method has no overriding statistical assumptions and will consist of fitting a Poisson's distribution for parameters with greater than 90% nondetects. Nonparametric quartile prediction (tolerance) intervals of 5% to 95% will be calculated for parameters with nondetects between 50% - 90% of the results.

Unlike the preceding ANOVA tests, for interval evaluations, there is no definitive statistical test result that indicates contamination. Thus for contamination analysis, the background Poisson or tolerance interval will be compared to the respective interval from each individual downgradient well. If the upper 95% value for the downgradient interval range is greater than the background well, then the data values will be examined to determine which results are contributing to the downgradient high interval value and if the data patterns indicate that there may be contamination. If one or two data values are causing the high interval value, then contamination may not actually exist. However, if there are several recent data values greater than the background upper interval, then contamination may exist at that location. Box and quartile plots will be used in this assessment as appropriate.

It must be noted that with a high proportion of nondetects (which effectively censor the low concentrations), an interval evaluation is unlikely to result in a definitive determination of contamination. At best, these evaluations can only give an indication of contamination. As such, any dataset that has a finding of potential contamination from an interval test will likely require further analysis over time before a final determination can be made.

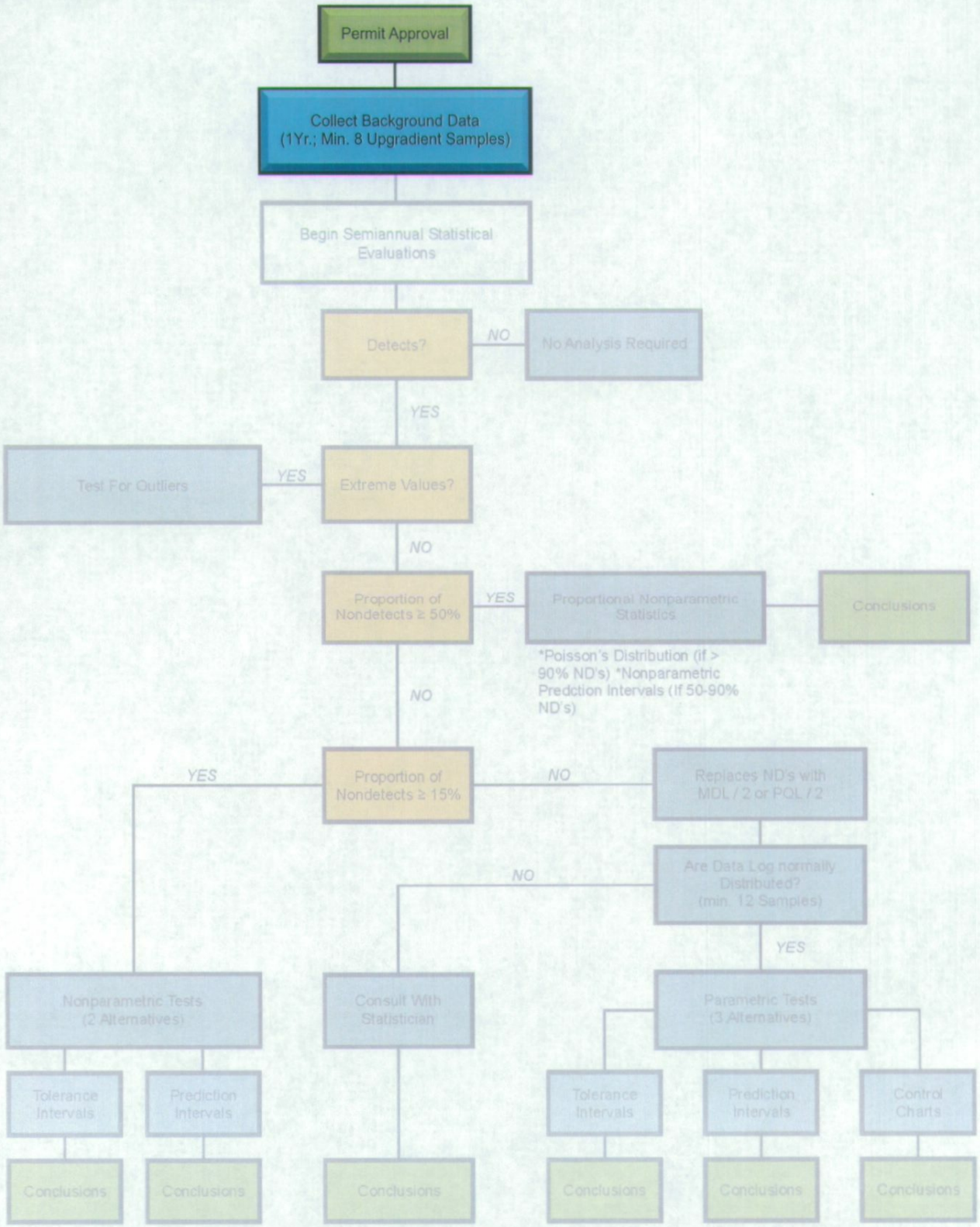
No Statistics will be necessary for parameters with 100% nondetects.

Calculation Procedures. The calculation procedures used for the statistical evaluations will be based on the procedures defined in the USGS, Techniques of Water Resources, TWRI 4.a.3, Book, Chapter A3 (http://pubs.usgs.gov/twri/twri4a3/html/pdf_new.html). As appropriate, computer software, e.g. SAS, JMP, or SPSS, will be used to perform the majority of the statistical calculations and associated graphic presentations.

Performance Standards for the statistical evaluations will be in accordance with the provisions of LAC 33:VII.805.B.6.c.

Zone 1 - Fluorogypsum Stack 7A

Figure 9B-1



Honeywell

Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0013_z1_stat_stack7a.cdr

ATTACHMENT 9C

Statistical Evaluation Plan for Stacks 3, 4, 5, 5A, 6 and Clearwells

Additional Metals Parameters

ATTACHMENT 9C

Statistical Evaluation Plan for Groundwater Monitoring Data
Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells
Additional Metals Parameters

This Statistical Evaluation Plan (SEP) presents the decision basis for choosing appropriate statistical methods to evaluate additional parameters to be analyzed in groundwater samples collected from the groundwater monitoring well network associated with Fluorogypsum Stacks 3, 4, 5, 5A, 6 and Clearwells at the Honeywell Specialty Materials, Inc. (Honeywell) facility in Geismar, Louisiana. The dataset to be evaluated for appropriate statistical methods includes laboratory analyses of beryllium, cadmium, cobalt, copper, lead, selenium, and vanadium in groundwater samples collected from permeable Zones 1 and 2.

At the time of this submittal (February 2008), an insufficient amount of data has been collected to perform statistical evaluations. Monitoring of the additional metals began in February 2008, and will continue on a quarterly basis for one year (with background samples collected on a monthly basis), at which time a sufficient amount of data will be collected for statistical evaluation and analysis. Accordingly, this SEP will be updated in February 2009, and statistical analysis of the additional parameters will begin.

The Decision-Tree/Flow-Chart process (LAC 33:VII.3005.Appendix C) will be used for evaluating appropriate statistical methods for the additional parameters. The Decision-Tree/Flow-Chart process, and therefore, the appropriate statistical methodologies are primarily based on percentages of detections for each monitored parameter in the dataset. Three statistical method outcomes can result for each parameter, based on the percentage of detections for each parameter. The fourth possible outcome is that no statistical analyses are necessary, if nondetects equal 100%. Figures 9C-1 and 9C-2 illustrate the current situation (background data collection), with regard to the Decision-Tree process. Upon the collection of sufficient data, this Attachment will be updated with separate Decision-Tree diagrams that illustrate each group of parameters that are applicable for the following statistical evaluations.

Parametric Tests (ANOVA) will be used for parameters with nondetects that are less than 15%. The general assumptions for parametric ANOVA tests are independent samples, normal population distribution (not necessarily sample) and equality of population variance (homoscedasticity). These assumptions will be tested in the analysis process, but the ANOVA procedure is fairly robust even if the strict normality and variance assumptions are not met, particularly if the sample sizes are approximately equal.

Nonparametric Tests (Kruskal-Wallis One-Way ANOVA) will be used for parameters with nondetects that are greater than or equal to 15%, and less than 50%. The Kruskal-Wallis One-Way ANOVA by ranks does not assume the data has a definitive distribution but for equivalence, this test assumes that the background and downgradient data groups have the same distribution. Differences between medians and distribution shape can result in a determination that the background and downgradient results are not equivalent, i.e. rejection of the null hypothesis of equivalence.

Proportional Nonparametric Statistics will be used for parameters with nondetects that are greater than or equal to 50%. The Proportional Nonparametric Statistics method has no overriding statistical assumptions and will consist of fitting a Poisson's distribution for parameters with greater than 90% nondetects. Nonparametric quartile prediction (tolerance) intervals of 5% to 95% will be calculated for parameters with nondetects between 50% - 90% of the results.

Unlike the preceding ANOVA tests, for interval evaluations, there is no definitive statistical test result that indicates contamination. Thus for contamination analysis, the background Poisson or tolerance interval will be compared to the respective interval from each individual downgradient well. If the upper 95% value for the downgradient interval range is greater than the background well, then the data values will be examined to determine which results are contributing to the downgradient high interval value and if the data patterns indicate that there may be contamination. If one or two data values are causing the high interval value, then contamination may not actually exist. However, if there are several recent data values greater than the background upper interval, then contamination may exist at that location. Box and quartile plots will be used in this assessment as appropriate.

It must be noted that with a high proportion of nondetects (which effectively censor the low concentrations), an interval evaluation is unlikely to result in a definitive determination of contamination. At best, these evaluations can only give an indication of

contamination. As such, any dataset that has a finding of potential contamination from an interval test will likely require further analysis over time before a final determination can be made.

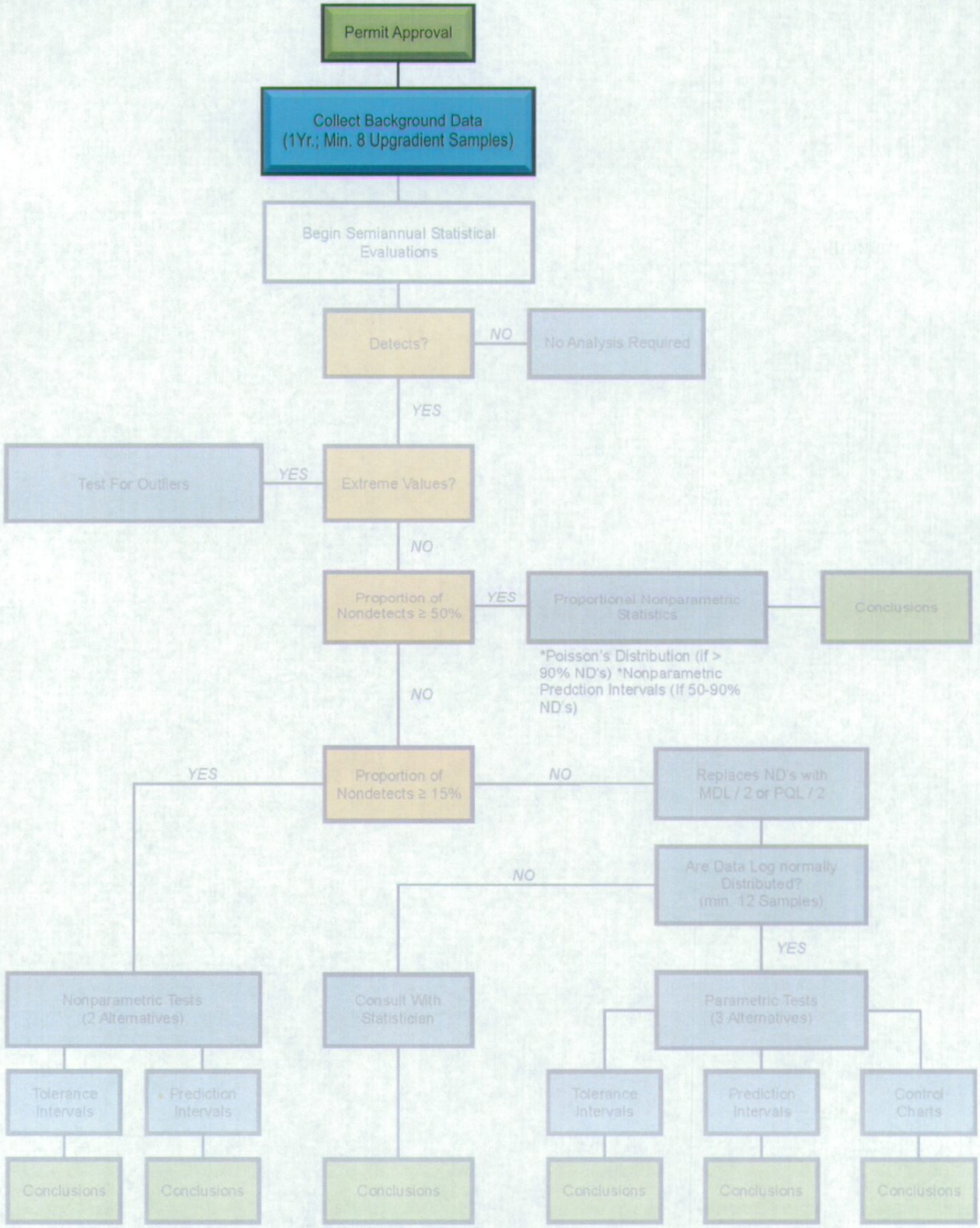
No Statistics will be necessary for parameters with 100% nondetects.

Calculation Procedures. The calculation procedures used for the statistical evaluations will be based on the procedures defined in the USGS, Techniques of Water Resources, TWRI 4.a.3, Book, Chapter A3 (http://pubs.usgs.gov/twrj/twri4a3/html/pdf_new.html). As appropriate, computer software, e.g. SAS, JMP, or SPSS, will be used to perform the majority of the statistical calculations and associated graphic presentations.

Performance Standards for the statistical evaluations will be in accordance with the provisions of LAC 33:VII.805.B.6.c.

Zone 1 - Fluorogypsum Stacks 3 – 6 and Clearwells
Additional Metal Parameters

Figure 9C-1



Honeywell

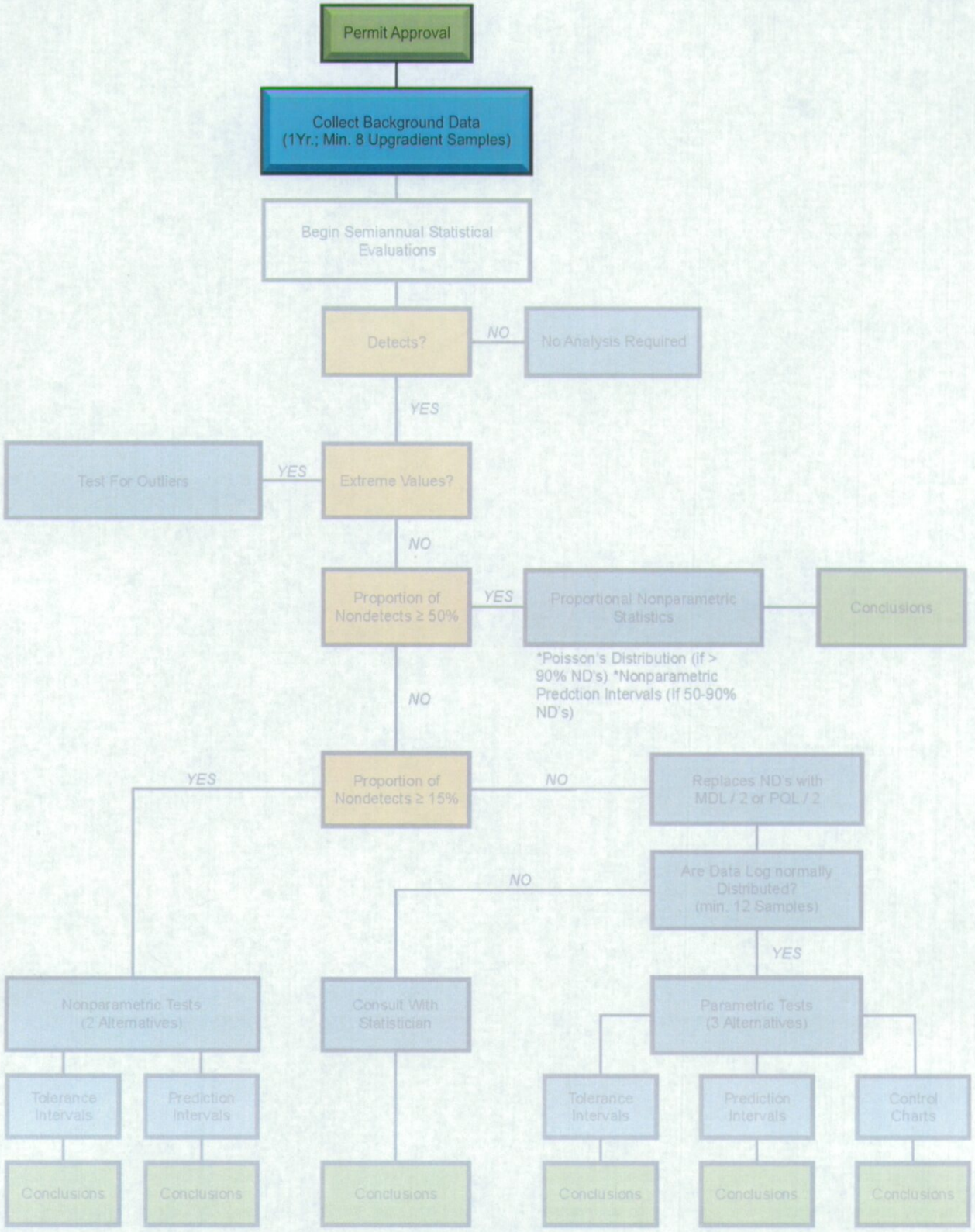
Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0014_z1_stat_metals.cdr

Zone 2 - Fluorogypsum Stacks 3 – 6 and Clearwells
Additional Metal Parameters

Figure 9C-2



Honeywell

Decision Tree Diagram

For Groundwater Data Statistical Procedure Selection

hnywll_125253_CDR_0015_z2_stat_metals.cdr

ATTACHMENT 10
Fluorogypsum Material Analysis

BEST COPY

GEOTECHNICAL EVALUATION SUMMARY
ACIDIC/NEUTRALIZED HF GYPSUM
GEISMAR, LOUISIANA

FOR:

ALLIED-SIGNAL INC.
GEISMAR, LOUISIANA

SEPTEMBER 1990

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
Geotechnical Engineers

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers

Dr. Louis J. Capozzoli, P.E.
Charles W. Hair, III, P.E.
James M. Aronstein, Jr., P.E.
Randal D. Sanders, P.E.
Charles L. Eustis, P.E.

7 September 1990

Allied-Signal, Inc.
P. O. Box 226
Geismar, Louisiana 70734

Attention: Mr. Dennis R. Cheuvront

Re: Geotechnical Evaluation Summary
Acidic/Neutralized HF Gypsum
Geismar, Louisiana
Consultant Agreement, 1 July 1990
LJC&A File: 82-7

Gentlemen:

The following paragraphs, in restating analytical findings regarding acidic and neutralized HF gypsum, summarize our conclusions/recommendations as to these materials' mechanical properties. Bases of such pronouncements are in our:

- March 1986 Intermediate Report on neutralized HF gypsum testing
- April 1986 Geotechnical Investigation Report for Stack Section 4 (a currently active disposal facility segment)
- January, August, and October 1987 Data Summaries of acidic HF gypsum sampling/testing.

Other than the sampling/testing and handling particulars provided by the enclosures, study conduct details discussed in such documents are not repeated here.

HF GYPSUM MECHANICAL PROPERTIES

Magnitude. Evaluation of results from laboratory testing of both acidic and neutralized HF gypsum - see the attached appendicies - yield the following "average" values for "fully aged" material:

10555 AIRLINE HIGHWAY, BATON ROUGE, LOUISIANA 70816, TELEPHONE (504) 293-2460

Parameter	Acidic HF Gypsum	Neutralized HF Gypsum
pH	less than 2.0	2.2 to 6.7
Compressive Strength	540,000 psf (3750 psi)	80,000 psf (555 psi)
Tensile Strength	9,500 psf (66 psi)	3,600 psf (25 psi)
Shear Modulus	2,000,000 psf (13,900 psi)	1,800,000 psf (12,500 psi)
Coefficient of Permeability	$5x10^{-8}$ cm/sec	$1x10^{-8}$ cm/sec
Porosity	35% of total volume	33% to 35% of total volume

Both varieties of HF gypsum possess an approximate 110 pound per cubic foot total unit weight, i.e. density of a 100% saturated mass in air. Consequently, buoyant unit weight, i.e. density of a mass submerged in water, is roughly 47 pounds per cubic foot. Except for neutralized HF gypsum's tensile strength, each parameter denoted above is unchanged from the Intermediate Report. Based on direct tension testing of specimens molded from a slurry and cured for about 1 year, the value for neutralized HF gypsum's tensile strength has been increased from the originally reported figure by a factor of approximately 2.5.

Development Rate. Initial "set" is slightly more rapid for acidic HF gypsum than for the neutralized material: within approximately 3 months of deposition from a slurry, acidic HF gypsum develops roughly 20% of its long term strength/stiffness whereas the neutralized residue attains only about 10% of its respective parameter values. As long as 15 years of "field" curing is necessary to complete either material's property development.

HANDLING CONSEQUENCES

In view of the differences between acidic and neutralized HF gypsum properties - especially long term strength/stiffness and time rate of development after sedimentation from a slurry: onland disposal of the acidic material will be easier and require less space than stacking the neutralized residue. As depicted on the attached sheet 1, a neutralized HF gypsum embankment must be built lower and/or with flatter exterior side slopes than a stack of acidic HF gypsum. Additionally neutralized HF gypsum stack sections must have edge perimeters 20% to 40% longer since the property developmental rate is slightly slower. These factors combine to require more land and larger active stack segments for

neutralized HF gypsum. In essence, onland disposal of neutralized HF gypsum is more akin to stacking "weak" phosphogypsum than to embanking "concrete like" acidic HF gypsum. Further, recovering - i.e. mining - and reusing - as aggregate, etc. - neutralized HF gypsum is less appealing due to such material's lower valued parameters.

STATE OF LOUISIANA
Charles William Hair III
REG. No. 15796
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

Very truly yours,

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

Charles W. Hair, III

CWH,III/cb

Enclosures: Appendix, Acidic HF Gypsum
Appendix, Neutralized HF Gypsum
Sheet 1, Embankment Profile Alternates

ACIDIC HF GYPSUM

Sheet 1, Compressive Strength Profiles

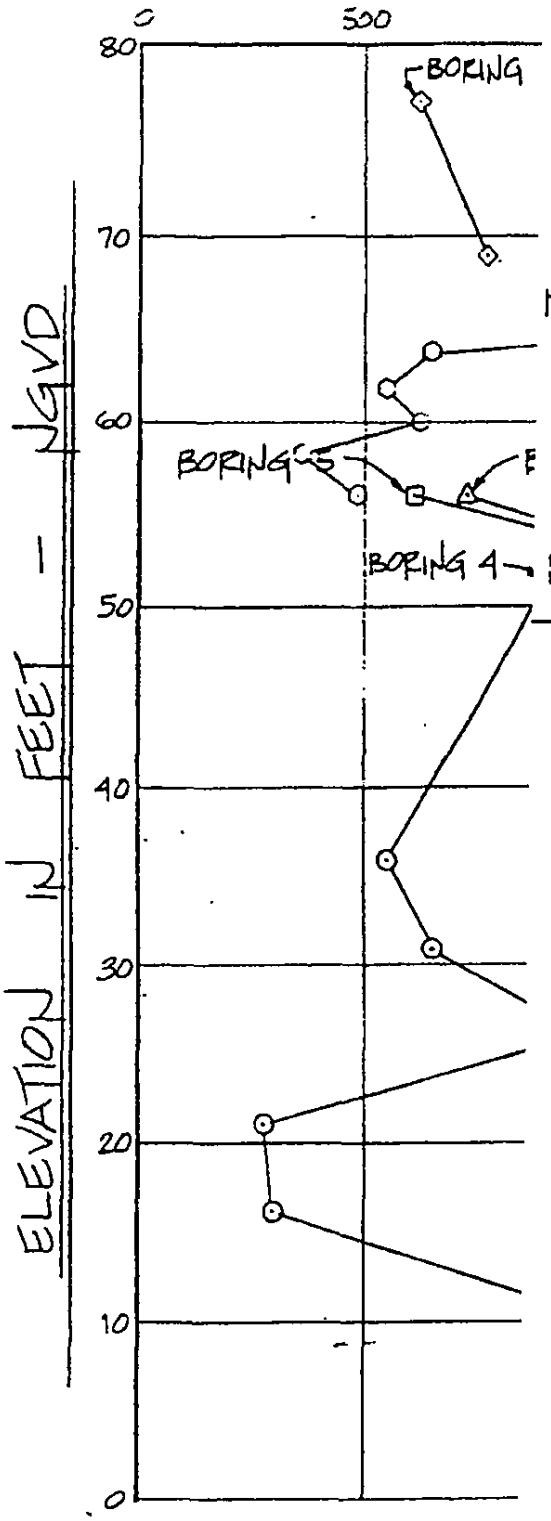
Sheet 2, Boring Plan

Tables 1 through 4, Laboratory Data

Figures 1 and 2, Grain Size Curves

Logs of Borings 1 through 10

BEST COPY



NOTE: ELEVATIONS PER SURVEY OF 10 APRIL 1985.

BORING No.	APPROX. STACK SURFACE ELEVATION, NGVD
1	69 FT.
2	60 FT.
3	80 FT.
4	80 FT.
5	80 FT.
6	80 FT. (MATERIAL NOT SET UP)
7	80 FT. (MATERIAL NOT SET UP)
8	80 FT. (MATERIAL NOT SET UP)
9	75 FT.
10	80 FT.

ACIDIC HF GYPSUM STUDY
GEISMAR, LOUISIANA

ALLIED CORPORATION
GEISMAR, LOUISIANA

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERS
BATON ROUGE, LOUISIANA

SCALE	DWN. KGC 13 JAN 87	FILE No.
SHOWN	CKD. CWH 13 JAN 87	82-7

COMPRESSIVE STRENGTH PROFILES

Sheet No. 1

Subject BORING PLAN

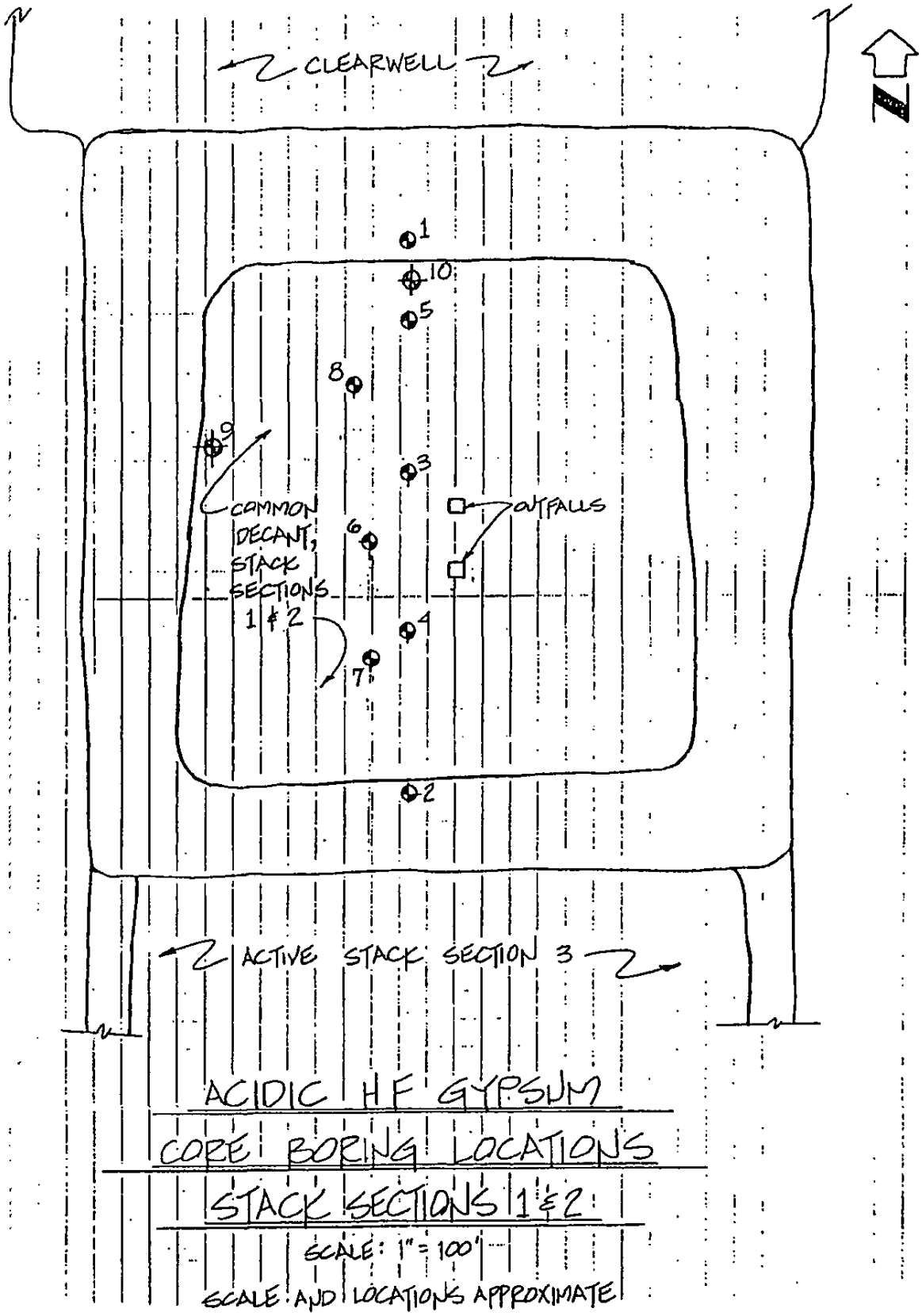
Sheet 2 Of 2

Made by KGQ Date 25 AUG 87

File No. 82-7

Checked by CWH Date 25 AUG 87

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers



ACIDIC HF GYPSUM

CORE BORING LOCATIONS

STACK SECTIONS 1 & 2

SCALE: 1" = 100'

SCALE AND LOCATIONS APPROXIMATE

TABLE 1
LABORATORY DATA

FILE 82-7

SAMPLE IDENTIFIER			UNIT WEIGHT (PCF)	STRENGTH (PSF)		FAILURE STRAIN (%)	PERMEABILITY COEFFICIENT (CM/SEC)
CORES BORING	DEPTHS			COMPRESSIVE	TENSILE		
1	1'0"	to 3'4"	121.5	320976		1	
1	7'4"	to 9'10"	109.5				2.05×10^{-8}
1	12'10"	to 14'10"	120.5		38413	1	
1	17'10"	to 19'10"	115.4				7.58×10^{-8}
1	40'10"	to 42'10"	114.6		16344	1	6.82×10^{-9}
2	10'	to 12'	130.7				5.06×10^{-9}
2	25'	to 27'	128.8		103177	1	
2	31'	to 33'	125.3				
2	35'	to 37'	126.2				2.57×10^{-8}
2	41'	to 43'	129.8		29664	1	8.32×10^{-9}
2	49'	to 51'	127.1	545760		1	
2	54'	to 57'	130.8		9547	1	2.11×10^{-8}

ACIDIC HF GYPSUM LABORATORY DATA TABLE 2 FILE NO. 82-7

BORING NO.	DEPTH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	COMPRESSION TEST TSF	COMPRESSION TEST % STRAIN	PRESSURE-KSF START	PRESSURE-KSF FAIL	TYPE FAILURE	OTHER
3	23- 25	28	124.0	97.1				52.37	1			VERTICAL SHEAR	
3	28- 30	26	136.3	108.0				105.27	1			VERTICAL SHEAR	
3	33- 35	16	139.1	120.4				96.32	1			VERTICAL SHEAR	
3	38- 40	23	143.1	116.0				79.45	1			VERTICAL SHEAR	
3	43- 45	18	131.7	111.2				96.00	1			VERTICAL SHEAR	
3	48- 50	15	138.4	120.2				158.15	1			VERTICAL SHEAR	
3	53- 55	16	134.1	116.0				185.49	1			NONE	
4	28- 30	25	121.6	97.1				65.62	1			VERTICAL SHEAR	
4	43- 45	15	112.1	97.5				39.33	1			VERTICAL SHEAR	
4	48- 50	22	113.4	93.2				46.90	1			VERTICAL SHEAR	
4	53- 55	26	112.8	89.6				71.71	1			VERTICAL SHEAR	
4	58- 60	26	106.4	84.5				20.30	1			VERTICAL SHEAR	
4	63- 65	20	110.0	92.0				20.97	1			VERTICAL SHEAR	
4	68- 70	16	133.1	114.6				66.25	1			VERTICAL SHEAR	
4	73- 75	16	131.0	113.4				80.34	1			VERTICAL SHEAR	
5	23- 25	13	113.7	100.9				50.46	1			VERTICAL SHEAR	
5	28- 30	15	133.6	116.0				102.05	1			VERTICAL SHEAR	
5	33- 35	14	138.9	121.6				166.18	1			NONE	
5	38- 40	16	133.5	114.7				96.95	1			VERTICAL SHEAR	
5	43- 45	16	135.4	116.6				165.30	1			VERTICAL SHEAR	
5	48- 50	17	137.8	117.5				159.62	1			VERTICAL SHEAR	

ACIDIC HF GYPSUM LABORATORY DATA TABLE 3 FILE NO. 82-7

BORING NO.	DEPTH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	PL	PI	COMPRESSION TEST TSF	% STRAIN	PRESSURE-KSF START	FAIL	TYPE FAILURE	OTHER
6	1- 3	29	120.3	93.0				1.27	2	0.12		MULTIPLE SHEAR	QD
6	3- 5	157	83.1	32.4				0.14	10	0.23		YIELD	QD
6	10- 11	44	117.6	81.6				2.60	3	0.60		BULGE	QD
7	3- 5	40	124.6	89.0				1.83	2	0.23		BULGE	QD
7	9- 10	33	124.9	93.7				4.42	3	0.55		BULGE	QD
8	0- 2	43											
8	3- 5	59	111.4	70.2				0.91	3	0.23		BULGE	QD
8	8- 10	55	110.4	71.1				2.10	2	0.52		BULGE	QD

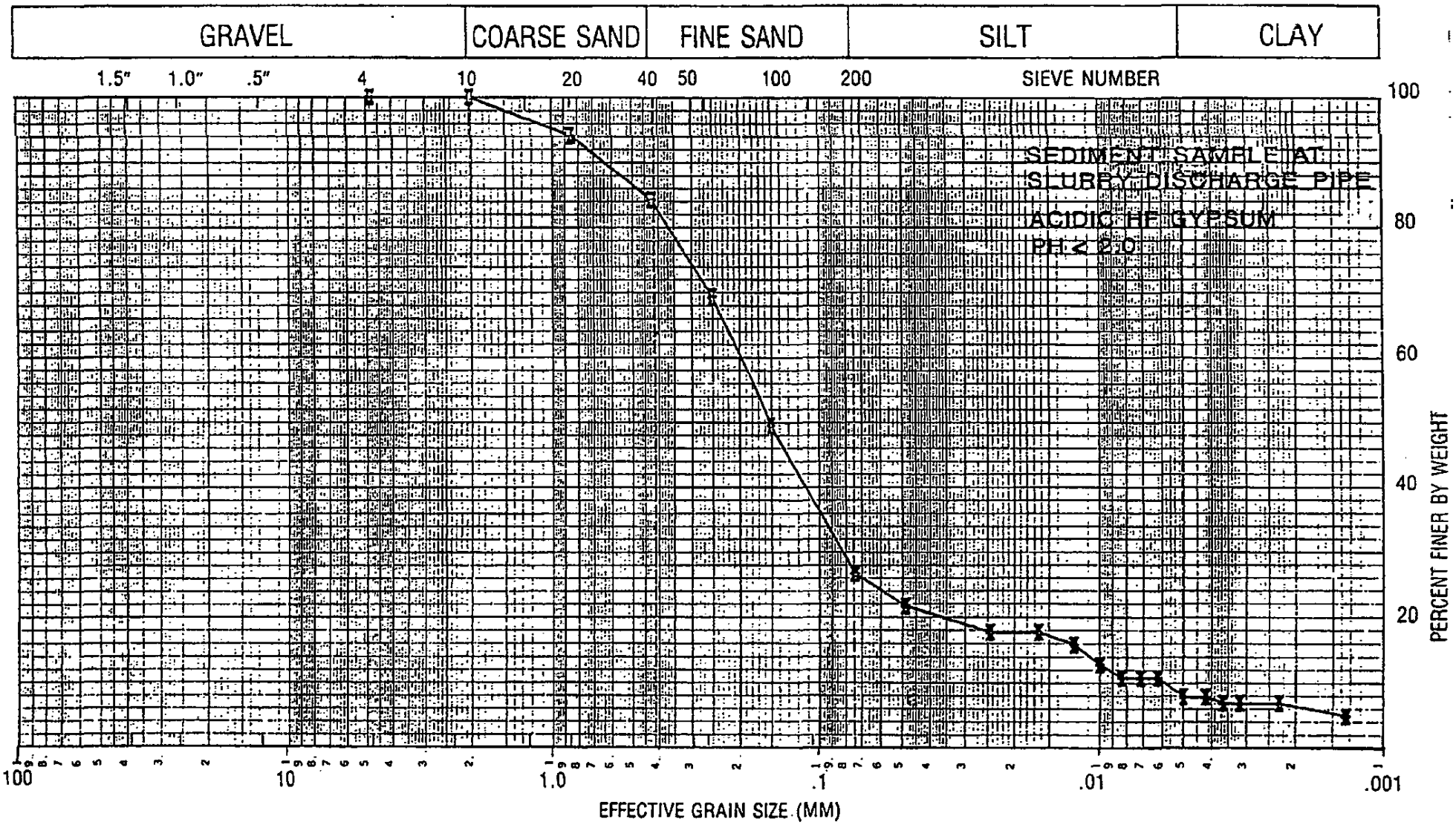
TABLE 4
LABORATORY DATA

FILE 82-7

SAMPLE IDENTIFIER		UNIT WEIGHT (PCF)	COMPRESSIVE STRENGTH (PSF)	FAILURE STRAIN (%)
CORE BORING	DEPTHS			
9	2' to 4'	129.4	231120	1
9	4' to 6'	123.4	272246	1
9	6' to 8'	129.5	208642	1
9	8' to 10'	120.7	217584	1
9	10' to 12'	123.1	94363	1
9	12' to 14'	118.6	79531	1
9	14' to 16'	120.8	89510	1
9	16' to 18'	136.1	51624	1
9	18' to 20'	94.0	69422	1
10	2' to 4'	108.2	89899	1
10	10' to 12'	117.2	111830	1

06JUL84

GRAIN SIZE CURVE



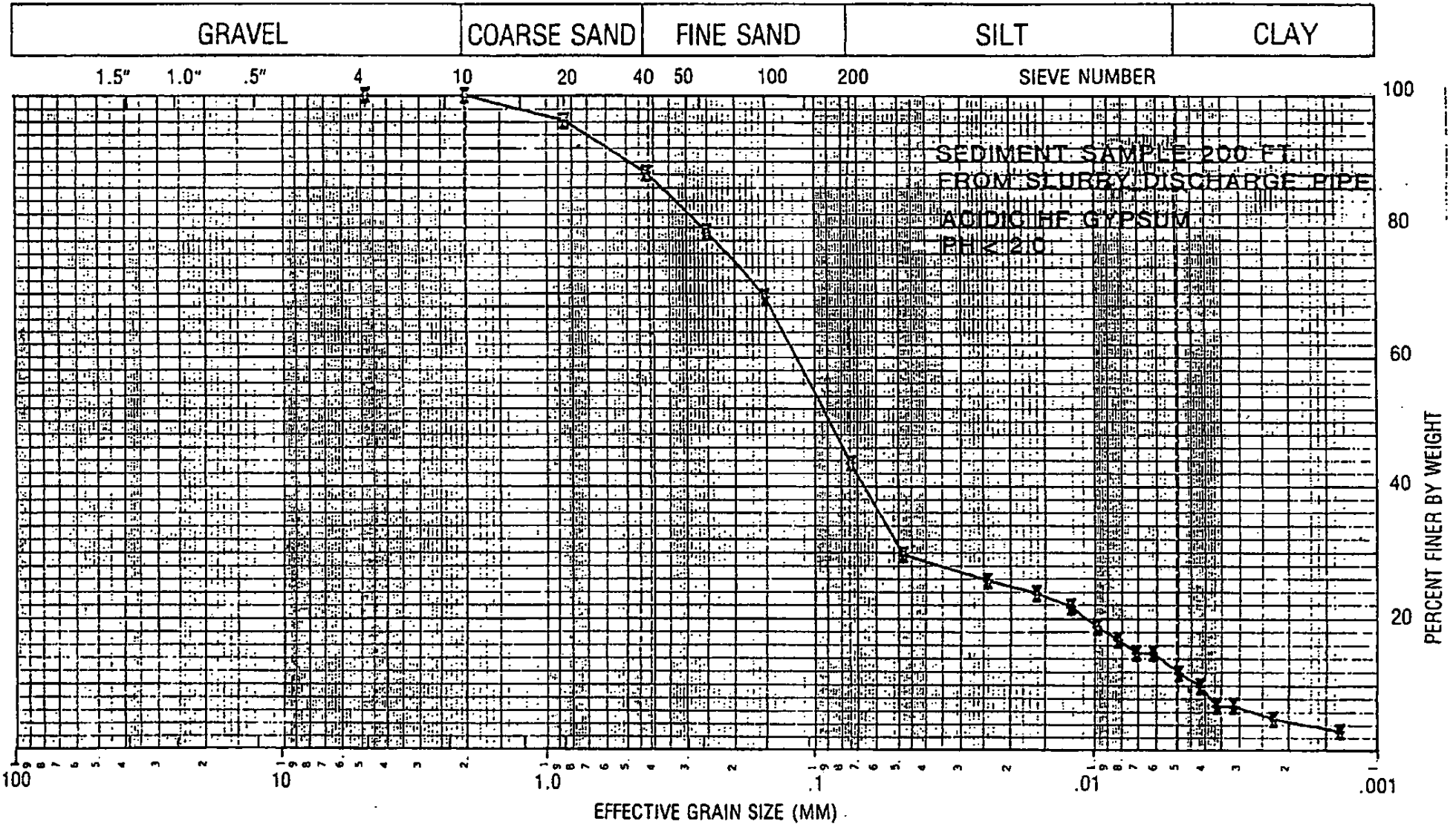
FILE 82- 7

FIGURE . . 1 (FIGURE 14, GEOTECHNICAL MANAGEMENT REPORT No. 5)

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

86JUL84

GRAIN SIZE CURVE



FILE 82- 7

FIGURE . . . 2 (FIGURE 15, GEOTECHNICAL MANAGEMENT REPORT No. 5)

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Chemical Corporation
Geismar, Louisiana

BORING 1
FILE 82-7
DATE 27 June 1984
TECHNICIAN AHC

Note: Samples are 2 inch diameter cores obtained with a diamond bitted NX barrel.

UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 57 Feet

DEPTH FEET	SAMPLES
0	Hard gray gypsum, 1 foot 9 inches recovered
	Hard gray gypsum, 1 foot 8 inches recovered
5	Hard gray gypsum, 1 foot 8 inches recovered
	Hard gray gypsum, 2 feet recovered
	Hard gray gypsum, 1 foot 10 inches recovered
10	Hard gray gypsum, 2 feet 3 inches recovered
	Hard gray gypsum, 2 feet 4 inches recovered
	Hard gray gypsum, 11 inches recovered
15	Hard gray gypsum, 2 feet 2 inches recovered
	Hard gray gypsum, 1 foot 9 inches recovered
20	Hard gray gypsum, 1 foot 7 inches recovered
	Hard gray gypsum, 2 feet 1 inch recovered
	Hard gray gypsum, 2 feet 4 inches recovered
25	Hard gray gypsum, 1 foot 11 inches recovered
	Hard gray gypsum, 2 feet 2 inches recovered
30	Hard gray gypsum, 2 feet 4 inches recovered
	Hard gray gypsum, 2 feet recovered
	Hard gray gypsum, 1 foot 11 inches recovered
35	Hard gray gypsum, 1 foot 9 inches recovered
	Hard gray gypsum, 2 feet 5 inches recovered
40	Hard gray gypsum, 2 feet 1 inch recovered
	Hard gray gypsum, 2 feet 3 inches recovered
	Hard gray gypsum, 1 foot 11 inches recovered
45	Hard gray gypsum, 2 inches recovered
	Hard gray gypsum, 2 feet 2 inches recovered
50	Hard gray gypsum, 1 foot 11 inches recovered

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Chemical Corporation
Geismar, Louisiana

BORING 1
FILE 82-7 /
DATE 28 June 1984
TECHNICIAN AHC

Note: Samples are 2 inch diameter cores obtained with a diamond bitted NX barrel.

UNDISTURBED SAMPLE ☒ STANDARD PENETRATION TEST BORING DEPTH 57 Feet

DEPTH FEET	SAMPLES	
50		
	■	Hard gray gypsum, 2 feet 2 inches recovered
	■	Hard gray gypsum, 1 foot 11 inches recovered
55	■	Hard gray gypsum, 2 feet 2 inches recovered
60		

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Chemical Corporation
Geismar, Louisiana

BORING 2
FILE 82-77
DATE 25 June 1984
TECHNICIAN RM

No Sample Recovered

Note: Samples are 2 inch diameter cores obtained with a diamond bitted NX barrel.

UNDISTURBED SAMPLE

STANDARD PENETRATION TEST

BORING DEPTH 46 Feet 10 Inches

DEPTH FEET	SAMPLES	
0		Hard gray gypsum, 5½ inches recovered
		Hard gray gypsum, 2 feet 2 inches recovered
5		Hard gray gypsum, 1 foot 10 inches recovered
		Hard gray gypsum, 1 foot 6 inches recovered
10		Hard gray gypsum, 1 foot 2 inches recovered
		Hard gray gypsum, 2 feet 10 inches recovered
		Hard gray gypsum, 2 feet recovered
15		Hard gray gypsum, 2 feet 3 inches recovered
		Hard gray gypsum, 1 feet 5 inches recovered
20		Hard gray gypsum, 2 feet 1 inches recovered
25		Hard gray gypsum, 1 foot 10 inches recovered
		Hard gray gypsum, 1 foot 9 inches recovered
30		Hard gray gypsum, 1 foot 10 inches recovered
35		Hard gray gypsum, 2 inches recovered
		Hard gray gypsum, 1 foot 11 inches recovered
40		Hard gray gypsum, 6 inches recovered
		Hard gray gypsum, 1 foot 9 inches recovered
		Hard gray gypsum, 1 foot 2 inches recovered
		Hard gray gypsum, 1 foot 6 inches recovered
45		Hard gray gypsum, 7 inches recovered
		Stiff tan clay, 1 foot recovered
50		

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 3
FILE 82-7
DATE 11 Sept. 1986
TECHNICIAN JRK

Classification Sample
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST

Note: Unless otherwise indicated, samples are 2 inch diameter cores obtained with a tungsten carbide bitted NX barrel.

BORING DEPTH 76½ Feet

DEPTH FEET	SAMPLES	
0		
5	■	Soft light gray gypsum (Shelby Tube)
10	■	Soft light gray gypsum (Shelby Tube)
15	■	Medium light gray gypsum (Shelby Tube)
20		Hard light gray gypsum
25	■	Hard light gray gypsum, 18 inches recovered
30	■	Hard light gray gypsum, 16 inches recovered
35	■	Hard light gray gypsum, 21 inches recovered
40	■	Hard light gray gypsum
45	■	Hard light gray gypsum, 21 inches recovered
50	■	Hard light gray gypsum, 18½ inches recovered

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FP18125

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 3
FILE 82-7
DATE 12 Sept. 1986
TECHNICIAN JRK

DEPTH FEET | SAMPLES

■ UNDISTURBED SAMPLE ☒ STANDARD PENETRATION TEST BORING DEPTH 76½ Feet

Depth (feet)	Description
50	
55	Hard light gray gypsum, 17 inches recovered
60	Hard light gray gypsum, 14 inches recovered
65	Hard light gray gypsum, 18 inches recovered
70	Hard light gray gypsum, 19 inches recovered
75	Hard light gray gypsum, 31 inches recovered (Note:clay at bottom of core)

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FP18125

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 4
FILE 82-71
DATE 12 Sept. 1986
TECHNICIAN JRK

Classification Sample
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST

Note: Unless otherwise indicated, samples are 2 inch diameter cores obtained with a tungsten carbide bitted NX barrel.

BORING DEPTH 75 Feet

DEPTH FEET	SAMPLES	
0		
5		Very soft tan and light gray gypsum (Shelby Tube)
10		Hard light gray gypsum (Shelby Tube)
15		Soft light gray gypsum (Shelby Tube)
20		Hard light gray gypsum, 11 inches recovered
25		Hard light gray gypsum, 13 inches recovered
30		Hard light gray gypsum, 20 inches recovered
35		Hard light gray gypsum, 10 inches recovered
40		Hard light gray gypsum, 12 inches recovered
45		Hard light gray gypsum, 5 inches recovered
50		Hard light gray gypsum, 18 inches recovered

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 4
FILE 82-7
DATE 15 Sept. 1986
TECHNICIAN JRK

Classification Sample

UNDISTURBED SAMPLE STANDARD PENETRATION TEST BORING DEPTH 75 Feet

DEPTH FEET	SAMPLES	
50		
		Hard light gray gypsum, 16 inches recovered
55		
		Hard light gray gypsum, 18 inches recovered
60		
		Hard light gray gypsum, 17 inches recovered
65		
		Hard light gray gypsum, 19 inches recovered
70		
		Hard light gray gypsum, 17 inches recovered (Note:clay at bottom of core)
75		

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 5
FILE 82-7
DATE 22 Sept. 1986
TECHNICIAN RCZ

Note: Unless otherwise indicated, samples are 2 inch diameter cores obtained with a tungsten carbide bitted NX barrel.

■ UNDISTURBED SAMPLE ☒ STANDARD PENETRATION TEST BORING DEPTH 68 Feet

DEPTH FEET	SAMPLES	
0		
5	■	Very soft light gray gypsum with 4 inch hard layer (Shelby Tube)
10	■	Very soft light gray gypsum (Shelby Tube)
15	■	Soft light gray gypsum (Shelby Tube)
20	■	Hard light gray gypsum, 17 3/4 inches recovered
25	■	Hard light gray gypsum, 16 1/2 inches recovered
30	■	Hard gray gypsum, 15 inches recovered
35	■	Hard gray gypsum, 20 inches recovered
40	■	Hard gray gypsum, 23 1/2 inches recovered
45	■	Hard gray gypsum, 23 inches recovered
50	■	Hard gray gypsum, 24 1/2 inches recovered

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 5
FILE 82-7
DATE 22 Sept 1986
TECHNICIAN RCZ

DEPTH FEET | SAMPLES

■ UNDISTURBED SAMPLE ☒ STANDARD PENETRATION TEST BORING DEPTH 68 Feet

50

Hard gray gypsum, 27 inches recovered

55

Hard gray gypsum, 21 inches recovered

60

Hard gray gypsum, 21 inches recovered

65

(Note: Clay encountered at 68 feet)

70

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FH18125

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 6
FILE 82-7
DATE 20 Aug. 1987
TECHNICIAN HAH

DEPTH FEET | SAMPLES

Classification Sample | No Sample Recovered | UNDISTURBED SAMPLE | STANDARD PENETRATION TEST | BORING DEPTH 13 Feet

0

Firm light gray gypsum (Shelby Tube)

Very loose tan and light gray gypsum (Shelby Tube)

5

10

Firm light gray gypsum (Shelby Tube)

Refusal at 13 feet

15

Boring 7

Boring Depth 13 Feet

0

Firm light gray gypsum (Shelby Tube)

5

Firm light gray gypsum (Shelby Tube)

Firm light gray gypsum (Shelby Tube)

10

Refusal at 13 feet

15

LOG OF BORING

PROJECT: HG Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 8
FILE 82-7
DATE 20 Aug 1987
TECHNICIAN HAH

DEPTH FEET | SAMPLES

Classification Sample
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 13 Feet

0

Light gray gypsum (Shelby Tube)

Firm light gray gypsum (Shelby Tube)

5

Firm light gray gypsum (Shelby Tube)

10

Refusal at 13 feet

15

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FP18125

LOG OF BORING

PROJECT: HF Gypsum Study
Geismar, Louisiana

FOR: Allied Corporation
Geismar, Louisiana

BORING 9
FILE 82-7
DATE 14 Oct. 1987
TECHNICIAN KMR

Classification Sample
UNDISTURBED SAMPLE
STANDARD PENETRATION TEST
BORING DEPTH 20 Feet

DEPTH FEET	SAMPLES	
0		Very dense light gray gypsum
		Very dense light gray gypsum
5		Very dense light gray gypsum
		Very dense light gray gypsum
10		Very dense light gray gypsum
		Very dense light gray gypsum
		Very dense light gray gypsum
15		Very dense light gray gypsum
		Very dense light gray gypsum
20		Very dense light gray gypsum

Boring 10

Boring Depth 20

0		Dense light gray gypsum
		Very dense light gray gypsum
5		Very dense light gray gypsum
		Very dense light gray gypsum
10		Very dense light gray gypsum
		Very dense light gray gypsum
		Very dense light gray gypsum
15		Very dense light gray gypsum
		Very dense light gray gypsum
20		Very dense light gray gypsum

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

FF18175

NEUTRALIZED HF GYPSUM

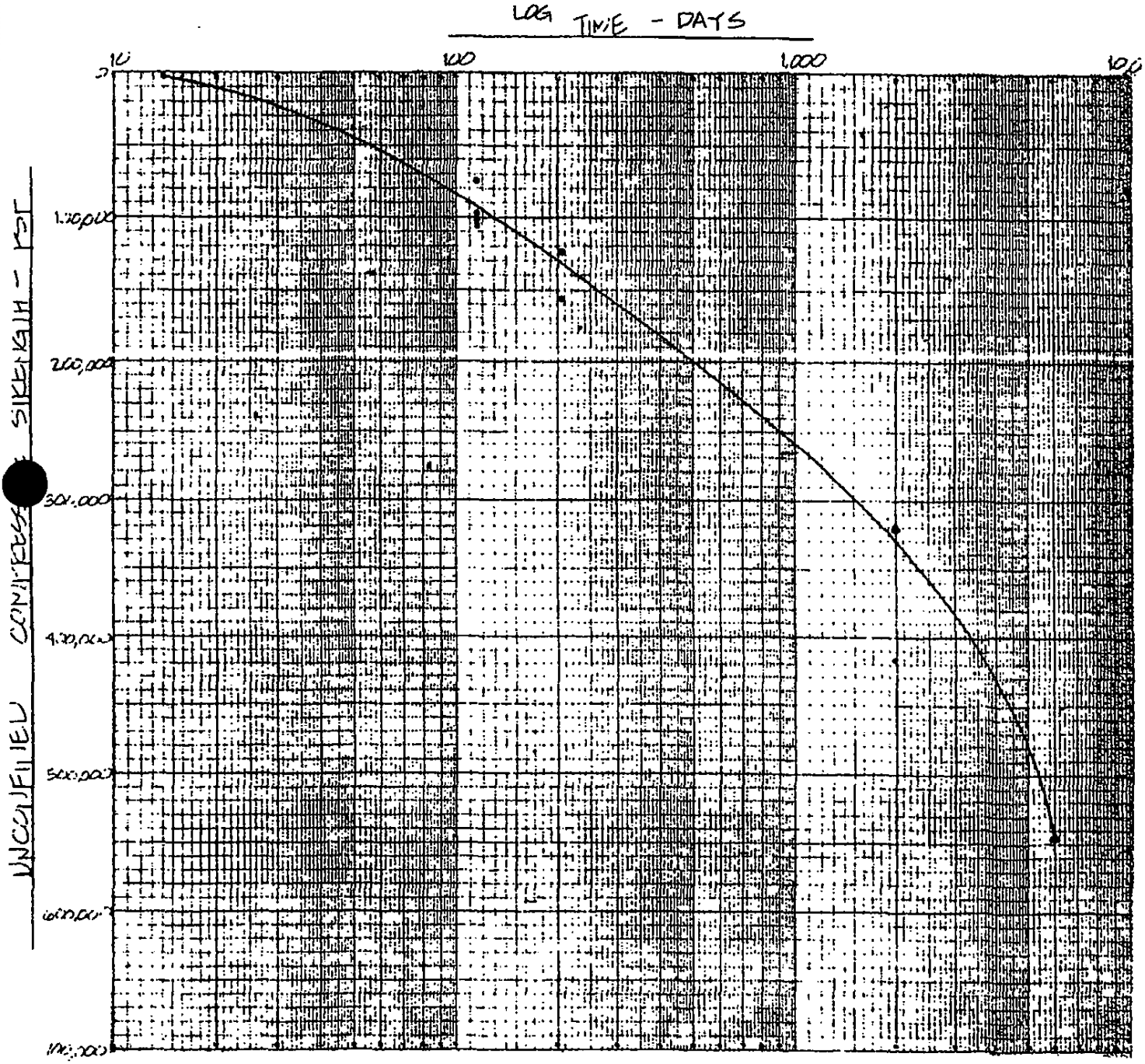
Sheet 1, Compression Test Results

Sheet 2, Boring Plan

Tables 1 through 6, Laboratory Data

Figures 1 through 12, Grain Size Curves

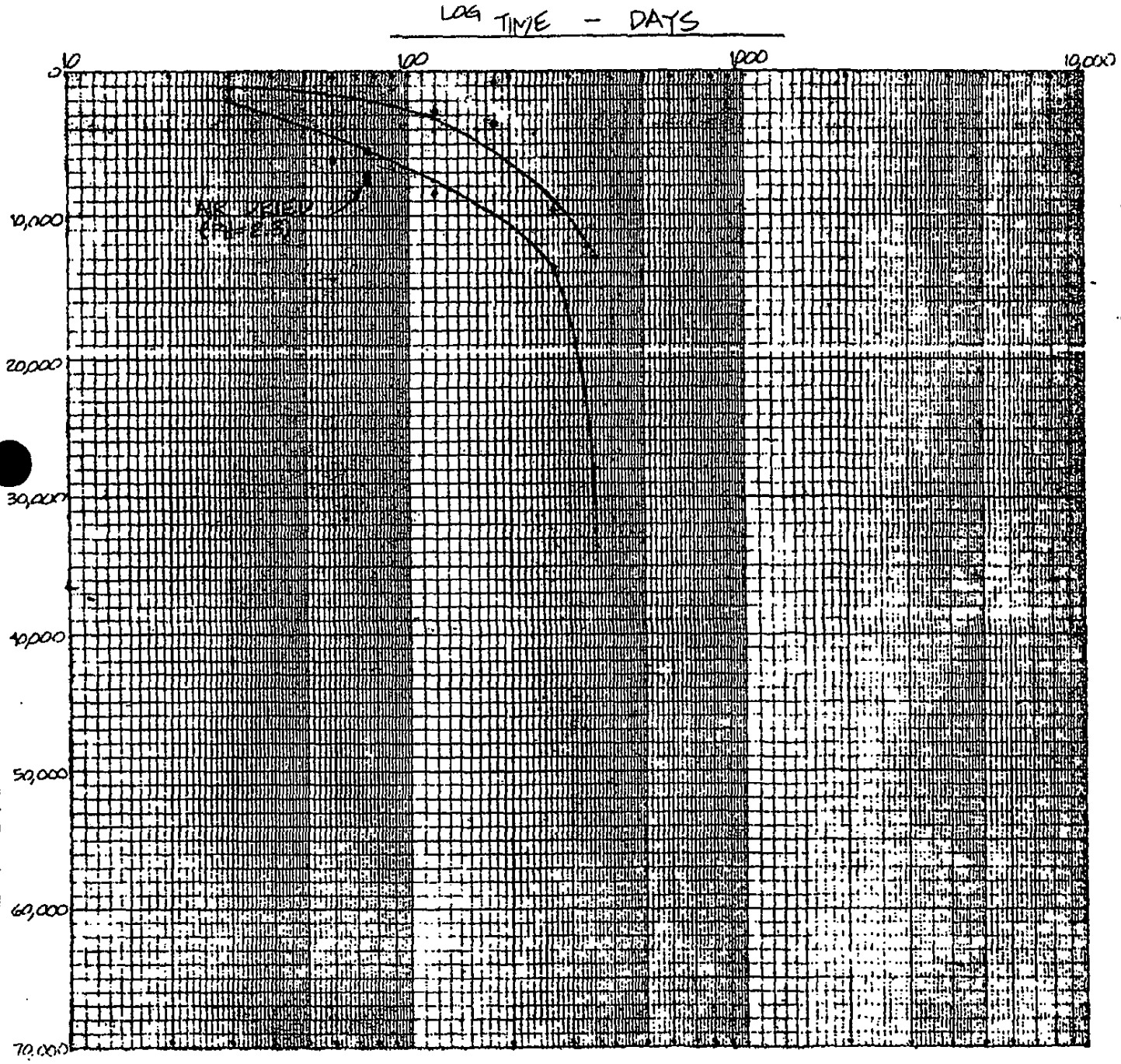
Logs of Borings 1 through 4



PH LESS THAN 2.0

ACIDIC HF GYPSUM

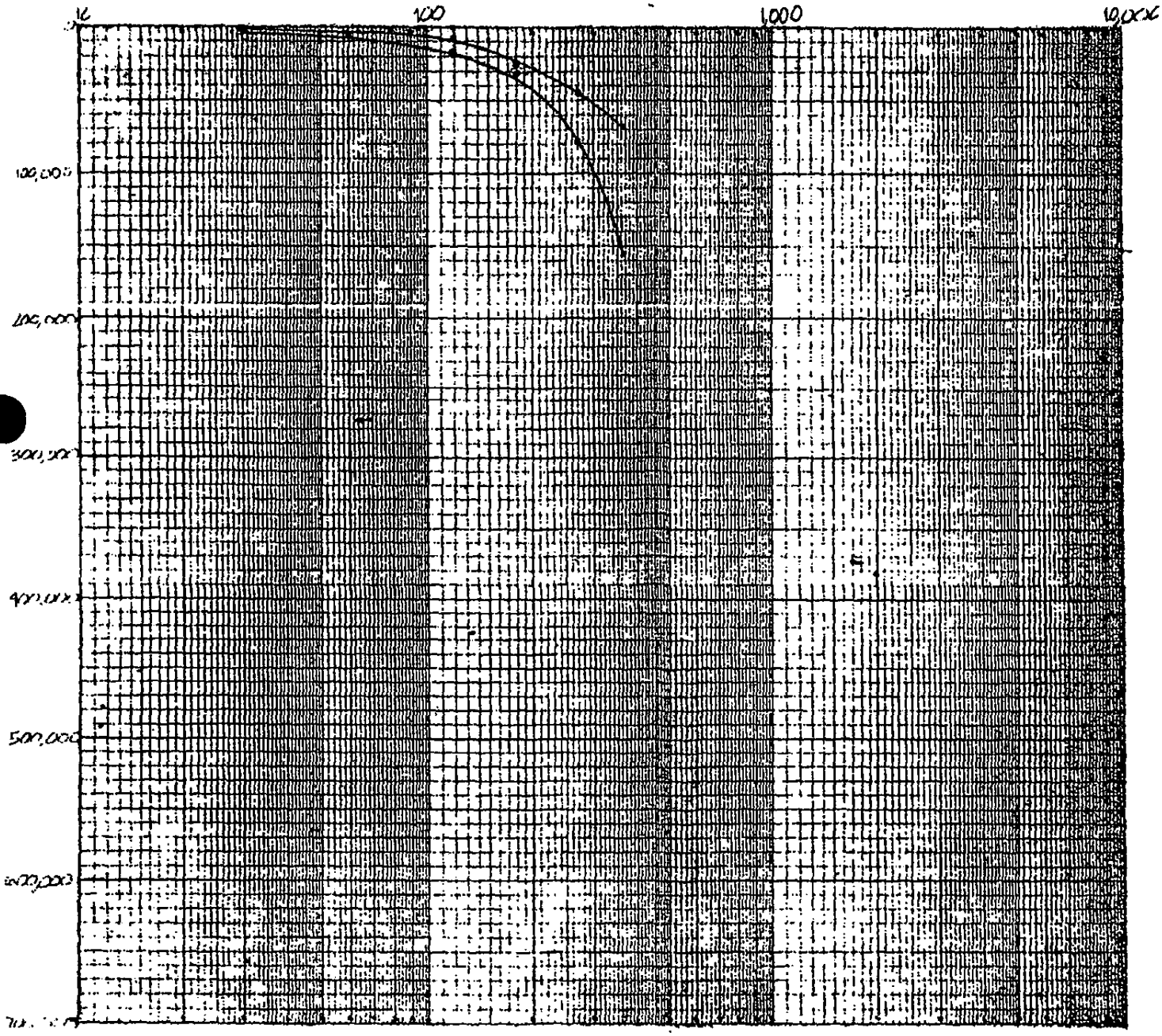
[illegible] SCALE
EEDS NEUTRALIZED
GYPSUM ORDINATES
A FACTOR OF 10



PH = 2.2 OR 2.3

NEUTRALIZED HF GYPSUM

LOG TIME – DAYS

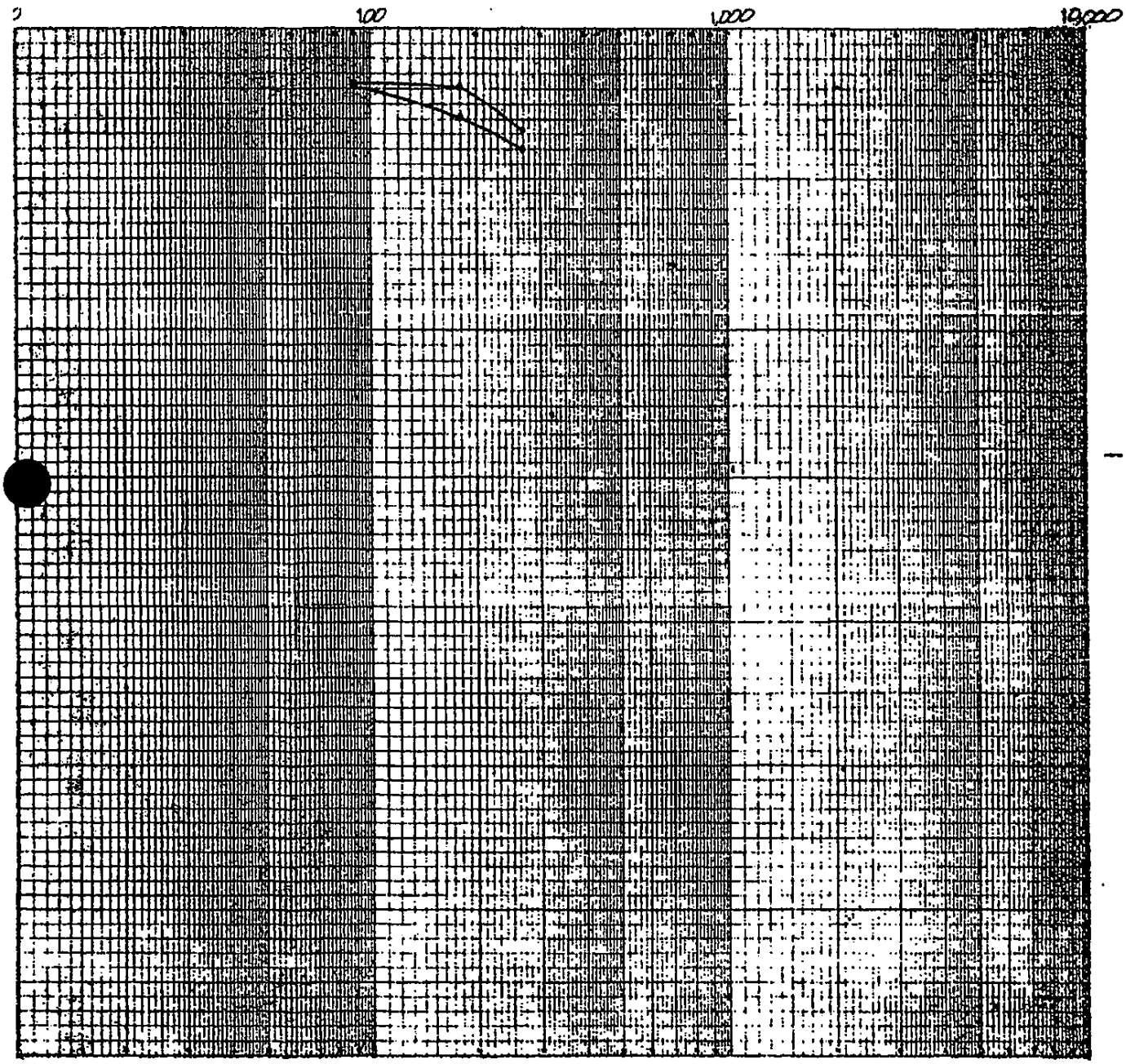


PH = 3.2

NEUTRALIZED HF GYPSUM

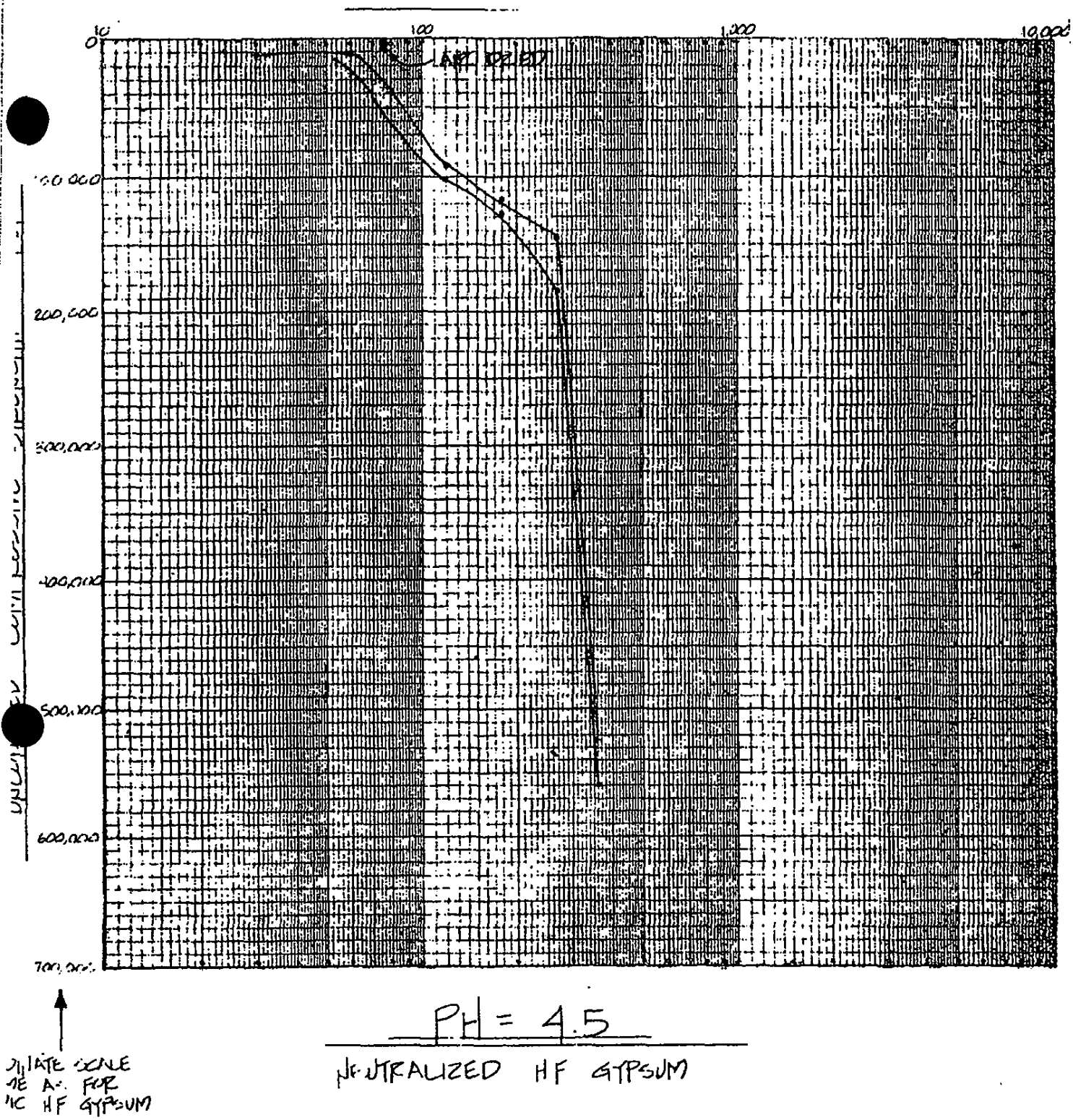
LINEAR SCALE
SAME AS FOR
BASIC HF GYPSUM

LOG TIME - DAYS



PH = 3.6

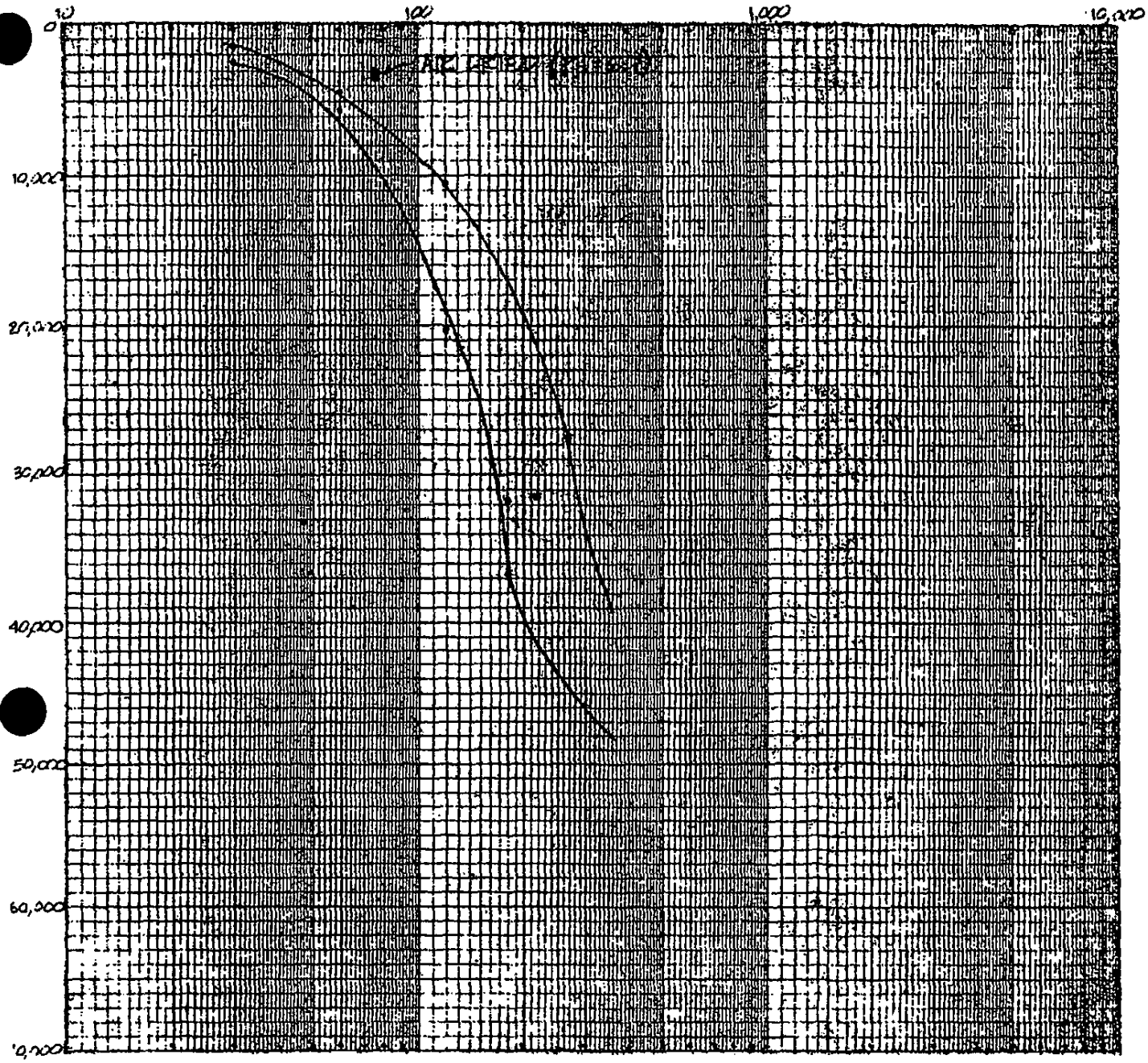
NEUTRALIZED HF GYPSUM



PH = 4.5

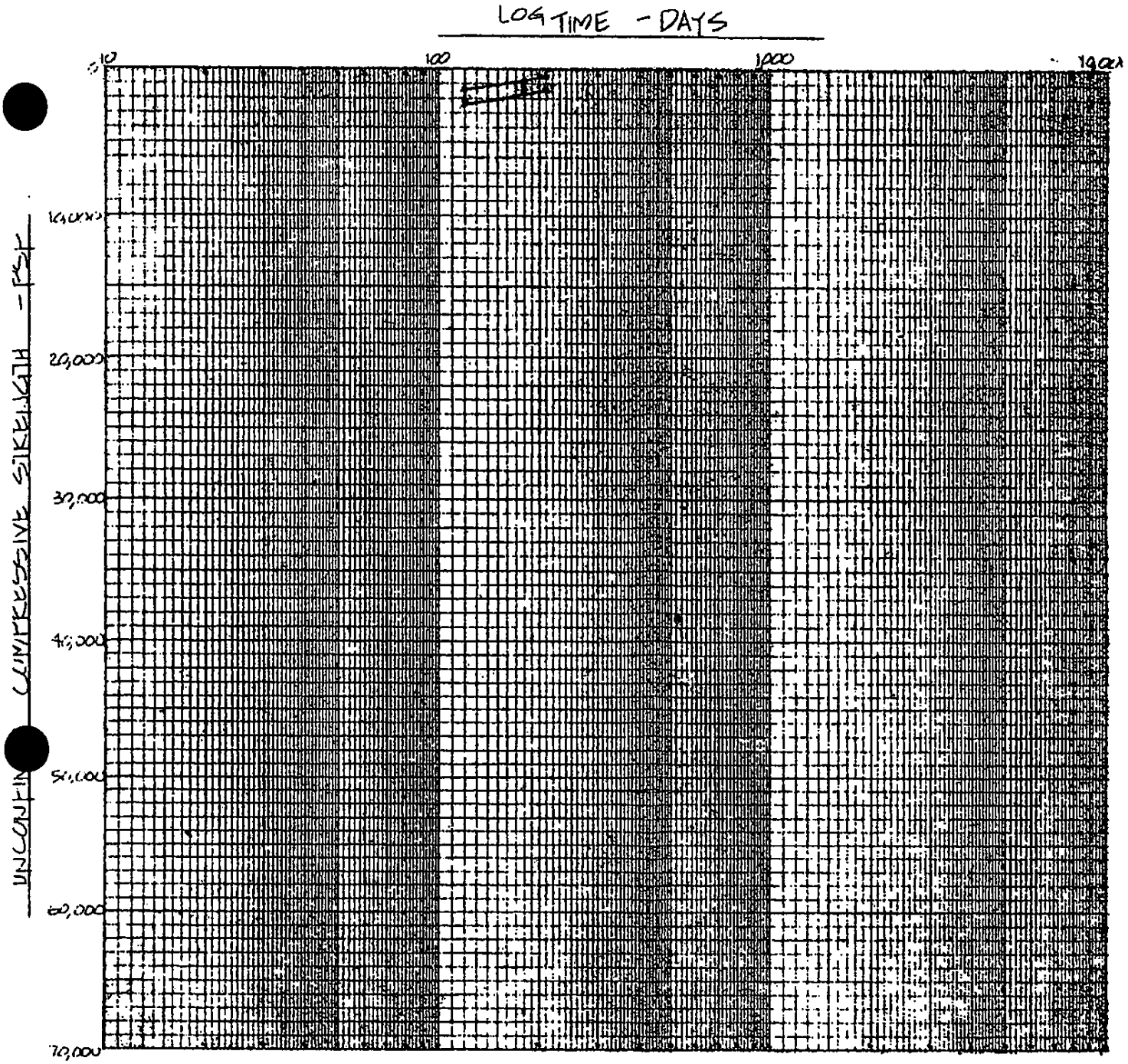
NEUTRALIZED HF GYPSUM

LOG TIME - DAYS



PH = 6.6 OR 6.7

NEUTRALIZED HF GYPSUM



PH INDETERMINATE

TEST SPECIMENS ARE CORES OF NEUTRALIZED HF GYPSUM CURED IN PLACE

(SEE SHEET 2 AND BORING LOGS 1 THROUGH 4)

COMPRESSIVE STRENGTH VERSUS LOG TIME

EXCEPT WHERE OTHERWISE INDICATED, STRENGTHS ARE BASED ON UNCONFINED COMPRESSION TESTS OF LABORATORY MOLDED AND CURED TEST CYLINDERS, 3 INCH DIAMETER X 6 INCH LENGTH.
SITE SAMPLED SLURRY WAS USED FOR MOLDING.
CURING WAS AT 100% HUMIDITY.

NEUTRALIZED HF GYPSUM STUDY
GEISMAR, LOUISIANA

ALLIED CHEMICAL CORPORATION
GEISMAR, LOUISIANA

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERS
BATON ROUGE, LOUISIANA

SCALE: | DWN. KGC 10 MAR 86 | FILE No.

Subject BORING PLAN

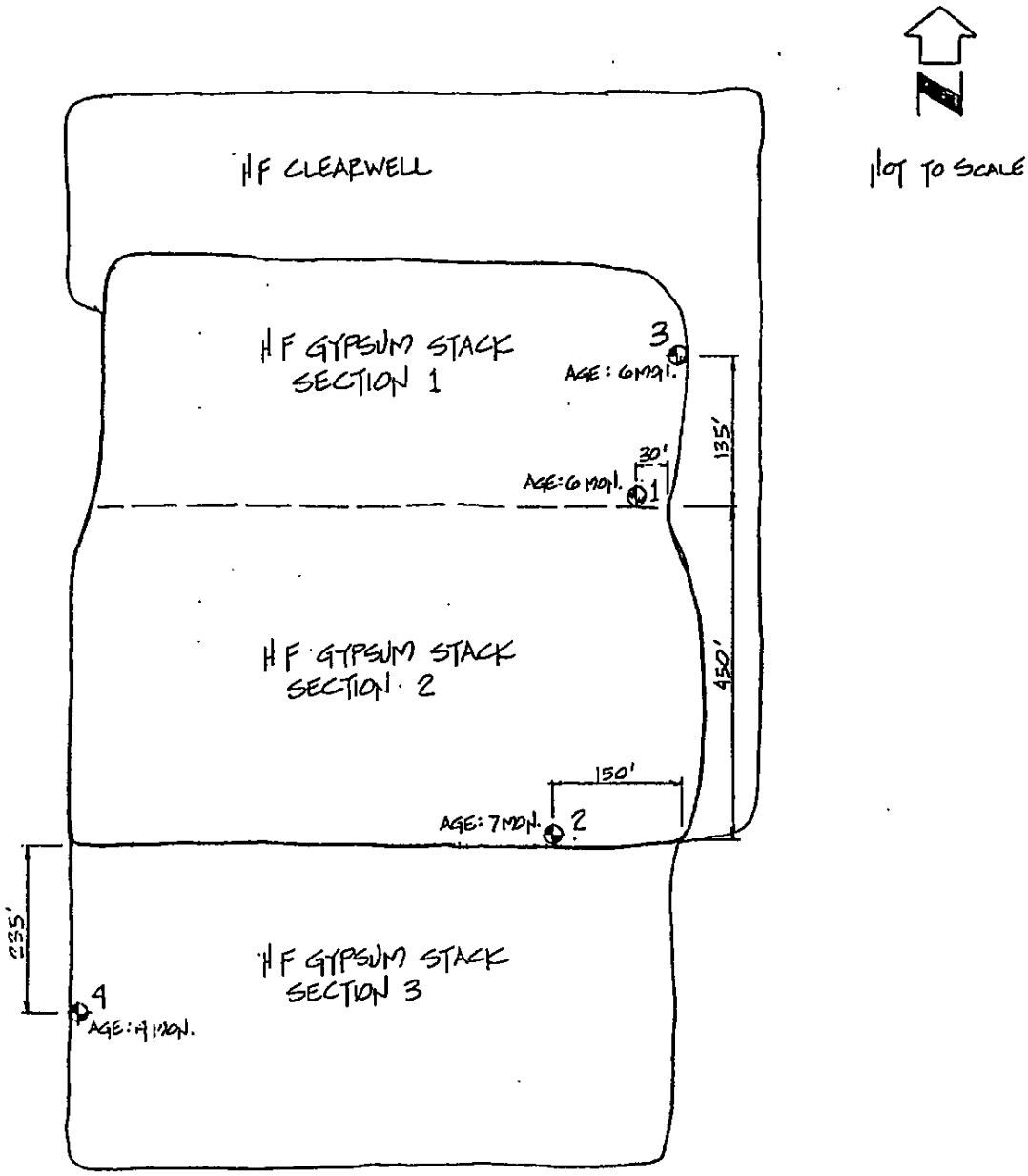
Sheet 2 Of 2

Made by KGG Date 10 MAR 86

File No. 82-7

Checked by CWH Date 10 MAR 86

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers



NOTES: 1- SECTIONS 1 AND 2 CONSIST OF ACIDIC HF GYPSUM COVERED BY AT LEAST 6 FEET OF NEUTRALIZED HF GYPSUM.

2- SECTION 3 COMPOSED ENTIRELY OF NEUTRALIZED HF GYPSUM.

NEUTRALIZED HF GYPSUM LABORATORY DATA TABLE 1 FILE NO. 82-7

CYLINDER NO.	pH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	COMPRESSION TEST TSF	COMPRESSION TEST % STRAIN	PRESSURE-KSF START	PRESSURE-KSF FAIL	TYPE FAILURE	CURING TIME DAYS	OTHER
3	6.6	8	133.2	123.4				18.39	2			MULTIPLE SHEAR	180	SIEVE
4	6.6	16	133.4	115.1				13.86	2			VERTICAL SHEAR	270	
6	6.6	14	135.7	119.1				13.71	3			VERTICAL SHEAR	270	
7	6.6	19	132.8	111.2				0.75	1			MULTIPLE SHEAR	30	
8	6.6	22	131.6	108.2				1.23	2			MULTIPLE SHEAR	30	
9	6.6	22	129.7	106.3				2.20	1			MULTIPLE SHEAR	60	
10	6.6	21	130.3	108.0				2.80	1			MULTIPLE SHEAR	60	
11	6.6	8	126.7	117.8				15.90	3			MULTIPLE SHEAR	180	
15	6.6	15	135.2	117.3				5.26	1			VERTICAL SHEAR	120	
16	6.6	16	136.7	118.0				10.14	0			VERTICAL SHEAR	120	
17	3.2	23	124.4	101.1				1.66	2			MULTIPLE SHEAR	30	
18	3.2	24	124.8	100.5				.89	3			MULTIPLE SHEAR	30	
19	3.2	19	130.0	109.5				4.69	1			VERTICAL SHEAR	120	
20	3.2	17	132.7	113.9				8.99	0			VERTICAL SHEAR	120	
21	3.2	15	128.6	111.5				16.23	1			MULTIPLE SHEAR	180	
22	3.2	18	130.7	110.4				12.86	2			MULTIPLE SHEAR	180	
24	3.2	15	131.1	113.7				39.35	2			VERTICAL SHEAR	270	

EUTRALIZED HF GYPSUM LABORATORY DATA TABLE 2 FILE NO. 82-7

YLINDER NO.	pH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	PL	PI	COMPRESSION TEST TSF	% STRAIN	PRESSURE-KSF START	FAIL	TYPE FAILURE	CURING TIME DAYS	OTHER
28	3.2	21	132.0	109.2				22.84	1			VERTICAL SHEAR	270	
29	3.2	24	118.5	95.7				2.45	1			MULTIPLE SHEAR	60	
30	3.2	21	121.3	99.9				3.38	2			MULTIPLE SHEAR	60	
34	2.2	24	153.0	122.9				0.43	4			MULTIPLE SHEAR	180	
35	2.2	21	155.1	128.6				1.41	4			MULTIPLE SHEAR	120	
38	2.2	18	148.2	125.9				4.21	2			MULTIPLE SHEAR	120	
39	2.2	17	147.9	126.7				4.88	2			VERTICAL SHEAR	270	
40	2.2	20	150.5	125.9				6.87	2			VERTICAL SHEAR	270	
41	2.2	19	137.6	116.1				0.97	10			MULTIPLE SHEAR	30	SIEVE
42	2.2	19	137.7	115.9				0.54	7			MULTIPLE SHEAR	30	
43	2.2	21	152.9	126.1				1.77	2			MULTIPLE SHEAR	180	
46	2.2	16	138.7	119.3				3.05	3			MULTIPLE SHEAR	60	
47	2.2	17	136.7	117.2				3.03	3			MULTIPLE SHEAR	60	
53	4.5	15	146.9	127.3				50.76	2			MULTIPLE SHEAR	120	
54	4.5	19	137.0	114.8				5.55	2			MULTIPLE SHEAR	30	SIEVE
55	4.5	18	137.6	116.8				5.54	1			MULTIPLE SHEAR	30	
56	4.5	17	150.8	128.7				92.70	2			VERTICAL SHEAR	270	

EUTRALIZED HF GYPSUM LABORATORY DATA TABLE 3 FILE NO. 82-7

YLINDER NO.	pH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	PL	PI	COMPRESSION TEST TSF	% STRAIN	PRESSURE-KSF START	FAIL	TYPE FAILURE	CURING TIME DAYS	OTHER
57	4.5	14	149.1	130.3				72.96	2			VERTICAL SHEAR	270	
58	4.5	18	153.0	129.4				45.57	1			MULTIPLE SHEAR	120	
59	4.5	16	152.8	131.8				64.49	1			MULTIPLE SHEAR	180	
60	4.5	17	150.2	128.8				58.01	1			MULTIPLE SHEAR	180	
62	4.5	15	137.2	119.5				5.04	1			NONE	60	
64	4.5	16	136.4	117.5				5.04	1			NONE	60	
65	3.6	21	118.4	97.6				1.88	1			MULTIPLE SHEAR	90	
66	3.6	24	122.1	98.3				1.90	1			MULTIPLE SHEAR	90	SIEVE
67	3.6	25	125.1	99.7				1.97	3			VERTICAL SHEAR	180	
68	3.6	24	117.2	94.8				2.96	3			VERTICAL SHEAR	180	

EUTRALIZED HF GYPSUM LABORATORY DATA TABLE 4 FILE NO. 82-7

CORE NO.	pH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	COMPRESSION TEST TSF	COMPRESSION TEST % STRAIN	COMPRESSION TEST PRESSURE-KSF START	COMPRESSION TEST PRESSURE-KSF FAIL	COMPRESSION TEST TYPE FAILURE	AIR DRYING APPROXIMATE TIME DAYS	POLYME ADD.
72	2.3	32.1	103.2	78.1				3.74					76	YES
73	2.3	25.5	114.3	91.1				2.75					76	YES
74	2.3	24.9	110.2	88.2				3.80					76	
75	4.5	12.2	119.7	106.7				1.40					76	YES
76	4.5	18.5	121.2	102.3				2.28					76	
77	4.5	13.2	NON TESTABLE											
78	6.7	21.1	115.8	95.7				1.29					76	
79	6.7	22.4	113.0	92.4				1.52					76	YES
80	6.7	23.1	121.4	98.6				1.69					76	

OTE: SAMPLES MOLDED ONSITE BY ALLIED CHEMICAL CORPORATION PERSONNEL, 14 MAY 1985

CORES TAKEN/TESTED BY LJC&A PERSONNEL, 29 JULY 1985

NEUTRALIZED HF GYPSUM — LABORATORY DATA — TABLE 5 — FILE NO. 82-7

BORING NO.	DEPTH	MOIST. %	DEN-PCF WET	DEN-PCF DRY	ATTERBERG LIMITS LL	PL	PI	COMPRESSION TEST TSF	% STRAIN	PRESSURE-KSF START	FAIL	TYPE FAILURE	APPROXIMATE TIME IN PLACE DAYS	OTHER
1	0- 2	47	117.9	80.0				0.68	10			YIELD	180	
1	2- 4	35	130.2	96.4				0.66	4			MULTIPLE SHEAR	180	SIEVE
1	4- 6	42	135.0	95.4				0.74	4			MULTIPLE SHEAR	180	
2	0- 2	39	130.9	94.2				0.64	7			MULTIPLE SHEAR	210	
2	2- 4	33	132.5	99.5				0.64	10			YIELD	210	
2	4- 5	27	127.0	100.2				0.26	10			YIELD	210	SIEVE
3	0- 2	33	122.7	92.0				0.45	3			MULTIPLE SHEAR	180	SIEVE
3	2- 4	21	105.9	87.6				0.83	7			MULTIPLE SHEAR	180	
3	4- 5	34	120.3	89.7				0.63	6			MULTIPLE SHEAR	180	
4	0- 2	31	124.7	95.4				0.72	4			MULTIPLE SHEAR	120	
4	2- 4	24	131.6	106.6				1.18	3			MULTIPLE SHEAR	120	SIEVE
4	4- 6	16	132.4	113.9				0.71	6			MULTIPLE SHEAR	120	

NOTE: EACH BORING SAMPLED ONLY NEUTRALIZED HF GYPSUM - SEE SHEET 2.

SAMPLE pH WAS INDETERMINATE.

NEUTRALIZED HF GYPSUM — LABORATORY DATA — TABLE 6 — FILE NO. 82-7

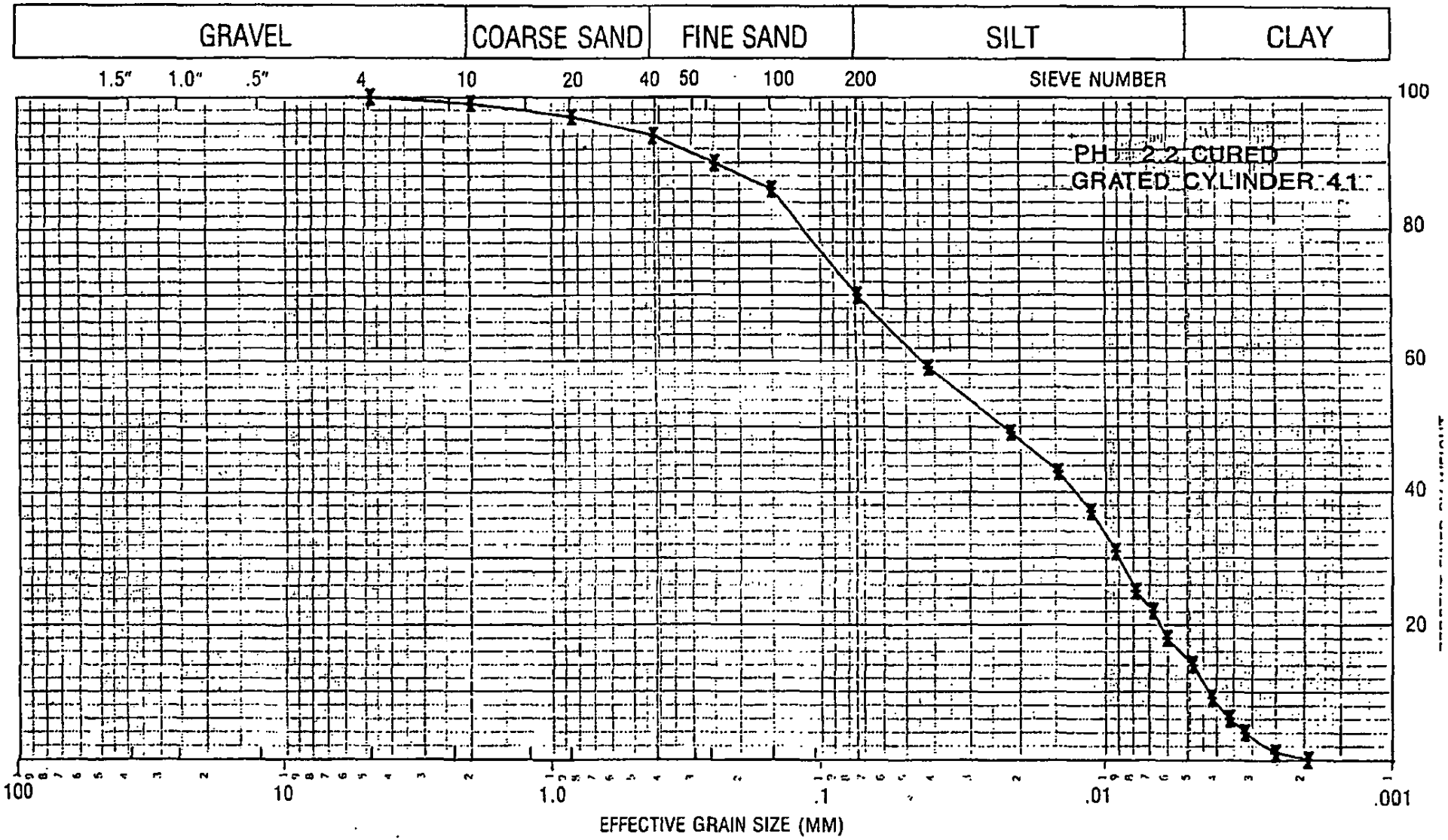
CYLINDER NO.	pH	MOIST %	DEN-PCF WET	DEN-PCF DRY	COMPRESSION TEST TSF	COMPRESSION TEST % STRAIN	TYPE FAILURE	CURING TIME DAYS
1	6.6	9	125.1	115.2	19.62	2	MULTIPLE SHEAR	360
5	6.6	7	125.2	116.8	24.05	2	MULTIPLE SHEAR	360
25	3.2	17	130.1	110.9	33.47	2	MULTIPLE SHEAR	365
26	3.2	11	125.7	112.9	77.25	2	MULTIPLE SHEAR	365
36	2.2	8	129.1	119.3	15.18	2	MULTIPLE SHEAR	360
37	2.2	7	128.1	119.4	6.54	2	MULTIPLE SHEAR	360
49	4.5	--	--	--	280.00	--	-- --	360
50	4.5	15	144.0	125.0	263.34	1	MULTIPLE SHEAR	360
51	4.5	15	142.2	123.3	262.68	1	MULTIPLE SHEAR	360
70	3.6	19	111.9	94.1	3.42	1	MULTIPLE SHEAR	270
71	3.6	10	106.2	96.6	4.00	2	MULTIPLE SHEAR	270

TENSION TEST

2	6.6				1.53			365
23	3.2				1.90			370
33	2.2				6.62			365

17JUN85

GRAIN SIZE CURVE

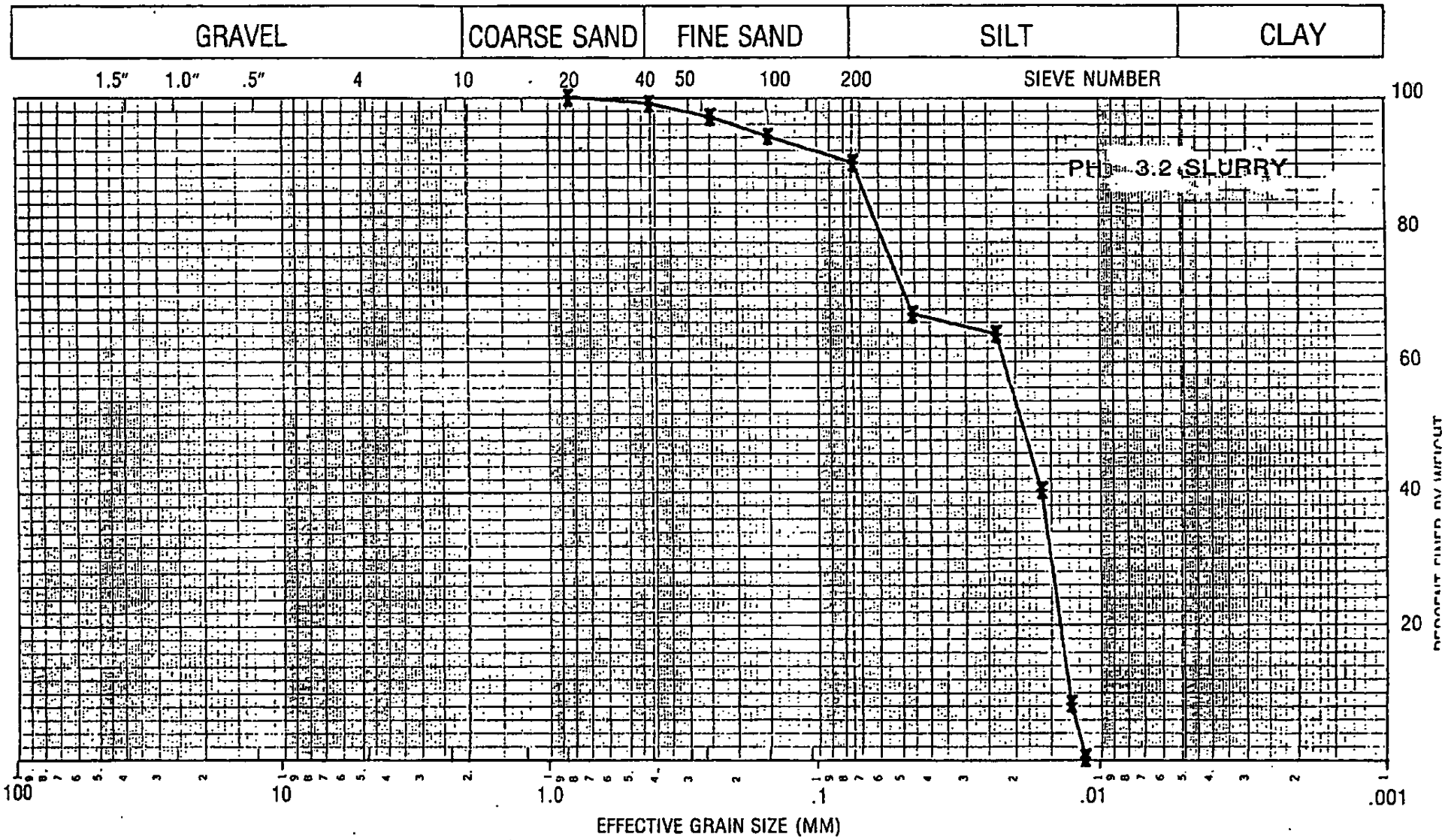


FILE 82- 7
FIGURE . . 1

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

18JUN85

GRAIN SIZE CURVE



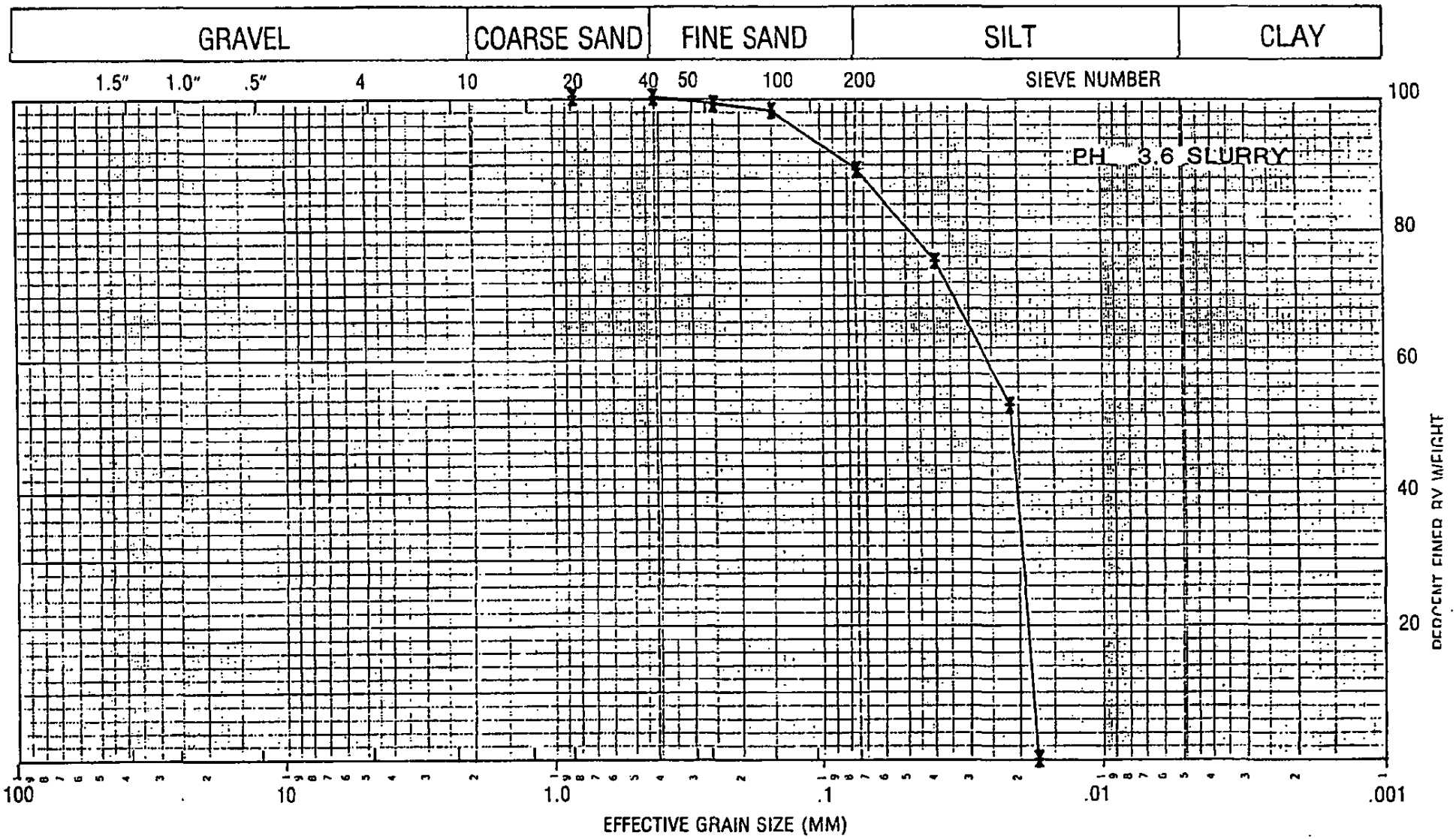
FILE 82- 7

FIGURE . . 2

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

12AUG85

GRAIN SIZE CURVE

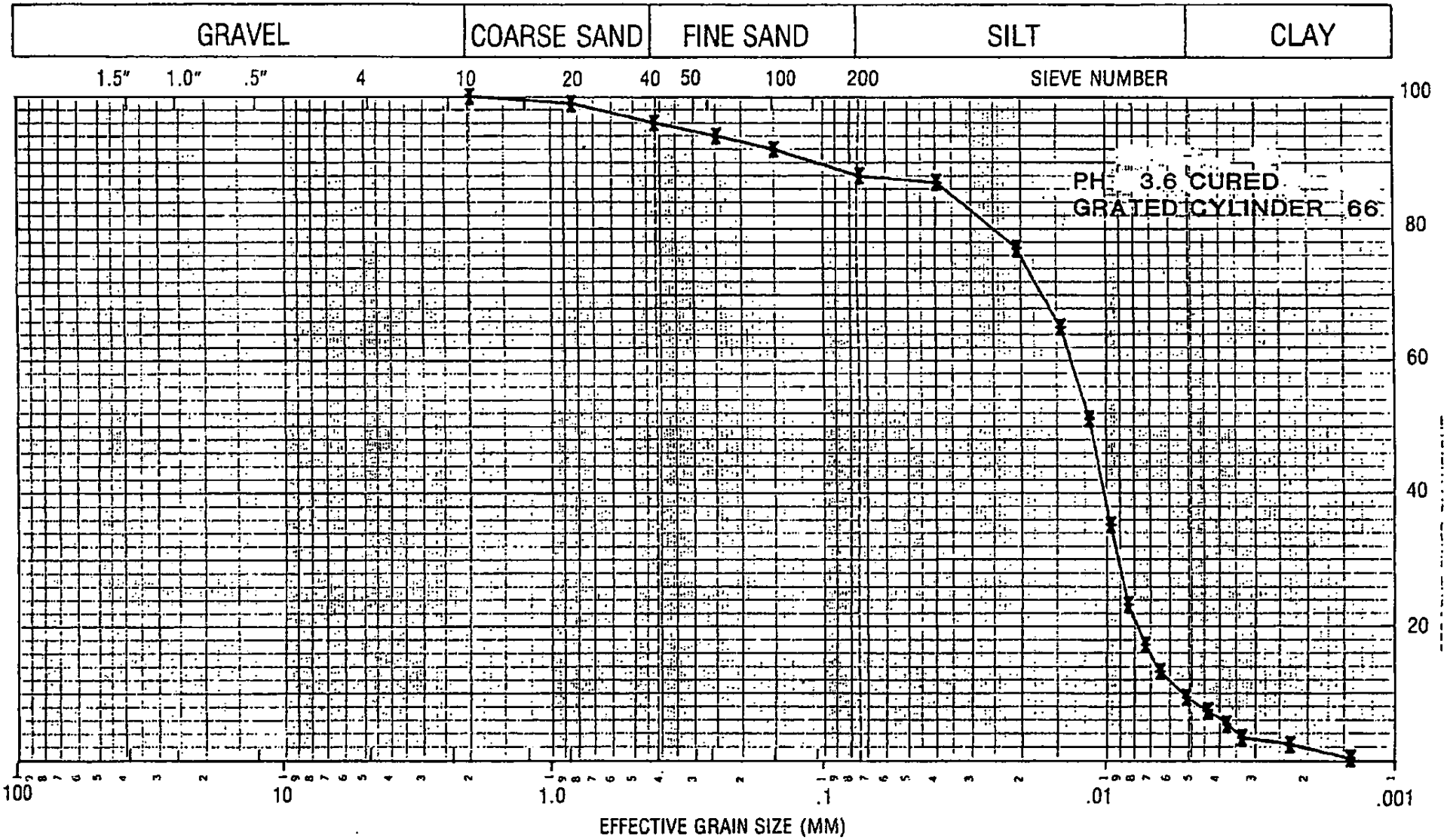


FILE . . : . 82- 7
FIGURE . . 3

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

06NOV85

GRAIN SIZE CURVE

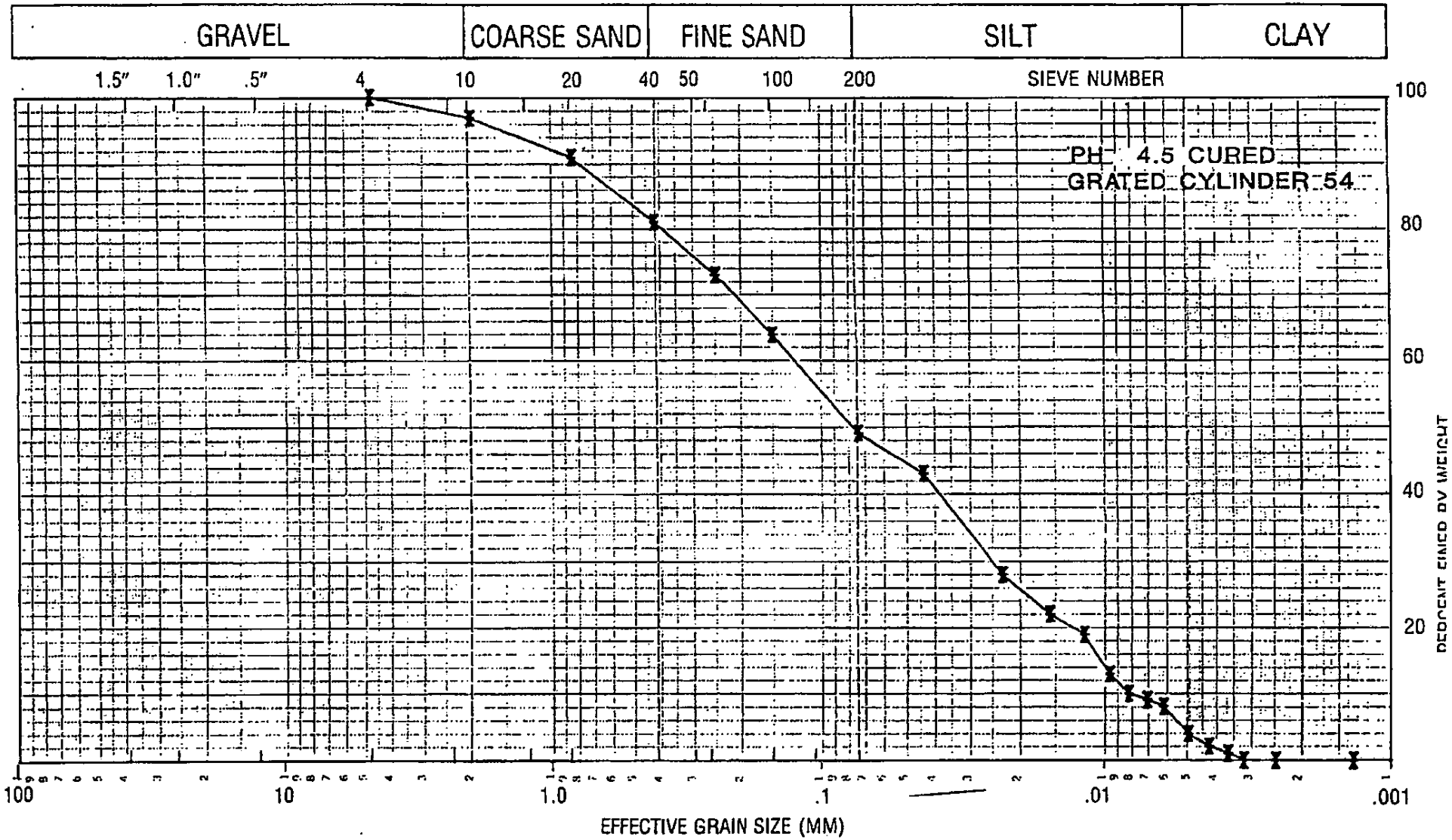


FILE 82- 7
FIGURE . . 4

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

17JUN85

GRAIN SIZE CURVE



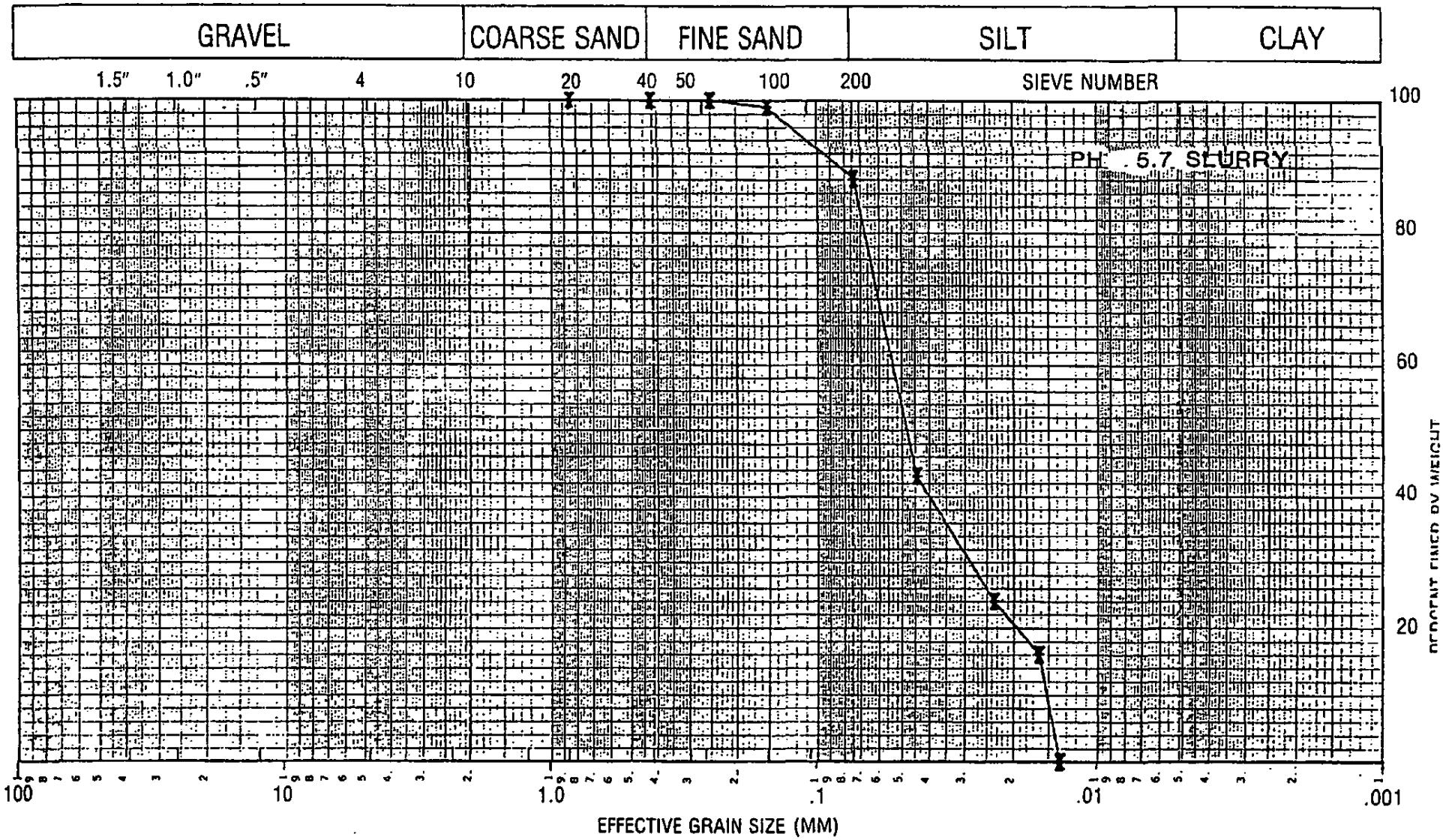
FILE 82- 7

FIGURE . . 5

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

08MAY85

GRAIN SIZE CURVE

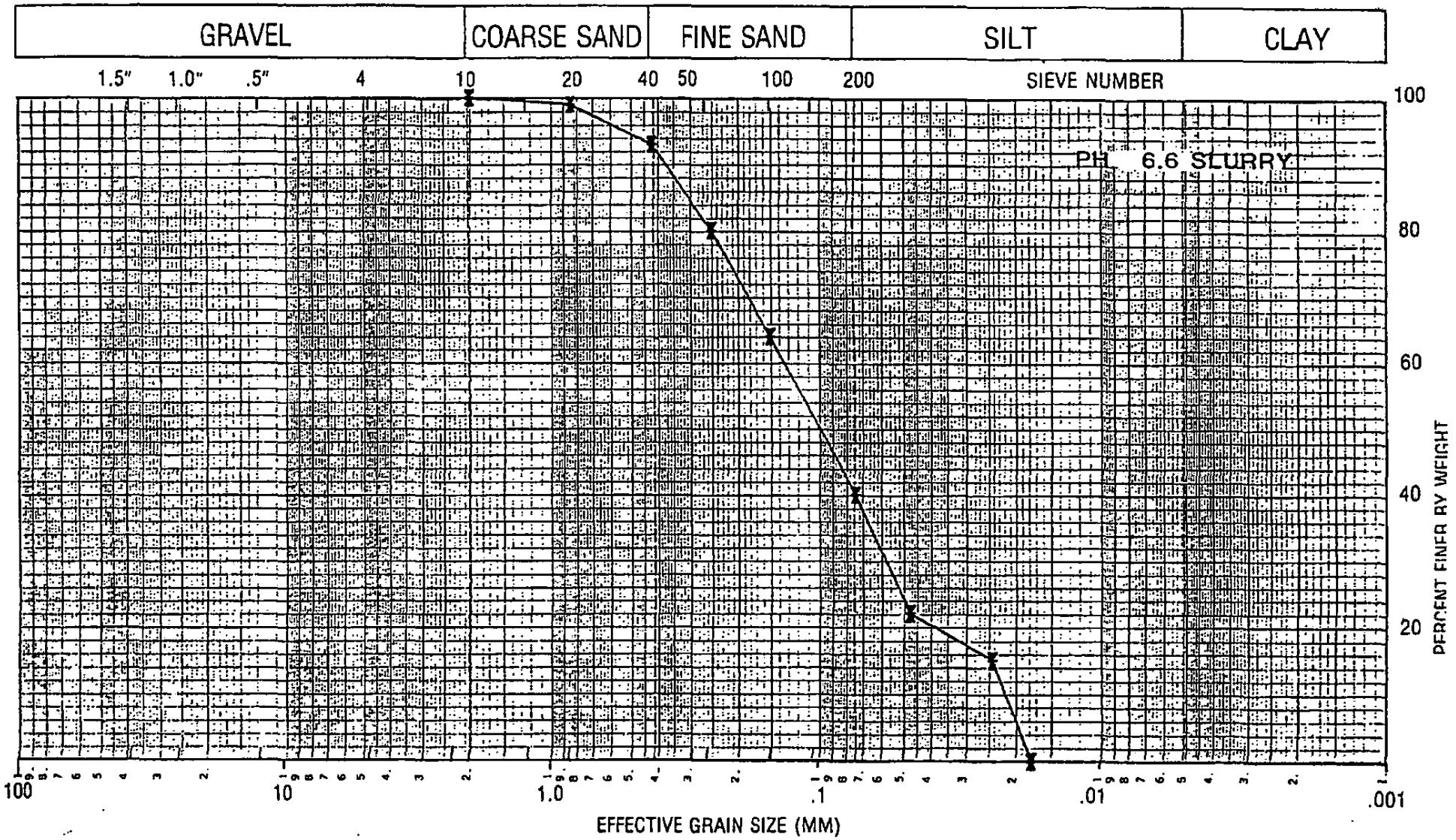


FILE 82- 7
FIGURE . . 6

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

08MAY85

GRAIN SIZE CURVE

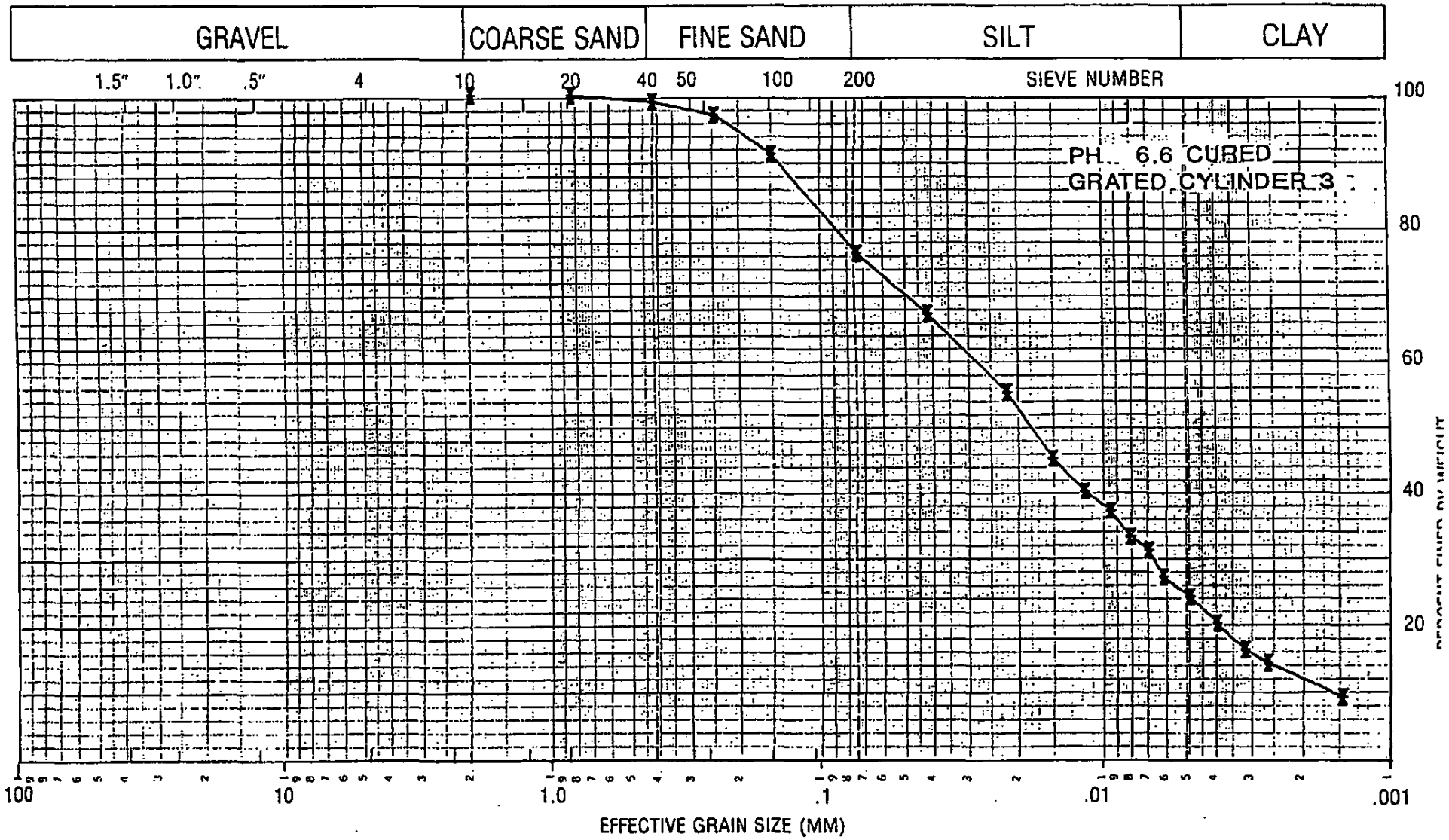


FILE 82- 7
FIGURE . . 7

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

04NOV85

GRAIN SIZE CURVE

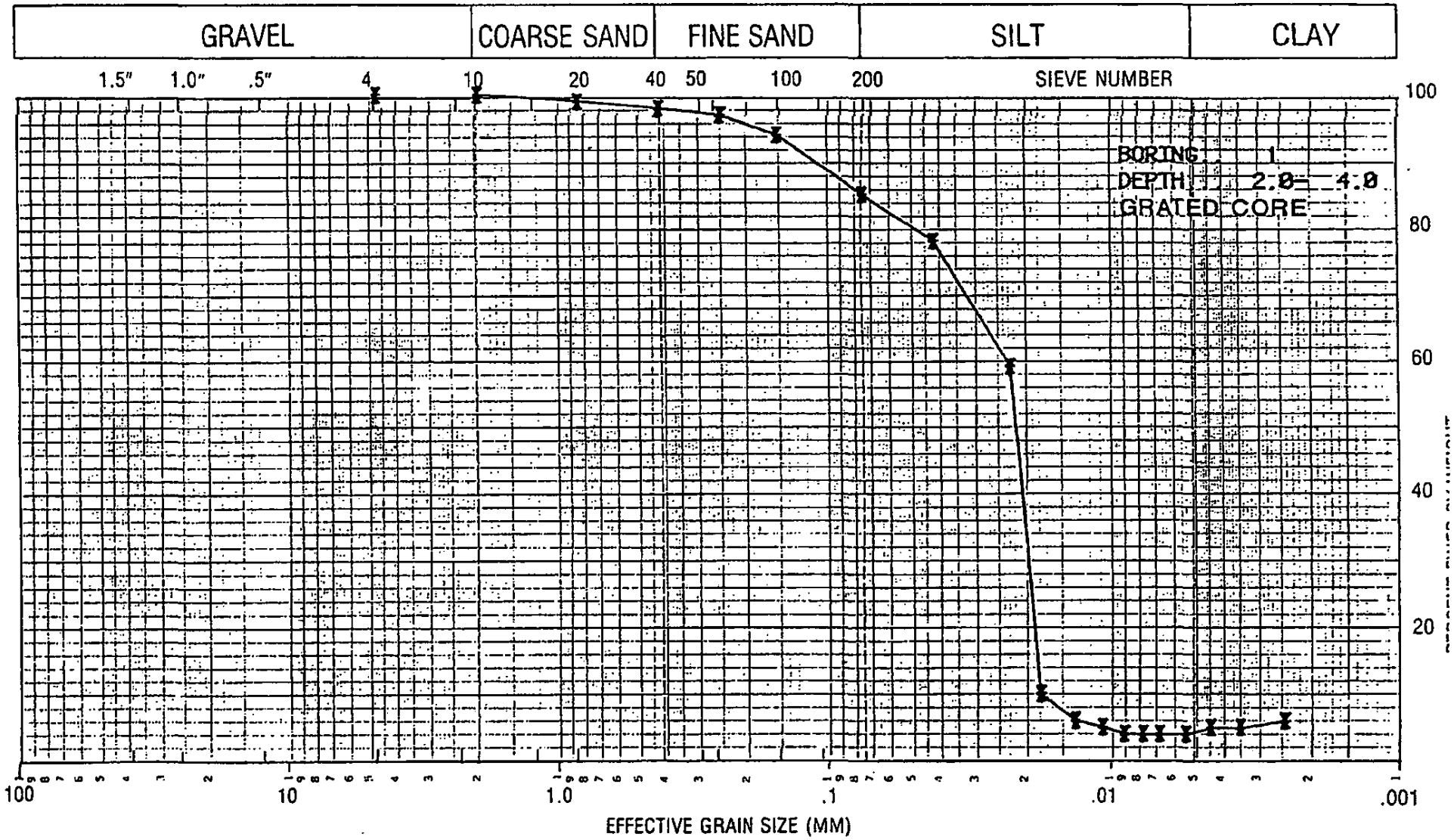


FILE 82- 7
FIGURE . . 8

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

04DEC85

GRAIN SIZE CURVE

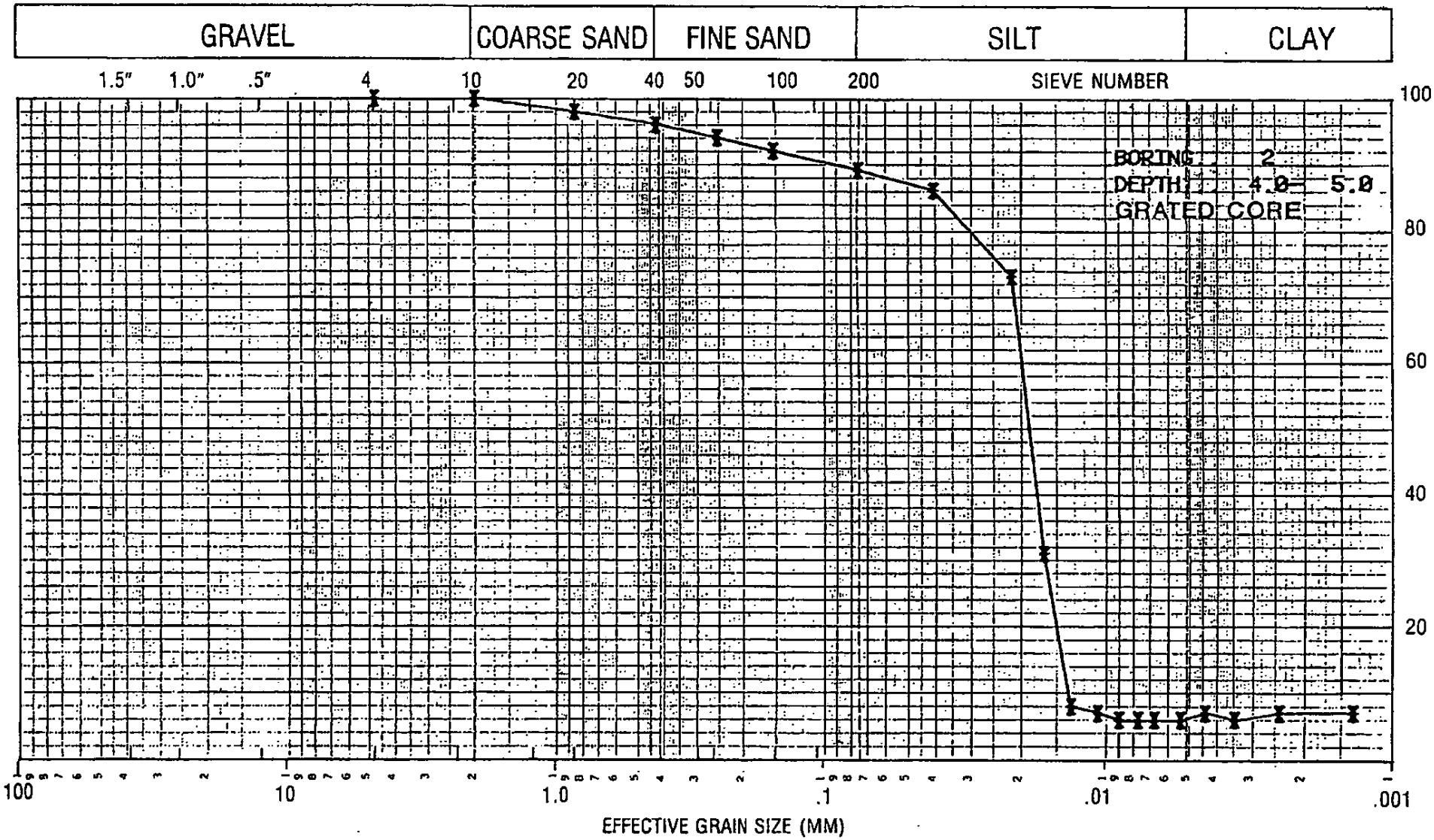


FILE 82- 7
FIGURE . . 9

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

04DEC85

GRAIN SIZE CURVE

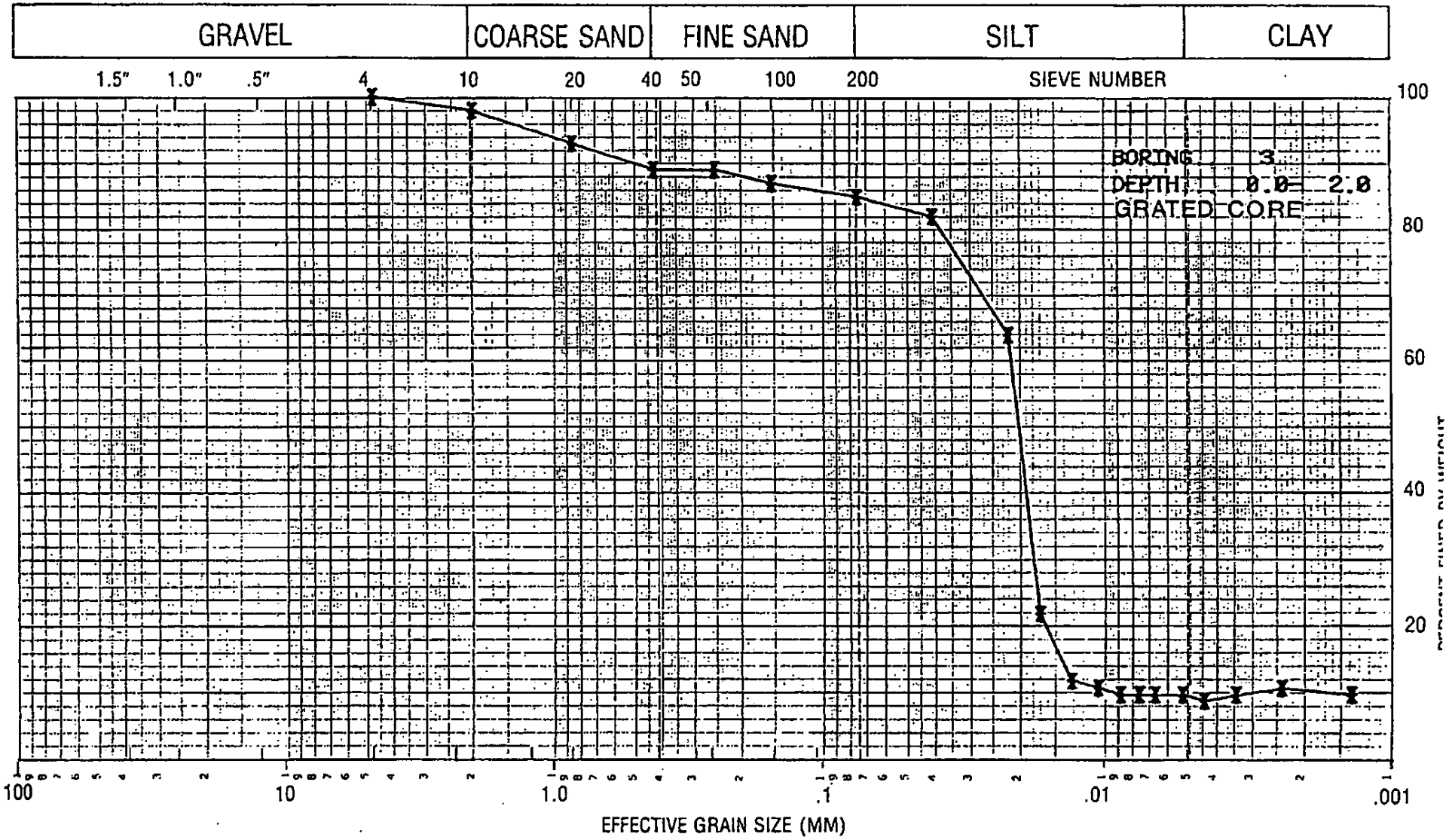


FILE 82- 7
FIGURE . . 10

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

04DEC85

GRAIN SIZE CURVE

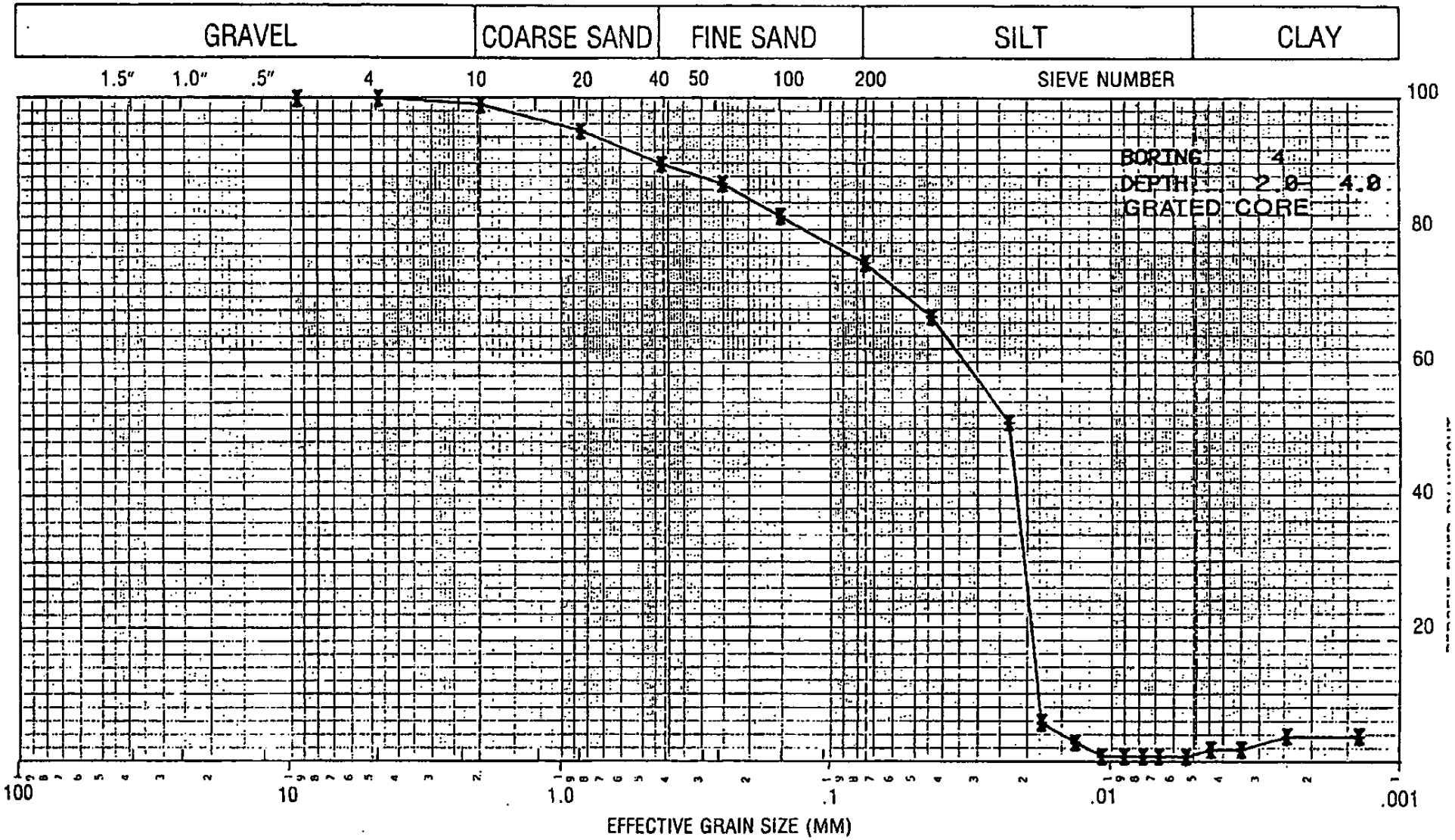


FILE 82- 7
FIGURE . . 11

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

04DEC85

GRAIN SIZE CURVE



FILE 82- 7
FIGURE . . 12

Louis J. Capozzoli and Associates, Inc.
Geotechnical Engineers

LOG OF BORING

PROJECT: Neutralized HF Gypsum Study
Geismar, Louisiana

FOR: Allied Chemical Corporation
Geismar, Louisiana

BORING I
FILE 82-7
DATE 27 Nov. 1985
TECHNICIAN MAJ

DEPTH FEET | SAMPLES

■ UNDISTURBED SAMPLE ☒ STANDARD PENETRATION TEST BORING DEPTH 6 Feet

0
Gypsum, 9 inch core length
Gypsum, 9 inch core length
5
Gypsum, 24 inch core length

Boring 2
Boring Depth 5 Feet

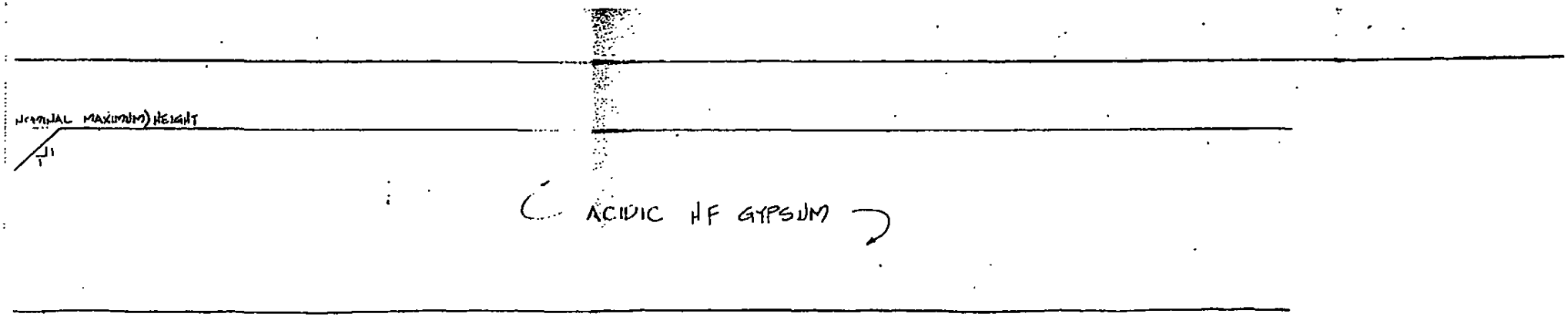
0
Gypsum, 20 inch core length
Gypsum, 18 inch core length
5
Gypsum, 11 inch core length

Boring 3
Boring Depth 5 Feet

0
Gypsum, 16 inch core length
Gypsum, 13 inch core length
5
Gypsum, 10½ inch core length

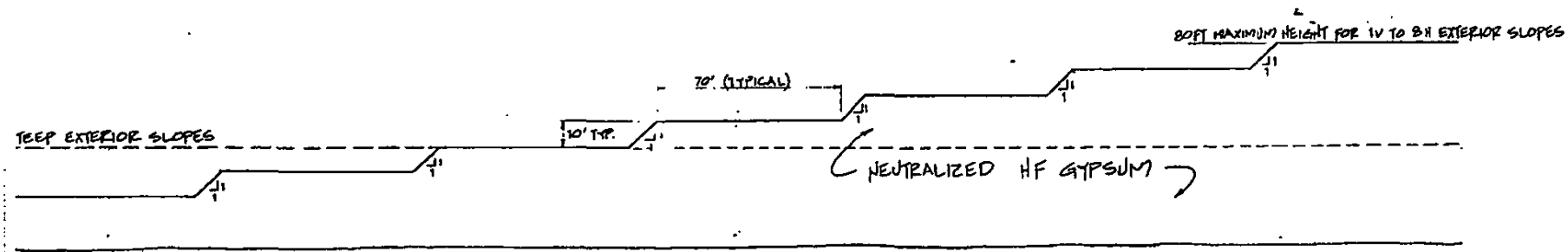
Boring 4
Boring Depth 6 Feet

0
Gypsum, 18 inch core length
Gypsum, 11½ core length
5
Gypsum, 18½ core length



ACIDIC HF GYPSUM

SCHEME CURRENTLY BEING USED



NEUTRALIZED HF GYPSUM

RESTRICTION TO 40FT. OR SLOPE FLATTENING NECESSARY TO PREVENT STACK BOTTOM TENSION CRACKING FROM CAUSING FAILURE.
KMENT HEIGHTS BETWEEN 10 AND 80 FEET MAY BE CONSTRUCTED WITH STEEPER EXTERIOR SLOPES: EMBANKMENT SLOPE HORIZONTAL COMPONENT = 1/10 DESIRED EMBANKMENT HEIGHT IN FEET.

R DETAILS ARE IN THE MARCH 1986 INTERMEDIATE REPORT ON NEUTRALIZED HF GYPSUM TESTING AND APRIL 1986 GEOTHNICAL
IGATION REPORT FOR STACK SECTION No. 4.

ACIDIC/NEUTRALIZED HF GYPSUM GEISMAR, LOUISIANA	
ALLIED-SIGNAL, INC. GEISMAR, LOUISIANA	
LOUIS J. CAPOZZOLI & ASSOCIATES, INC. GEOTECHNICAL ENGINEERS BATON ROUGE, LOUISIANA	
SCALE 1" = 40'	DWN. KGC 14 JAN 86 CKD. CWH 2 SEP 86
EMBANKMENT PROFILE ALTERNATES	1

ATTACHMENT 11
Waste Stream Analyses

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Fluorspar

Waste Generation Rate: ☐ Cubic yards ☑ Tons > 100 per year

Process Generating the Waste: Maintenance and Repair Activities

Current Disposal Procedure: Off spec fluorspar is hauled and placed into the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Fluorspar	98 %	
Other (Inert)	2 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	T. Todd Harter	**6/6/2007**

Report of Laboratory Analysis

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: HF FLUOROSPAR (TOTAL) **Client:** HONEYWELL SPECIALTY MATERIALS

Project: ANNUAL SW PROFILE **Site:** None

Lab ID: 20477394 **Project No.:** 2063329

Description: None **Matrix:** Other **%Moisture:** n/a

Collected: 10/06/06 **Received:** 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	EPA 6010	77601	1	334.		mg/kg	16.7	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Antimony	EPA 6010	77601	1	ND		mg/kg	5.00	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Arsenic	EPA 6010	77601	1	6.08		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Barium	EPA 6010	77601	1	141.		mg/kg	16.7	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Beryllium	EPA 6010	77601	1	ND		mg/kg	0.417	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Cadmium	EPA 6010	77601	1	ND		mg/kg	0.417	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Calcium	EPA 6010	77601	1	75700		mg/kg	41.7	10-Oct-06	11-Oct-06 16:25	KJR (1)	—
Chromium	EPA 6010	77601	1	2.42		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Cobalt	EPA 6010	77601	1	ND		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Copper	EPA 6010	77601	1	1.67		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Iron	EPA 6010	77601	1	494.		mg/kg	8.33	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Lead	EPA 6010	77601	1	5.22		mg/kg	0.417	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Magnesium	EPA 6010	77601	1	ND		mg/kg	41.7	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Manganese	EPA 6010	77601	1	34.0		mg/kg	1.25	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Mercury	EPA 7471	77630	1	ND		mg/kg	0.0158	11-Oct-06	11-Oct-06 14:05	KDG (1)	
Nickel	EPA 6010	77601	1	ND		mg/kg	3.33	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Potassium	EPA 6010	77601	1	377.		mg/kg	41.7	10-Oct-06	13-Oct-06 02:20	KJR (1)	
Selenium	EPA 6010	77601	1	18.8		mg/kg	2.92	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Silver	EPA 6010	77601	1	ND		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Sodium	EPA 6010	77601	1	65.9		mg/kg	41.7	10-Oct-06	13-Oct-06 02:20	KJR (1)	
Thallium	EPA 6010	77601	1	ND		mg/kg	0.833	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Vanadium	EPA 6010	77601	1	ND		mg/kg	4.17	10-Oct-06	11-Oct-06 16:25	KJR (1)	
Zinc	EPA 6010	77601	1	2.93		mg/kg	1.67	10-Oct-06	11-Oct-06 16:25	KJR (1)	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10288
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Report of Laboratory Analysis

Pace Analytical
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: HF FLUOROSPAR
Client: HONEYWELL SPECIALTY MATERIALS
Project: ANNUAL SW PROFILE
Site: None
Lab ID: 20477387 (TCLP)
Project No.: 2063329
Description: None
Matrix: Other
%Moisture: n/a
Collected: 10/06/06
Received: 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:35	KJR (1)	5.00
Barium	EPA 6010	77746	1	ND		mg/L	2.00	13-Oct-06	13-Oct-06 12:35	KJR (1)	100.
Cadmium	EPA 6010	77746	1	ND		mg/L	0.100	13-Oct-06	13-Oct-06 12:35	KJR (1)	1.00
Chromium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:35	KJR (1)	5.00
Lead	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:35	KJR (1)	5.00
Mercury	EPA 7470	77747	1	ND		mg/L	0.000200	12-Oct-06	12-Oct-06 17:30	KDG (1)	0.200
Selenium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:35	KJR (1)	1.00
Silver	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:35	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0661
Louisiana Dept. of Health and Hospitals / Drinking Water - LA080023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS& E Waste Coordinator: Todd Harter

Waste Name: HF WWTP Clarifier Underflow

Waste Generation Rate: ☑ Cubic yards ☐ Tons > 100 per year

Process Generating the Waste: HF WWTP Operations
HF WWTP Cleaning - Routine Maintenance and Repairs

Current Disposal Procedure: HF WWTP clarifier underflow sludge is returned back to the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
HF WWTP Sludge	100	TCLP Metals
TOTAL	**100**	

Physical Data

Flash Point N/A °F **Color** Tan

pH 6-9 **Odor** N/A

Physical State at 70 °F ☐Solid ☐ Liquid ☑Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name Non Regulated Material – HF WWTP Clarifier Sludge

Name	Signature	Date
Todd Harter	Todd Harter	**6/6/2007**

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical
New Orleans Laboratory

Client ID: HF CLARIFIER (METALS)
Client: HONEYWELL SPECIALTY MATERIALS
Project: SW ANNUAL PROFILE
Site: None
Lab ID: 20482977
Project No.: 2064186
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 11/08/06
Received: 11/08/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	EPA 6010	78862	1	632.		mg/kg	20.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Antimony	EPA 6010	78862	1	ND		mg/kg	6.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Arsenic	EPA 6010	78862	1	15.3		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Barium	EPA 6010	78862	1	ND		mg/kg	20.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Beryllium	EPA 6010	78862	1	11.7		mg/kg	0.500	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Cadmium	EPA 6010	78862	1	2.64		mg/kg	0.500	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Calcium	EPA 6010	78862	1	252000		mg/kg	50.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Chromium	EPA 6010	78862	1	111.		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Cobalt	EPA 6010	78862	1	7.97		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Copper	EPA 6010	78862	1	90.9		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Iron	EPA 6010	78862	1	20900		mg/kg	10.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Lead	EPA 6010	78862	1	ND		mg/kg	0.500	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Magnesium	EPA 6010	78862	1	2300		mg/kg	50.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Manganese	EPA 6010	78862	1	1490		mg/kg	1.50	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Mercury	EPA 7471	78855	1	ND		mg/kg	0.0171	17-Nov-06	17-Nov-06 15:40	KDG (1)	
Nickel	EPA 6010	78862	1	130.		mg/kg	4.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Potassium	EPA 6010	78862	1	228.		mg/kg	50.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Selenium	EPA 6010	78862	1	61.8		mg/kg	3.50	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Silver	EPA 6010	78862	1	ND		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Sodium	EPA 6010	78862	1	578.		mg/kg	50.0	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Thallium	EPA 6010	78862	1	ND		mg/kg	1.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Vanadium	EPA 6010	78862	1	36.7		mg/kg	5.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	
Zinc	EPA 6010	78862	1	681.		mg/kg	2.00	17-Nov-06	17-Nov-06 15:48	KJR (1)	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

11/27/2006 15:51:10

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10288
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Report of Laboratory Analysis

Pace Analytical* New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: HF CLARIFIER
Client: HONEYWELL SPECIALTY MATERIALS
Project: SW ANNUAL PROFILE
Site: None
Lab ID: 20482976 (TCLP)
Project No.: 2064186
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 11/08/06
Received: 11/08/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	78995	1	ND		mg/L	0.200	17-Nov-06	17-Nov-06 14:18	KJR (1)	5.00
Barium	EPA 6010	78995	1	ND		mg/L	2.00	17-Nov-06	17-Nov-06 14:18	KJR (1)	100.
Cadmium	EPA 6010	78995	1	ND		mg/L	0.100	17-Nov-06	17-Nov-06 14:18	KJR (1)	1.00
Chromium	EPA 6010	78995	1	ND		mg/L	0.200	17-Nov-06	17-Nov-06 14:18	KJR (1)	5.00
Lead	EPA 6010	78995	1	ND		mg/L	0.200	17-Nov-06	17-Nov-06 14:18	KJR (1)	5.00
Mercury	EPA 7470	78994	1	ND		mg/L	0.000200	17-Nov-06	17-Nov-06 11:43	KDG (1)	0.200
Selenium	EPA 6010	78995	1	ND		mg/L	0.200	17-Nov-06	17-Nov-06 14:18	KJR (1)	1.00
Silver	EPA 6010	78995	1	ND		mg/L	0.200	17-Nov-06	17-Nov-06 14:18	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Dossier City, (4) Houston, or (0) subcontract or field.

11/27/2006 15:51:10

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA060023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Quick Lime

Waste Generation Rate: ☑ Cubic yards ☐ Tons > 100

Process Generating the Waste: Lime Silo - Routine Maintenance and Repair Activities

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Percent	Test Method
Lime	99.0 %	
Other	1.0 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH 11.9

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	Todd Harter	6/6/2007

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical®
New Orleans Laboratory

Client ID: WASTEWATER LIME (TOTAL)
Client: HONEYWELL SPECIALTY MATERIALS
Project: ANNUAL SW PROFILE
Site: None
Lab ID: 20477396
Project No.: 2063329
Description: None
Matrix: Other
%Moisture: n/a
Collected: 10/06/06
Received: 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis	Reg. Limit
Aluminum	EPA 6010	77601	1	1320		mg/kg	15.6	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Antimony	EPA 6010	77601	1	ND		mg/kg	4.69	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Arsenic	EPA 6010	77601	1	25.0		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Barium	EPA 6010	77601	1	ND		mg/kg	15.6	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Beryllium	EPA 6010	77601	1	ND		mg/kg	0.391	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Cadmium	EPA 6010	77601	1	ND		mg/kg	0.391	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Calcium	EPA 6010	77601	1	274000		mg/kg	39.1	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Chromium	EPA 6010	77601	1	10.4		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Cobalt	EPA 6010	77601	1	1.06		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Copper	EPA 6010	77601	1	ND		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Iron	EPA 6010	77601	1	2460		mg/kg	7.81	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Lead	EPA 6010	77601	1	ND		mg/kg	0.391	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Magnesium	EPA 6010	77601	1	1790		mg/kg	39.1	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Manganese	EPA 6010	77601	1	14.5		mg/kg	1.17	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Mercury	EPA 7471	77630	1	ND		mg/kg	0.0194	11-Oct-06	11-Oct-06 14:08 KDG (1)	
Nickel	EPA 6010	77601	1	14.9		mg/kg	3.12	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Potassium	EPA 6010	77601	1	116.		mg/kg	39.1	10-Oct-06	13-Oct-06 02:30 KJR (1)	
Selenium	EPA 6010	77601	1	71.1		mg/kg	2.73	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Silver	EPA 6010	77601	1	ND		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Sodium	EPA 6010	77601	1	271.		mg/kg	39.1	10-Oct-06	13-Oct-06 02:30 KJR (1)	
Thallium	EPA 6010	77601	1	ND		mg/kg	0.781	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Vanadium	EPA 6010	77601	1	25.3		mg/kg	3.91	10-Oct-06	11-Oct-06 16:35 KJR (1)	
Zinc	EPA 6010	77601	1	11.9		mg/kg	1.56	10-Oct-06	11-Oct-06 16:35 KJR (1)	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
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Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA060023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10268
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical® New Orleans Laboratory

Client ID: WASTEWATER LIME
Client: HONEYWELL SPECIALTY MATERIALS
Project: ANNUAL SW PROFILE
Site: None
Lab ID: 20477389 (TCLP)
Project No.: 2063329
Description: None
Matrix: Other
%Moisture: n/a
Collected: 10/06/06
Received: 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 14:58	KJR (1)	5.00
Barium	EPA 6010	77746	1	ND		mg/L	2.00	13-Oct-06	13-Oct-06 14:58	KJR (1)	100.
Cadmium	EPA 6010	77746	1	ND		mg/L	0.100	13-Oct-06	13-Oct-06 14:58	KJR (1)	1.00
Chromium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 14:58	KJR (1)	5.00
Lead	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 14:58	KJR (1)	5.00
Mercury	EPA 7470	77747	1	ND		mg/L	0.000200	12-Oct-06	12-Oct-06 17:34	KDG (1)	0.200
Selenium	EPA 6010	77746	1	0.255		mg/L	0.200	13-Oct-06	13-Oct-06 14:58	KJR (1)	1.00
Silver	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 14:58	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
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(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
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Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0581
Louisiana Dept. of Health and Hospitals / Drinking Water - LA060023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Furnace Residue - Calcium Sulfate - Ca_2SO_4

Waste Generation Rate: ☐ Cubic yards ☑ Tons 1,500 per day

Process Generating the Waste: HF Plant - By-Product from the production of HF_2 gas.

Current Disposal Procedure: Slurry and pump the Ca_2SO_4 onto the Fluorogypsum Stack Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Calcium Sulfate	99 %	
Other	1 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	Todd Harter	**6/6/2007**

Report of Laboratory Analysis

Pace Analytical
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: HF FURNACE RESIDUE (TOTAL) **Client:** HONEYWELL SPECIALTY MATERIALS

Project: ANNUAL SW PROFILE **Site:** None

Lab ID: 20477392 **Project No.:** 2063329

Description: None **Matrix:** Other **%Moisture:** n/a

Collected: 10/06/06 **Received:** 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	EPA 6010	77601	1	128.		mg/kg	12.7	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Antimony	EPA 6010	77601	1	ND		mg/kg	3.80	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Arsenic	EPA 6010	77601	1	7.69		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Barium	EPA 6010	77601	1	25.9		mg/kg	12.7	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Beryllium	EPA 6010	77601	1	ND		mg/kg	0.316	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Cadmium	EPA 6010	77601	1	ND		mg/kg	0.316	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Calcium	EPA 6010	77601	1	92200		mg/kg	31.6	10-Oct-06	11-Oct-06 16:14	KJR (1)	—
Chromium	EPA 6010	77601	1	2.35		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Cobalt	EPA 6010	77601	1	ND		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Copper	EPA 6010	77601	1	ND		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Iron	EPA 6010	77601	1	438.		mg/kg	6.33	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Lead	EPA 6010	77601	1	ND		mg/kg	0.316	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Magnesium	EPA 6010	77601	1	41.2		mg/kg	31.6	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Manganese	EPA 6010	77601	1	29.2		mg/kg	0.949	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Mercury	EPA 7471	77630	1	ND		mg/kg	0.0176	11-Oct-06	11-Oct-06 14:01	KDG (1)	
Nickel	EPA 6010	77601	1	ND		mg/kg	2.53	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Potassium	EPA 6010	77601	1	69.5		mg/kg	31.6	10-Oct-06	13-Oct-06 02:11	KJR (1)	
Selenium	EPA 6010	77601	1	22.8		mg/kg	2.22	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Silver	EPA 6010	77601	1	ND		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Sodium	EPA 6010	77601	1	109.		mg/kg	31.6	10-Oct-06	13-Oct-06 02:11	KJR (1)	
Thallium	EPA 6010	77601	1	ND		mg/kg	0.633	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Vanadium	EPA 6010	77601	1	ND		mg/kg	3.16	10-Oct-06	11-Oct-06 16:14	KJR (1)	
Zinc	EPA 6010	77601	1	7.30		mg/kg	1.27	10-Oct-06	11-Oct-06 16:14	KJR (1)	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
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(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA060023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10268
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Report of Laboratory Analysis

Pace Analytical
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: HF FURNACE RESIDUE
Client: HONEYWELL SPECIALTY MATERIALS
Project: ANNUAL SW PROFILE
Site: None
Lab ID: 20477385 (TCLP)
Project No.: 2063329
Description: None
Matrix: Other
%Moisture: n/a
Collected: 10/06/06
Received: 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:05	KJR (1)	5.00
Barium	EPA 6010	77746	1	ND		mg/L	2.00	13-Oct-06	13-Oct-06 12:05	KJR (1)	100.
Cadmium	EPA 6010	77746	1	ND		mg/L	0.100	13-Oct-06	13-Oct-06 12:05	KJR (1)	1.00
Chromium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:05	KJR (1)	5.00
Lead	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:05	KJR (1)	5.00
Mercury	EPA 7470	77747	1	ND		mg/L	0.000200	12-Oct-06	12-Oct-06 17:22	KDG (1)	0.200
Selenium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:05	KJR (1)	1.00
Silver	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 12:05	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
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Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
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10/17/2006 16:02:46

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Louisiana Dept. of Health and Hospitals / Drinking Water - LA060023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environment - E-10268
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: MPP WWTP Filter Cake –Synthetic Fluorspar (Calcium Fluoride)

Waste Generation Rate: ☐ Cubic yards ☑ Tons 17,000 per year

Process Generating the Waste: Filter cake is generated from the MPP wastewater treatment process.

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Filter Cake	70 %	
Water	30 %	
Other	1 %	
TOTAL	> 100 %	

Physical Data

Flash Point N/A °F

pH 5-6

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	T. Todd Harter	6/6/2007

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical
New Orleans Laboratory

Client ID: SYNTHETIC FLUOR (TOTAL) **Client:** HONEYWELL SPECIALTY MATERIALS

Project: ANNUAL SW PROFILE **Site:** None

Lab ID: 20477397 **Project No.:** 2063329

Description: None **Matrix:** Other **%Moisture:** n/a

Collected: 10/06/06 **Received:** 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	EPA 6010	77601	1	18.7		mg/kg	16.4	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Antimony	EPA 6010	77601	1	ND		mg/kg	4.92	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Arsenic	EPA 6010	77601	1	81.7		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Barium	EPA 6010	77601	1	ND		mg/kg	16.4	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Beryllium	EPA 6010	77601	1	ND		mg/kg	0.410	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Cadmium	EPA 6010	77601	1	ND		mg/kg	0.410	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Calcium	EPA 6010	77601	1	166000		mg/kg	41.0	10-Oct-06	11-Oct-06 16:40	KJR (1)	—
Chromium	EPA 6010	77601	1	9.85		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Cobalt	EPA 6010	77601	1	ND		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Copper	EPA 6010	77601	1	ND		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Iron	EPA 6010	77601	1	378.		mg/kg	8.20	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Lead	EPA 6010	77601	1	ND		mg/kg	0.410	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Magnesium	EPA 6010	77601	1	568.		mg/kg	41.0	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Manganese	EPA 6010	77601	1	10.3		mg/kg	1.23	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Mercury	EPA 7471	77630	1	0.0686		mg/kg	0.0167	11-Oct-06	11-Oct-06 14:29	KDG (1)	
Nickel	EPA 6010	77601	1	ND		mg/kg	3.28	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Potassium	EPA 6010	77601	1	54.5		mg/kg	41.0	10-Oct-06	13-Oct-06 02:34	KJR (1)	
Selenium	EPA 6010	77601	1	42.7		mg/kg	2.87	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Silver	EPA 6010	77601	1	ND		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Sodium	EPA 6010	77601	1	3920		mg/kg	41.0	10-Oct-06	13-Oct-06 02:34	KJR (1)	
Thallium	EPA 6010	77601	1	ND		mg/kg	0.820	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Vanadium	EPA 6010	77601	1	4.19		mg/kg	4.10	10-Oct-06	11-Oct-06 16:40	KJR (1)	
Zinc	EPA 6010	77601	1	16.7		mg/kg	1.64	10-Oct-06	11-Oct-06 16:40	KJR (1)	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050023
Florida Dept. of Health (NELAC) - E87695
Kansas Dept. of Health Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical
New Orleans Laboratory

Client ID: SYNTHETIC FLUOR
Client: HONEYWELL SPECIALTY MATERIALS
Project: ANNUAL SW PROFILE
Site: None
Lab ID: 20477390 (TCLP)
Project No.: 2063329
Description: None
Matrix: Other
%Moisture: n/a
Collected: 10/06/06
Received: 10/09/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 15:03	KJR (1)	5.00
Barium	EPA 6010	77746	1	ND		mg/L	2.00	13-Oct-06	13-Oct-06 15:03	KJR (1)	100.
Cadmium	EPA 6010	77746	1	ND		mg/L	0.100	13-Oct-06	13-Oct-06 15:03	KJR (1)	1.00
Chromium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 15:03	KJR (1)	5.00
Lead	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 15:03	KJR (1)	5.00
Mercury	EPA 7470	77747	1	ND		mg/L	0.000200	12-Oct-06	12-Oct-06 17:35	KDG (1)	0.200
Selenium	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 15:03	KJR (1)	1.00
Silver	EPA 6010	77746	1	ND		mg/L	0.200	13-Oct-06	13-Oct-06 15:03	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

10/17/2006 16:02:46

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - 88-0681
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050023
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health .Environment - E-10268
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Fluorspar

Waste Generation Rate: ☐ Cubic yards ☑ Tons > 100 per year

Process Generating the Waste: Maintenance and Repair Activities

Current Disposal Procedure: Off spec fluorspar is hauled and placed into the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Fluorspar	98 %	
Other (Inert)	2 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	[signature]	1/9/2006

STL

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Fluorspar

Lab Sample ID: 700-6067-2
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

8260B Volatile Organic Compounds by GC/MS -TCLP

Method: 8260B
Preparation: 5030B
Dilution: 20
Date Analyzed: 09/23/2005 1514
Date Prepared: 09/23/2005 1514
Date Leached: 09/22/2005 1615

Analysis Batch: 700-11220
Tclp Batch: 700-11116

Instrument ID: VMG5973
Lab File ID: G092311.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Benzene		<0.10		0.10
Carbon tetrachloride		<0.10		0.10
Chlorobenzene		<0.10		0.10
Chloroform		<0.10		0.10
1,2-Dichloroethane		<0.10		0.10
1,1-Dichloroethene		<0.10		0.10
Methyl Ethyl Ketone		<0.50		0.50
Tetrachloroethene		<0.10		0.10
Trichloroethene		<0.10		0.10
Vinyl chloride		<0.040		0.040

Surrogate	%Rec	Acceptance Limits
Dibromofluoromethane	100	86 - 126
Toluene-d8	80	77 - 116
4-Bromofluorobenzene	94	70 - 130

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Fluorspar

Lab Sample ID: 700-6067-2

Client Matrix: Solid

Date Sampled: 09/20/2005 1100

Date Received: 09/22/2005 0902

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) -TCLP

Method:	8270C	Analysis Batch: 700-11511		Instrument ID:	SMC5973
Preparation:	3520C	Prep Batch: 700-11383		Lab File ID:	C092928A.D
Dilution:	5.0	Tclp Batch: 700-11117		Initial Weight/Volume:	200 mL
Date Analyzed:	09/30/2005 0218			Final Weight/Volume:	1.0 mL
Date Prepared:	09/28/2005 0810			Injection Volume:	
Date Leached:	09/22/2005 1540				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
1,4-Dichlorobenzene		<0.050		0.050
2,4-Dinitrotoluene		<0.050		0.050
Hexachlorobenzene		<0.050		0.050
Hexachlorobutadiene		<0.050		0.050
Hexachloroethane		<0.050		0.050
o-Cresol		<0.050		0.050
m & p – Cresol		<0.050		0.050
Nitrobenzene		<0.050		0.050
Pentachlorophenol		<0.25		0.25
Pyridine		<0.25		0.25
2,4,5-Trichlorophenol		<0.050		0.050
2,4,6-Trichlorophenol		<0.050		0.050

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	52	5.0 - 108
2-Fluorobiphenyl	54	31 - 118
2-Fluorophenol	40	10 - 126
Nitrobenzene-d5	62	35 - 122
Phenol-d5	41	29 - 113
Terphenyl-d14	34	37 - 149

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Fluorspar

Lab Sample ID: 700-6067-2
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method: 6010B
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 10/01/2005 1216
Date Prepared: 09/29/2005 1035

Analysis Batch: 700-11680
Prep Batch: 700-11450

Instrument ID: TJA ICP TRACE
Lab File ID: SEP3005
Initial Weight/Volume: 0.52 g
Final Weight/Volume: 50.0 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Cadmium		<0.48		0.48
Lead		1.8		0.48
Selenium		<0.96		0.96
Silver		<0.96		0.96

Method: 6010B
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 10/04/2005 0848
Date Prepared: 09/29/2005 1035

Analysis Batch: 700-11728
Prep Batch: 700-11450

Instrument ID: NO EQUIPMENT
Lab File ID: N/A
Initial Weight/Volume: 0.52 g
Final Weight/Volume: 50.0 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Chromium		<0.96		0.96

Method: 6010B
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 10/06/2005 0609
Date Prepared: 09/29/2005 1035

Analysis Batch: 700-11966
Prep Batch: 700-11450

Instrument ID: TJA ICP TRACE
Lab File ID: OCT0505
Initial Weight/Volume: 0.52 g
Final Weight/Volume: 50.0 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Arsenic		2.3		0.96
Barium		1800		0.96

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-TCLP

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6087-1

Client Sample ID: Fluorspar

Lab Sample ID: 700-6087-2
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-TCLP

Method: 6010B
Preparation: 3010A
Dilution: 1.0
Date Analyzed: 09/24/2005 1120
Date Prepared: 09/23/2005 1256

Analysis Batch: 700-11180
Prep Batch: 700-11141

Instrument ID: TJA ICP TRACE
Lab File ID: SEP2308
Initial Weight/Volume: 5.0 mL
Final Weight/Volume: 25.0 mL

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Silver		<1.0		1.0
Arsenic		<1.0		1.0
Barium		3.2		1.0
Cadmium		<0.50		0.50
Chromium		<1.0		1.0
Lead		<0.50		0.50
Selenium		<1.0		1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-TCLP

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 09/27/2005 1306
Date Prepared: 09/26/2005 1250
Date Leached: 09/22/2005 1540

Analysis Batch: 700-11321
Prep Batch: 700-11242
Tclp Batch: 700-11117

Instrument ID: LEEMAN PS200
Lab File ID: N/A
Initial Weight/Volume: 5.0 mL
Final Weight/Volume: 40 mL

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Mercury		<0.020		0.020

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A
Preparation: 7471A
Dilution: 5.0
Date Analyzed: 09/27/2005 1343
Date Prepared: 09/26/2005 1250

Analysis Batch: 700-11317
Prep Batch: 700-11244

Instrument ID: LEEMAN PS200
Lab File ID: N/A
Initial Weight/Volume: 0.61 g
Final Weight/Volume: 40 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Mercury		0.75		0.066

Client: Honeywell International Inc

Job Number: 700-6067-1

General Chemistry

Client Sample ID: Fluorspar

Lab Sample ID: 700-6067-2
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

Analyte	Result	Qual	Units	RL	Dil	Method
Flashpoint	>140		Fahrenheit	1.0	1.0	1010
	Anly Batch: 700-11265	Date Analyzed 09/26/2005 1600			DryWt Corrected: N	
Cyanide, Reactive	<10		mg/Kg	10	1.0	9012
	Anly Batch: 700-12093	Date Analyzed 10/06/2005 0943			DryWt Corrected: N	
	Prep Batch: 700-12092	Date Prepared: 10/07/2005 0400				
Sulfide, Reactive	<5.0		mg/Kg	5.0	1.0	9034
	Anly Batch: 700-12084	Date Analyzed 10/07/2005 1600			DryWt Corrected: N	
	Prep Batch: 700-12083	Date Prepared: 10/07/2005 1600				
pH	8.79		SU	0.200	1.0	9040B
	Anly Batch: 700-11269	Date Analyzed 09/26/2005 1500			DryWt Corrected: N	
Percent Moisture	9.3		%	0.10	1.0	160.3
	Anly Batch: 700-11343	Date Analyzed 09/27/2005 1540				
Percent Solids	91		%	0.10	1.0	160.3
	Anly Batch: 700-11343	Date Analyzed 09/27/2005 1540				

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Furnace Residue - Calcium Sulfate - Ca_2SO_4

Waste Generation Rate: ☐ Cubic yards ☑ Tons 1,500 per day

Process Generating the Waste: HF Plant - By-Product from the production of HF_2 gas.

Current Disposal Procedure: Slurry and pump the Ca_2SO_4 onto the Fluorogypsum Stack Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Calcium Sulfate	99 %	
Other	1 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	Todd Harter	1/9/2006

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Furnace Residue

Lab Sample ID: 700-6067-1
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

8260B Volatile Organic Compounds by GC/MS -TCLP

Method: 8260B
Preparation: 5030B
Dilution: 20
Date Analyzed: 09/23/2005 1442
Date Prepared: 09/23/2005 1442
Date Leached: 09/22/2005 1615

Analysis Batch: 700-11220
Tclp Batch: 700-11116

Instrument ID: VMS5973
Lab File ID: G092310.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Benzene		<0.10		0.10
Carbon tetrachloride		<0.10		0.10
Chlorobenzene		<0.10		0.10
Chloroform		<0.10		0.10
1,2-Dichloroethane		<0.10		0.10
1,1-Dichloroethene		<0.10		0.10
Methyl Ethyl Ketone		<0.50		0.50
Tetrachloroethene		<0.10		0.10
Trichloroethene		<0.10		0.10
Vinyl chloride		<0.040		0.040

Surrogate	%Rec	Acceptance Limits
Dibromofluoromethane	102	66 - 125
Toluene-d8	97	77 - 116
4-Bromofluorobenzene	102	70 - 130

SEVERN TRENT STL

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Furnace Residue

Lab Sample ID: 700-6067-1
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) -TCLP

Method: 8270C
Preparation: 3520C
Dilution: 5.0
Date Analyzed: 09/30/2005 0147
Date Prepared: 09/28/2005 0810
Date Leached: 09/22/2005 1540

Analysis Batch: 700-11511
Prep Batch: 700-11383
Tclp Batch: 700-11117

Instrument ID: SMC5973
Lab File ID: C092925A.D
Initial Weight/Volume: 200 mL
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
1,4-Dichlorobenzene		<0.050		0.050
2,4-Dinitrotoluene		<0.050		0.050
Hexachlorobenzene		<0.050		0.050
Hexachlorobutadiene		<0.050		0.050
Hexachloroethane		<0.050		0.050
o-Cresol		<0.050		0.050
m & p - Cresol		<0.050		0.050
Nitrobenzene		<0.050		0.050
Pentachlorophenol		<0.25		0.25
Pyridine		<0.25		0.25
2,4,5-Trichlorophenol		<0.050		0.050
2,4,6-Trichlorophenol		<0.050		0.050

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	60	5.0 - 108
2-Fluorobiphenyl	60	31 - 118
2-Fluorophenol	40	10 - 128
Nitrobenzene-d5	64	35 - 122
Phenol-d5	41	29 - 113
Terphenyl-d14	62	37 - 149

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6087-1

Client Sample ID: Furnace Residue

Lab Sample ID: 700-6087-1
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry

Method: 6010B
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 10/01/2005 1157
Date Prepared: 09/29/2005 1035

Analysis Batch: 700-11680
Prep Batch: 700-11450

Instrument ID: TJA ICP TRACE
Lab File ID: SEP3005
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50.0 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Arsenic		<0.83		0.83
Cadmium		<0.42		0.42
Chromium		5.5		0.83
Lead		1.2		0.42
Selenium		<0.83		0.83
Silver		<0.83		0.83

Method: 6010B
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 10/06/2005 0603
Date Prepared: 09/29/2005 1035

Analysis Batch: 700-11966
Prep Batch: 700-11450

Instrument ID: TJA ICP TRACE
Lab File ID: OCT0505
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50.0 mL

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Barium		120		0.83

6010B Inductively Coupled Plasma - Atomic Emission Spectrometry-TCLP

Method: 6010B
Preparation: 3010A
Dilution: 1.0
Date Analyzed: 09/24/2005 1114
Date Prepared: 09/23/2005 1256

Analysis Batch: 700-11180
Prep Batch: 700-11141

Instrument ID: TJA ICP TRACE
Lab File ID: SEP2305
Initial Weight/Volume: 5.0 mL
Final Weight/Volume: 25.0 mL

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Silver		<1.0		1.0
Arsenic		<1.0		1.0
Barium		<1.0		1.0
Cadmium		<0.50		0.50
Chromium		<1.0		1.0
Lead		<0.50		0.50
Selenium		<1.0		1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-TCLP

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

Client Sample ID: Furnace Residue

Lab Sample ID: 700-6067-1
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-TCLP

Method:	7470A	Analysis Batch: 700-11321		Instrument ID:	LEEMAN PS200
Preparation:	7470A	Prep Batch: 700-11242		Lab File ID:	N/A
Dilution:	1.0	Tclp Batch: 700-11117		Initial Weight/Volume:	5.0 mL
Date Analyzed:	09/27/2005 1300			Final Weight/Volume:	40 mL
Date Prepared:	09/26/2005 1250				
Date Leached:	09/22/2005 1540				

Analyte	DryWt Corrected: N	Result (mg/L)	Qualifier	RL
Mercury		<0.020		0.020

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 700-11317		Instrument ID:	LEEMAN PS200
Preparation:	7471A	Prep Batch: 700-11244		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.61 g
Date Analyzed:	09/27/2005 1315			Final Weight/Volume:	40 mL
Date Prepared:	09/26/2005 1250				

Analyte	DryWt Corrected: N	Result (mg/Kg)	Qualifier	RL
Mercury		0.030		0.013

Analytical Data

Client: Honeywell International Inc

Job Number: 700-6067-1

General Chemistry

Client Sample ID: Furnace Residue

Lab Sample ID: 700-6067-1
Client Matrix: Solid

Date Sampled: 09/20/2005 1100
Date Received: 09/22/2005 0902

Analyte	Result	Qual	Units	RL	Dil	Method
Flashpoint	>140		Fahrenheit	1.0	1.0	1010
	Anly Batch: 700-11285		Date Analyzed 09/26/2005 1500		DryWt Corrected: N	
Cyanide, Reactive	<10		mg/Kg	10	1.0	9012
	Anly Batch: 700-12093		Date Analyzed 10/08/2005 0943		DryWt Corrected: N	
	Prep Batch: 700-12092		Date Prepared: 10/07/2005 0400			
Sulfide, Reactive	<5.0		mg/Kg	5.0	1.0	9034
	Anly Batch: 700-12084		Date Analyzed 10/07/2005 1600		DryWt Corrected: N	
	Prep Batch: 700-12083		Date Prepared: 10/07/2005 1600			
Sulfide, Reactive	<5.0		mg/Kg	5.0	1.0	9034
	Anly Batch: 700-12084		Date Analyzed 10/07/2005 1600		DryWt Corrected: N	
	Prep Batch: 700-12083		Date Prepared: 10/07/2005 1600			
pH	2.32		SU	0.200	1.0	9040B
	Anly Batch: 700-11289		Date Analyzed 09/26/2005 1500		DryWt Corrected: N	
Percent Moisture	0.13		%	0.10	1.0	160.3
	Anly Batch: 700-11343		Date Analyzed 09/27/2005 1540			
Percent Solids	100		%	0.10	1.0	160.3
	Anly Batch: 700-11343		Date Analyzed 09/27/2005 1540			

Honeywell

Waste Stream Determination Form

Gelsmar Facility

General Information

Department: HS& E Waste Coordinator: Todd Harter

Waste Name: HF WWTP Clarifier Underflow

Waste Generation Rate: ☑ Cubic yards ☐ Tons > 100 per year

Process Generating the Waste: HF WWTP Operations
HF WWTP Cleaning - Routine Maintenance and Repairs

Current Disposal Procedure: HF WWTP clarifier underflow sludge is returned back to the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
HF WWTP Sludge	100	TCLP Metals
TOTAL	100	

Physical Data

Flash Point N/A °F **Color** Tan

pH 6-9 **Odor** N/A

Physical State at 70 °F ☐Solid ☐ Liquid ☑Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name Non Regulated Material – HF WWTP Clarifier Sludge

Name	Signature	Date
Todd Harter	Todd Harter	1/9/2006

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Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099815
Client Project ID: Honeywell

Solid results are reported on a dry weight basis

Lab Sample No: 608551404 Project Sample Number: 6099815-001 Date Collected: 09/12/05 14:00
Client Sample ID: CLARIFIER UNDERFLOW Matrix: Soil Date Received: 09/14/05 09:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Metals								
RCRA Metals, ICP, TCLP	Prep/Method: EPA 3010 / EPA 6010							
Arsenic	ND	ug/l	850.	09/19/05 10:50	TJG1	7440-38-2		5000
Barium	ND	ug/l	200.	09/19/05 10:50	TJG1	7440-39-3		100000
Cadmium	ND	ug/l	50.0	09/19/05 10:50	TJG1	7440-43-9		1000
Chromium	ND	ug/l	100.	09/19/05 10:50	TJG1	7440-47-3		5000
Lead	ND	ug/l	500.	09/19/05 10:50	TJG1	7439-92-1		5000
Selenium	ND	ug/l	500.	09/19/05 10:50	TJG1	7782-49-2		1000
Silver	ND	ug/l	100.	09/19/05 10:50	TJG1	7440-22-4		5000
Date Digested	09/17/05			09/17/05				
Mercury, CVAAS, TCLP	Method: EPA 1311							
Date Extracted	09/16/05			09/16/05				
Mercury, CVAAS, TCLP	Method: EPA 7470							
Mercury	ND	ug/l	2.00	09/20/05 08:53	SYW	7439-97-6		200
GC/MS Semivolatiles								
Semivolatile Organics, TCLP	Prep/Method: EPA 3510 / EPA 8270							
1,4-Dichlorobenzene	ND	ug/l	100	09/27/05 17:56	JMF1	106-46-7		7500
2-Methylphenol (o-Cresol)	ND	ug/l	100	09/27/05 17:56	JMF1	95-48-7		200000
3&4-Methylphenol	ND	ug/l	100	09/27/05 17:56	JMF1			200000
Nitrobenzene	ND	ug/l	100	09/27/05 17:56	JMF1	98-95-3		2000
Hexachloro-1,3-butadiene	ND	ug/l	100	09/27/05 17:56	JMF1	87-68-3		500
2,4,6-Trichlorophenol	ND	ug/l	100	09/27/05 17:56	JMF1	88-06-2		2000
2,4,5-Trichlorophenol	ND	ug/l	500	09/27/05 17:56	JMF1	95-95-4		400000
2,4-Dinitrotoluene	ND	ug/l	100	09/27/05 17:56	JMF1	121-14-2		130
Hexachlorobenzene	ND	ug/l	100	09/27/05 17:56	JMF1	118-74-1		130
Pentachlorophenol	ND	ug/l	500	09/27/05 17:56	JMF1	87-86-5		100000
Pyridine	ND	ug/l	100	09/27/05 17:56	JMF1	110-86-1		5000
Hexachloroethane	ND	ug/l	100	09/27/05 17:56	JMF1	67-72-1		3000
Nitrobenzene-d5 (S)	74	%		09/27/05 17:56	JMF1	4165-60-0		
2-Fluorobiphenyl (S)	73	%		09/27/05 17:56	JMF1	321-60-8		
Terphenyl-d14 (S)	82	%		09/27/05 17:56	JMF1	1718-51-0		
Phenol-d6 (S)	64	%		09/27/05 17:56	JMF1	13127-88-3		
2-Fluorophenol (S)	56	%		09/27/05 17:56	JMF1	367-12-4		
2,4,6-Tribromophenol (S)	75	%		09/27/05 17:56	JMF1	118-97-6		
Date Extracted	09/23/05			09/23/05				

REPORT OF LABORATORY ANALYSIS
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9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099815
Client Project ID: Honeywell

Lab Sample No: 608551404 Project Sample Number: 6099815-001 Date Collected: 09/12/05 14:00
Client Sample ID: CLARIFIER UNDERFLOW Matrix: Soil Date Received: 09/14/05 09:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC/MS Volatiles								
8260 TCLP Volatiles Soil	Method: EPA 8260							
Benzene	ND	ug/l	50.	09/16/05 11:46	KBL1	71-43-2		500
2-Butanone (MEK)	ND	ug/l	1000	09/16/05 11:46	KBL1	78-93-3		200000
Carbon tetrachloride	ND	ug/l	50.	09/16/05 11:46	KBL1	56-23-5		500
Chlorobenzene	ND	ug/l	50.	09/16/05 11:46	KBL1	108-90-7		100000
Chloroform	ND	ug/l	200	09/16/05 11:46	KBL1	67-66-3		6000
1,2-Dichloroethane	ND	ug/l	50.	09/16/05 11:46	KBL1	107-06-2		500
1,1-Dichloroethene	ND	ug/l	50.	09/16/05 11:46	KBL1	75-35-4		700
Tetrachloroethene	ND	ug/l	50.	09/16/05 11:46	KBL1	127-18-4		700
Trichloroethene	ND	ug/l	50.	09/16/05 11:46	KBL1	79-01-6		500
Vinyl chloride	ND	ug/l	100	09/16/05 11:46	KBL1	75-01-4		200
Toluene-d8 (S)	99	%		09/16/05 11:46	KBL1	2037-26-5		
4-Bromofluorobenzene (S)	103	%		09/16/05 11:46	KBL1	460-00-4		
1,2-Dichloroethane-d4 (S)	110	%		09/16/05 11:46	KBL1	17060-07-0		

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Fax: 913.599.1759

Lab Project Number: 6099815
Client Project ID: Honeywell

Lab Sample No: 608551412 Project Sample Number: 6099815-002 Date Collected: 09/12/05 14:00
Client Sample ID: CLARIFIER UNDERFLOW METALS Matrix: Soil Date Received: 09/14/05 09:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	Reglmt
Metals								
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010							
Arsenic	4.14	mg/kg	1.74	09/21/05 14:18	TJG1	7440-38-2		
Barium	ND	mg/kg	1.74	09/21/05 14:18	TJG1	7440-39-3		
Cadmium	ND	mg/kg	0.872	09/21/05 14:18	TJG1	7440-43-9		
Chromium	18.3	mg/kg	0.872	09/21/05 14:18	TJG1	7440-47-3		
Lead	0.982	mg/kg	0.872	09/21/05 14:18	TJG1	7439-92-1		
Selenium	ND	mg/kg	5.23	09/22/05 13:24	TJG1	7782-49-2	1	
Silver	ND	mg/kg	1.22	09/21/05 14:18	TJG1	7440-22-4		
Date Digested	09/19/05			09/19/05				
Mercury, Soil CVAAS	Method: EPA 7471							
Mercury	ND	mg/kg	0.304	09/20/05 11:43	SYW	7439-97-6		
Wet Chemistry								
Cyanide, Reactive, Soil	Method: SW-846 7.3.3.2							
Cyanide, Reactive	ND	mg/kg	0.986	09/22/05	ACM			
Sulfide, Reactive, Soil	Method: SW-846 7.3.4.2							
Sulfide, Reactive	ND	mg/kg	39.4	09/19/05	PDA			
pH, Soil by EPA 9045	Method: EPA 9045							
pH	6.58			09/20/05 16:00	AJM			
Flash Point, Open Cup	Method: ASTM D92							
Flash Point	>210 deg F			09/26/05	ACM			
Organics Prep								
Percent Moisture	Method: SM 2540G							
Percent Moisture	49.3	%		09/20/05	JDM			

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Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099815
Client Project ID: Honeywell

PARAMETER FOOTNOTES

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	The reporting limit was elevated due to sample matrix interferences from target and/or non-target analytes requiring a dilution.

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Phone: 913.599.5665
Fax: 913.599.1759

QUALITY CONTROL DATA

Lab Project Number: 6099815
Client Project ID: Honeywell

QC Batch: 204311 — Analysis Method: EPA 8270
QC Batch Method: EPA 3510 — Analysis Description: Semivolatile Organics, TCLP
Associated Lab Samples: 608551404

METHOD BLANK: 608586772
Associated Lab Samples: 608551404

Parameter	Units	Blank Result	Reporting Limit	Footnotes
1,4-Dichlorobenzene	ug/l	ND	100	
2-Methylphenol (o-Cresol)	ug/l	ND	100	
3&4-Methylphenol	ug/l	ND	100	
Nitrobenzene	ug/l	ND	100	
Hexachloro-1,3-butadiene	ug/l	ND	100	
2,4,6-Trichlorophenol	ug/l	ND	100	
2,4,5-Trichlorophenol	ug/l	ND	500	
2,4-Dinitrotoluene	ug/l	ND	100	
Hexachlorobenzene	ug/l	ND	100	
Pentachlorophenol	ug/l	ND	500	
Pyridine	ug/l	ND	100	
Hexachloroethane	ug/l	ND	100	
Nitrobenzene-d5 (S)	%	62		
2-Fluorobiphenyl (S)	%	65		
Terphenyl-d14 (S)	%	77		
Phenol-d6 (S)	%	56		
2-Fluorophenol (S)	%	54		
2,4,6-Tribromophenol (S)	%	67		

LABORATORY CONTROL SAMPLE: 608586780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
1,4-Dichlorobenzene	ug/l	500.00	323.6	65	50-110	
2-Methylphenol (o-Cresol)	ug/l	500.00	330.8	66	46-110	
3&4-Methylphenol	ug/l	500.00	336.2	67	44-110	
Nitrobenzene	ug/l	500.00	370.0	74	35-110	
Hexachloro-1,3-butadiene	ug/l	500.00	335.1	67	37-110	
2,4,6-Trichlorophenol	ug/l	500.00	370.4	74	47-121	
2,4,5-Trichlorophenol	ug/l	500.00	403.0	81	55-110	

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Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: MPP WWTP Filter Cake –Synthetic Fluorspar (Calcium Fluoride)

Waste Generation Rate: ☐ Cubic yards ☑ Tons 17,000 per year

Process Generating the Waste: Filter cake is generated from the MPP wastewater treatment process.

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes _____ _____ _____

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Filter Cake	70 %	
Water	30 %	
Other	1 %	
TOTAL	> 100 %	

Physical Data

Flash Point N/A °F

pH 5-6

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	Todd Harter	1/20/2006

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: MP FILTERCAKE
Client: HONEYWELL SPECIALTY MATERIALS
Project: FILTERCAKE
Site: None
Lab ID: 20424510 Leachate
Project No.: 2056898
Description: None
Matrix: Other
%Moisture: n/a
Collected: 01/16/06
Received: 01/17/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:31	KJR (1)	5.00
Barium	EPA 6010	68375	1	ND		mg/L	2.00	20-Jan-06	20-Jan-06 14:31	KJR (1)	100.
Cadmium	EPA 6010	68375	1	ND		mg/L	0.100	20-Jan-06	20-Jan-06 14:31	KJR (1)	1.00
Chromium	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:31	KJR (1)	5.00
Lead	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:31	KJR (1)	5.00
Mercury	EPA 7470	68325	1	ND		mg/L	0.000200	20-Jan-06	20-Jan-06 14:46	KDG (1)	0.200
Selenium	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:31	KJR (1)	1.00
Silver	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:31	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Bossier City, (4) Houston, or (0) subcontract or field.

1/26/2006 16:11:44

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - LA050004
Louisiana Dept. of Health and Hospitals / Drinking Water - LA060004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Quick Lime

Waste Generation Rate: ☑ Cubic yards ☐ Tons > 100

Process Generating the Waste: Lime Silo - Routine Maintenance and Repair Activities

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stacking Facility.

Waste Classification

☐ Hazardous Waste ☑ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ☑ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Percent	Test Method
Lime	99.0 %	
Other	1.0 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH 11.9

Physical State at 70 °F ☑ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter	Todd Harter	1/20/2006

Report of Laboratory Analysis

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Client ID: LIME
Client: HONEYWELL SPECIALTY MATERIALS
Project: FILTERCAKE
Site: None
Lab ID: 20424511 Leachate
Project No.: 2056898
Description: None
Matrix: Other
%Moisture: n/a
Collected: 01/16/06
Received: 01/17/06

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:35	KJR (1)	5.00
Barium	EPA 6010	68375	1	ND		mg/L	2.00	20-Jan-06	20-Jan-06 14:35	KJR (1)	100.
Cadmium	EPA 6010	68375	1	ND		mg/L	0.100	20-Jan-06	20-Jan-06 14:35	KJR (1)	1.00
Chromium	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:35	KJR (1)	5.00
Lead	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:35	KJR (1)	5.00
Mercury	EPA 7470	68325	1	ND		mg/L	0.000200	20-Jan-06	20-Jan-06 14:48	KDG (1)	0.200
Selenium	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:35	KJR (1)	1.00
Silver	EPA 6010	68375	1	ND		mg/L	0.200	20-Jan-06	20-Jan-06 14:35	KJR (1)	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
(1b) Flash point less than 140 degrees F is hazardous for ignitibility.
Analysis performed in (1) New Orleans, (2) Baton Rouge, (3) Baxter City, (4) Houston, or (9) subcontract or field.

1/26/2006 16:11:44

New Orleans Laboratory Certifications
Louisiana Dept. of Environmental Quality (LELAP) - 02006
Arkansas Dept. of Environmental Quality - LA050004
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Florida Dept. of Health (NELAC) - E87936
Kansas Dept. of Health Environment - E-10266
U.S. Dept. of Agriculture Foreign Soil Permit - S-47270

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Pace Analytical™
New Orleans Laboratory

Report of Laboratory Analysis
Project Number: 2028172

ACCREDITED IN ACCORDANCE WITH nelac

Pace Analytical™
New Orleans Laboratory

Sample Cross Reference Report

www.pacelabs.com

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504 469.0333
Fax 504.469 0555

Client: HONEYWELL SPECIALTY MATERIALS

Project: FLUORO-GYP STACK WASTE DET.

Project No.: 2028172

Sample ID	Lab ID	Matrix	Collection Date/Time		Received Date/Time	
CALCIUM SULFATE	20224830	Soil	02/20/2004	13:45	02/23/2004	13:55
CLARIFIER UNDERFLOW	20224831	Soil	02/20/2004	10:05	02/23/2004	13:55
FLUORSPAR	20224829	Soil	02/20/2004	10:30	02/23/2004	13:55
HF LIME SILO	20224827	Soil	02/20/2004	13:30	02/23/2004	13:55
MP FILTER CAKE	20224828	Soil	02/20/2004	10:05	02/23/2004	13:55
CLARIFIER UNDERFLOW	20224832	Water	02/23/2004	07:40	02/23/2004	13:30

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/TW - E-10266
LELAP (NELAP WW/HZ) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

Pace Analytical™
New Orleans Laboratory

Report of Quality Control

www.pacelabs.com

Pace Analytical Services, Inc
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Project No.: 2028172

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS %Rec	LCSD %Rec	LCS RPD	MS Spike	MS %Rec	MSD %Rec	(1)MS RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	RPD Max	Qu
Arsenic	38114	ND	1 00	mg/L	5000	96			5000	95	95	0		75 - 129	65 - 140	20	
Barium	38114	ND	1 00	mg/L	5000	99			5000	93	91	2		78 - 129	58 - 134	20	
Cadmium	38114	ND	0 100	mg/L	1000	108			1000	108	108	0		76 - 125	55 - 132	20	
Chromium	38114	ND	0 500	mg/L	5000	97			5000	88	84	2		81 - 129	62 - 137	20	
Lead	38114	ND	0 500	mg/L	5000	100			5000	91	91	0		79 - 131	56 - 134	20	
Selenium	38114	ND	0 200	mg/L	1000	91			1000	88	89	1		74 - 121	59 - 140	20	
Silver	38114	ND	0 500	mg/L	1000	113			1000	106	101	5		60 - 145	60 - 141	20	
Mercury	38115	ND	0 000200	mg/L	1	90			1	114	113	1		80 - 120	50 - 150	20	
Aluminum	38302	ND	20.0	mg/kg	6700	86			238	2598 *	1409 *	25 *		58 - 142	70 - 130	20	Q3
Antimony	38302	ND	6 00	mg/kg	80	94			238	95	86	8		1 - 223	50 - 133	20	
Arsenic	38302	ND	1 00	mg/kg	146	99			952	89	81	8		79 - 122	54 - 128	20	
Barium	38302	ND	20.0	mg/kg	140	98			952	99	80	14		78 - 122	50 - 144	20	
Beryllium	38302	ND	0 500	mg/kg	68	99			24	99	12 *	26 *		81 - 118	65 - 130	20	
Boron	38302	ND	5 00	mg/kg	38	96			476	94	83	10		24 - 176	70 - 130	20	
Cadmium	38302	ND	0 500	mg/kg	244	100			24	200 *	76	23 *		80 - 120	52 - 130	20	Q3
Calcium	38302	ND	500.	mg/kg	3320	88								77 - 123	70 - 130	20	
Chromium	38302	ND	1 00	mg/kg	99	98			95	101	41 *	23 *		79 - 121	50 - 150	20	
Cobalt	38302	ND	5 00	mg/kg	43	97			238	93	83	9		77 - 121	55 - 136	20	
Copper	38302	ND	1 00	mg/kg	70	100			119	98	73	17		79 - 121	50 - 150	20	
Iron	38302	ND	10.0	mg/kg	12300	79								57 - 142	70 - 130	20	
Lead	38302	ND	0 300	mg/kg	73	100			238	93	81	10		80 - 120	50 - 150	20	
Lithium	38302	ND	5 00	mg/kg					1190	78	77	2		70 - 130	53 - 123	20	
Magnesium	38302	ND	500.	mg/kg	2040	93								76 - 124	70 - 130	20	
Manganese	38302	ND	1.50	mg/kg	249	95			238	98	68	17		76 - 124	50 - 150	20	
Molybdenum	38302	ND	1 00	mg/kg	31	106			476	93	88	6		77 - 122	70 - 130	20	
Nickel	38302	ND	4 00	mg/kg	82	95			238	94	80	11		76 - 123	58 - 128	20	
Potassium	38302	ND	500.	mg/kg	1920	98								71 - 129	70 - 130	20	
Selenium	38302	ND	1 00	mg/kg	87	93			952	85	79	7		69 - 131	50 - 122	20	
Silver	38302	ND	1 00	mg/kg	126	65			24	65	0 *	200 *		60 - 140	50 - 146	20	
Sodium	38302	ND	500.	mg/kg	337	72								55 - 145	70 - 130	20	
Strontium	38302	ND	5 00	mg/kg	52	88			476	97	90	7		79 - 121	70 - 130	20	
Thallium	38302	ND	1 00	mg/kg	118	99			952	92	87	6		75 - 125	62 - 119	20	
Tin	38302	ND	2 00	mg/kg	62	137			476	89	77	10		42 - 156	70 - 130	20	
Titanium	38302	ND	1 00	mg/kg	319	89								39 - 161	70 - 130	20	
Vanadium	38302	ND	5 00	mg/kg	107	101			238	92	68	17		75 - 125	51 - 140	20	
Zinc	38302	ND	2 00	mg/kg	138	96			238	101	42 *	24 *		78 - 122	50 - 150	20	

#Error
ARL denotes Adjusted Reporting Limit, corrected for sample size, dilution and moisture content as applicable.
* denotes recovery outside of QC limits
(1) MS RPD is calculated via SW-846 rules: on the basis of spiked sample concentrations rather than spike recoveries

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/HW - E-10260
LELAP (NELAP WW/HZ) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469 0555

Project No.: 2028172

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS %Rec	LCSD %Rec	LCS RPD	MS Spike	MS %Rec	MSD %Rec	(1)MS DUP RPD	QC Limits LCS	QC Limits MS/MSD	RPD Max	Qu
Mercury	38309	ND	0 100	mg/kg	8 3	111			0 2	118	122	3	54 - 146	75 - 125	20	
Aluminum	38384	ND	200	ug/L	2000	115			4000	109	117	5	79 - 122	50 - 150	20	
Antimony	38384	ND	60 0	ug/L	2000	111			1000	103	102	1	79 - 135	50 - 150	20	
Arsenic	38384	ND	10 0	ug/L	2000	104			4000	98	99	1	81 - 121	76 - 125	20	
Barium	38384	ND	200	ug/L	2000	108			4000	102	104	2	85 - 118	68 - 126	20	
Beryllium	38384	ND	5 00	ug/L	2000	105			100	103	104	1	85 - 117	76 - 126	20	
Boron	38384	ND	50 0	ug/L	2000	105			2000	102	103	1	70 - 130	88 - 125	20	
Cadmium	38384	ND	5 00	ug/L	2000	107			200	105	106	1	83 - 120	71 - 119	20	
Calcium	38384	ND	500	ug/L	4000	103							86 - 122	50 - 150	20	
Chromium	38384	ND	10 0	ug/L	2000	107			400	102	103	1	85 - 117	60 - 137	20	
Cobalt	38384	ND	50 0	ug/L	2000	108			1000	101	101	0	89 - 114	72 - 120	20	
Copper	38384	ND	10 0	ug/L	2000	106			500	97	95	1	85 - 117	65 - 144	20	
Iron	38384	ND	100	ug/L	2000	101			2000	88	92	2	83 - 124	50 - 150	20	
Lead	38384	ND	3 00	ug/L	2000	105			1000	99	100	1	81 - 122	69 - 125	20	
Lithium	38384	ND	50 0	ug/L	4000	103			4000	100	102	1	70 - 130	70 - 130	20	
Magnesium	38384	ND	500	ug/L	4000	103							88 - 118	50 - 150	20	
Manganese	38384	ND	15 0	ug/L	2000	105			1000	99	100	1	84 - 119	50 - 150	20	
Molybdenum	38384	ND	50 0	ug/L	2000	104			2000	100	101	1	91 - 112	85 - 113	20	
Nickel	38384	ND	40 0	ug/L	2000	107			1000	99	99	1	87 - 117	69 - 121	20	
Potassium	38384	ND	500	ug/L	4000	105							86 - 117	50 - 150	20	
Selenium	38384	ND	10 0	ug/L	2000	103			4000	98	98	0	84 - 118	75 - 122	20	
Silver	38384	ND	10 0	ug/L	1000	105			100	90	89	2	72 - 124	50 - 134	20	
Sodium	38384	ND	500	ug/L	4000	99							69 - 130	50 - 150	20	
Strontium	38384	ND	50 0	ug/L	2000	103			2000	101	101	1	70 - 130	70 - 130	20	
Thallium	38384	ND	10 0	ug/L	2000	102			4000	101	102	1	84 - 116	69 - 118	20	
Tin	38384	ND	20 0	ug/L	2000	101			2000	94	95	1	89 - 118	91 - 118	20	
Titanium	38384	ND	10 0	ug/L	2000	105			2000	101	102	1	70 - 130	70 - 130	20	
Vanadium	38384	ND	50 0	ug/L	2000	107			1000	95	97	1	88 - 114	73 - 125	20	
Zinc	38384	ND	20 0	ug/L	2000	108			1000	100	101	1	82 - 120	61 - 131	20	
Mercury	38386	ND	0 200	ug/L	1	101			1	82	87	5	80 - 120	75 - 125	20	

#Error
ARL denotes Adjusted Reporting Limit - corrected for sample size, dilution and moisture content as applicable.
* denotes recovery outside of QC limits.
(1) MS RPD is calculated via SW-846 rules: on the basis of spiked sample concentrations rather than spike recoveries

Laboratory Certifications:
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Kansas Dept. of Health & Environment/ELW/DW - E-10266
LELAP (NELAP WW/ID) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

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Report Qualifiers

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Project No.: 2028172

Analyte Qualifiers

Qualifier	Qualifier Description
C3	The result for this parameter is not corrected for moisture content

QC Qualifiers

Qualifier	Qualifier Description
Q3	The matrix spike recoveries are poor due to the presence of this analyte in the sample at a concentration greater than 4 times the spiked amount. Acceptable method performance for this analyte has been demonstrated by the laboratory control sample

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Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: Environmental Waste Coordinator: Todd Harter

Waste Name: HF_2 Lime Silo

Waste Generation Rate: ✔ Cubic yards ❑ Tons > 100

Process Generating the Waste: Routine Maintenance and Repair Activities

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stack

Waste Classification

❑ Hazardous Waste ✔ Non-Hazardous Waste ❑ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✔ Testing (See Attached Results) ❑ Process Knowledge (See Attached MSDS)

Waste Composition	Percent	Test Method
Lime	99.0 %	
Other	1.0 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ✔ Solid ❑ Liquid ❑ Semi-Solid ❑ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter		3/9/2004

Report of Laboratory Analysis

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New Orleans Laboratory

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Pace Analytical Services, Inc
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469 0333
Fax: 504.469.0555

Client ID: HF LIME SILO
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224827
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis	Reg. Limit
Aluminum	SW 6010	38302	1	392		mg/kg	17 0	02-Mar-04	03-Mar-04 18:42 KJR	
Antimony	SW 6010	38302	1	ND		mg/kg	5 09	02-Mar-04	03-Mar-04 18:42 KJR	
Arsenic	SW 6010	38302	1	ND		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Barium	SW 6010	38302	1	ND		mg/kg	17 0	02-Mar-04	03-Mar-04 18:42 KJR	
Beryllium	SW 6010	38302	1	ND		mg/kg	0 424	02-Mar-04	03-Mar-04 18:42 KJR	
Cadmium	SW 6010	38302	1	1 30		mg/kg	0 424	02-Mar-04	03-Mar-04 18:42 KJR	
Calcium	SW 6010	38302	1	340000		mg/kg	424	02-Mar-04	03-Mar-04 18:42 KJR	
Chromium	SW 6010	38302	1	10 1		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Cobalt	SW 6010	38302	1	ND		mg/kg	4 24	02-Mar-04	03-Mar-04 18:42 KJR	
Copper	SW 6010	38302	1	ND		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Iron	SW 6010	38302	1	424		mg/kg	8 48	02-Mar-04	03-Mar-04 18:42 KJR	
Lead	SW 6010	38302	1	2 70		mg/kg	0 254	02-Mar-04	03-Mar-04 18:42 KJR	
Magnesium	SW 6010	38302	1	2230		mg/kg	424	02-Mar-04	03-Mar-04 18:42 KJR	
Manganese	SW 6010	38302	1	14 6		mg/kg	1 27	02-Mar-04	03-Mar-04 18:42 KJR	
Mercury	SW 7471	38309	1	ND		mg/kg	0 0400	02-Mar-04	03-Mar-04 08:39 PJG	
Nickel	SW 6010	38302	1	ND		mg/kg	3 39	02-Mar-04	03-Mar-04 18:42 KJR	
Potassium	SW 6010	38302	1	ND		mg/kg	424	02-Mar-04	03-Mar-04 18:42 KJR	
Selenium	SW 6010	38302	1	7 00		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Silver	SW 6010	38302	1	4 90		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Sodium	SW 6010	38302	1	ND		mg/kg	424	02-Mar-04	03-Mar-04 18:42 KJR	
Thallium	SW 6010	38302	1	ND		mg/kg	0 848	02-Mar-04	03-Mar-04 18:42 KJR	
Vanadium	SW 6010	38302	1	10.4		mg/kg	4 24	02-Mar-04	03-Mar-04 18:42 KJR	
Zinc	SW 6010	38302	1	11 5		mg/kg	1 70	02-Mar-04	03-Mar-04 18:42 KJR	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity
(1b) Flash point less than 140 degrees F is hazardous for ignitibility
(1c) Reactive cyanide above 250 ppm is hazardous for reactivity
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity.
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/HW - E-10266
LELAP (NELAP WW/HZ) - 02006
EQD - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone 504.469 0333
Fax 504.469 0555

Client ID: HF LIME SILO
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224827 Leachate
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 15:47	KJR	5 00
Barium	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 15:47	KJR	100
Cadmium	SW 6010	38114	1	ND	C3	mg/L	0 100	27-Feb-04	27-Feb-04 15:47	KJR	1 00
Chromium	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 15:47	KJR	5 00
Lead	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 15:47	KJR	5 00
Mercury	SW 7470	38115	1	ND	C3	mg/L	0 000200	27-Feb-04	27-Feb-04 15:02	PJG	0 200
Selenium	SW 6010	38114	1	ND	C3	mg/L	0 200	27-Feb-04	27-Feb-04 15:47	KJR	1 00
Silver	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 15:47	KJR	5 00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
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Reporting Limit is corrected for sample size, dilution and moisture content if applicable
Qu lists qualifiers. Specific qualifiers are defined at the end of the report
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity
(1b) Flash point less than 140 degrees F is hazardous for ignitibility
(1c) Reactive cyanide above 250 ppm is hazardous for reactivity
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

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Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/HW - E-10266
LELAP (NELAP WW/ID) - 02006
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Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: Environmental Waste Coordinator: Todd Harter

Waste Name: MPP Filter Cake – Calcium Fluoride

Waste Generation Rate: ✔ Cubic yards ❑ Tons 9,200 per year

Process Generating the Waste: Filter cake is generated from the MPP wastewater treatment process.

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stack

Waste Classification

❑ Hazardous Waste ✔ Non-Hazardous Waste ❑ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✔ Testing (See Attached Results) ❑ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Filter Cake	50-60 %	
Water	40- 50 %	
Other	1 – 10 %	
TOTAL	> 100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ✔ Solid ❑ Liquid ❑ Semi-Solid ❑ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter		3/9/2004

Report of Laboratory Analysis

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Client ID: MP FILTER CAKE
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224828
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis	Reg. Limit
Aluminum	SW 6010	38302	1	158		mg/kg	15.9	02-Mar-04	03-Mar-04 18:46 KJR	
Antimony	SW 6010	38302	1	ND		mg/kg	4.76	02-Mar-04	03-Mar-04 18:46 KJR	
Arsenic	SW 6010	38302	1	ND		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Barium	SW 6010	38302	1	ND		mg/kg	15.9	02-Mar-04	03-Mar-04 18:46 KJR	
Beryllium	SW 6010	38302	1	ND		mg/kg	0.397	02-Mar-04	03-Mar-04 18:46 KJR	
Cadmium	SW 6010	38302	1	0.520		mg/kg	0.397	02-Mar-04	03-Mar-04 18:46 KJR	
Calcium	SW 6010	38302	1	136000		mg/kg	397	02-Mar-04	03-Mar-04 18:46 KJR	
Chromium	SW 6010	38302	1	7.80		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Cobalt	SW 6010	38302	1	ND		mg/kg	3.97	02-Mar-04	03-Mar-04 18:46 KJR	
Copper	SW 6010	38302	1	8.90		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Iron	SW 6010	38302	1	712		mg/kg	7.94	02-Mar-04	03-Mar-04 18:46 KJR	
Lead	SW 6010	38302	1	1.40		mg/kg	0.238	02-Mar-04	03-Mar-04 18:46 KJR	
Magnesium	SW 6010	38302	1	ND		mg/kg	397	02-Mar-04	03-Mar-04 18:46 KJR	
Manganese	SW 6010	38302	1	14.2		mg/kg	1.19	02-Mar-04	03-Mar-04 18:46 KJR	
Mercury	SW 7471	38309	1	ND		mg/kg	0.0364	02-Mar-04	03-Mar-04 08:44 PJG	
Nickel	SW 6010	38302	1	ND		mg/kg	3.17	02-Mar-04	03-Mar-04 18:46 KJR	
Potassium	SW 6010	38302	1	ND		mg/kg	397	02-Mar-04	03-Mar-04 18:46 KJR	
Selenium	SW 6010	38302	1	2.30		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Silver	SW 6010	38302	1	1.70		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Sodium	SW 6010	38302	1	2120		mg/kg	397	02-Mar-04	03-Mar-04 18:46 KJR	
Thallium	SW 6010	38302	1	ND		mg/kg	0.794	02-Mar-04	03-Mar-04 18:46 KJR	
Vanadium	SW 6010	38302	1	12.3		mg/kg	3.97	02-Mar-04	03-Mar-04 18:46 KJR	
Zinc	SW 6010	38302	1	35.5		mg/kg	1.59	02-Mar-04	03-Mar-04 18:46 KJR	

23 parameter(s) reported

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(1c) Reactive cyanide above 250 ppm is hazardous for reactivity
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity.
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
p-cresol are synonyms for 2,3,4-methylphenol, respectively.
achlorobutadiene is hexachloro-1,3-butadiene

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1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone 504.469.0333
Fax 504.469.0555

Client ID: MP FILTER CAKE
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224828 Leachate
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:01	KJR	5 00
Barium	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:01	KJR	100
Cadmium	SW 6010	38114	1	ND	C3	mg/L	0 100	27-Feb-04	27-Feb-04 16:01	KJR	1 00
Chromium	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:01	KJR	5 00
Lead	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:01	KJR	5 00
Mercury	SW 7470	38115	1	ND	C3	mg/L	0 000200	27-Feb-04	27-Feb-04 15:04	PJG	0 200
Selenium	SW 6010	38114	1	ND	C3	mg/L	0 200	27-Feb-04	27-Feb-04 16:01	KJR	1 00
Silver	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:01	KJR	5 00

8 parameter(s) reported

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DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity
(1b) Flash point less than 140 degrees F is hazardous for ignitibility
(1c) Reactive cyanide above 250 ppm is hazardous for reactivity.
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/IW - E-10266
LELAP (NELAP WW/HZ) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

Honeywell

Waste Stream Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Fluorspar

Waste Generation Rate: ✔ Cubic yards ❑ Tons > 100 per year

Process Generating the Waste: Maintenance and Repair Activities

Current Disposal Procedure: Haul and place the material onto the Fluorogypsum Stack

Waste Classification

❑ Hazardous Waste ✔ Non-Hazardous Waste ❑ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✔ Testing (See Attached Results) ❑ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Fluorspar	98 %	
Other	2 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ✔ Solid ❑ Liquid ❑ Semi-Solid ❑ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter		3/9/2004

* As – Naturally occurring concentration varies from geographic location where mined.

Report of Laboratory Analysis

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New Orleans Laboratory

www.pacelabs.com

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469 0333
Fax: 504.469 0555

Client ID: FLUORSPAR
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224829
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	SW 6010	38302	1	220		mg/kg	19 6	02-Mar-04	03-Mar-04 18:51	KJR	
Antimony	SW 6010	38302	1	ND		mg/kg	5 88	02-Mar-04	03-Mar-04 18:51	KJR	
Arsenic	SW 6010	38302	1	ND		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Barium	SW 6010	38302	1	195		mg/kg	19 6	02-Mar-04	03-Mar-04 18:51	KJR	
Beryllium	SW 6010	38302	1	ND		mg/kg	0 490	02-Mar-04	03-Mar-04 18:51	KJR	
Cadmium	SW 6010	38302	1	ND		mg/kg	0 490	02-Mar-04	03-Mar-04 18:51	KJR	
Calcium	SW 6010	38302	1	77600		mg/kg	490	02-Mar-04	03-Mar-04 18:51	KJR	
Chromium	SW 6010	38302	1	1 30		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Cobalt	SW 6010	38302	1	ND		mg/kg	4 90	02-Mar-04	03-Mar-04 18:51	KJR	
Copper	SW 6010	38302	1	ND		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Iron	SW 6010	38302	1	1180		mg/kg	9 80	02-Mar-04	03-Mar-04 18:51	KJR	
Lead	SW 6010	38302	1	5 20		mg/kg	0 294	02-Mar-04	03-Mar-04 18:51	KJR	
Magnesium	SW 6010	38302	1	ND		mg/kg	490	02-Mar-04	03-Mar-04 18:51	KJR	
Manganese	SW 6010	38302	1	55 2		mg/kg	1 47	02-Mar-04	03-Mar-04 18:51	KJR	
Mercury	SW 7471	38309	1	0 0630		mg/kg	0 0400	02-Mar-04	03-Mar-04 08:46	PJG	
Nickel	SW 6010	38302	1	ND		mg/kg	3 92	02-Mar-04	03-Mar-04 18:51	KJR	
Potassium	SW 6010	38302	1	ND		mg/kg	490	02-Mar-04	03-Mar-04 18:51	KJR	
Selenium	SW 6010	38302	1	ND		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Silver	SW 6010	38302	1	ND		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Sodium	SW 6010	38302	1	ND		mg/kg	490	02-Mar-04	03-Mar-04 18:51	KJR	
Thallium	SW 6010	38302	1	ND		mg/kg	0 980	02-Mar-04	03-Mar-04 18:51	KJR	
Vanadium	SW 6010	38302	1	ND		mg/kg	4 90	02-Mar-04	03-Mar-04 18:51	KJR	
Zinc	SW 6010	38302	1	5 80		mg/kg	1 96	02-Mar-04	03-Mar-04 18:51	KJR	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
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m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/DW - E-10260
LELAP (NELAP WW/DW) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

Report of Laboratory Analysis

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New Orleans Laboratory

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Pace Analytical Services, Inc.
1000 Riverbend Blvd Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Client ID: FLUORSPAR
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224829 Leachate
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	SW 6010	38114	1	ND	C3	mg/L	1.00	27-Feb-04	27-Feb-04 16:08	KJR	5.00
Barium	SW 6010	38114	1	1.14	C3	mg/L	1.00	27-Feb-04	27-Feb-04 16:08	KJR	100
Cadmium	SW 6010	38114	1	ND	C3	mg/L	0.100	27-Feb-04	27-Feb-04 16:08	KJR	1.00
Chromium	SW 6010	38114	1	ND	C3	mg/L	0.500	27-Feb-04	27-Feb-04 16:08	KJR	5.00
Lead	SW 6010	38114	1	ND	C3	mg/L	0.500	27-Feb-04	27-Feb-04 16:08	KJR	5.00
Mercury	SW 7470	38115	1	ND	C3	mg/L	0.000200	27-Feb-04	27-Feb-04 15:05	PJG	0.200
Selenium	SW 6010	38114	1	ND	C3	mg/L	0.200	27-Feb-04	27-Feb-04 16:08	KJR	1.00
Silver	SW 6010	38114	1	ND	C3	mg/L	0.500	27-Feb-04	27-Feb-04 16:08	KJR	5.00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
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(1c) Reactive cyanide above 250 ppm is hazardous for reactivity
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
,p-cresol are synonyms for 2,3,4-methylphenol, respectively
nchlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/HW - E-10266
LELAP (NELAP WW/HZ) - 02006
EQD - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

BSi Inspectorate Surveying
Metals & Minerals
101 Woodland Highway Belle Chasse, LA 70037
Tel: 504-392-7660
Fax: 504-393-5248
www.inspectorate.com

HONEYWELL CORP.
P.O. BOX 226
Geismar, LA 70734

February 12, 2004

BSI INSPECTORATE FILE NO.: 04-60111-4037

Attn: John McCarthy

Certificate of Analysis

RE: M/V "STELLENBOSCH"
ACID GRADE FLUORSPAR
VESSEL COMPOSITE
LAB REFERENCE NO.: CD34367

As per your instructions, we sampled and analyzed the above described material which discharged from holds #1, #3, & #5 of the M/V "STELLENBOSCH" at PCS Nitrogen Dock, Geismar, Louisiana on January 31- February 1, 2004.

Accordingly, we report the following analytical results:

Analyte	*Result*
Loss on Drying (Moisture), H_2O, %	9.21
Calcium Fluoride, CaF_2, %	97.24
Silica, SiO_2, %	0.39
Calcium Carbonate, $CaCO_3$, %	0.91
Arsenic, As, ppm	3
Total Chloride as NaCl	0.035
Sulfide, %	0.0164
Soluble Chloride as NaCl	0.011
Sulfur, S, %	0.036
Phosphorus Pentoxide, P_2O_5, %	0.016
Organics (ISO 3703)	0.047
R2O3	0.46

Particle Size Distribution (Wet Screening)	
Screen Size	%
+ 40 Mesh	Nil
+ 100 Mesh	2.2
+ 200 Mesh	18.0
+ 325 Mesh	23.5
- 325 Mesh	56.3

BSI INSPECTORATE SURVEYING

for Vic King

BSI Inspectorate Surveying
Metals & Minerals
101 Woodland Highway Belle Chasse, LA 70037
Tel: 504-392-7000
Fax: 504-393-5248
www.inspectorate.com

HONEYWELL CORP.
P.O. BOX 226
Geismar, LA 70734

March 3, 2004

BSI INSPECTORATE FILE NO.: 04-60111-4058

Attn: John McCarthy

Certificate of Analysis

RE: M/V "ALEX D"
ACID GRADE FLUORSPAR
VESSEL COMPOSITE
LAB REFERENCE NO.: CD34687

As per your instructions, we sampled and analyzed the above described material which discharged from holds #2 & #7 of the M/V "ALEX D" at PCS Nitrogen Dock, Geismar, Louisiana on February 18-21 2004.

Accordingly, we report the following analytical results:

Analyte	*Result*
Loss on Drying (Moisture), H_2O, %	8.61
Calcium Fluoride, CaF_2, %	97.83
Silica, SiO_2, %	1.14
Calcium Carbonate, $CaCO_3$, %	0.39
Arsenic, As, ppm	<1
Total Chloride as NaCl	0.007
Sulfide, %	0.0017
Soluble Chloride as NaCl	0.003
Sulfur, S, %	0.02
Phosphorus Pentoxide, P_2O_5, %	0.018
Organics (ISO 3703)	0.053
R2O3	0.14

Particle Size Distribution (Wet Screening)	
Screen Size	%
+ 40 Mesh	0.5
+ 100 Mesh	17.4
+ 200 Mesh	22.3
+ 325 Mesh	17.3
- 325 Mesh	42.5

BSI INSPECTORATE SURVEYING

Vic King

Honeywell

Waste Steam Determination Form

Geismar Facility

General Information

Department: HS&E Waste Coordinator: Todd Harter

Waste Name: Furnace Residue - Calcium Sulfate - Ca_2SO_4

Waste Generation Rate: ☐ Cubic yards ✔ Tons 1500 per day

Process Generating the Waste: HF Plant - By-Product from the production of HF_2 gas.

Current Disposal Procedure: Slurry and pump the Ca_2SO_4 onto the fluorogypsum stack for processing as an road aggregate.

Waste Classification

☐ Hazardous Waste ✔ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✔ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Calcium Sulfate	99 %	
Other	1 %	
TOTAL	100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ✔ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter		3/9/2004

Report of Laboratory Analysis

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New Orleans Laboratory

www.pacelabs.com

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone 504.469.0333
Fax 504.469 0555

Client ID: CALCIUM SULFATE
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224830
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	SW 6010	38302	1	82 0		mg/kg	17 5	02-Mar-04	03-Mar-04 19:04	KJR	
Antimony	SW 6010	38302	1	ND		mg/kg	5 26	02-Mar-04	03-Mar-04 19:04	KJR	
Arsenic	SW 6010	38302	1	ND		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Barium	SW 6010	38302	1	112		mg/kg	17 5	02-Mar-04	03-Mar-04 19:04	KJR	
Beryllium	SW 6010	38302	1	ND		mg/kg	0 439	02-Mar-04	03-Mar-04 19:04	KJR	
Cadmium	SW 6010	38302	1	ND		mg/kg	0 439	02-Mar-04	03-Mar-04 19:04	KJR	
Calcium	SW 6010	38302	1	68000		mg/kg	439	02-Mar-04	03-Mar-04 19:04	KJR	
Chromium	SW 6010	38302	1	2 70		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Cobalt	SW 6010	38302	1	ND		mg/kg	4 39	02-Mar-04	03-Mar-04 19:04	KJR	
Copper	SW 6010	38302	1	ND		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Iron	SW 6010	38302	1	559		mg/kg	8 77	02-Mar-04	03-Mar-04 19:04	KJR	
Lead	SW 6010	38302	1	1 60		mg/kg	0 263	02-Mar-04	03-Mar-04 19:04	KJR	
Magnesium	SW 6010	38302	1	ND		mg/kg	439	02-Mar-04	03-Mar-04 19:04	KJR	
Manganese	SW 6010	38302	1	23 1		mg/kg	1 32	02-Mar-04	03-Mar-04 19:04	KJR	
Mercury	SW 7471	38309	1	ND		mg/kg	0 0392	02-Mar-04	03-Mar-04 08:48	PJG	
Nickel	SW 6010	38302	1	ND		mg/kg	3 51	02-Mar-04	03-Mar-04 19:04	KJR	
Potassium	SW 6010	38302	1	ND		mg/kg	439	02-Mar-04	03-Mar-04 19:04	KJR	
Selenium	SW 6010	38302	1	ND		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Silver	SW 6010	38302	1	ND		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Sodium	SW 6010	38302	1	ND		mg/kg	439	02-Mar-04	03-Mar-04 19:04	KJR	
Thallium	SW 6010	38302	1	ND		mg/kg	0 877	02-Mar-04	03-Mar-04 19:04	KJR	
Vanadium	SW 6010	38302	1	ND		mg/kg	4 39	02-Mar-04	03-Mar-04 19:04	KJR	
Zinc	SW 6010	38302	1	4 90		mg/kg	1 75	02-Mar-04	03-Mar-04 19:04	KJR	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size
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(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity.
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(1c) Reactive cyanide above 250 ppm is hazardous for reactivity.
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
o,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07599
Kansas Dept. of Health & Environment/ELW/HW - E-10266
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Report of Laboratory Analysis

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Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone 504.469.0333
Fax 504.469.0555

Client ID: CALCIUM SULFATE
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224830 Leachate
Project No.: 2028172
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 02/20/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:13	KJR	5 00
Barium	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:13	KJR	100
Cadmium	SW 6010	38114	1	ND	C3	mg/L	0 100	27-Feb-04	27-Feb-04 16:13	KJR	1 00
Chromium	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:13	KJR	5 00
Lead	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:13	KJR	5 00
Mercury	SW 7470	38115	1	ND	C3	mg/L	0 000200	27-Feb-04	27-Feb-04 15:11	PJG	0 200
Selenium	SW 6010	38114	1	ND	C3	mg/L	0 200	27-Feb-04	27-Feb-04 16:13	KJR	1 00
Silver	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:13	KJR	5 00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
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methyl ethyl keytone is a synonym for 2-butanone
p-cresol are synonyms for 2,3,4-methylphenol, respectively
hlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
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LELAP (NELAP WW/HZ) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S Territories)

Calcium Sulfate Analysis

Tables 2A, 2B and 2C

TABLE 2A

EP TOXICITY TEST RESULTS [1]

Contaminant	Concentration (mg/l)	Maximum Allowable Concentration (mg/l)	Analytical Method [2]
Arsenic	0.295	5.0	7060, 7061
Barium	2.0	100.0	7080, 7081
Cadmium	0.010	1.0	7030. 7031
Chromium	0.080	5.0	7190, 7191
Lead	0.151	5.0	7420, 7421
Mercury	0.0002	0.2	7470, 0000
Selenium	<0.2	1.0	7740, 7741
Silver	<0.002	5.0	7760, 7761

[1] No detectable quantities of any chlorinated hydrocarbon pesticides were detected.

[2] Refers to: Test methods for Evaluating Solid Waste-Physical/Chemical Methods, EPA Manual SW-846, July, 1982.

TABLE 2B

TCLP TEST RESULTS [1]

Contaminant	Concentration (mg/l)	Regulatory Level (mg/l)
Chromium	0.025	5.0
Lead	0.25	5.0
Selenium	0.027	5.0

[1] Data developed by the USEPA in their studies of the Mining Waste Exclusion.

TABLE 2C

METHOD 1312 TEST RESULTS

Concentration (mg/l)

Constituent	Slurry	Pond Water	Interceptor Ditch	Flurorgypsum Residue
Arsenic	0.77	0.66	0.84	0.14
Barium	0.051	0.092	<0.05	<0.05
Cadmium	0.05	0.076	0.068	<0.01
Chromium	3	2.89	2.22	0.1
Lead	2.33	2.74	0.11	<0.1
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Selenium	<0.005	<0.005	<0.005	<0.005
Silver	<0.01	<0.01	<0.01	<0.01

Honeywell

Waste Steam Determination Form

Geismar Facility

General Information

Department HS&E Waste Coordinator Todd Harter

Waste Name Raw River Clarifier Underflow

Waste Generation Rate ☐ Cubic yards ☐ Tons N/A

Process Generating the Waste Process Water Generation

Current Disposal Procedure Return raw Mississippi River water back into the river

Waste Classification

☐ Hazardous Waste ✔ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✔ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
Solids	10 %	
Water	90 %	
TOTAL	> 100 %	

Physical Data

Flash Point N/A °F

pH N/A

Physical State at 70 °F ☐ Solid ✔ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name N/A

Name	Signature	Date
Todd Harter		3/9/2004

Report of Laboratory Analysis

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Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555

Client ID: CLARIFIER UNDERFLOW
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224832
Project No.: 2028172
Description: None
Matrix: Water
%Moisture: n/a
Collected: 02/23/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Aluminum	SW 6010	38384	1	390000		ug/L	200	03-Mar-04	04-Mar-04 12:48	KJR	
Antimony	SW 6010	38384	1	ND		ug/L	60 0	03-Mar-04	04-Mar-04 12:48	KJR	
Arsenic	SW 6010	38384	1	89 4		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Barium	SW 6010	38384	1	4130		ug/L	200	03-Mar-04	04-Mar-04 12:48	KJR	
Beryllium	SW 6010	38384	1	19 5		ug/L	5 00	03-Mar-04	04-Mar-04 12:48	KJR	
Cadmium	SW 6010	38384	1	18 5		ug/L	5 00	03-Mar-04	04-Mar-04 12:48	KJR	
Calcium	SW 6010	38384	1	2490000		ug/L	500	03-Mar-04	04-Mar-04 12:48	KJR	
Chromium	SW 6010	38384	1	362		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Cobalt	SW 6010	38384	1	169		ug/L	50 0	03-Mar-04	04-Mar-04 12:48	KJR	
Copper	SW 6010	38384	1	379		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Iron	SW 6010	38384	1	439000		ug/L	100	03-Mar-04	04-Mar-04 12:48	KJR	
Lead	SW 6010	38384	1	361		ug/L	3 00	03-Mar-04	04-Mar-04 12:48	KJR	
Magnesium	SW 6010	38384	1	223000		ug/L	500	03-Mar-04	04-Mar-04 12:48	KJR	
Manganese	SW 6010	38384	1	17300		ug/L	15 0	03-Mar-04	04-Mar-04 12:48	KJR	
Mercury	SW 7470	38386	1	1 10		ug/L	0 200	04-Mar-04	04-Mar-04 13:49	PJG	
Nickel	SW 6010	38384	1	409		ug/L	40 0	03-Mar-04	04-Mar-04 12:48	KJR	
Potassium	SW 6010	38384	1	46000		ug/L	500	03-Mar-04	04-Mar-04 12:48	KJR	
Selenium	SW 6010	38384	1	ND		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Silver	SW 6010	38384	1	25 4		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Sodium	SW 6010	38384	1	19400		ug/L	500	03-Mar-04	04-Mar-04 12:48	KJR	
Thallium	SW 6010	38384	1	ND		ug/L	10 0	03-Mar-04	04-Mar-04 12:48	KJR	
Vanadium	SW 6010	38384	1	710		ug/L	50 0	03-Mar-04	04-Mar-04 12:48	KJR	
Zinc	SW 6010	38384	1	1550		ug/L	20 0	03-Mar-04	04-Mar-04 12:48	KJR	

23 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2.0 or greater than 12.5 is hazardous for corrosivity
(1b) Flash point less than 140 degrees F is hazardous for ignitibility
(1c) Reactive cyanide above 250 ppm is hazardous for reactivity.
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group.
methyl ethyl keytone is a synonym for 2-butanone
m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/IW - E-10266
LELAP (NELAP WW/HZ) - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

Report of Laboratory Analysis

Pace Analytical™
New Orleans Laboratory

www.pacelabs.com

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
Saint Rose, LA 70087

Phone 504.469.0333
Fax 504.469.0555

Client ID: CLARIFIER UNDERFLOW
Client: HONEYWELL SPECIALTY MATERIALS
Project: FLUORO-GYP STACK WASTE DET.
Site: None
Lab ID: 20224832 Leachate
Project No.: 2028172
Description: None
Matrix: Water
%Moisture: n/a
Collected: 02/23/04
Received: 02/23/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Arsenic	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:17	KJR	5 00
Barium	SW 6010	38114	1	ND	C3	mg/L	1 00	27-Feb-04	27-Feb-04 16:17	KJR	100
Cadmium	SW 6010	38114	1	ND	C3	mg/L	0 100	27-Feb-04	27-Feb-04 16:17	KJR	1 00
Chromium	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:17	KJR	5 00
Lead	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:17	KJR	5 00
Mercury	SW 7470	38115	1	ND	C3	mg/L	0 000200	27-Feb-04	27-Feb-04 15:12	PJG	0 200
Selenium	SW 6010	38114	1	ND	C3	mg/L	0 200	27-Feb-04	27-Feb-04 16:17	KJR	1 00
Silver	SW 6010	38114	1	ND	C3	mg/L	0 500	27-Feb-04	27-Feb-04 16:17	KJR	5 00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit
DF denotes Dilution Factor of final sample. PF denotes sample Prep Factor which accounts for a non-routine sample size.
Reporting Limit is corrected for sample size, dilution and moisture content if applicable.
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(1c) Reactive cyanide above 250 ppm is hazardous for reactivity.
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity.
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group
methyl ethyl keytone is a synonym for 2-butanone
m,p-cresol are synonyms for 2,3,4-methylphenol, respectively
hexachlorobutadiene is hexachloro-1,3-butadiene

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Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/HW - E-10266
LELAP /NELAP WW/HD - 02006
EQB - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U.S. Territories)

Honeywell

Waste Steam Determination Form

Geismar Facility

General Information

Department: HS& E Waste Coordinator: Todd Harter

Waste Name: HF WWTP Clarifier Sludge

Waste Generation Rate: ✓ Cubic yards ☐ Tons 100

Process Generating the Waste: HF WWTP Cleaning - Routine Maintenance and Repairs

Current Disposal Procedure: Fluorogypsum Stacking Facility – Gallagher Pump and Haul

Waste Classification

☐ Hazardous Waste ✓ Non-Hazardous Waste ☐ Universal Waste

If Hazardous List EPA Waste Codes

Determination Method ✓ Testing (See Attached Results) ☐ Process Knowledge (See Attached MSDS)

Waste Composition	Concentration	Test Method
HF WWTP Sludge	100	TCLP Metals
TOTAL	100	

Physical Data

Flash Point N/A °F **Color** Tan

pH 6-9 **Odor** N/A

Physical State at 70 °F ✓ Solid ☐ Liquid ☐ Semi-Solid ☐ Gas

Specific Gravity N/A

DOT Shipping Name Non Regulated Material – HF WWTP Clarifier Sludge

Name	Signature	Date
Todd Harter		10/1/2004

Pace Analytical Services Inc
1000 Riverbend Blvd Suite F
Saint Rose LA 70067

Phone 504 469 0333
Fax 504 469 0555

Pace Analytical™
New Orleans Laboratory

Report of Laboratory Analysis
Project Number: 2039229

ACCREDITED IN ACCORDANCE WITH nelac

Pace Analytical™
New Orleans Laboratory

Sample Cross Reference Report

Pace Analytical Services, Inc
1000 Riverwood Blvd Suite F
Saint Rose LA 70087

Phone 504 469 0333
Fax 504 469 0555

Client: HONEYWELL SPECIALTY MATERIALS

Project: CLARIFIER SLUDGE

Project No.: 2039229

Sample ID	Lab ID	Matrix	Collection Date/Time		Received Date/Time	
HF CLARIFIER SLUDGE	20298158	Soil	09/22/2004	10:00	09/22/2004	17:45

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste . E07595
Kansas Dept. of Health & Environment/EL WHW E-10266
LELAP (NELAP WW/HZ) . 02006
EOD - Certified Puerto Rico Chemist
U.S. Dept. of Agriculture Animal & Plant Health Inspection Services . Foreign Soil Import (U.S. Territories)

9.30.2004 11:13:19

Report of Laboratory Analysis

Pace Analytical
New Orleans Laboratory

Pace Analytical Services, Inc
1000 Riverwood Blvd. Suite F
Saint Rose LA 70087

Phone 504 469 0333
Fax 504 469 0555

Client ID: HF CLARIFIER SLUDGE
Client: HONEYWELL SPECIALTY MATERIALS
Project: CLARIFIER SLUDGE
Site: None
Lab ID: 20298158 Leachate
Project No.: 2039229
Description: None
Matrix: Soil
%Moisture: Not Corrected
Collected: 09/22/04
Received: 09/22/04

ParameterName	Method	Batch	DF	Result	Qu	Units	Reporting Limit	Prep.	Analysis			Reg. Limit
Arsenic	SW 6010	49669	1	ND	C3	mg/L	1 00	29-Sep-04	29-Sep-04	14:32	KJR	5 00
Barium	SW 6010	49669	1	ND	C3	mg/L	1 00	29-Sep-04	29-Sep-04	14:32	KJR	100
Cadmium	SW 6010	49669	1	ND	C3	mg/L	0 100	29-Sep-04	29-Sep-04	14:32	KJR	1 00
Chromium	SW 6010	49669	1	ND	C3	mg/L	0 500	29-Sep-04	29-Sep-04	14:32	KJR	5 00
Lead	SW 6010	49669	1	ND	C3	mg/L	0 500	29-Sep-04	29-Sep-04	14:32	KJR	5 00
Mercury	SW 7470	49670	1	ND	C3	mg/L	0 000200	29-Sep-04	29-Sep-04	14:19	PJG	0 200
Selenium	SW 6010	49669	1	ND	C3	mg/L	0 200	29-Sep-04	29-Sep-04	14:32	KJR	1 00
Silver	SW 6010	49669	1	ND	C3	mg/L	0 500	29-Sep-04	29-Sep-04	14:32	KJR	5 00

8 parameter(s) reported

ND denotes Not Detected at or above the adjusted reporting limit.
DF denotes Dilution Factor of final sample PF denotes sample Prep Factor which accounts for a non-routine sample size
Reporting Limit is corrected for sample size, dilution and moisture content if applicable
Qu lists qualifiers. Specific qualifiers are defined at the end of the report
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
(1a) pH less than 2 0 or greater than 12.5 is hazardous for corrosivity.
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(1c) Reactive cyanide above 250 ppm is hazardous for reactivity
(1d) Reactive sulfide above 500 ppm is hazardous for reactivity.
Ethylene is a common synonym for the IUPAC standard ethene in all compounds with this functional group
methyl ethyl keytone is a synonym for 2-butanone
o,m,p-cresol are synonyms for 2,3 4-methylphenol respectively
Hexachlorobutadiene is hexachloro-1,3-butadiene

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/NW E 10266
LELAP (HELAP WW/HZ) - 02006
EOB - Certified Puerto Rico Chemist
U S Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U S Territories)

Pace Analytical™
New Orleans Laboratory

Report of Quality Control

Pace Analytical Services, Inc
1000 Riverbend Blvd. Suite F
Saint Rose LA 70087

Phone 504 469 0333
Fax 504 469 0555

Project No.: 2039229

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS %Rec	LCSD %Rec	LCS RPD	MS Spike	MS %Rec	MSD %Rec	(1)MS RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	RPD Max	Qu
Arsenic	49669	ND	1 00	mg/L	5000	113			5000	114	114	0		75 - 129	65 - 140	20	
Barium	49669	ND	1 00	mg/L	5000	114			5000	115	114	1		78 - 129	58 - 134	20	
Cadmium	49669	ND	0 100	mg/L	1000	111			1000	110	109	0		76 - 125	55 - 132	20	
Chromium	49669	ND	0 500	mg/L	5000	111			5000	113	113	1		81 - 129	62 - 137	20	
Lead	49669	ND	0 500	mg/L	5000	119			5000	116	116	0		79 - 131	56 - 134	20	
Selenium	49669	ND	0 200	mg/L	1000	106			1000	106	107	1		74 - 121	59 - 140	20	
Silver	49669	ND	0 500	mg/L	1000	111			1000	110	108	1		60 - 145	60 - 141	20	
Mercury	49670	ND	0 000200	mg/L	1	112			1	102	100	3		80 - 120	50 - 150	20	

#Error
ARL denotes Adjusted Reporting Limit corrected for sample size, dilution and moisture content as applicable.
* denotes recovery outside of QC limits
(1) MS RPD is calculated via SW-846 rules: on the basis of spiked sample concentrations rather than spike recoveries.

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E07595
Kansas Dept. of Health & Environment/ELW/HW - E 10266
LELAP (NELAP WW/HZ) - 02006
EOB - Certified Puerto Rico Chemist
U S Dept. of Agriculture Animal & Plant Health Inspection Services - Foreign Soil Import (U S Territories)

9/30/2004 11:13:35

Pace Analytical™
New Orleans Laboratory

Report Qualifiers

Pace Analytical Services, Inc
1000 Riverpond Blvd Suite F
Saint Rose LA 70067

Phone 504 469 0333
Fax 504 469 0555

Project No.: 2039229

Analyte Qualifiers

Qualifier	Qualifier Description
C3	The result for this parameter is not corrected for moisture content

9/30/2004 11:13:36

Laboratory Certifications:
Louisiana Dept. of Health and Hospitals (ELAP)/Drinking Water LA 030013
Florida Dept. of Health/Hazardous Waste - E87595
Kansas Dept. of Health & Environment/ELW/HW - E 10266
LELAP (NELAP WW/HZ) - 02006
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U S Dept. of Agriculture Animal & Plant Health Inspection Services
Foreign Soil Import (U S Territories)

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

September 27, 2007

Todd Harter
HONEYWELL SPECIALTY MATERIALS
P.O. Box 226
5525 Hwy 3115
Geismar, LA 70734

RE: Project: 2074104
RE: Project ID: Detection Monitoring

Dear Todd Harter:

Enclosed are the analytical results for sample(s) received by the laboratory on September 20, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Randy Shackelford

ACCREDITED IN ACCORDANCE WITH nelac

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, execpt in full, without the written consent of Pace Analytical Services, Inc.

Sample Cross Reference

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Client: HONEYWELL SPECIALTY MATERIALS

Project ID: Detection Monitoring

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
CLEARWELL WATER	20554258	Water	09/20/07 08:00	09/20/07 13:05
RESIDUE SLURRY	20554259	Water	09/20/07 08:00	09/20/07 13:05

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Project Narrative

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Sample Receipt Condition:

All samples were received in accordance with EPA protocol.

Holding Times:

All holding times were met.

Blanks:

The following blank results were above reporting limits:

Batch 91786 sample 20554471 Acetone

Laboratory Control Samples:

LCS recoveries outside of QC limits are qualified in the Report of Quality Control section.

Matrix Spikes and Duplicates:

MS or MSD recoveries outside of QC limits are qualified in the Report of Quality Control section.

Surrogates:

All surrogate recoveries were within QC limits.

Project Narrative

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
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St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Analytical Method	Batch	Sample used for QC
EPA 6010	91835	Batch sample from another client
EPA 8260	91786	Batch sample from another client
SM 4500-H B	91798	Batch sample from another client

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from the a different client was used.

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

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New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: CLEARWELL WATER
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554258
Matrix: Water
% Moisture: n/a
Description: None
Prep Level: Water
Batch: 91786
Method: 8260 VOAs Water

Collected: 20-Sep-07
Received: 20-Sep-07
Prepared: 24-Sep-07
Analyzed: 24-Sep-07 15:36 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit	Reg Limit
67-64-1	Acetone	1	A11,B	27.5	10.0	
107-13-1	Acrylonitrile	1		ND	20.0	
71-43-2	Benzene	1		ND	5.00	
74-97-5	Bromochloromethane	1		ND	5.00	
75-27-4	Bromodichloromethane	1		ND	5.00	
75-25-2	Bromoform	1		ND	5.00	
74-83-9	Bromomethane	1		ND	5.00	
78-93-3	2-Butanone (MEK)	1	A11	ND	10.0	
75-15-0	Carbon disulfide	1		ND	5.00	
56-23-5	Carbon tetrachloride	1		ND	5.00	
108-90-7	Chlorobenzene	1		ND	5.00	
75-00-3	Chloroethane	1		ND	5.00	
67-66-3	Chloroform	1		ND	5.00	
74-87-3	Chloromethane	1		ND	5.00	
96-12-8	1,2-Dibromo-3-chloropropane	1		ND	5.00	
124-48-1	Dibromochloromethane	1		ND	5.00	
106-93-4	1,2-Dibromoethane (EDB)	1		ND	5.00	
74-95-3	Dibromomethane	1		ND	5.00	
95-50-1	1,2-Dichlorobenzene	1		ND	5.00	
106-46-7	1,4-Dichlorobenzene	1		ND	5.00	
110-57-6	trans-1,4-Dichloro-2-butene	1		ND	5.00	
75-34-3	1,1-Dichloroethane	1		ND	5.00	
107-06-2	1,2-Dichloroethane	1		ND	5.00	
75-35-4	1,1-Dichloroethene	1		ND	5.00	
156-59-2	cis-1,2-Dichloroethene	1		ND	5.00	
156-60-5	trans-1,2-Dichloroethene	1		ND	5.00	
78-87-5	1,2-Dichloropropane	1		ND	5.00	
10061-01-5	cis-1,3-Dichloropropene	1		ND	5.00	
10061-02-6	trans-1,3-Dichloropropene	1		ND	5.00	
100-41-4	Ethylbenzene	1		ND	5.00	

9/27/2007 20:43:52

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical® New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: CLEARWELL WATER
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554258
Matrix: Water
% Moisture: n/a
Description: None
Prep Level: Water
Batch: 91786
Method: 8260 VOAs Water

Collected: 20-Sep-07
Received: 20-Sep-07
Prepared: 24-Sep-07
Analyzed: 24-Sep-07 15:36 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit	Reg Limit
591-78-6	2-Hexanone	1		ND	10.0	
74-88-4	Iodomethane	1		ND	5.00	
75-09-2	Methylene chloride	1	A11	ND	5.00	
108-10-1	4-Methyl-2-pentanone (MIBK)	1		ND	10.0	
100-42-5	Styrene	1		ND	5.00	
630-20-6	1,1,1,2-Tetrachloroethane	1		ND	5.00	
79-34-5	1,1,2,2-Tetrachloroethane	1		ND	5.00	
127-18-4	Tetrachloroethene	1		ND	5.00	
108-88-3	Toluene	1		ND	5.00	
[illegible]-55-6	1,1,1-Trichloroethane	1		ND	5.00	
79-00-5	1,1,2-Trichloroethane	1		ND	5.00	
79-01-6	Trichloroethene	1		ND	5.00	
75-69-4	Trichlorofluoromethane	1		ND	5.00	
96-18-4	1,2,3-Trichloropropane	1		ND	5.00	
108-05-4	Vinyl acetate	1		ND	10.0	
75-01-4	Vinyl chloride	1		ND	5.00	
	m&p-Xylene	1		ND	10.0	
95-47-6	o-Xylene	1		ND	5.00	

48 compound(s) reported

9/27/2007 20:43:52

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Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical® New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: RESIDUE SLURRY
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554259
Matrix: Water
% Moisture: n/a
Description: None
Prep Level: Water
Batch: 91786
Method: 8260 VOAs Water

Collected: 20-Sep-07
Received: 20-Sep-07
Prepared: 24-Sep-07
Analyzed: 24-Sep-07 15:57 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit	Reg Limit
67-64-1	Acetone	1	A11,B	21.5	10.0	
107-13-1	Acrylonitrile	1		ND	20.0	
71-43-2	Benzene	1		ND	5.00	
74-97-5	Bromochloromethane	1		ND	5.00	
75-27-4	Bromodichloromethane	1		ND	5.00	
75-25-2	Bromoform	1		ND	5.00	
74-83-9	Bromomethane	1		ND	5.00	
78-93-3	2-Butanone (MEK)	1	A11	ND	10.0	
75-15-0	Carbon disulfide	1		ND	5.00	
56-23-5	Carbon tetrachloride	1		ND	5.00	
108-90-7	Chlorobenzene	1		ND	5.00	
75-00-3	Chloroethane	1		ND	5.00	
67-66-3	Chloroform	1		ND	5.00	
74-87-3	Chloromethane	1		ND	5.00	
96-12-8	1,2-Dibromo-3-chloropropane	1		ND	5.00	
124-48-1	Dibromochloromethane	1		ND	5.00	
106-93-4	1,2-Dibromoethane (EDB)	1		ND	5.00	
74-95-3	Dibromomethane	1		ND	5.00	
95-50-1	1,2-Dichlorobenzene	1		ND	5.00	
106-46-7	1,4-Dichlorobenzene	1		ND	5.00	
110-57-6	trans-1,4-Dichloro-2-butene	1		ND	5.00	
75-34-3	1,1-Dichloroethane	1		ND	5.00	
107-06-2	1,2-Dichloroethane	1		ND	5.00	
75-35-4	1,1-Dichloroethene	1		ND	5.00	
156-59-2	cis-1,2-Dichloroethene	1		ND	5.00	
156-60-5	trans-1,2-Dichloroethene	1		ND	5.00	
78-87-5	1,2-Dichloropropane	1		ND	5.00	
10061-01-5	cis-1,3-Dichloropropene	1		ND	5.00	
10061-02-6	trans-1,3-Dichloropropene	1		ND	5.00	
100-41-4	Ethylbenzene	1		ND	5.00	

9/27/2007 20:43:53

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

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Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
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Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
Arkansas Dept. of Environmental Quality - LA050004
Florida Dept. of Health (NELAC) - E87595
Kansas Dept. of Health Environmental - E-10266
Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

Sample Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical® New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: RESIDUE SLURRY
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554259
Matrix: Water
% Moisture: n/a
Description: None
Prep Level: Water
Batch: 91786
Method: 8260 VOAs Water

Collected: 20-Sep-07
Received: 20-Sep-07
Prepared: 24-Sep-07
Analyzed: 24-Sep-07 15:57 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit	Reg Limit
591-78-6	2-Hexanone	1		ND	10.0	
74-88-4	Iodomethane	1		ND	5.00	
75-09-2	Methylene chloride	1	A11	ND	5.00	
108-10-1	4-Methyl-2-pentanone (MIBK)	1		ND	10.0	
100-42-5	Styrene	1		ND	5.00	
630-20-6	1,1,1,2-Tetrachloroethane	1		ND	5.00	
79-34-5	1,1,2,2-Tetrachloroethane	1		ND	5.00	
127-18-4	Tetrachloroethene	1		ND	5.00	
108-88-3	Toluene	1		ND	5.00	
[illegible]-55-6	1,1,1-Trichloroethane	1		ND	5.00	
79-00-5	1,1,2-Trichloroethane	1		ND	5.00	
79-01-6	Trichloroethene	1		ND	5.00	
75-69-4	Trichlorofluoromethane	1		ND	5.00	
96-18-4	1,2,3-Trichloropropane	1		ND	5.00	
108-05-4	Vinyl acetate	1		ND	10.0	
75-01-4	Vinyl chloride	1		ND	5.00	
	m&p-Xylene	1		ND	10.0	
95-47-6	o-Xylene	1		ND	5.00	

48 compound(s) reported

9/27/2007 20:43:53

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Sample Results

Pace Analytical Services, Inc.
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St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Pace Analytical® New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: CLEARWELL WATER
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554258
Matrix: Water
%Moisture: n/a
Description: None
Collected: 09/20/07
Received: 09/20/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Antimony	EPA 6010	91835	10	D2	ND	ug/L	600.	25-Sep-07	27-Sep-07 19:23	KJR	
Arsenic	EPA 6010	91835	10	D2	1620	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
Barium	EPA 6010	91835	10	D2	ND	ug/L	2000	25-Sep-07	27-Sep-07 19:23	KJR	
Beryllium	EPA 6010	91835	10	D2	238.	ug/L	50.0	25-Sep-07	27-Sep-07 19:23	KJR	
Cadmium	EPA 6010	91835	10	D2	111.	ug/L	50.0	25-Sep-07	27-Sep-07 19:23	KJR	
Chromium	EPA 6010	91835	10	D2	5940	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
Cobalt	EPA 6010	91835	10	D2	452.	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
Copper	EPA 6010	91835	10	D2	4710	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
[illegible]d	EPA 6010	91835	10	D2	260.	ug/L	50.0	25-Sep-07	27-Sep-07 19:23	KJR	
[illegible]el	EPA 6010	91835	10	D2	6740	ug/L	400.	25-Sep-07	27-Sep-07 19:23	KJR	
Selenium	EPA 6010	91835	10	D2	ND	ug/L	350.	25-Sep-07	27-Sep-07 19:23	KJR	
Silver	EPA 6010	91835	10	D2	ND	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
Thallium	EPA 6010	91835	10	D2	ND	ug/L	100.	25-Sep-07	27-Sep-07 19:23	KJR	
Vanadium	EPA 6010	91835	10	D2	1800	ug/L	500.	25-Sep-07	27-Sep-07 19:23	KJR	
Zinc	EPA 6010	91835	10	D1	24400	ug/L	200.	25-Sep-07	27-Sep-07 19:23	KJR	

15 parameter(s) reported

9/27/2007 20:43:56

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Sample Results

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Phone: 504.469.0333
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LELAP # 02006

Pace Analytical®
New Orleans Laboratory

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: RESIDUE SLURRY
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554259
Matrix: Water
%Moisture: n/a
Description: None
Collected: 09/20/07
Received: 09/20/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
Antimony	EPA 6010	91835	10	D2	ND	ug/L	600.	25-Sep-07	27-Sep-07 19:28	KJR	
Arsenic	EPA 6010	91835	10	D2	1490	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
Barium	EPA 6010	91835	10	D2	ND	ug/L	2000	25-Sep-07	27-Sep-07 19:28	KJR	
Beryllium	EPA 6010	91835	10	D2	279.	ug/L	50.0	25-Sep-07	27-Sep-07 19:28	KJR	
Cadmium	EPA 6010	91835	10	D2	123.	ug/L	50.0	25-Sep-07	27-Sep-07 19:28	KJR	
Chromium	EPA 6010	91835	10	D2	7020	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
Cobalt	EPA 6010	91835	10	D2	518.	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
Copper	EPA 6010	91835	10	D2	5340	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
[illegible]d	EPA 6010	91835	10	D2	274.	ug/L	50.0	25-Sep-07	27-Sep-07 19:28	KJR	
[illegible]el	EPA 6010	91835	10	D2	7700	ug/L	400.	25-Sep-07	27-Sep-07 19:28	KJR	
Selenium	EPA 6010	91835	10	D2	ND	ug/L	350.	25-Sep-07	27-Sep-07 19:28	KJR	
Silver	EPA 6010	91835	10	D2	ND	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
Thallium	EPA 6010	91835	10	D2	ND	ug/L	100.	25-Sep-07	27-Sep-07 19:28	KJR	
Vanadium	EPA 6010	91835	10	D2	2110	ug/L	500.	25-Sep-07	27-Sep-07 19:28	KJR	
Zinc	EPA 6010	91835	10	D1	27000	ug/L	200.	25-Sep-07	27-Sep-07 19:28	KJR	

15 parameter(s) reported

9/27/2007 20:43:56

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Sample Results

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Phone: 504.469.0333
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LELAP # 02006

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: CLEARWELL WATER
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554258
Matrix: Water
%Moisture: n/a
Description: None
Collected: 09/20/07
Received: 09/20/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
pH	SM 4500-H	91798	1		1.62	Std. Units		21-Sep-07	21-Sep-07 16:50	TAE	

1 parameter(s) reported

9/27/2007 20:43:59

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
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Sample Results

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Phone: 504.469.0333
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LELAP # 02006

Client: HONEYWELL SPECIALTY MATERIALS

Client ID: RESIDUE SLURRY
Project: 2074104
Project ID: Detection Monitoring
Site: None
Lab ID: 20554259
Matrix: Water
%Moisture: n/a
Description: None
Collected: 09/20/07
Received: 09/20/07

Analyte	Method	Batch	DF	Qu	Result	Units	Reporting Limit	Prep.	Analysis		Reg. Limit
pH	SM 4500-H	91798	1		1.74	Std. Units		21-Sep-07	21-Sep-07 16:50	TAE	

1 parameter(s) reported

9/27/2007 20:43:59

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
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Organics Quality Control

Pace Analytical®
New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Method: EPA 8260

Project: 2074104 **LCS:** 20554472 9/24/2007 11:41:00 AM

Batch: 91786 **MS:** 20554473 9/24/2007 12:46:00 PM

Units: ug/L **Original for MS:** 2055281 Batch Sample

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Acetone	50	80.57	161	50	482.40	526.6	496.6	88	28	6	22 - 165	11 - 171	20	\11,Q
Acrylonitrile	150	127.8	85	150	0.00	144.3	141.3	96	94	2	10 - 150	10 - 150	20	Q5
Benzene	50	52.8	106	50	0.00	54.71	54.66	109	109	0	70 - 135	60 - 144	20	Q5
Bromochloromethane	50	54.76	110	50	0.00	56.72	58.18	113	116	3	57 - 146	59 - 141	20	Q5
Bromodichloromethane	50	62.7	125	50	0.00	64.81	64.74	130	130	0	61 - 156	59 - 156	20	Q5
Bromoform	50	87.95	176 *	50	0.00	88.96	89.09	178 *	178 *	0	56 - 154	50 - 153	20	Q5,Q1
Bromomethane	50	54.5	109	50	0.00	52.58	52.85	105	106	1	44 - 158	37 - 165	20	Q5
2-Butanone (MEK)	50	69.26	139	50	0.00	77.4	72.63	155	145	6	32 - 157	20 - 168	20	\11,Q
Carbon disulfide	50	38.43	77	50	0.00	37.78	39.05	76	78	3	40 - 147	36 - 152	20	Q5
Carbon tetrachloride	50	55.66	111	50	0.00	59.08	57.18	118	114	3	50 - 166	44 - 170	20	Q5
Chlorobenzene	50	57.78	116	50	0.00	58.08	58.54	116	117	1	73 - 129	67 - 134	20	Q5
Chloroethane	50	71.27	143	50	0.00	59.6	57.06	119	114	4	38 - 163	34 - 170	20	Q5
Chloroform	50	51.8	104	50	0.00	53.45	52.91	107	106	1	71 - 133	64 - 140	20	Q5
Chloromethane	50	73.12	146	50	0.00	68.99	69.09	138	138	0	32 - 149	22 - 163	20	Q5
1,2-Dibromo-3-chloropropa	50	66.46	133	50	0.00	71.87	75.26	144	151 *	5	34 - 145	28 - 150	20	Q5
bromochloromethane	50	72.53	145	50	0.00	74.6	77.03	149 *	154 *	3	63 - 147	58 - 147	20	Q5,Q1
1,2-Dibromoethane (EDB)	50	66.78	134	50	0.00	70.18	70.01	140	140	0	60 - 147	55 - 149	20	Q5
Dibromomethane	50	63.91	128	50	0.00	68	67.66	136	135	1	60 - 147	56 - 148	20	Q5
1,2-Dichlorobenzene	50	54.96	110	50	0.00	55.56	57.78	111	116	4	67 - 135	61 - 139	20	Q5
1,4-Dichlorobenzene	50	52.84	106	50	0.00	54.01	55.1	108	110	2	66 - 133	64 - 133	20	Q5
trans-1,4-Dichloro-2-butene	100	116.5	117	100	0.00	123.8	125.8	124	126	2	17 - 178	21 - 164	20	Q5
1,1-Dichloroethane	50	43.62	87	50	0.00	45.08	45.66	90	91	1	64 - 135	59 - 142	20	Q5
1,2-Dichloroethane	50	59.51	119	50	0.00	63.41	62.92	127	126	1	53 - 164	51 - 161	20	Q5
1,1-Dichloroethene	50	44.26	89	50	0.00	44.34	44.92	89	90	1	51 - 143	44 - 152	20	Q5
cis-1,2-Dichloroethene	50	44.63	89	50	0.00	45.54	45.58	91	91	0	59 - 139	56 - 145	20	Q5
trans-1,2-Dichloroethene	50	43.3	87	50	0.00	44.91	44.92	90	90	0	59 - 139	56 - 145	20	Q5
1,2-Dichloropropane	50	55.68	111	50	0.00	57.37	57.5	115	115	0	69 - 135	66 - 138	20	Q5
cis-1,3-Dichloropropene	50	62.09	124	50	0.00	62.44	63.54	125	127	2	66 - 141	58 - 142	20	Q5
trans-1,3-Dichloropropene	50	63.07	126	50	0.00	65.13	64.14	130	128	2	57 - 150	50 - 151	20	Q5
Ethylbenzene	50	52.7	105	50	0.00	53.11	53.69	106	107	1	67 - 132	58 - 138	20	Q5
2-Hexanone	50	56.36	113	50	0.00	59.79	56.93	120	114	5	36 - 154	25 - 163	20	Q5
Iodomethane	50	47.37	95	50	0.00	48.7	49.03	97	98	1	43 - 159	36 - 160	20	Q5
Methylene chloride	50	42.56	85	50	120.70	151.3	153.9	61	66	2	29 - 159	19 - 158	20	\11,Q
4-Methyl-2-pentanone (MI	50	60.22	120	50	0.00	64.43	64.83	129	130	1	13 - 162	10 - 157	20	Q5
Styrene	50	58.35	117	50	0.00	58.09	58.01	116	116	0	71 - 134	54 - 144	20	Q5
1,1,1,2-Tetrachloroethane	50	65.1	130	50	0.00	65.84	66.12	132	132	0	73 - 146	65 - 150	20	Q5

* denotes recovery outside of QC limits.

9/27/2007 20:44:02

MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
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Organics Quality Control

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Phone: 504.469.0333
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LELAP # 02006

Method: EPA 8260

Project: 2074104 **LCS:** 20554472 9/24/2007 11:41:00 AM

Batch: 91786 **MS:** 20554473 9/24/2007 12:46:00 PM

Units: ug/L **Original for MS:** 2055281 Batch Sample

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
1,1,2,2-Tetrachloroethane	50	66.55	133	50	0.00	71.8	73.65	144	147 *	3	50 - 142	46 - 145	20	Q5
Tetrachloroethene	50	59.76	120	50	0.00	57.6	57.67	115	115	0	42 - 156	39 - 151	20	Q5
Toluene	50	53.96	108	50	1.49	56.07	56.3	109	110	0	72 - 132	64 - 139	20	Q5
1,1,1-Trichloroethane	50	52.87	106	50	0.00	55.09	53.77	110	108	2	65 - 136	59 - 141	20	Q5
1,1,2-Trichloroethane	50	64.75	130	50	0.00	66.3	66.46	133	133	0	67 - 144	60 - 146	20	Q5
Trichloroethene	50	56.01	112	50	0.00	57.35	57.69	115	115	1	69 - 136	61 - 141	20	Q5
Trichlorofluoromethane	50	66.08	132	50	0.00	42.75	56.85	86	114	28 *	42 - 161	38 - 160	20	Q5
1,2,3-Trichloropropane	50	64.89	130	50	0.00	68.04	70.69	136	141	4	52 - 152	51 - 151	20	Q5
Vinyl acetate	50	44.13	88	50	0.00	43.68	42.3	87	85	3	21 - 190	10 - 185	20	Q5
Vinyl chloride	50	59.1	118	50	0.00	54.7	58.12	109	116	6	40 - 146	28 - 161	20	Q5
m&p-Xylene	100	106.3	106	100	0.00	107.4	108.5	107	109	1	70 - 129	66 - 132	20	Q5
o-Xylene	50	53.71	107	50	0.00	53.98	54.43	108	109	1	70 - 129	66 - 132	20	Q5

48 compound(s) reported

* denotes recovery outside of QC limits.

9/27/2007 20:44:02

MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
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Pennsylvania DEP (NELAC) 68-04202
U.S. Dept. of Agricultural Foreign Soil Permit - S-47270

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New Orleans Laboratory

Surrogate Recovery

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Batch: 91786 **Project:** 2074104

Lab ID	Sample ID	Qu	Sur 1 %Rec	Sur 2 %Rec	Sur 3 %Rec	Sur 4 %Rec	Sur 5 %Rec	Sur 6 %Rec	Sur 7 %Rec	Sur 8 %Rec
20554471	91786 BLANK 1		114	104	89					
20555041	91786 BLANK 2		110	104	90					
20554472	91786 LCS 1		95	86	93					
20555042	91786 LCS 2		92	86	92					
20554258	CLEARWELL WATE		124	101	90					
20554473	GP-07-255-SB-1 (3-5)		100	88	93					
20554474	GP-07-255-SB-1 (3-5)		103	85	92					
20554259	RESIDUE SLURRY		117	103	91					
	QC limits:		71-129	68-124	74-122					

Sur 1: 4-Bromofluorobenzene (S)
Sur 2: Dibromofluoromethane (S)
Sur 3: Toluene-d8 (S)

* denotes surrogate recovery outside of QC limits.
D denotes surrogate recovery is outside of QC limits due to sample dilution, and is not considered an excursion.

9/27/2007 20:44:05

Louisiana Dept. of Environmental Quality (LELAP) - 02006
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Organics Method Blank

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1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Blank ID: 91786 BLANK 1 **Project:** 2074104

Lab ID: 20554471

Description: 8260 VOAs Full List Water BLK **Prep Level:** Water **Batch:** 91786

Method: Water EPA 8260

Prepared: 24-Sep-07 **Analyzed:** 24-Sep-07 0:00 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit
67-64-1	Acetone	1	A11	11.1	10.0
107-13-1	Acrylonitrile	1		ND	20.0
71-43-2	Benzene	1		ND	5.00
108-86-1	Bromobenzene	1		ND	5.00
74-97-5	Bromochloromethane	1		ND	5.00
75-27-4	Bromodichloromethane	1		ND	5.00
75-25-2	Bromoform	1		ND	5.00
74-83-9	Bromomethane	1		ND	5.00
78-93-3	2-Butanone (MEK)	1	A11	ND	10.0
104-51-8	n-Butylbenzene	1		ND	5.00
135-98-8	sec-Butylbenzene	1		ND	5.00
98-06-6	tert-Butylbenzene	1		ND	5.00
75-15-0	Carbon disulfide	1		ND	5.00
56-23-5	Carbon tetrachloride	1		ND	5.00
108-90-7	Chlorobenzene	1		ND	5.00
75-00-3	Chloroethane	1		ND	5.00
67-66-3	Chloroform	1		ND	5.00
74-87-3	Chloromethane	1		ND	5.00
95-49-8	2-Chlorotoluene	1		ND	5.00
106-43-4	4-Chlorotoluene	1		ND	5.00
96-12-8	1,2-Dibromo-3-chloropropane	1		ND	5.00
124-48-1	Dibromochloromethane	1		ND	5.00
106-93-4	1,2-Dibromoethane (EDB)	1		ND	5.00
74-95-3	Dibromomethane	1		ND	5.00
95-50-1	1,2-Dichlorobenzene	1		ND	5.00
541-73-1	1,3-Dichlorobenzene	1		ND	5.00
106-46-7	1,4-Dichlorobenzene	1		ND	5.00
110-57-6	trans-1,4-Dichloro-2-butene	1		ND	5.00
75-71-8	Dichlorodifluoromethane	1		ND	5.00
75-34-3	1,1-Dichloroethane	1		ND	5.00

9/27/2007 20:44:08

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

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St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Blank ID: 91786 BLANK 1 **Project:** 2074104

Lab ID: 20554471

Description: 8260 VOAs Full List Water BLK **Prep Level:** Water **Batch:** 91786

Method: Water EPA 8260

Prepared: 24-Sep-07 **Analyzed:** 24-Sep-07 0:00 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit
107-06-2	1,2-Dichloroethane	1		ND	5.00
75-35-4	1,1-Dichloroethene	1		ND	5.00
156-59-2	cis-1,2-Dichloroethene	1		ND	5.00
156-60-5	trans-1,2-Dichloroethene	1		ND	5.00
78-87-5	1,2-Dichloropropane	1		ND	5.00
142-28-9	1,3-Dichloropropane	1		ND	5.00
594-20-7	2,2-Dichloropropane	1		ND	5.00
563-58-6	1,1-Dichloropropene	1		ND	5.00
10061-01-5	cis-1,3-Dichloropropene	1		ND	5.00
10061-02-6	trans-1,3-Dichloropropene	1		ND	5.00
100-41-4	Ethylbenzene	1		ND	5.00
87-68-3	Hexachloro-1,3-butadiene	1		ND	5.00
591-78-6	2-Hexanone	1		ND	10.0
74-88-4	Iodomethane	1		ND	5.00
98-82-8	Isopropylbenzene (Cumene)	1		ND	5.00
99-87-6	p-Isopropyltoluene	1		ND	5.00
75-09-2	Methylene chloride	1	A11	ND	5.00
108-10-1	4-Methyl-2-pentanone (MIBK)	1		ND	10.0
1634-04-4	Methyl-tert-butyl ether	1		ND	5.00
91-20-3	Naphthalene	1		ND	5.00
103-65-1	n-Propylbenzene	1		ND	5.00
100-42-5	Styrene	1		ND	5.00
630-20-6	1,1,1,2-Tetrachloroethane	1		ND	5.00
79-34-5	1,1,2,2-Tetrachloroethane	1		ND	5.00
127-18-4	Tetrachloroethene	1		ND	5.00
108-88-3	Toluene	1		ND	5.00
87-61-6	1,2,3-Trichlorobenzene	1		ND	5.00
120-82-1	1,2,4-Trichlorobenzene	1		ND	5.00
71-55-6	1,1,1-Trichloroethane	1		ND	5.00
79-00-5	1,1,2-Trichloroethane	1		ND	5.00

9/27/2007 20:44:09

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
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Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

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Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Blank ID: 91786 BLANK 1 **Project:** 2074104

Lab ID: 20554471

Description: 8260 VOAs Full List Water BLK **Prep Level:** Water **Batch:** 91786

Method: Water EPA 8260

Prepared: 24-Sep-07 **Analyzed:** 24-Sep-07 0:00 RMP

Units: ug/L

CAS Number	Analyte	Dilution	Qu	Result	Reporting Limit
79-01-6	Trichloroethene	1		ND	5.00
75-69-4	Trichlorofluoromethane	1		ND	5.00
96-18-4	1,2,3-Trichloropropane	1		ND	5.00
95-63-6	1,2,4-Trimethylbenzene	1		ND	5.00
108-67-8	1,3,5-Trimethylbenzene	1		ND	5.00
108-05-4	Vinyl acetate	1		ND	10.0
75-01-4	Vinyl chloride	1		ND	5.00
	m&p-Xylene	1		ND	10.0
95-47-6	o-Xylene	1		ND	5.00

69 compound(s) reported

9/27/2007 20:44:09

ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MDL denotes method detection limit

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
For moisture results, wet denotes result is not corrected for moisture and n/a denotes not applicable.
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Inorganics Quality Control

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New Orleans Laboratory

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Antimony	91835	ND	60.0	ug/L	1000	1070	107	1000	2.94	1052	1077	105	107	2		78 - 128	51 - 146	20	
Arsenic	91835	ND	10.0	ug/L	1000	1059	106	1000	0.00	1039	1061	104	106	2		79 - 122	68 - 130	20	
Barium	91835	ND	100.	ug/L	1000	1129	113	1000	7.30	1108	1123	110	112	1		80 - 120	56 - 133	20	
Beryllium	91835	ND	5.00	ug/L	1000	1105	111	1000	0.00	1084	1091	108	109	1		81 - 118	66 - 129	20	
Cadmium	91835	ND	5.00	ug/L	1000	1073	107	1000	0.08	1038	1053	104	105	1		81 - 119	44 - 146	20	
Chromium	91835	ND	10.0	ug/L	1000	1058	106	1000	1.38	1020	1032	102	103	1		81 - 120	58 - 135	20	
Cobalt	91835	ND	10.0	ug/L	1000	1103	110	1000	0.55	1072	1087	107	109	1		82 - 120	63 - 123	20	
Copper	91835	ND	10.0	ug/L	1000	1084	108	1000	13.03	1125	1138	111	113	1		77 - 123	62 - 136	20	
Lead	91835	ND	5.00	ug/L	1000	1076	108	1000	0.03	1038	1062	104	106	2		79 - 122	58 - 131	20	
Nickel	91835	ND	40.0	ug/L	1000	1107	111	1000	0.93	1070	1090	107	109	2		80 - 121	57 - 129	20	
Selenium	91835	ND	35.0	ug/L	1000	1073	107	1000	0.00	1043	1062	104	106	2		76 - 120	59 - 131	20	
Silver	91835	ND	10.0	ug/L	500	556.5	111	500	0.00	544.7	552.8	109	111	1		67 - 129	10 - 154	20	
Thallium	91835	ND	10.0	ug/L	1000	1102	110	1000	0.00	1054	1072	105	107	2		75 - 122	47 - 133	20	
Vanadium	91835	ND	50.0	ug/L	1000	1099	110	1000	2.25	1075	1088	107	109	1		81 - 120	66 - 129	20	
Zinc	91835	ND	20.0	ug/L	1000	1102	110	1000	67.18	1149	1164	108	110	1		78 - 124	51 - 139	20	

9/27/2007 20:44:12

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
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Inorganics Quality Control

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St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Parameter	Batch	Blank	ARL	Units	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	MSD RPD	DUP RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
pH	91798			1. Units	6	5.95	99		6.60						0	97 - 103	-	20	

* denotes recovery outside of QC limits.
ND denotes Not Detected at or above the adjusted reporting limit or PQL.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

9/27/2007 20:44:15

Louisiana Dept. of Environmental Quality (LELAP) - 02006
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Qualifier Summary

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose , LA 70087

Phone: 504.469.0333
Fax: 504.469.0555
LELAP # 02006

Project: 2074104

Qualifier	Qualifier Description
A11	This analyte is a common solvent. Its presence in field samples may be an artifact of sample collection, transport, laboratory storage or analysis.
B	This analyte was detected in the method blank.
D1	The analysis was performed at a dilution due to the high analyte concentration.
D2	The analysis was performed at a dilution due to the presence of matrix interferences.
Q1	The matrix spike recoveries are poor. Acceptable method performance for this analyte has been demonstrated by the laboratory control sample recovery.
Q10	The spike recovery was above the laboratory QC limits, however, the data are reported without qualification since the target analyte was not detected in the corresponding samples.
Q5	Insufficient sample was provided to perform matrix spike analyses on any sample in this analytical batch. Method performance for this analyte has been demonstrated by the laboratory control sample recovery.

Louisiana Dept. of Environmental Quality (LELAP) - 02006
Louisiana Dept. of Health and Hospitals / Drinking Water - LA050004
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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2074104

Page: of

1120641

Section A Required Client Information:
Company: HONEYWELL GELSMAR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:
Report To:
Copy To:
Purchase Order No.:
Project Name: HISTACK · DISTRIBUTION MONITORING TASK 1
Project Number:

Section C Invoice Information:
Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER
Site Location STATE:

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	8260 VOA	6010 METALS	HCL	TLP METALS (RCRA)	1311/6010	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	CLEARWELL WATER	WW				9/20/07	8:00		5	1		1	~~1~~						1	1	1				20554258
2	RESIDUE SLURRY	WW				9/20/07	8:00		5	1		1	~~1~~						1	1	1				299
3	FURNACE RESIDUE	SL				9/20/07	8:00		1	1										1		1			
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
FOR LIST OF PARAMETERS	S Todd Harter	9/20/07	8:30	Pace	9/20/07	0850				
SEE PROFILE		9/20/07	1305	N/mellu / Pace	9/20/07	1305	39	Y	N	Y
3535-1										

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: S Todd Harter
SIGNATURE of SAMPLER: S Todd Harter
DATE Signed (MM/DD/YY): 9/20/07

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ATTACHMENT 12
Preliminary Closure Plan

PRELIMINARY CLOSURE PLAN
HONEYWELL
FLUOROGYPSUM STACKING FACILITY
GEISMAR, LOUISIANA

Calcium sulfate is currently harvested from the facility to meet existing demands. The material is removed from the stabilized stacks after an appropriate curing time. At this time it is anticipated that upon cessation of plant operations, aggressive recycling of material from the stacking facility will continue until all material is reclaimed and clean closure of the site can be demonstrated. The time period for completion of recycling operations will be dependent upon the demand for material at the time of closure. Upon the completion of recycling activities and the attainment of clean closure, the site will be returned to regional topography with fill material where needed and seeded vegetative cover to inhibit erosion. The facility's run-off diversion system will be maintained until all available material is harvested and closure is completed.

The storage water from the clearwells will be pumped to the lime treatment unit prior to being discharged to the Mississippi River in accordance with Honeywell's LPDES Permit. The facility's clearwells will be restored by removal of deposited material for placement in the stacking facility.

The starter dike levees surrounding areas of the stacking facility will be graded to provide fill material as needed for depression areas, prevent ponding of rainwater, and promote natural drainage across restored clearwells and stacking areas.

Fluorogypsum Stacking Facility
Clean Closure Operation and Maintenance Estimate[1]

Mining Operations

Total Fluorogypsum Volume to be Mined[2]	11,000,000 yds^3
Annual Mining Rate[3]	670,730 yds^3
Estimated Mining Period to Clean Closure	16.40 years

"Post Closure" Activites[4]

Annual Operation and Maintenance Activities

Wastewater Treatment Plant O/M[5]	$	250,000	per year
Fluorogypsum Stacking O/M[6]	$	250,000	per year
Annual Inspection of the Facility	$	2,000	per year
Subtotal Annual Operation and Maintenance Activities	*$*	*502,000*	

"Post Closure" Groundwater Monitoring

Annual Groundwater Monitoring (for 30 years)[7]	$	60,000	per year
Quarterly Monitoring		$20,000	per year
Analytical		$20,000	per year
Semi-Annual Reporting		$20,000	per year
Subtotal for "Post Closure" Groundwater Monitoring	*$*	*1,800,000*	

Closure Activities

Cut/Fill and Seeding/Mulching Activites[8]	$	3,000,000	one-time
P/A Monitoring Wells	$	40,000	one-time
Final Closure Plan	$	20,000	one-time
Subtotal Closure Activities	*$*	*3,060,000*	

Closure Cost Estimate

Description of the Activity	Unit Cost ($)	Unit	No. of Units	Total Cost ($)
Annual Operation and Maintenance Activities (Fluorogypsum O/M) for the estimated mining period of 16 years	$ 502,000	years	16.40	$ 8,232,821
"Post Closure" Groundwater Monitoring	$ 60,000	years	30	$ 1,800,000
Closure Activities	$ 3,060,000	one-time	-	$ 3,060,000
			Total Closure Estimate	**$ 13,092,821**

Notes:

Cost Estimate performed on September 30, 2007

[1] - This cost estimate is based on 2007 dollars

[2] - Mining operations based on the following fluorogypsum capacity:
5.4 million cubic yards in Main Clearwell, Aux Clearwells, Stack 3, Stack 4, Stack 5, Stack 5A, and Stack 6
2.8 million cubic yards in Stack 7A/7B

[3] - Based on milling take rate of 670,730 cubic yards per year

[4] - With the term "**Post Closure**" Honeywell refers to the time period from the fluorogypsum facility ceases to accept waste and until such time when all the fluorogypsum has been reclaimed by the mining activities and clean closure of the facility has been demonstrated.
For the purposes of this cost estimate, "Post Closure" period is assumed to be 30 years.

[5] - Wastewater treatment estimate is based on the following 2006 data:
Wastewater Treatment Plant Operation Budget - $1,300,000
During the time that post closure the wastewater treatment plant will only be operated to treat stack leachate.
It is estimated that the plant will be operated only 25% of the year.
Storm water will be discharged separately from leachate.

[6] - Fluorogypsum stacking O/M estimate is based on the following 2006 data:
Fluorogypsum Stack Budget - $1,300,000
During post closure the stacking of residue will be discontinued however drainage, piping, and miscellaneous issues involving water management will occur and will need to be handled on a year by year basis.

[7] - Annual groundwater monitoring estimate is based on the following groundwater monitoring and reporting 2006 data:
Quarterly Monitoring Cost - $20,000
Semi-Annual Reporting Cost - $20,000
Analytical Cost - $20,000

[8] - Cut/fill and seeding/mulching activities cost is based on 145 acres of fluorogypsum stacking area.

Fluorogypsum Stacking Facility
Closure and Post Closure Cost Estimate Meeting Requirements of LAC 33:VII.711.E.3

Task	Unit	Quantity	Cost per Unit[1] ($)	Total Cost ($)
Notify the Assistant Secretary of intent to commence closure	LS	1	0	$ -
Draining of the clearwells	LS	1	$ 150,000	$ 150,000.00
Final grading before placement of cap	acre	145	$ 1,000	$ 145,000.00
Cover material[2]	ft^3	22,518,517	$ 0.48	$ 10,808,888.16
Placement of final cover[3]	acre	148	$ 6,200	$ 915,697.30
Seeding and mulching	acre	148	$ 2,000	$ 295,386.23
Closure certification preparation	LS	1	$ 35,000	$ 35,000.00
			Total Closure Estimate	**$ 12,349,971.69**
Annual Groundwater Monitoring (for 30 years)				
Quarterly Monitoring	annual	30	$ 20,000	$ 600,000.00
Analytical	annual	30	$ 20,000	$ 600,000.00
Semi-Annual Reporting	annual	30	$ 20,000	$ 600,000.00
			Subtotal Annual Groundwater Monitoring	*$ 1,800,000.00*
Annual Inspection of the Facility	annual	30	$ 2,000	$ 60,000.00
			Subtotal Annual Inspection of the Facility	*$ 60,000.00*
			Total Post-Closure Estimate	**$ 1,860,000.00**
			Total Closure and Post-Closure Estimate	**$ 14,209,971.69**

Notes:

Cost Estimate performed on September 30, 2007

[1] - Based on 2007 RS Means Cost Data and other available current 2007 pricing

[2] - Includes testing of the borrow material

[3] - Includes 2-ft of recompacted clay with a permeability of less than $1x10^{-7}$ cm/sec and 6 inches of topsoil

CLOSURE NOTIFICATION DOCUMENT

DRAFT
TO BE REVISED

Clerk of Court
Ascension Parish
P.O. Box 192
Donaldsonville, Louisiana 70346

RE: Fluorogypsum Stacking Facility Closure Letter, Facility ID Number GD-005-0313, Agency of Interest No. 2082, Permit P-0216, Honeywell International Inc., Geismar, LA.

Dear Sir or Madam:

On , , , we will formally close our Fluorogypsum Stacking Facility located northwest of Geismar and southeast of the intersection of La Hwys. 30 and 3115. per the approval of the Louisiana Department of Environmental Quality, Office of Environmental Services, Permits Division.

This facility is located or property at Township 9 south, Range 2 east, Sections 37, 38, 39, 40, 41, 42 and 55, Ascension Parish, Louisiana.

This land is zone rural and will continue to be used for industrial purposes.

Respectfully

/sth

ATTACHMENT 13
Construction QA/QC Plan

CONSTRUCTION QUALITY ASSURANCE PLAN
FOR HF GYPSUM STACK 7A
EARTHWORK, LINER AND DRAIN SYSTEM

HONEYWELL – GEISMAR FACILITY
ASCENSION PARISH, LOUISIANA

Prepared For:
Honeywell International, Inc.
Specialty Materials

Prepared By:
Ardaman and Associates, Inc.
8008 S. Orange Ave., Orlando, FL 32809

11/28/07

Nadim F. Fuleihan, Sc.D, P.E.
Louisiana Registration No. 20978

CONSTRUCTION QUALITY ASSURANCE PLAN
FOR HF GYPSUM STACK 7A
EARTHWORK, LINER AND DRAIN SYSTEM

HONEYWELL – GEISMAR FACILITY
ASCENSION PARISH, LOUISIANA

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 DEFINITION OF TERMS 1
3.0 LINER CRITERIA 2
4.0 CERTIFICATION 2
5.0 SCOPE OF CQA ACTIVITIES 3
6.0 APPLICABLE DOCUMENTS 3
7.0 POR SUBMITTALS 6
8.0 LINES AND GRADES 7
9.0 SITE PREPARATION 7
10.0 EARTH FILL 7
11.0 CLAY LINER 8
12.0 GEOTEXTILE AND HDPE GEONET 11
13.0 CORRUGATED HDPE PIPE AND FITTINGS 16
14.0 AGGREGATES 18
15.0 PRESSURE RATED HDPE PIPE AND FITTINGS 20
16.0 CONCRETE EROSION CONTROL MAT 22
17.0 CONSTRUCTION MEETINGS 23
18.0 CONSTRUCTION CERTIFICATION REPORT (CCR) 23

CONSTRUCTION QUALITY ASSURANCE PLAN
FOR HF GYPSUM STACK 7A
EARTHWORK, LINER AND DRAIN SYSTEM

HONEYWELL – GEISMAR FACILITY
ASCENSION PARISH, LOUISIANA

1.0 INTRODUCTION

1.1 This Construction Quality Assurance (CQA) Plan has been prepared to provide the Owner, Design Engineer, Construction Quality Assurance Professional of Record, and the Contractor the means that govern the construction quality of the earthwork, compacted clay liner and drain system for Stack 7A in accordance with the Construction Plans, the Technical Specifications, and as specified herein and to satisfy the environmental protection requirements under the current Louisiana Department of Environmental Quality (LDEQ) Office of Environmental Services Rules and Regulations.

1.2 The CQA Professional of Record will be responsible for implementing the CQA Plan and will submit a certification report to the LDEQ at the completion of the project.

2.0 DEFINITION OF TERMS

The terms used in this CQA Plan shall be interpreted and understood as follows:

2.1 The term "ASTM" means ASTM International (formerly American Society for Testing and Materials).

2.2 The term "Construction Quality Assurance (CQA)" is hereby defined as meaning a planned system of activities that provides the OWNER and permitting agency assurance that the earthwork, liner and drain systems were constructed as specified in the Technical Specifications and presented in the Construction Plans. CQA includes observations and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility. CQA refers to measures taken by the CQA organization to assess if the installer or contractor is in compliance with the Technical Specifications and Construction Plans for this project.

2.3 The term "Construction Certification Report (CCR)" is hereby defined as meaning the construction report prepared and sealed by the "CQA Professional of Record (POR)" and submitted to the LDEQ.

2.4 The term "CQA Professional of Record (POR)" is hereby defined as an authorized representative of the OWNER, who has overall responsibility for construction quality assurance and confirming that the facility was constructed in general accordance with Technical Specifications and Construction Plans approved by the permitting agency. The POR shall be registered as a Civil Engineer in the State of Louisiana and experienced in geotechnical testing and its interpretations. Experience and education shall include geotechnical engineering, engineering geology, soil mechanics, geotechnical laboratory testing, construction quality assurance, and quality control testing, and hydrogeology. The POR must show competency and experience in certifying like installations and be approved by the permitting agency, and presently employed by or practicing as a geotechnical engineer in a recognized geotechnical/environmental engineering organization. The credentials of the POR must meet or exceed the minimum requirements of the permitting agency. Any references to monitoring, testing, or observations to be performed by the POR should be interpreted to mean the POR or a CQA Monitor working under the POR's direction. The POR is also referred to herein as the "Engineer".

2.5 The term "CQA Monitor" denotes a representative of the Engineer who works under the direct supervision of the Engineer and reports directly to the Engineer. The CQA Monitor will be onsite full-time during construction to monitor quality assurance and perform onsite tests and observations.

2.6 The term "Contract Documents" is hereby defined as meaning the official set of documents issued by the OWNER. The documents include bidding requirements, contract forms, contract conditions, contract specifications, contract drawings or plans, addenda, and contract modifications.

2.7 The term "Contract Specifications" is hereby defined as meaning the qualitative requirements for products, materials, and workmanship upon which the contract is based. The terms "Technical Specifications" (or "Specifications") may be used interchangeably throughout this document.

2.8 The term "Contract Drawings" is hereby defined as meaning all project related Drawings and Plans including design modifications.

2.9 The term "Contractor" is hereby defined as meaning the entity awarded the contract to furnish the materials and perform the work as described by the Contract Documents, the Technical Specifications, Construction Plans, and this CQA Plan.

2.10 The term "Design Engineer" denotes the individuals or firms responsible for the design and preparation of the project Construction Plans and Technical Specifications.

2.11 The term "Earthwork" is hereby defined as meaning the construction activity involving the use of soil materials.

2.12 The term "Nonconformance" is hereby defined as meaning a deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate. Examples of non-conformance include, but are not limited to physical defects, test failures, and inadequate documentation.

2.13 The term "Owner's Representative" denotes the individual that is an official representative of the Owner responsible for planning, organizing, and controlling the design and construction activities.

2.14 The term "Owner" denotes Honeywell International Inc.

2.15 The term "Quality Assurance" is hereby defined as meaning a planned and systematic pattern of procedures and documentation performed by the POR and CQA Monitor to ensure that items of work or services meet the requirements of the contract documents.

2.16 The term "QUALITY CONTROL" is hereby defined as meaning to measure and regulate the characteristics of an item or service to comply with the requirements of the contract documents. Quality control is the responsibility of the Contractor.

3.0 LINER CRITERIA

3.1 The base area, interceptor ditch and perimeter dike of the proposed Stack 7A facility will have a compacted clay liner that will be constructed in accordance with the Louisiana Department of Environmental Quality Office of Environmental Services Rules and Regulations, the Technical Specifications, the Construction Drawings and this CQA Plan.

3.2 The compacted clay liner shall have a minimum thickness of three (3) feet and a hydraulic conductivity equal to or less than 5×10^{-8} cm/sec. Specific material, pre-construction testing, construction procedures and quality assurance criteria for the compacted clay liner are outlined in Section 11 of this CQA Plan.

4.0 CERTIFICATION

4.1 The facility construction will be certified by the Engineer as being in compliance with or exceeding the construction procedures and criteria stated herein. This certification will be issued by the Engineer and submitted to the Louisiana Department of Environmental Quality upon completion of all construction activities and prior to accepting waste.

5.0 SCOPE OF CQA ACTIVITIES

Construction quality assurance activities that will be undertaken by the POR or his designated CQA Monitor(s) will include, but not be limited to, the following:

- Documenting observations, testing, findings, and conformance of work to the Technical Specifications and Construction Drawings.
- Assembling and documenting of Manufacturer's or Supplier's certificates provided by the Contractor for materials used in construction.
- Testing of borrow soils to document compliance with material Specification requirements.
- Monitoring construction and testing of the in-place compacted clay liner to document compliance with moisture content, compaction, permeability and thickness criteria.
- Testing of any ancillary High Density Polyethylene (HDPE) geomembrane.
- Monitoring installation and testing of drain system components including HDPE pipes and fittings, geotextile and HDPE geonet, and aggregates.
- Monitor installation and testing for all other construction activities including site preparation, earthwork for site grading, concrete erosion control mat construction, HDPE seepshield installation, and steel pile-line sleeve installation.
- Reviewing Contractor's as-built survey records to document compliance with specified line and grade tolerances.
- Preparing the Construction Certification Report for submittal to the permitting authority (LDEQ). Daily field reports, and laboratory and field test results will be included in the Construction Certification Report.

6.0 APPLICABLE DOCUMENTS

6.1 DOCUMENTS

6.1.1 Industrial Solid Waste Disposal Facility Permit Application

6.1.2 Report of Geotechnical Investigation HF Stack 7 Honeywell Facility Geismar, Louisiana Rev.1.

6.1.3 Technical Specifications

6.1.4 Construction Drawings. The detailed design drawings will become part of this Plan and part of the contract entered into for performance of work covered by this project.

6.2 CODES AND STANDARDS

The following Codes, Standards, Specifications, Publications, and/or Regulations shall be made part of this Plan and will become part of the contract entered into for performance of the work covered herein. The latest edition in effect at the time of the contract shall apply.

OSHA	Occupational Safety and Health Act of 1970
AASHTO M 252	Corrugated Polyethylene Drainage Tubing
ASTM C 31	Standard Practice or Making and Curing Concrete Test Specimens in the Field
ASTM C 33	Standard Specification for Concrete Aggregates
ASTM C 39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 136	Test Method for Sieve Analysis of Fine and Coarse Aggregate

ASTM C 150	Standard Specification for Portland Cement
ASTM C 618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM 413	Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate
ASTM D 422	Standard Method for Particle-size Analysis of Soils
ASTM D 570	Standard Test Method for Water Absorption of Plastics
ASTM D 638	Standard Test Method for Tensile Properties of Plastics
ASTM D 695	Standard Test Method for Compressive Properties of Rigid Plastics
ASTM D 696	Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D 746	Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
ASTM D 790	Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D 1004	Test Method for Initial Tear Resistance of Plastic Film and Sheeting
ASTM D 1140	Test Method for Amount of Material in Soils Finer than the No. 200 Sieve
ASTM D 1203	Standard Test Method for Volatile Loss from Plastics Using Activated Carbon Methods
ASTM D 1204	Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
ASTM D 1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D 1248	Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
ASTM D 1505	Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 1556	Test Method for Density and Unit Weight of Soil In Place by the Sand Cone Method
ASTM D 1557	Test Method for Moisture Density Relations of Soils and Soil-aggregate Mixtures Using 10-pound (4.54 kilograms) Hammer and 18-inch (457 millimeters) Drop." (Modified Proctor)
ASTM D 1587	Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes
ASTM D 1603	Test Method for Carbon Black in Olefin Plastics
ASTM D 1683	Standard Test Method for Failure of Sewn Seams in Woven Fabrics
ASTM D 1693	Standard Test Method for Environmental Stress Cracking of Ethylene Plastics
ASTM D 1898	Standard Recommended Practice for Sampling of Plastics

ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2216	Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-aggregate Mixtures
ASTM D 2240	Standard Test Method for Rubber Property – Durometer Hardness
ASTM D 2412	Standard Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading
ASTM D 2434	Test Method for Permeability of Granular Soils (Constant Head)
ASTM D 2487	Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2488	Description and Identification of Soils (Visual-Manual Procedure)
ASTM D 2513	Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings
ASTM D 2663	Standard Test Methods for Carbon Black Dispersion in Rubber
ASTM D 2837	Standard Specification for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
ASTM D 2922	Test Methods for Density of Soil and Soil – Aggregate In Place by Nuclear Methods
ASTM D 2937	Test Method for Density of Soil In Place by the Drive Cylinder Method
ASTM D 2974	Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D 3015	Standard Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds
ASTM D 3017	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3261	Standard Specification for Butt Heat Fusion Polyethylene Plastic Pipe and Tubing
ASTM D 3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM D 3776	Standard Test Methods for Weight (Mass) per Unit Area of Woven Fabrics
ASTM D 3786	Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics-Diaphragm Bursting Strength Tester Method
ASTM D 3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D 4254	Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
ASTM D 4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4437	Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes

ASTM D 4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D 4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4643	Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method
ASTM D 4716	Standard Test Method for Constant Head Hydraulic Transmissivity (In-Plane Flow) of Geotextiles and Geotextile Related Products
ASTM D 4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D 4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Other Related Products
ASTM D 4944	Standard Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester Method
ASTM D 4959	Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method
ASTM D 5035	Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
ASTM D 5084	Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter (Laboratory Test)
ASTM D 5199	Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM D 5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D 5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D 5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D 5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes
ASTM D 6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
ASTM E 96	Standard Test Methods for Water Vapor Transmission of Materials
ASTM F 714	Standard Specification for Polyethylene Plastic Pipe Based on Outside Diameter
FTM 101	Puncture Resistance and Elongation Test (1/8 inch Radius Probe Method), Federal Test Method 2065

7.0 POR SUBMITTALS

7.1 The Engineer will submit a construction certification report (CCR) per Section 4.0 of this CQA Plan to the OWNER within thirty (30) days of the completion of field activities.

7.2 The CCR will include material certificates, test data, field reports, confirmation tests and as-built drawings.

8.0 LINES AND GRADES

8.1 The project shall be constructed to the elevations, lines, grades and cross sections shown on the Drawings.

8.2 The Owner reserves the right to make changes in the design and/or construction drawings as conditions indicate are necessary for the construction of a safe and permanent structure. Any such revisions will be indicated on the final as-built drawings.

9.0 SITE PREPARATION

9.1 Subgrade preparation for earth fill shall consist of clearing and grubbing operations within the limits of construction. Clearing shall consist of cutting, removal and disposal of all trees, brush, debris and other objectional organic material resting on or protruding above ground within the limits of grading as indicated on the Design Drawings. Grubbing shall consist of removal and disposal of stumps, roots and other objectional organic material within the limits of grading as indicated on the Design Drawings. Stumps shall be removed entirely. Roots and matted roots shall be grubbed to at least 12 inches below the proposed subgrade surface.

9.2 No earth fill shall be placed on any part of the foundation until such areas have been inspected and approved by the Engineer. Prior to fill placement, the foundation areas receiving earth fill shall be scarified and wetted or dried as needed.

10.0 EARTH FILL

10.1 Earth fill shall be used as needed to alter the fundamental contours of the site the design lines and grades including construction of the perimeter dike, starter dike and internal access dikes. Earth fill for preparation of the clay liner subgrade and earth fill for construction of the perimeter dike shall be Clayey Earth Fill. Earth fill for construction of the starter dike and internal access dike shall be General Earth Fill.

10.2 Earth fill material shall be obtained from approved borrow areas or stockpiles. Clayey Earth Fill shall consist of clean SC, CL or CH-type soils (ASTM D 2487) free of deleterious materials and approved by the Engineer. General Earth Fill shall consist of clean SC, ML, MH, CL or CH-type soils (ASTM D 2487) free of deleterious materials and approved by the Engineer. During loading of borrow material at the borrow site, stones, roots, and debris shall be removed from the fill and disposed of prior to hauling to the construction site.

10.3 Prior to construction, the Engineer will obtain representative samples of earth fill materials from the Contractor's proposed borrow source(s) and perform Atterberg limit determinations (ASTM D 4318), sieve analyses (ASTM D 421 and D 422), moisture content determinations (ASTM D 2216) and Standard Proctor compaction tests (ASTM D 698).

10.4 Earth fill shall be placed to grades specified in the Construction Plans and Technical Specifications. The subgrade on which the structural fill is to be placed shall be proof-rolled using a 20 to 30 ton loaded dump truck or other pneumatic tired vehicle of similar size and weight. The proof-rolling shall be observed by the Engineer. Unsuitable materials and/or conditions shall be removed and replaced with compacted earth fill. Prior to receiving earth fill, the foundation area shall be scarified by disking or other means approved by the Engineer. The finished surface shall be firm, unyielding, without abrupt elevation changes, wheel ruts, or standing water.

10.5 General Earth Fill shall be placed and spread in relatively horizontal layers having loose thickness not greater than 12 inches, wetted or dried, as needed, homogenized to obtain a uniform molding moisture content in the range of 2 percent dry to 3 percent wet of the standard Proctor optimum moisture content

(ASTM D698) and compacted to a dry density equal to or greater than 95 percent of the Standard Proctor maximum dry density (ASTM D 698).

10.6 Clayey Earth Fill shall be placed and spread in relatively horizontal layers having loose thickness not greater than 12 inches, wetted or dried, as needed, homogenized prior to compaction to obtain a uniform molding moisture content wet of the standard Proctor optimum moisture content (ASTM D 698) but not greater than 5 percent higher than the optimum moisture content. Clayey earth fill shall be compacted to a dry density equal to or greater than 98 percent of the Standard Proctor dry density at the corresponding molding moisture content (ASTM D 698).

10.7 Dikes shall be over-built by placing and compacting earthen fill at least one foot beyond the final fill slope on each side. Each layer shall be kept level with the necessary grading equipment. Upon completion of compaction, the slopes shall be cut back to the final slope. Particular care must be used to obtain the required compaction along the edges of the fill slopes.

10.8 The compacted surface of each layer of material shall be scarified and wetted or dried, as needed, prior to placement of the next lift to ensure proper bonding between successive lifts.

10.9 The Engineer will perform in-situ moisture content and dry density determinations by the drive cylinder method (ASTM D 2937) a minimum of once per 22,500 square feet for compacted natural ground subgrade and a minimum of once per 2000 cubic yards of compacted fill. The Engineer will compare the results of these tests to the results of the Standard Proctor test (ASTM D 698) to determine compliance with the specified compaction criteria. The Engineer will perform thickness measurements, as needed.

10.10 The Contractor will be required to remove any earth fill material that does not comply with the compaction requirements and replace the earth fill at his own expense.

10.11 If an in-place density test fails to meet the requirements for compaction and/or moisture, the area shall be reworked and then retested. If, however, the second test fails to meet the criteria, the area failing the criteria shall be delineated, and reworked or removed, and then retested. The areas requiring reworking/recompacting shall be noted on record drawings and reported.

10.12 The location, lift designation, and elevation or depth of the field density and moisture tests (passing, failing, and retests) shall be recorded and noted on the respective test records.

10.13 Engineer will review and confirm the Contractor's report documenting type and size of compaction equipment in use, including:

- For sheepsfoot rollers: drum diameter and length, empty and ballasted weight, arrangement of feet, length and face area of feet, and the yoking arrangement.
- For rubber tired rollers: tire inflation pressure, spacing of tires, and empty and ballasted wheel loads.
- For vibratory rollers: static weight, imparted dynamic force, operating frequency of vibration, and drum diameter and length.

10.14 The Owner reserves the right to witness third party testing provided by the Engineer and perform additional testing, if so desired.

11.0 CLAY LINER

11.1 The clay liner for the Stack 7A cell bottom, interceptor ditch, and the inboard slope of the perimeter dike shall consist of a minimum three 3-foot thick layer of Clay Liner Fill having a compacted hydraulic conductivity equal to or less than 5×10^{-8} cm/sec. The clay liner shall be constructed by placement and compaction of clay liner fill materials in successive 6- to 9-inch thick lifts. In-situ clay soils that meet the material criteria for clay liner fill may be mixed, wetted or dried, as needed, homogenized in-place and compacted to construct the initial lift of the clay liner. The remaining thickness of the clay liner shall be constructed by hauling placing and compacting clay liner fill borrow materials obtained from Engineer-approved off-site and/or on-site borrow sources.

11.2 Pre-Construction Testing

11.2.1 Prior to construction, a minimum of three representative samples of clay liner fill materials from each proposed borrow source shall be submitted by the Contractor to the Engineer for pre-construction laboratory index, compaction and permeability testing. Atterberg limit determinations (ASTM D 4318), sieve analyses (ASTM D 421 and D 422) and moisture content determinations (ASTM D 2216) will be performed on each representative sample. One Standard Proctor compaction test (ASTM D 698) will be performed on a combined homogenized sample of the three representative samples, and at least three laboratory permeability tests (ASTM D 5084) will be performed on test specimens taken from the combined sample using molding conditions consistent with the project Specifications. The results of the pre-construction material testing are intended to indicate that the Contractor's proposed clay liner fill materials can consistently meet or exceed project specifications. No earth fill materials shall be placed for construction of the clayey soil base without this pre-construction testing and approval by the Engineer.

11.2.2 Prior to full scale clay liner construction, a field test strip shall be constructed by the Contractor. The test strip shall have a minimum dimension of 100 feet long by 25 feet wide, and shall be of sufficient size such that full scale liner construction procedures can be duplicated from the test strip. The test strip shall be constructed using the same equipment for spreading, kneading and compaction and the same construction procedures (e.g., number of passes, moisture addition and homogenization, if needed) that are anticipated for use during full scale liner construction.

11.2.3 The Engineer will perform moisture content (ASTM D 2216), fines content (ASTM D 1140) and Atterberg limits (ASTM D 4318) determinations on a minimum of five random samples of the clay liner fill material delivered to the site for construction of the test strip. For each lift of the clay liner test strip, the Engineer will perform at least five field density and moisture determinations using the drive cylinder method (ASTM D 2937 and D 2216), and laboratory hydraulic conductivity tests will be conducted in triaxial type permeameters (ASTM D 5084) on a minimum of 5 thin-walled tube samples or drive cylinder samples. The test strip shall be considered acceptable if the measured hydraulic conductivities of undisturbed samples from the test strip meet the requirements of the specifications at the 95 percent confidence level. If the test strip fails to achieve the desired results, the Contractor shall construct additional test strips until the project specification requirements can be met.

11.2.4 Upon completion of each test strip lift, the thickness of the lift will be measured by a field representative of the Engineer at a minimum of five random locations to check for thickness adequacy.

11.3 Full scale clay liner construction shall begin only after completion of a successful test strip. If field and laboratory test data indicate that the installed test strip meets the project specifications, it may be used as part of the liner provided that is adequately protected by the Contractor from drying and equipment damage after installation. The Contractor shall scarify the edges of the test strip and add water if necessary prior to placing and compacting additional liner material around the test strip. A minimum one-foot overlap shall be maintained for mixing and compaction between the test strip and the liner. The same equipment and procedures used in the test strip construction shall be used for the full scale liner.

11.4 The clay liner shall be constructed by placing, spreading, wetting or drying, as needed, homogenizing and then compacting successive 6- to 9-inch thick layers. Clay liner fill materials shall meet the following compaction criteria:

Property	Test Method	Criterion
In-Place Dry Density (γ_d) Water Content at Compaction	ASTM D 2922 [2] ASTM D 3017 [2]	$\gamma_d \geq 95\%\ \gamma_{dmax}$ or S>85% [1] 0 to 8% > w_{opt} [1]

[1] 95% of γ_{dmax} as determined by Standard Proctor compaction test (ASTM D 698) for clay liner fill, or saturation, S>85%
[2] Or alternate method approved by the Engineer
Note that on the wet side of optimum, S>85% corresponds to a dry density equal to or greater than about 97% of the Standard Proctor dry density at the molding moisture content (ASTM D 698)

11.5 Upon completion of the compaction process, the surface of the liner shall be smoothed with a steel drum or rubber-tired compactor. A grader may be used to remove any excess material from the installed liner. The surface of the liner shall be smooth, free from roller marks, holes, depressions more than 0.5 inches deep, or protrusions extending above the surface more than 1 inch. No object shall protrude above the compacted clay liner surface. Areas not meeting the thickness requirements shall be augmented with additional material. The added material shall be reworked into the installed liner to ensure homogeneity and proper bonding. This may be done by scarification of the surface prior to the addition of new material.

11.6 The completed liner shall be protected from traffic and erosion. Any damaged areas shall be repaired and grades re-established. Where compacted areas have been disturbed or damaged, as determined by the Engineer, the surface of these areas shall be scarified, re-shaped, re-wetted as needed, re-homogenized and re-compacted to the required density prior to further construction.

11.7 To prevent desiccation cracking, the Contractor shall maintain the moisture content of the completed liner sections, as needed, by regularly spraying the surface of the installed liner with clean water.

11.8 The Engineer will inspect and test each lift of the constructed clay liner to determine compliance with the Specifications. Samples for construction quality assurance testing will be obtained by a field representative of the Engineer from random locations within each completed lift. The construction quality assurance test frequencies during clay liner construction are specified below. However, if there are indications of a change in material quality or construction procedures, additional tests will be performed to determine compliance, as determined by the Engineer.

11.9 The following field tests will be performed by a field representative of the Engineer during construction of the clay liner.

- A minimum of twelve moisture content (ASTM D 3017 or ASTM D 2216) and field density (ASTM D 2922 or ASTM D 2937) determinations will be conducted per acre per lift of the compacted clay liner.

- A minimum of four thickness measurements will be conducted per acre per lift of the compacted clay liner. The above thickness measurement frequencies will be doubled for the first 5 acres of clay liner construction.

11.10 The following laboratory tests will be performed by the Engineer during construction of the clay liner

- Percent fines (ASTM D 1140) of the liner construction material will be determined at a minimum frequency of two tests per acre per lift of installed liner.

- Atterberg limits determinations (ASTM D 4318) will be performed on one sample per acre per lift of installed liner.

- Hydraulic conductivity testing of Shelby tube or drive cylinder samples obtained from the compacted liner will be conducted at a minimum frequency of one test per acre per lift. Laboratory hydraulic conductivity tests will be conducted in triaxial type permeameters, in accordance with ASTM D 5084.

- The above frequencies will be doubled for the first 5 acres of clay liner construction.

11.11 Holes in the clay liner created as a result of destructive testing (i.e., Shelby tube, drive cylinder sampling, field density determinations and thickness measurements) shall be backfilled and tamped uniformly in 2-inch thick lifts by the Contractor using a rod. The backfill material shall be the same as the liner construction material. At the liner surface, the backfill material shall extend slightly beyond the edge of sample hole to make sure that a good tie-in with the surrounding liner is achieved.

11.12 If the hydraulic conductivity documented from a test sample obtained from a clay liner section does not meet the project specification requirement of equal to or less than 5.0×10^{-8} cm/sec, that liner section shall be reworked or the materials replaced and re-compacted, whichever is appropriate. Alternatively, the Contractor may elect to have additional random sample(s) taken from that liner section and tested by the Engineer. If reasonable assurance can be provided via the additional tests such that, at the 95 percent confidence level, the hydraulic conductivity of that clay liner section meets or exceeds the hydraulic conductivity requirement of these specifications, that clay liner section shall be considered acceptable.

11.13 Any excavations required for failed tests shall be repaired by scarifying the walls of the excavation, backfilling and compacting the fill material to the criteria required by the Specifications.

11.14 The locations of the field density and moisture tests and the undisturbed samples shall be recorded and noted on the respective test records.

11.15 The Contractor shall maintain and restore the condition of completed sections of the clay liner to the degree of compaction, allowable range of moisture contents and appearance indicated in the Specifications prior to and during placement of the compacted clay liner. At no time shall the surface be allowed to dry significantly or develop desiccation cracks. If cracks form, the clay liner shall be recompacted after reworking and remixing with water to achieve the specified range of allowable molding moisture content and specified degree of compaction.

11.16 Engineer will be required to perform and document the following visual observations:

- Record daily atmospheric conditions.
- Approve type and size of compaction equipment in use:
  - For sheepsfoot rollers, confirm the drum diameter and length, empty and ballasted weight, arrangement of feet, length and face area of feet, and the yoking arrangement.
  - For rubber tired rollers, confirm the tire inflation pressure, spacing of tires, and empty and ballasted wheel loads.
  - For vibratory rollers, confirm the static weight, imparted dynamic force, operating frequency of vibration, and drum diameter and length.
- Observe and record compactive effort, uniformity of compaction and scarification and connection between compacted lifts. Record number of passes for disking (mixing) operations, and of a roller by type, size and weight of roller.

11.17 The Owner reserves the right to witness third party testing provided by the Engineer and perform additional testing, if so desired.

12.0 GEOTEXTILE AND HDPE GEONET

12.1 The geonet/geotextile composite material specified for use in construction of the stack underdrain system shall consist of a HDPE geonet with non-woven geotextiles heat bonded to both sides of the geonet. The geonet shall be manufactured from unreinforced HDPE designed and manufactured for use in drainage geonets. All geotextiles shown on the Drawings shall be non-woven geotextiles.

12.2 The uncolored base resin used to manufacture the geonet shall have a density of at least 0.932 gms/cm^3. The formulated colored resin shall have properties equivalent to ASTM D 1248, Type III, Category 4 or 5, and Grade P34. The resin shall contain not less than 97 percent of the base polymer,

and not less than 2.0 percent carbon black as defined in ASTM D 1248 for Class C high density polyethylene. The geonet shall contain no more than 3 percent carbon black, anti-oxidants and heat stabilizers combined, and no other additives, fillers or extenders. The geonet shall be manufactured from virgin resin, with no more than 3 percent regrind material. No post-consumer resin of any type shall be used.

12.3 The geonet shall be uniform in appearance and composition and shall be free of tears, cuts, gels, undispersed ingredients, any signs of contamination by foreign matter, or any defect that may affect serviceability. A complete description of the geonet proposed for use and the Manufacturer's product data sheets shall be submitted to the Engineer for approval at least two weeks prior to installation. Certification from the Manufacturer that the geonet is in compliance with the project Specifications shall also be supplied to the Engineer two weeks prior to installation. The HDPE geonet shall meet the following criteria:

Property	Test Method	Criterion
Melt Index	ASTM D 1238, Condition E	≤1.0 gm/10 minutes
Carbon Black Content	ASTM D 1603	≥2.0% & <3.0%
Density	ASTM D 1505	≥0.94 g/cm^3
Thickness	ASTM D 5199	≥0.20 inches
Mass Per Unit Area	ASTM D 3776	≥23 oz/yd^2
Transmissivity	ASTM D 4716	≥1.0x10^{-3} m^2/sec*
Tensile Strength	ASTM D 5035	≥45 lb/in **

* Machine direction under a compressive load of 10 lb/in^2 and at a gradient of 1.0.
**Machine direction.

12.4. Geotextiles for the geonet/geotextile composite and where shown on the Drawings shall be a non-woven, needle-punched fabric manufactured from 100 percent polyester or 100 percent polypropylene. The geotextiles shall be uniform and homogeneous in appearance and composition, and free from tears, cuts, thin spots, or any defects that may affect serviceability. The geotextiles shall meet the following criteria.

Property	Units	Test Method	Criteria	
			Composite Geotextiles	12 oz/yd^2 Geotextile
Mass per Unit Area	oz/yd^2	ASTM D 3776	≥8	≥12
Thickness	mils	ASTM D 5199	≥90	≥130
Apparent Opening Size	USSS†	ASTM D 4751	≥100	≥100
Grab Tensile Strength*	lbs	ASTM D 4632	≥120	≥275
Grab Elongation*	%	ASTM D 4632	≥50	≥50
Trapezoidal Tear Strength*	lbs	ASTM D 4533	≥50	≥110
Puncture Resistance	lbs	ASTM D 4833	≥80	≥150
Mullen Burst Strength	psi	ASTM D 3786	≥360	≥480
Permeability to Water	cm/sec	ASTM D 4491	≥0.2	≥0.2

* Machine and transverse directions.
† United States Standard Sieve Size

12.5. The following manufacturers of 12 oz/yd^2 geotextile and products are approved for use, provided the above criteria are satisfied: (i) Polyfelt TS-800 non-woven polypropylene geotextile; or (ii) Amoco 4512 non-woven polypropylene geotextile.

12.6. A complete description of the geotextiles proposed for use and the Manufacturer's product data sheets shall be submitted to the Engineer for approval at least two weeks prior to installation. Certification from the Manufacturers that the geotextiles are in compliance with the project Specifications shall also be supplied to the Engineer two weeks prior to installation.

12.7. Geonet/Geotextile Composite: The geonet and geotextiles in the composite shall meet the requirements of the project Specifications. The geonet/geotextile composite shall also: (i) display a transmissivity (ASTM D 4716 using a compressive load of 10 lb/in^2 and a gradient of 1.0) equal to or greater than 2.0×10^{-4} m^2/sec in the machine direction and 1.0×10^{-4} m^2/sec in the transverse direction; and (ii) the bond between the geotextiles and the geonet shall exhibit an average ply adhesion of equal to or greater than 4.0 lb/in and a minimum peel strength on any specimen of 2.0 lb/in determined in accordance with ASTM D 413.

12.8. A complete description of the geonet/geotextile composite proposed for use with a minimum 1 square yard sample and the Manufacturer's product data sheets shall be submitted to the Engineer for approval at least two weeks prior to installation. Certification from the Manufacturer that the geonet/geotextile composite is in compliance with the project Specifications shall also be supplied to the Engineer at least two weeks prior to installation.

12.9. Standard factory testing reports for raw materials including melt index and specific gravity or density for each batch of resin used to manufacture the geonet shall be submitted to the Engineer for approval at least two weeks prior to installation. The resin Manufacturer's certificate of analysis for each batch of resin shall also be provided to the Engineer at least two weeks prior to installation.

12.10. Factory quality control certificates for the geonet component of the geonet/geotextile shall be provided to the Engineer by the Manufacturer at least two weeks prior to installation. As a minimum, the quality control certificates shall contain the geonet roll identification number, date manufactured, roll width and length, and resin batch number. The following factory quality control tests shall be provided at the frequencies indicated in the table below. Failure of any of the tests shall result in rejection of the corresponding lot of geonet

Property	Test Method	Frequency
Mass per Unit Area	ASTM D 3776	Every 10 Rolls
Thickness	ASTM D 5199	Every 10 Rolls
Tensile Strength*	ASTM D 5035	Every 10 Rolls
Transmissivity**	ASTM D 4716	Every 20 Rolls
Melt Index	ASTM D 1238	Once per Batch of Resin or Every 10 Rolls
Carbon Black Content	ASTM D 1603	Once per Batch of Resin or Every 10 Rolls
Density	ASTM D 1505	Once per Batch of Resin or Every 10 Rolls

* Machine and transverse direction.
** Machine direction.

12.11. Factory quality control certificates for the geotextile component of the geonet/geotextile composite shall be provided to the Engineer by the Manufacturer at least two weeks prior to installation. The quality control certificates shall contain the geotextile roll number, date manufactured, roll length and width. The Manufacturer shall provide test results to the Engineer for every 5,000 yd^2 of geotextile or at least one sample per lot of geotextile for mass per unit area, thickness, apparent opening size, permeability to water, and grab tensile strength and elongation in accordance with the test procedures in the project Specifications. Failure of any of the tests shall result in rejection of the corresponding lot of geotextile.

12.12. The geotextiles and geonet/geotextile composite shall be visually inspected at the factory prior to shipment for compliance with the physical appearance requirements of the project Specifications. All necessary repairs shall be made by the Manufacturer at the factory prior to shipment.

12.13. Each geotextile and geonet/geotextile composite roll shall be individually packaged at the factory to prevent damage during shipping and handling, and shall be completely wrapped by a protective ultraviolet resistant thin plastic film having a minimum thickness of 2 mils. The Manufacturer shall provide each roll with a label indicating the roll number, product name, length, width and date manufactured.

12.14. The Contractor shall be responsible for unloading and storing the geotextile and geonet/geotextile composite rolls. The geotextiles and geonet/geotextile composite shall remain wrapped in the protective cover and shall be stored, as recommended by the Manufacturer and approved by the Engineer, in an area of the site that protects the geotextiles from moisture, water, gypsum, dirt, ultraviolet light and mechanical damage until the time of installation. The rolls shall not be unwrapped more than one hour before use. Handling of the rolls shall be in accordance with the Manufacturer's recommendations, and shall be as needed to protect the geotextiles from damage.

12.15. The geonet/geotextile composite and geotextiles shall be installed at the locations and to the lines and dimensions shown on the Drawings. The geonet/geotextile composite shall be cut to the widths shown on the Drawings and deployed, where practical, with the roll length parallel to the edge of the crest of the dike to minimize joints. The geonet/geotextile composite and geotextiles shall be installed in a smooth and unwrinkled condition in uniform contact with the underlying materials, and held in place as needed and approved by the Engineer until covered.

12.16. The ends of the geonet at a joint shall be overlapped 4 inches, and tied together with polyethylene or polypropylene ties recommended by the Manufacturer and approved by the Engineer. Metallic ties shall not be used. A minimum of three ties shall be used at each joint, and the ties shall be of a color to allow easy inspection (e.g., white or yellow) against the black geonet. The upper and lower geotextiles of the composite at the joint shall be overlapped a minimum of 4 inches, and the top geotextile overlap shall be sewn in accordance with the procedures outlined in the project Specifications.

12.17. The geotextile wrapping the collector drain shall not be left exposed for more than 48 hours prior to covering. After unrolling, the geonet/geotextile composite shall not be left exposed for more than 7 days prior to covering.

12.18. The exposed edge of the geonet on all cut sides and ends of the geonet/geotextile composite shall be covered with a piece of the same geotextile as on the composite overlapped 12 inches minimum on the bottom and top of the composite. The edge of the top lap shall be held in-place until covered using spot thermal bonding or black PVC pipe wrapping tape as approved by the Engineer and, if needed, temporary sand bags. The upper and lower geotextiles along the uncut edge of the geonet/geotextile composite shall be sewn in accordance with the procedures outlined in the project Specifications.

12.19. Geotextiles shall be installed where shown on the Drawings in a manner that minimizes seams. The geotextiles shall be cut to the dimensions shown on the Drawings, overlapped if needed, and installed in a smooth unwrinkled condition in contact with the underlying materials. The geotextiles shall be held in place as needed until covered in accordance with Section 12.17.

12.20. Upon unrolling, the geonet/geotextile composite shall be ballasted as needed to prevent wind or hydrostatic uplift by carefully placing fine sand or fluorogypsum as windrows across the geonet strips perpendicular to the roll length at a minimum spacing of 40 feet.

12.21. Field seams in geotextiles shall be made using a minimum overlap of 4 inches. The geotextile panels shall be sewn together with a sewing machine using a flat sewn seam with one row of stitches with a minimum of 4 stitches per inch, or a seam and stitching pattern recommended by the Manufacturer and approved by the Engineer. The thread used to sew the seams shall be 2000 denier minimum, or as recommended by the Manufacturer and approved by the Engineer, and shall have the same composition as the geotextile. The strength of field seams shall not be less than 50 percent of that of the unaged geotextile in any principal direction when tested in accordance with ASTM D 1683 at a strain rate of 12 inches/minute. The Contractor shall submit details of the proposed sewing method (type of stitch, number of stitches per inch, number of stitching rows, distance from the edge of the geotextile to the stitches, weight and type of thread, etc.) and a minimum 3 feet long sample of the sewn seam for approval by the Engineer at least one week prior to installation.

12.22. All tears, punctures, thinly stretched sections, or any other defect that may, as determined by the Engineer, render the geotextile unsuitable, shall be repaired by the Contractor. Repairs shall be made by overlaying a patch of geotextile over the damaged area with a 12 inch minimum lap all around. The patch shall be sewn to the geotextile all around the patch perimeter. Patches on geotextiles on the geonet/geotextile composite shall be held in place by thermal bonding or 2-inch wide black PVC pipe wrapping tape, and sewn in accordance with the procedures outlined in the project Specifications

where directed by the Engineer. Geotextile and geonet/geotextile composite that require more than one repair to the geotextile per roll shall be rejected and replaced.

12.23. The Contractor shall obtain and secure samples of the geotextile, and geonet/geotextile composite for destructive testing by the Engineer when the rolls are delivered to the site or subsequently during installation as requested by the Engineer. The samples shall be obtained from locations designated by the Engineer. All samples shall be properly marked and identified by the Contractor. The Contractor shall repair all openings created by sampling in accordance with the project Specifications or completely remove the full width of the roll at the sampling location.

12.24. The Contractor shall visually inspect the surfaces of the installed non-woven geotextiles, and geonet/geotextile composite for any defects including, but not limited to, rips, tears, punctures and defective seams. The Contractor shall identify, mark, and repair all noted defects, as well as defects designated by the Engineer. Repairs to geotextiles shall be made in accordance with the project Specifications. Geonet/geotextile composite with damage to both geotextile surfaces at any location shall be removed and replaced.

12.25. The Contractor shall visually inspect the surfaces for soil, gypsum, dust or debris that could result in clogging of the geonet or geotextiles. If soil, gypsum, dust or debris is entrapped in the geonet, it shall be removed and replaced or the surfaces cleaned as approved by the Engineer.

12.26. The Engineer will undertake observations and perform quality assurance tests to determine compliance of the materials and work with the project Specifications. Quality control by the Engineer will include monitoring and/or inspecting: (i) geotextile handling, installation, overlapping and field seaming; (ii) geonet/geotextile composite handling, installation, overlapping and field joining; (iii) the geotextile and geonet for damage; and (iv) the geotextile and geonet for excessive entrapped soil, gypsum, dust or debris that could reduce the transmissivity of the composite.

12.27. Laboratory quality assurance tests will be performed by the Engineer on the geonet/geotextile composite materials at the following minimum indicated frequencies.

Material	Property	Test Method	Minimum Testing Frequency
Geonet Component	Thickness Mass Per Unit Area Density Carbon Black Content Tensile Strength	ASTM D 5199 ASTM D 3776 ASTM D 1505 ASTM D 1603 ASTM D 5035	Once per 10 rolls
	Transmissivity	ASTM D 4716	Once per 20 rolls
Geotextile Component	Thickness Mass Per Unit Area Grab Strength & Elongation	ASTM D 5199 ASTM D 3776 ASTM D 4632	Once per 10 rolls
	Apparent Opening Size Permeability	ASTM D 4751 ASTM D 4491	Once per 20 rolls
	Field Seam Strength	ASTM D 1683	Once per 200 feet of field seam
Geonet/Geotextile Composite	Transmissivity Ply Adhesion	ASTM D 4716 ASTM D 413	Once per 20 rolls Once per 10 rolls

Failure of any sample to meet or exceed the requirements specified herein shall be considered cause for rejection of the material or installed section from which the sample was collected to the extent designated by the Engineer. If the Contractor can establish to the Engineer, via additional tests performed by the Engineer at Contractor's expense, that the failed sample is representative of a smaller section of the installed material than the entire lot represented by the original test sample, then only that portion will be rejected, provided, however, that the additional tests are performed by the Engineer representing the Owner.

12.28. The following submittals are required from the Contractor as part of the requirements of the project Specifications.

- A complete description of each non-woven geotextile, the Manufacturer's product data sheets for each, and the Manufacturer's certification that the geotextiles meet the requirements of the project Specifications.
- Factory quality control certificates for each roll of non-woven geotextile HDPE geonet, and geonet/geotextile composite.
- Proposed sewing method for field seaming the non-woven geotextiles and a minimum 3 feet long sample of sewn seam.
- A complete description of the HDPE geonet/geotextile composite, a minimum 1 square yard sample of the composite and 1 square yard sample of the non-woven geotextile used on the composite, the Manufacturer's product data sheets, and the Manufacturer's certification that the geonet/geotextile composite meets the requirements of the project Specifications.

13.0 CORRUGATED HDPE PIPE AND FITTINGS

13.1 The underdrain system collector pipe shall consist of a 6-inch diameter slotted corrugated HDPE pipe. The pipe and fittings shall be in compliance with AASHTO specification M 252 "Corrugated Polyethylene Drainage Tubing".

13.2 The HDPE pipe and fittings shall be manufactured using High-density polyethylene resin with properties equivalent to ASTM D 1248 Type III, Class C, Category 4 or 5, Grade P33 or P34, and ASTM D 3350 classification PE335434C. (This is a special resin required for compatibility with the site process water.) The resin must contain at least 2 percent carbon black as defined in ASTM D 1248 for Class C pipe. The pipe and fittings material shall contain no more than 3 percent carbon black, anti-oxidants and heat stabilizers combined, and no other additives, fillers or extenders. The pipe and fittings shall be manufactured from virgin resin with less than 3 percent regrind material.

13.3 All pipes and fittings shall have good appearance qualities. The pipe and fittings shall be homogeneous throughout, and the surfaces shall be smooth and uniform with no visible defects. The pipes shall be free of holes, cracks, nicks, cuts, gouges, scratches, blisters, gels, undispersed ingredients, any signs of contamination by foreign inclusions, or any defect that may affect serviceability.

13.4 Perforations in the corrugated HDPE pipe shall consist of slots cleanly cut and evenly spaced along 4 lines around the pipe circumference and centered within the corrugation valleys along the length of the pipe. Perforations located in immediately adjacent corrugation valleys shall be offset by 45 degrees. Perforations shall satisfy the following criteria:

- Slot Width (inches) < 0.125
- Slot Length (inches) < 1.0
- Perforated Area (in^2/foot) > 4.0

13.5 A complete description of the proposed HDPE base resin, pipe perforations and fittings that meet the requirements of the Specifications, in addition to a 2-foot long sample of the perforated pipe, shall be submitted to the Engineer for approval at least two weeks prior to installation.

13.6 The Contractor shall comply with the pipe Manufacturer's recommendations for handling and storing pipe and fittings. The pipe shall be stored on clean, level ground to prevent undue scratching or gouging and as needed to protect the pipe from being covered with excessive dirt and/or gypsum, from water and moisture, and from mechanical abrasion. Care shall be taken to minimize the amount of soil or gypsum collected inside the pipe while handling and installing. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp objects, and care shall be exercised during installation not to damage the pipes and fittings.

13.7 Any pipe section, fitting or joint which becomes broken, cracked, crushed, cut, scratched, gouged or otherwise rendered unsuitable, as determined by the Engineer, shall be removed and replaced by the Contractor. Scratches greater than 6 inches in length and gouges exhibiting a depth in excess of 8 percent of the wall thickness of the pipe shall be cause for rejection of pipe or fittings to the extent designated by the Engineer.

13.8 Joints between corrugated pipe sections and fittings shall be the split coupling type. All joints shall be made by: (i) butting the two adjacent pipe sections end-to-end; (ii) centering the coupling at the joint and wrapping it tightly around the pipe sections; (iii) tightly wrapping the coupling to the adjacent pipe sections with PVC pipe tape around the pipe and coupling circumference a minimum of 3 times for at least a length of 2 inches at each end of the coupling; and (iv) placing one weather resistant polypropylene lashing or stainless steel tie wire tightly around each end of the coupling. The joint shall prevent structural separation of adjacent pipe sections and provide a tightly fitting joint such that gaps do not exist which could allow the migration of the surrounding filter gravel into the pipe. Tape used for the joints shall be PVC-type, black color, 2 inch wide, 10 mil thick pipe wrapping tape approved by the Engineer. A minimum of 2 polypropylene lashing ties or 2 stainless steel wire ties shall be used to secure each coupling. Polypropylene lashing ties shall be weather-resistant polypropylene non-releaseable ties with minimum loop tensile strength of 90 lb. Stainless steel tie wire shall be AISI Type 316 stainless steel. Joints between fittings and pipe sections shall be made in a similar manner.

13.9 Laying, handling and installation of the pipe shall be in accordance with the Manufacturer's recommendations, the project Specifications, and the details shown on the Drawings. Pipe sections shall be joined adjacent to the trench, prior to placing the pipe on the pipe bedding. Care shall be taken not to drop the pipe while moving it, and to avoid excess stress or strain during installation. When pulling the pipe, either a pulling head or a suitable wraparound sleeve with rubber protective cover shall be used to prevent the pulling cables from damaging the pipe.

13.10 Pipeline installation and placement of backfill around pipelines shall be performed when the pipe is in a contracted state, i.e., during the cool of the morning, at night, or during periods of over-cast skies. Immediately after placement, the pipe shall be thoroughly and completely embedded, supported, and covered, and the backfill compacted, in accordance with the Specifications and the details shown on the Drawings.

13.11 Care shall be exercised during construction not to damage the pipe or fittings. Construction equipment shall not be allowed to pass over any pipe until a minimum of 3 feet of compacted cover is placed above the crown of the pipe. Any pipe section, fitting or joint which becomes broken, cracked, crushed, cut, scratched, gouged or otherwise rendered unsuitable, as determined by the Engineer, shall be removed and replaced by the Contractor. Scratches greater than 6 inches in length and gouges exhibiting a depth in excess of 8 percent of the wall thickness of the pipe or fitting shall be cause for rejection of a pipe section or fitting to the extent designated by the Engineer.

13.12 The Engineer will undertake observations and inspections to determine compliance of the materials and work with the project Specifications. Quality assurance by the Engineer will include monitoring and/or inspecting: (i) the HDPE pipe and fittings; (ii) any damage during installation; and (iii) the installation, alignment and joining of all pipe, and fittings.

13.13 The following submittals are required from the Contractor as part of the requirements of the project Specifications.

- A complete description of the HDPE pipe and fittings with the Manufacturer's product data sheets, description of the HDPE resin, Manufacturer's certificate of analysis for the HDPE resin, and Manufacturer's certification that the pipe and fittings satisfy the requirements of the project Specifications.
- A 2-foot long sample of the perforated HDPE pipe.

14.0 AGGREGATES

14.1 Silica gravel (also referred on the Drawings simply as "gravel") shall consist of rounded, sub-rounded to sub-angular processed clean silica gravel, and shall classify as a GP-type poorly graded fine gravel, or fine gravel with coarse sand in accordance with ASTM Standard D 2487. The silica gravel shall contain at least 98 percent silica (of which at least 50 percent is in the form of primary silica), less than 1 percent carbonate minerals (ASTM Standard D 4373), and less than 0.1 percent organic material (ASTM Standard D 2974 - Method C). The silica gravel shall exhibit the following gradation requirements as determined using ASTM Standards D 421 and D 422 unless approved otherwise by the Engineer.

U.S. Standard Sieve Size	Percent Passing (Dry Weight Basis)
3/4-inch	100
3/8-inch	65-100
No. 4	6-50
No. 8	0-8
No. 40	0-1
No. 200	0-0.3

14.2 A complete description of the proposed silica gravel, mineralogic composition, gradation test results, a 25 pound sample of aggregate, and the Supplier's certification confirming compliance with the project Specifications shall be submitted to the Engineer for approval at least two weeks prior to construction.

14.3 Coarse Sand shall consist of clean coarse silica sand containing at least 35 percent rounded, sub-rounded to sub-angular particles, and no more than 65 percent angular particles. The coarse sand shall contain at least 98 percent silica, no more than 1 percent carbonate minerals (ASTM Standard D 4373), and shall classify as an SP-type poorly graded coarse sand with fine gravel to SP-type poorly graded medium to coarse sand in accordance with ASTM Standard D 2487. The coarse sand shall exhibit the following gradation requirements as determined using ASTM Standards D 421 and D 422 unless approved otherwise by the Engineer.

U.S. Standard Sieve Size	Percent Passing (Dry Weight Basis)
3/8-inch	100
No. 4	62-100
No. 6	35-87
No. 8	15-64
No. 10	12-50
No. 20	0-20
No. 40	0-10
No. 200	0-0.5

14.4 A complete description of the proposed coarse sand, mineralogic composition, gradation test results, a 25 pound sample of aggregate, and the Supplier's certification confirming compliance with the project Specifications shall be submitted to the Engineer for approval at least two weeks prior to construction.

14.5 Fine Sand shall consist of clean fine silica sand. The fine sand shall contain at least 98 percent silica, no more than 1 percent carbonate minerals (ASTM Standard D 4373) and shall classify as an SP-type poorly graded medium to fine sand in accordance with ASTM Standard D 2487. The fine sand shall exhibit the following gradation requirements as determined using ASTM Standards D 421 and D 422 unless approved otherwise by the Engineer.

U.S. Standard Sieve Size	Percent Passing (Dry Weight Basis)
No. 10	100
No. 20	60-100
No. 40	25-72
No. 60	10-41
No. 100	0-20
No. 140	0-11
No. 200	0-4
No. 270	0-1

14.6 A complete description of the proposed fine sand, mineralogic composition, gradation test results, a 25 pound sample of aggregate, and the Supplier's certification confirming compliance with the project Specifications shall be submitted to the Engineer for approval at least two weeks prior to construction.

14.7 Placement of the aggregates shall be in accordance with the locations, lines, grades, dimensions and details shown or identified on the Drawings, and in compliance with this section. Where applicable, care shall be exercised during placement so as not to damage underlying geotextiles or geonets. Any damage to geotextiles or geonets shall be repaired by the Contractor at his expense.

14.8 For installation of silica gravel around HDPE pipes, silica gravel shall be placed on both sides of the pipe and above the pipe to the minimum thickness and dimensions shown on the Drawings. Placement of the silica gravel shall be controlled such that the gravel completely surrounds the pipe. Sufficient silica gravel material shall be worked under the haunch of the pipe up to the springline to provide side support throughout, and precautions shall be taken to prevent lateral or vertical movement of the pipe during filling. The pipe shall be weighted down as needed. The silica gravel shall completely fill around and be in contact with the entire pipe circumference, with particular care taken to ensure that voids are not present around the lower one-third of the pipe circumference. Care shall be exercised so as not to damage the pipes.

14.9 Sand filter sections shall be placed at each end of the silica gravel, as shown on the Drawings, and in accordance with the installation procedures described above for the gravel. Care shall be taken to prevent the silica gravel and sand materials from becoming contaminated with gypsum or dust, prior to and during placement.

14.10 The silica gravel, coarse sand, and fine sand in the collector drain and/or outlets shall be placed and compacted, as needed, to a dry density corresponding to a relative density equal to or greater than 65 percent relative density, as determined in accordance with ASTM D 4253 and 4254.

14.11 The Engineer will undertake observations and perform quality assurance tests to determine compliance of the materials and work with the project Specifications. The Engineer will obtain samples of aggregates and perform quality control tests, including particle shape (ASTM D 2488), gradation (ASTM D 422), and total carbonates (ASTM D 4373), as needed, and will monitor the placement of aggregates.

14.12 The following submittals are required from the Contractor as part of the requirements of the project Specifications.

- A complete description of the Contractor's proposed silica gravel, mineralogic composition and gradation test results, a 25 pound sample for the silica gravel, and the Supplier's certification confirming compliance with the Specification requirements.
- A complete description of the Contractor's proposed coarse sand, mineralogic composition and gradation test results, a 25 pound sample of the coarse sand, and the Supplier's certification confirming compliance with the Specification requirements.
- A complete description of the Contractor's proposed fine sand, mineralogic composition and gradation test results, a 25 pound sample of the fine sand, and the Supplier's certification confirming compliance with the Specification requirements.

15.0 PRESSURE RATED HDPE PIPE AND FITTINGS

15.1 The base resin used to manufacture pressure rated pipes and fittings shall be high density, high molecular weight polyethylene (HDPE) with properties equivalent to ASTM D 1248, Type III, Class C, Category 5, Grade P34, and ASTM D 3350 cell classification PE345434C. The pipe and fittings shall be manufactured from virgin resin with no regrind material. The formulated resin shall contain not less than 97 percent of the base polymer, and not less than 2 percent carbon black as defined in ASTM D 1248 for Class C pipe. The formulated resin shall contain no more than 3 percent carbon black, anti-oxidants and heat stabilizers combined, and no other additives, fillers or extenders.

15.2 All pipes and fittings shall have good appearance qualities. The pipe and fittings shall be homogeneous throughout, and the surfaces shall be smooth and uniform with no visible defects. The pipes shall be free of holes, cracks, nicks, cuts, gouges, scratches, blisters, gels, undispersed ingredients, any signs of contamination by foreign inclusions, or any defect that may affect serviceability.

15.3 Pipe and fitting dimensions, workmanship, standard dimension ratio (SDR) and corresponding pressure rating shall be in accordance with the requirements of ASTM F 714, and the pipe material shall meet the following criteria:

Property	Test Method	Criterion
Density	ASTM D 1505	>0.945 g/cc
Melt Index	ASTM D 1238	<0.15 g/10 minutes
Carbon Black Content	ASTM D 1603	2.0% & <3.0%
Flexural Modulus	ASTM D 790	>125,000 psi
Tensile Strength at Yield	ASTM D 638, Type IV*	>3,000 psi
Elongation at Yield	ASTM D 638, Type IV*	>8%
Modulus of Elasticity	ASTM D 638, Type IV*	>100,000 psi
Environmental Stress Crack Resistance	ASTM D 1693, Condition C	>5,000 hrs
Hardness	ASTM D 2240	>60 Shore "D"
Compressive Strength at Yield	ASTM D 695	>1,600 psi
Hydrostatic Design Basis	ASTM D 2837	>1,600 psi
Low Temperature Brittleness	ASTM D 746	<-118°C
Thermal Expansion Coefficient	ASTM D 696	<0.022%/°C

*Type IV Specimen tested at a rate of strain of 2 inches/minute

15.4 The Contractor or Supplier shall submit a complete description of the HDPE pipe and fittings proposed for use to the Engineer at least two weeks prior to pipe installation for approval. The Manufacturer's product data sheets and certification from the Manufacturer that the pipe and fittings are in compliance with the project Specifications shall also be supplied to the Engineer at least two weeks prior to installation.

15.5 Molded fittings shall meet the requirements of the project Specifications, and the requirements of ASTM D 2513 and D 3261. Fabricated fittings made by butt fusing cut segments of pipe shall be used where shown on the Drawings. Fabricated fittings shall be made using pipe segments meeting the base resin, physical appearance and physical property requirements of the project Specifications. All pipe segments in a pre-fabricated fitting shall be pressure rated to exceed by 20% the highest pipe pressure rating to which they are intended to be connected; i.e., they shall be fabricated using heavier wall and lower SDR pipe segments (as needed to have the pre-fabricated fitting fully pressure-rated to match or exceed the highest pipe pressure rating to which they are intended to be connected). Shop drawings for fabricated fittings shall be submitted to the Engineer at least two weeks prior to fabrication for approval.

15.6 HDPE plates, where required for fabrication of HDPE seepshields, shall have the thicknesses and dimensions shown on the Drawings. The uncolored base resin used to manufacture the HDPE plates shall be polyethylene having a minimum density of 0.932 g/cm^3. The formulated colored resin shall classify as a Type III, Category 4 or 5, Grade P34, Class C High Density Polyethylene in accordance

with ASTM Standard D 1248. The resin shall contain not less than 97 percent of the base polymer, and not less than 2.0 percent carbon black. Carbon black dispersion in the HDPE plates shall be rated as: (i) ≥9 of 10 views as Category 1 or 2, and ≤ 1 of 10 views as Category 3 classified using ASTM Standard D 5596; or (ii) A1, A2 or B1 classified using the ASTM Standard D 2663 dispersion classification chart on specimens prepared in accordance with ASTM Standard D 3015. The variation in carbon black content within each resin batch shall be no greater than ±5 percent from the average carbon black content. The HDPE plates material shall contain no more than 3 percent carbon black, anti-oxidants and heat stabilizers combined, and no other additives, fillers or extenders. The HDPE plates shall be manufactured from virgin resin, with no more than 3 percent regrind material. Regrind material, if used, must be of the same formulation as the virgin resin. No post consumer resin of any type may be used. All HDPE plate sheets shall have good appearance qualities and shall be free of pinholes, holes, blisters, gels, undispersed ingredients, fish-eye blemishes, any signs of contamination by foreign matter, or any defect that may affect serviceability. The edges of the sheets shall be straight and free from nicks and cuts.

15.7 The HDPE pipe, and the pipe and fittings, shall be joined using butt, heat fusion welds. All joints shall be made in compliance with the Manufacturer's recommended practice, subject to the Engineer's approval. All joints shall be made by trained technicians qualified by the Manufacturer and using equipment and controlled procedures approved by the Manufacturer. All pipe joints shall be stronger than the pipe itself under both tension and hydrostatic loading conditions. The joints shall be leak-tight, homogeneous and uniform throughout. The Contractor shall submit written documentation for each weld (including repairs) certifying compliance with the Manufacturer's standard specifications and Quality Assurance / Quality Control plan for the butt, heat fusion technique.

15.8 Other type of joints such as bolted polyethylene flanged connections shall not be used except where specifically called for on the Drawings (e.g., at connections to seepshields), or if specifically approved by the Engineer or Owner. The bolted flange connection shall be made in accordance with the Manufacturer's recommendations and the details shown on the Drawings. The flange outside diameter and drilling configuration shall conform to ANSI standards, and the bolts, nuts and washers shall be AISI type 316 stainless steel. The HDPE flanges shall be protected with a 316 stainless steel backup ring.

15.9 The Contractor shall comply with the pipe Manufacturer's recommendations for handling and storing pipe and fittings. The pipe shall be stored on clean, level ground to prevent undue scratching or gouging and as needed to protect the pipe from being covered with excessive dirt and/or gypsum, from water and moisture, and from mechanical abrasion. Care shall be taken to minimize the amount of soil or gypsum collected inside the pipe while handling and installing. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp objects, and care shall be exercised during installation not to damage the pipes and fittings.

15.10 Any pipe section, fitting or joint which becomes broken, cracked, crushed, cut, scratched, gouged or otherwise rendered unsuitable, as determined by the Engineer, shall be removed and replaced by the Contractor. Scratches greater than 6 inches in length and gouges exhibiting a depth in excess of 8 percent of the wall thickness of the pipe shall be cause for rejection of pipe or fittings to the extent designated by the Engineer.

15.11 Laying, handling and installation of the pipe shall be in accordance with the Manufacturer's recommendations, the project Specifications, and the details shown on the Drawings. Pipe sections shall be joined adjacent to the trench, prior to placing the pipe on the pipe bedding. Care shall be taken not to drop the pipe while moving it, and to avoid excess stress or strain during installation. When pulling the pipe, either a pulling head or a suitable wraparound sleeve with rubber protective cover shall be used to prevent the pulling cables from damaging the pipe.

15.12 Pipeline installation and placement of backfill around pipelines shall be performed when the pipe is in a contracted state, i.e., during the cool of the morning, at night, or during periods of over-cast skies. Immediately after placement, the pipe shall be thoroughly and completely embedded, supported, and covered, and the backfill compacted, in accordance with the Specifications and the details shown on the Drawings.

15.13 Care shall be exercised during construction not to damage the pipes and fittings. Construction equipment shall not be allowed to pass over any pipe until a minimum of 3 feet or one pipe diameter, whichever is greater, of compacted cover is placed above the crown of the pipe. Any pipe section, fitting or joint which becomes broken, cracked, crushed, cut, scratched, gouged or otherwise rendered unsuitable, as determined by the Engineer, shall be removed and replaced by the Contractor. For example scratches greater than 6 inches in length and gouges exhibiting a depth in excess of 8 percent of the wall thickness of the pipe or fitting shall be cause for rejection of a pipe section or fitting to the extent designated by the Engineer.

15.14 The Engineer, representing the Owner, will undertake observations and inspections to determine compliance of the materials and work with the project Specifications. Quality control by the Engineer will include monitoring and/or inspecting: (i) the HDPE pipe and fittings for correct size, SDR rating, workmanship, and fabrication; (ii) any damage during installation; and (iii) the installation, alignment and welding of all pipe, fittings and seepshields.

15.15 The following submittals are required from the Contractor or Owner's pipe supplier as part of the requirements of the smooth-walled HDPE pipe and fitting Specifications.

- A complete description of the HDPE pipe and fittings with the Manufacturer's product data sheets, description of the HDPE resin, Manufacturer's certificate of analysis for the HDPE resin, and Manufacturer's certification that the pipe and fittings satisfy the requirements of the project Specifications.
- Shop drawings for the HDPE pipe fittings and seepshields.

16.0 CONCRETE EROSION CONTROL MAT

16.1 Concrete erosion control mats (with thicknesses as shown on the Drawings) shall consist of concrete-filled uniform section mat (Fabriform-type) facing, with weep holes, underlain by non-woven geotextile filter fabric.

16.2 The fabric forms shall consist of 100 percent woven polyester or polypropylene with a mass per unit area of no less than 6 oz/yd^2 and with a double-layer mass per unit area of no less than 12 oz/yd^2. The fabric forms shall consist of multiple panels of double-layer fabric joined together in such a manner as to provide an average thickness as shown on the Drawings. Individual width panels shall be cut to suitable lengths and the two layers of fabric separately joined edge to edge by means of a heavy thread, double stitched. The tensile strength of stitch joints shall be not less than 100 pounds per inch.

16.3 Grout shall consist of a mixture of Portland cement, fine aggregate and water so proportioned and mixed as to provide a pumpable slurry. Pozzolan and grout fluidizers conforming to the project Specifications may be used at the option of the Contractor. The mix shall obtain a minimum compressive strength of 2000 psi at 28 days when tested in accordance with ASTM C 31 and ASTM C 39. The grout mix design shall be submitted to the Engineer for approval at least two weeks prior to installation of the mats.

16.4 Portland cement shall conform to ASTM C 150. Pozzolan, if used, shall conform to ASTM C 618. Only clean fresh water shall be used. Aggregate shall meet the requirements of ASTM C 33, except as to grading. Aggregate grading shall be reasonably consistent and shall be well-graded from the maximum size which can be handled with available pumping equipment.

16.5 The mat shall contain weep holes at the specific locations shown on the Drawings. The weep holes, where specified, shall consist of 7/8-inch inside diameter polyethylene tubes through the mat on a 60-inch center to center spacing. The weep holes shall not protrude past the bottom surface of the mat.

16.6 Prior to placement of the fabric form panels, a layer of 12 oz/yd^2 non-woven geotextile, meeting the requirements of geotextile specifications, shall be placed on the prepared subgrade to the lines and dimensions shown on the Drawings. Prior to grout injection, the fabric form panels shall be positioned to the locations, lines and grades shown on the Drawings. Panels of fabric may be factory assembled in predetermined sizes and joined together side-by side at the site by field sewing or by means of

zipper closures attached to the upper and lower layers of fabric. Simple butt joints, either sewn or unsewn, will not be permitted.

16.7 Only approved grout mixing, pumping and agitating equipment shall be used in preparation and handling of the grout. All oil and other rust inhibitors shall be removed from the pumps and mixers. All materials shall be accurately measured by volume or weight as they are fed into the mixer or delivered to the pump. The quantity of water shall be such as to produce a grout having a pumpable consistency. Time of mixing shall be not less than one minute. If agitated continuously, the grout may be held in the mixer or agitator for a period not exceeding two and a half hours in temperatures below 70°F and for a period not exceeding two hours at higher temperatures. If there is a lapse in a pumping operation, the grout shall be re-circulated through the pump or through the mixer drum (or agitator) and pump.

16.8 Grout shall be introduced into the space between the layers of fabric and shall be injected in such a way that excessive pressure on the fabric envelope is avoided. The injection pipe shall be wrapped tightly at the point of injection with a strip of burlap and the burlap pushed into the slit as the injection pipe is withdrawn in order to minimize spillage of grout.

16.9 The thickness of the mat shall be measured by survey or other appropriate methods, approved by the Engineer. Any mat measuring less than 90 percent of the average of all thickness measurements shall be re-injected with grout until the average thickness has been attained.

16.10 Foot traffic shall not be permitted on the freshly pumped mat when such traffic will cause permanent indentations in the mat surface. Walk boards shall be used where necessary.

16.11 The Engineer will undertake observations and perform quality assurance tests to determine compliance with the project Specifications. Quality control by the Engineer will include checking layout and measuring dimensions of the fabric forms, placement and spacing of weep holes, placement of expansion joints, measuring the thickness of the mat, and taking field samples of the grout for compressive strength tests in accordance with ASTM C 31 and ASTM C 39.

16.12 The Contractor shall submit a complete description of the erosion control mat, weep holes and proposed grout mixture to the Engineer for approval at least two weeks prior to installation of the mat.

17.0 CONSTRUCTION MEETINGS

17.1 The Engineer will conduct weekly construction meetings at the project site on a day of the week and time to be specified. The Contractor and subcontractors shall be present at these construction meetings along with the Owner Representative. The Contractor shall prepare and present progress summary reports, address safety issues and present updated schedules in a format approved by the POR and Owner. The Engineer will present CQA progress reports and will issue weekly meeting minutes to the Owner and all meeting atendees.

18.0 CONSTRUCTION CERTIFICATION REPORT (CCR)

18.1 The quality assurance records of inspection and testing shall be compiled by the Engineer and Owner's Representative.

18.2 The Engineer, on behalf of the Owner, will submit monthly update reports with a summary of construction activities, progress summary and updated schedules.

18.3 Upon completion of construction, the Engineer, on behalf of the Owner, will submit to the permitting agency (LDEQ) a Construction Certification Report (CCR) certifying that the earthwork, clay liner and drain system were constructed in accordance with the Drawings, Specifications and CQA Plan.

18.4 At a minimum, the CCR will contain:

- A summary of all construction activities.
- A summary of all laboratory and field test results.

- Sampling and testing location drawings.
- A description of significant construction problems and the resolution of these problems.
- As-built plans.
- A statement of compliance with the Construction Plans and Technical Specifications.
- The CCR shall be signed and stamped by a Civil Engineer registered in the State of Louisiana.

18.5 The as-built plans will accurately site the constructed location of all work items. The Engineer will review and verify that plans are correct. As-built plans will be included in the CCR as appropriate.

ATTACHMENT 14
Fluorogypsum Residue Stacking Process

Honeywell

Fluorine Products Engineering
Baton Rouge, Louisiana

Date: 11/1/01

To: Dennis Cheuvront, Brad Campesi, Mark Goldberger, Mike Graham, John McCarthy, Richard White

From: Karen Nixon

Subject: Residue Stacking Process

I'm sure this is not the first time you have seen the following information, but I ask that you look over this one final time. I would like to meet with you in the near future to discuss this document. Please make comments.

PRELIMINARY

Residue Stacking Process

Stacking Sequence

Modified 4/27/0

Purpose and Scope

The purpose of this paper is to document the materials, methods, and quality control to be used in the construction of new and operating residue stack components to insure uniformity and safety for residue stack operations. This paper contains detailed descriptions of tasks and processes used in construction of the various residue stack components, which include dikes, ramps, berms, overflow boxes, outfall and slurry piping employed in new, reactivated, and operating residue stacks.

Stack Facilities and Operation

Initial construction of a stack incorporates a 5' high by 16' wide perimeter starter dike, 12" piping to deliver residue slurry from the HF plant into the stack, a central 6' by 6' timber overflow box structure enclosing the inlet ends of a pair of 16" diameter overflow pipes that return slurry water to the plant by way of existing clearwells, and a 5' high by 16' wide ramp to access the overflow box. The starter dike forms the outer boundary of the initial residue deposits, contains the slurry water, and serves as the initial buttress against which deposits of fresh residue are built into a free standing truncated pyramid shaped stack. An active stack is "grown" by raising and moving inward its operating perimeter. The operating perimeter consists of a 32' wide embankment that contains the slurry water and fresh residue within the stack. At an active stack's initial elevation, this 32' wide embankment will include the original 16' wide starter dike plus a 16' width of pulled up residue from the stack interior. Day to day tasks are performed in the operation of stacking HF residue in an active stack. Operations are routinely performed by two long-boomed [presently a 60 foot boom] tracked excavators in a circuitous path along the operating perimeter of the active stack. The excavators travel and work along this operating perimeter to grow the active stack. Growth of the active stack is accomplished by continuously building up the stack's perimeter using deposited residue in the stack within the excavator boom's reach. Growth of the active residue stack is accomplished in 4-1/2' high increments. A typical increment

incorporates approximately 200' of operating perimeter. After an operating stack reaches its final elevation [approximately 80' above grade], the deposited residue is subsequently mined after an idle period to allow the residue deposits to harden sufficiently. Subsequent new stacks can be built over reactivated mined out stack areas, or on new areas.

The detailed task descriptions presented in this document define the typical steps in the processes currently utilized in operating and "growing" an active stack. These tasks are performed on discrete increments of the active stack operating perimeter and other components to effect 4' to 5' [rendered as 4-1/2' in this writing] stepped increases in stack height. . The tasks followed in stack building are the same for each successive increment around the top perimeter of the active stack. These tasks are described in this document as occurring one after the other for each increment; however, in practice this is not the case. Several increments are worked simultaneously, each on different tasks, which provides time for accumulating residue deposits, hardening of the various residue placements, slurry line movement, etc., and other necessary operations.

Each increment is approximately 4-1/2' high, 32' wide, and approximately 200' long, extending approximately 100' on either side of its slurry discharge location. The product of completion of all tasks for an increment is a slab of hardening residue that is positioned on top of, and approximately 4-1/2' inboard of, the previous underlying operating perimeter. The increments are built one next to the other, progressing in sequence around the stack operating perimeter. Concurrent with building the perimeter increments, the overflow box access ramp is built up by approximately 4-1/2'. The width of the top of the ramp is maintained at a minimum of 16'. For a new stack, the access ramp is built directly over the two overflow pipes. In addition to providing a means to access the overflow box, the initial installation of the access ramp is also needed to keep the overflow pipes from floating during startup of a new stack. Completion of an entire circuit of increments around the active stack, and raising the access ramp constitutes one 4-1/2' lift. Following completion of a lift, the pond water elevation in the active stack can be raised. This is accomplished by adding weir boards onto the overflow box entrance weir, and adding sections of vertical pipe to the overflow pipe inlets to attain a rise in the water elevation matching the 4-1/2' elevation rise, or lift, of the operating perimeter. Note that incremental adjustments in pond water elevation between lifts can also be achieved by adding or removing weir boards

from the overflow box inlet. This is commonly done to adjust for pond water inventory and freeboard, and to insure an adequate depth of pond water in which to discharge the residue slurry. During the course of all of the activities, the slurry discharge location is continually altered to provide sufficient quantities of settled residue when and where needed for raising the stack operating perimeter and access ramp.

This completes the activities for one 4-1/2' lift on an active stack. This same pattern is repeated several times until an active stack reaches its finished elevation [typically EL. 100' NGVD]. The one exception to this is the possible incorporation of an intermediate 20' wide permanent bench into the stack configuration, which is typical for a grass roots stack installation at the site. The bench is located approximately half way up the stack at EL. 60' NGVD. To accomplish this, the normal 32' wide operating perimeter embankment at EL> 60' is built 50' wide, further toward the stack center. The subsequent lift is then started 20' inboard of the outer operating perimeter boundary, leaving the 20' wide bench. The incorporation of this bench is driven by actual soil conditions at the particular stack site. Requirement of the bench on subsequent stacks will be driven by this same parameter. It is possible that for reactivated stacks, the underlying soils will have gone through a sufficient period of consolidation and strength gain to obviate the need for the bench; however, this would be determined on a stack by stack basis. Engineering should be consulted as to whether to incorporate the bench on individual stacks. A typical completed stack cross section is shown in Appendix G.

Stack Growing Details

The following individual tasks are performed in the day to day stacking operation. Refer to Appendix A for sketches associated with the following task descriptions. Tasks prefixed with a P are indicated for activities involving the stack operating perimeter. Tasks prefixed with an R are indicated for activities associated with the overflow box access ramp.

Task P1

Position the excavator: atop the starter dike [this area of the operating perimeter is called "outboard dike" in subsequent operations]. The slurry pipeline is atop the outboard side of the starter dike crown, and remains in

that general location throughout the entire stacking process. Slurry from the pipeline is deposited into the impoundment by breaking a flanged joint and pulling the open end of the line across the dike to point toward the stack interior. Operating from the top of the starter dike, the excavator reaches out and pulls slurried residue from the boom extension up to the inboard side of the starter dike. This is done over a dike length increment of approximately 100' upstream to 100' downstream of the slurry discharge point. This material is worked over a period of days, pulling and piling more material as can be supported by the stiffening previously pulled material. The freshly dug residue is then allowed to cure, until it strengthens to the point of being able to support its weight plus the weight of the excavator. 1 to 1-1/2 weeks curing time is required to increase the stiffness of the deposit for this purpose. *CAUTION! The residue material comprising the inboard dike must cure to sufficient strength before proceeding to Task P2. Refer to Appendix I for guidelines in determining the suitability of this material in supporting the excavator.* This initial task of inboard dike construction is carried out around the entire operating perimeter before proceeding to Task P2. Task P1 is the only task that is done in a continuous fashion around the entire stack perimeter before proceding to the next task. Following completion of Task P1, the remainder of the tasks are done over discrete increments of approximately 200' in length.

Task P2

Position the excavator atop the "pulled up" material from Task P1 [also called "inboard dike" in subsequent operations]. Operating on the newly placed inboard dike, the excavator places a layer of freshly dug residue on top of the starter dike to partially dry to a workable consistency for use in Task P3.

Task P3

With the excavator operating atop the inboard dike, little mounds 4'-6" high are constructed 4'-6" inboard of the outer starter dike crown, and spaced 30' on center to support the slurry pipe. The semi-dried residue placed on the starter dike in Task P2 is used to construct the mounds. The slurry pipe is then moved from its normal position on the outboard crown edge of the starter dike, and placed on top of the mounds.

Task P4

With the excavator operating atop the inboard dike, a continuous solid berm is constructed on the outboard edge of the starter dike crown, using the remainder of the semi-dried residue on top of the starter dike.

Task P5

With the excavator operating atop the inboard dike a crossover ramp is constructed at the downstream end of the 200' long stacking increment. The purpose of this crossover ramp is twofold: 1] it serves to support the slurry line which will be laid across the operating perimeter to discharge into the stack, and 2] it forms the closure piece for the increment. The downstream end of the slurry pipeline within the increment is bent inward and placed atop the crossover ramp to discharge to the interior of the stack. At this point in the stack growing sequence the inboard dike, the outboard dike, the crossover, and the operating perimeter of the upstream increment are all elevated 4'-6" above the operating perimeter of the current increment being worked. These components form the walls of a cavity approximately 200' long, 16' wide and 4-1/2' deep.

Task P6

The cavity described in the previous task is then filled with fresh residue dug from the stack interior along the increment being worked. Concurrent with the filling operation, the slurry pipeline is repositioned from atop the mounds to atop the continuous berm, which constitutes the outer limit of the outboard dike. This increment is allowed to dry for 1 week to 1-1/2 weeks. At this point, the top of the whole embankment within the current increment is at the same elevation, and approximately 32 ' wide.

Task P7

With the excavator operating atop the inboard dike, a layer of fresh residue is dug from the stack interior and placed on top of the outboard dike to cure to a semi-dry consistancy. This semi-dried residue will be alternately used and replenished in the next several task.

Task P8

With the excavator operating atop the outboard dike, the excavator pulls up and piles a 4'-6" thickness of fresh residue on top of the sideslope, to extend the inboard dike toward the stack interior. This is done in successive

layers over a period of time to raise the inboard dike elevation by 4-1/2'. The freshly dug residue is reworked daily as in Task P1, and then allowed to cure, until it strengthens to the point of being able to support its weight plus the weight of the excavator. The semi-dried residue deposited on the outboard dike to dry in Task P7 is used to supplement the freshly dug and reworked material at the upper portion of the work. 1 to 1-1/2 weeks of curing time is required to increase the stiffness of these deposits to support the excavator. *CAUTION! The residue materials comprising the inboard dike must cure to sufficient strength before proceeding to the next task. Refer to Appendix I for guidelines in determining the suitability of this material in supporting the excavator.*

Task P8A [only at EL. 60' NGVD]

Engineering should be consulted as to whether to incorporate a stepped-in bench on individual stacks. Typical completed grassroots stacks incorporated a 20' wide step-in, or bench, at El. 60' NGVD. A typical completed stack cross section having a bench is shown in Appendix G. The incorporation of the bench is driven by structural strength of the underlying subgrade. For reactivation of mined out stacks, an example of which is stack #3, whose subsoils have been compressed and strengthened by the weight of its stack, incorporation of a bench in subsequent stack building on the same footprint may not be necessary.

Widening of the inboard dike at elevation 60' NGVD follows the same routine described in Task P8, except that the width of the pulled up material is increased to provide an additional 20' of perimeter width for use as the bench. Thus, an additional 20' of width of constructed into the widening of the inboard dike at El. 60' NGVD. The finished width of the operating perimeter at El. 60' NGVD is constructed to 52'. Construct a raised edge on the inboard edge of the inboard dike using semi-dried residue from Task P7. As in previous tasks, the pulled up material is worked over a period of several days, and then allowed to cure for 1 to 1-1/2 week to become sufficiently stiff enough to support its own weight and the weight of the excavator. The layer of fresh residue that is placed in Task P7 on the outboard dike may be replenished as needed and used for building the slurry pipe support mounds in Task P8B. Following completion of Task P8A, work proceeds through Tasks P8B, P8C, and P8D for the offset operating perimeter at El. 60' NGVD.

Task 8B

The work in Task P8B is identical with that of Task P3, except that centerline of the mounds for support of the slurry pipe are offset 30' from the outboard edge of the operating perimeter. This will provide enough offset to leave a 20' bench in place in the next steps. The mounds are built approximately 4'-6" high, and are spaced 30' on centers. Semi-dried residue material for mound construction is used from Task P7, and as supplemented in Task P8A. The slurry pipe is repositioned to rest on the mounds. Freshly dug residue is layered atop the outboard dike to replenish that used in mound construction, and partially dry for use in the next task.

Task 8C

As in Task P4, with the excavator operating atop the inboard dike, a continuous solid berm is constructed just outside of the mounds, except that its outer edge is offset from the outer crown edge of the outboard dike by 20'. Material used in construction of the berm is left over from Task P7, and as supplemented in Task P8B.

Task 8D

A crossover ramp is constructed as in Task P5. With the excavator operating atop the inboard dike, a crossover ramp is constructed at the downstream end of the 200' long offset stacking increment. This crossover ramp closes in the 200' long by 4'-6" deep cavity for this increment. The slurry pipe is repositioned to atop the continuous berm, and the discharge end bent to discharge into the stack interior, and placed on the crossover ramp for support. The cavity is then filled with freshly dug residue up to the level of the ramp, the berm, and the previous increment, and allowed to cure for 1 to 1-1/2 weeks. With the completion of activities for Tasks P8A, B, C and D, the stack growing process then proceeds back to Task P7, then progresses through Tasks P8, 9, 10 and 11, by-passing Tasks P8A, B, C and D for the El. 60' NGVD bench.

Task P9

CAUTION! The residue materials deposited in the previous task must be of sufficient strength before proceeding to the next task. Refer to Appendix I for guidelines in determining the suitability of this material in supporting the excavator before attempting to position the excavator on this material. With the excavator

operating atop the raised inboard dike, the slurry pipeline is pulled 4-1/2' feet inboard, and raised 4-1/2' above the top of the starter dike by supporting it every 30' with a little mounds built using residue that has been allowed to partially dry on top of the outboard dike in Task P7. This operation is identical to that described for Task P2 plus P3. With the excavator operating atop the inboard dike, little mounds 4'-6" high are constructed 4'-6" inboard of the outboard dike crown, and spaced 30' on center to support the slurry pipe. The semi-dried residue placed on the outboard dike in Task P7, and supplemented in Task P8, is used to construct the mounds. The slurry pipe is then moved from its position on the outboard dike crown edge and placed on top of the mounds. Replinish the semi-dried residue for the next step if a sufficient volume is not left after completing this task.

Task P10

With the excavator operating atop the raised inboard dike, construct the continuous berm and crossover ramp as described in previous tasks to enclose the increment cavity, using semi-dried residue deposited in the previous tasks.

Task P11

Fill the increment cavity with freshly dug residue from the stack interior to the same level as the berm, the crossover ramp, the inboard ramp, and the previous increment. The slurry pipeline is then relocated to the top of the continuous berm.

This completes the sequencing of activities in active stack construction. These tasks are repeated in sequence until the stack reaches its final elevation at El. 100' NGVD. Throughout all of these activities, concurrent activities also need to be performed to maintain the overflow box, access ramp, and overflow pipe elevations consistent with the elevation of the operating perimeter, and for plant operations to maintain proper pond water levels for an adequate operating surge volume and for storage of excess rainwater. Activities described in Tasks P7 through P11 [excluding Task P8A, B, C and D] are successively continued through the remaining life

of the active stack. The only exception, as stated earlier, is the 20' wide bench at El. 60' NGVD that is incorporated into the configuration of stacks with weak subsoils.

Overflow Pipes and Related Structures

A typical active stack usually incorporates one overflow structure, optimally located in the middle of the stack. Water from the slurried residue exits the active stack interior by gravity flow over the overflow box weir, then through two 16" diameter schedule 80 PVC pipes that are routed under the stack to discharge into the Auxiliary Clearwell. The inlet sections of the overflow pipes are vertical risers. Surrounding the two pipe risers is the overflow box. The box is typically 6' by 6' and constructed with a 4" by 4" timber frame and 2" by 12" horizontal plank sides. All box materials consist of Wolmanized pine attached with 316SS nails or 316SS threaded fasteners. The heights of the overflow box and the two discharge pipe risers are maintained in increments to coincide with the stack operating perimeter elevations, and consistent with the HF plant process water management requirements. The 16" diameter pipes are oversized to account for scale buildup over time from the calcium sulfate in the pond water. A single clean 16" pipe used in the existing stack area footprint is large enough to deliver 3,000 GPM of overflow rate with a few feet of differential liquid head, however, over time the pipe I.D. becomes constricted by scaling and deformed by settlement, requiring both pipes to be in operation convey full flow. With a bit of luck and a good stack site, a single pair of overflow lines might last the life of the stack, and still be able to return pond water at required rates even considering scaling. Deformation of the pipes due to settlement of the stack is usually the biggest factor restricting overflow rate, and has often lead to replacement of the pipes prior to complete growing of a stack. In typical operation both of the overflow pipe inlet risers are maintained at the same elevation. The top of the overflow box is maintained higher than the overflow pipe inlets. The side of the box opposite the access ramp is lower than the other three sides but still higher than the overflow pipes, and is used as a weir to regulate the level of water within the impoundment, and to help prevent sediment from entering the box and overflow pipes. Elevation of the pond water within the active impoundment is regulated by adding or removing one or more of the 2" by 12" overflow box weir boards.

It is necessary for motorized equipment [excavators, pickup trucks] to access the overflow box and pipes in order to monitor condition of the box and pipe inlets, to add sections to the 16" overflow pipe risers, or to

manilpulate the weir board elevation. Initially this access is provided by construction of a 16' wide [crown width] by 5' high embankment. The initial embankment is installed on top of the overflow pipes, and serves to keep them from floating during initial operation of the stack. Subsequent ramp embankments are built over the initial embankment using settled reside along the ramp sides. The initial ramp embankment material may be in-situ clay [CL], select residue, #610 crushed limestone or crushed concrete, alone or over a limestone boulder base. For a grass roots stack, the material of choice is clay [CL], which is normally available at the site, and excavated from the internal area of the new stack. Material, installation, and quality control requirements for the various materials used in construction of access ramps and starter dikes can be found in the appendices. Ramps constructed within a mined-out stack that is being reactivated may be constructed of the same materials as that for grass roots installation. Starter dike materials need to offer a lever of impermeability to contain the pond water and to satisfy environmental agency requirements, thus clay [CL] or a mined profile of in situ hardened residue in a mined out stack to be reactivated. The preferred method of reestablishing a starter dike to reactivate a mined stack is to mine out the starter dike profile as shown in Appendix G. Compared to an equal cross section of other materials, the mined profile offers the greatest strength and stability.

Whether in a grass roots or reactivated stack, the access ramp serves the purposes of providing access to the overflow box, and of weighting the overflow pipes to keep them from floating during the initial stages of stack operation. Described below is a sequence of tasks to be followed in raising the elevations of the overflow box, overflow pipe, and access ramp. Once a stack is in active service, the access ramp, overflow box, and overflow line elevations must be continually raised to function with the ever increasing elevations of the perimeter dikes, and to control pond water elevations and inventory within the stack. The following tasks are performed for these operations, and are described below.

Task R1

With the excavator operating on the existing access ramp top, the overflow box is raised a minimum of 5' above the existing overflow box top in preparation for raising the access ramp. This is done by extending the 4" by 4" frame, and attaching additional 2" by 12" side boards, along the same lines as the existing box, until the desired height is attained. The overflow pipes are not raised at this time.

Task R2

Operating on the access ramp within 50' of the overflow box, the excavator begins the ramp raising operation by pulling up residue from the stack interior to buildup the ramp slopes and edge of crown [this operation is similar to that described in Task P1 for starter dikes]. This is done by building up the ramp sideslopes upward [4-1/2'] and outward [to preserve a 16' crown width] using freshly dug residue, pulled up and worked over a period of time until it is sufficiently stiff to hold its shape, and to contain subsequent deposits of freshly dug residue. Concurrently, a layer of freshly dug residue is placed on top of the access ramp and allowed to partially dry to a workable consistency. This partially dried residue is used in conjunction with the pulled up residue for buildup of the access ramp. A portion of this partially dried residue is also used for construction of the wingwalls and end berm in a later task in this sequence.

Task R3

Next, with the excavator operating on the existing top of ramp, a 4-1/2' mound is built at the ramp side of the overflow box with partially dried residue from the top of the ramp, or from the sideslopes. The residue used from the sideslopes is replenished and worked with more freshly dug residue. The location of this mound is offset away from the overflow box by approximately 5', to avoid putting horizontal pressure on the box. If access is needed to the box, temporary fill is placed within the cavity formed between the box and the mound.

Task R4

Next, operating on top of the existing ramp, the excavator digs a large hole in front of the weir side of the overflow box. The hole extends outward to the maximum reach of the excavator. The residue excavated from the hole, in conjunction with partially dried residue, is used to construct 30' long "wingwalls" on either side of the overflow box. The wingwalls extend diagonally from each side of the overflow box end of the ramp and extend into the interior of the stack, at angles of approximately 120^0 from the ramp. Each wingwall is approximately 4-1/2' high. If partially dried residue is used from the ramp slopes, or from the top of the ramp, it is replaced with freshly dug residue.

The purpose of the hole and the wingwalls is to help keep entrained residue from entering the overflow box along with the pond water. Pond water must pass through the hole before entering the box. Because the flow cross section at the hole is large, the velocity of the water slows and allows for some residue to settle out. Whenever residue is discharged along the access ramp, the flow tends to follow along the side of the ramp, taking the most direct path to the overflow box. The wingwalls redirect the flow to further into the interior of the stack where a greater amount of entrained residue can settle before the flow approaches the overflow box.

Task R5

At this point, a 4-1/2' high wall of residue encloses the existing ramp on three sides. Now, operating on the outboard [away from the box] end of the ramp, the excavator constructs a 4-1/2' high mound connecting the built up sideslopes of the ramp, and enclosing the ramp top with a 4-1/2' high wall of stiff residue. This second berm [the first one was construcdted in Task R3] is placed at a distance of no greater than 50' away from the other berm near the outfall box, and forms the fourth side to enclose a cavity on top of the access ramp. The cavity is approximately 50' long by 14' wide by 4-1/2' high, and is bounded by the two berms and the built up sideslopes and crown edges. This cavity will be the first increment of the access ramp to be raised. The 50' limitation on the increment length applies to this first increment, and to all of the subsequent increments, and is set by the maximum reach capability of the excavator.

Task R6

Operating on the ramp, on the outboard end of the first cavity, the excavator fills the first cavity with fresh residue dug from along the ramp sideslopes. This residue is then allowed to dry and strengthen for 1 to 1-1/2 weeks, completing raising the first ramp increment 4-1/2'. *CAUTION! The residue materials deposited in the this task must be of sufficient strength before placing equipment on it. Refer to Appendix I for guidelines in determining the suitability of this material in supporting the excavator before attempting to position the excavator on this material.*

Subsequent connecting increments of the ramp, extending all the way to the operating perimeter, are built in this same manner. This operation described by the above tasks is repeated for each successive incremental

raising of the dikes and box. As with the building of the perimeter dikes, the operation of raising the access ramp is intermittent and done in conjunction with the raising of the operating perimeter.

Overflow Piping Risers

Periodically, the elevation of the tops of the overflow pipe risers must be raised to maintain consistency with the stack operating height and pond water levels. Each extension is composed of a 5' or so piece of 16" sch. 80 PVC pipe having a socket/socket coupling glued to one end. The riser is extended by inserting the plain end of the extension into the existing socket end of the riser.

Slurry Piping

In conjunction with the operating perimeter and ramp building activities, pipelines delivering residue slurry to the active stack must be continually modified to deposit residue when and where needed to support these activities. If a single stack is in active service, typically two separate slurry pipelines from the two residue transfer pumps alternately deliver slurry to the active stack. If two separate stacks are in operation, a single slurry pipeline serves each one. Each pump and its associated pipeline is independent of the other, and can be operated while the other pipeline is modified to suit conditions. The two pipelines are manifolded at the pumps such that either pump can be used with either pipeline. All of the slurry piping is 12" SDR11 HDPE. The pipe is typically purchased in double random lengths. Two joints are butt welded together, and a flange adapter and flange installed on each end of the double jointed pipe. The slurry pipe is fabricated at a convenient location in the field, and brought to the stack in 80' [preferred] or 100' long flanged spools. One completed flanged joint of slurry pipe is 80' or 100' long [each 40' or 50' double random length from the factory, depending upon the manufacturer. The two factory joints are fusion butt welded together. On each open end is fusion welded a stub end with a class 150 van stone flange. It is desired to have the joint lengths consistent for easy substitution. Altering the slurry discharge point at the stack is accomplished by breaking a flanged joint in the pipeline at the proposed location of slurry discharge, and bending the downstream end of the flexible slurry piping to point into the stack interior, at right angles with the operating perimeter. Because the slurry pipelines are placed on the outboard side of the operating perimeter, crossings are made with residue to bridge these locations where needed. Various thicknesses of HDPE have been used in the stack operations.

Over the years, it became evident that the SDR11 schedule,.although higher in initial cost, was more economical overall than lighter schedules because of its better availability and wear characteristics.

PRELIMINARY

Residue Stacking Process

Appendices

Modified 11/1/01

A. Task Sketches

B. Clay Construction Material Description and Installation Specifications

C. HF Residue Construction Material Description and Installation Specifications

D. #610 Limestone and Crushed Concrete Material and Installation Specifications

E. Material Specification for Concrete Exposed to Pond Water

F. Typical Cross Sections for Dikes, Ramps, and Keys

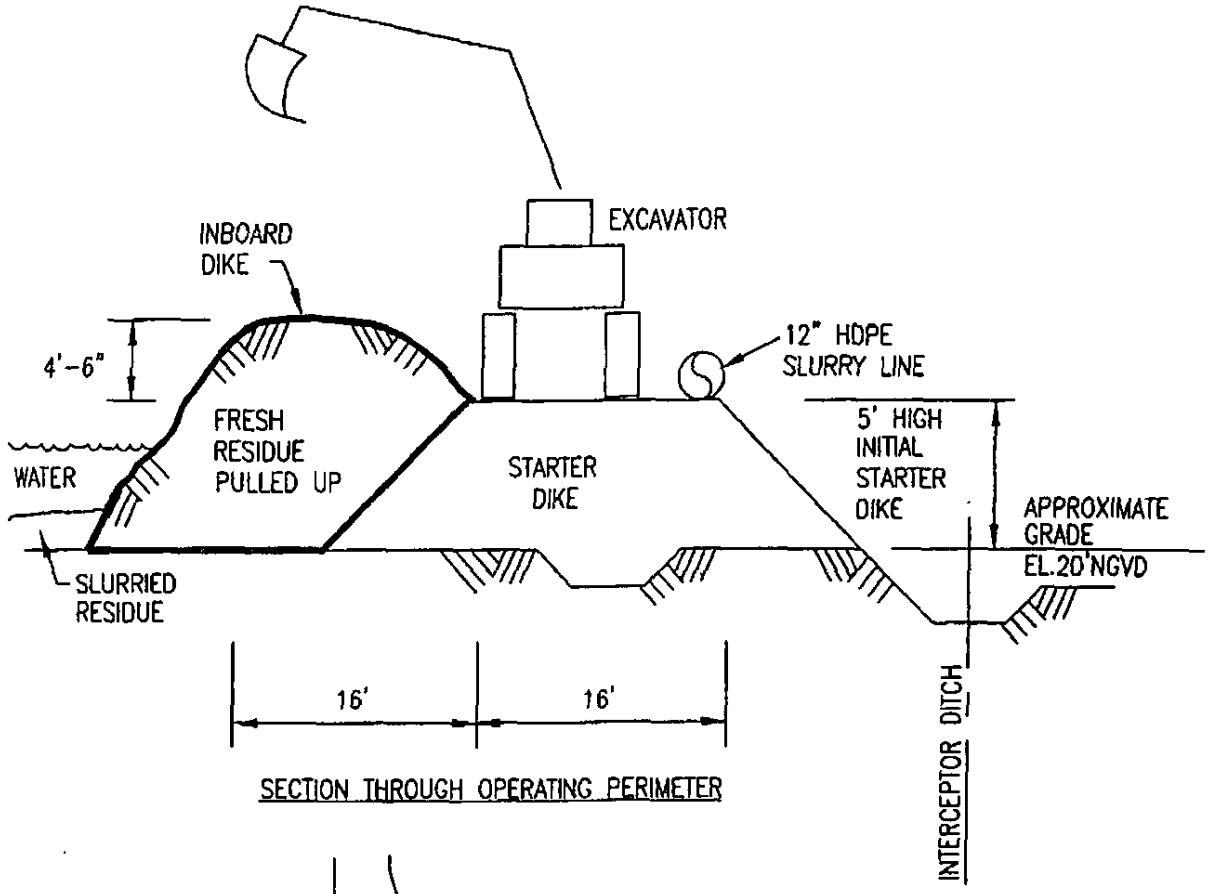
G. Typical Finished Residue Stack Life Cycle Cross Section

H. L. J. Capozzoli Report 4-3-85

I. L.J. Capozzoli Memo dated 2/6/01 on Residue Strength Determination

J. L.J. Capozzoli Proposal dated 3/20/01 for In-Situ Residue Strength Determination

APPENDIX A



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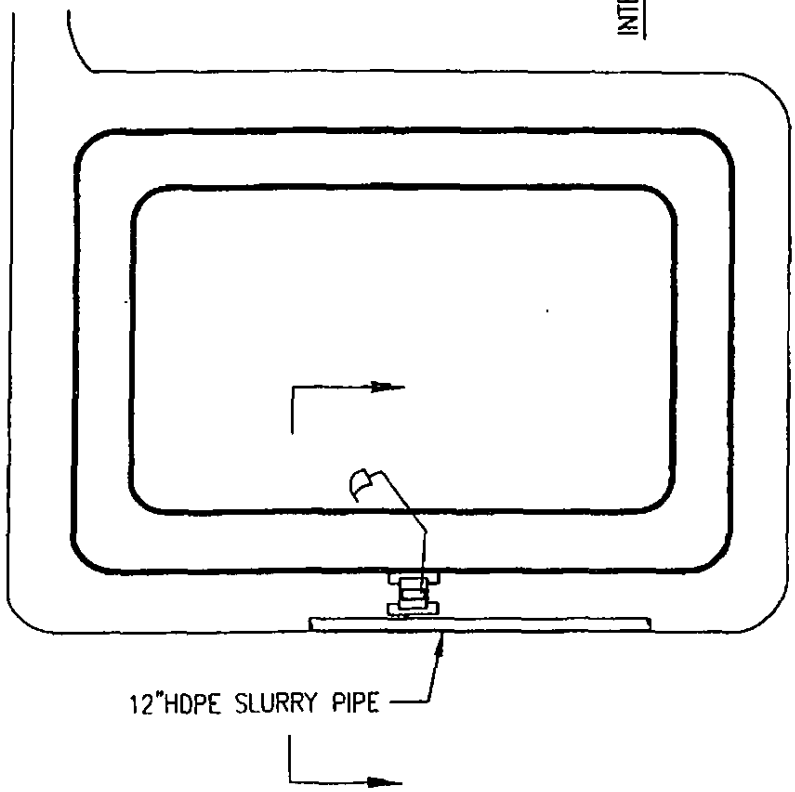

PLAN OF ACTIVE STACK

TASK P1

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SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
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Honeywell
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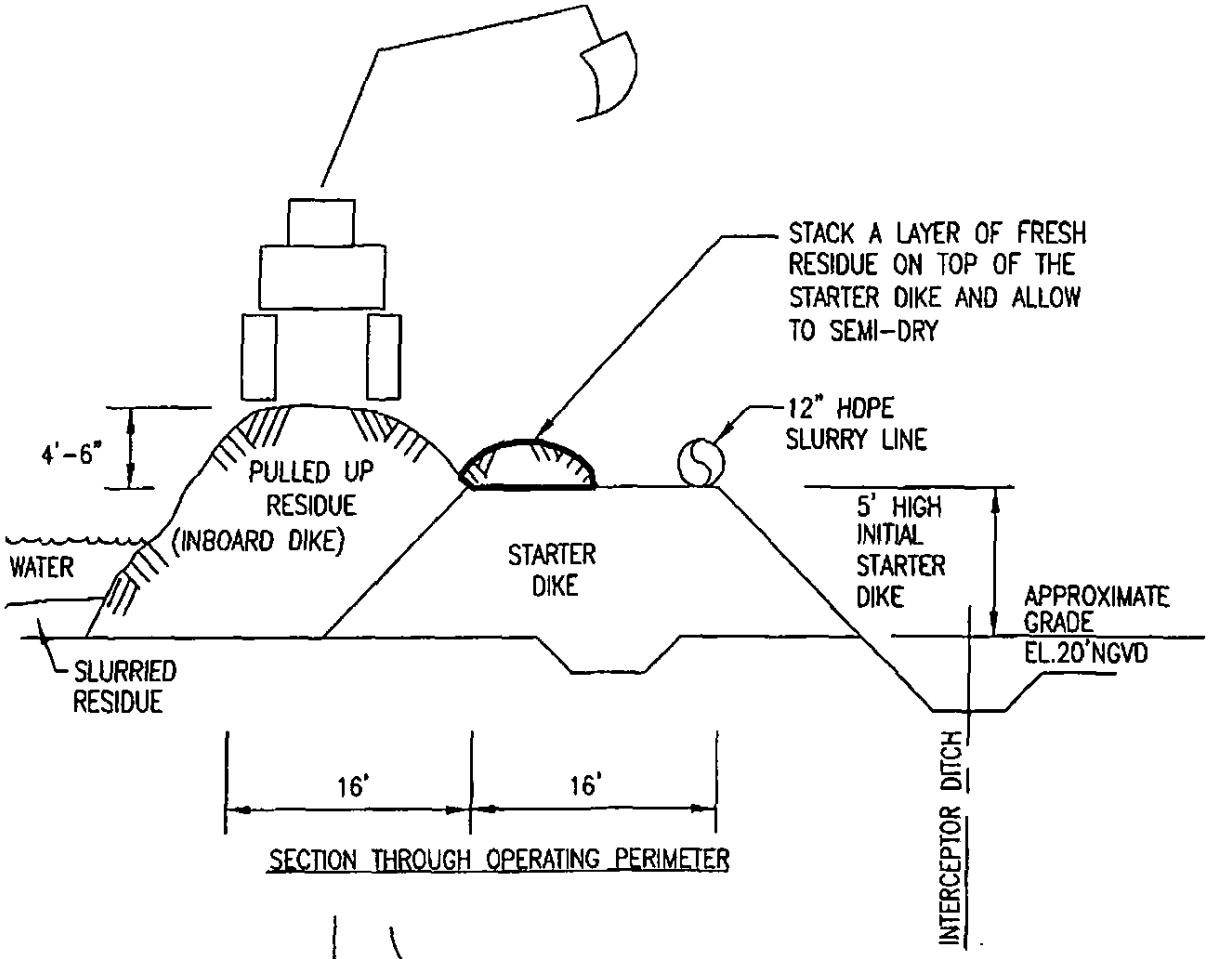

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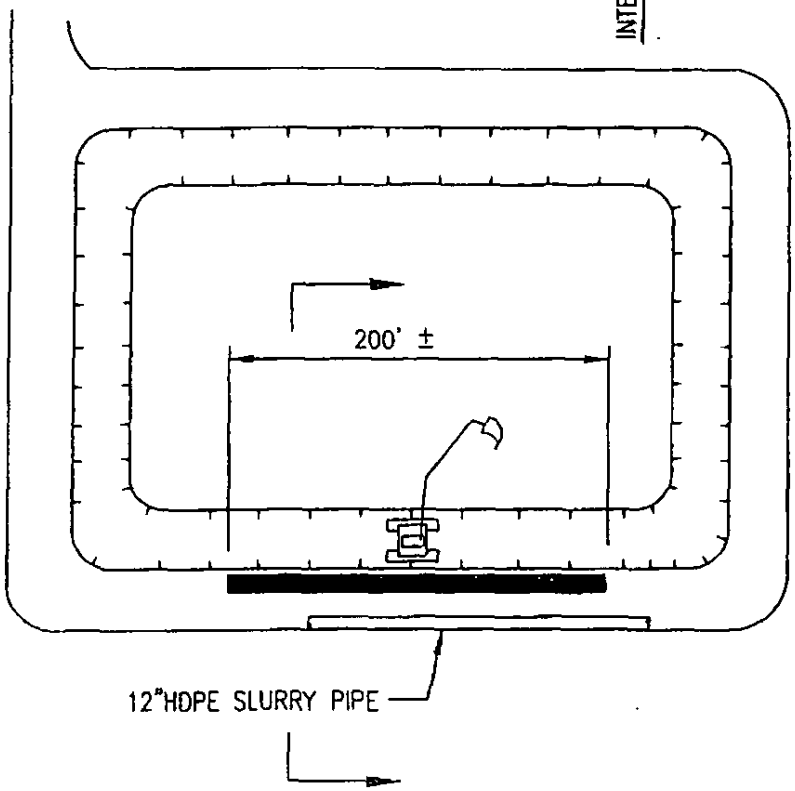

PLAN OF ACTIVE STACK

TASK P2

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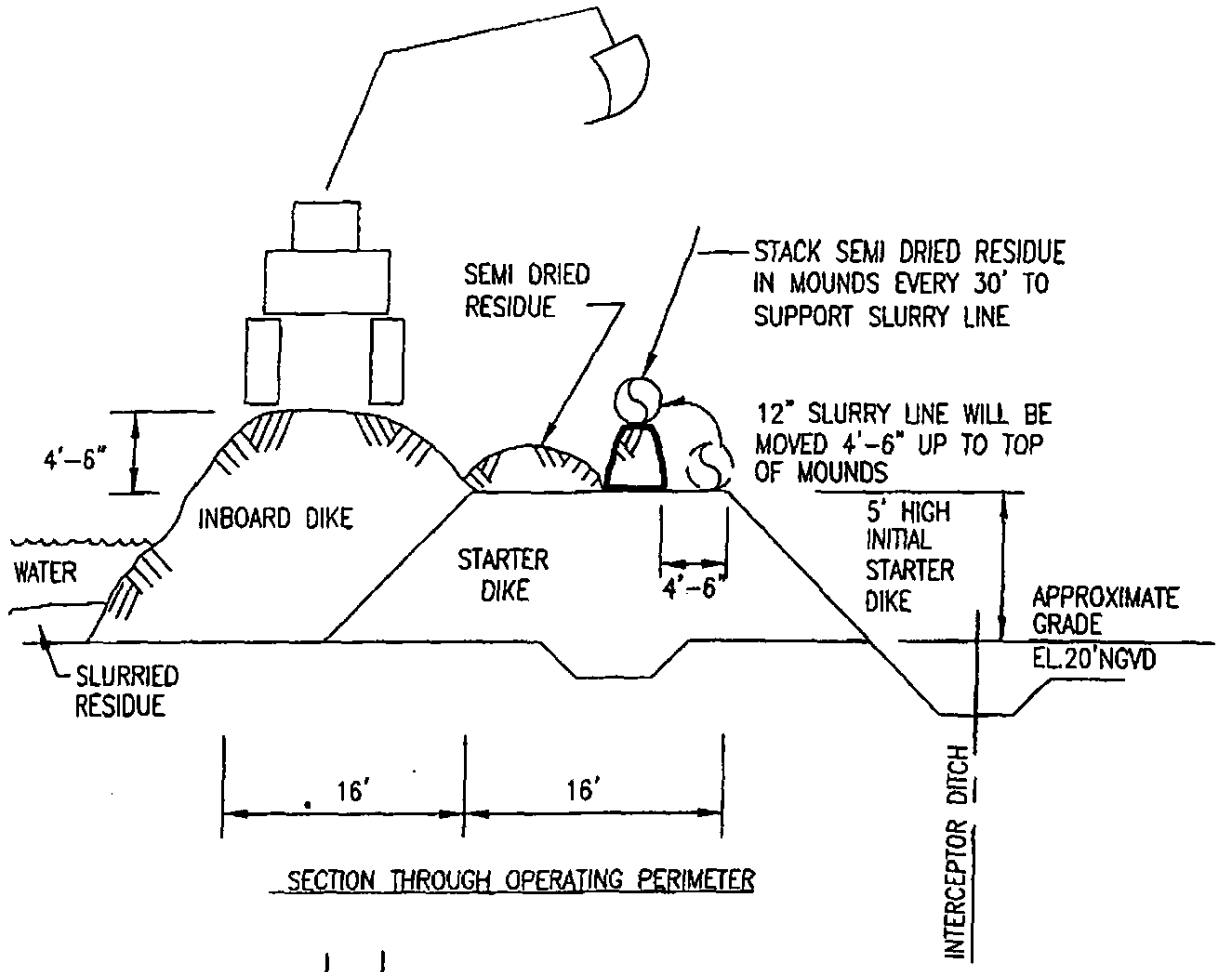

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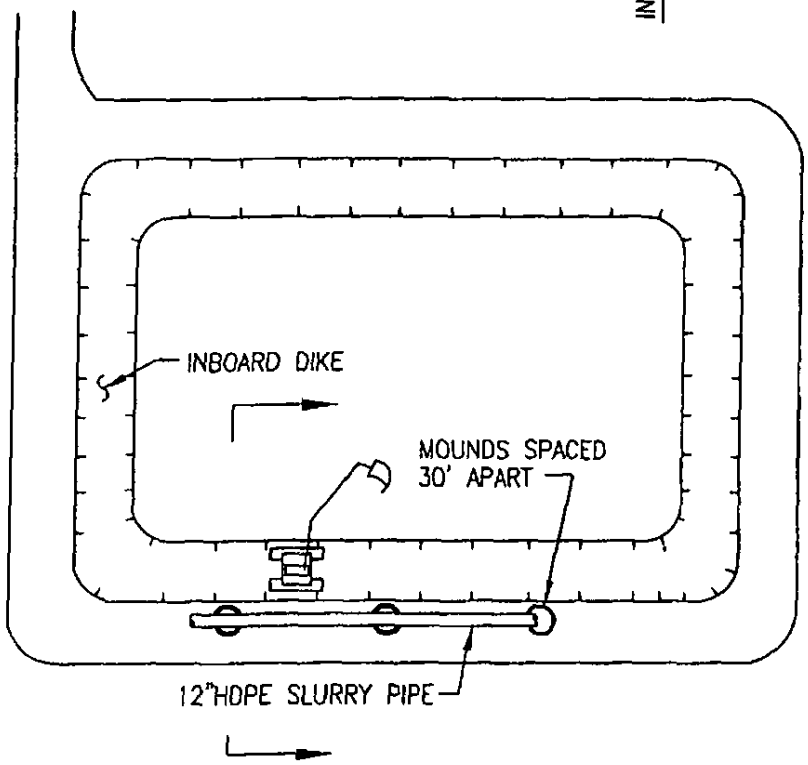

PLAN OF ACTIVE STACK

TASK P3

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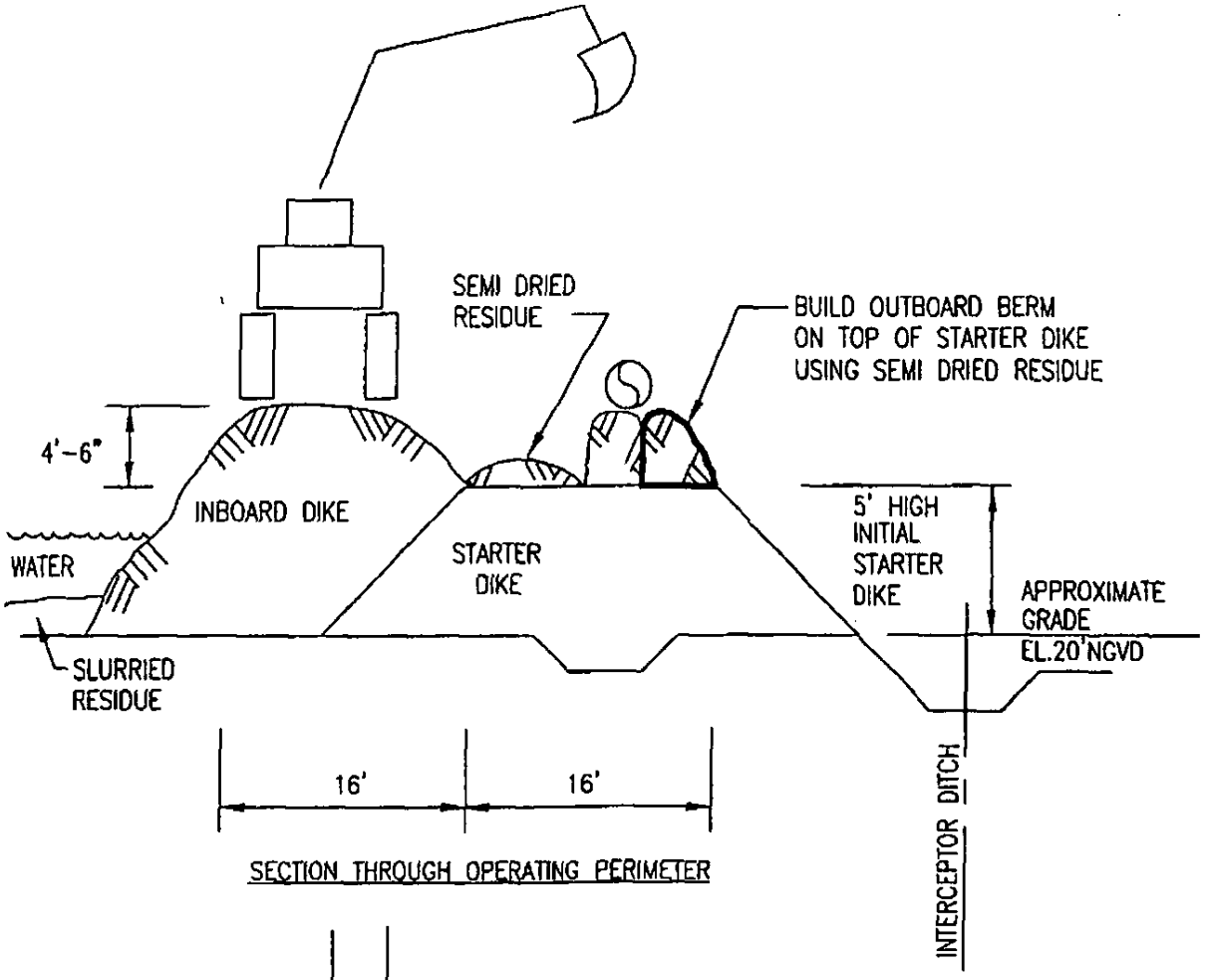

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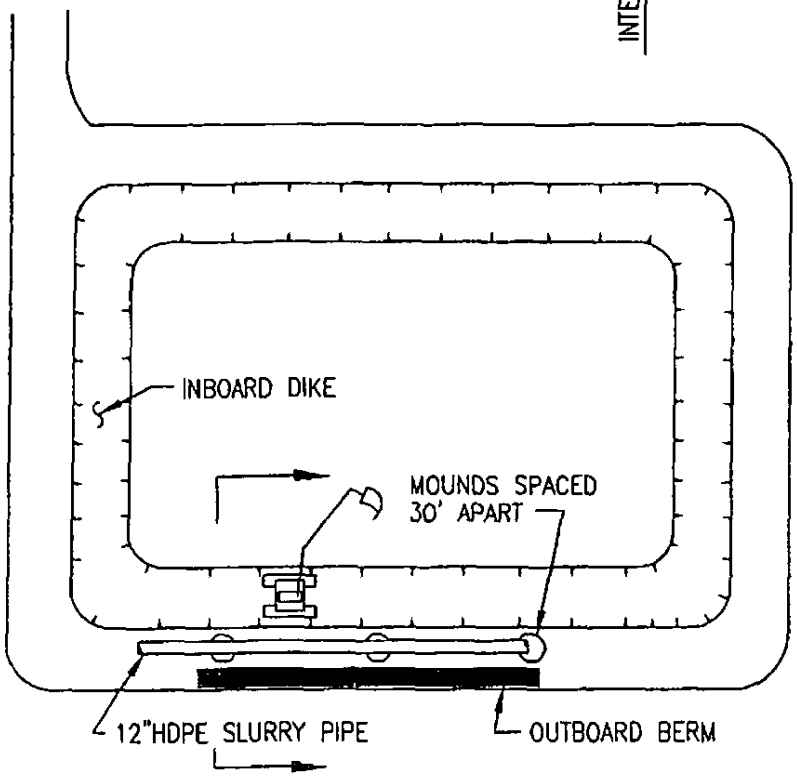

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TASK P4

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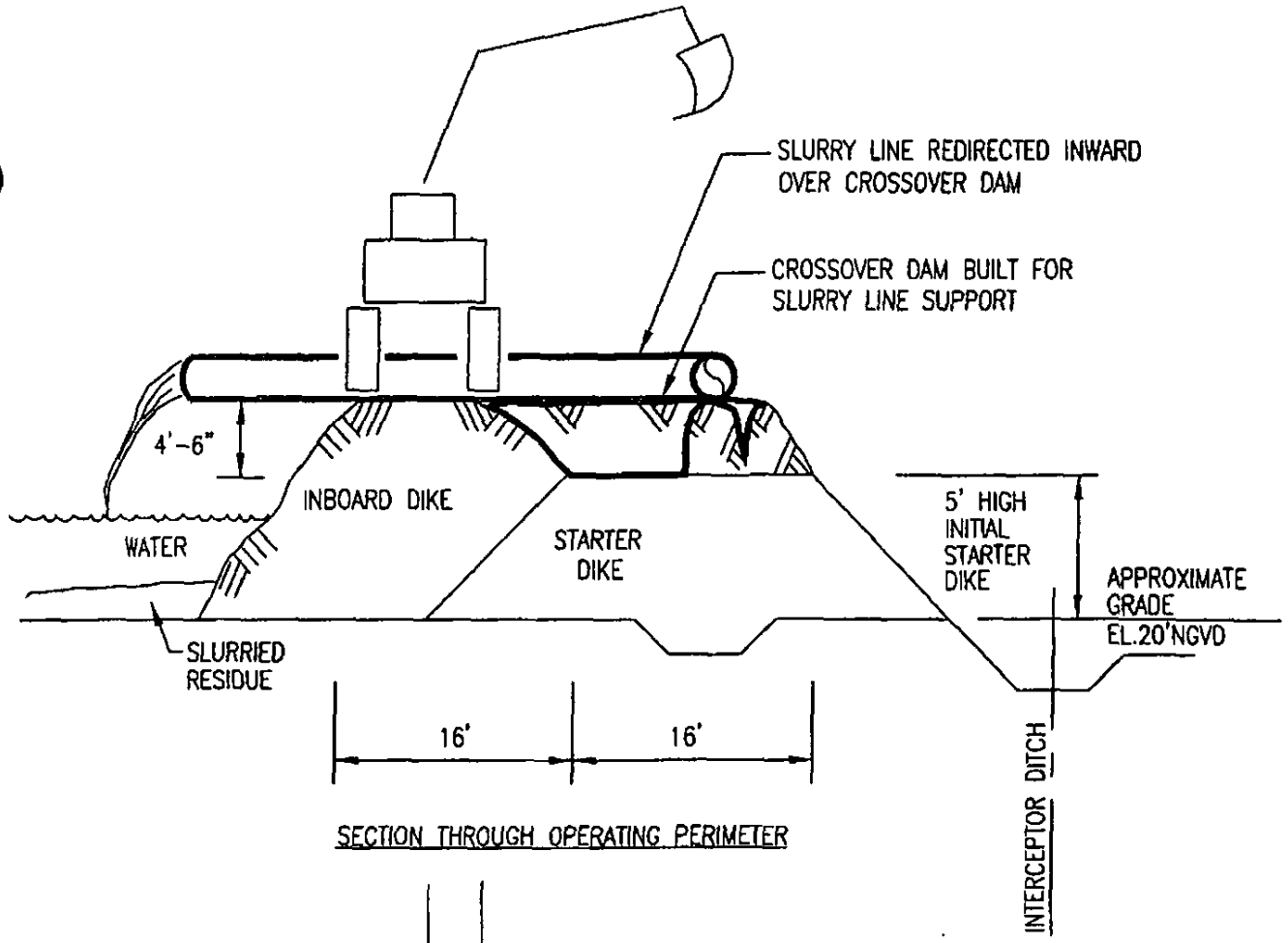

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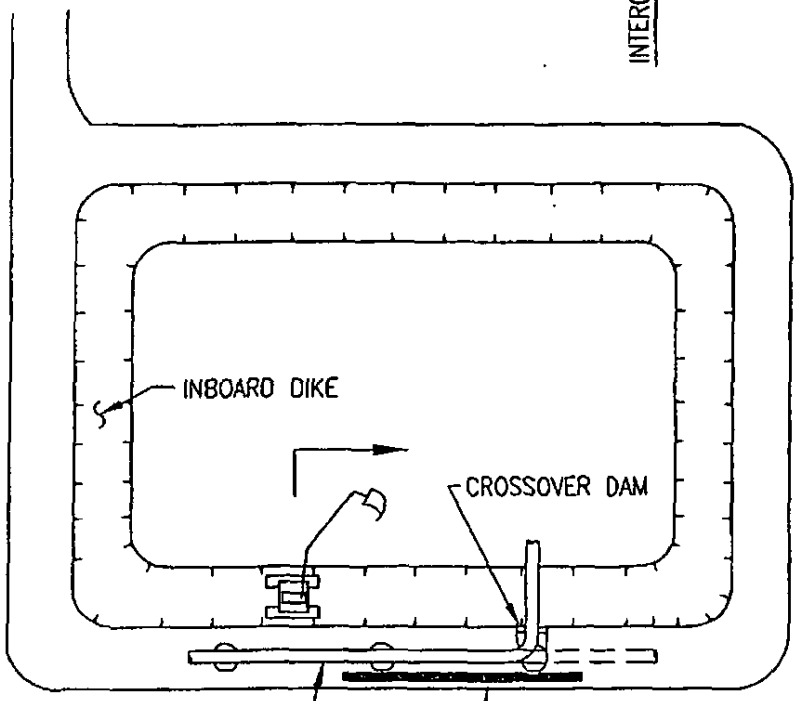

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TASK P5

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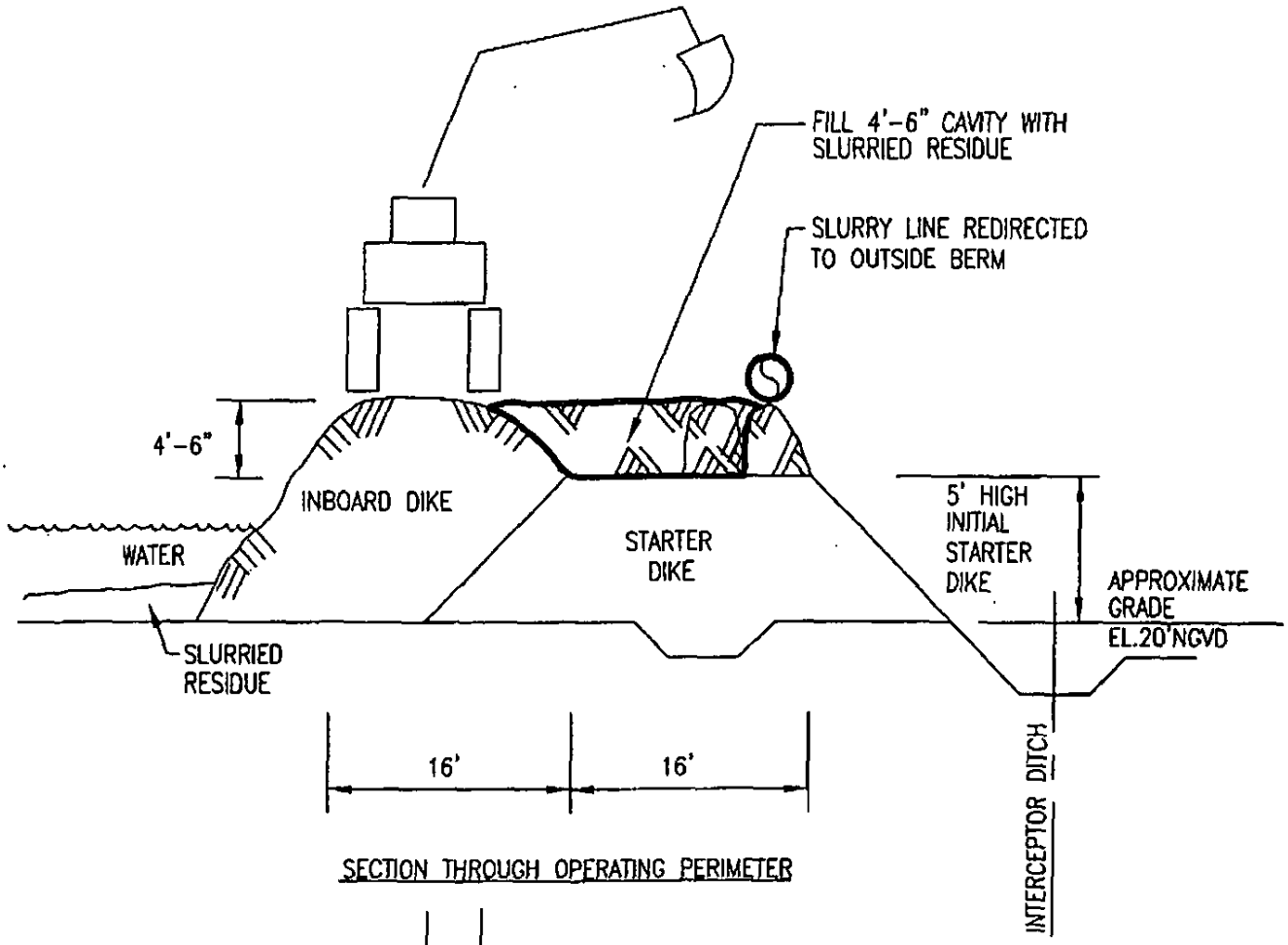

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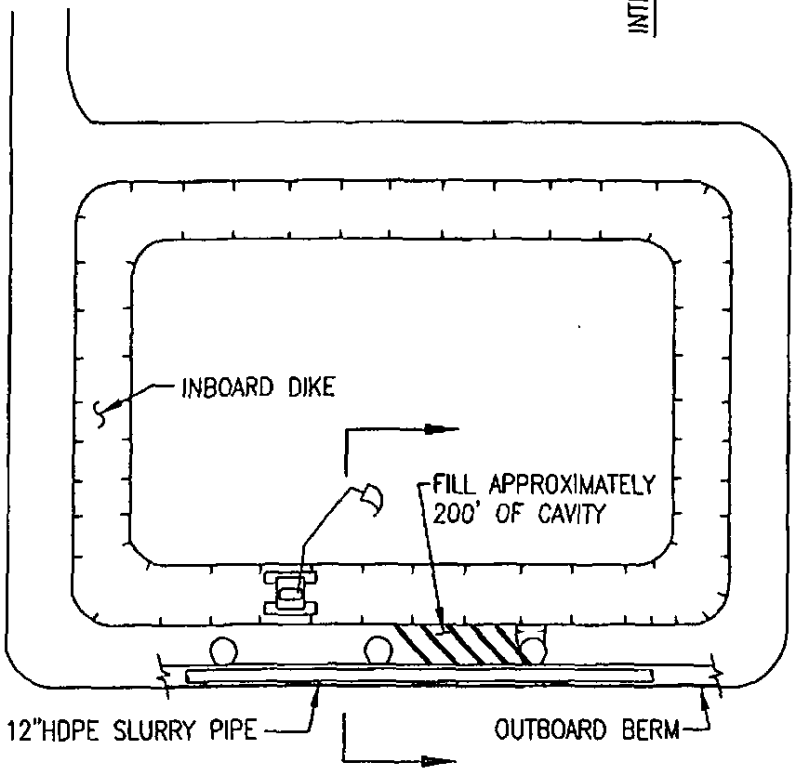

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TASK P6

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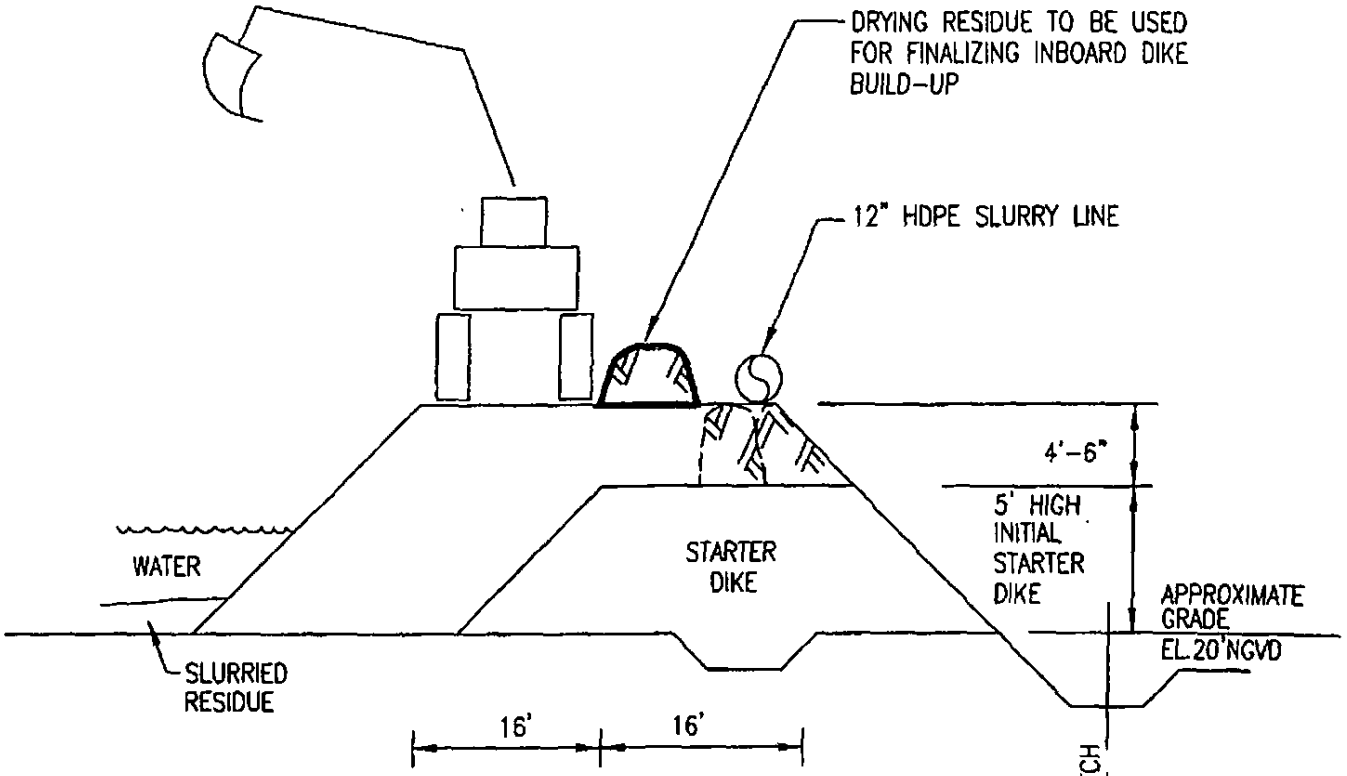

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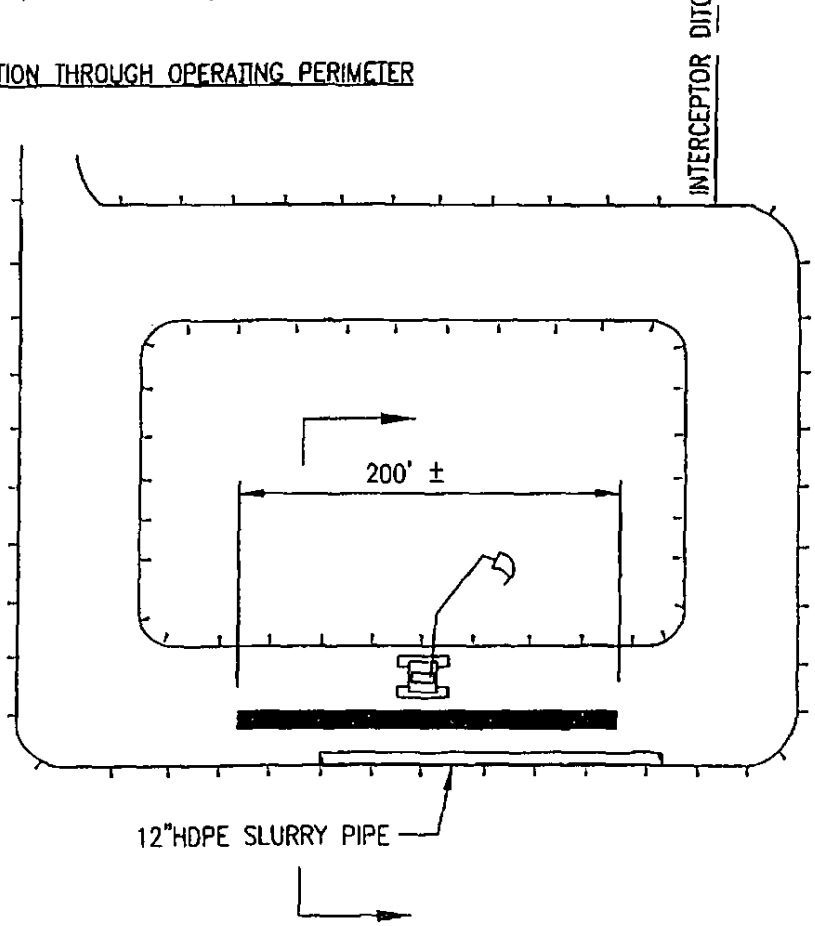

NOTE: 1) THIS IS ESSENTIALLY THE SAME AS TASKP2

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TASK P7

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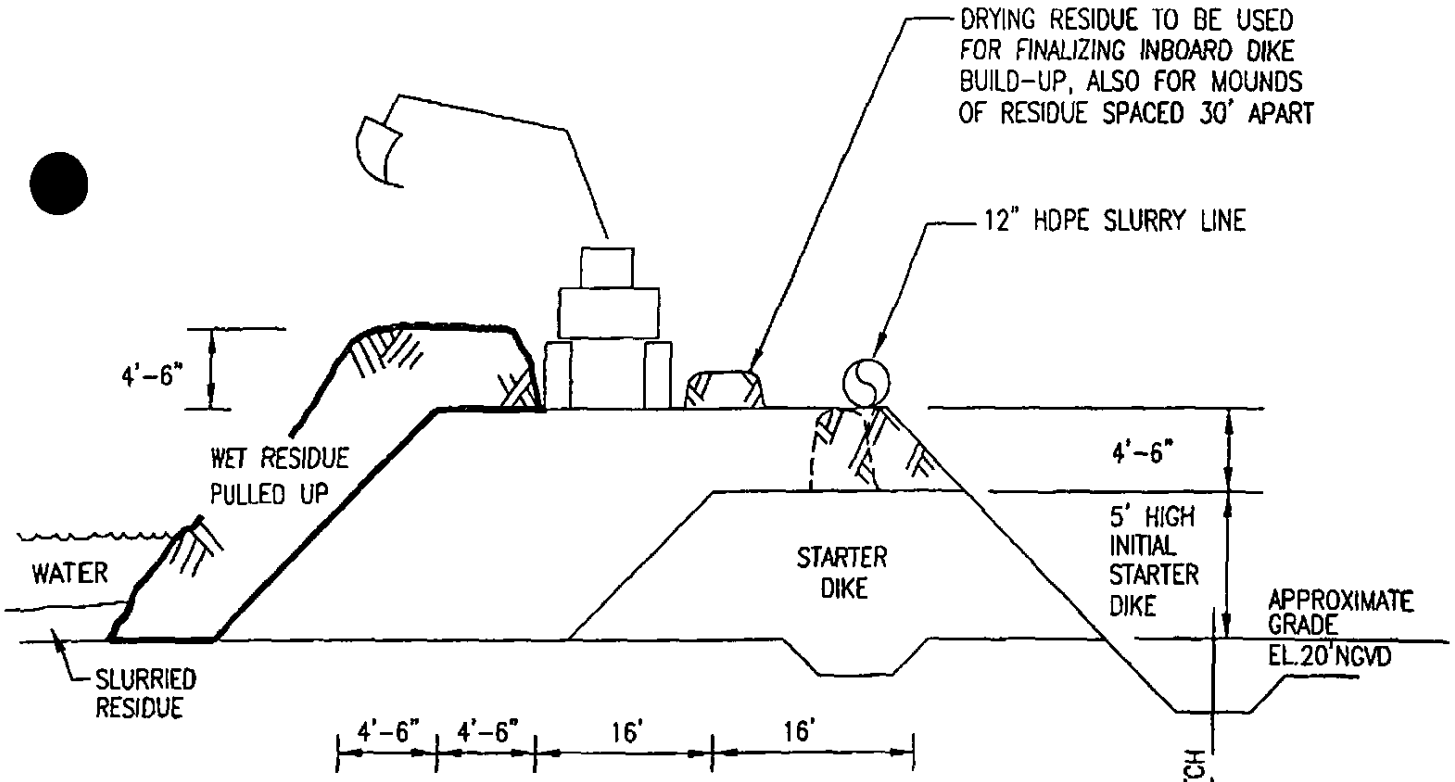

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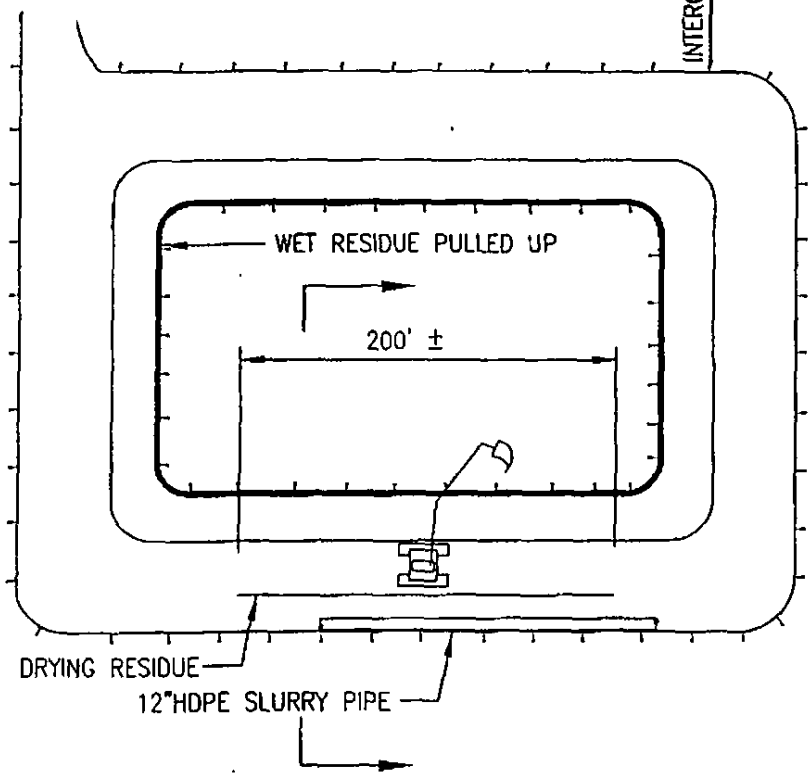

PLAN OF ACTIVE STACK

TASK P8

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RESIDUE STACK BUILDING
PROCESS
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Honeywell
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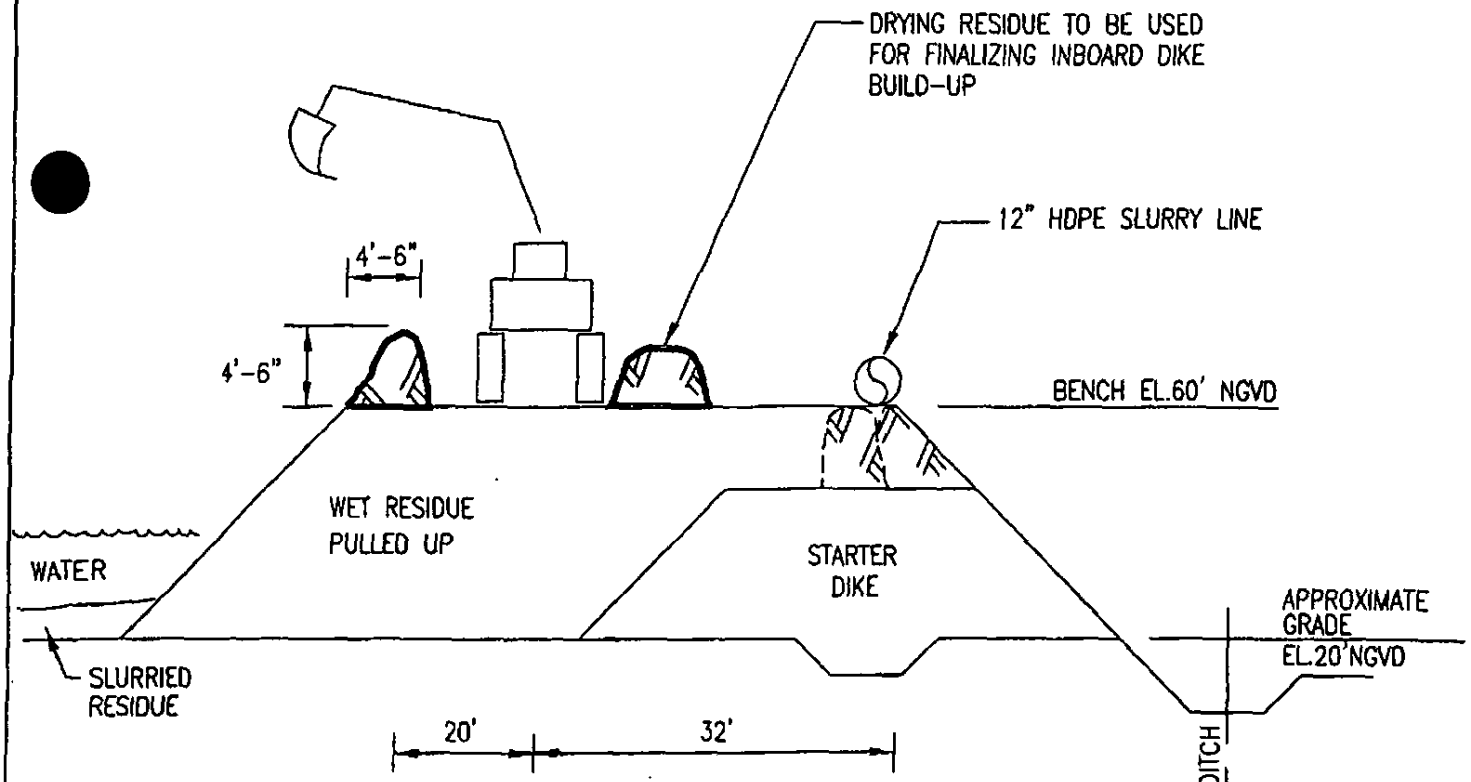
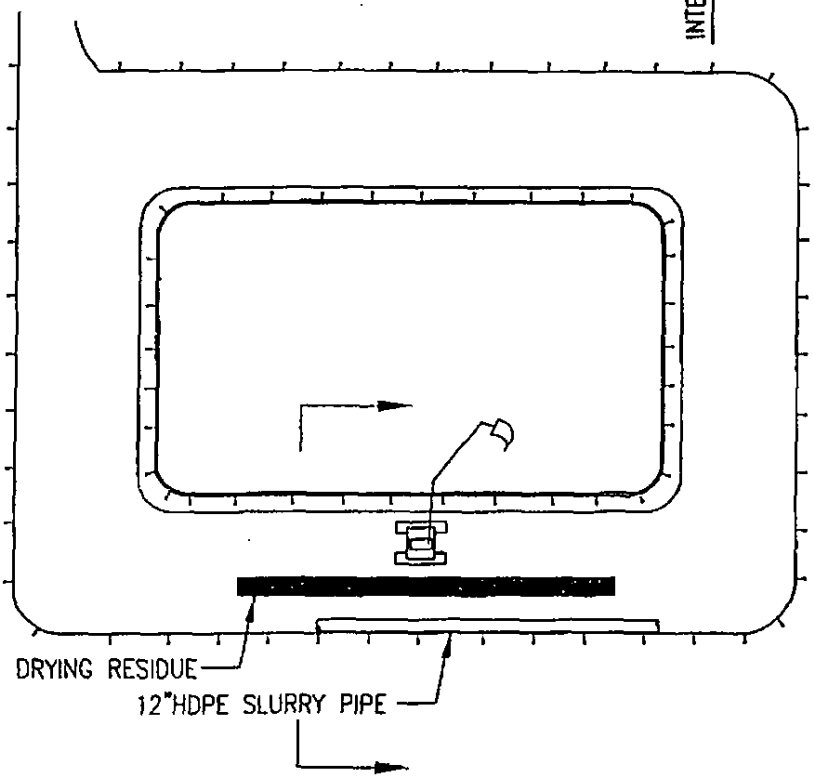


SECTION THROUGH OPERATING PERIMETER



PLAN OF ACTIVE STACK

TASK P8A

NOTICE

THIS DRAWING, THE PROPERTY OF HONEYWELL IS FURNISHED SUBJECT TO RETURN ON DEMAND AND THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DESIGN WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION WHETHER WILLFUL OR NEGLIGENT.

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

JOB NO. A8787 SCALE NONE

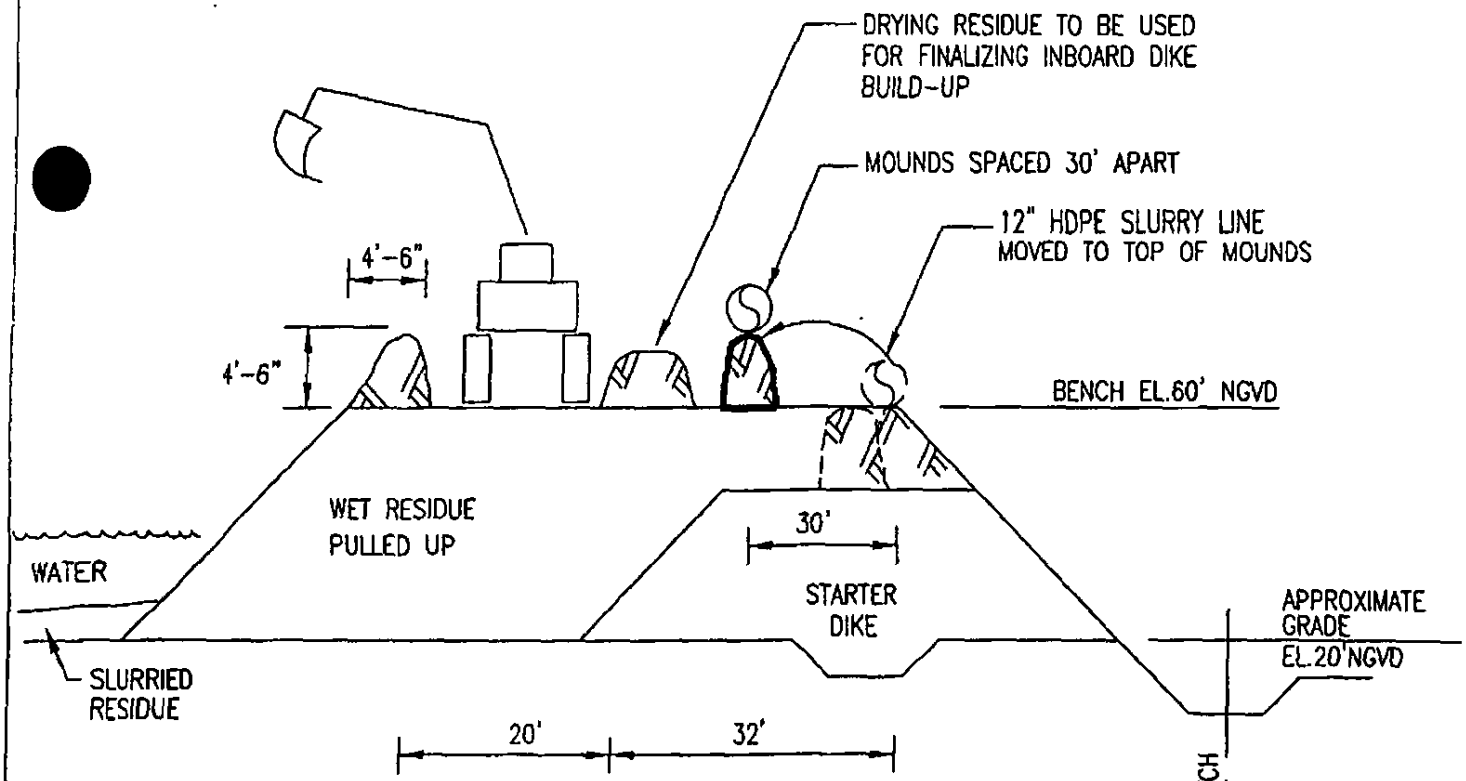
SHEET NO. OF

RESIDUE STACK BUILDING PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

571-A-2244-9 REV. 0



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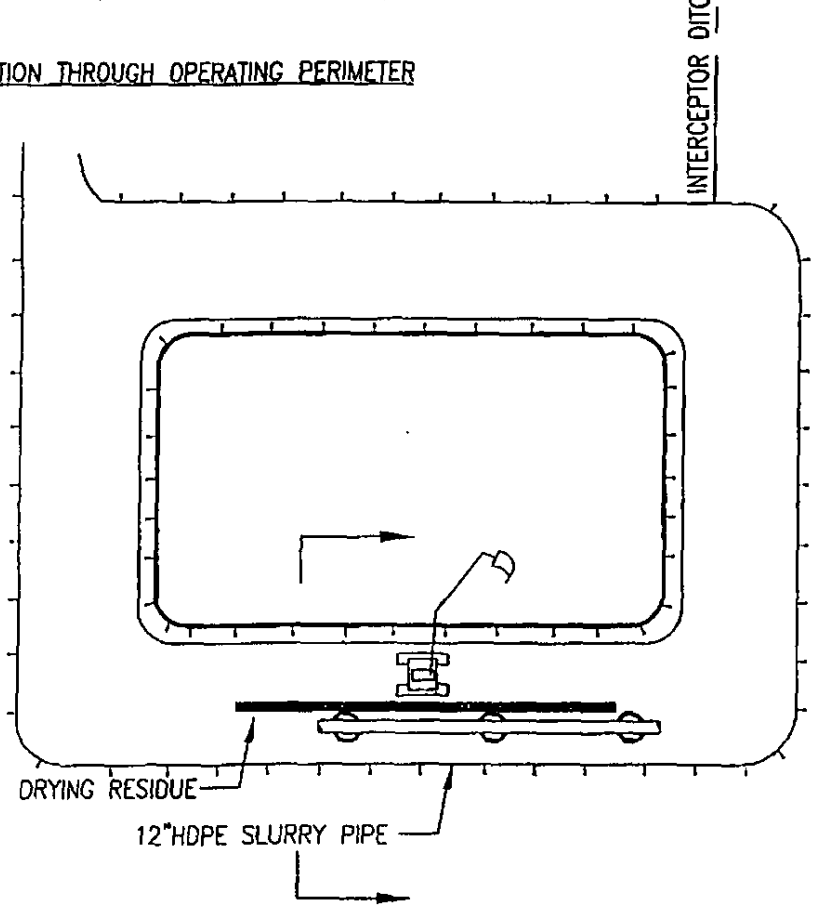

NOTE: IDENTICAL TO TASKP3

PLAN OF ACTIVE STACK

TASK P8B

NOTICE

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NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

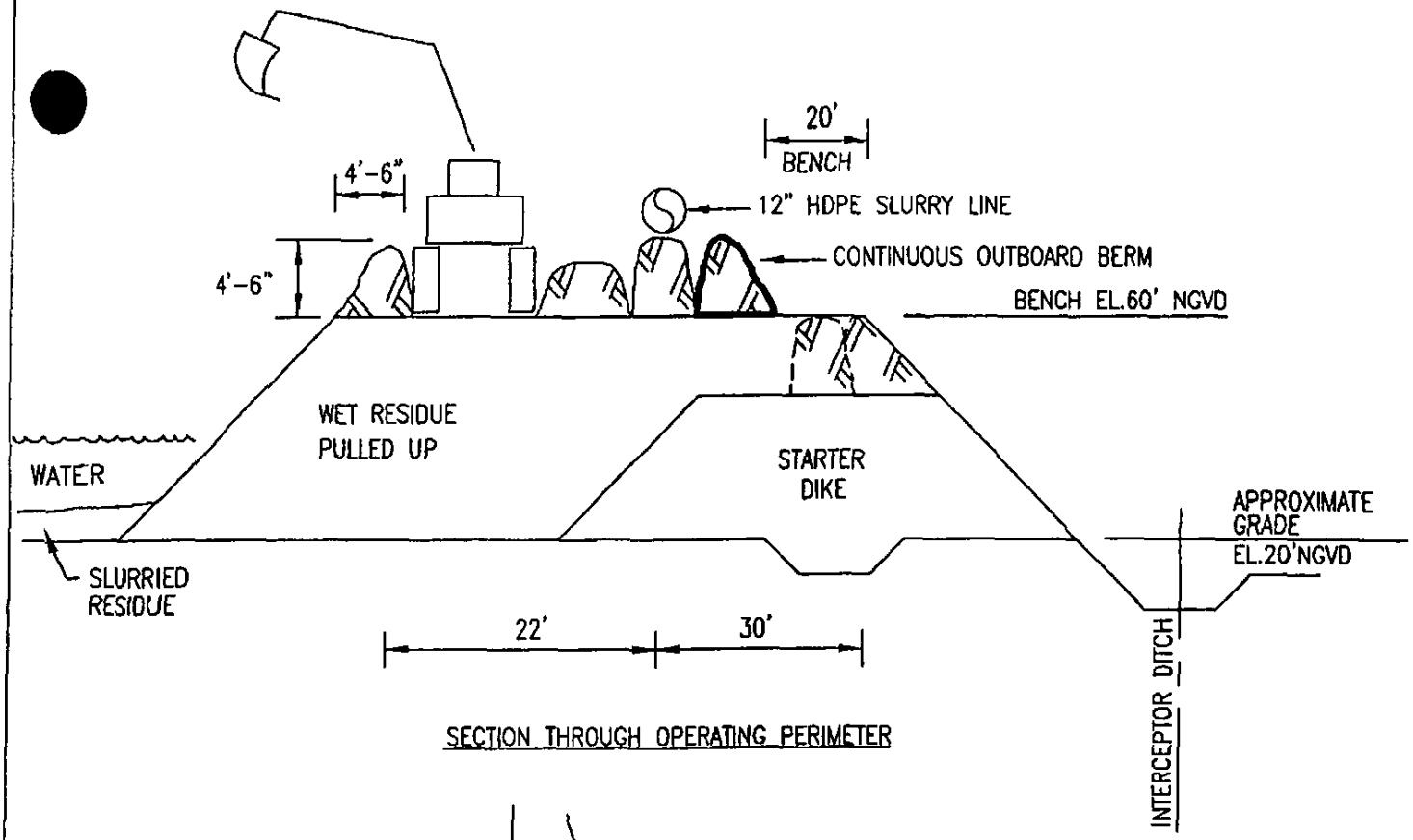
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

571-A-2244-10 REV. 0



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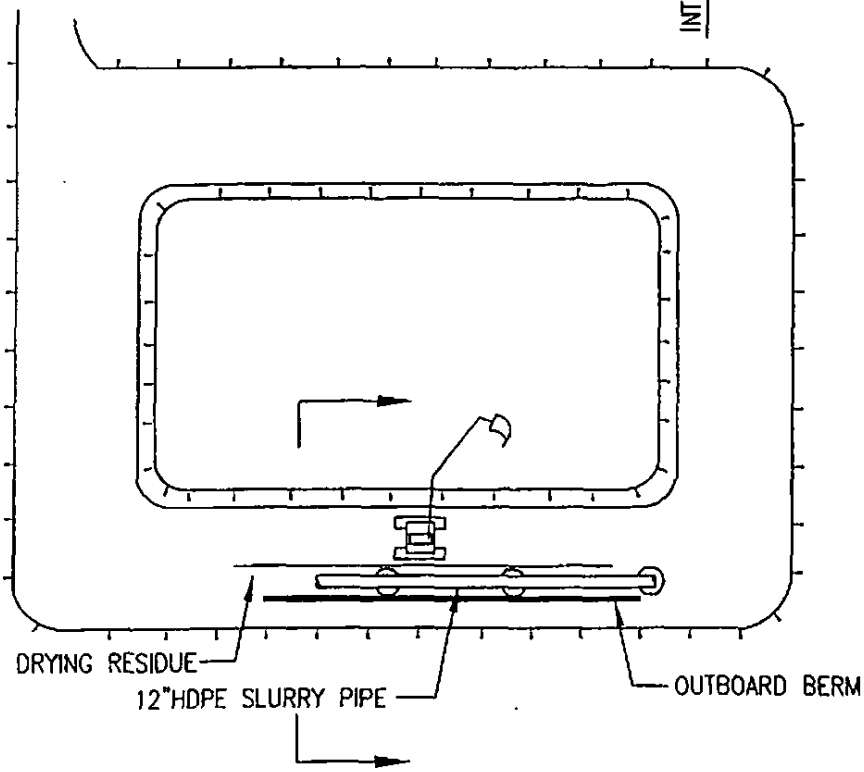

PLAN OF ACTIVE STACK

TASK P8C

NOTICE

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NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	FMG

JOB NO. A8787 SCALE NONE

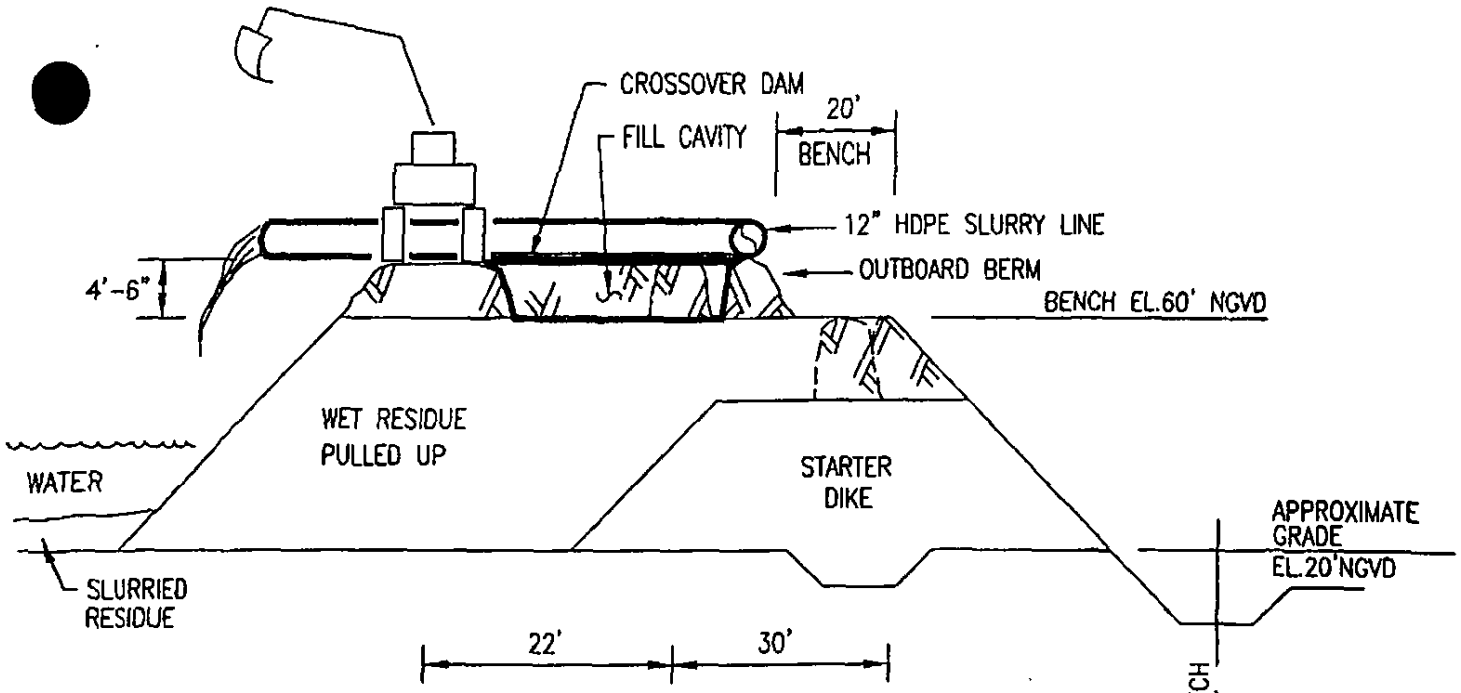
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

571-A-2244-11 REV. 0



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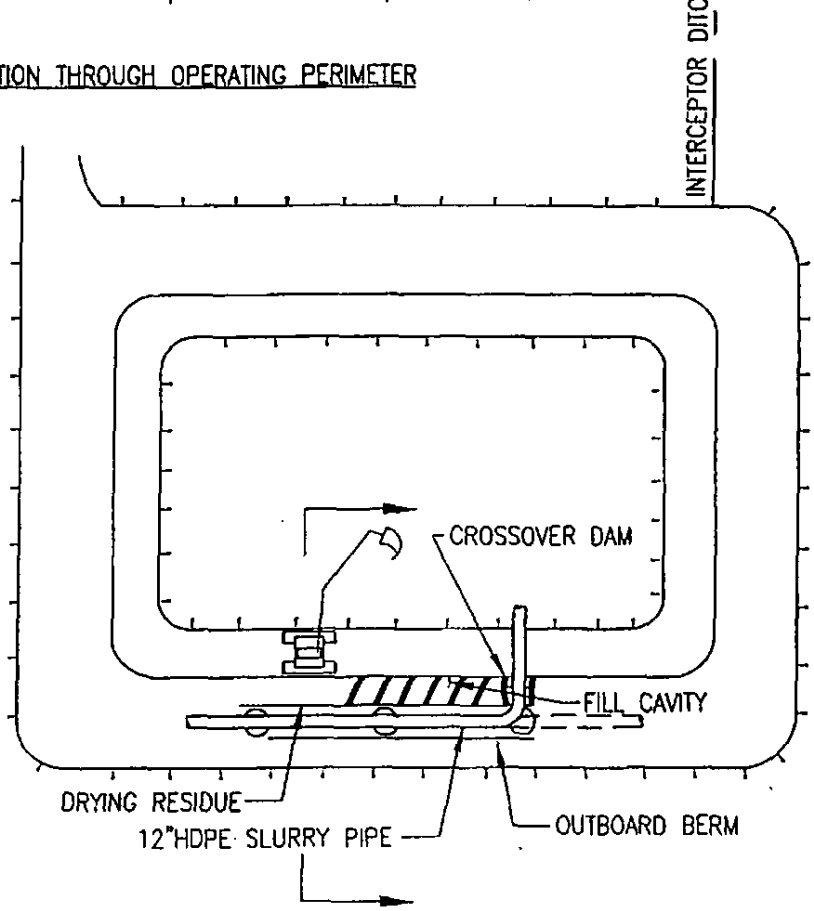

PLAN OF ACTIVE STACK

TASK P8D

NOTICE

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NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

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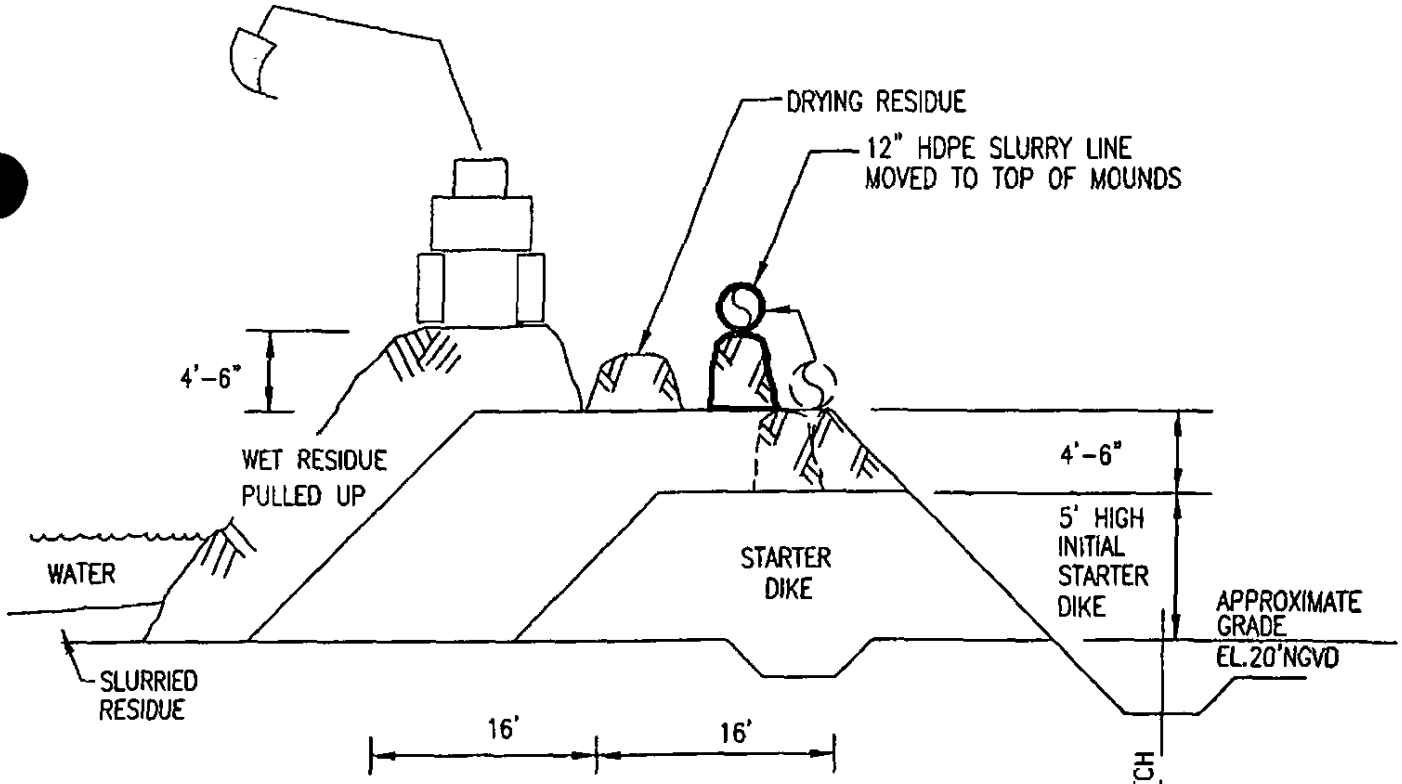

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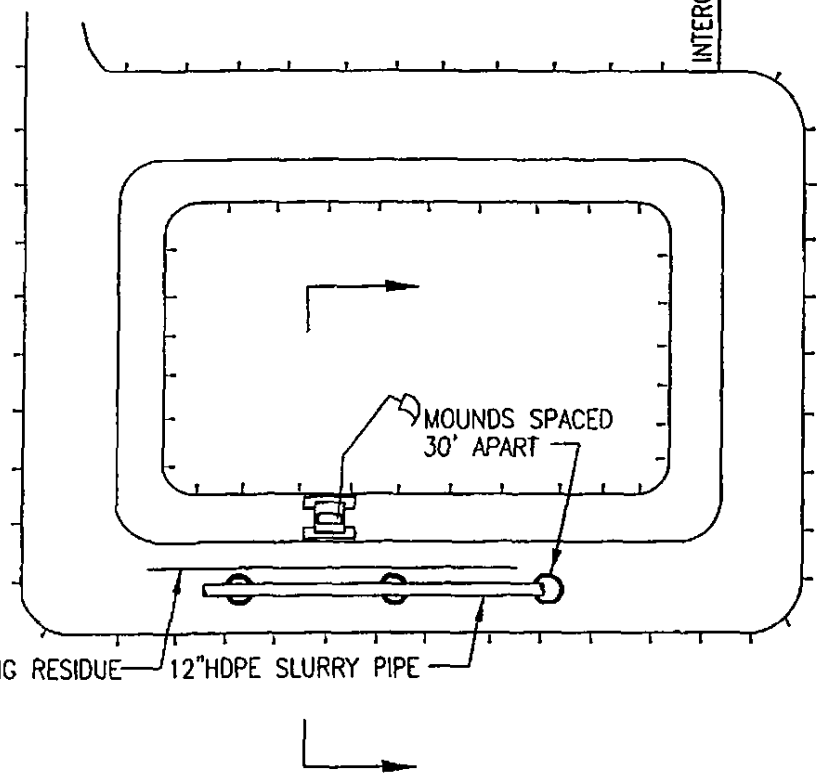

NOTE: IDENTICAL TO TASKP2 & TASKP3

PLAN OF ACTIVE STACK

TASK P9

NOTICE

THIS DRAWING, THE PROPERTY OF HONEYWELL IS FURNISHED SUBJECT TO RETURN ON DEMAND AND THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DESIGN WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION WHETHER WILLFUL OR NEGLIGENT.

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0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

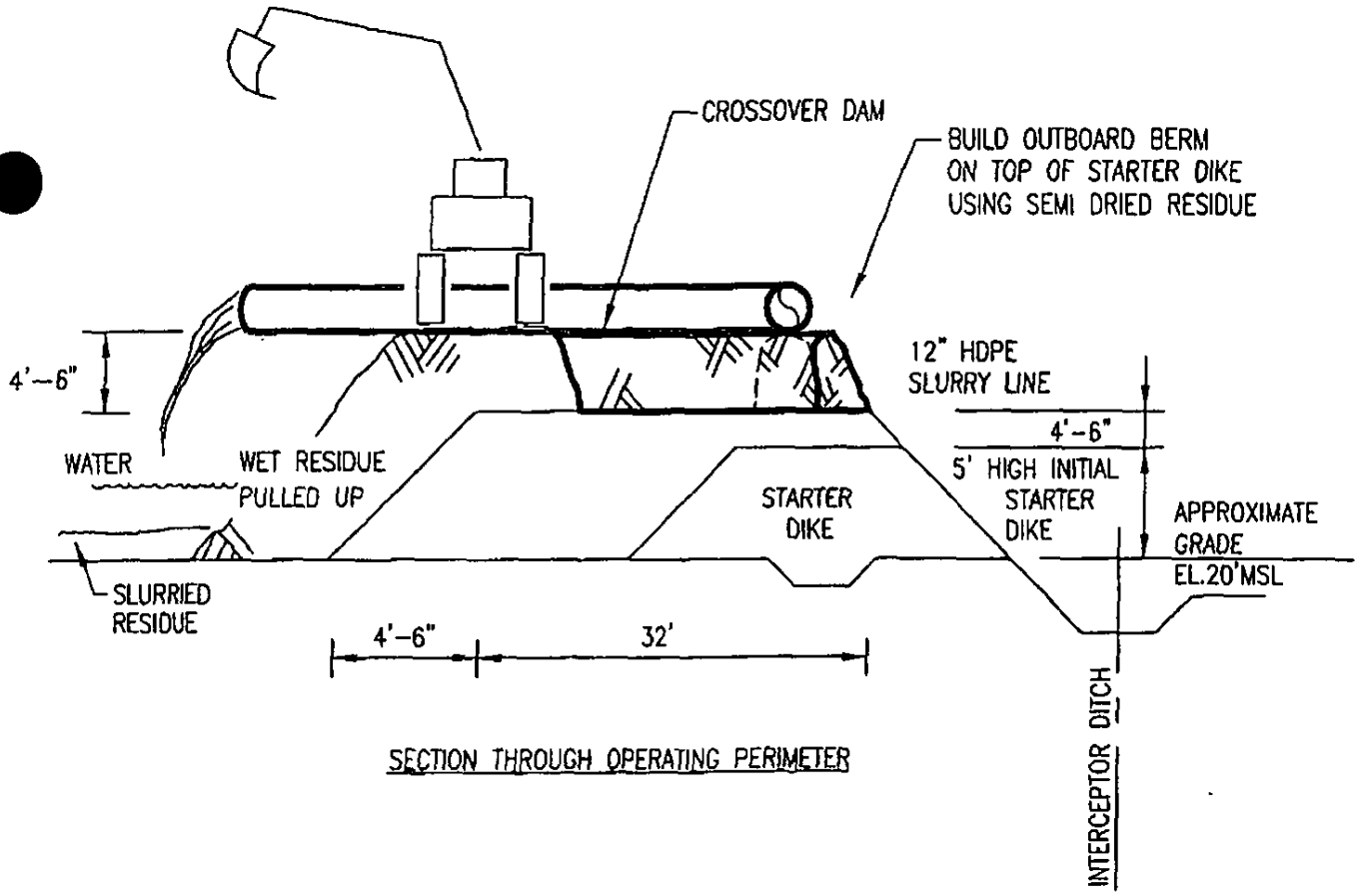
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

571-A-2244-13 REV. 0



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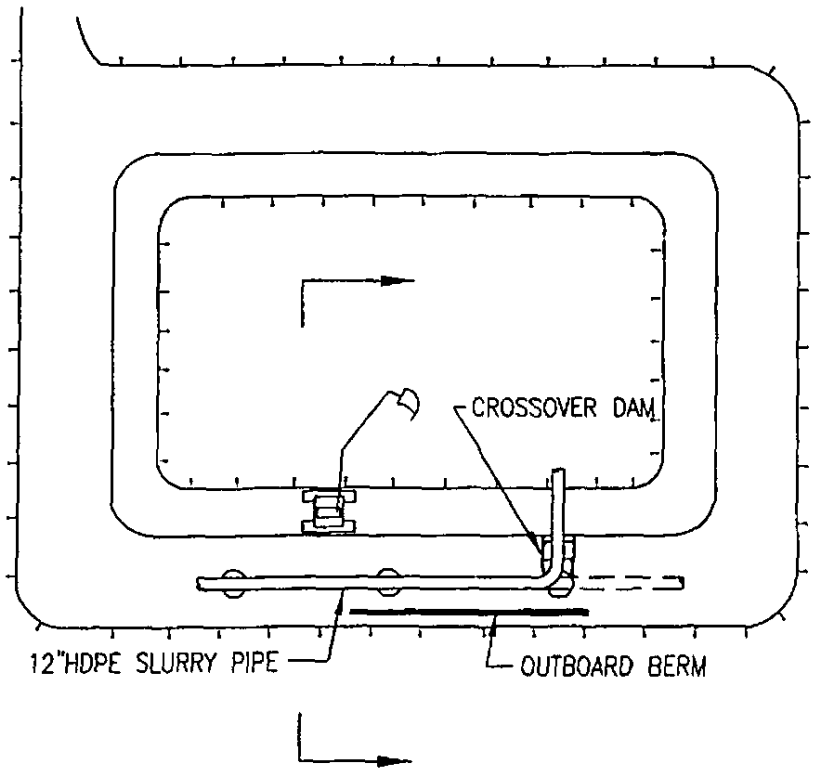


NOTE: SIMILAR TO TASKP4 AND P5

PLAN OF ACTIVE STACK

TASK P10

NOTICE

THIS DRAWING, THE PROPERTY OF HONEYWELL IS FURNISHED SUBJECT TO RETURN ON DEMAND AND THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DESIGN WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION WHETHER WILLFUL OR NEGLIGENT.

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

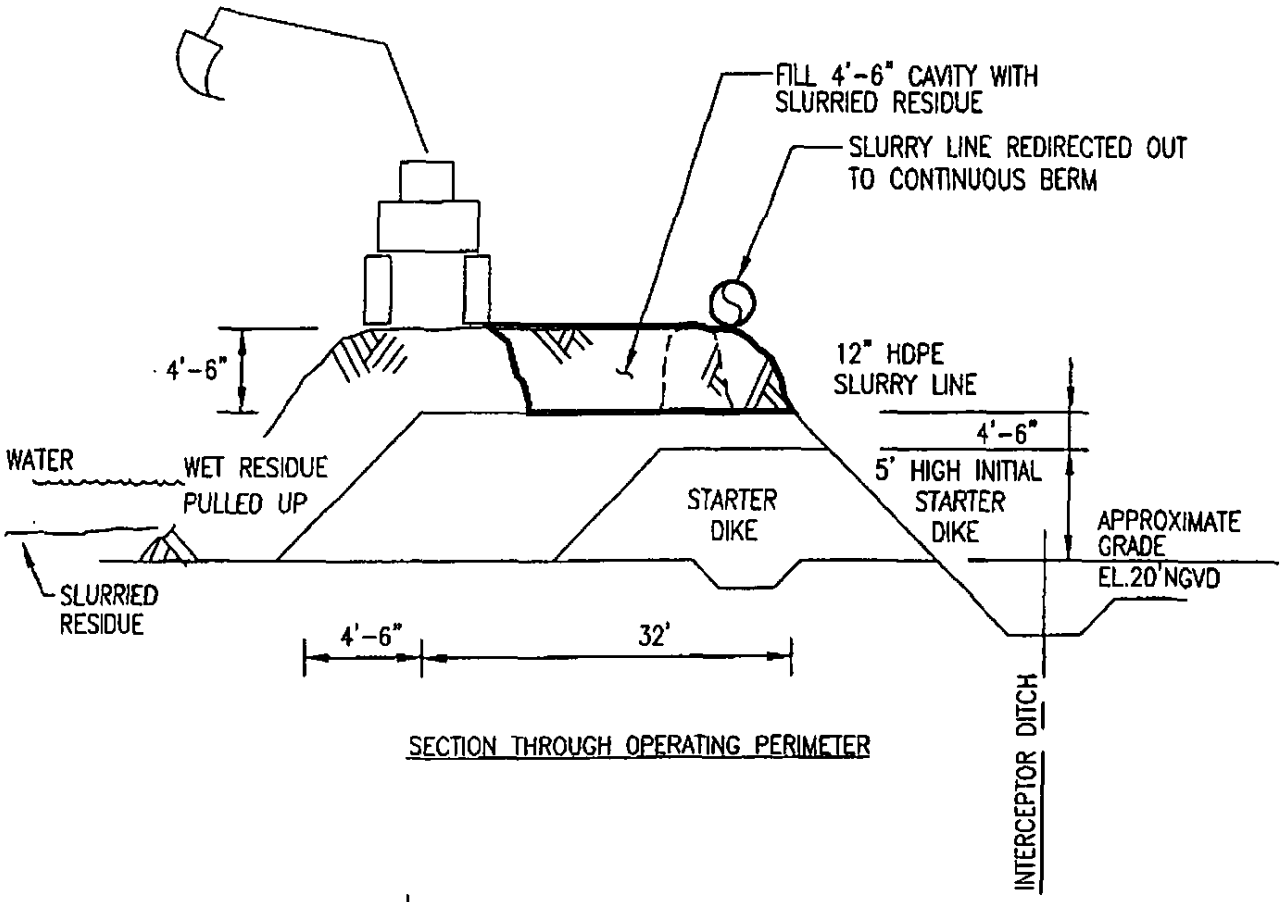
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

571-A-2244-14 REV. 0



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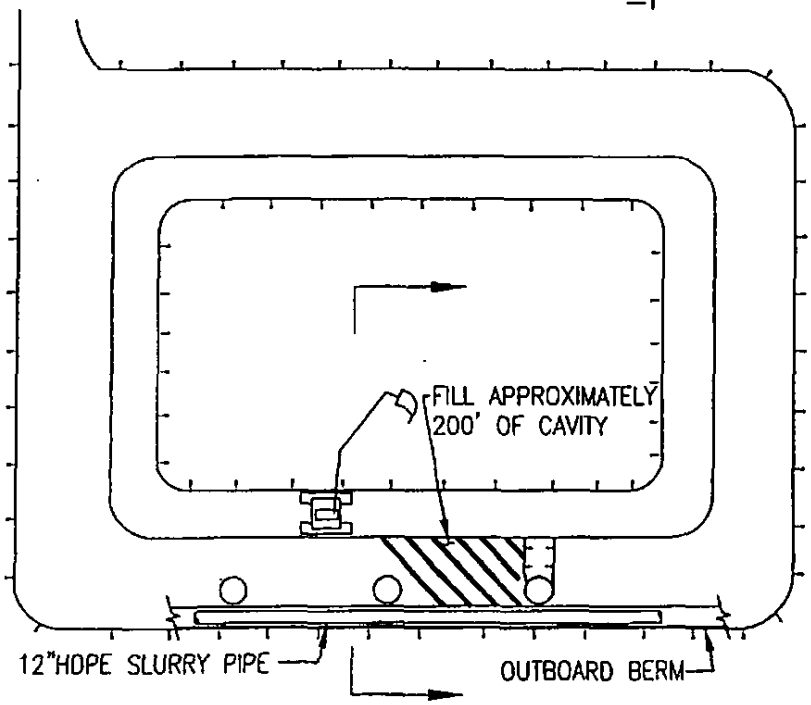


PLAN OF ACTIVE STACK

NOTE: SIMILAR TO TASKP6

NOTICE

THIS DRAWING, THE PROPERTY OF HONEYWELL IS FURNISHED SUBJECT TO RETURN ON DEMAND AND THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DESIGN WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION WHETHER WILLFUL OR NEGLIGENT.

TASK P11

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

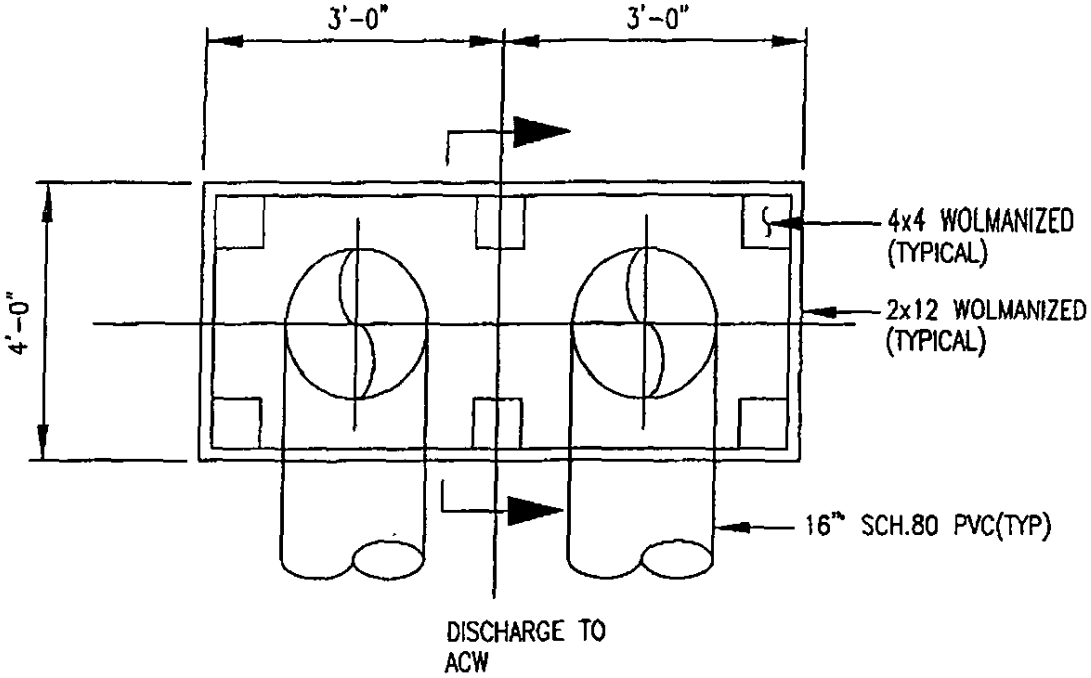
RESIDUE STACK BUILDING PROCESS
GEISMAR, LOUISIANA

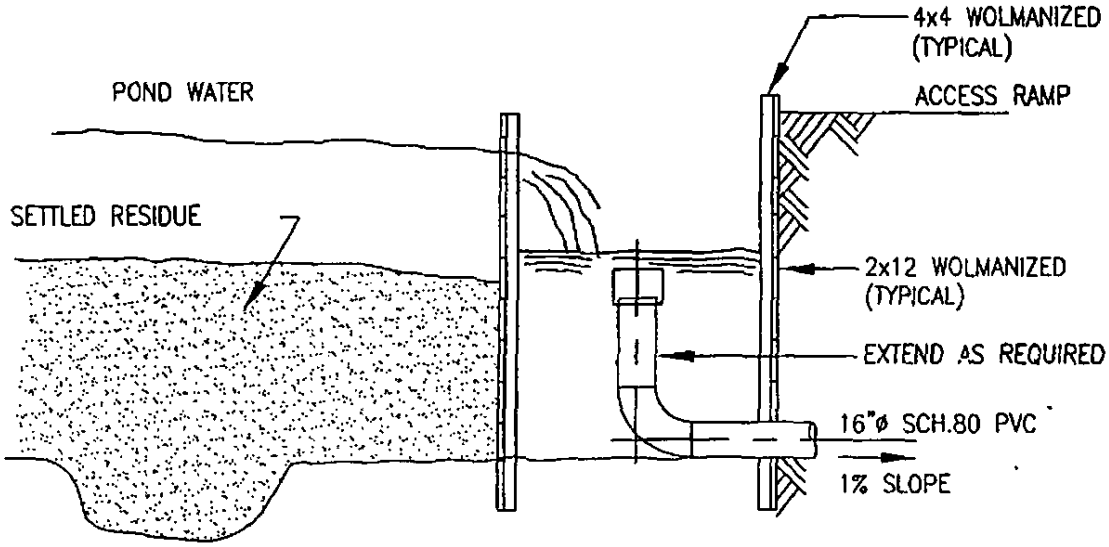
Honeywell SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	01/12/01	PMG	03/01

JOB NO. A8787 SCALE NONE
SHEET NO. OF

571-A-2244-15 REV. 0





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TASK R1

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMC

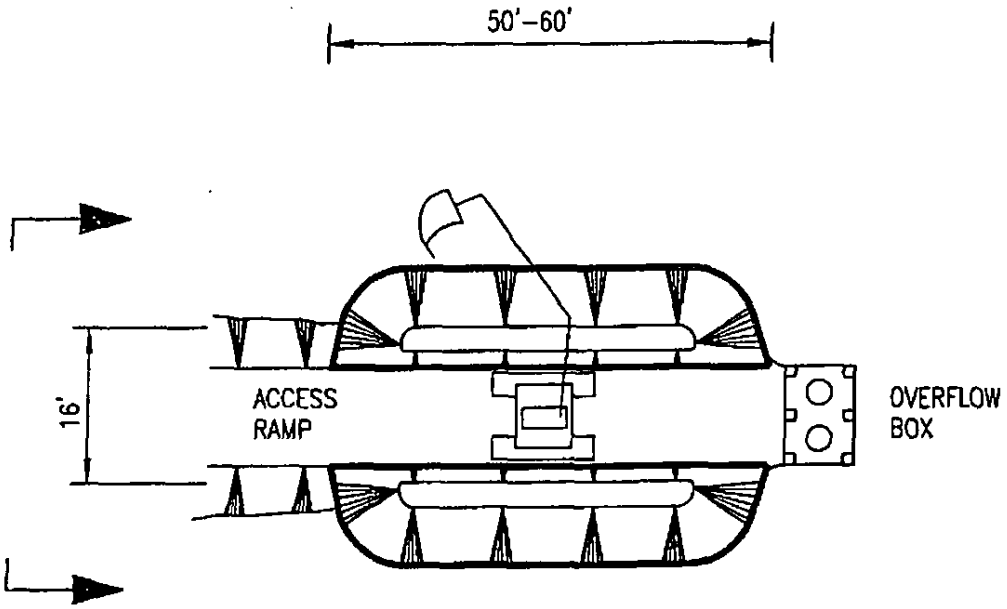
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

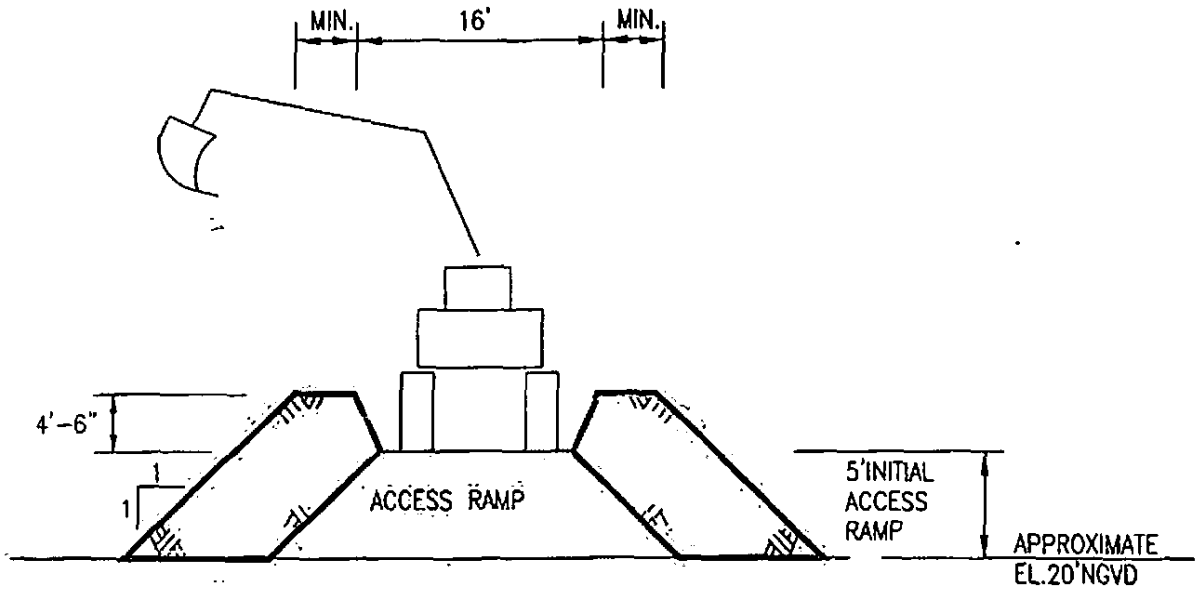
Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	02/01/01	PMC	03/01

571-A-2245-1 REV. 0



PLAN



SECTION

NOTICE

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TASK R2

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

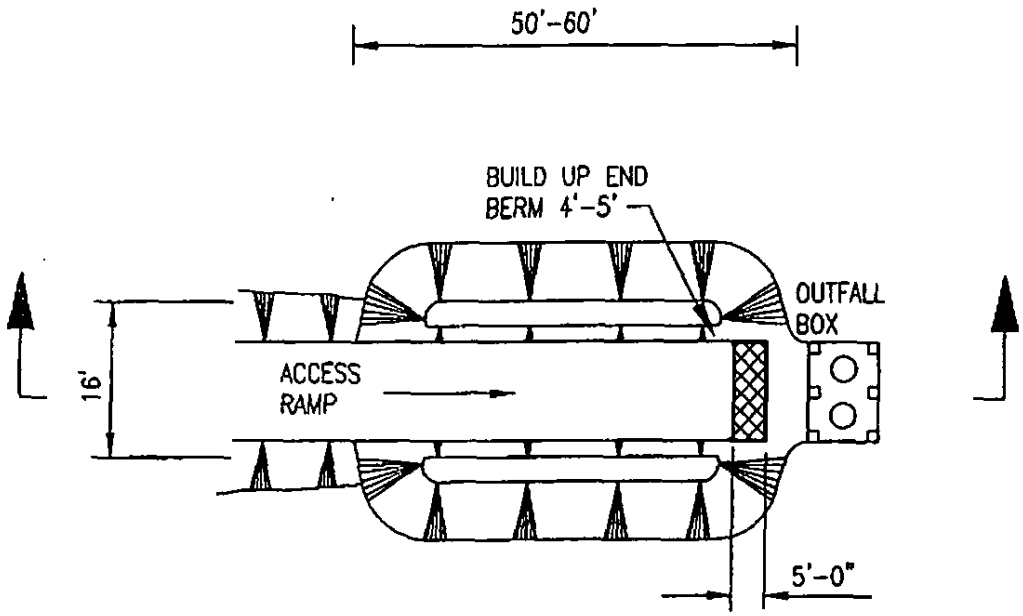
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	02/01/01	PMG	03/01

571-A-2245-2 REV. 0



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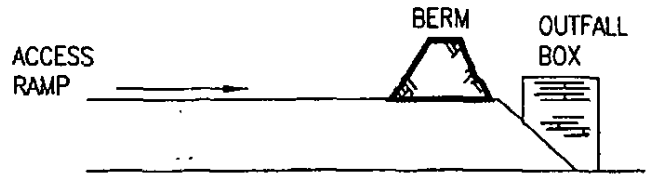

SECTION

NOTICE

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TASK R3

NO.	REVISION	DRWN.	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

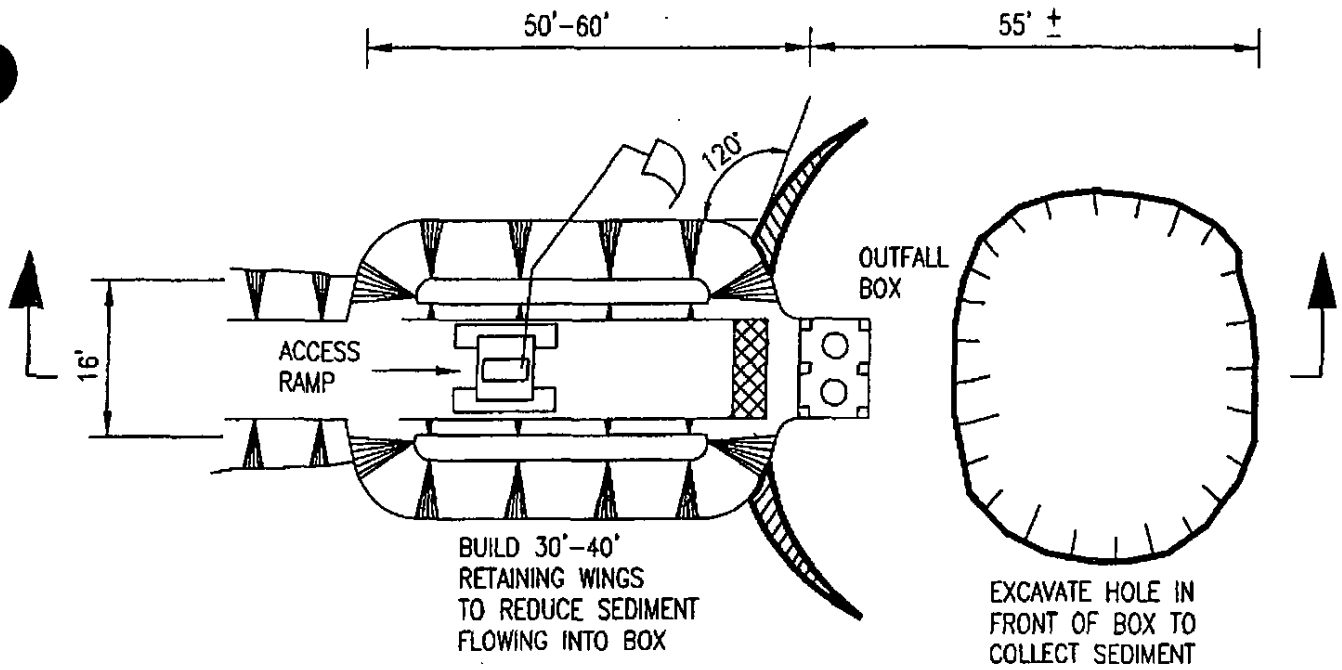
JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	02/02/01	PMG	03/01

571-A-2245-3 REV. 0



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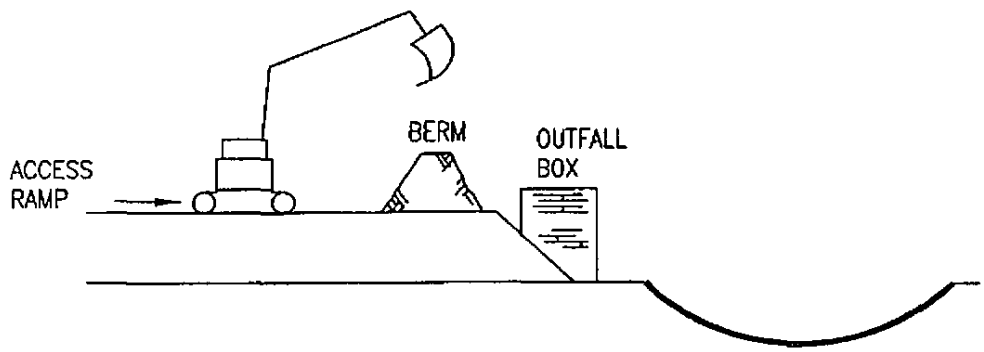

SECTION

NOTICE

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TASK R4

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

JOB NO. A8787 SCALE NONE

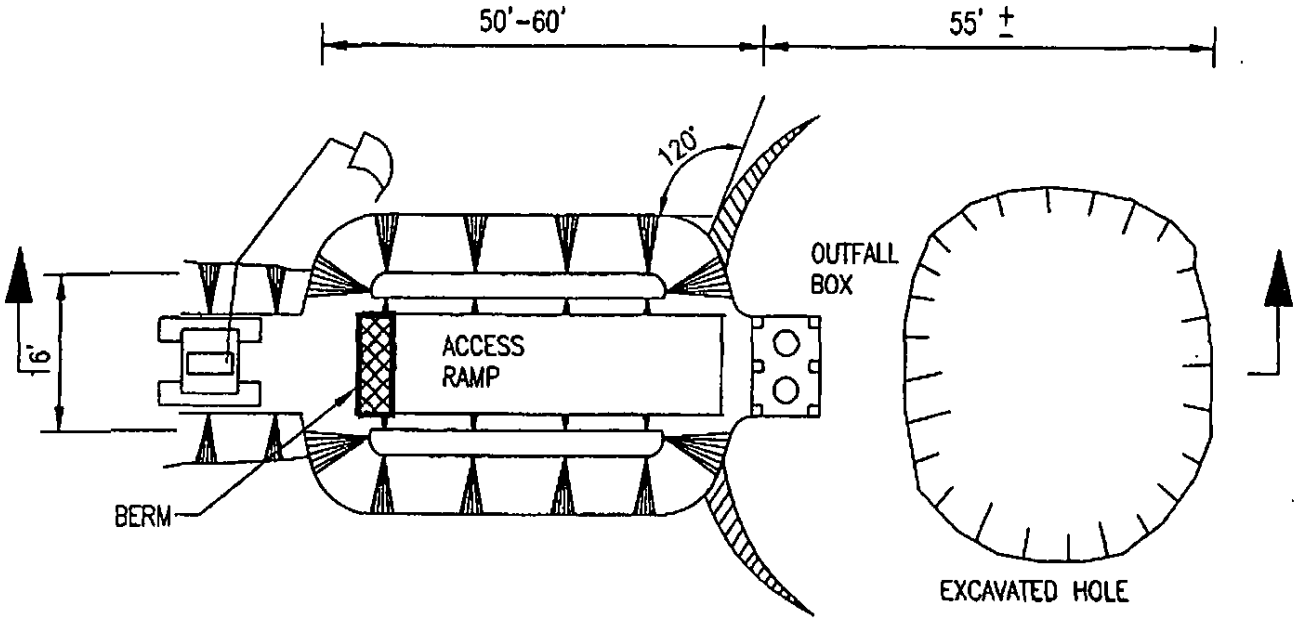
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

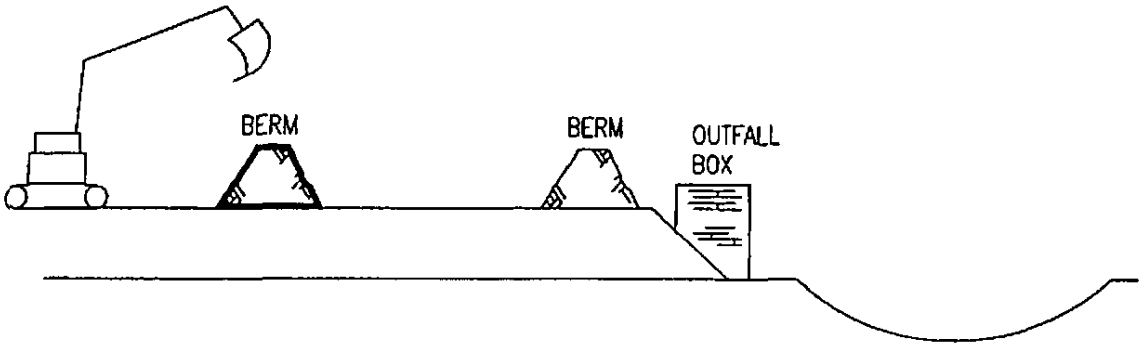
Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	02/02/01	PMG	03/01

571-A-2245-4 REV. 0



PLAN



SECTION

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TASK R5

REVISION	DRWN	DATE	APPROVED BY
ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

JOB NO. A8787 SCALE NONE
SHEET NO. OF

RESIDUE STACK BUILDING
PROCESS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	02/02/01	PMG	03/01

571-A-2245-5 REV. 0

Last Plot Date: 03/19/01

APPENDIX B

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

Appendix, 82-7
Stack 3, 10 Nov. 00

SPECIFICATIONS FOR COMPACTION OF CLAY SOILS
Stack 3 Outfall Box Access Ramp

After the subgrade where fill is to be placed has been approved by the engineer, the contractor can start his compaction operations. Compaction required of the subgrade is described in the job specifications and shall be performed as described herein. No fill shall be placed on any area of the subgrade which has not been accepted by the engineer. Notwithstanding the engineer's acceptance of the subgrade, any soft spots where the contractor believes he may have difficulty in obtaining the desired compaction shall be removed and replaced with compacted backfill as described herein.

One week prior to the contractor placing any fill on the site, he shall inform the engineer of the borrow pit he desires to use. The engineer will check the borrow pit to insure that the soil meets the specifications for the fill. The engineer will also obtain the necessary fill control curves. Initial acceptance of the soil in the borrow pit does not mean acceptance of the entire borrow pit since the soil encountered in the pit can change.

Clay soils used for fill shall conform to ASTM Standard D2487, latest revision, CL material. The material shall be placed on the site and either dried or moistened to get the moisture content within 2% of its optimum. The material shall then be compacted to the 90% ASTM D-1557 modified Proctor density.

The thickness of lifts used shall be no more than the height of the teeth on sheep's foot rollers. Generally, for 48 inch diameter or smaller drum rollers, the maximum compacted lift thickness acceptable is 6 inches. For rollers with drums of 60 inches in diameter and larger, with teeth about 9 inches long, a 9 inch final compacted lift thickness will be acceptable. The sole determination of the thickness of a lift will be the capability of the contractor's equipment to obtain the required compaction.

When obtaining the average density of a lift to determine its conformance to specifications, the lift will be immediately rejected if any density is more than 2% below the required average.

While, generally, sheep's foot rollers are most suitable for compaction of clay soils, the contractor may use spiketooth rollers, rubber tired rollers, or any fill compaction equipment that has sufficient mass to compact the soil. Generally, the drums of sheep's foot rollers should be filled with water, or for additional weight, with both water and sand. Tractors or other vehicles used primarily for hauling WILL NOT be allowed as fill compaction equipment. The contractor should also have smooth wheel rollers to seal the working area at the end of the day's operations so that overnight rains will not saturate the soil and delay his work. These rollers should also be used to seal the surface whenever rainfall is imminent. The soil engineer will instruct the contractor to modify or remove from the site any equipment that in his opinion is not capable of compacting the fill to the required density.

The soil engineer will be on the site during all working hours and will accept or reject a lift within two hours after being requested. No material will be placed on any lifts that has not been accepted by the engineer.

APPENDIX C

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineer

Charles W. Hale, III, P.E.
James M. Aronstein, Jr. P.E.
Charles L. Eustis, P.E.
David P. Sauls, P.E.

Louis J. Capozzoli, ScD, P.
Consultant

- MEMORANDUM -

32 January 2001

TO : Mr. Phil Gauthier
Honeywell, Inc.

FROM : David P. Sauls
Louis J. Capozzoli & Associates, Inc.

SUBJECT : Use of Residue Material for Starter Dike Construction
LJC&A File: 82-7

The residue used to construct starter dike embankments should be taken from active stacking operations - in this current case Stack 5 or 6. Moisture content will be on the range of 25 to 40 percent. The unconfined compressive strength at 7 days of the hardened residue should be at least 20 psi (2880 psf). This material would be similar in composition to that identified by operators as suitable for raising levees in conventional stack expansion. A residue dry enough to maintain shape and form when placed, yet still wet or "fresh" enough to allow hydration to take place for strength gain. If the material is too dry, adding water will not create the desired strength gain properties. All residue starter dike material should be semi-compacted by a minimum of three passes per lift by the tracks of a D-6 (or equivalent) or larger dozer. There is no rigid compaction percentage requirement as confirmation with compaction testing is not applicable to the residue. Residue creates a strength gain through hydration and not mechanical compacted energy. Field strength techniques such as penetrometer or mini-vane in situ tests can be used to observe strength gain with time.

Mined "florolite" from inactive stacks should not be used because it lacks a strength gain ability and looses strength when exposed to water (rain and/or pond). If it were absolutely required to be considered for use, it should only be used as a core which would be protected from water exposure by a clay blanket of nominally 2 foot thickness. The recycled material should not be finer than a 610 gradation because it will experience significant crushing during compaction and placement. The resulting compacted recycled material will result in a crushed grain size equivalent to a silt size material.

APPENDIX D

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineer

Charles W. Hair, III, P.E.
James M. Aronstein, Jr. P.E.
Charles L. Eustis, P.E.
David P. Sauls, P.E.

Louis J. Capozzoli, ScD, P.E.
Consultant

- MEMORANDUM -

18 December 2000

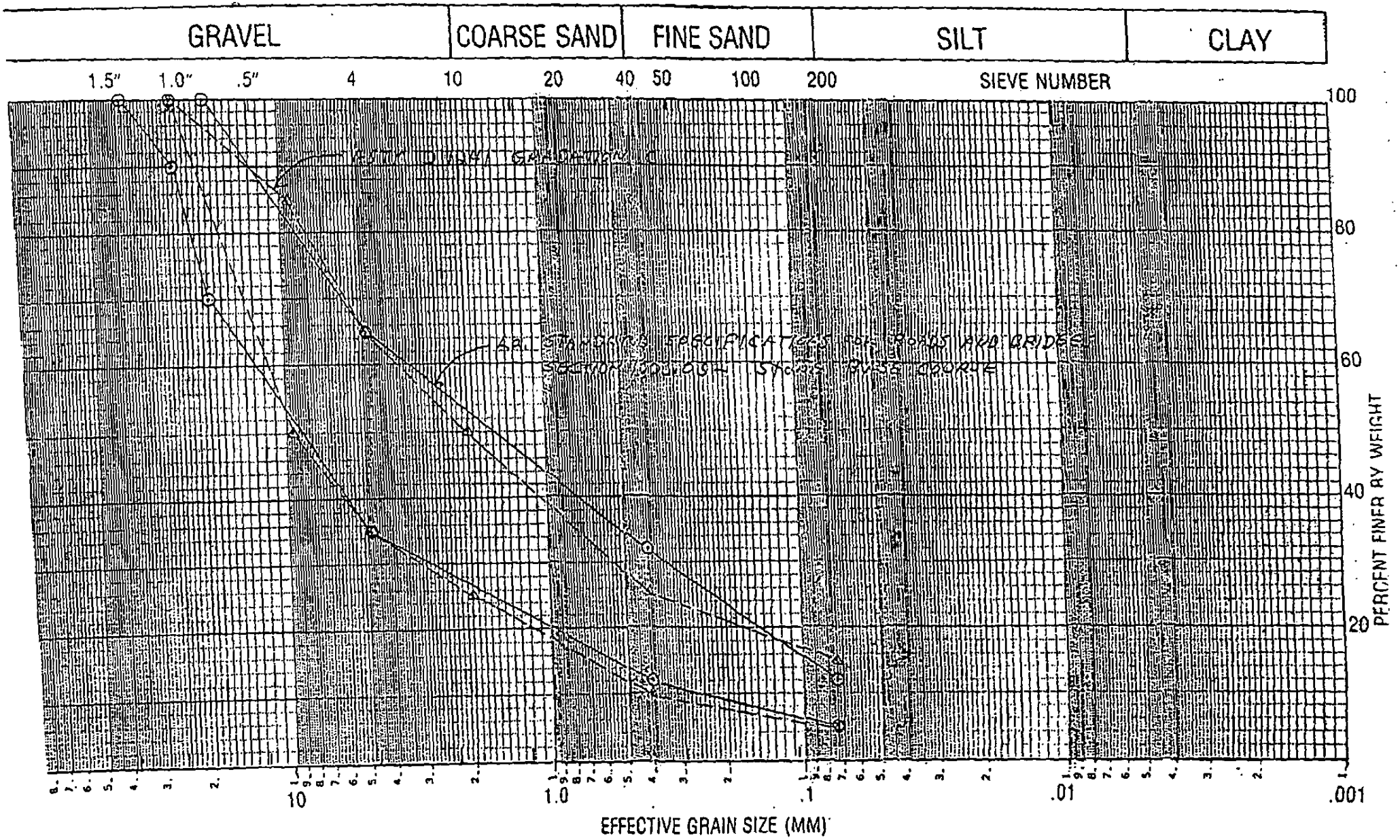
TO : Mr. Phil Gauthier
Honeywell

FROM : David P. Sauls DPS
Louis J. Capozzoli & Associates, Inc.

SUBJECT : Construction Specifications
Quality Control Stack 3
Outfall Box Ramp
Honeywell
Geismar, Louisiana
LJC&A File: 82-7

The following memorandum provides specifications for the construction of the Stack 3 Outfall Box Ramp using 610 limestone are provided by the following. Gradation of the 610 limestone should be in the range of grain size distribution as previously provided to you. The material should be placed and compacted to 70% relative density, using ASTM D-4253 and D-4254. No geo-grid or geo-textile fabric is required with the use of this aggregate material. The geo-grid placement was only required for the potential use of a clay embankment.

GRAIN SIZE CURVE



E . . . .

Subject BASE COURSE COMPARISON Sheet 1 Of 1

Made by MJK Date 27 Nov

File No. 82-7 Checked by DPS Date 27 Nov 01

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers

ASTM D1241 GRADATION C			La Standard Specs for Roads & Bridges section 1003.03 - Base course - (d) STONE		
Sieve No.	Size in mm	Percent Passing	Sieve No.	Size in mm	Percent Passing
1	25.0	100	1½	38.0	100
3/8	9.5	50-85	1	25.0	90-100
4	4.75	35-65	3/4	19.0	70-100
10	2.0	25-50	4	4.75	35-65
40	0.425	15-30	40	0.425	12-32
200	0.075	5-15	200	0.075	5-12

APPENDIX E

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers

Charles W. Hair, III, P.E.
James M. Aronstein, Jr., P.E.
Charles L. Eustis, P.E.
David P. Sauls, P.E.

Louis J. Capozzoli, ScD, P.E.
Consultant

DATE: 3-Oct-00

FAX NO: (1) 376-0159 (2) 642-4881

NUMBER OF PAGES: 1 (INCLUDES TRANSMITTAL SHEET)

TO: (1) Mr. Phil Gauthier (2) Mr. Warren Huff

COMPANY: Honeywell

FROM: David P. Sauls

LJC&A FILE: 82-7

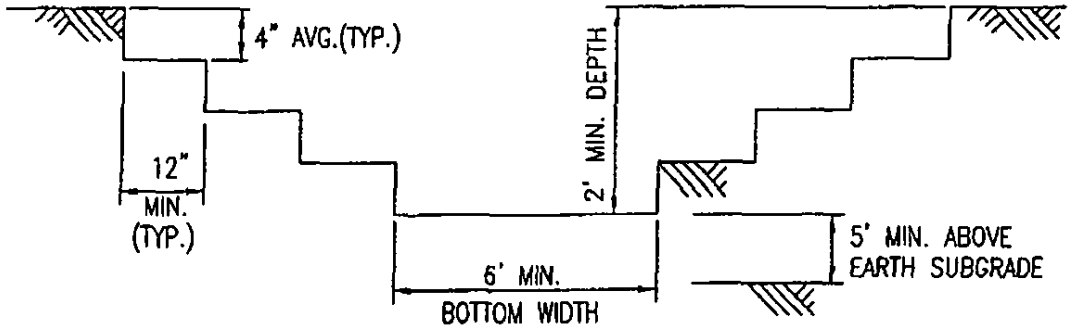
SUBJECT: Pipe Drain Concrete Mix - available from Sorrento Lumber

$180.77/yd 3 yd min. + $75/delivery

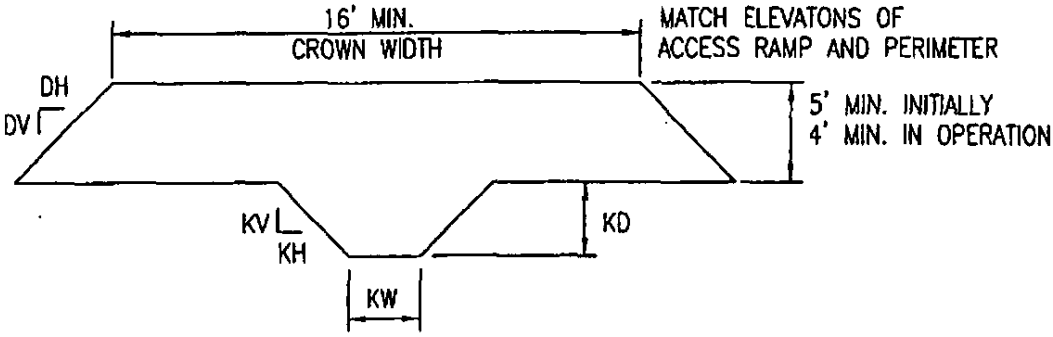
CONCRETE MIX:

Materials:	Quantities
Coarse Aggregates	1786 lbs.
Fine Aggregates	1285 lbs.
Cement (Type 1)	452 lbs.
Fly Ash (Class C)	112 lbs.
Water	24 gals.
ADDERS:	
Super P	102 ozs.
Eclipse (shrinkage reducing admixture)	192 ozs.
Micro Silica	75 lbs.

APPENDIX F



TYPICAL MINED KEY IN CURED RESIDUE



TYPICAL STARTER DIKE(WITH KEY)
TYPICAL ACCESS RAMP(NO KEY)

CONSTRUCTION OF STARTER DIKE OR ACCESS RAMP ON EARTH SUBGRADE

DIKE/RAMP MATERIAL	MATERIAL SPEC	INSTALLATION SPEC	QC TESTING	DIKE SIDES DH:DV	KEY BOTTOM WIDTH KW	KEY DEPTH KD	KEY SLOPES KH:KV
CLAY	CL	APPENDIX	NOTE 1	1:1 MIN.	4' MIN.	4' MIN.	1:1 MIN.
RESIDUE	SPECIAL	APPENDIX	NOTE 2	1:1 MIN.	4' MIN.	4' MIN.	1:1 MIN.
610 LIMESTONE	ASTM D1241, GRADATION C	APPENDIX	NOTE 1	1 1/2:1 MIN.	4' MIN.	4' MIN.	1:1 MIN.

CONSTRUCTION OF STARTER DIKE OR ACCESS RAMP ON HARDENED RESIDUE IN MINED-OUT STACK

DIKE/RAMP MATERIAL	MATERIAL SPEC	INSTALLATION SPEC	QC TESTING	DIKE SIDES DH:DV	KEY BOTTOM WIDTH KW	KEY DEPTH KD	KEY SLOPES KH:KV
CLAY	CL	APPENDIX	NOTE 1	1:1 MIN.	6' MIN.	2' MIN.	3:1 MIN.
RESIDUE	SPECIAL	APPENDIX	NOTE 2	1:1 MIN.	6' MIN.	2' MIN.	3:1 MIN.
610 LIMESTONE	ASTM D1241, GRADATION C	APPENDIX	NOTE 1	1 1/2:1 MIN.	6' MIN.	2' MIN.	3:1 MIN.

NOTICE

THIS DRAWING, THE PROPERTY OF HONEYWELL IS FURNISHED SUBJECT TO RETURN ON DEMAND AND THE CONDITION THAT THE INFORMATION AND TECHNOLOGY EMBODIED HEREIN SHALL NOT BE DISCLOSED OR USED AND THE DRAWING SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART EXCEPT AS PREVIOUSLY AUTHORIZED IN WRITING. ANY PERSON WHO MAY RECEIVE OR OBSERVE THIS DESIGN WILL BE HELD STRICTLY LIABLE FOR ANY VIOLATION WHETHER WILLFUL OR NEGLIGENT.

NOTES
1) PROCTOR AND NUCLEAR BACKSCATTER
2) SHEAR TEST PER APPENDIX
3) KEY NOT INCLUDED IN ACCESS RAMP INSTALLATION
4) INFORMATION ON THIS DRAWING IS TYPICAL. ACTUAL REQUIREMENTS ARE SITE-SPECIFIC.

NO.	REVISION	DRWN	DATE	APPROVED BY
0	ISSUED FOR CONSTRUCTION	NLT	03/01	PMG

JOB NO. A8787 SCALE NONE
SHEET NO. OF

TYPICAL CROSS SECTIONS FOR STARTER DIKES, RAMPS AND KEYS
GEISMAR, LOUISIANA

Honeywell
SPECIALTY CHEMICALS

DRAWN BY	DATE	CHECK BY	DATE
NLT	03/06/01	PMG	03/01

571-A-2243 REV. 0

APPENDIX G

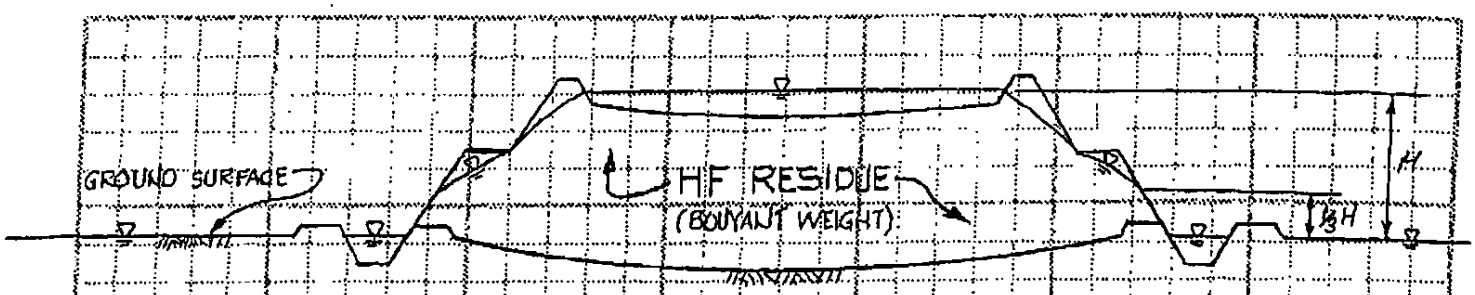
Subject INACTIVE HF RESIDUE EMBANKMENT STAGES

Appendix, Page 3

Made by BJB Date 18 JAN 01

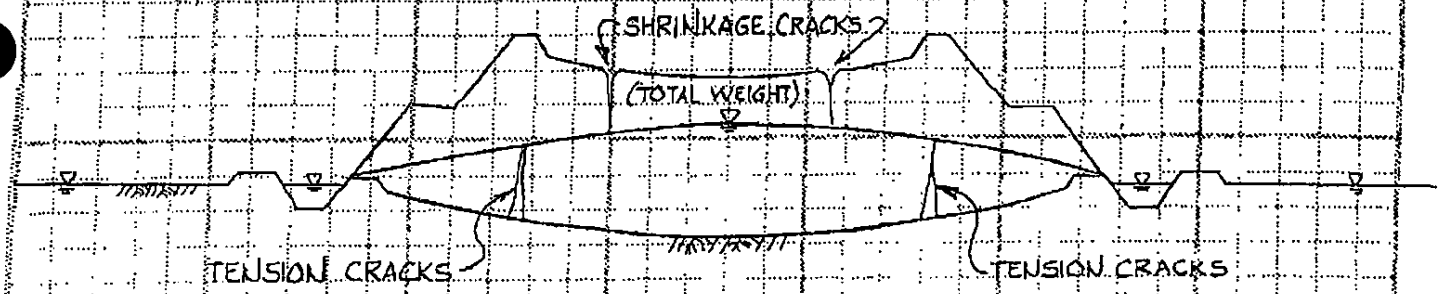
File No. 82-7 Checked by DPS Date 18 JAN 01

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers



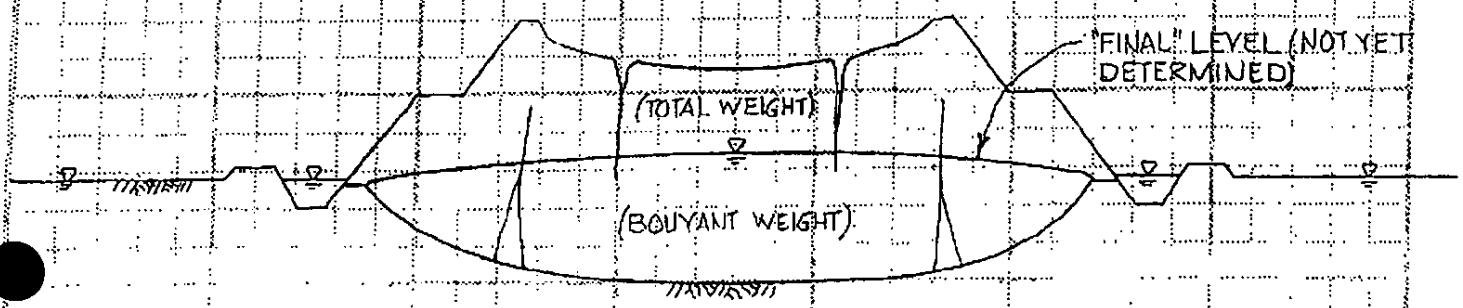
INITIAL STAGE

FIGURE 1



TRANSITION STAGE

FIGURE 2



ULTIMATE STAGE

FIGURE 3

BEHAVIOR OF INACTIVE HF RESIDUE

Stage	Considerations: Stability against slope failure	Considerations: Seepage
INITIAL (Figure 1) - Just after taking pile out of service. HF residue embankment is in its final "active" configuration.	Safety factor equal to value determined by latest monitoring. - HF residue "buoyed" by internal water. - Soils strengthened during the past years of controlled loading. - Overall stability (at this stage) is not a problem.	No pile water recharge except for rainfall. - Seepage exists exterior slopes 1/3 the distance up from the toe. - Amount of seepage will depend on permeability of the HF residue mass. - Quality (pH, P&F content, etc.) also requires checking.
TRANSITION (Figure 2) - Exterior HF residue pile surface subsides due to: - Settlement of the subsoil. - Shrinkage of the HF residue as it "dries" (due to falling intra-pile internal water level). This stage will last roughly 12 to 18 months - possibly longer - depending on permeability of the HF residue mass.	Safety factor will initially decrease then increase as the internal water level drops. - HF residue will transition from buoyant" to "total" weight thereby adding driving force along critical stability arc. - Conversely, the "Total weight" HF residue will be stronger (due to additional confining stress) resulting in a safety factor increase. - "Final" safety factor still requires determination. - "Drying mud puddle" shrinkage cracks will develop. - "Tension" cracks could develop in the HF residue at its interface with the subsoil. Cracks could affect stability by introducing planes of weakness in the HF residue mass.	Internal water level drops (rate indeterminate). - Seepage volume will decrease. - Recharge of the internal water level will be by rainfall only. - "Over the side" rainfall runoff will occur- rate and quality must be determined.

Considerations		
Stage	Stability Against Slope Failure	Seepage
ULTIMATE (Figure 3) - Pile exterior surfaces and internal water level essentially constant. Minor deformations may still continue due to slight continued subsoil movements.	Safety Factor will gradually increase as subsoils attain "final" consolidation and grain shear strength. - Horizontal hydrostatic pressure against "drying mud puddle" or "tension" crack walls could trigger slope failure. - Long term creep (continued soil deformation under constant stress) may be a problem if transition stage safety factor is too low. More investigation is required to determine the minimum acceptable safety factor.	Reduced seepage will occur. - Recharge of internal water level solely by penetrating rainfall unless pile reopened. - Quality of over the side rainfall runoff needs to be determined. Possibly can be directly discharged, i.e. rainfall runoff may not be contaminated after several rains.

APPENDIX H

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engin

Dr. Louis J. Capozzoli, Jr., P.E.
Glynn P. Gautreau, P.E.
James M. Aronstein, Jr., P.E.
Charles W. Hair, III, P.E.
Randal D. Sanders, P.E.
Charles L. Eustis, P.E.

3 April 1985

Allied Chemical Corporation
P. O. Box 226
Geismar, Louisiana 70734

Attention: Mr. Dennis R. Cheuvront

Re: Geotechnical Management
HF Gypsum Stack
July 1984 through March 1985
Geismar, Louisiana
Report No. 5
Consultants Agreement, 1 July 1984
Our File: 82-7

Gentlemen:

Between 3 and 5 months of effective storage remain at your existing HF gypsum embankment. Basis for such longevity assessment, procedures for continuing onland disposal, and acidic HF gypsum properties - all stemming from geotechnical information and facility operational experience generated during this time frame - are stated in the report's main body. Enclosures provide facility operational details, geotechnical instrumentation readings, laboratory test results, and other supporting analytical data. Previous reports in this series, especially the initial one, present geotechnical management background.

GEOTECHNICAL MANAGEMENT

Stack Operation. The active HF gypsum stack has risen between 10 and 12 feet during the past 9 months. Such height increase equates to approximately 100 acre feet per year - about 20 percent greater than the "nominal" loading rate projected in previous reports. Exterior slopes, encompassing a single decant area, have been maintained according to standing recommendations - see Report No. 4. The phreatic surface was kept sufficiently high to provide continuous decant wetting and (desirable from a stability standpoint) embankment buoyancy. Between 1 and 3 feet of edge dike freeboard was provided.

Chief operational feature during this time frame was the increasing difficulty in stacking newly deposited HF gypsum. Such result stemmed from the stacking dragline's ability to now circumnavigate the reduced perimeter decant section in about 1 1/2 months. The reason for, and consequences of, such stacking difficulty are discussed below.

At present, the stack expansion is almost ready to receive HF gypsum deposition. The exterior toe dike system is completely installed. You have indicated that only 2 abandoned monitor wells remain to be located and sealed. Also still to be closed off is the active inclinometer No. 702 and its associated standpipe piezometer. These are located at the approximate center of the expansion's northern edge - see sheet 1.

Two additional items concerning stack operation and management relative to this period were: completion of the acidic HF gypsum mechanical property testing's first phase and our inspection of paving slab heave near the stack's western toe (in your operating plant area).

Geotechnical Data. The attached Site Visit Memoranda 10 and 11 plus Daily Field Reports 19 through 24 describe our engineering observations, technician activities, and onsite instrumentation monitoring. Results of an April 1985 topographic survey are provided on the sheet 1 Embankment Plan and Exterior Slope Profiles. Sheets 2 and 3, respectively, summarize piezometer and inclinometer instrumentation readings; Figures 1 through 13 are individual inclinometer readings taken during this period. All installed instrumentation remains fully operational. However, access to instrumentation station No. 702 is becoming increasingly difficult.

Piezometers, as in the past, have shown a slight decrease in excess pore water pressure. Inclinometer 701A, at the stack's east toe, has moved very little during this time span. Conversely, Inclinometers 702A and 703A, the latter at the stack's west toe, have shown some foundation soil movement during the same period. No. 702A moved outward (away from the stack) about 1/2 inch between the 35 and 40 foot depths. Such deflection occurred at the beginning of the report period. No. 703A has exhibited movement in both directions during this time. These movements cancelled themselves out.

The initial phase of HF gypsum property assessment was based on testing specimens of the presently produced acidic material: cores from the existing embankment as well as cylinders molded from slurry sediment. Field work necessary to extract the cores and cylinders, together with laboratory testing particulars, are in Daily Field Report No. 18 and the attached Field and Laboratory Analyses appendix. Detailed laboratory results are on sheet 4, figures 14 and 15, plus tables 1 and 2. Findings are summarized in the next section.

GEOTECHNICAL ANALYSES

Subsoil Performance. Excess pore water pressure and lateral subsoil deformation performances during this period continue showing clay soil consolidation and strengthening/stiffening. An approximate 6 inch increase in settlement - a computed value - has occurred during this time frame. By extrapolating past analyses, roughly 5 1/2 feet of vertical

settlement (from the original ground surface elevation) have taken place at the embankment center point since initiation. Roughly 80 percent of the total settlement possible under the present HF gypsum loading is embodied in this value.

Acidic HF Gypsum Properties. Compressive and tensile strengths - necessary to compute embankment stability - shear moduli, permeability coefficients, porousity, and time rate of parameter development was determined. For the presently produced fully aged HF gypsum, "minimum" values for such parameters are:

Compressive Strength - 540,000 PSF (3,750 psi)
Tensile Strength - 9,500 PSF(66 psi)
Shear Modulus - 2,000,000 PSF (13,900 psi)
Coefficient of Permeability - $5x10^{-8}$ cm/sec
Porousity - 35% of total volume

In terms of property development, sedimented HF gypsum does not acquire significant strength, stiffness, or impermeabilility until approximately 3 months after placement. At that time, roughly 20 percent of the above parameter values are generated. Within about 9 months of placement, up to a third of the aged (long term) strength/stiffness properties - and most of the impermeability - developes. Essentially all of the above stated strength/stiffness is acquired after 5 to 15 years. Testing to date indicates continuing slow development of the compressive strength value - see sheet 4.

Overall property characterization stems from chemical, rather than mechanical, particulate bonding. Consequently, grain size distribution differences (due to deposition location with respect to the slurry discharge pipe - see figures 14 and 15) are a factor only during the first few weeks following placement. After the embanked HF gypsum has taken its initial "set", no significant property differences related to material location should occur. The major causes of any parameter discontinuity will be impurities, foreign matter, and other such anomolies.

HF Gypsum Condition. From previous soil deformation, stress distribution analyses, load induced settlement dishing has generated an approximate 4,800 psf tensile stress in the HF gypsum just above the embankment's interface with natural soil. Based on the tensile strength reported above, a 1.98 safety factor against tension cracking results. Such value indicates the HF gypsum is probably uncracked at this time. Stacking to approximately 13 feet (elevation 157 feet, NGVD) will be necessary to generate tensile stress sufficient for reducing this safety factor below 1.0, i.e. to crack the HF gypsum. Consequently, the currently produced and inplace HF gypsum should remain integral for the forseeable future.

Safety Factor. Computer analysis using integral acidic HF gypsum properties (with allowance for undetected anomolies) and augmented soil strength values, produces a minimum 1.80 safety factor against slope failure. "Critical" area is the existing

embankment's south face - see sheet 1. Overall, such value is indicative of a long term, stable embankment.

Storage Life. Considering problems experienced with ongoing operations, at most 5 months of longevity remain for the existing stack. Stack life will be curtailed not by mechanical instability of the HF gypsum or underlying soils, but rather by the rapidity with which the stacking dragline traverses the decant edge. In effect, the HF gypsum barely has sufficient time for acquiring strength to support the dragline as that equipment makes an increasingly shorter run. By this fall, the dragline's run will be too quick for the newly stacked HF gypsum to support.

Pavement Heave. Continuing observation of this phenomenon indicates pavement displacement could be due to acid attack of the underlying soil or stack generated horizontal subsoil movement laterally deflecting Neutralization Plant support piling. In the former case, a soil volume increase will occur near the acid leak source(s): spill collection gutters, sewers, etc. For the latter instance, westward pile and pile cap movement could be pushing adjacent paving slabs so as to cause buckling at north-south oriented joints. Additional study, as outlined in Site Visit Memorandum No. 11, of this problem is necessary. You have undertaken such work, to include reinstallation of the more badly damaged pavement sections.

OPERATIONAL RECOMMENDATIONS

From the present time through fall 1985, managing onland disposal of HF gypsum should involve:

1) The initial production run - for approximately 1 month - of neutralized HF gypsum residue. This should occur by the end of May.

2) Continuation of HF gypsum stacking per sheet 5. This is also the permissible configuration of the embankment subsequent to abandonment. Our monitoring visit timing will continue on the present bi-monthly schedule.

3) Spot elevations around the existing stack edge crest just after slurry deposition operations are shifted to the expansion. The operational change over should be planned for September or November.

4) Completion of all measures necessary to prepare the expansion for operational use: sealing the 2 open monitor wells and instrumentation station No. 702, installation of monitoring instrumentation, removal of "uncontaminated" incident rainfall, etc.

5) Setting an additional inclinometer(s) in the Neutralization Plant adjacent to the existing stack's western toe.

The first recommendation will allow production of specimens for neutralized HF gypsum analysis. Our 7 June 1984 proposal to you details such study, actually an extension of the acidic HF gypsum evaluation described above. Concievably, neutralized HF gypsum strength magnitude or development rate could be sufficiently adverse to curtail use of the existing embankment before this fall. The expansion should therefore be prepared for slurry receipt by the end of May. Monitor well and instumentation station closure should use the procedure employed in 1981 to similarly prepare your phosphate gypsum stack expansion (see Report No. 2, our file 80-12). The last recommendation will help insure no undetected subsoil displacement damage occurs to process equipment support piling. We are providing, under separate cover, proposals for geotechnically conducting the latter 2 work items.

OPERATIONAL PLANNING

The next geotechnical management report should be published at the end of 1985. This will allow incorporation of initial findings from the neutralized HF gypsum evaluation. Based on such information, the report will recommend the necessary side slopes, construction techniques, and monitoring instrumentation to produce a safe neutralized HF gypsum stack.

You have questioned the advisability of storing water atop the existing facility once it is taken out of service. This is desirable from the standpoint of embankment stability: buoyancy generated by a high intrastack phreatic surface reduces the embankment's weight "felt" by the foundation soil. Consequently, the existing embankment decant, once it is out of service, should be kept wetted. Further, no problem will result from storing up to 8 feet of water there. However, a minimum 3 feet of freeboard on the edge dikes should be provided to prevent overtopping.

SUMMARY

At most, 5 months of HF gypsum storage remain in the existing embankment. Basis of such longevity pronouncement, together with means of achieving it, are in the report. Recommendations for handling future onland HF gypsum disposal, as well as evaluation of HF gypsum mechanical properties and other phenomena associated with onland HF gypsum storage, are included.

Very truly yours,

LOUIS J. CAPOZZOLI & ASSOCIATES, INC.

STATE OF LOUISIANA
Charles William Hair III
REG. No. 15796
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING

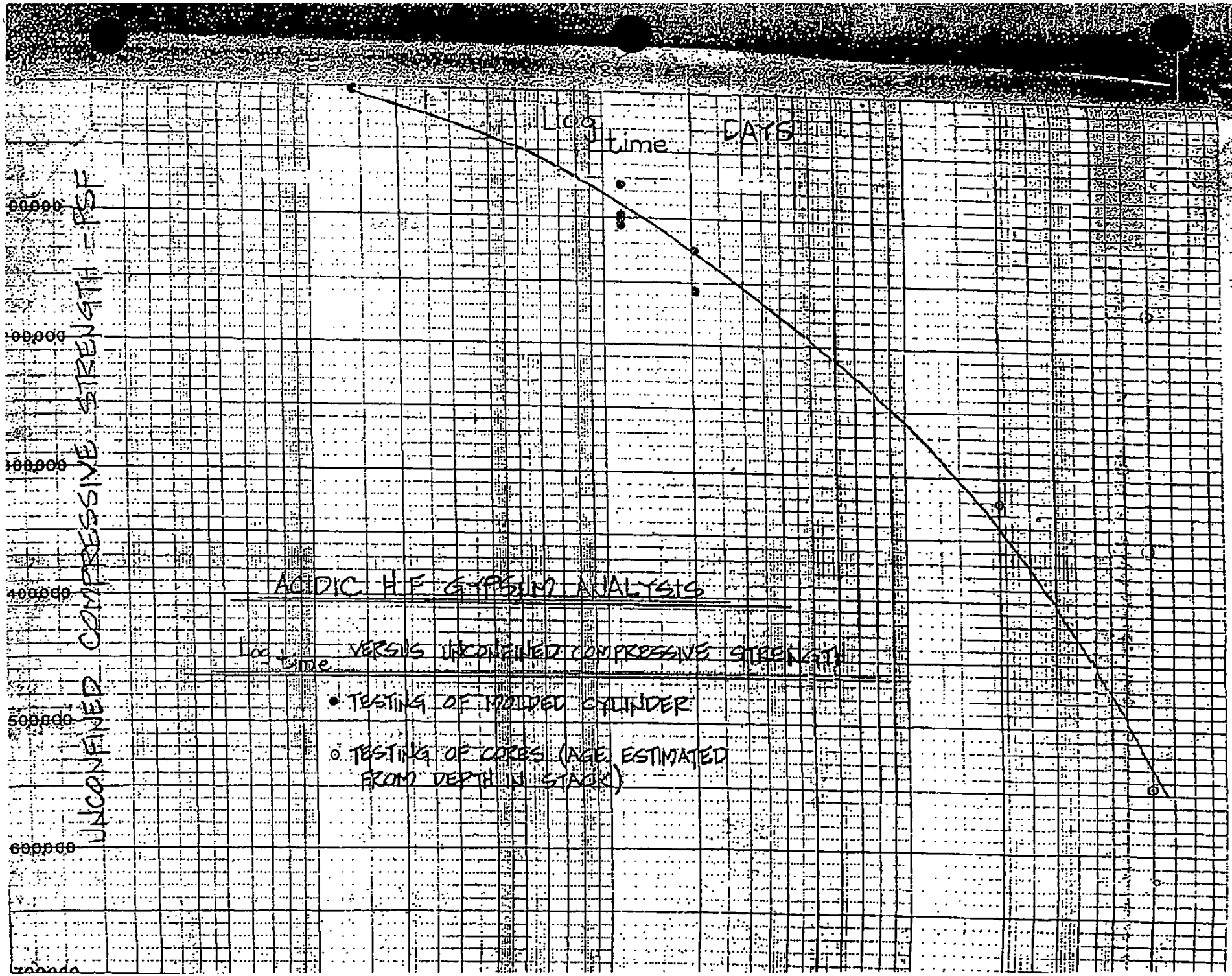
Charles W. Hair, III

Dr. Louis J. Capozzoli, Jr.

Enclosures:

- Site Visit Memoranda, 10 and 11
- Daily Field Reports, 18 through 24
- Appendix, Field and Laboratory Analyses - Acidic HF Gypsum
- Sheet 1, Plan and Cross Sections, Stability Analysis
- Sheet 2, Piezometer Data
- Sheet 3, Inclinometer Data Summary
- Sheet 4, Acidic HF Gypsum Analysis
- Sheet 5, Exterior Side Slope Recommendation
- Figures 1 through 13, Inclinometer Readings
- Figures 14 and 15, Grain Size Curves
- Tables 1 and 2, Laboratory Data
- Logs of Borings 1 and 2

APPENDIX I


Log time DAYS
UNCONFINED COMPRESSIVE STRENGTH - PSF
0
100000
200000
300000
400000
500000
600000
700000
ACIDIC H F GYPSUM ANALYSIS
Log time VERSUS UNCONFINED COMPRESSIVE STRENGTH
• TESTING OF MOLDED CYLINDER
○ TESTING OF CORES (AGE ESTIMATED FROM DEPTH IN STACK)

SHEET 2

APPENDIX J

P.O. # 4500041851

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. *Geotechnical Engineers*

Charles W. Hair, III, P.E.
James M. Aronstein, Jr. P.E.
Charles L. Eustis, P.E.
David P. Sauls, P.E.

Louis J. Capozzoli, ScD, P.E.
Consultant

20 March 2001

Honeywell
P. O. Box 4727
Baton Rouge, Louisiana 70821

Attention: Mr. Philip Gauthier

Re: Strength Behavior of HF Residue
In Situ and Laboratory Evaluations
Honeywell Specialty Chemicals
Geismar, Louisiana

Gentlemen:

This letter is our proposal for providing the engineering needed for a laboratory and in situ determination of the thixotropic strength gain behavior of HF residue. Our services' scope, budget cost, anticipated timing, and administrative conduct aspects are presented in the paragraphs below. Enclosures provide a pricing and administrative details.

PROJECT DESCRIPTION

Your interest is to determine the in situ strength of residue as it is placed in a moist state and hardens over time. Also in conjunction would be a comparison of in situ and laboratory strengths from molded and cured cylinders. The operating objective is that the strength testing technique must be portable and preferably a hand-held device not requiring assistance of support vehicles or additional equipment. Also, the strength variation with depth at early stages of the residue placement is of interest in addition to simply the surface crust strength. The goal is to correlate strength to allowable bearing pressures for correlation to the support required for trafficking of track hoe equipment over the HF residue in the stacking process.

ENGINEERING EVALUATION

In order to provide the necessary design data for supporting trafficking of equipment during the stacking process, we will perform a three phase investigation involving field sample collection, laboratory testing, and engineering analysis.

Field Testing. Hand-operated vane testing offers the opportunity to penetrate and determine strength measurements at a variety of depth intervals. The standard test method for field vane shear testing is described in ASTM D-2573. This test technique involves a four bladed vane on the end of a solid rod forced into the residue and then rotated. The torque required to rotate the vane can be related to the shear strength of the soil.

The in situ testing will be conducted over a 56 day time period to document the strength gain as the HF residue hardens. The vane testing would be conducted at and repeated at three sites. The initial testing would begin at three days after residue placement. We will then return at 7, 10, 14, 21, 28, and 56 days to repeat strength measurements. Initially, we would be able to use the vane to measure strength variation with depth down to approximately 10 feet. However, as the residue hardens with time, our ability to penetrate the vane to that depth will obviously diminish. Somewhere in the 10 to 21 day time period, the strength of the residue would require us to switch over to hand-operated cone penetrometer devices to measure the surface strength.

10555 AIRLINE HIGHWAY, BATON ROUGE, LOUISIANA 70816
TELEPHONE (225) 293-2460 FAX (225) 293-2463

We would begin our laboratory cylinder sample preparation with collecting several 5 gallon buckets with residue on what would be described as Day 1 of its initial placement. We would return the bulk sample to our laboratory at which time we would mold 2 inch diameter by 4 inch tall cylinders for laboratory strength testing. A set of three cylinders corresponding to each proposed field testing day would be molded. Therefore, we would mold cylinders to be tested at 3, 7, 10, 14, 21, 28, and 56 days. We would use our conventional unconfined compression device to measure the compressive strength of the cylinders.

Engineering Analyses. Our engineering evaluation will correlate laboratory and in situ strength comparisons for the HF residue over time. All engineering data plus test site plan location, laboratory test results, and developed strength parameters will be included in a written report. This written report will also evaluate the allowable bearing pressure values for the residue over time to allow correlation to the support required for trafficking of equipment over the HF residue as it hardens.

COSTS

Based on the above project scope, you may anticipate a fee of $7,000. This would be invoiced in increments of $2,500, $2,500 and $2,000 at the end of each month during project conduct.

COORDINATION

Timing. We can commence work within a week after receiving your authorization. Field work can be coordinated at your earliest convenience to collect the bulk samples required for laboratory cylinder molding and to designate the positions for subsequent field testing. Strength data will be developed over the next eight weeks with preliminary information provided to you as it is developed.

Liaison. We will maintain contact throughout this project with you or any other representative you designate. Other communication channels will be established, as you deem necessary. For the field work phase, we will coordinate directly with and your onsite field representatives primarily Mr. Mike Graham.

COMMERCIAL

We will perform this evaluation according to the conventional Honeywell commercial purchase order. Other administrative data necessary to our working on this project will be provided upon request. Alternatively, you may provide an authorization letter referencing our proposal.

CLOSING

We appreciate the opportunity to be of continued service to Honeywell Specialty Chemicals in the development of strength behavior related to HF residue stacking.

Very truly yours,

Louis J. Capozzoli & Associates, Inc.

David P. Sauls

David P. Sauls

DPS/cc

LOUIS J. CAPOZZOLI & ASSOCIATES, INC. Geotechnical Engineers

Charles W. Hair, III, P.E.
James M. Aronstein, Jr. P.E.
Charles L. Bustis, P.E.
David P. Sauls, P.E.

Louis J. Capozzoli, ScD, P.E.
Consultant

- MEMORANDUM -

6 February 2001

TO : Mr. Phil Gauthier
Honeywell Specialty Chemicals

FROM : David P. Sauls
Louis J. Capozzoli & Associates, Inc.

SUBJECT : In Situ Strength Determinations on HF Residue
LJC&A File: 82-7

This memorandum references our discussions to the review possible scenarios to determine in situ strength of residue as it is placed in a moist state and hardens over time. The operating objective was that this tested technique could be portable and preferably a hand-held device not requiring assistance of support vehicles or additional equipment. Also the strength variation with depth was of interest in addition to simply the surface crust strength.

Vane testing offers the opportunity to penetrate and determine strength measurements at a variety of depth intervals. The testing methodology whether in use by drilling rig and/or hand equipment, it is described in the standard test method for field vane shear test in cohesive soil ASTM D-2573. The test technique involves a four-bladed vane on the end a solid rod forced into the soil and then rotated. The torque required to rotate the vane can be related to the shear strength of the soil. The originator of this device is the Geonor Company. The attached print outs are provided from their web-site.

This in situ strength testing could be conducted over a length of time to document the strength gain as the HF residue hardens. There are several issues to address prior to embarking on this testing program mainly we would need to evaluate the ability to penetrate the vane and rods into the hardened residue at the time which the operators generally believe they can track their equipment over the surface. At this time with the very hard HF residue, one of the surface cone penetometer devices may be required. A combination of the two test apparatus may be required to investigate the residue strength gained over time and at depth.

Attachments: ASTM D-2573
Geonor Vane Testing Information
Surface, Penetometers by ELE International Catalog

10555 AIRLINE HIGHWAY, BATON ROUGE, LOUISIANA 70816
TELEPHONE (225) 293-2460 FAX (225) 293-2463

Designation: D 2573 – 72 (Reapproved 1978)

Standard Test Method for Field Vane Shear Test in Cohesive Soil[1]

This standard is issued under the fixed designation D 2573; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This method covers the field vane test in soft, saturated, cohesive soils. Knowledge of the nature of the soil in which each vane test is to be made is necessary for assessment of the applicability and interpretation of the test.

2. Summary of Method

2.1 The vane shear test basically consists of placing a four-bladed vane in the undisturbed soil and rotating it from the surface to determine the torsional force required to cause a cylindrical surface to be sheared by the vane; this force is then converted to a unit shearing resistance of the cylindrical surface. It is of basic importance that the friction of the vane rod and instrument be accounted for; otherwise, the friction would be improperly recorded as soil strength. Friction measurements under no-load conditions (such as the use of a blank stem in place of the vanes, or a vane that allows some free rotation of the rod prior to loading) are satisfactory only provided that the torque is applied by a balanced moment does not result in a side thrust. As torsional forces become greater during a test, a side thrust in the instrument will result in an increase in friction that is not accounted for by initial no-load readings. Instruments involving side thrust are not recommended. The vane rod may be of sufficient rigidity that it does not twist under full load conditions; otherwise a correction must be made for plotting torque-rotation curves.

3. Apparatus

3.1 The vane shall consist of a four-bladed vane as illustrated in Fig. 1. The height of the vane shall be twice the diameter. Vane dimensions shall be as specified in Table 1. Sizes other than those specified in Table 1 shall be used only with the permission of the engineer in charge of the boring program. The ends of the vane may be tapered (see Fig. 1). The penetrating edge of the vane blade shall be sharpened having an included angle of 90°.

3.2 The vane shall be connected to the surface by means of steel torque rods. These rods shall have sufficient diameter such that their elastic limit is not exceeded when the vane is stressed to its capacity (Note 1). They shall be so coupled that the shoulders of the male and female ends shall meet to prevent any possibility of the coupling tightening when the torque is applied during the test. If a vane housing is used, the torque rods shall be equipped with well-lubricated bearings where they pass through the housing. These bearings shall be provided with seals to prevent soil from entering them. The torque rods shall be guided so as to prevent friction from developing between the torque rods and the walls of casing or boring.

NOTE 1—If torque versus rotation curves are to be determined, it is essential that the torque rods be calibrated (prior to use in the field). The amount of rod twist (if any) must be established in degrees per foot per unit torque. This correction becomes progressively more important as the depth of the test increases and the calibration must be made at least to the maximum depth of testing anticipated.

3.3 Torque shall be applied to the torque rods, thence to the vane. The accuracy of the torque reading should be such that it will produce a variation not to exceed ±25 lb/ft² (1.2 kPa) shear strength.

3.4 It is preferable to apply torque to the vane with a geared drive. In the absence of a geared drive, it is acceptable to apply the torque directly by hand with a torque wrench or equivalent. The duration of the test should be controlled by the requirements of 4.3.

4. Procedure

4.1 In the case where a vane housing is used, advance the

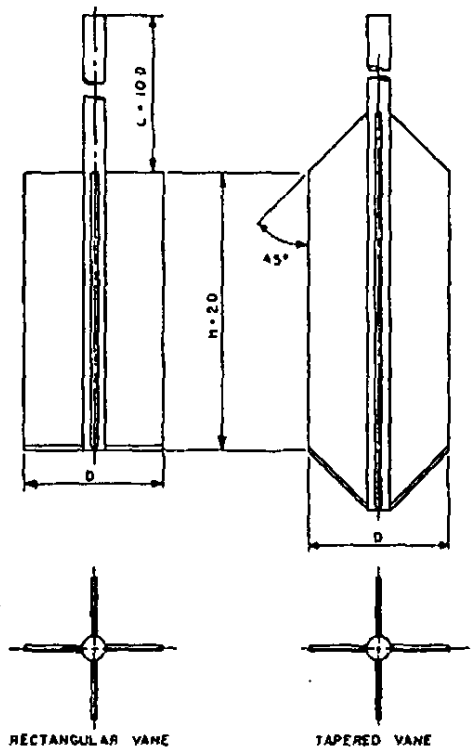


FIG. 1 Geometry of Field Vane

[1] This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.02 on Sampling and Related Field Testing for Soil Investigations.

Current edition approved Jan. 17, 1972. Published February 1972. Originally published as D 2573 – 67 T. Last previous edition D 2573 – 67 T.

TABLE 1 Recommended Dimensions of Field Vanes[A]

Casing Size	Diameter, in. (mm)	Height, in. (mm)	Thickness of Blade, in. (mm)	Diameter of Vane Rod, in. (mm)
AX	1½ (38.1)	3 (76.2)	1/16 (1.6)	½ (12.7)
BX	2 (50.8)	4 (101.6)	1/16 (1.6)	½ (12.7)
NX	2½ (63.5)	5 (127.0)	⅛ (3.2)	½ (12.7)
4 in. (101.6 mm)[B]	3⅝ (92.1)	7¼ (184.1)	⅛ (3.2)	½ (12.7)

[A] Selection of the vane size is directly related to the consistency of the soil being tested, that is, the softer the soil the larger the vane diameter.
[B] Inside diameter.

housing to a depth which is at least five vane housing diameters less than the desired depth of the vane tip. Where no vane housing is used, stop the hole in which the vane is lowered at a depth such that the vane tip may penetrate undisturbed soil for a depth of at least five times the diameter of the hole.

4.2 Advance the vane from the bottom of the hole or the vane housing in a single thrust to the depth at which the test is to be conducted. Take precautions to make sure no torque is applied to the torque rods during the thrust.

4.3 With the vane in position, apply the torque to the vane at a rate which should not exceed 0.1°/s. This generally requires a time to failure of from 2 to 5 min, except in very soft clays where the time to failure may be as much as 10 to 15 min. In stiffer materials, which reach failure at small deformations, it may be desirable to reduce the rate of angular displacement so that a reasonable determination of the stress-strain properties can be obtained. During the rotation of the vane, hold it at a fixed elevation. Record the maximum torque. With apparatus with geared drives, it is desirable to record intermediate values of torque at intervals of 15 s or at lesser frequency if conditions require.

4.4 Following the determination of the maximum torque, rotate the vane rapidly through a minimum of 10 revolutions; the determination of the remoulded strength should be started immediately after completion of rapid rotation and in all cases within 1 min after the remoulding process.

4.5 In the case where soil is in contact with the torque rods, determine the friction between the soil and the rod by means of torque tests conducted on similar rods at similar depths with no vane attached. Conduct the rod friction test at least once on each site; this shall consist of a series of torque tests at varying depths.

4.6 In apparatus in which the torque rod is completely isolated from the soil, conduct a friction test with a blank rod (Note 2) at least once on each site to determine the magnitude of the friction of the bearings. In a properly functioning vane apparatus, this friction should be negligible.

NOTE 2—In some cases it is not necessary to remove the vane for the friction test. As long as the vane is not in contact with the soil, that is, where it is retracted into a casing, the friction measurement is not affected.

4.7 Conduct undisturbed and remoulded vane tests at intervals of not less than 2½ ft (0.76 m) throughout the soil profile when conditions will permit vane testing (Note 3). Do not conduct the vane test in any soil that will permit drainage or dilates during the test period, such as sands or silts or in soils where stones or shells are encountered by the vane in such a manner as to influence the results.

NOTE 3—This spacing may be varied only by the engineer in charge of the boring program.

5. Calculation

5.1 Calculate the shear strength of the soil in the following manner: The turning moment required to shear the soil is as follows:

$$T = s \times K$$

where:
T = torque, lbf·ft (or N·m),
s = shear strength of the clay, lbf/ft^2 (or kPa), and
K = constant, depending on dimensions and shape of the vane, ft^3 (or m^3).

5.2 Assuming the distribution of the shear strength is uniform across the ends of a cylinder and around the perimeter, calculate the value of K as follows:

Inch-Pound Units:

$$K = (\pi/1728) \times (D^2H/2) \times [1 + (D/3H)]$$

Metric Units:

$$K = (\pi/10^6) \times (D^2H/2) \times [1 + D/3H)]$$

where:
D = measured diameter of the vane, in. (or cm), and
H = measured height of vane, in. (or cm).

It is important that these dimensions are checked periodically to ensure the vane is not distorted or worn.

5.3 As the ratio of length to breadth of the vane is 2:1, the value of K may be simplified in terms of the diameter so that it becomes the following:

Inch-Pound Units:

$$K = 0.0021D^3$$

Metric Units:

$$K = 0.00000366D^3$$

5.4 Since the value of s is required, it is more useful to write the equation as follows:

$$s = T \times k$$

where:
k = $1/K$ and
T, the torque, is measured so that s can be calculated.

5.5 For the tapered vane of Fig. 1, the following modified equation may be used for the vane constant:

Inch-Pound Units:

$$K = 1/1728\ [\pi D^3 + 0.37\ (2D^3 - d^3)]$$

Metric Units:

$$K = 1/10^6\ [\pi D^3 + 0.37\ (2D^3 - d^3)]$$

where:
d = rod diameter, in. (cm). For a ½-in. (1.27-cm) rod this reduces to:

Inch-Pound Units:

$$K = 0.00225D^3 - 0.00003$$

Metric Units:

$$K = 0.00000388D^3 - 0.00000076$$

6. Report

6.1 For each vane test record the following observations:

6.1.1 Date of the test,

6.1.2 Boring number,

6.1.3 Size and shape of the vane (tapered or rectangular),

6.1.4 Depth of the vane tip,

6.1.5 Depth of the vane tip below the housing or bottom of the hole,

6.1.6 Maximum torque reading, and intermediate readings if required for the undisturbed test,

6.1.7 Time to failure of the test,

6.1.8 Rate of remoulding,

6.1.9 Maximum torque reading for the remoulded and

6.1.10 Notes on any deviations from standard test procedure.

6.2 In addition, record the following observations for boring:

6.2.1 Boring number,

6.2.2 Location,

6.2.3 Log of the soil conditions,

6.2.4 Reference elevation,

6.2.5 Method of making the hole,

6.2.6 Description of the vane, that is, housed or not,

6.2.7 Description of the method of applying and measuring the torque,

6.2.8 Notes on the driving resistance,

6.2.9 Name of the drilling foreman, and

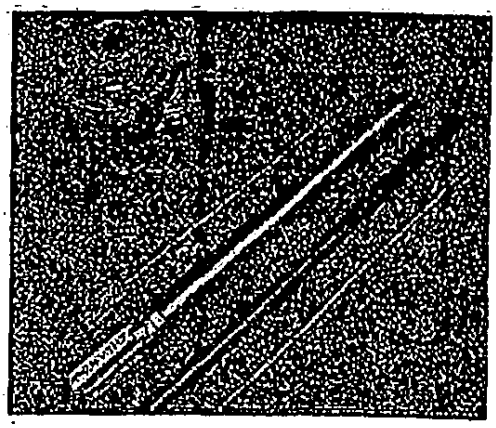
6.2.10 Name of the supervising engineer.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, PA 19103.

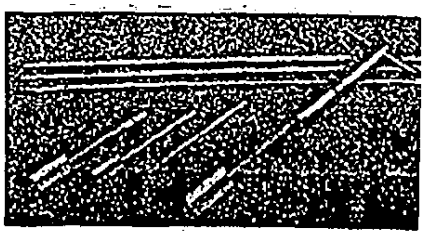
In Situ Soil Testing

Geonor H-10
Field Shear Vane Borer



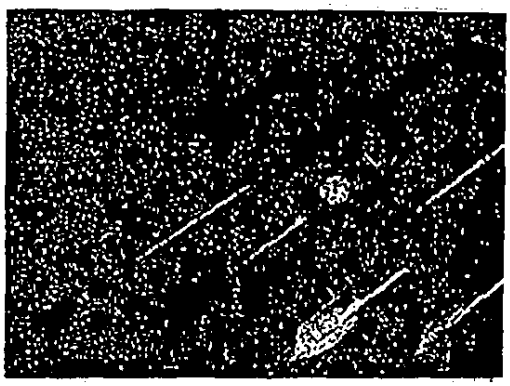
- Detailed field investigation of undrained shear strength and sensitivity of soft and medium stiff clays
- From 0 to 30 meters by hand jack, even through hard layers of clays, sand or silt
- Two vane sizes. Measurement range from 0 to 60 kPa and 0 to 100 kPa
- Top-level accuracy results, can be used for the design of earth fill foundations and embankments
- Details and Technical Specifications

Geonor H-60
Hand-Held Vane Tester



- Preliminary field investigation of undrained shear strength of soft to stiff clays
- Quick and easy to use, low weight
- Direct manual boring down to 3 meters
- Measurement range from 0 to 200 kPa
- Delivered with calibration certification
- Details and Technical Specifications

Geonor H-70
Field Inspection Vane Tester

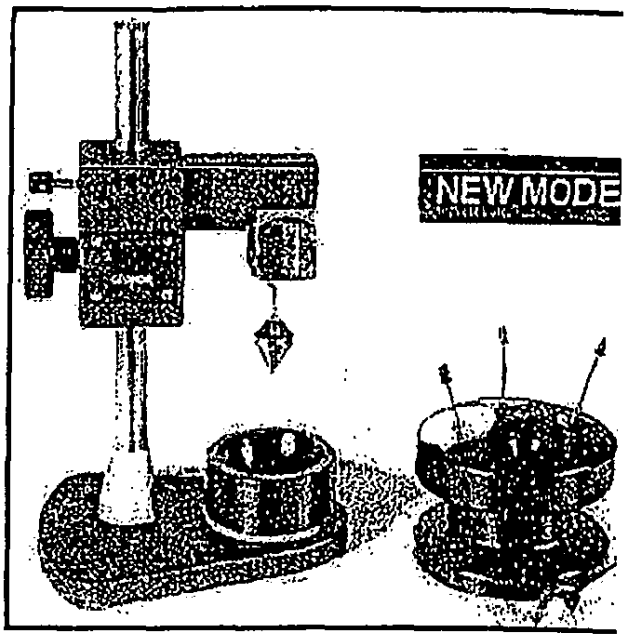


- Preliminary field investigation of undrained shear strength of soft to medium stiff clays
- Better evaluation of rod-soil frictions with the Geonor 180 degrees slip-coupling system
- Direct penetration to 10 meters, without need for preboring
- Two vane sizes. Measurement range from 0 to 80 kPa and 0 to 160 kPa
- Details and Technical Specifications

Laboratory Soil Testing

Geonor Fall Cone Apparatus

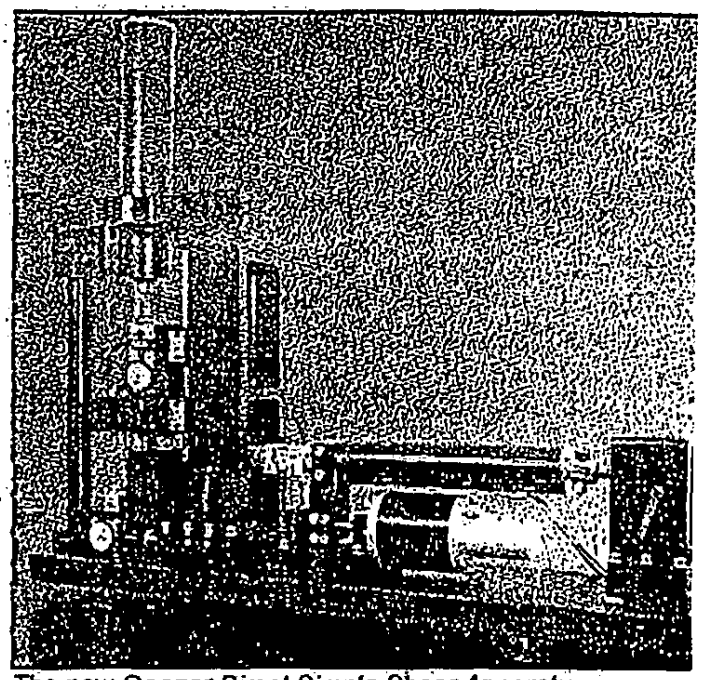
- Rapid, simple and accurate measurement of:
  - Undrained shear strength
  - Shear strength of remoulded samples, and thereby sensitivity
  - Liquid limit W_L
- Testing capacity: shear strengths of 0.01 to 200 kPa (0.001 to 20 t/m^2)
- Portable and easy to use
- Complies with Scandinavian standards
- Designed by the Norwiegian Geotechnical Institute, NGI
- Details and Technical Specifications



Geonor Fall Cone Apparatus

GEONOR Direct Simple Shear Appparatus

- K_0 conditions during consolidation
- Drained or undrained conditions during shear
- Monotonic or cyclical shear loading
- *Motorized operation (easily automated)*
- Designed and used by the Norwegian Geotechnical Institute
- Details and Technical Specifications



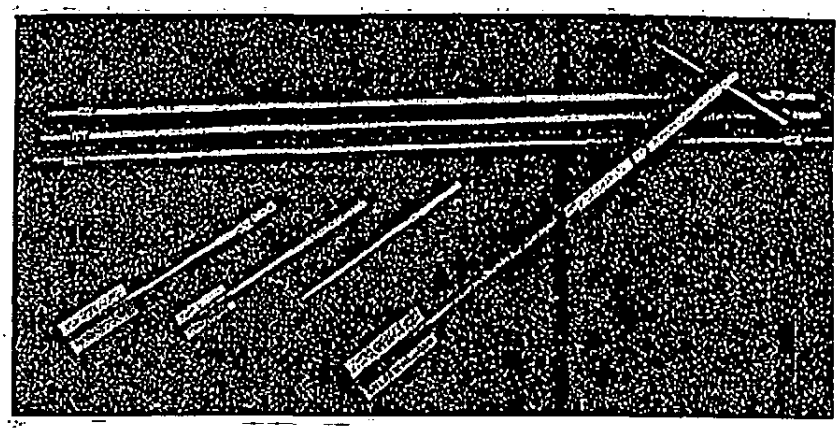
The new Geonor Direct Simple Shear Apparatus

Contact us for more information at:

North and South American Customers: geonor@geonor.com, Milford, PA, USA
Outside North and South America: geonor@geonor.no, Oslo, Norway

Geotechnical Testing

The Original Geonor H-60 Hand-Held Vane Tester



FEATURES:

- Preliminary field investigation of undrained shear strength of soft to stiff clays
- Quick and easy to use, low weight
- Direct manual boring down to 3 meters
- Measurement range from 0 to 200 kPa
- Delivered with calibration certification

The field vane shear test (FVST) is the most commonly used methods for measuring the undrained shear strength of soft to stiff clays. For this reason, a preliminary investigation of soft clays with a hand-held vane tester is both economic and fully relevant. It also has good repeatability and is quick in providing valuable information for the planning of more detailed surveys.

However, results with systematic errors can occur if the testing equipment used is inaccurate or unreliable. Such errors can result in high costs if they are incorporated in the final design parameters. The Geonor H-60 hand-held vane tester is a fully professional instrument for preliminary FVST investigations. Each unit is delivered with its individual calibration certificate. The authentic Geonor H-60 was originally developed in 1966 by the Norwegian Geotechnical Institute (NGI). It has since been constantly improved by Geonor in co-operation with NGI and is used today in over 60 countries throughout the world.

Beware of low quality copies of the original Geonor H-60.

TECHNICAL CHARACTERISTICS:
GEONOR H-60 FIELD HAND-HELD VANE TESTER

The Geonor H-60 consists of three exchangeable vanes, extended by 0.5 m rods.

The instrument covers three ranges of measurement, 0-50, 0-100, 0-200 kPa, depending on the size of vane used: 16 x 32 mm, 20 x 40 mm or 25.4 x 50.8 mm.

The peak value is determined by means of the scale-ring, which has to be turned back to zero position before each measurement. The instrument is sufficiently rugged to be used as a handle during penetration and extraction of the vane. To correct for skin friction of the extension rods, dummy tests are performed with rods only.

Total weight: 3.10 kg

Quantity	Part No.	Description
-	20000	Vane tester complete for 3m depth:
	-	-
6	20001	Extension rod L = 0.5 m, Ø = 10 mm
1	20002	Vane, 16 x 32 mm (0.63" x 1.25"): 0-200 kPa
1	20003	Vane, 20 mm x 40 mm (0.79" x 1.58"): 0-100 kPa
1	20004	Vane, 25.4 x 50.8 mm (1" x 2"): 0-50 kPa
1	20006	Dummy
1	20007	Carrying case
2	20008	Wrench, 8 mm
1	20009	Wrench, 17 mm
10	20010	Connection piece for extension rods and vanes
1	20100	Instrument for hand-held vane tester

Contact us for more information at:

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Outside North and South America: geonor@geonor.no, Oslo, Norway

Geotechnical Testing

The Original Geonor H-70 Field Inspection Vane Tester

FEATURES:

- Preliminary field investigation of undrained shear strength of soft to medium stiff clays
- Better evaluation of rod-soil frictions with the Geonor 180 degrees slip-coupling system
- Direct penetration to 10 meters, without need for preboring
- Two vane sizes. Measurement range from to 80 kPa and 0 to 160 kPa

The field vane shear test (FVST) is the most widely used method for measuring the undrained shear strength of soft to medium stiff clays in-situ. For this reason, preliminary testing of soft clays with an inspection vane is both economic and fully relevant. It has good repeatability and is quick in providing valuable information for the planning of more detailed

taken into account. This is a major cause of over estimations of undrained shear strength.
- The vane itself must be able to withstand the tough conditions met during operation at such depths.

The Geonor H-70 field inspection vane tester wa

surveys.

Some criteria have nevertheless to be respected in order to obtain reliable results from a preliminary F[illegible]T;
- [illegible]e vane tester should allow direct penetration from ground level, in order to avoid soil disturbances due to boreholes and casings.
- The friction between rods and soil (which invariably *occurs below 3 m depths) should be* originally developed in Norway for the special tas of preliminary investigations in soft clays without preboring. It is a comparatively low-cost, still fully professional instrument. The Geonor H-70 allows for safe vane boring down to 10 meters by simple hammering, drilling or pressing. It is a lightweight instrument that can be carried by a single person *But most of all, its unique 180 degrees "anti-*friction" slip coupling system always ascertains the real friction between rods and soil. The vane itself is made of a high-quality stainless steel.

TECHNICAL CHARACTERISTICS:
GEONOR H-70 FIELD INSPECTION VANE TESTER

Installation: sledge hammer, portable rock drill or pressed down

Instrument accuracy: +/- 3% of full range
Two sizes of vanes: range of measurment from 0 to 80 kPa (0-8 T/m^2) and 0 to 160 kPa (0-16 T/m^2)

Quantity	Part No.	Description
-	21500	Vane tester complete for 10m depth:
10	10200	Extension rod 25 x 1000 mm
10	10500	Connection piece, M18 x 1.5
1	10900	Drive head, hexagonal, 24 mm, M18
2	12200	Spanner for extension rods
1	21501	Instrument for field inspection vane
1	21502	Adaptor, hexagonal, 24 mm
1	21503	Lower part for field inspection vane
1	21504	Vane, 60 x 120 mm: 0-160 kPa
1	21505	Vane, 75.8 x 151.5 mm: 0-80 kPa
1	14600	Extractor for Ø 22 & 25 mm extension rods
1	15100	Ball cone clamp, 21-28 mm
1	19000	Crow bar
1	19100	Transport case, steel

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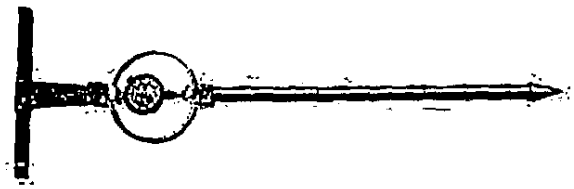
Outside North and South America: geonor@geonor.no, Oslo, Norway

ELE International



Proving Ring Penetrometer

The CN-970 Proving Ring Penetrometer is a 30 degree cone penetrometer used to determine the bearing capacity of subgrades or to measure soil compaction. The penetrometer also serves as a rapid means of determining the penetration resistance of soil in shallow exploration work.

Features

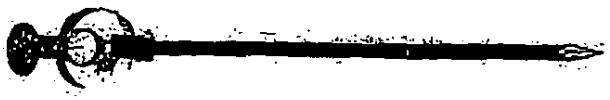
- Brake type dial indicator holds final reading until manually released.
- 250 lb. (1.1 kN) capacity proving ring.
- Lightweight and compact for easy transport to the field.

Specifications

Proving Ring.	250 lb. (1.1 kN) capacity.
Dial Indicator.	Brake type.
Shaft.	3/4" (19 mm) diam. x 18" l. (457 mm); graduated at 6" (152 mm) intervals.
Extension Rod.	3/4" (19 mm) diam. x 36" l. (914 mm); graduated at 6" (152 mm) intervals.
Cone.	30 degree; 1 sq. in.; replaceable.
Handle.	Cast aluminum.
Weight.	Net 12 lbs. (5.4 kg).

Model

CN-970.



C.O.E. Cone Penetrometer

The CN-973 Cone Penetrometer is the principal instrument used in evaluating soil trafficability. It consists of a 30 degree cone with a 1/2 sq. in. base area, proving ring, dial indicator, extension rod and a handle.

Features

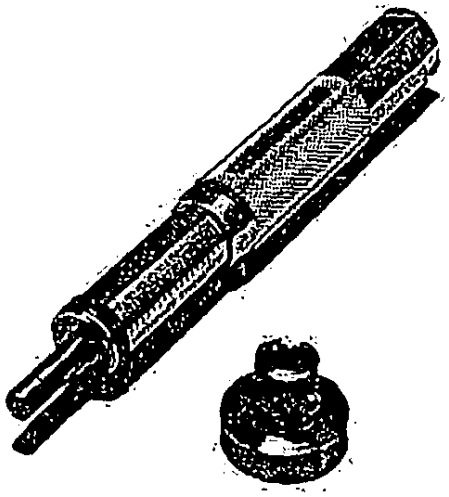
- Factory calibrated dial indicator reads directly in pounds per square inch (psi).
- Manufactured in accordance with Corps of Engineers specifications.

Specifications

Proving Ring.	150 lb. capacity; dial indicator calibrated direct in psi, 0 to 300 psi by 5 psi subdivisions.
Shaft.	5/8" (15.8 mm) diam. x 19" L (483 mm).
Cone.	30 degree; 1/2 sq. in. base area.
Weight.	Net 2 lbs. (0.9 kg).

Model

CN-973.



Pocket Penetrometer

The CL-700A Pocket Penetrometer was originally developed for use by field personnel in checking visual classification of soils. Data was compiled on several thousand unconfined compressive strength tests of silty clays and clayey soils against the penetrometer readings to develop the scale. A close relationship exists between the penetrometer's scale reading and soil type.

Features

- *Direct-reading scale in tons/sq. ft. and kg/sq. cm.*
- Ground and polished stainless steel loading piston.
- Calibrated spring and penetrometer body plated for rust resistance and long life.
- Convenient belt-loop style carrying case.
- Optional Adapter Foot for testing very soft materials.

Specifications

Range.	0.25 to 4.5 tons/sq. ft. (kg/sq. cm).
Scale Divisions.	0.25 tons/sq. ft. (kg/sq. cm).
Load Piston.	1/4" (6 mm) diam.; stainless steel.
Carrying Case.	Canvas; belt-loop style.
Dimensions.	3/4" diam. x 6-3/8" l. (19 x 162 mm).
Weight.	Net 7 oz. (198 g).

Model

Note: Shown with Adapter Foot (CL-701); not included, order separately.

CL-700A.

Accessories

CL-701. Adapter Foot. 1" (25.4 mm) diam. Increases piston area 16 times f testing on soft materials.

Special Note:

The Pocket Penetrometer does not replace field and laboratory testing analysis

ATTACHMENT 15

LDEQ correspondence – Exemption of Liner and Leachate Requirements (5A)

State of Louisiana

Department of Environmental Quality

M. J. "MIKE" FOSTER, JR.
GOVERNOR

April 1, 2002

J. DALE GIVENS
SECRETARY

CERTIFIED MAIL 7099 3400 0007 7057 0673
RETURN RECEIPT REQUESTED

Mr. Brad Campesi
Honeywell International
P. O. Box 226
Geismar, LA 70734

RE: Exemption Request
Honeywell International
Geismar Plant
Gypsum Stack (No. 5-A)
GD-005-0313/P-0216
Agency Interest No. 2082
Ascension Parish

Dear Mr. Campesi:

The Permits Division is in receipt of your letter dated October 4, 2001 requesting an exemption from LAC 33:VII.315.F. for the above referenced facility. This regulation prohibits construction of a new solid waste facility or modification of an existing facility to commence without a permit.

According to our records, your facility currently has a pending permit renewal application dated December 14, 1999, and resubmitted on March 6, 2001. Also, your facility submitted a major modification application dated March 5, 2001. That modification pertains to an additional fluorogypsum stacking facility, stack 5A.

Your request of October 4, 2001, contains three separate issues: an exemption allowed by LAC 33:VII.307 to begin construction of the facility prior to receiving a final decision on your permit modification request; a waiver allowed under LAC 33:VII.315.R of the requirements for a leachate and liner system for the bottom of the stack; and a waiver, allowed under LAC 33:VII.315.R of the requirements for a slope that does not exceed a 3:1 ratio.

The Department finds that the proposed early construction exemption will not pose any adverse impact to public health, safety, welfare, or the environment. Considering these facts, your request for an exemption in accordance with LAC 33:VII.307 is hereby approved. Please be reminded that this exemption does not imply approval of your pending permit modification or permit renewal and all construction activities shall be conducted at your company's own risk. Additionally, please note that the exemption is only for construction activities that are outlined in your permit modification application dated March 5, 2001 and the supporting attachments.

Please note that this exemption does not allow the introduction of any fluorogypsum waste to the new stack, stack 5A. Activities permitted under this exemption include soil excavation and grading, construction of levees, plugging and abandoning monitoring wells, as approved, and other activities that do not involve placing any fluorogypsum waste into the new unit.

The Department finds that there will be no changes to the type of material being deposited into this new stack from the similar materials deposited into your currently permitted stacks. Therefore, your request for a waiver of the Leachate and Liner System requirements for the bottom of the stack, allowed by LAC 33:VII315.R, is hereby approved.

The Department considered your request for the waiver of the slope requirements, allowed by LAC 33:VII315.R, and does not feel that Honeywell has submitted the appropriate supplemental information with this request. If you wish to pursue this waiver, please submit an addendum to your permit modification request. That addendum should include a slope stability analysis.

In the future, please reference your Agency Interest Number (AI# 2082) and your Solid Waste Identification Number (GD-005-0313) on all correspondence to this office pertaining to this site.

If you have any questions concerning this matter, please contact Mr. Scott Guilliams of the Permits Division at (225) 765-0195.

Sincerely,

Linda Korn Levy
Assistant Secretary

sg

c: Capital Regional Office
Bijan Sharafkhani, Environmental Technology Division

ATTACHMENT 16
LPDES Permit – Permit No. LA0006181

State of Louisiana

Department of Environmental Quality

M.J "MIKE" FOSTER, JR.
GOVERNOR

July 15, 2002

J. DALE GIVENS
SECRETARY

CERTIFIED MAIL 7000 1530 0006 2105 8260 **-RETURN RECEIPT REQUEST**

File No.: LA0006181
AI No.: 2082
Activity No.: PER19980004

Mr Brad Campesi, Environmental Engineer
Honeywell International, Inc
Geismar Plant
Post Office Box 226
Geismar, LA 70734

RE: Louisiana Pollutant Discharge Elimination System (LPDES) permit to discharge process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater to the Mississippi River from an existing hydrogen fluoride, fluorocarbon, and fluoropolymer facility located at 5525 Louisiana Highway 3155, near the intersection of Highway 30 and Highway 3115 in Geismar, Ascension Parish.

Dear Mr. Campesi:

This Office has received and evaluated comments submitted by Honeywell International, Inc. in response to the public notice published in the Office of Environmental Services Public Notice Mailing List on June 3, 2002, and the GONZALES WEEKLY on June 7, 2002. The Office's response to comments submitted by Honeywell International, Inc. are summarized below. No comments have been received from the general public

Issue 1:

Honeywell International requests the description for Outfall 001 given on Part I, page 2 of 7 read as follows: Outfall 001, the continuous discharge of treated process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) and Fluoropolymer facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater which discharges to the Mississippi River (estimated flow is 1.047 MGD).

Response to Issue 1:

This Office concurs with the permittee's request. The outfall description for Outfall 001 has been changed to read: Outfall 001, the continuous discharge of treated process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) and Fluoropolymer facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater which discharges to the Mississippi River (estimated flow is 1.047 MGD).

Issue 2

Honeywell requests that the Outfall 001 description on page 3 of the Fact Sheet read: the continuous discharge of treated process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) and Fluoropolymer facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater which discharges to the Mississippi River (estimated flow is 1.047 MGD).

Response to Issue 2:

This Office acknowledges and concurs with the above mentioned changes recommended for the factsheet However, the factsheet is a document that is designed to accompany a draft permit rather than a final permit That document won't be changed, but this document will serve to update the record

Issue 3:

Honeywell requests the removal of the following statement included on page 5 of the Fact Sheet for Outfall 002. "Chromium was deleted as a parameter".

Response to Issue 3:

Similar to the Response to Issue 2, this Office acknowledges the permittee's request to remove the statement that Chromium was deleted as a parameter on page 5 of the factsheet, however since the factsheet is designed to accompany the draft permit and not the final permit, this document will serve to update the record. Chromium was not deleted as a parameter at Outfall 002 in the Final Permit.

Issue 4.

Honeywell requests the LDEQ include a statement on page 5 of the Fact Sheet for Outfall 003 referencing the removal of the requirement to report daily average discharge of clarifying agents used in the intake raw river water treatment as a noticeable change

Response to Issue 4.

Similar to earlier responses, this Office acknowledges the changes recommended for the factsheet. However, since the factsheet is a document that is designed to accompany a draft permit rather than a final permit. That document won't be changed, but this document will serve to update the record.

Issue 5:

Honeywell requests that the Outfall 001 description in the Fact Sheet, page 10 read: treated process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) and Fluoropolymer facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater.

Response to Issue 5:

Again, this Office acknowledges and concurs with the above mentioned changes recommended for the factsheet. However, the factsheet is a document that is designed to accompany a draft permit rather than a final permit. That document won't be changed, but this document will serve to update the record

Pursuant to the Clean Water Act (33 U S C. 1251 et seq.), and the Louisiana Environmental Quality Act (La. R.S 30:2001, et seq.), the attached LPDES permit has been issued. Provisions of this permit may be appealed in writing pursuant to La R S 2024(A) within 30 days from receipt of the permit Only those provisions specifically appealed will be suspended by a request for hearing unless the secretary or the assistant secretary elects to suspend other provision(s) as well A request for hearing must be sent to the following:

Louisiana Department of Environmental Quality
Office of the Secretary
Attention: Hearings Clerk, Legal Division
Post Office Box 82282
Baton Rouge, Louisiana 70884-2282

This permit shall replace the previously effective EPA (NPDES) permit. All future correspondence regarding this permit shall use the Agency Interest (AI) number 2082 and LPDES permit number LA0006181

In accordance with Part II, Paragraph O of the permit, monitoring results should be reported on a Discharge Monitoring Report (DMR) form per the schedule specified. A copy of the form to be used is attached for your convenience

Should you have any questions concerning any part of the permit, please feel free to contact Jenniffer Lane of the Office of Environmental Services at the address on the preceding page or telephone (225) 765-0548

Sincerely,

Linda Korn Levy
Assistant Secretary

jdl

Attachments

c: cover letter and title page:

Mr David Ferrand
Customer Assistance Center
Maynard/Ketchum-Room 310

c. cover letter and permit:

Ms Evelyn Rosborough (6WQ-CA)
U S. Environmental Protection
Agency, Region VI (by Certified Mail)

Capital Regional Office
Office of Environmental Compliance

Permit Compliance Unit
Office of Environmental Compliance

c: cover letter and permit:

Jenniffer Lane
Permits Division

Water File "A" Left

NAME

ADDRESS

FACILITY LOCATION

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004
Approval expires 05-31-98

PERMIT NUMBER (2-16)	DISCHARGE NUMBER (17-19)

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM				TO			
	(20-21)	(22-23)	(24-25)		(26-27)	(28-29)	(30-31)

☐ Check here if No Discharge

NOTE: Read Instructions before completing this form

PARAMETER (32-37)		(3 Card Only) QUANTITY OR LOADING (46-53) AVERAGE	(54-61) MAXIMUM	UNITS	(4 Card Only) QUALITY OR CONCENTRATION (38-45) MINIMUM	(46-53) AVERAGE	(54-61) MAXIMUM	UNITS	NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
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	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)		TELEPHONE		DATE		
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA CODE	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

PERMIT NUMBER
LA0006181
AI No.: 2082

OFFICE OF ENVIRONMENTAL SERVICES

Water Discharge Permit

Pursuant to the Clean Water Act, as amended (33 U.S.C. 1251 et seq.), and the Louisiana Environmental Quality Act, as amended (La. R. S. 30:2001 et seq.), rules and regulations effective or promulgated under the authority of said Acts, and in reliance on statements and representations heretofore made in the application, a Louisiana Pollutant Discharge Elimination System permit is issued authorizing

Honeywell International, Inc.
Geismar Plant
Post Office Box 226
Geismar, LA 70734

Type Facility: hydrogen fluoride, fluorocarbon, and fluoropolymer facility

Location: 5525 Louisiana Highway 3155, near the intersection of Highway 30 and Highway 3115 in Geismar
Ascension Parish

Receiving Waters: Mississippi River

to discharge in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III attached hereto.

This permit shall become effective on July 12, 2002

This permit and the authorization to discharge shall expire five (5) years from the effective date of the permit.

Issued on July 12, 2002

Linda Korn Levy
Assistant Secretary

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning the effective date and lasting through the expiration date the permittee is authorized to discharge from:

Outfall 001, the continuous discharge of treated process wastewater and process area stormwater associated with the HFC-HCFC (Hydro fluorocarbon and Hydrochlorofluorocarbon) and Fluoropolymer facility, utility wastewaters including cooling tower blowdown and other miscellaneous non-process wastewaters, and non-process area stormwater which discharges to the Mississippi River (estimated flow is 1.047 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic		Discharge Limitations				Monitoring Requirements	
		(lbs/day, UNLESS STATED)		Other Units (mg/L, UNLESS STATED)			
CONVENTIONAL	STORET Code	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow-MGD	50050	Report	Report	---	---	Continuous	Recorder
pH Range Excursions (Continuous Monitoring), Number of Events >60 Minutes	82581	---	0(*1)	---	---	Continuous	Recorder
pH Range Excursions (Continuous Monitoring), Monthly Total Accumulated Time in Minutes	82582	---	446(*1)	---	---	Continuous	Recorder
pH Minimum/Maximum Values (Standard Units)	00400	---	---	Report (Min)	Report (Max)	Continuous	Recorder
BOD_5	00310	226	611	---	---	3/week	24-hr. Composite
TSS	00530	389	1261	---	---	3/week	24-hr. Composite
NONCONVENTIONAL							
Total Fluoride	00951	163.04	326.08	---	---	3/week	24-hr. Composite
METALS AND CYANIDE(*2)							
Total Chromium	01034	5.48	13.69	---	---	3/week	24-hr. Composite
VOLATILE COMPOUNDS(*2)							
Acrylonitrile	34215	0.46	1.15	---	---	1/year	24-hr. Composite
Benzene	34030	0.28	0.66	---	---	1/year	24-hr. Composite
Carbon Tetrachloride	32102	0.70	1.88	---	---	1/year	24-hr. Composite
Chlorobenzene	34301	0.70	1.88	---	---	1/year	24-hr. Composite
Chloroethane	34311	0.54	1.46	---	---	1/year	24-hr. Composite
Chloroform	32106	0.55	1.61	---	---	1/year	24-hr. Composite
1,1-Dichloroethane	34496	0.11	0.29	---	---	1/year	24-hr. Composite
1,2-Dichloroethane	34531	0.89	2.84	---	---	1/year	24-hr. Composite
1,1-Dichloroethylene	34501	0.11	0.30	---	---	1/year	24-hr. Composite
1,2-trans-Dichloroethylene	34546	0.12	0.33	---	---	1/year	24-hr. Composite
1,2-Dichloropropane	34541	0.97	3.92	---	---	1/year	24-hr. Composite

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001 continued)

Effluent Characteristic	STORET Code	Discharge Limitations (lbs/day, UNLESS STATED) Monthly Average	Daily Maximum	Other Units (ug/L, UNLESS STATED) Monthly Average	Daily Maximum	Monitoring Requirements Measurement Frequency	Sample Type
1,3-Dichloropropylene	34561	0.97	3.92	---	---	1/year	24-hr. Composite
Ethylbenzene	34371	0.70	1.88	---	---	1/year	24-hr. Composite
Methyl Chloride	34418	0.54	1.46	---	---	1/year	24-hr. Composite
Methylene Chloride	34423	0.18	0.84	---	---	1/year	24-hr. Composite
Tetrachloroethylene	34475	0.26	0.81	---	---	1/year	24-hr. Composite
Toluene	34010	0.14	0.37	---	---	1/year	24-hr. Composite
1,1,1-Trichloroethane	34506	0.11	0.29	---	---	1/year	24-hr. Composite
1,1,2-Trichloroethane	34511	0.16	0.63	---	---	1/year	24-hr. Composite
Trichloroethylene	39180	0.13	0.34	---	---	1/month	24-hr. Composite
Vinyl Chloride	39175	0.48	0.85	---	---	1/year	24-hr. Composite
ACID COMPOUNDS(*2)							
2,4-Dimethylphenol	34606	0.09	0.23	---	---	1/year	24-hr. Composite
4,6-Dinitro-o-Cresol	34657	0.39	1.37	---	---	1/year	24-hr. Composite
2,4-Dinitrophenol	34616	5.96	21.20	---	---	1/year	24-hr. Composite
2-Nitrophenol	34591	0.32	1.14	---	---	1/year	24-hr. Composite
4-Nitrophenol	34646	0.80	2.85	---	---	1/year	24-hr. Composite
Phenol	34694	0.09	0.23	---	---	1/year	24-hr. Composite
BASE NEUTRAL COMPOUNDS(*2)							
Acenaphthene	34205	0.09	0.23	---	---	1/year	24-hr. Composite
Acenaphthylene	34200	0.09	0.23	---	---	1/year	24-hr. Composite
Anthracene	34220	0.09	0.23	---	---	1/year	24-hr. Composite
Benzo(a)anthracene	34526	0.09	0.23	---	---	1/year	24-hr. Composite
Benzo(a)pyrene	34247	0.10	0.24	---	---	1/year	24-hr. Composite
3,4-Benzofluoranthene	34230	0.10	0.24	---	---	1/year	24-hr. Composite
Benzo(k)fluoranthene	34242	0.09	0.23	---	---	1/year	24-hr. Composite
Bis(2-ethylhexyl) phthalate	39100	0.47	1.27	---	---	1/year	24-hr. Composite
Chrysene	34320	0.09	0.23	---	---	1/year	24-hr. Composite
1,2-Dichlorobenzene	34536	0.97	3.92	---	---	1/year	24-hr. Composite
1,3-Dichlorobenzene	34566	0.70	1.88	---	---	1/year	24-hr. Composite
1,4-Dichlorobenzene	34571	0.70	1.88	---	---	1/year	24-hr. Composite
Diethyl phthalate	34336	0.23	0.56	---	---	1/year	24-hr. Composite
Dimethyl phthalate	34341	0.09	0.23	---	---	1/year	24-hr. Composite
Di-n-butyl phthalate	39110	0.10	0.21	---	---	1/year	24-hr. Composite
Fluoranthene	34376	0.11	0.27	---	---	1/year	24-hr. Composite
Fluorene	34381	0.09	0.23	---	---	1/year	24-hr. Composite
Hexachlorobenzene	39700	0.49	1.17	---	---	1/year	24-hr. Composite

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001 continued)

Effluent Characteristic		Discharge Limitations				Monitoring Requirements	
		(lbs/day, UNLESS STATED)		Other Units (ug/L, UNLESS STATED)			
	STORET Code	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Hexachlorobutadiene	34391	0.70	1.88	---	---	1/year	24-hr. Composite
Hexachloroethane	34396	0.97	3.92	---	---	1/year	24-hr. Composite
Naphthalene	34696	0.09	0.23	---	---	1/year	24-hr. Composite
Nitrobenzene	34447	11.05	31.63	---	---	1/year	24-hr. Composite
Phenanthrene	34461	0.09	0.23	---	---	1/year	24-hr. Composite
Pyrene	34469	0.10	0.24	---	---	1/year	24-hr. Composite
1,2,4-Trichlorobenzene	34551	0.97	3.92	---	---	1/year	24-hr. Composite

WHOLE EFFLUENT (ACUTE) TOXICITY TESTING (*3)	STORET Code			(Percent %, UNLESS STATED) Monthly Avg Minimum	48-Hour Minimum	Measurement Frequency	Sample Type
NOEC, Pass/Fail [0/1],(*4) Lethality, Static Renewal, 48-Hour Acute, *Pimephales promelas*	TEM6C	---	---	Report	Report	1/year	24-hr. Composite
NOEC, Value [%], Lethality, Static Renewal, 48-Hour Acute, *Pimephales promelas*	TOM6C	---	---	Report	Report	1/year	24-hr. Composite
NOEC, Pass/Fail [0/1],(*4) Lethality, Static Renewal 48-Hour Acute, *Daphnia pulex*	TEM3D	---	---	Report	Report	1/year	24-hr. Composite
NOEC, Value [%], Lethality, Static Renewal, 48-Hour Acute *Daphnia pulex*	TOM3D	---	---	Report	Report	1/year	24-hr. Composite

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001 continued)

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

Outfall 001, at the point of discharge to the Mississippi River from the HFC/HCFC treatment facility after the co-mingling of all the contributing streams previously defined and prior to mixing with any other waters.

FOOTNOTE(S):

(*1) The pH shall be within the range of 6.0 - 9.0 standard units at all times subject to the continuous monitoring pH range excursion provisions at Part II.J.

(*2) See Part II.K.

(*3) Biomonitoring shall be performed on a flow weighted composite discharge from Outfalls 001 and 002. The biomonitoring results shall be reported on the DMR for Outfall 001.

(*4) If a test failure has occurred and the required retests have been performed, the test results are to be reported on the DMR as follows:

Parameter Code	Report
Retest #1 22415	0 Pass, or, 1 Fail
Retest #2 22416	0 Pass, or, 1 Fail

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

During the period beginning the effective date and lasting through the expiration date the permittee is authorized to discharge from:

Outfall 002, the continuous discharge of treated process wastewater and process area stormwater associated with the hydrogen fluoride facility, utility wastewaters including cooling tower blowdown and other miscellaneous and other non-process wastewaters which discharge to the Mississippi River (Estimated flow 0.410 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic		Discharge Limitations				Monitoring Requirements	
		(lbs/day, UNLESS STATED)		Other Units (mg/L, UNLESS STATED)			
	STORET Code	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
CONVENTIONAL AND NONCONVENTIONAL							
Flow-MGD	50050	Report	Report	---	---	Continuous	Recorder
pH Range Excursions (Continuous Monitoring), Number of Events >60 Minutes	82581	---	0(*1)	---	---	Continuous	Recorder
pH Range Excursions (Continuous Monitoring), Monthly Total Accumulated Time in Minutes	82582	---	446(*1)	---	---	Continuous	Recorder
pH Minimum/Maximum Values (Standard Units)	00400	---	---	Report (Min)	Report (Max)	Continuous	Recorder
TSS	00530	4357	9042	---	---	3/week	24-hr. Composite
Total Fluoride	00951	1315	2795	---	---	3/week	24-hr. Composite
METALS							
Total Nickel	01067	4.9	16.4	---	---	3/week	24-hr. Composite
Total Zinc	01092	18.1	59.2	---	---	3/week	24-hr. Composite
Total Chromium	01034	1.1	3.6	---	---	3/week	24-hr. Composite

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Biomonitoring for this outfall shall be reported on the DMR for Outfall 001.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

Outfall 002, at the point of discharge from the HF lime treatment facility after the commingling of all contributing streams.

FOOTNOTE(S):

(*1) The pH shall be within the range of 6.0 - 9.0 standard units at all times subject to the continuous monitoring pH range excursion provisions at Part II.J.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

During the period beginning the effective date and lasting through the expiration date the permittee is authorized to discharge from:

Outfall 003, the continuous discharge of the underflow stream associated with the raw river water intake clarification system which discharges to the Mississippi River (estimated flow is 0.029 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic		Discharge Limitations				Monitoring Requirements	
				Other Units			
		(lbs/day, UNLESS STATED)		(mg/L, UNLESS STATED)			
	STORET Code	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Measurement Frequency (*1)	Sample Type (*2)
Flow-MGD	50050	Report	Report	---	---	1/week	Estimate

COAGULANTS:

The quantity and types of all coagulants (clarifying agents) used in the intake raw river water treatment clarification system during the sampling month shall be recorded. Records of the quantity and type of coagulants used shall be retained for three (3) years following Part III.C.3. No DMR reporting shall be required.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

Outfall 003, at the point of discharge of the underflow from the raw river water intake clarifier prior to combining with the waters of the Mississippi River.

FOOTNOTE(S):

(*1) When discharging.

(*2) See Part II.I.

PART II

OTHER REQUIREMENTS

In addition to the standard conditions required in all permits and listed in Part III, the Office has established the following additional requirements in accordance with the Louisiana Water Quality Regulations.

A. The Department of Environmental Quality reserves the right to impose more stringent discharge limitations or additional restrictions, if necessary, to maintain the water quality integrity and the designated uses of the receiving water bodies.

B. This permit does not in any way authorize the permittee to discharge a pollutant not listed or quantified in the application or limited or monitored for in the permit.

C. Authorization to discharge pursuant to the conditions of this permit does not relieve the permittee of any liability for damages to state waters or private property. For discharges to private land, this permit does not relieve the permittee from obtaining proper approval from the landowner for appropriate easements and rights of way.

D. For definitions of monitoring and sampling terminology see Part III, Section F.

E. LABORATORY ACCREDITATION

1. Laboratory procedures and analyses performed by commercial laboratories shall be in accordance with the requirements set forth under LAC 33:I.Subpart 3, Chapters 49-55.

2. Laboratory data generated by commercial laboratories that are not accredited under LAC 33:I.Subpart 3, 47-57, will not be accepted by LDEQ. Retesting of analysis will be required by an accredited commercial laboratory. When retesting of effluent is not possible (i.e., data reported DMR's for prior month's sampling), the data generated will be considered invalid and in violation of the LPDES permit.

3. Regulations on the Environmental Laboratory Accreditation Program and a list of labs that have applied for accreditation are available on the LDEQ website located at www.deq.state.la.us/lelap/. Questions concerning this program may be directed to (225) 765-0741.

4. DEFINITIONS

a. "Accreditation" means the formal recognition by the department of a laboratory's competence wherein a specific test or types of tests can be accurately and successfully performed in compliance

OTHER REQUIREMENTS (continued)

with all the minimum requirements set forth in the regulations regarding laboratory accreditation.

b. "Commercial Laboratory" means any laboratory that performs analyses for third parties for a fee or other compensation, except those commercial laboratories accredited by the Department of Health and Hospitals in accordance with R.S.49:1001 et seq.

F. 24-HOUR ORAL REPORTING: DAILY MAXIMUM LIMITATION VIOLATIONS

Under the provisions of Part III.D.6.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to the Office of Environmental Compliance within 24 hours from the time the permittee became aware of the violation followed by a written report in five days.

NONCONVENTIONALS
Fluoride

METALS
Total Chromium
Total Nickel
Total Zinc

VOLATILE COMPOUNDS
Acrylonitrile
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-trans-Dichloroethylene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl Chloride
Methylene Chloride
Tetrachloroethylene
Toluene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Vinyl Chloride

OTHER REQUIREMENTS (continued)

ACID COMPOUNDS
2,4-Dimethylphenol
4,6-Dinitro-o-cresol
2,4-Dinitrophenol
2-Nitrophenol
4-Nitrophenol
Phenol

BASE NEUTRAL COMPOUNDS
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
3,4-Benzofluoranthene
Benzo(k)fluoranthene
Bis(2-ethylhexyl)phthalate
Chrysene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Naphthalene
Nitrobenzene
Phenanthrene
Pyrene
1,2,4-Trichlorobenzene

G. COMPOSITE SAMPLING (24-HOUR)

1. STANDARD PROVISIONS

Unless otherwise specified in this permit, the term "24-hour composite sample" means a sample consisting of a minimum of four (4) aliquots of effluent collected at regular intervals over a normal 24-hour operating day and combined in proportion to flow or a sample continuously collected in proportion to flow over a normal 24-hour operating period.

OTHER REQUIREMENTS (continued)

2. VOLATILE COMPOUNDS

For the "24-hour composite" sampling of volatile compounds using EPA Methods 601, 602, 603, 624, 1624, or any other 40 CFR Part 136 (See LAC 33:IX.2531) method approved after the effective date of the permit, the permittee shall manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. These aliquots must be combined in the laboratory to represent the composite sample of the discharge. One of the following alternative methods shall be used to composite these aliquots.

a. Each aliquot is poured into a syringe. The plunger is added, and the volume in the syringe is adjusted to 1-1/4 ml. Each aliquot (1-1/4 ml.) is injected into the purging chamber of the purge and trap system. After four (4) injections (total 5 ml.), the chamber is purged. Only one analysis or run is required since the aliquots are combined prior to analysis.

b. Chill the four (4) aliquots to 4 Degrees Centigrade. These aliquots must be of equal volume. Carefully pour the contents of each of the four aliquots into a 250-500 ml. flask which is chilled in a wet ice bath. Stir the mixture gently with a clean glass rod while in the ice bath. Carefully fill two (2) or more clean 40 ml. zero head-space vials from the flask and dispose of the remainder of the mixture. Analyze one of the aliquots to determine the concentration of the composite sample. The remaining aliquot(s) are replicate composite samples that can be analyzed if desired or necessary.

c. Alternative sample compositing methods may be used following written approval by this Office.

The individual samples resulting from the application of these compositing methods shall be analyzed following the procedures specified for the selected test method. The resulting analysis shall be reported as the daily composite concentration.

As an option to the above compositing methods, the permittee may manually collect four (4) aliquots (grab samples) in clean zero head-space containers at regular intervals during the actual hours of discharge during the 24-hour sampling period using sample collection, preservation, and handling techniques specified in the test method. A separate analysis shall be conducted for each discrete grab sample following the approved

OTHER REQUIREMENTS (continued)

test methods. The determination of daily composite concentration shall be the arithmetic average (weighted by flow) of all grab samples collected during the 24-hour sampling period.

H. 40 CFR PART 136 (See LAC 33:IX.2531) ANALYTICAL REQUIREMENTS

Unless otherwise specified in this permit, monitoring shall be conducted according to analytical, apparatus and materials, sample collection, preservation, handling, etc., procedures listed at 40 CFR Part 136, and in particular, Appendices A, B, and C (See LAC 33:IX.2531).

I. FLOW MEASUREMENT "ESTIMATE" SAMPLE TYPE

If the flow measurement sample type in Part I is specified as "estimate", flow measurements shall not be subject to the accuracy provisions established at Part III.C.6 of this permit. The daily flow value may be estimated using best engineering judgement.

J. pH RANGE EXCURSION PROVISIONS

Where a permittee continuously measures the pH of wastewater as a requirement or option in a Louisiana Pollutant Discharge Elimination System (LPDES) permit, the permittee shall maintain the pH of such wastewater within the range set forth in the permit, except that excursions from the range are permitted, provided:

1. The total time during which the pH values are outside the required range of pH values shall not exceed 446 minutes in any calendar month; and

2. No individual excursion from the range of pH values shall exceed 60 minutes.

For the purposes of this section, an "excursion" is an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth in the permit.

K. MINIMUM QUANTIFICATION LEVEL (MQL)

If any individual analytical test result is less than the minimum quantification level listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

OTHER REQUIREMENTS (continued)

METALS AND CYANIDE	MQL (µg/L)
Antimony (Total)	60
Arsenic (Total)	10
Beryllium (Total)	5
Cadmium (Total)	1
Chromium (Total)	10
Chromium (3+)	10
Chromium (6+)	10
Copper (Total)	10
Lead (Total)	5
Mercury (Total)	0.2
Molybdenum (Total)	30
Nickel (Total) Freshwater	40
Nickel (Total) Marine	5
Selenium (Total)	5
Silver (Total)	2
Thallium (Total)	10
Zinc (Total)	20
Cyanide (Total)	20

VOLATILE COMPOUNDS	MQL (µg/L)
Acrolein	50
Acrylonitrile	50
Benzene	10
Bromoform	10
Carbon Tetrachloride	10
Chlorobenzene	10
Chlorodibromomethane	10
Chloroethane	50
2-Chloroethylvinylether	10
Chloroform	10
Dichlorobromomethane	10
1,1-Dichloroethane	10
1,2-Dichloroethane	10
1,1-Dichloroethylene	10
1,2-Dichloropropane	10
1,3-Dichloropropylene	10
Ethylbenzene	10
Methyl Bromide [Bromomethane]	50
Methyl Chloride [Chloromethane]	50
Methylene Chloride	20
1,1,2,2-Tetrachloroethane	10
Tetrachloroethylene	10
Toluene	10

OTHER REQUIREMENTS (continued)

1,2-trans-Dichloroethylene	10
1,1,1-Trichloroethane	10
1,1,2-Trichloroethane	10
Trichloroethylene	10
Vinyl Chloride	10

ACID COMPOUNDS	MOL (µg/L)
2-Chlorophenol	10
2,4-Dichlorophenol	10
2,4-Dimethylphenol	10
4,6-Dinitro-o-Cresol [2-Methyl-4,6-Dinitrophenol]	50
2,4-Dinitrophenol	50
2-Nitrophenol	20
4-Nitrophenol	50
p-Chloro-m-Cresol [4-Chloro-3-Methylphenol]	10
Pentachlorophenol	50
Phenol	10
2,4,6-Trichlorophenol	10

BASE/NEUTRAL COMPOUNDS	MOL (µg/L)
Acenaphthene	10
Acenaphthylene	10
Anthracene	10
Benzidine	50
Benzo(a)anthracene	10
Benzo(a)pyrene	10
3,4-Benzofluoranthene	10
Benzo(ghi)perylene	20
Benzo(k)fluoranthene	10
Bis(2-chloroethoxy) Methane	10
Bis(2-chloroethyl) Ether	10
Bis(2-chloroisopropyl) Ether	10
Bis(2-ethylhexyl) Phthalate	10
4-Bromophenyl Phenyl Ether	10
Butylbenzyl Phthalate	10
2-Chloronapthalene	10
4-Chlorophenyl Phenyl Ether	10
Chrysene	10
Dibenzo(a,h)anthracene	20
1,2-Dichlorobenzene	10
1,3-Dichlorobenzene	10
1,4-Dichlorobenzene	10
3,3'-Dichlorobenzidine	50
Diethyl Phthalate	10
Dimethyl Phthalate	10

OTHER REQUIREMENTS (continued)

Di-n-Butyl Phthalate	10
2,4-Dinitrotoluene	10
2,6-Dinitrotoluene	10
Di-n-octyl Phthalate	10
1,2-Diphenylhydrazine	20
Fluoranthene	10
Fluorene	10
Hexachlorobenzene	10
Hexachlorobutadiene	10
Hexachlorocyclopentadiene	10
Hexachloroethane	20
Indeno(1,2,3-cd)pyrene [2,3-o-Phenylene Pyrene]	20
Isophorone	10
Naphthalene	10
Nitrobenzene	10
n-Nitrosodimethylamine	50
n-Nitrosodi-n-Propylamine	20
n-Nitrosodiphenylamine	20
Phenanthrene	10
Pyrene	10
1,2,4-Trichlorobenzene	10

PESTICIDES	MQL (µg/L)
Aldrin	0.05
Alpha-BHC	0.05
Beta-BHC	0.05
Gamma-BHC [Lindane]	0.05
Delta-BHC	0.05
Chlordane	0.2
4,4'-DDT	0.1
4,4'-DDE [p,p-DDX]	0.1
4,4'-DDD [p,p-TDE]	0.1
Dieldrin	0.1
Alpha-Endosulfan	0.1
Beta-Endosulfan	0.1
Endosulfan Sulfate	0.1
Endrin	0.1
Endrin Aldehyde	0.1
Heptachlor	0.05
Heptachlor Epoxide [BHC-Hexachlorocyclohexane]	0.05
PCB-1242	1.0
PCB-1254	1.0
PCB-1221	1.0
PCB-1232	1.0
PCB-1248	1.0

OTHER REQUIREMENTS (continued)

PCB-1260	1.0
PCB-1016	1.0
Toxaphene	5.0

The permittee may develop an effluent specific method detection limit (MDL) in accordance with Appendix B to 40 CFR Part 136 (See LAC 33:IX.2531). For any pollutant for which the permittee determines an effluent specific MDL, the permittee shall send to this Office a report containing QA/QC documentation, analytical results, and calculations necessary to demonstrate that the effluent specific MDL was correctly calculated. An effluent specific minimum quantification level (MQL) shall be determined in accordance with the following calculation:

$$MQL = 3.3 \times MDL$$

Upon written approval by this Office, the effluent specific MQL may be utilized by the permittee for all future Discharge Monitoring Report (DMR) calculations and reporting requirements.

L. ZEBRA MUSSEL TREATMENT:

According to section 3.d., "Samples and Composites", of the biomonitoring requirements paragraph of this permit, the permittee must collect composite samples that "are representative of any periodic episodes of chlorination, biocide usage, or other potentially toxic substance discharged on an intermittent basis". Anytime the treatment method involves an increase in the concentration of a treatment chemical, a change in type of treatment chemical used, or if any event occurs that creates the potential for an effluent with a higher toxic nature, additional biomonitoring according to the terms and conditions of the biomonitoring section of Part II of this permit shall be required.

The permittee must notify this Office if changes occur in the zebra mussel control plan and obtain approval prior to initiating the new treatment. If chlorine is applied as part of the zebra mussel treatment program, the permittee must comply with a daily maximum Total Residual Chlorine (TRC) concentration limit of 0.2 mg/L. Monitoring shall be performed at a frequency of 1/day, by grab sample, during periods of chlorine application. A net Total Residual Chlorine concentration contribution calculated as a negative value shall be reported as zero.

The zebra mussel control plan must contain the following:

OTHER REQUIREMENTS (continued)

1. Material Safety Data Sheets for the zebra mussel treatment chemical to be used;

2. A list of all chemicals suspected to be in the waste stream to be treated;

3. A flow diagram of the wastewater stream to be treated (including the location of the point of zebra mussel treatment, clarification, filtration, etc.);

4. Anticipated treatment frequency and duration;

5. Treatment chemicals quantities (concentration and masses);

6. Average flow of the waste stream;

7. Name of the receiving stream.

To receive approval, submit your request along with a copy of the zebra mussel treatment plan to the following address:

Ronnie Bean
Supervisor of Municipal and Commercial Waste Unit
Permits Division
Office of Water Resources
Department of Environmental Quality
Post Office Box 82135
Baton Rouge, Louisiana 70884-2135

M. The permittee shall achieve compliance with the effluent limitations and monitoring requirements specified for discharges in accordance with the following schedule:

Effective date of the permit

N. PERMIT REOPENER CLAUSE

In accordance with LAC 33:IX.2361.C.3, this permit may be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitations issued or approved under sections 301(b)(2)(c) and (D); 304(b)(2); and 307(a)(2) of the Clean Water Act, if the effluent standard or limitations so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

OTHER REQUIREMENTS (continued)

2. Controls any pollutant not limited in the permit; or

3. Require reassessment due to change in 303(d) status of waterbody; or

4. Incorporates the results of any total maximum daily load allocation, which may be approved for the receiving water body.

O. DISCHARGE MONITORING REPORTS

Monitoring results must be reported on a Discharge Monitoring Report (DMR) form (EPA No. 3320-1 or an approved substitute). All monitoring reports must be retained for a period of at least three (3) years from the date of the sample measurement. The permittee shall make available to this Department, upon request, copies of all monitoring data required by this permit.

If there is a no discharge event at any of the monitored outfall(s) during the reporting period, place an "X" in the NO DISCHARGE box located in the upper right corner of the Discharge Monitoring Report.

Reporting periods shall end on the last day of the month. Monitoring results for each month shall be summarized on a Discharge Monitoring Report (DMR) Form and submitted to this Department per schedule below, postmarked no later than the 15th day of the month following each reporting period.

Permittees shall be required to submit DMR's according to the following schedule or as per established practice:

For parameter(s) with monitoring frequency(ies) of 1/month or more frequent:

Submit DMR by the 15th day of the following month.

For parameter(s) with monitoring frequency(ies) of 1/quarter:

Monitoring Period	DMR Due Date
January 1 - March 30	April 15th
April 1 - June 30	July 15th
July 1 - September 30	October 15th
October 1 - December 30	January 15th

For parameter(s) with monitoring frequency(ies) of semi-annual:

OTHER REQUIREMENTS (continued)

Monitoring Period	DMR Due Date
January 1 - June 30	July 15th
July 1 - December 31	January 15th

For parameter(s) with monitoring frequency(ies) of 1/year:

Monitoring Period	DMR Due Date
January 1 - December 31	January 15th

Duplicate copies of DMR's (one set of originals and one set of copies) signed and certified as required by LAC 33:IX.2333.B, and all other reports (one set of originals) required by this permit shall be submitted to the Permit Compliance Unit, and the appropriate DEQ regional office (one set of copies) at the following addresses:

Department of Environmental Quality
Office of Environmental Compliance
Permit Compliance Unit
Post Office Box 82215
Baton Rouge, Louisiana 70884-2215

Capital Regional Office
Office of Environmental Compliance
Surveillance Division
5222 Summa Court
Baton Rouge, Louisiana 70809

P. 48 HR ACUTE BIOMONITORING REQUIREMENTS: FRESHWATER

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO OUTFALL(S):	001 and 002
REPORTED ON DMR AS FINAL OUTFALL:	TX1Y
CRITICAL DILUTION:	0.0486%
EFFLUENT DILUTION SERIES:	0.065%, 0.0486%, 0.0364%, 0.0273%, and 0.0205%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136 (See LAC 33:IX.2531)

OTHER REQUIREMENTS (continued)

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA/600/4-90/027F, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

Pimephales promelas (Fathead minnow) acute static renewal 48-hour definitive toxicity test using EPA/600/4-90/027F, or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95 % confidence level does not occur. Acute test failure is defined as a demonstration of a statistically significant lethal effect at test completetion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

2. PERSISTENT LETHALITY

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal effects at the critical dilution. Significant lethal effects are herein defined as a statistically significant difference at the 95% confidence level between the survival of the appropriate test organism in a specified effluent dilution and the control (0% effluent).

a. Part I Testing Frequency Other Than Monthly

i. The permittee shall conduct a total of two (2) additional tests for any species that demonstrates significant lethal effects at the critical dilution. The two additional tests shall be conducted monthly during the next two consecutive months. The permittee shall not substitute either of the two additional tests in lieu of routine toxicity testing, unless the specified testing frequency for the species demonstrating significant lethal effects is monthly. The full report shall be prepared for each test required by this section in accordance with procedures outlined in item 4 of this section.

ii. If one or both of the two additional tests demonstrates significant lethal effects at the critical dilution, the permittee shall initiate Toxicity Reduction Evaluation (TRE)

OTHER REQUIREMENTS (continued)

requirements as specified in item 5 of this section. The permittee shall notify this Office in writing within 5 days of the failure in any retest, and the TRE initiation date will be the test completion date of the first failed retest.

iii. If one or both of the two additional tests demonstrates significant lethal effects at the critical dilution, the permittee shall henceforth increase the frequency of testing for this species to once per quarter for the life of the permit.

iv. The provisions of item 2.a are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at the critical dilution.

3. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

i. Each toxicity test control (0% effluent) must have a survival equal to or greater than 90%.

ii. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: *Daphnia pulex* survival test; and Fathead minnow survival test.

iii. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal effects are exhibited for: *Daphnia pulex* survival test; and Fathead minnow survival test.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

OTHER REQUIREMENTS (continued)

b. Statistical Interpretation

For the *Daphnia pulex* survival test and the Fathead minnow survival test, the statistical analyses used to determine if there is a statistically significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/600/4-90/027F, or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 3.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test regardless of the NOEC, and the permittee shall report a NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness and alkalinity to the closest downstream perennial water for;

(a) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(b) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(a) a synthetic dilution water control which fulfills the test acceptance requirements of item 3.a was run concurrently with the receiving water control;

(b) the test indicating receiving water toxicity has been carried out to completion (i.e., 48 hours);

(c) the permittee includes all test results indicating receiving water toxicity with the full report and information required by item 4 below; and

OTHER REQUIREMENTS (continued)

(d) the synthetic dilution water shall have a pH, hardness and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect two flow-weighted composite samples from the outfall(s) listed at item 1.a above.

ii. The permittee shall collect a second composite sample for use during the 24-hour renewal of each dilution concentration for both tests. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 36 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 4 degrees Centigrade during collection, shipping and/or storage.

iii. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in item 4. of this section.

v. MULTIPLE OUTFALLS: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in item 1.a above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.

OTHER REQUIREMENTS (continued)

4. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this Part in accordance with the Report Preparation Section of EPA/600/4-90/027F, for every valid or invalid toxicity test initiated, whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of Part III.C.3 of this permit. The permittee shall submit the first full report to:

Department of Environmental Quality
Office of Environmental Compliance
Enforcement Division
P.O. Box 82215
Baton Rouge, Louisiana 70884-2215
Attn: Permit Compliance Unit

b. A valid test for each species must be reported on the DMR during each reporting period specified in Part I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the LOWEST Survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for this Office to review.

c. The permittee shall report the following results of each valid toxicity test on the subsequent monthly DMR for that reporting period in accordance with Part III.D.4 of this permit. Submit retest information clearly marked as such with the following month's DMR. Only results of valid tests are to be reported on the DMR. The permittee shall submit the Table I summary sheet with each valid test.

i. *Pimephales promelas* (Fathead minnow)

(a) If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM6C.

(b) Report the NOEC value for survival, Parameter No. TOM6C.

OTHER REQUIREMENTS (continued)

ii. Daphnia pulex

(a) If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D.

(b) Report the NOEC value for survival, Parameter No. TOM3D.

The permittee shall submit the toxicity testing information contained in Table 1 of this permit with the DMR subsequent to each and every toxicity test reporting period. The DMR and the summary table should be sent to the address indicated in 4.a. The permittee is not required to send the first complete report nor summary tables to EPA.

5. TOXICITY REDUCTION EVALUATION (TRE)

a. Within ninety (90) days of confirming lethality in the retests, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The TRE Action Plan shall lead to the successful elimination of effluent toxicity at the critical dilution and include the following:

i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the document "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA-600/6-91/003) or alternate procedures. When the

OTHER REQUIREMENTS (continued)

permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, Va. 22161

ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 24 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).

OTHER REQUIREMENTS (continued)

b. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.

c. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:

   i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;

   ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and

   iii. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution.

   The TRE Activities Report shall be submitted to the following addresses:

   Department of Environmental Quality
   Office of Environmental Compliance
   Enforcement Division
   P.O. Box 82215
   Baton Rouge, Louisiana 70884-2215
   Attn: Permit Compliance Unit

   U.S. Environmental Protection Agency, Region 6
   Water Enforcement Branch, 6 EN-WC
   1445 Ross Avenue
   Dallas, Texas 75202

d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

OTHER REQUIREMENTS (continued)

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the above addresses.

TABLE 1
SUMMARY SHEET

Daphnia pulex ACUTE SURVIVAL TEST RESULTS

PERMITTEE: Honeywell International, Inc.
FACILITY SITE: Geismar Plant
LPDES PERMIT NUMBER: LA0006181
OUTFALL IDENTIFICATION: 001, 002, and 003
OUTFALL SAMPLE IS FROM _____ SINGLE _____ MULTIPLE DISCHARGES
BIOMONITORING LABORATORY: _____
DILUTION WATER USED: _____ RECEIVING WATER _____LAB WATER
CRITICAL DILUTION 0.0486% DATE TEST INITIATED_____

Are the test results to be considered valid? ____yes ____no
If X no (test invalid), what are the reasons for invalidity?

Is this a retest of a previous invalid test? ____ yes____no
Is this a retest of a previous test failure? ____ yes____no

NOEC = ____% effluent
$LC_{50}48$ = ____% effluent

DILUTION SERIES RESULTS
percent survival

TIME OF READING	REP	0%	0.065%	0.0486%	0.0364%	0.0273%	0.0205%
24-HOUR	A						
	B						
	C						
	D						
	E						
48-HOUR	A						
	B						
	C						
	D						
	E						
MEAN							

Is the mean survival at 48 hours significantly less (p=0.05) than the control survival for the low flow or critical dilution?
_____yes _____no

TABLE 2
SUMMARY SHEET

Pimephales promelas ACUTE SURVIVAL TEST RESULTS

PERMITTEE: Honeywell International, Inc.
FACILITY SITE: Geismar Plant
LPDES PERMIT NUMBER: LA0006181
OUTFALL IDENTIFICATION: 001, 002, and 003
OUTFALL SAMPLE IS FROM _____ SINGLE _____ MULTIPLE DISCHARGES
BIOMONITORING LABORATORY: _____
DILUTION WATER USED: _____ RECEIVING WATER _____ LAB WATER
CRITICAL DILUTION 0.0486% DATE TEST INITIATED _____

Are the test results to be considered valid? ____yes ____no
If __X__no (test invalid), what are the reasons for invalidity?

Is this a retest of a previous invalid test? ____ yes____no
Is this a retest of a previous test failure? ____ yes____no

NOEC = ____% effluent
$LC_{50}48$ = ____% effluent

DILUTION SERIES RESULTS
percent survival

TIME OF READING	REP	0%	0.065%	0.0486%	0.0364%	0.0273%	0.0205%
24-HOUR	A						
	B						
	C						
	D						
	E						
48-HOUR	A						
	B						
	C						
	D						
	E						
MEAN							

Is the mean survival at 48 hours significantly less (p=0.05) than the control survival for the low flow or critical dilution?
_____yes _____no

ATTACHMENT A

Permit No. LA0006181

Company Name: Honeywell International, Inc.
Address: Post Office Box 226
Geismar, LA 70734

1. Other than "cosmetic changes" such as correcting typos and grammatical errors, is the final permit different from the draft permit?

_____ YES _____ NO

If yes, what differences exist? _____

2. Did the company request changes in the permit after the draft was issued?

_____ YES _____ NO

If yes, what changes were requested? _____

Were the changes incorporated into the final permit?

_____ YES _____ NO

3. Did the public request changes in the permit after the draft was issued?

_____ YES _____ NO

If yes, what changes were requested? _____

Were the changes incorporated into the final permit?

_____ YES _____ NO

PART III
STANDARD CONDITIONS FOR LPDES PERMITS

SECTION A. GENERAL CONDITIONS

1. Introduction
In accordance with the provisions of LAC 33:IX.2355, et. seq., this permit incorporates either expressly or by reference ALL conditions and requirements applicable to Louisiana Pollutant Discharge Elimination System Permits (LPDES) set forth in the Louisiana Environmental Quality Act (LEQA), as amended, as well as ALL applicable regulations.

2. Duty to Comply
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Louisiana Environmental Quality Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. Penalties for Violation of Permit Conditions
   a. LA. R. S. 30:2025 provides for civil penalties for violations of these regulations and the Louisiana Environmental Quality Act. LA. R. S. 30:2076.2 provides for criminal penalties for violation of any provisions of the LPDES or any order or any permit condition or limitation issued under or implementing any provisions of the LPDES program. (See Section E. Penalties for Violation of Permit Conditions for additional details).

   b. Any person may be assessed an administrative penalty by the State Administrative Authority under LA. R. S. 30:2025 for violating a permit condition or limitation implementing any of the requirements of the LPDES program in a permit issued under the regulations or the Louisiana Environmental Quality Act.

4. Toxic Pollutants
   a. Other effluent limitations and standards under Sections 301, 302, 303, 307, 318, and 405 of the Clean Water Act. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, the state administrative authority shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

   b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions, or standards for sewage sludge use or disposal even if the permit has not yet been modified to incorporate the requirement.

5. Duty to Reapply
If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The new application shall be submitted at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the state administrative authority. (The state administrative authority shall not grant permission for applications to be submitted later than the expiration date of the existing permit.) Continuation of expiring permits shall be governed by regulations promulgated at LAC 33:IX.2321 and any subsequent amendments.

6. Permit Action
This permit may be modified, revoked and reissued, or terminated for cause in accordance with LAC 33:IX.2383, 2385, 2387, 2407 and 2769. The causes may include, but are not limited to, the following:

a. Noncompliance by the permittee with any condition of the permit;

b. The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time;

c. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;

d. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge; or

e. Failure to pay applicable fees under the provisions of LAC 33: IX. Chapter 13.

The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

7. Property Rights
This permit does not convey any property rights of any sort, or any exclusive privilege.

8. Duty to Provide Information
The permittee shall furnish to the state administrative authority, within a reasonable time, any information which the administrative authority may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the state administrative authority, upon request, copies of records required to be kept by this permit.

9. Criminal and Civil Liability
Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to La. R.S. 30:2025.

10. Oil and Hazardous Substance Liability
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

11. State Laws
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Clean Water Act.

12. Severability
If any provision of these rules and regulations, or the application thereof, is held to be invalid, the remaining provisions of these rules and regulations shall not be affected, so long as they can be given effect without the invalid provision. To this end, the provisions of these rules and regulations are declared to be severable.

13. Dilution
A permittee shall not achieve any effluent concentration by dilution unless specifically authorized in the permit. A permittee shall not increase the use of process water or cooling water or otherwise attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve permit limitations or water quality.

SECTION B. PROPER OPERATION AND MAINTENANCE

1. Need to Halt or Reduce not a Defense
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Duty to Mitigate
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

The permittee shall also take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

3. Proper Operation and Maintenance

a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

b. The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and other functions necessary to ensure compliance with the conditions of this permit.

4. Bypass of Treatment Facilities

a. Bypass. the intentional diversion of waste streams from any portion of a treatment facility.

b. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Section B.4.c. and 4.d of these standard conditions.

c. Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Office of Environmental Services, Permits Division, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in LAC 33:IX.2355.L.6, (24-hour notice) and Section D.6.e. of these standard conditions.

d. Prohibition of bypass

(1) Bypass is prohibited, and the state administrative authority may take enforcement action against a permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities,

retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

(c) The permittee submitted notices as required by Section B.4.c of these standard conditions.

(2) The state administrative authority may approve an anticipated bypass after considering its adverse effects, if the state administrative authority determines that it will meet the three conditions listed in Section B.4.d(1) of these standard conditions.

5. Upset Conditions

a. Upset. an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Section B.5.c. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required by LAC 33:IX.2355.L.6.b.ii. and Secton D.6.e.(2) of these standard conditions; and

(4) The permittee complied with any remedial measures required by Section B.2 of these standard conditions.

d. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. Removed Substances
Solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the state.

7. Percent Removal
For publicly owned treatment works, the 30-day average percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent in accordance with LAC 33:IX.2645.A.3. and B.3.

SECTION C. MONITORING AND RECORDS

1. Inspection and Entry
The permittee shall allow the state administrative authority, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by the law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

Enter upon the permittee's premises where a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept for inspection or sampling purposes. Most inspections will be unannounced and should be allowed to begin immediately, but in no case shall begin more than thirty (30) minutes after the time the inspector presents his/her credentials and announces the purpose(s) of the inspection. Delay in excess of thirty (30) minutes shall constitute a violation of these regulations. However, additional time can be granted if the inspector or the Administrative Authority determines that the circumstances warrant such action.

b. Have access to and copy, at reasonable times, any records that the department or its authorized representative determines are necessary for the enforcement of these regulations. For records maintained in either a central or private office that is open only during normal office hours and is closed at the time of inspection, the records shall be made available as soon as the office is open, but in no case later than the close of business the next working day;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Louisiana Environmental Quality Act, any substances or parameters at any location.

e. Sample Collection

(1) When the inspector announces that samples will be collected, the permittee will be given an additional thirty (30) minutes to prepare containers in order to collect duplicates. If the permittee cannot obtain and prepare sample containers within this time, he is considered to have waived his right to collect duplicate samples and the sampling will proceed immediately. Further delay on the part of the permittee in allowing initiation of the sampling will constitute a violation of these regulations.

(2) At the discretion of the administrative authority, sample collection shall proceed immediately (without the additional 30 minutes described in Section C.1.a. above) and the inspector shall supply the permittee with a duplicate sample.

f. It shall be the responsibility of the permittee to ensure that a facility representative familiar with provision of its wastewater discharge permit, including any other conditions or limitations, be available either by phone or in person at the facility during all hours of operation. The absence of such personnel on-site who are familiar with the permit shall not be grounds for delaying the initiation of an inspection except in situations as describe d in Section C.1.b. of these standard conditions. The permittee shall be responsible for providing witnesses/escorts during inspections. Inspectors shall abide by all company safety rules and shall be equipped with standard safety equipment (hard hat, safety shoes, safety glasses) normally required by industrial facilities.

g. Upon written request copies of field notes, drawings, etc., taken by department personnel during an inspection shall be provided to the permittee after the final inspection report has been completed.

2. Representative Sampling
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. All samples shall be taken at the outfall location(s) indicated in the permit. The state administrative authority shall be notified prior to any changes in the outfall location(s). Any changes in the outfall location(s) will be subject to modification, revocation and reissuance in accordance with LAC 33:IX.2383.

3. Retention of Records
Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the state administrative authority at any time.

4. Record Contents
Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The time(s) analyses were begun;
e. The individual(s) who performed the analyses;
f. The analytical techniques or methods used;
g. The results of such analyses; and
h. The results of all quality control procedures.

5. Monitoring Procedures
a. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 (See LAC 33:IX.2531) or, in the case of sludge use or disposal, approved under 40 CFR part 136 (See LAC 33:IX.2531) unless otherwise specified in 40 CFR part 503, unless other test procedures have been specified in this permit. This includes procedures contained in the latest EPA approved edition of the following publications:

(1) "Standard Methods for the Examination of Water and Waste Water". This publication is available from the American Public Health Association, Publication Sales, P. O. Box 753, Waldorf, MD 20604-0573, Phone number (301) 893-1894, Fax number (301) 843-0159.

(2) "Annual Book of Standards, Vols 1101-1103, Water I, Water II, and Atmospheric Analysis". This publication is available from the American Society for Testing Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Phone number (610) 832-9500.

(3) "Methods for Chemical Analysis of Water and Wastes, Revised, March 1983," U.S. Environmental Protection Agency, Analytical Quality Control Laboratory, Cincinnati, Ohio. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-84-128677.

b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate

records of such activities.

c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory. General sampling protocol shall follow guidelines established in the "Handbook for Sampling and Sample Preservation of Water and Wastewater, 1982" U.S. Environmental Protection Agency. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-83-124503. General laboratory procedures including glassware cleaning, etc. can be found in the "Handbook for Analytical Quality Control in Water and Wastewater Laboratories, 1979," U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory. This publication is available from the Environmental Protection Agency, Phone number (513) 569-7562. Order by EPA publication number EPA-600/4-79-019.

6. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

a. "A Guide to Methods and Standards for the Measurement of Water Flow, 1975," U.S. Department of Commerce, National Bureau of Standards. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, phone number (800) 553-6847. Order by NTIS publication number COM-75-10683.

b. "Flow Measurement in Open Channels and Closed Conduits, Volumes 1 and 2," U.S. Department of Commerce, National Bureau of Standards. This publication is available from the National Technical Service (NTIS), Springfield, VA, 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-273 535.

c. "NPDES Compliance Flow Measurement Manual," U.S. Environmental Protection Agency, Office of Water Enforcement. This publication is available from the National Technical Information Service (NTIS), Springfield, VA 22161, Phone number (800) 553-6847. Order by NTIS publication number PB-82-131178.

7. Prohibition for Tampering; Penalties

a. LA R.S. 30:2025 provides for punishment of any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit.

b. LA R.S. 30:2076.2 provides for penalties for any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non compliance.

8. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 (See LAC 33:IX.2531) or, in the case of sludge use and disposal, approved under 40 CFR part 136 (See LAC 33:IX.2531) unless otherwise specified in 40 CFR part 503, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the state administrative authority.

9. Averaging of Measurements
Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the state administrative authority in the permit.

10. Laboratory Accreditation

a. LAC 33:I.Subpart 3, Chapters 45-59 provide requirements for an accreditation program specifically applicable to commercial laboratories, wherever located, that provide chemical analyses, analytical results, or other test data to the department, by contract or by agreement, and the data is:

(1) Submitted on behalf of any facility, as defined in R.S.30:2004;
(2) Required as part of any permit application;
(3) Required by order of the department;
(4) Required to be included on any monitoring reports submitted to the department;
(5) Required to be submitted by contract;or
(6) Otherwise required by department regulations.

b. The department laboratory accreditation program is designed to ensure the accuracy, precision, and reliability of the data generated, as well as the use of department-approved methodologies in generation of that data. Laboratory data generated by commercial environmental laboratories that are not accredited under these regulations will not be accepted by the department. Retesting of analysis will be required by an accredited commercial laboratory.

Where retesting of effluent is not possible (i.e. data reported on DMRs for prior month's sampling), the data generated will be considered invalid and in violation of the LPDES permit.

c. Regulations on the Environmental Laboratory Accreditation Program and a list of labs that have applied for accreditation, are available on the department website located at:

http://www.deq.state.la.us/laboratory/index.htm.

Questions concerning the program may be directed to (225) 765-0582.

SECTION D. REPORTING REQUIREMENTS

1. Facility Changes
The permittee shall give notice to the state administrative authority as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under LAC 33:IX.2357.A.1.

c. For Municipal Permits. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Section 301, or 306 of the CWA if it were directly discharging those pollutants; and any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause

violation of the effluent limitations specified herein.

2. Anticipated Noncompliance
The permittee shall give advance notice to the state administrative authority of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers
This permit is not transferable to any person except after notice to the state administrative authority. The state administrative authority may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act or the Louisiana Environmental Quality Act. (See LAC 33:IX.2381; in some cases, modification or revocation and reissuance is mandatory.)

a. Transfers by modification. Except as provided in LAC 33: IX.2381.B, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under LAC 33:IX.2383.B.2), or a minor modification made (under LAC 33:IX.2385) to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act and the Louisiana Environmental Quality Act.

b. Automatic transfers. As an alternative to transfers under LAC 33:IX.2381.A., any LPDES permit may be automatically transferred to a new permittee if:

(1) The current permittee notifies the administrative authority at least 30 days in advance of the proposed transfer date in Section D.3.b.(2) below;

(2) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

(3) The state administrative authority does not notify the existing permittee and the proposed new permittee of his or her intent to modify or revoke and reissue the permit. A modification under this subsection may also be a minor modification under LAC 33:IX.2385. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Section D.3.b.(2) of these standard conditions.

4. Monitoring Reports
Monitoring results shall be reported at the intervals and in the form specified in Part II.

5. Compliance Schedules
Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

6. Requirements for Notification

a. Emergency Notification
As required by LAC 33.I.3915, in the event of an unauthorized discharge that does cause an emergency condition, the discharger shall notify the hotline (DPS 24-hour Louisiana Emergency Hazardous Materials Hotline) by telephone at (225) 925-6595 (collect calls accepted 24 hours a day) immediately (a reasonable period of time after taking prompt measures to determine the nature, quantity, and potential off-site impact of a release, considering the exigency of the circumstances), but in no case later than one hour after learning of the discharge. (An emergency condition is any condition which could reasonably be expected to endanger the health and safety of the public, cause significant adverse impact to the land, water, or air environment, or cause severe damage to property.) Notification required by this section will be made regardless of the amount of discharge. Verbal Notification Procedures are listed in Section D.6.c. of these standard conditions.

A written report shall be provided within seven calendar days after the telephone notification. The report shall contain the information listed in Section D.6.d. of these standard conditions and any additional information in LAC 33:I.3925.B.

b. Prompt Notification

As required by LAC 33:I.3917, in the event of an unauthorized discharge which exceeds reportable quantity specified in LAC 33:I.Subchapter E, but does not cause an emergency condition, the discharger shall notify the Office of Environmental Compliance by e-mail utilizing the Incident Report Form and procedures found at www.deq.state.la.us/surveillance or by telephone within 24 hours after learning of the discharge. Otherwise, verbal notification should be made to the Office of Environmental Compliance at (225) 763-3908 during office hours or (225) 342-1234 after hours, weekends, and holidays.

c. Information for Verbal Notifications. The following guidelines will be utilized as appropriate, based on the conditions and circumstances surrounding any unauthorized discharge, to provide relevant information regarding the nature of the discharge:

(1) name of person making the notification and telephone number where any return calls from response agencies can be placed;

(2) name and location of facility or site where the unauthorized discharge is imminent or has occurred using common landmarks. In the event of an incident involving transport, include the name and address of transporter and generator;

(3) date and time the incident began and ended, or estimated time of continuation if discharge is continuing;

(4) extent of any injuries and identification of any known personnel hazards which response agencies may face;

(5) common or scientific chemical name, U.S. Department of Transporatation hazard classification, and best estimate of amounts of any and all discharged pollutants;

(6) brief description of the incident sufficient to allow response agencies to formulate level and extent of response activity.

d. Written Notification Procedures. Written reports for any unauthorized discharge that requires verbal notification under Section D.6.a. or 6.b., or that requires written notification under LAC 33:I.3919, will be submitted by the discharger to the department in accordance with this section within seven calendar days after the telephone notification. Written notification reports will include, but are not limited to, the following information:

(1) name of person, company, or other party who is filing the written report;

(2) time and date of verbal notification, name of person making the notification, and identification of the site or facility, vessel, transport vehicle, or storage area from which the unauthorized discharge occurred;

(3) date(s), time(s), and duration of the unauthorized discharge and, if not corrected, the anticipated time it is expected to continue;

(4) details of the circumstances and events leading to any emergency condition, including incidents of loss of sources of radiation;

(5) common or scientific chemical name, the CAS number, U.S. Department of Transportation hazard

classification, and best estimate of amounts of any and all discharge pollutants, including methodology for calculations and estimates;

(6) statement of actual or probable fate or disposition of the pollutant or source of radiation;

(7) remedial actions taken, or to be taken, to stop unauthorized discharges or to recover pollutants or sources of radiation.

Please see LAC 33:I.3925.B for additional written notification procedures.

e. Twenty-four Hour Reporting. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and; steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The following shall be included as information which must be reported within 24hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit (see LAC 33:IX.2355.M.3.b.);

(2) Any upset which exceeds any effluent limitation in the permit;

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the administrative authority in Part II of the permit to be reported within 24 hours (LAC 33:IX.2361.G.).

7. Other Noncompliance
The permittee shall report all instances of noncompliance not reported under Section D.4., 5., and 6., at the time monitoring reports are submitted. The reports shall contain the information listed in Section D.6.e.

8. Other Information
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the state administrative authority, it shall promptly submit such facts or information.

9. Discharges of Toxic Substances
In addition to the reporting requirements under Section D.1-8, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Office of Environmental Services, Permits Division as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant

i. listed at Chapter 23, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter (100 µg/L);
(2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micro-grams per liter (500 µg/L) for 2,4 -dinitro-phenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application

in accordance with LAC33:IX.2331.G.7; or

(4) The level established by the state administrative authority in accordance with LAC 33:IX.2361.F.; or

ii. which exceeds the reportable quantity levels for pollutants at LAC 33:I. Subchapter E.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant:

i. listed at Chapter 23, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/L);
(2) One milligram per liter (1 mg/L) for antimony;
(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with LAC 33:IX.2331.G.7; or
(4) The level established by the state administrative authority in accordance with LAC 33:IX.2361.F.; or

ii. which exceeds the reportable quantity levels for pollutants at LAC 33:I. Subchapter E.

10. Signatory Requirements

All applications, reports, or information submitted to the state administrative authority shall be signed and certified.

a. All permit applications shall be signed as follows:

(1) For a corporation - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or,

(b) The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

NOTE: DEQ does not require specific assignments or delegations of authority to responsible corporate officers identified in Section D.10.a.(1)(a). The agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the state administrative authority to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under Section D.10.a.(1)(b). rather than to specific individuals.

(2) For a partnership or sole proprietorship - by a general partner or the proprietor, respectively; or

(3) For a municipality, state, federal, or other public agency - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a federal agency includes:

(a) The chief executive officer of the agency, or

(b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

b. All reports required by permits and other information requested by the state administrative authority shall be signed by a person described in Section D.10.a., or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in Section D.10.a. of these standard conditions;
(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (a duly authorized representative may thus be either a named individual or an individual occupying a named position; and,
(3) The written authorization is submitted to the state administrative authority.

c. Changes to authorization. If an authorization under Section D.10.b. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Section D.10.b. must be submitted to the state administrative authority prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing a document under Section D.10. a. or b. above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Availability of Reports
All recorded information (completed permit application forms, fact sheets, draft permits, or any public document) not classified as confidential information under R.S. 30:2030(A) and 30:2074(D) and designated as such in accordance with these regulations (LAC 33:IX.2323 and LAC 33:IX.2763) shall be made available to the public for inspection and copying during normal working hours in accordance with the Public Records Act, R.S. 44:1 et seq.

Claims of confidentiality for the following will be denied:
a. The name and address of any permit applicant or permittee;
b. Permit applications, permits, and effluent data.
c. Information required by LPDES application forms provided by the state administrative authority under LAC 33:IX.2331 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

SECTION E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITION

1. Criminal

a. Negligent Violations
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who negligently violates any provision of the LPDES, or any order issued by the secretary under the LPDES, or any permit condition or limitation implementing any such provision in a permit issued under the LPDES by the secretary, or any requirement imposed in a pretreatment program approved under the LPDES is subject to a fine of not less

than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. If a conviction of a person is for a violation committed after a first conviction of such person, he shall be subject to a fine of not more than $50,000 per day of violation, or imprisonment of not more than two years, or both.

b. Knowing Violations
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly violates any provision of the LPDES, or any permit condition or limitation implementing any such provisions in a permit issued under the LPDES, or any requirement imposed in a pretreatment program approved under the LPDES is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or imprisonment for not more than 3 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, he shall be subject to a fine of not more than $100,000 per day of violation, or imprisonment of not more than six years, or both.

c. Knowing Endangerment
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly violates any provision of the LPDES, or any order issued by the secretary under the LPDES, or any permit condition or limitation implementing any such provisions in a permit issued under the LPDES by the secretary, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both. A person which is an organization shall, upon conviction of violating this Paragraph, be subject to a fine of not more than one million dollars. If a conviction of a person is for a violation committed after a first conviction of such person under this Paragraph, the maximum punishment shall be doubled with respect to both fine and imprisonment.

d. False Statements
The Louisiana Revised Statutes LA. R. S. 30:2076.2 provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the LPDES or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the LPDES, shall, upon conviction, be subject to a fine of not more than $10,000, or imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this Subsection, he shall be subject to a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Civil Penalties
The Louisiana Revised Statutes LA. R. S. 30:2025 provides that any person found to be in violation of any requirement of this Subtitle may be liable for a civil penalty, to be assessed by the secretary, an assistant secretary, or the court, of not more than the cost to the state of any response action made necessary by such violation which is not voluntarily paid by the violator, and a penalty of not more than $27,500 for each day of violation. However, when any such violation is done intentionally, willfully, or knowingly, or results in a discharge or disposal which causes irreparable or severe damage to the environment or if the substance discharge is one which endangers human life or health, such person may be liable for an additional penalty of not more than one million dollars.

(**PLEASE NOTE**: These penalties are listed in their entirety in Subtitle II of Title 30 of the Louisiana Revised Statutes.)

SECTION F. DEFINITIONS

All definitions contained in Section 502 of the Clean Water Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:

1. "Clean Water Act" means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972) Pub.L.92-500, as amended by Pub.L. 95-217, Pub.L. 95-576, Pub.L. 96-483 and Pub.L. 97-117, 33 U.S.C. 1251 et. seq.).

2. "Accreditation" means the formal recognition by the department of a laboratory's competence wherein specific tests or types of tests can be accurately and successfully performed in compliance with all minimum requirements set forth in the regulations regarding laboratory accreditation.

3. "Administrator" means the Administrator of the U.S. Environmental Protection Agency, or an authorized representative.

4. "Applicable effluent standards and limitations" means all state and Federal effluent standards and limitations to which a discharge is subject under the Clean Water Act, including, but not limited to, effluent limitations, standards or performance, toxic effluent standards and prohibitions, and pretreatment standards.

5. "Applicable water quality standards" means all water quality standards to which a discharge is subject under the Clean Water Act.

6. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

7. "Commercial Laboratory" means any laboratory that performs analyses or tests for third parties for a fee or other compensation, except those commercial laboratories accredited by the Department of Health and Hospitals in accordance with R.S.49:1001 et seq.

8. "Daily Discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the sampling day. Daily discharge determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily discharge determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day.

9. "Daily Maximum" discharge limitation means the highest allowable "daily discharge" during the calendar month.

10. "Director" means the U.S. Environmental Protection Agency Regional Administrator or an authorized representative.

11. "Environmental Protection Agency" means the U.S. Environmental Protection Agency.

12. "Grab sample" means an individual sample collected in less than 15 minutes.

13. "Industrial user" means a nondomestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.

14. "LEQA" means the Louisiana Environmental Quality Act.

15. "Louisiana Pollutant Discharge Elimination System (LPDES)" means those portions of the Louisiana Environmental Quality Act and the Louisiana Water Control Law and all regulations promulgated under their authority which are deemed equivalent to the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act in accordance with Section 402 of the Clean Water Act and all applicable federal regulations.

16. "Monthly Average" (also known as Daily Average), other than for fecal coliform bacteria, discharge limitations means the highest allowable average of "daily discharge(s)" over a calendar month, calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes monthly average concentration effluent limitations or conditions, the monthly average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily discharge concentration, F = daily flow and n = number of daily samples; monthly average discharge =

$$\frac{C_1F_1 + C_2F_2 + \ldots + C_nF_n}{F_1 + F_2 + \ldots + F_n}$$

The monthly average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.

17. "National Pollutant Discharge Elimination System" means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Clean Water Act.

18. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

19. "Sewage sludge" means the solids, residues, and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff, that are discharged to or otherwise enter a publicly owned treatment works.

20. "Treatment works" means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Clean Water Act, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extension, improvement, remodeling, additions, and alterations thereof.

21. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

22. For fecal coliform bacteria, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.

23. The term "MGD" shall mean million gallons per day.

24. The term "mg/L" shall mean milligrams per liter or parts per million (ppm).

25. The term "ug/L" shall mean micrograms per liter or parts per billion (ppb).

26. "Weekly average", other than for fecal coliform bacteria, is the highest allowable arithmetic mean of the daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The weekly average for fecal coliform bacteria is the geometric mean of the daily discharges over a calendar week.

27. "12-hour composite sample" consists of 12 effluent portions collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.

28. "6-hour composite sample" consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

29. "3-hour composite sample" consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

30. Sanitary Wastewater Term(s):

    a. "24-hour composite sample" consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.

A Right

ROUTING SHEET

RUSH [X] MAJOR PERMIT: [X]

LOG #: ACTIVITY #: PER19980004

FILE #: LA0006181 PERMIT #: LA0006181 AI #: 2082

COMPANY/FACILITY Honeywell International, Inc.

LOCATION Geismar

PERMIT (PRELIM DRAFT, DRAFT, FINAL) [ ] MODIFICATION (MINOR, MAJOR) [ ] GENERAL PERMIT AUTH. [ ]

OTHER [ ]

PERMIT WRITER Jennifer Lane - JDL

SECTION: PETROCHEM [✓] LEVEL1 IND [ ] LEVEL2 IND [ ] MUN & COMM WASTE [ ]
MEDIA: WATER [✓] SOLID WASTE [ ] HAZARDOUS WASTE [ ] AIR [ ]

PRELIMINARY DRAFT, NOD, LETTER, OTHER REVIEW (circle one)

	Initials	Date			
By Permit ~~Coordinator~~ Supervisor	DVC	02/26/02	Return to Permit Writer to address comments?	YES ___	NO ✓
COMMENTS:					
By Technical Reviewer	BVZ	4/11/02 4-2-02	Return to Permit Writer to address comments?	YES ✓	NO ___
MEDIA: Water			NAME: Jay Ardell		
COMMENTS: Don't need to review again					
By Program Manager	HJL	3/1/02	Return to Permit Writer to address comments?	YES ✓	NO ___
COMMENTS:					
By Administrator or Asst. Admin.			Return to Permit Writer to address comments?	YES ___	NO ___
COMMENTS:					
By Assistant Secretary			Return to Permit Writer to address comments?	YES ___	NO ___
COMMENTS:					

DRAFT (PERMIT, MAJOR MOD) REVIEW (circle one)

	Initials	Date			
By Permit ~~Coordinator~~ Supervisor	DVC	5/22/02	Return to Permit Writer to address comments?	YES ___	NO ✓
COMMENTS:					
By Technical Reviewer	BVZ	5/22/02	Return to Permit Writer to address comments?	YES ___	NO ✓
MEDIA:			NAME:		
COMMENTS:					
By Program Manager	HJL	5/22/02	Return to Permit Writer to address comments?	YES ✓	NO ___
COMMENTS:					
By Administrator or Asst. Admin.			Return to Permit Writer to address comments?	YES ___	NO ___ Notice Id 947
COMMENTS:					
By Assistant Secretary	[signature]	5/29	Return to Permit Writer to address comments?	YES ✓	NO ___
COMMENTS:					

OK to PN

RUSH MAY 30 2002 KJ

FINAL (PERMIT, MINOR MOD, MAJOR MOD, GENERAL PERMIT AUTHORIZATION) REVIEW (circle one)

	Initials	Date			
By Permit ~~Coordinator~~ Supervisor	DVC	7/11/02	Return to Permit Writer to address comments?	YES ___	NO ✓
COMMENTS:					
By Technical Reviewer	BVZ	7/11/02	Return to Permit Writer to address comments?	YES ___	NO ✓
MEDIA:			NAME:		
COMMENTS:					
By Program Manager	Leave		Return to Permit Writer to address comments?	YES ___	NO ___
COMMENTS:					
By Administrator or Asst. Admin.	[signature]	7/12	Return to Permit Writer to address comments?	YES ___	NO ___
COMMENTS:					
By Assistant Secretary			Return to Permit Writer to address comments?	YES ___	NO ___
COMMENTS:					

final

ROUTING SHEET

RUSH [ ] MAJOR PERMIT: [X]

LOG #: _____ ACTIVITY #: PER19980004

FILE #: _____ PERMIT #: LA0006181 AI #: 2082

COMPANY/FACILITY Honeywell International, Inc.

LOCATION Geismar

PERMIT (PRELIM DRAFT, DRAFT, FINAL) [ ] MODIFICATION (MINOR, MAJOR) [ ] GENERAL PERMIT / OTHER [ ]

PERMIT WRITER ~~Cynthia Clark (CAC)~~ Jenniffer Lane (JDL)

SECTION: PETROCHEM [X] LEVEL1 IND [ ] LEVEL2 IND [ ] MUN & COMM WAS
MEDIA: WATER [ ] SOLID WASTE [ ] HAZARDOUS WASTE [ ] AIR [ ]

PRELIMINARY DRAFT, NOD, LETTER, OTHER REVIEW (circle one)

	Initials	Date	
By Permit Coordinator	[illegible]	4/16/01	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Technical Reviewer	[illegible]	3-15-01	Return to Permit Writer to address comments? YES ✓ NO ____
MEDIA: Water			NAME: Gary Aydell
COMMENTS:			
By Program Manager	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Administrator or Asst. Admin.	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Assistant Secretary	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			

DRAFT (PERMIT, MAJOR MOD) REVIEW (circle one)

	Initials	Date	
By Permit Coordinator	DVC	10/19/01	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Technical Reviewer	SVF	11/21/01	Return to Permit Writer to address comments? YES ✓ NO ____
MEDIA: Water			NAME: Bruce Fielding
COMMENTS:			
By Program Manager	[illegible]	11/30/01	Return to Permit Writer to address comments? YES ✓ NO ____
COMMENTS:			
By Administrator or Asst. Admin.	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Assistant Secretary	[illegible]	12/14/01	Return to Permit Writer to address comments? YES ____ NO ✓
COMMENTS: TO Pub Part 12/14			

FINAL (PERMIT, MINOR MOD, MAJOR MOD, GENERAL PERMIT AUTHORIZATION) REVIEW (circle one)

	Initials	Date	
By Permit Coordinator	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Technical Reviewer	____	____	Return to Permit Writer to address comments? YES ____ NO ____
MEDIA:			NAME:
COMMENTS:			
By Program Manager	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Administrator or Asst. Admin.	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			
By Assistant Secretary	____	____	Return to Permit Writer to address comments? YES ____ NO ____
COMMENTS:			

DEC 14 2001 [illegible]

COVER SHEET

RUSH ____ O/G: Drilling ____

COMPANY/FACILITY ~~[illegible]~~ Honeywell International, Inc.

LOCATION ____

DRAFT PERMIT[ ] FINAL PERMIT[ ] TEMP. PERMIT[ ] MODIFICATION[ ] MAJOR [Yes]

PERMIT WRITER CAC [illegible] Section: Oil/Gas ____ Industrial ____ Municipal ____ General Permits ____ Pet/Chem ____

APPLICATION REVIEWED

[ ] FWS ____ [ ] LSHPO ____

410-Day ____ Due Date ____ Initials Date Date Rec. Date Completed

By AV Coordinator [illegible] 12/15/98 AV Reviewer [illegible] 12/15/98 2/3/99

COMMENTS TO REVIEWER: ____

COMMENTS FROM REVIEWER: NO ENF. / ~~#~~ BD AVAILABLE

DRAFT REVIEWED Initials Date

[ ] EPA ____ [ ] FWS ____

By Permit Coordinator ____ ____ Return to Permit Writer to address comments? YES ____ NO ____ 906

COMMENTS TO CLERICAL ASST: ____

SUPR'V COMMENTS: ____

By Program Manager ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

By Administrator or Asst. Admin. ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

By Assistant Secretary ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

FINAL PERMIT REVIEWED

Initials Date [ ] EPA ____ [ ] FWS ____

By Coordinator ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

By Program Manager ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

By Administrator or Assist. Admin ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

By Assistant Secretary ____ ____ Return to Permit Writer to address comments? YES ____ NO ____

COMMENTS: ____

APP. RECEIVED 10-14-98

ID # 147 WP # 1734

PARISH Ascension

FILE NUMBER LA0006181

PREVIOUS ACTION AI#38811

✓ ____ APP. PENDING ____
No Yes Date, Permit Writer

✓ ____ DRAFT OUT ____
No Yes Date, Permit Writer

____ ✓ FINAL PERMIT 3-28-94
No Yes Date, Permit Writer

OUTSTANDING FEES ____

ISSUANCE INV.# ____

FEE ____ Date $ ____ Amount Paid

FED. TAX ID NUMBER 22-2640650

MUCI-08070202

FRONT GATE COOR. LAT. 30° 13' 41" LONG 91° 23' 12"

Outfall No. 001
SUBEGMENT NO. 070301 SENSITIVE yes ____ No ____

Outfall No. ____
SUBEGMENT NO. ____ SENSITIVE yes ____ No ____

A Left

ATTACHMENT A

Permit No. LA0006181

Company Name: Honeywell International, Inc.
Address: Post Office Box 226
Geismar, LA 70734

1. Other than "cosmetic changes" such as correcting typos and grammatical errors, is the final permit different from the draft permit?

____ YES ✓ NO

If yes, what differences exist? _____

2. Did the company request changes in the permit after the draft was issued?

✓ YES ____ NO

If yes, what changes were requested? 1.) Changes in the wording of Outfall 001 description 2.)Clarification on a couple of items in the Fact Sheet

Were the changes incorporated into the final permit?

✓ YES ____ NO Changes to the Fact Sheet were noted in the the response to comments instead of the Fact Sheet document.

3. Did the public request changes in the permit after the draft was issued?

____ YES ✓ NO

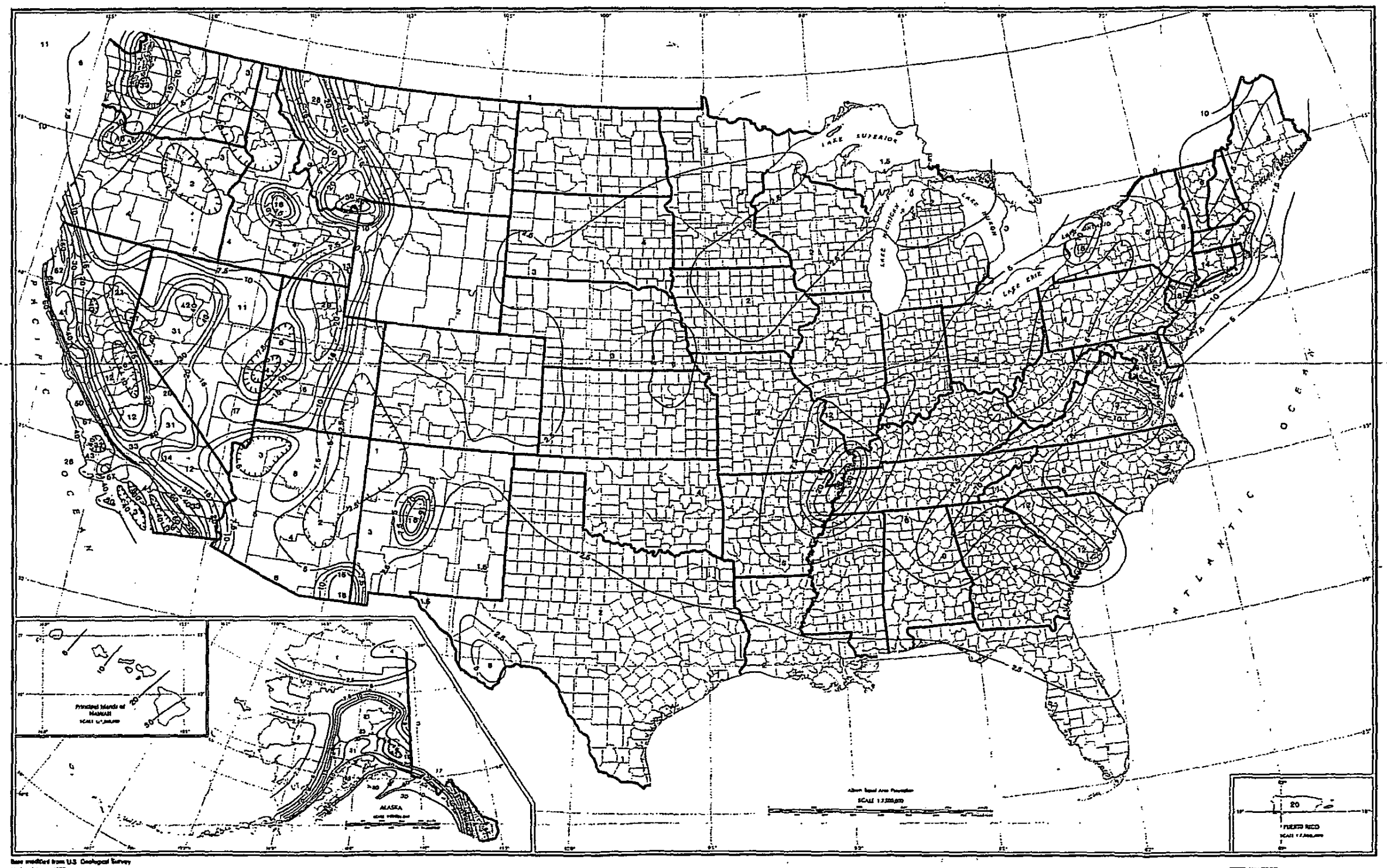
If yes, what changes were requested? _____

Were the changes incorporated into the final permit?

____ YES ____ NO

ATTACHMENT 17
Earthquake Acceleration and Velocity

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

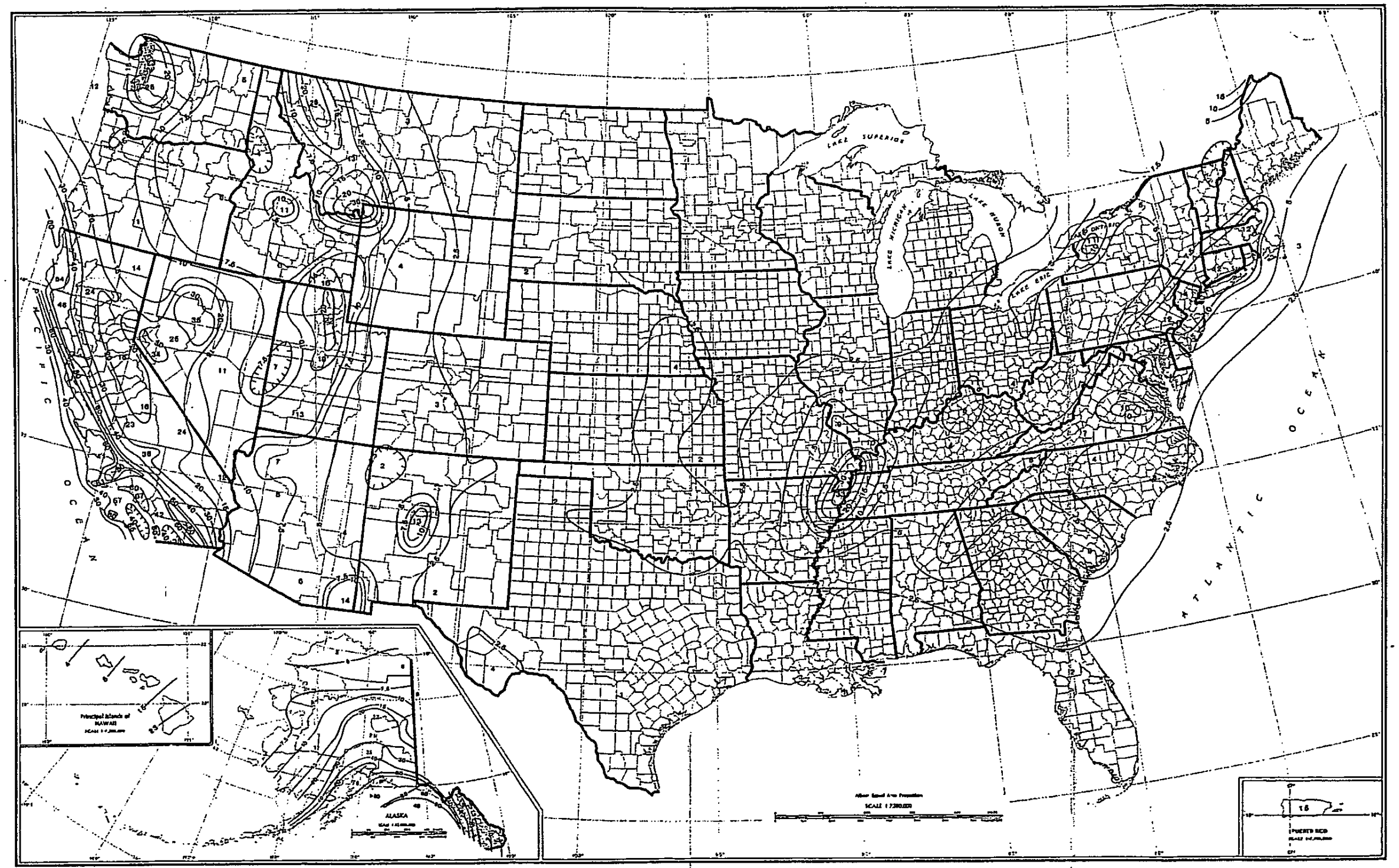


Base modified from U.S. Geological Survey National Atlas, 1970

MAP A.–HORIZONTAL ACCELERATION (90 PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 50 YEARS)

EXPLANATION

—40— Contour--Horizontal acceleration expressed as percent of gravity. *Some areas show acceleration values without contours. Hachures indicate closed area of lower acceleration. Data for Hawaii and Puerto Rico from Federal Emergency Management Agency (1985)*



Base modified from U.S. Geological Survey National Atlas 1970

MAP B.–HORIZONTAL VELOCITY (90 PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 50 YEARS)

EXPLANATION

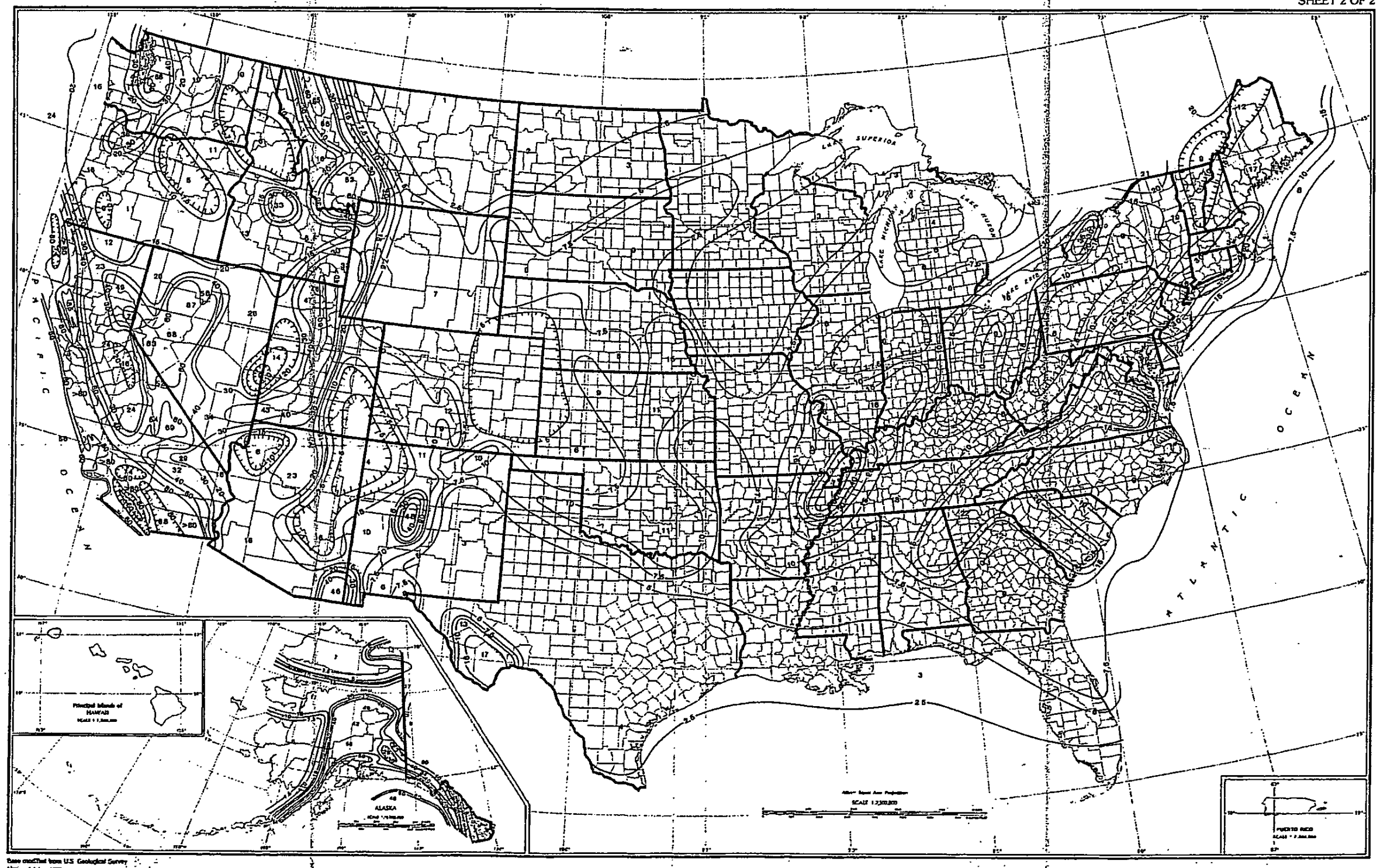
—5— Contour--Horizontal velocity expressed as centimeters per second. Some areas show velocity values without contours. Hachures indicate closed area of lower velocity. Data for Hawaii and Puerto Rico from Federal Emergency Management Agency (1985)

PROBABILISTIC EARTHQUAKE ACCELERATION AND VELOCITY MAPS FOR THE UNITED STATES AND PUERTO RICO

By

S. T. Algermissen, D. M. Perkins, P. C. Thenhaus, S. L. Hanson, and B. L. Bender

1990

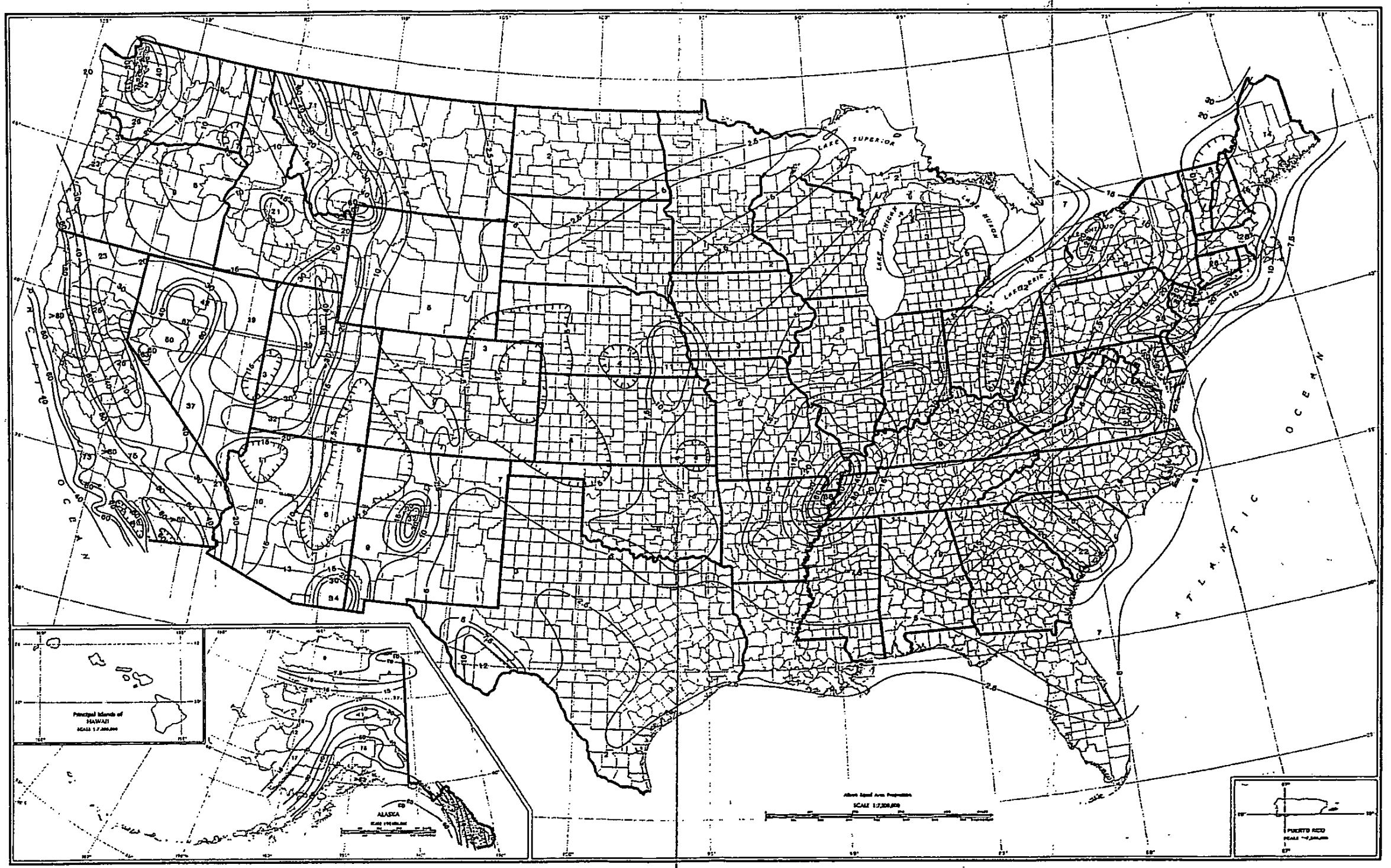


Base modified from U.S. Geological Survey National Atlas, 1970

MAP C.–HORIZONTAL ACCELERATION (90 PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 250 YEARS)

EXPLANATION

—5— Contour--Horizontal acceleration expressed as percent of gravity. Some areas show acceleration values without contours. Hachures indicate closed area of lower acceleration. No data available for Hawaii and Puerto Rico



Base modified from U.S. Geological Survey National Atlas, 1970

MAP D.-HORIZONTAL VELOCITY (90 PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 250 YEARS)

EXPLANATION

—15— Contour--Horizontal velocity expressed as centimeters per second. Some areas above velocity values without contours. Hachures indicate closed area of lower velocity. No data available for Hawaii and Puerto Rico

PROBABILISTIC EARTHQUAKE ACCELERATION AND VELOCITY MAPS FOR THE UNITED STATES AND PUERTO RICO

By

S. T. Algermissen, D. M. Perkins, P. C. Thenhaus, S. L. Hanson, and B. L. Bender

1990

ATTACHMENT 18

Earthwork Calculations for the Existing Stack 5A

PROPOSED NEW AUXILIARY CLEARWELL/RESIDUE STACK #5A
CLAY REQUIREMENTS CALCULATIONS

ITEM	X-SECT AREA	LENGTH	VOLUME
STARTER DIKE	224 SQ. FT	2130 FT.	17,671 CU. YDS.
INTERCEPTER DIKE	150 SQ. FT.	2280 FT	12,667 CU. YDS.
RECOMPACTED DITCH BOTTOM	96 SQ. FT.	760 FT.	2,702 CU. YDS.
PARTIAL LINER TO MAINTAIN 10 FT. MIN. CLAY BOTTOM BENEATH STACK 6	165 SQ. FT.	760 FT.	4,644 CU. YDS.
TOTAL COMPACTED CLAY REQUIREMENTS			37,684 CU. YDS.

ATTACHMENT 19
Monitoring Well Analytical Data

BACKGROUND DATA

BACKGROUND GROUNDWATER QUALITY DATA

Well F-3 Sample Date	pH	Spec Cond	TDS	*TOC	Sulfate	Fluoride	Aluminum
2/10/1982	7.3	1798	1393	3.2	482	1.37	0.04
5/11/1982	7.2	1198	1026	9	266	1.39	1.96
8/9/1982	7.2	1300	1066	7	249	1.74	0.26
10/25/1982	7.1	1800	1452	10	356	1.30	0.02

*TOC Data Collected on 4/11/83, 8/8/83, 11/14/83 and 6/18/84.

Well F-4 Sample Date	pH	Spec Cond	TDS	*TOC	Sulfate	Fluoride	Aluminum
2/10/1982	6.8	608	587	1.8	2	0.66	0.04
5/11/1982	7	598	486	4	23	1.07	2.03
8/9/1982	7	760	488	8	20	0.68	0.15
10/25/1982	7	800	654	2	1	0.61	0.02

*TOC Data Collected on 4/11/83, 8/8/83, 11/14/83 and 6/18/84.

Well F-5 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.4	810	587	2	93	0.48	0.67
6/23/1987	7.3	900	640	14	26	0.51	0.15
9/10/1987	7.2	900	665	4	34	0.36	0.31
11/3/1987	7.6	950	706	6	18	0.4	1.08

Well F-6 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.8	600	446	6	24	0.46	0.67
6/23/1987	7.4	640	478	40	18	0.26	0.10
9/10/1987	7.1	680	514	17	6	0.39	0.25
11/3/1987	7.7	760	522	4	3	0.43	0.09

Well F-7 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.4	500	356	17	34	0.44	0.47
6/23/1987	7.2	530	379	37	22	0.47	0.17
9/10/1987	7.3	550	382	21	32	0.34	0.14
11/3/1987	7.8	720	475	3	19	0.40	0.44
Average	7.4	575	398	20	27	0.41	0.31
Std Dev	0.3	99	53	14	7	0.06	0.17
Avg+2 Std Dev	8.0	773	503	47	41	0.52	0.65

NOTE: Wells F11, F12B, and F13 were compared to Well F7.

Well F-8 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.3	540	387	9	53	0.31	0.62
6/23/1987	7.1	565	413	26	14	0.37	0.12
9/10/1987	7.2	540	416	1	3	0.27	0.29
11/3/1987	7.3	610	164	2	3	0.31	0.80

Well F-9 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.5	435	307	8	34	0.38	0.52
6/23/1987	7.3	470	344	13	22	0.42	0.17
9/10/1987	7.2	490	375	1	5	0.30	0.25
11/3/1987	7.5	490	328	1	3	0.36	0.04

Well F-10 Sample Date	pH	Spec Cond	TDS	TOC	Sulfate	Fluoride	Aluminum
3/13/1987	7.3	460	336	2	84	0.6	0.60
6/23/1987	6.9	410	338	7	51	0.08	0.08
9/10/1987	7.1	410	340	5	117	0.27	0.27
11/3/1987	7.2	460	316	1	58	0.31	0.23

ANALYTICAL DATA

Well #	Date Sampled	pH (Stand. Units)	Sp.Cond (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-3	10-Feb-82	7.3	1798	1393		482	1.37	0.4
F-4	10-Feb-82	6.8	608	507		2	0.66	0.04
F-4	11-May-82	7	598	486		23	1.07	2.03
F-3	11-May-82	7.2	1198	1026		266	1.39	1.96
F-4	09-Aug-82	7	760	488		20	0.68	0.16
F-3	09-Aug-82	7.2	1300	1066		249	1.74	0.26
F-4	25-Oct-82	7	800	654		1	0.61	0.02
F-3	25-Oct-82	7.1	1800	1452		356	1.3	0.02
F-4	17-Jan-83	7.3	520			2	0.95	0.02
F-3	17-Jan-83	7.5	900			296	1.57	0.02
F-4	11-Apr-83	6.6	519		1.8	37	0.65	0.09
F-3	11-Apr-83	6.6	1000		3.2	322	0.98	0.02
F-4	25-Apr-83	6.9				6		
F-3	25-Apr-83	7						
F-3	08-Aug-83	6.7	920		9	187	0.82	0.09
F-4	08-Aug-83	7	578		4	3	0.82	0.12
F-3	27-Aug-83	6.9						
F-4	14-Nov-83	6.9	650	588	8	4	0.51	0.11
F-3	14-Nov-83	7.1	900	724	7	39	0.67	0.13
F-4	18-Jun-84	7.2	620	464	2	2	0.7	0.4
F-3	18-Jun-84	7.4	760	645	10	79	0.69	0.4
F-3	11-Dec-84	7.4	1.096	1.133	9	312	1	0.04
F-4	11-Dec-84	7.3	595	587	7	17	0.78	0.03
F-3	20-May-85	6.7	880	1.08	1	133	1.08	0.4
F-4	20-May-85	6.5	580	532	1	7	0.96	0.4
F-4	24-Jun-85	6.5						
F-3	24-Jun-85	6.7						
F-4	15-Jul-85	6.9						
F-3	15-Jul-85	7.1						
F-3	30-Sep-85	7.1	1238	1349	15	471	0.98	0.03
F-4	30-Sep-85	7.2	561	412	5	1	0.92	0.04
F-3	12-Nov-85	6						
F-4	14-Apr-86	7.2	650	483	3	1	0.77	0.04
F-3	14-Apr-86	7.3	1300	1178	3	471	0.81	0.03
F-3	28-Jan-87					1638		
F-9	13-Mar-87	7.5	435	307	8	34	0.38	0.52
F-10	13-Mar-87	7.3	460	336	2	84	0.6	0.6
F-5	13-Mar-87	7.4	810	587	2	93	0.48	0.67
F-7	13-Mar-87	7.4	500	356	17	34	0.44	0.47
F-8	13-Mar-87	7.3	540	387	9	53	0.31	0.62
F-6	13-Mar-87	7.8	600	446	6	24	0.46	0.67
F-4	18-Mar-87					54		
F-4	22-Jun-87	7	810	580	.38	13	0.7	0.11
F-3	22-Jun-87	7	2100	2533	13	1615	0.85	0.45
F-6	23-Jun-87	7.4	640	478	40	18	0.26	0.1
F-10	23-Jun-87	6.9	410	338	7	51	0.08	0.08
F-7	23-Jun-87	7.2	530	379	37	22	0.47	0.17

Well #	Date Sampled	pH (Stand. Units)	Sp. Cond. (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-8	23-Jun-87	7	565	413	26	14	0.37	0.12
F-5	23-Jun-87	7.3	900	640	14	26	0.51	0.15
F-9	23-Jun-87	7.3	470	344	13	22	0.42	0.17
F-4	03-Aug-87				8			
F-3	03-Aug-87			2047		1035		
F-9	10-Sep-87	7.2	490	375	1	5	0.3	0.25
F-7	10-Sep-87	7.3	550	382	21	38	0.34	0.14
F-5	10-Sep-87	7.2	900	665	4	34	0.36	0.31
F-6	10-Sep-87	7.1	680	514	17	5	0.39	0.25
F-8	10-Sep-87	7.2	540	416	1	3	0.27	0.29
F-10	10-Sep-87	7.1	410	340	5	117	0.27	0.27
F-8	02-Nov-87	7.3	610	164	2	3	0.31	0.8
F-9	03-Nov-87	7.5	490	328	1	3	0.36	0.04
F-4	03-Nov-87	7	820	500	2	38	0.78	0.06
F-5	03-Nov-87	7.6	950	706	6	18	0.4	1.08
F-10	03-Nov-87	7.2	460	316	1	58	0.31	0.23
F-6	03-Nov-87	7.7	760	522	4	3	0.43	0.09
F-7	03-Nov-87	7.8	720	475	3	19	0.4	0.44
F-3	04-Nov-87	7.7	1100	964	3	270	0.83	0.16
F-4	17-Nov-87					32		
F-6	07-Apr-88	7.3	600	405	11	4	0.5	0.74
F-5	07-Apr-88	7.2	960	579	23	6	0.43	0.69
F-7	07-Apr-88	7.2	490	327	10	11	0.42	0.01
F-8	07-Apr-88	7.2	520	371	6	2	0.3	0.81
F-9	07-Apr-88	7.65	500	318	4	5	0.38	0.01
F-3	08-Apr-88	7.6	1500	1342	13	495	0.72	0.13
F-4	08-Apr-88	6.9	830	409	22	1	0.52	0.1
F-10	08-Apr-88	6.5	400	224	5	42	0.26	0.01
F-4	27-Jun-88				8.8			
F-10	27-Jun-88	6.7						
F-5	17-Oct-88	8	990	684	5	2	0.35	0.48
F-4	17-Oct-88	7.4	860	703	1	124	1.01	0.23
F-9	17-Oct-88	7.7	450	355	1	1	0.29	0.17
F-8	17-Oct-88	7.5	500	376	1	4	0.31	0.17
F-7	17-Oct-88	7.9	650	495	2	2	0.35	0.21
F-6	17-Oct-88	8	740	578	2	1	0.36	0.29
F-3	18-Oct-88	8.1	1300	1290	2	455	0.71	0.45
F-10	18-Oct-88	7.8	450	359	3	50	0.25	0.13
F-6	06-Dec-88			413				
F-10	06-Dec-88			260				
F-4	06-Dec-88					30		
F-4	02-May-89	7.4	1000	1929	1	132	1.04	0.09
F-10	02-May-89	7.8	450	396	1	73	0.38	0.11
F-5	02-May-89	7.1	900	706	5	1	0.38	0.11
F-7	02-May-89	7.1	580	411	1	3	0.44	0.09
F-8	02-May-89	7.3	560	551	1	1	0.33	0.13
F-6	02-May-89	7.7	620	624	2	5	0.46	0.08
F-9	02-May-89	7.2	525	395	1	1	0.32	0.08

Well #	Date Sampled	pH (Stand. Units)	Sp.Cond. (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-3	02-May-89	7.1	1700	2005	2	950	0.8	0.45
F-6	06-Jul-89			475				
F-4	06-Jul-89		970	785		170		
F-3	06-Jul-89			2199	2	950	0.8	0.36
F-9	06-Jul-89		500					
F-10	06-Jul-89			338				
F-5	26-Oct-89	7.8	1000	469	17	9	0.53	0.13
F-8	26-Oct-89	7.5	580	433	9	1	0.39	0.52
F-10	30-Oct-89	6.5	370	301	4	5	0.38	0.03
F-4	30-Oct-89	6.8	810	585	119	30	0.74	0.2
F-3	30-Oct-89	6.4	1700	2056	9	450	0.97	0.67
F-6	30-Oct-89	6.4	860	549	8	4	0.5	0.12
F-9	30-Oct-89	6	500	372	16	1	0.45	0.03
F-7	30-Oct-89	6.5	560	407	10	4	0.54	0.1
F-3	14-Dec-89	7.3			3			
F-4	14-Dec-89				2			
F-7	15-Dec-89	7.2					0.6	
F-6	15-Dec-89	7.4	570					
F-10	15-Dec-89	6.7						
F-9	15-Dec-89	7.2						
F-8	19-Jun-92	7.96	620	479	11.86	0.16	0.17	0.01
F-5	19-Jun-92	7.51	1000	782	6.66	1.8	0.26	0.027
F-9	19-Jun-92	8.07	540	407	3.19	0	0.21	0.01
F-7	19-Jun-92	8.11	590	460	7.99	3.99	0.32	0.01
F-6	19-Jun-92	8.23	660	537	3.84	1.02	0.3	0.01
F-4	20-Jun-92	7.94	1050	756	2.84	87.71	0.97	0.01
F-10	20-Jun-92	8.22	340	294	2.51	50.65	0.18	0.4
F-3	20-Jun-92	7.76	1500	1885	2.44	967.9	1.105	0.033
F-7	10-Dec-92	7.55	570	356	0.02	3.47	0.32	0.19
F-9	10-Dec-92	7.6	520	321	0.01	0.07	0.24	0.03
F-8	10-Dec-92	7.35	600	396	0	0.15	0.18	0.06
F-5	10-Dec-92	7.691	970	623	4.7	1.96	0.28	0.04
F-6	10-Dec-92	7.47	660	437	2.08	0.95	0.32	0.04
F-4	14-Dec-92	8.01	1075	754	1.68	88.2	1.09	0.04
F-10	14-Dec-92	8.24	340	240	0	46.4	0.18	0.4
F-3	14-Dec-92	8.36	1800	1634	1.45	841.8	1.3	0.04
F-7	09-Jun-93	7.6	690	507	3	2	0.3	0.06
F-4	09-Jun-93	7.1	1200	671	2	52	0.76	0.04
F-6	09-Jun-93	7.4	620	447	3	3	0.32	0.04
F-8	09-Jun-93	7.3	700	434	2	0	0.17	0.04
F-9	09-Jun-93	7.3	620	419	2	0	0.21	0.04
F-10	09-Jun-93	7.6	360	229	1	45	0.19	0.58
F-3	09-Jun-93	7.3	1900	1590	2	673	0.72	0.05
F-5	09-Jun-93	7.6	1300	681	6	1	0.23	0.05
F-6	07-Dec-93	7.38	600	440	3	0	0.35	0.04
F-7	07-Dec-93	7.53	630	400	4	1	0.3	0.03
F-5	07-Dec-93	7.67	840	597	6	2	0.3	0.1

Well #	Date Sampled	pH (Stand. Units)	Sp.Cond. (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-9	08-Dec-93	7.15	530	351	2	0	0.24	0.04
F-8	08-Dec-93	7.25	580	416	2	0	0.22	0.06
F-3	09-Dec-93	7.6	1800	1476	2	581	0.9	0.13
F-4	09-Dec-93	7.25	880	718	3	30	0.97	0.07
F-6	18-May-94	7.93	640	492	3	3	0.3	0.02
F-5	18-May-94	8.1	1300	717	6	3	0.26	0.1
F-4	18-May-94	7.38	930	654	3	48	0.93	0.04
F-3	18-May-94	8.03	1810	1422	2	428	0.73	0.02
F-7	18-May-94	7.96	540	439	2	3	0.32	0.02
F-8	18-May-94	7.49	640	472	2	0	0.2	0.05
F-10	18-May-94	7.81	370	245	0	38	0.23	0.01
F-9	18-May-94	7.51	590	371	2	0	0.28	0.01
F-5	12-Dec-94	8.1	869	639	6	2	0.32	0.06
F-9	12-Dec-94	8.22	461	335	1	0	0.21	0.07
F-8	12-Dec-94	7.97	527	375	2	0	0.21	0.1
F-7	12-Dec-94	8.12	522	390	2	2	0.32	0.17
F-10	12-Dec-94	8.1	529	409	2	3	0.34	0.07
F-4	14-Dec-94	7.09	880	746	3	57	1.09	0.1
F-10	14-Dec-94	7.25	307	271	1	41	0.23	0.34
F-8	15-Dec-94	7.5	1088	1161	2	329	0.78	0
F-3	08-Jun-95	6.8	259	1082	3.72	285	0.74	0.038
F-5	08-Jun-95	6.56	151	682	7.88	0.22	0.31	0.0305
F-7	08-Jun-95	7.21	113	428	3.38	0.09	0.41	0.033
F-8	09-Jun-95	7.17	51	437	1.97	0.1	0.26	0.031
F-9	09-Jun-95	7.12	42	335	1.69	0.08	0.29	0.024
F-6	09-Jun-95	7.1	58	431	2.56	0.57	0.28	0.022
F-4	09-Jun-95	7.35	40	652	2.34	39	0.91	0.03
F-10	09-Jun-95	7.21	27	247	1.29	44	0.26	0.03
F-3	05-Dec-95	7.43	1500	1256	3.01	372	0.67	0.044
F-5	08-Dec-95	7.61	1500	824	6.75	22.31	0.286	0.0645
F-6	08-Dec-95	7.45	970	479	2.97	1.98	0.344	0.091
F-4	11-Dec-95	6.85	1010	735	3.95	27.6	1.02	0.055
F-7	11-Dec-95	7.91	550	426	4.59	0.63	0.302	0.091
F-8	11-Dec-95	7.55	750	439	2.245	0.09	0.2	0.075
F-10	11-Dec-95	7.49	480	304	1.73	53.36	0.187	0.069
F-9	11-Dec-95	7.52	720	270	1.51	0.07	0.207	0.063
F-5	14-Jun-96	7.02	1300	810	5.91	1	0.112	0.03
F-7	14-Jun-96	7.02	810	569	3.74	1	0.296	0.03
F-6	14-Jun-96	7.13	720	564	5.33	1	0.26	0.019
F-3	14-Jun-96	7.02	1900	1345	2.64	409	0.65	0.0415
F-8	17-Jun-96	7.13	700	529	2.5	1	0.161	0.034
F-10	17-Jun-96	6.68	410	375	0.105	55	0.161	0.023
F-4	17-Jun-96	7.07	1100	648	9.34	7	1.07	0.023
F-9	17-Jun-96	7.11	600	462	0.21	1	0.215	0.024
F-8	10-Oct-96	7.15	1700	447	2.06	0.08	0.2	0.021
F-9	10-Oct-96	7.27	1550	353	1.34	0	0.236	0.009
F-7	10-Oct-96	7.2	1910	523	4.18	0.13	0.291	0.054
F-6	10-Oct-96	7.34	1750	477	2.81	0.25	0.373	0.016

Well #	Date Sampled	pH (Stand. Units)	Sp Cond (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-5	10-Oct-96	7.2	2900	682	4.74	0.13	0.31	0.021
F-4	10-Oct-96	6.99	1940	594	5.94	3.07	0.872	0.057
F-3	10-Oct-96	7.27	2580	1263	2.49	352	0.62	0.017
F-10	10-Oct-96	7.5	1270	269	1.33	57.6	0.182	0.013
F-9	07-May-97	6.94	610	448	2.55	0	0.26	0.03
F-8	07-May-97	6.71	670	404	1.93	0.54	0.23	0.024
F-3	07-May-97	6.9	1200	1044	2.33	154	0.554	0.007
F-4	07-May-97	6.92	860	545	3.59	0.91	0.89	0.007
F-5	07-May-97	6.82	1100	715	6.64	1.02	0.35	0.212
F-6	07-May-97	7.24	660	468	6.68	1.24	0.39	0.0134
F-7	07-May-97	7	880	581	5.58	0.47	0.33	0.108
F-10	07-May-97	7.01	440	264	0.74	56	0.24	0.048
F-4	04-Nov-97	6.68	1000	640	3.01	30.4	0.964	0.026
F-5	04-Nov-97	6.84	1000	696	6.34	0.02	0.28	0.433
F-6	04-Nov-97	7.55	800	547	4.02	0	0.32	0.038
F-7	04-Nov-97	6.98	820	512	4.3	0	0.29	0.077
F-8	04-Nov-97	6.65	660	446	2.46	0	0.2	0.059
F-9	04-Nov-97	6.71	580	349	1.57	0	0.24	0.059
F-3	04-Nov-97	6.57	1000	1067	2.32	197.8	0.58	0.037
F-10	04-Nov-97	6.93	445	278	1.11	47.6	0.21	0.049
F-10	05-May-98	7.09	450	327	0.88	48	0.19	0.036
F-9	05-May-98	7.02	670	385	1.66	0	0.21	0.028
F-8	05-May-98	6.98	760	426	2.13	0	0.175	0.026
F-7	05-May-98	7.06	910	544	4.25	0	0.25	0.023
F-6	05-May-98	6.08	820	478	2.87	0	0.31	0.009
F-5	05-May-98	6.4	1160	715	5.42	0.01	0.22	0.078
F-3	05-May-98	7.4	1460	994	1.79	102.2	0.58	0.027
F-4	05-May-98	6.78	960	752	2.25	83.7	1.1	0.017
F-4	14-Oct-98	6.63	900	656	3.2	43.1	1.01	0.04
F-3	14-Oct-98	6.72	1480	1238	3.21	278.2	0.586	0.033
F-5	14-Oct-98	6.62	1020	673	6.215	0.37	0.218	0.363
F-6	14-Oct-98	7.03	810	508	3.41	0.26	0.276	0.022
F-7	14-Oct-98	6.67	1050	614	10.7	0.26	0.207	0.062
F-8	14-Oct-98	6.61	640	415	1.73	0.33	0.17	0.055
F-9	14-Oct-98	7.03	590	359	0.08	0.13	0.195	0.038
F-10	14-Oct-98	6.71	410	284	0.05	43.3	0.18	0.044
F-4	21-May-99	6.85	978	667	3.3	16.8	0.969	0
F-5	21-May-99	6.74	1196	768	7.17	0.28	0.29	0.0725
F-6	21-May-99	6.99	814	570	4.1	0.21	0.34	0.012
F-7	21-May-99	6.65	1248	732	9.695	0.25	0.26	0.051
F-8	21-May-99	6.56	764	495	2.87	0.31	0.18	0.047
F-9	21-May-99	7.01	695	404	2.18	0	0.22	0.03
F-3	21-May-99	6.75	1752	1354	2.73	355.2	0.74	0
F-10	21-May-99	6.78	456	409	1.68	50.6	0.195	0.02
F-10	04-Nov-99	6.5	469	308	1.2	52.5	0.227	0.022
F-6	04-May-00	7.05	779	593	4	0.1	0.299	0.02
F-8	04-May-00	6.88	673	491	2.7	0	0.16	0.02
F-9	04-May-00	6.99	618	334	1.75	0	0.31	0.02

Well #	Date Sampled	pH (Stand. Units)	Sp.Cond. (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-7	04-May-00	7.03	1100	884	13.05	0	0.214	0.02
F-10	04-May-00	6.74	462	330	1.16	48.2	0.2	0.02
F-5	04-May-00	7.12	1060	779	7.44	0.1	0.24	0.02
F-4	04-May-00	7.05	1150	806	2.66	60.4	1.295	0.046
F-3	04-May-00	7.3	1520	1404	2.63	400.7	0.74	0.02
F-7	23-Oct-00	7.17	1322	974	16.72	0	0.23	0.01
F-8	23-Oct-00	7.02	730	478	2.73	0	0.2	0.008
F-5	23-Oct-00	7.49	1178	778	7.86	0	0.285	0.007
F-3	23-Oct-00	7.34	2130	2022	2.72	632	0.82	0.024
F-9	23-Oct-00	7.08	687	374	1.77	4	0.42	0.03
F-6	23-Oct-00	7.26	812	626	4.22	0	0.2	0.008
F-4	24-Oct-00	7.28	1230	863	2.62	63	1.3	0.01
F-10	24-Oct-00	7.18	444	330	1.1	62	0.22	0.008
F-3	09-May-01	7.52	1600	1404	2.52	468	0.83	0.04
F-5	09-May-01	7.28	1100	811	7.65	0	0.08	0.05
F-4	09-May-01	7.33	1200	819	2.34	69	1.4	0.0485
F-10	09-May-01	7.16	500	339	1.06	34	0.27	0.053
F-6	09-May-01	7.28	690	501	3.18	0	0.34	0.043
F-7	09-May-01	7.27	1400	963	15.07	0	0.22	0.054
F-8	09-May-01	7.05	660	491	2.6	0	0.21	0.045
F-9	09-May-01	7.2	640	445	1.64	5	0.52	0.048
F-3	08-Oct-01	7.18	1630	1196	2.47	497	0.77	0.025
F-5	09-Oct-01	7.26	1080	775	7.43	0.2	0.26	0.025
F-4	09-Oct-01	7.02	1170	844	2.53	128	1.26	0.025
F-9	09-Oct-01	7.08	643	470	1.83	0	0.51	0.025
F-8	09-Oct-01	7.03	645	496	2.53	3	0.21	0.025
F-6	09-Oct-01	7.2	688	595	3.74	0	0.33	0.025
F-10	09-Oct-01	6.73	405	316	1.32	100	0.28	0.025
F-7	09-Oct-01	7.1	1220	1006	16.89	5	0.25	0.025
F-4	21-Feb-02	7.1	1130			27.5	0.67	
F-9	21-Feb-02	7.2	769			0	0.38	
F-3	21-Feb-02	7.2	1710			385	0.48	
F-10	21-Feb-02	6.7	419			107	0.14	
F-5	21-Feb-02	7.1	1210			0	0.25	
F-8	21-Feb-02	7	739			0	0.1	
F-7	21-Feb-02	7.2	1550			0	0.1	
F-6	21-Feb-02	7.2	788			0	0.15	
F-9	14-May-02	7.3	784	452	2.9	0	1.34	0
F-8	14-May-02	7.3	751	420	3.1	0	0.5	0
F-3	14-May-02	7.4	1560	992	6.8	259	0.65	0
F-6	14-May-02	7.4	792	476	3.6	0	0.5	0
F-5	14-May-02	7.4	1210	720	7.4	0	0.5	0
F-4	14-May-02	7.2	1160	664	3.3	36.8	1.59	0
F-10	15-May-02	7.1	473	260	1.8	92.1	0.5	0
F-11	16-Dec-02	6.91	880	204	3.4	33	0.8	0.075
F-12B	16-Dec-02	6.98	680	400	4.5	35	0.8	0.075
F-5	16-Dec-02	7.05	1110	648	8.2	8	1.3	0.075
F-13	16-Dec-02	8.63	840	616	3.9	165	1	0.075

Well #	Date Sampled	pH (Stand. Units)	Sp.Cond. (umhos /cm)	Total Dissolved Solids (mg/l)	Total Organic Carbon	Sulfate (mg/l)	Fluoride (mg/l)	Aluminum (mg/l)
F-10	17-Dec-02	6.73	630	604	1.5	253		
F-6	17-Dec-02	7.08	710	504	4.7	0.8	1	0.075
F-4	17-Dec-02	7.05	1180	720	5.4	49	0.6	0.075
F-9	17-Dec-02	7.07	740	584	3.3	26	1	0.075
F-8	17-Dec-02	7.02	600	404	3.4	8	1	0.075
F-3	09-Jun-03	7.1	2260	1810	5.2	610	0.6	0.2
F-13	09-Jun-03	7.9	745	487	5.5	39.9	0.6	0.2
F-12B	09-Jun-03	7.1	710	457	7.1	13.2	0.2	0.2
F-11	09-Jun-03	7.1	1220	765	5.5	3.4	0.5	0.2
F-5	09-Jun-03	7.1	1320	825	7.9	0.8	0.3	0.2
F-9	10-Jun-03	7.1	850	503	4	3.9	0.2	0.2
F-4	10-Jun-03	7	1480	907	6	129	0.04	0.2
F-8	10-Jun-03	6.9	830	497	5.8	0.8	0.2	0.2
F-10	10-Jun-03	6.6	770	505	4.2	256	0.4	0.2
F-6	10-Jun-03	7.2	940	508	6.7	0.8	0.5	0.2
F-11	11-Nov-03	7.1	1140	749	4.5	1.3	0.2	
F-13	11-Nov-03	7.3	705	385	2.8	23.7	0.3	
F-13C	11-Nov-03							
F-12B	11-Nov-03	7.1	653	412	5.4	0.8	0.2	
F-9	11-Nov-03	7.1	847	531	2.6	35	0.2	
F-8	11-Nov-03	6.7	735	459	5.2	0.6	0.2	
F-6	11-Nov-03	6.9	756	578	4.1	0.6	0.2	0.26
F-5	11-Nov-03	7.2	1140	739	8.2	0.6	0.2	0.32
F3B	11-Nov-03							
F-3	11-Nov-03	7	2050	1700	2.3	746	1.3	0.66
F-13B	11-Nov-03							
F-10C	12-Nov-03							
F-10B	12-Nov-03	6.7	694	492	2.3	436	0.3	
F-4	12-Nov-03	6.8	1250	844	3.1	104	0.2	
F-10	12-Nov-03	6.7	735	459	5.2	0.6	0.2	

FIRST QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
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First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-3	F-4	F-5	F-6	F-8
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	13-Feb-07	14-Feb-07	15-Feb-07	15-Feb-07	13-Feb-07
Casing Elevation (ft MSL)	23.67	23.61	20.83	21.49	21.46
Water Level (from top of casing) (ft)	6.45	6.32	4.20	3.81	4.30
Water Table Elevation (ft MSL)	17.22	17.29	16.63	17.68	17.16
Vol. Purged (gals)	1.20	1.1	1.1	1.8	1.5
pH (Standard units)	6.78	6.57	6.6	6.74	6.81
Specific Conductance (µmhos/cm)	1270	774	1040	838	573
Total Dissolved Solids (mg/L)	1920	635	660	510	970
Total Organic Carbon (mg/L)	2.07	4.68	8.04	5.25	2.35
Sulfate (mg/L)	1190	<1	<1	0.34	<10
Flouride (mg/L)	0.89	0.31	0.25	<1	0.23
Aluminum (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	0.0411	0.0202	0.0782	0.0282	0.0398
Arsenic, Dissolved (mg/L)	0.0162	<0.01	<0.01	<0.01	<0.01
Calcium (mg/L)	355	120	82.1	59.1	77.1
Calcium, Dissolved (mg/L)	369	114	80.7	51.4	83.6
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
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First Half 2007 Groundwater Monitoring Report
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Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-8B	F-9	F-9B	F-10	F-10B
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	14-Feb-07	13-Feb-07	13-Feb-07	14-Feb-07	14-Feb-07
Casing Elevation (ft MSL)	21.26	23.19	23.04	24.18	24.18
Water Level (from top of casing) (ft)	0.80	5.29	6.30	6.45	8.30
Water Table Elevation (ft MSL)	20.46	17.90	16.74	17.73	15.88
Vol. Purged (gals)	0.7	0.6	0.8	0.9	0.7
pH (Standard units)	6.45	6.8	11.7	6.88	6.86
Specific Conductance (µmhos/cm)	926	751	3590	2150	420
Total Dissolved Solids (mg/L)	625	700	1320	435	845
Total Organic Carbon (mg/L)	14.4	<2	5.89	<2	15.6
Sulfate (mg/L)	0.22	221	<1	138	18.5
Flouride (mg/L)	<1	0.26	0.11	0.98	0.31
Aluminum (mg/L)	<0.2	<0.2	0.321	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	0.249	<0.2	<0.2
Arsenic (mg/L)	<0.01	0.0347	0.0411	0.125	0.149
Arsenic, Dissolved (mg/L)	0.0536	<0.01	0.0165	0.125	0.0182
Calcium (mg/L)	83.3	130	445	63.9	56.2
Calcium, Dissolved (mg/L)	83.9	136	467	63.6	51.4
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
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gals - gallons
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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
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Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-11	F-12B	F-12C	F-13	F-13B
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	15-Feb-07	13-Feb-07	13-Feb-07	14-Feb-07	14-Feb-07
Casing Elevation (ft MSL)	21.57	20.20	20.40	20.57	20.67
Water Level (from top of casing) (ft)	3.90	3.62	3.50	3.48	3.89
Water Table Elevation (ft MSL)	17.67	16.58	16.90	17.09	16.78
Vol. Purged (gals)	1.35	1.4	1	1.1	0.9
pH (Standard units)	6.52	6.73	6.49	7.01	6.56
Specific Conductance (µmhos/cm)	1060	880	765	918	1090
Total Dissolved Solids (mg/L)	650	840	690	1320	2710
Total Organic Carbon (mg/L)	2.9	2.72	9.68	<2	2.93
Sulfate (mg/L)	<1	15.8	<10	610	1500
Flouride (mg/L)	0.39	0.28	0.43	0.3	0.33
Aluminum (mg/L)	0.291	<0.2	0.475	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	0.0741	0.0316	0.116	<0.01	0.0299
Arsenic, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	0.0205
Calcium (mg/L)	113	162	127	188	443
Calcium, Dissolved (mg/L)	105	171	131	188	409
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
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Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-14	F-15	F-16	MW-B1	MW-B2
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	15-Feb-07	15-Feb-07	15-Feb-07	12-Feb-07	13-Feb-07
Casing Elevation (ft MSL)	19.82	24.14	21.70	19.61	19.46
Water Level (from top of casing) (ft)	1.21	5.51	6.00	6.45	5.14
Water Table Elevation (ft MSL)	18.61	18.63	15.70	13.16	14.32
Vol. Purged (gals)	1.5	1.6	0.9	1.15	1.2
pH (Standard units)	6.48	6.24	6.95	6.89	7.19
Specific Conductance (µmhos/cm)	1010	3360	2070	891	1300
Total Dissolved Solids (mg/L)	700	3590	1390	965	1480
Total Organic Carbon (mg/L)	4.02	<2	24.9	9.2	27.3
Sulfate (mg/L)	33.6	2280	<10	<10	47.4
Flouride (mg/L)	1.76	5.7	0.45	0.38	0.5
Aluminum (mg/L)	<0.2	<0.2	<0.2	0.207	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	<0.01	0.0487	0.0224	0.0505	0.0489
Arsenic, Dissolved (mg/L)	<0.01	0.0304	<0.01	0.0181	0.0264
Calcium (mg/L)	101	584	43.7	69	32.2
Calcium, Dissolved (mg/L)	95.6	522	37.2	71.3	32
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	0.0232	0.0345	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	0.0309	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

FIRST QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID	
	MW-B3	MW-B4
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	12-Feb-07	12-Feb-07
Casing Elevation (ft MSL)	20.97	20.62
Water Level (from top of casing) (ft)	6.43	3.76
Water Table Elevation (ft MSL)	14.54	16.86
Vol. Purged (gals)	1.2	0.5
pH (Standard units)	6.56	6.98
Specific Conductance (µmhos/cm)	286	1470
Total Dissolved Solids (mg/L)	490	1760
Total Organic Carbon (mg/L)	<2	19
Sulfate (mg/L)	49.2	<10
Flouride (mg/L)	0.4	0.38
Aluminum (mg/L)	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2
Arsenic (mg/L)	0.0286	0.0324
Arsenic, Dissolved (mg/L)	0.0125	0.0417
Calcium (mg/L)	74.2	42.1
Calcium, Dissolved (mg/L)	80.1	36.7
Chromium (mg/L)	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

SECOND QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-3	F-4	F-5	F-6	F-8
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	16-May-07	18-May-07	16-May-07	16-May-07	17-May-07
Casing Elevation (ft MSL)	23.67	23.61	20.83	21.49	21.46
Water Level (from top of casing) (ft)	6.82	6.37	4.76	4.70	5.47
Water Table Elevation (ft MSL)	16.85	17.24	16.07	16.79	15.99
Vol. Purged (gals)	1.20	0.8	1.1	1	1.5
pH (Standard units)	6.7	6.61	6.65	6.88	6.98
Specific Conductance (µmhos/cm)	2400	1090	1250	1030	1660
Total Dissolved Solids (mg/L)	1940	600	650	540	490
Total Organic Carbon (mg/L)	<2	3.13	7.27	4.85	2.28
Sulfate (mg/L)	1060	<1	<1	<1	3.06
Flouride (mg/L)	0.82	0.3	0.24	0.31	0.22
Aluminum (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	<0.01	0.0226	0.0886	0.0409	0.026
Arsenic, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium (mg/L)	394	118	91.4	57.3	84.7
Calcium, Dissolved (mg/L)	322	103	82.4	54.8	87.5
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

SECOND QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-8B	F-9	F-9B	F-10	F-10B
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	17-May-07	17-May-07	17-May-07	18-May-07	18-May-07
Casing Elevation (ft MSL)	21.26	23.19	23.04	24.18	24.18
Water Level (from top of casing) (ft)	0.75	6.50	6.43	6.45	4.71
Water Table Elevation (ft MSL)	20.51	16.69	16.61	17.73	19.47
Vol. Purged (gals)	0.7	1.4	0.9	0.9	1
pH (Standard units)	6.78	6.93	13	6.88	6.92
Specific Conductance (µmhos/cm)	1380	1030	4200	610	1330
Total Dissolved Solids (mg/L)	680	610	760	410	700
Total Organic Carbon (mg/L)	14.9	<2	3.23	3.51	14.6
Sulfate (mg/L)	<1	97.4	1.41	207	<1
Flouride (mg/L)	0.21	0.24	0.13	0.82	0.32
Aluminum (mg/L)	<0.2	<0.2	0.453	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	0.489	<0.2	<0.2
Arsenic (mg/L)	<0.01	<0.01	<0.01	0.0864	0.127
Arsenic, Dissolved (mg/L)	<0.01	<0.01	<0.01	0.0764	<0.01
Calcium (mg/L)	75.3	117	272	60.7	55.6
Calcium, Dissolved (mg/L)	88.7	124	280	62.6	48.4
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

SECOND QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-11	F-12B	F-12C	F-13	F-13B
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	16-May-07	17-May-07	17-May-07	17-May-07	17-May-07
Casing Elevation (ft MSL)	21.57	20.20	20.40	20.57	20.67
Water Level (from top of casing) (ft)	4.86	5.19	4.70	5.16	5.42
Water Table Elevation (ft MSL)	16.71	15.01	15.70	15.41	15.25
Vol. Purged (gals)	1.5	1.3	1.5	1	0.9
pH (Standard units)	6.74	6.48	6.64	7.02	6.63
Specific Conductance (µmhos/cm)	1270	1540	1030	1670	3440
Total Dissolved Solids (mg/L)	660	960	360	1310	2880
Total Organic Carbon (mg/L)	2.84	3.22	6.97	<2	2.28
Sulfate (mg/L)	<1	129	13.6	684	1450
Flouride (mg/L)	0.37	0.22	0.35	0.32	0.34
Aluminum (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	0.136	<0.01	0.0294	<0.01	0.0124
Arsenic, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium (mg/L)	113	183	117	191	459
Calcium, Dissolved (mg/L)	108	184	116	198	434
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

SECOND QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID				
	F-14	F-15	F-16	MW-B1	MW-B2
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	18-May-07	18-May-07	16-May-07	16-May-07	18-May-07
Casing Elevation (ft MSL)	19.82	24.14	21.70	19.61	19.46
Water Level (from top of casing) (ft)	1.00	5.73	7.47	6.38	5.89
Water Table Elevation (ft MSL)	18.82	18.41	14.23	13.23	13.57
Vol. Purged (gals)	1	1.3	0.9	1.2	1.4
pH (Standard units)	6.55	6.7	7.42	6.92	7.19
Specific Conductance (µmhos/cm)	1200	4050	2370	1570	2400
Total Dissolved Solids (mg/L)	610	3710	1470	820	1190
Total Organic Carbon (mg/L)	3.55	<2	22.3	8.81	26.4
Sulfate (mg/L)	37.7	2250	<1	<1	1.1
Flouride (mg/L)	1.73	5.8	0.45	0.43	0.48
Aluminum (mg/L)	<0.2	<0.2	<0.2	0.751	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic (mg/L)	<0.01	0.0195	<0.01	0.0205	0.0134
Arsenic, Dissolved (mg/L)	<0.01	<0.01	0.0104	<0.01	<0.01
Calcium (mg/L)	104	540	46.3	74.4	32
Calcium, Dissolved (mg/L)	94.4	503	42.3	65.3	31.1
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04	<0.04	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

SECOND QUARTER 2007 SAMPLING DATA
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RECAP FORM 6 - GROUNDWATER MONITORING WELL SAMPLING EVENT SUMMARY
First Half 2007 Groundwater Monitoring Report
Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

Parameter	WELL ID	
	MW-B3	MW-B4
Purging Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Sampling Method	Submersible Pump/Low-Flow	Submersible Pump/Low-Flow
Date Sampled	15-May-07	15-May-07
Casing Elevation (ft MSL)	20.97	20.62
Water Level (from top of casing) (ft)	7.81	5.79
Water Table Elevation (ft MSL)	13.16	14.83
Vol. Purged (gals)	1	0.9
pH (Standard units)	6.7	7.91
Specific Conductance (µmhos/cm)	893	3160
Total Dissolved Solids (mg/L)	580	1670
Total Organic Carbon (mg/L)	<2	16.3
Sulfate (mg/L)	29.3	<1
Flouride (mg/L)	0.34	0.34
Aluminum (mg/L)	<0.2	<0.2
Aluminum, Dissolved (mg/L)	<0.2	<0.2
Arsenic (mg/L)	<0.01	<0.01
Arsenic, Dissolved (mg/L)	<0.01	<0.01
Calcium (mg/L)	99.9	29
Calcium, Dissolved (mg/L)	81.9	20.6
Chromium (mg/L)	<0.01	<0.01
Chromium, Dissolved (mg/L)	<0.01	<0.01
Nickel (mg/L)	<0.04	<0.04
Nickel, Dissolved (mg/L)	<0.04	<0.04
Zinc (mg/L)	<0.02	<0.02
Zinc, Dissolved (mg/L)	<0.02	<0.02

Note:
ft - feet
gals - gallons
mg/L - milligrams per Liter
MSL - Mean Sea Level
µmhos/cm - micromhos per centimeter
< - A result less than the Method Detection Limit

OCTOBER 2007 POTENTIOMETRIC SURFACE DATA

Honeywell International, Inc., Specialty Materials
Geismar, Ascension Parish, Louisiana

	WELL ID				
	F-3	F-4	F-5	F-6	F-8
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	23.67	23.61	20.83	21.49	21.46
Water Level (from top of casing) (ft)	5.63	5.81	3.63	3.02	6.27
Water Table Elevation (ft MSL)	18.04	17.80	17.20	18.47	15.19

	WELL ID				
	F-8B	F-9	F-9B	F-10	F-10B
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	21.26	23.19	23.04	24.18	24.18
Water Level (from top of casing) (ft)	3.35	7.97	10.06	5.27	15.43
Water Table Elevation (ft MSL)	17.91	15.22	12.98	18.91	8.75

	WELL ID				
	F-11	F-12B	F-12C	F-13	F-13B
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	21.57	20.20	20.40	20.57	20.67
Water Level (from top of casing) (ft)	4.94	10.22	10.41	10.44	13.01
Water Table Elevation (ft MSL)	16.63	9.98	9.99	10.13	7.66

	WELL ID				
	F-14	F-15	F-16	F-17	F-18
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	19.82	24.14	21.70	19.80	20.30
Water Level (from top of casing) (ft)	0.80	6.03	18.29	10.36	6.17
Water Table Elevation (ft MSL)	19.02	18.11	3.41	9.44	14.13

	WELL ID				
	F-19	F-20	F-21	F-22	F-23
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	20.35	20.40	22.88	20.45	20.35
Water Level (from top of casing) (ft)	8.35	6.40	6.80	8.05	5.04
Water Table Elevation (ft MSL)	12.00	14.00	16.08	12.40	15.31

	WELL ID				
	F-24	MW-B1	MW-B2	MW-B3	MW-B4
Date Sampled	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07	18-Oct-07
Casing Elevation (ft MSL)	20.40	19.61	19.46	20.97	20.62
Water Level (from top of casing) (ft)	5.60	7.42	7.29	6.25	17.32
Water Table Elevation (ft MSL)	14.80	12.19	12.17	14.72	3.30

Note:
ft - feet

ATTACHMENT 20
Facility Recordkeeping

SOLID WASTE FACILITY INPSPECTION REPORT FORM

Honeywell

Solid Waste Monitoring
HF Gypsum Stack Inspection Log

TO BE COMPLETED ONCE PER WEEK AND WITHIN 24 HOURS OF A RAINFALL EVENT OF 0.5 INCHES OR MORE.

Date of Inspection:_____

Days Since Last Rainfall:_____ Amount of Rainfall:_____Inches

Maintain records as indicated below. Submit the completed form to the Environmental Engineer following each inspection.

HF GYPSUM STACK	Stabilized		Condition	
	Yes	No	Good	Poor
Any evidence of deterioration of the dikes or stack?				
Any evidence of overtopping?				
Any leaks in the dikes?				
Any evidence of malfunctions or improper operation?				
Are covers on dikes sufficient enough to stop erosion?				
Any evidence of excessive vegetative growth that prevents proper access, inspection, or operation, or may provide a conduit for groundwater contamination?				
Any evidence of dead vegetation or wet spots outside the stacking area which indicates leakage?				
Is there adequate drainage of runoff water into the collection system? * Note: If standing water is occurring then need to regrade				

Stabilization Measures Required:

_____
_____
_____
_____
_____

Stabilization to be completed by:_____ On or before:_____

Name	Signature	Date/Time

Any conditions that may adversely impact the environmental that can not be corrected immediately, must be reported to the Environmental Department (via voice mail or e-mail) immediately. Todd Harter (225-642-2758) or Lucius Gloston (225-642-2792).

SOLID WASTE GENERATOR ANNUAL REPORT

Honeywell

Specialty Materials
Honeywell
P.O. Box 226
Geismar, LA 70734

July 27, 2006

CERTIFIED MAIL NO: 7004 1160 0003 2917 1187

Louisiana Department of Environmental Quality
Financial Services Division
Attn: SW Reports
P. O. Box 4303
Baton Rouge, LA 70821-4303

RE: FY 2006 Solid Waste Disposer Annual Report, Agency Interest No. 2082, Permit Number P-0216R1, Honeywell International Inc., Geismar, LA

Dear Sir or Madam:

In accordance with LAC 33:VII.713.C.1.a and solid waste permit number P-0216R1, Honeywell is submitting its Solid Waste Disposer Annual Report for the period of July 1, 2005 through June 30, 2006.

The enclosed report details the solid waste placed in the permitted surface impoundment for the aforementioned twelve-month period.

Should you have any questions regarding this submittal, please contact Todd Harter at (225) 642-2758.

Respectfully,

J. William Lessig
Site Leader

Enclosure

BL/sth

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
SOLID WASTE DISPOSER ANNUAL REPORT

TYPE I AND II LANDFILLS, LANDFARMS, SURFACE IMPOUNDMENTS AND TYPE III CONSTRUCTION DEMOLITION DEBRIS AND WOODWASTE LANDFILLS

(Please Refer to the Detailed Instructions)

1. Site Identification No. GD-005-0313 July 1, 2005 through June 30, 2006
2. Permit Number P-0216R1
3. Name of Permit Holder Honeywell International Inc. (Formerly Allied Signal)
4. Name of Disposal Facility Fluorogypsum Stacking Facility
5. Mailing Address P.O. Box 226, Geismar, LA 70734 Parish Ascension
6. Contact Todd Harter Telephone (225) 642-2768
7. Type of Facility ____ Landfill ____ Landfarm X Surface Impoundment
   ____ Construction/Demolition Debris Landfill ____ Woodwaste Landfill

8. Surface Impoundments. This section applies only to surface impoundments.

   A. Indicate the quantity of waste (solids/sludge) that has been removed from the surface impoundments during the past year (July 1 - June 30).

   29,772 –Synthetic Calcium Fluoride
   120,174 – Calcium Sulfate
   Wet-weight Tons 149,946 - Tons

   B. Provide the identification number and permit number of the facility used to dispose of the waste.

   Site Identification Number D-063-1941 (29,772 tons Synthetic Calcium Fluoride)

   Facility Permit Number P-0080R1 (29,772 tons Synthetic Calcium Fluoride)

   120,174 tons of Calcium Sulfate was mined from the stacking facility and reused as an LDOTD approved construction aggregate.

9. Type I and II Landfills, Landfarms and Surface Impoundments. This section applies only to Type I and II landfills, landfarms and surface impoundments.

   A. Estimated remaining permitted capacity (expressed in wet-weight tons) 1,129,732

   B. Estimated life of facility (expressed in months and based on the permitted capacity of the facility) 22 months

10. Construction/Demolition and Woodwaste Landfills. This section applies only to construction/demolition and woodwaste landfills. Please mark all that apply.

   [ ] This facility receives only woodwaste that are beneficially used in accordance with a Best Management Practice Plan that has been approved in writing by the Department of Agriculture and submitted to the Office of Environmental Services, Permits Division
   [ ] This facility receives only woodwaste resulting from utility right-of-way clearings. These woodwaste are only received from utility companies or their authorized contractors.
   [ ] This construction/demolition debris facility receives only wastes that have been generated on-site.
   [ ] This woodwaste facility receives only waste generated by the owner of the property on which this facility is located.

This form is to be returned to Financial Services Division at the following address no later than August 1 of each reporting year. Questions regarding the form may be directed to the Financial Services Division at 225-765-0239.

Financial Services Division
Attn: SW Reports
P. O. Box 82231
Baton Rouge, LA 70884-2231

July 1, 2005 thru June 30, 2006 Page 2 of 4

Site Identification Number GD-005-0313 Permit Number P-0216R1

11. Summary of Non-industrial Waste Disposed: Provide below a summary of the non-industrial waste received for this reporting period.
Note: Landfarm facilities are required to report in wet-weight tons and dry-weight tons. All other facilities must report only in wet-weight tons.

(A) Non-Industrial Waste	(B) Quantity (Wet-Weight Tons)	(C) Quantity (Dry-Weight Tons)
N/A	0	0
(D) TOTAL:		0

(E) Quantity of Waste Received (In-State):	0
(F) Quantity of Waste Received (Out-of-State):	0

12. CERTIFICATION: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature Date 7/27/2006

Name and Title William Lessig / Site Leader

Site Identification Number GD-005-0313 Permit Number P-0216R1

13. Type I Facilities: This section applies only to Type I facilities. Provide a summary of the industrial waste received utilizing the seven-digit number that has been assigned to each industrial waste by the administrative authority. All like industrial wastes are to be reported together. Subtotals of all like industrial wastes are to be provided. Copy this form as necessary.

(A) Seven Digit Industrial Waste Number	(B) Quantity (Wet-Weight Tons)	(C) Quantity (Dry-Weight Tons)	(D) Subtotals of Like Industrial Wastes
0313-022	439,930		439,930
0313-042	16,060		16,060
0313-043	9,580		9,580
(E) SUBTOTAL:	465,570		
(F) TOTAL:			465,570

(G) Quantity of Waste Received (In-State):	0*
(H) Quantity of Waste Received (Out-of-State):	0

*All waste generated On-site

Site Identification Number GD-005-0313 Permit Number P-0216R1

14. **All Facilities**: Provide all calculations used to compute the quantity (expressed in wet-weight tons) of solid waste received at the facility. Landfarm facilities must provide the calculations used to compute the quantity (in dry-weight tons) of solid waste received at the facility. Surface impoundments must provide all calculations used to compute the quantity of total suspended solid disposed in the facility.

All data was collection through production reports and scale tickets.

Fluorogypsum **0313-022**

2005 HF Acid Production (July – December) – 62,559 tons
2006 HF Acid Production (January – June) – 57,313 tons

Total - 119,872 tons

Fluorogypsum conversion factor = 3.67 tons for every ton of HF Acid produced.

Fluorogypsum Generation = 119,872 * 3.67 = 439,930 Wet Tons

HF Plant Clarifier Sludge **0313-042**

2005 Lime Consumption (July – December) – 4,941 tons
2006 Lime Consumption (January – June) – 4,030 tons

Total - 8,971 tons

HF clarifier sludge conversion factor = 1.79 tons for every ton of lime consumed.

HF Plant Clarifier Sludge Produced = 8,971 * 1.79 = 16,060 Wet Tons

Synthetic Calcium Fluoride **0313-043**

Loads Hauled – 479
Average size of each load – 20 cubic yards

Synthetic calcium fluoride conversion factor - 1 cubic yard = 1 ton

Synthetic Calcium Fluoride Production = 479 * 20 = 9,580 Wet Tons

Fluorogypsum Removed

3rd Quarter 05	4th Quarter 05	1st Quarter 06	2nd Quarter 06
64,169 tons	20,110 tons	15,340 tons	20,555 tons

Fluorogypsum removed	120,174 tons
Synthetic Calcium Fluoride removed	29,772 tons

Removal Total 149,946 Wet Tons

DETAILED INSTRUCTIONS FOR TYPE I AND II FACILITIES LANDFILLS, LANDFARMS, SURFACE IMPOUNDMENTS AND CLASS III CONSTRUCTION DEMOLITION DEBRIS AND WOODWASTE DISPOSER ANNUAL REPORT

1. Identification Number: Indicate the identification number that has been assigned to the site by the administrative authority. Also, enter the year in which the report applies.

2. Permit Number: Enter the permit number for the facility in which this report applies. **Each individual permitted facility is to be reported on a separate form.**

3. Name of the Permit Holder: Enter the name of which the permit has been issued.

4. Name of Facility: Enter the name of the facility for which this report applies.

5. Mailing Address: Enter the mailing address for the facility, and the parish location.

6. Contact: Enter the name of the person knowledgeable of the information submitted on the report and his/her telephone number.

7. Type of Facility: Place a check by the type of facility being reported.

8. This section applies only to Surface Impoundments.
   A. Indicate the quantity of waste removed from the surface impoundment(s).
   B. Provide the identification number and permit number of the facility used to dispose of the waste removed from the surface impoundment(s).
   NOTE: Permit holders of surface impoundments shall report the quantity (expressed in wet-weight tons) of total suspended solids received by the facility.

9. This section applies only to Type I and II Landfills, Landfarms and Surface Impoundments.
   A. Estimated remaining permitted capacity. Enter the amount of remaining permitted capacity for the facility in wet-weight tons.
   B. Estimated life of facility. Enter the life of the facility in months and based on the permitted capacity of the facility.

10. This section applies only to construction/demolition debris and woodwaste facilities only. Place a check by the appropriate statement(s).

11. Summary of non-industrial waste disposed.
   (A) Enter the two digit waste number that applies.

01 Residential	06 Incinerator Ash	10 Stable
02 Commercial	07 Domestic Sewage Sludge	11 Infectious Waste
03 Trash	08 Underground Storage Tank Corrective Action Waste	12 Friable Asbestos
04 Woodwaste		13 Other, also specify name
05 Construction/Demolition Debris	09 Agricultural Waste	

   (B) Enter the amounts of non-industrial waste received in wet-weight tons. No other methods of reporting will be accepted.
   (C) This section applies only to landfarms. Enter the quantity of waste received in dry-weight tons.
   (D) Total: Enter the totals of wet-weight tons and dry-weight tons (landfarms must also enter dry-weight).
   (E) Quantity of Waste (In-State): Enter the total amount of waste received from in-state sources in wet-weight tons.
   (F) Quantity of Waste (Out-of-State): Enter the total amount of waste received from out-of-state sources in wet-weight tons.

12. Certification: The facility's legally authorized representative for the site operations should sign the form. Enter the date, name and the title of the person signing this form.

13. This section applies to Type I facilities. Provide a summary of all industrial solid waste received for disposal.
   (A) Industrial Waste Number: Enter the seven-digit number assigned to each waste stream by the administrative authority.
   (B) Quantity of Waste Received: Enter the quantity of waste received in wet-weight tons.
   (C) Quantity Dry-Weight Tons: This section applies only to landfarm facilities. Enter the quantity of waste received in dry-weight tons.
   (D) Subtotal of Like Industrial Wastes: Enter the subtotals of each like industrial waste received by the facility.
   (E) Subtotal: Enter the subtotals for each page of this section of the report. Subtotals of the amounts received by the facility in wet-weight tons (Column B) and dry-weight tons must be provided.
   (F) Total: Enter the total of waste received by the facility in wet-weight tons and dry-weight tons.
   (G) Quantity of Waste Received (In-State): Enter the total amount of waste received from in-state sources.
   (H) Quantity of Waste Received (Out-of-State): Enter the total amount of waste received from out-of-state sources.

14. Provide all calculations used to compute the quantity of solid waste received at the facility.

To: Ms. JEANNE
from: Jenna

INVOICE

NO. 1954

REQ # 1368 0463

Specializing in
Equip. Rentals
Industrial Plant
Services

[illegible]
[illegible]
P.O. BOX 31
ST. GABRIEL, LA 70776
342-8136 • 342-9547 • 342-5891
FAX (504) 342-5632

Please Pay From This Invoice

Mr. Ron Snell
David Guffey
Emilio Pena
Jennifer Stacy

Date: 2/6/06

Job # Geismar

P.O. # 4500854659

Rented To: Honeywell

Address: P. O. Box 23
Geismar, La 70734

12/29/05-1/06/06	- (21) trips @ $167.00/trip	$3,507.00
1/7-1/10/06	- (13) " " " "	2,171.00
1/12-1/18/06	- (18) " " " "	3,006.00
1/19-1/25/06	- (15) " " " "	2,505.00
		$11,189.00

67

Love calcium chloride from MHP to HF Stacks:

1/9/06	- D6 Dozer, 4 hrs. @ $65.00 hr.	260.00
1/3/06	- " " 8 " " " "	520.00
1/17/06	- " " 4 " " " "	260.00
1/23/06	- (3) 14-yd. trucks, 4 hrs. ea., total 12 hrs. @ $40.00	480.00
1/23/06	- D6 Dozer, 4 hrs. @ $65.00 hr.	260.00
1/23/06	- Operator only, 4 hrs. @ $25.00 hr.	100.00
1/27/06	- Operator only, 4 hrs. @ $25.00 hr.	100.00
		$1,920.00

20 Hrs. 65.00
12 Hrs 40.00
8 25.00

TOTAL $13,169.00

PO# 4500854659

FOR JANUARY, 2006, HITTING FEBRUARY, 2006.

Jan 10 06 10:38a A J L Inc. 2256425662 p.1

St. Gabriel Contractors (642-8136)
PO Box 31, St. Gabriel, LA 70776
Fax: 225-642-5662 email: ifm001@bellsouth.net
Website: www.ajlent.com

To: Mr. Jeanne

FAX

PO# 4500844207

CC: RON SNELL
EMILIO PENA
DAVID GUFFEY
JENNIFER STACEY

From: Tressie Pipsair, Honeywell
Fax #: 642-35~~11~~04

REQ# 13650086

From: Jeanne Date: 1/10/06

PO# 4500844207

Subject: PO# Needed for INV# 9336 (below) Pages: 1

Message:

STATEMENT

A.J.L. ENTERPRISES INCORPORATION

NO. 9336

Specializing in Equipment Rentals Industrial Plant Services

Please Pay From This Statement

P.O. BOX 31 · ST. GABRIEL, LA 70776
(225) 642-8136 · (225) 642-8347 · (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

Rented To: HONEYWELL
Address: P. O. Box 23
Geismar, LA 70734

Date 1/9/06
Job # Geismar, LA
P.O. # 4500844207

12/1-12/3/05 -	(8) trips @ $167.00/trip	1,336.00
12/4-12/11/05 -	NC TRIPS	
12/10-12/14/05 -	(8) trips @ $167.00/trip	1,336.00
12/15-12/21/05 -	(13) " " " "	2,171.00
12/22-12/28/05 -	(16) " " " "	2,672.00
		$7,515.00

45

Move calcium chloride from MMP to HF Stacks:

12/6 - D6 Dozer, M/O, 4 hrs. @ $65.00 hr.	260.00
12/21 - D8 Dozer, " 8 " " " "	520.00
12/29 - D8 Dozer, " 8 " " " "	520.00
12/29 - 14-yd. Dump Truck, 4 hrs. @ $65.00 hr.	260.00
	1,560.00
12/21 - 14-yd. Dump Truck, 8 hrs. @ $65.00 hr.	520.00
	2,080.00
TOTAL	$9,595.00

32

FOR DECEMBER HITTING IN JANUARY, 2005

Dec 07 05 01:42p A J L Inc. 2256425662 p.1

Industrial Fill Materials (642-5691)
Industrial Plant Maintenance (642-8492)
PO Box 88, St. Gabriel, LA 70776
St. Gabriel Contractors (642-8136)
PO Box 31, St. Gabriel, LA 70776
Fax: 225-642-5662 email: ifm001@bellsouth.net
Website: www.ajlent.com

TO: Ms. Jeanne
From: Jessie

REQ#13599020

PO#4500827917

PO#4500827917

CC: RON SNELL
DAVID GUFFEY
EMILIO PENA
JENNIFER STACE

FAX

To: Tressie Pipsair, Honeywell
Fax #: 642-35~~11~~04
From: Jeanne Date: 12/6/05
Subject: PO# Needed Pages: 1
Message:

STATEMENT

A.J.L. ENTERPRISES INCORPORATION

NO. 9312

Specializing in Equipment Rentals Industrial Plant Services

Please Pay From This Statement

P.O. BOX 31 • ST. GABRIEL, LA 70776
(225) 642-8136 • (225) 642-8347 • (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

Rented To: HONEYWELL
Address: P. O. Box 23
Geismar, LA 70734

Date 12/6/05
Job # Geismar
P.O. # 4500827917

(R 1/03)

11/3-11/9/05 - (18) trips @ $167.00/trip		$3,006.00
11/10-11/16/05 - (14) " " " "		2,338.00
11/17-11/23/05 - (13) " " " "		2,171.00
11/23-11/30/05 - (17) " " " "		2,839.00
		$10,354.00
Move calcium chloride from MMP to HF Stacks:		
11/7 - D6 Dozer, M/O, 4 hrs. @ $65.00 hr.		260.00
11/15- " " " 4 " " " "		260.00
11/25- " " " 4 " " " "		260.00
11/29- (3) 14-yd. Dump Trucks, M/O, total of 2 hrs. @ $55.00 hr		110.00
		$ 890.00
TOTAL		$11,244.00

FOR NOVEMBER, 2005, HITTING IN DECEMBER, 2005

CC: Rn Sneul
David Guffey
Emilio Pena
Jennifer Stacey

STATEMENT

A.J.L. ENTERPRISES INCORPORATION

NO. 9294

Specializing In Equipment Rentals Industrial Plant Services

P.O. BOX 31 · ST. GABRIEL, LA 70776
(225) 642-8136 · (225) 642-8347 · (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

Please Pay From This Statement

Rented To: HONEYWELL

Address: P. O. Box 23

Geismar, LA 70734

Date 11/07/05

Job # Geismar, LA

P.O. #

(R 1/00)

9/29-10/5/05	-	(18) trips @ $167.00/trip	$3,006.00
10/6-10/12/05	-	(19) " " " "	3,173.00
10/13-10/19/05	-	(21) " " " "	3,507.00
10/20-10/26/05	-	(20) " " " "	3,340.00
10/27-11/2/05	-	(18) " " " "	3,006.00

96

subtotal: $16,032.00

Blend & stack: 9/29 - 10/20/05

Excavator - 7 days @ $500/day	$3,500.00
Excavator Operator - 72 hours @ $22.90/hr.	1,648.80
Laborers - 144 hours @ $10.50/hour	1,512.00
Front end Loader Operator - 93 hours @ 22.90	2,729.70
D-6 Dozer & Operator - 12 hrs @ $65.00/hour	780.00
sub:	9,570.50
TOTAL:	$ 25,602.50

truck ⇒ 26 yrd
25 yrd
two sizes

AJL Enterprises, Inc.

Industrial Fill Materials (642-5691)
Industrial Plant Maintenance (642-8492)
PO Box 88, St. Gabriel, LA 70776
St. Gabriel Contractors (642-8136)
PO Box 31, St. Gabriel, LA 70776
Fax: 225-642-5662 email: ifm001@bellsouth.net
Website: www.ajlent.com

* To: Ms. Jeanne

From: Tressie

Rec'd in SAP for 10/3/05
REQ # 13501607
PO# 4500795622

FAX

To: Tressie Pipsair, Honeywell
Fax #: 642-35~~11~~04

From: Jeanne Date: 10/03/05

Subject: PO# needed Pages: 1

Thanks Jeanne

Message: for INVOICE # 9270

CC: RON SNELL
DAVID GUFFEY
EMILIO PENA
JENNIFER STACY

STATEMENT

9270
NO. ~~XXXX~~

A.J.L. ENTERPRISES INCORPORATION

Specializing in Equipment Rentals Industrial Plant Services

Please Pay From This Statement

P.O. BOX 31 · ST. GABRIEL, LA 70776
(225) 642-8136 · (225) 642-8347 · (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

PO #4500795622

Rented To: HONEYWELL P.O. Box 226

Address: Geismar, LA 70734

Date 10/3/05

Job # Geismar

PO # → P.O.# 4500795622

(R 1/03)

9/1-9/7/05 - 11 trips @ $167.00/trip		$ 1,837.00
9/8-9/13/05 - 14 " " " "		2,338.00
9/15-21/05 - 22 " " " "		3,674.00
9/22-9/28/05- 16 " " " "		2,672.00
	*	$10,521.00

63

FOR SEPTEMBER, HITTING IN OCTOBER, 2005

Sep 13 05 09:44a A J L Inc. 2256425662 p.1

Website: www.ajlent.com

REFAX: 9/13/05 - PO needed please - Thanks

FAX

To: Tressie Pipsair, Honeywell

Fax #: 642-35[redacted]04

From: Jeanne Date: 9/6/05

Subject: PO# Needed Pages: 1

FAXED

REQ # 13501471

To: Ms. Jeanne

From: Jeanne

STATEMENT

A.J.L. ENTERPRISES INCORPORATION

NO. 9242

Specializing In Equipment Rentals Industrial Plant Services

P.O. BOX 31 · ST. GABRIEL, LA 70776
(225) 642-8136 · (225) 642-8347 · (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

Please Pay From This Statement

PO# 4500795481

Rented To: HONEYWELL

Address:

Date 9/5/05

Job # Geismar

P.O. # 4500795481

(R 1/03)

Tractor w/Driver:

Rental, Dumping:

7/28-31/05	- 10 trips @ $140/trip	$ 1,400.00
8/1-3/05	- 9 " " $167/trip	1,503.00
8/4-10/05	- 13 " " " "	2,171.00
8/11-17/05	- 12 " " " "	2,004.00
8/18-26/05	- 17 " " " "	2,839.00
8/25-31/05	- 13 " " " "	2,171.00
		$12,088.00

cc: Ron Snell
David Guffey
Emilio Penal
Jennifer Stacy

64
+10
74

Move calcium chloride from MMP to HF Stacks:

7/8 - D6 Dozer, M/O, 4 hrs. @ $65.00 hr.	$ 260.00
8/1 - " " " 8 " " " "	520.00
8/4 - " " " 6 " " " "	390.00
	$ 1,170.00

18 + 6 24

Fix ramp in DAP Bldg. and clean along wall:

7/30 - D6 Dozer, M/O, 6 hrs. @ $65.00 hr.	$ 390.00
Operator O/T differential, 6 hrs. @ $11.45 hr.	68.70
8/4-10 - F.E. Loader, Operator O/T, 31 hrs. @ $34.35 hr.	1,064.85
	$ 1,523.55

TOTAL: $14,781.55

FOR AUGUST, 2005, HITTING IN SEPT., 2005

Aug 11 05 12:51p A J L Inc. 2256425662 p.1

To: Ms. Jeanne

From Jessie

SECOND REQUEST

REQ #13429669

PO# 4500771798

AJL Enterprises, Inc.
Industrial Fill Materials (642-5691)
Industrial Plant Maintenance (642-8492)
PO Box 88, St. Gabriel, LA 70776
St. Gabriel Contractors (642-8136)
PO Box 31, St. Gabriel, LA 70776
Fax: 225-642-5662 email: ifm001@bellsouth.net
Website: www.ajlent.com

cc: Bryan Butts
Emilio Pena
David Guffey
Jennifer Stacey

FAXED

Phone 642-3513

Thanks!

FAX

To: Tressie Pipsair, Honeywell
Fax #: 642-35[illegible]04
From: Jeanne Date: 8/2/05
Subject: PO# Needed Pages: 1

STATEMENT

INVOICE NO. 9221

Specializing In Equipment Rentals Industrial Plant Services

A.J.L. ENTERPRISES INCORPORATION
P.O. BOX 31 · ST. GABRIEL, LA 70776
(225) 642-8136 · (225) 642-8347 · (225) 642-5691
FAX (225) 642-5662
www.ajl-enterprises.com

Please Pay From This Statement

Rented To: HONEYWELL
Address: P.O. Box 226
Geismar, LA 70734

Mail to: Global Bus. Services
P. O. Box 981241
El Paso, TX 79998

Date 8/2/05
Job # Geismar
P.O. #

Tractor w/Driver - Rental, Dumping:

6/30-7/6/05	- (16)	trips @ $195.50/trip	$3,128.00
7/6-7/13/05	- (20)	" " " "	3,910.00
7/14-20/05	- (20)	" " " "	3,910.00
7/21-27/05	- (16)	" " " "	3,128.00
			$14,076.00

72

For July, 2005, Hitting in August, 2005

State of Louisiana

Department of Environmental Quality

M.J. "MIKE" FOSTER, JR.
GOVERNOR

January 9, 1997

J. DALE GIVENS
SECRETARY

MEMORANDUM

TO: Solid Waste Generators
Solid Waste Disposers

FROM: William J. Mollere
Administrator
Solid Waste Division

SUBJECT: Seven-Digit Waste Code Number Issuance

As of November 1, 1995, the solid waste disposal facilities, which accept industrial solid waste from off-site sources, began issuing the seven digit waste codes required by the regulations. The disposers report these numbers to the Solid Waste Division.

The Division will continue to issue waste codes for those waste streams that are disposed on-site, out-of-state, or at a hazardous waste facility. A Solid Waste generator supplemental form is included for this purpose.

New generators of industrial waste are required to contact the Division to obtain a generator identification number and for company name changes or change of address. They are also required to contact the appropriate disposal facility to obtain their Louisiana Waste Code Number.

The Solid Waste Regulations will be changed accordingly to reflect these changes.

Should you have any questions, please contact Mrs. Yolunda Righteous at (504) 765-0249.

WJM/JLG:ew

Enclosure

OFFICE OF SOLID AND HAZARDOUS WASTE HAZARDOUS WASTE DIVISION P.O. BOX 82178 BATON ROUGE, LOUISIANA 70884-2178
TELEPHONE (504) 765-0355 FAX (504) 765-0617

recycled paper
AN EQUAL OPPORTUNITY EMPLOYER

INDUSTRIAL WASTE CODE LIST

001-ABSORBENT PADS
002-ASBESTOS CONTAMINATED MATERIAL/ASBESTOS
003-ASH/INCINERATOR AND BOILER
004-BAGHOUSE DUST
005-BATTERIES SPENT
006-BLASTING MEDIA
007-BOILER BLOWDOWN
008-CARBON/CARBON BLACK/COKE/COAL
009-CATALYST/CAT FINES
010-CEMENT KILN DUST
011-CLEANOUT MATERIAL
012-CONTAMINATED CONCRETE AND INSULATION
013-CONTAMINATED PIPING
014-CONTAMINATED SAND/SOIL
015-COOLING TOWER WOOD AND DEBRIS
016-DESICCANT
017-DISTILLATION BOTTOMS/DISTILLATE
018-EMPTY CONTAMINATED CONTAINERS
019-FIRE BRICK/FURNACE BRICK/REACTOR BRICK
020-FLOCCULENT SOLIDS
021-FOUNDRY SAND
022-GYPSUM
023-INSULATION/NON-ASBESTOS
024-LABORATORY WASTES
025-LIME
026-METALLIC SALTS AND OXIDES
027-OFF SPEC./SPENT MATERIALS
028-PCB (LOW-LEVEL PCB CONT. MATERIALS)
029-PESTICIDE/HERBICIDE CONTAMINATED MATERIAL
030-PLANT MAINT. DEBRIS; CONTAMINATED ARTICLES
031-SLAG
032-SPENT BAUXITE (RED MUD)
033-SPENT CAUSTIC
034-TREATED WOODWASTE
035-VESSEL, EXCHANGER, TANK, AND PIPE SCALES

SLUDGES

036-COOLING TOWER BASIN SLUDGE
037-IMPOUNDMENT SLUDGES/SOLIDS
038-PAINT WASTE
039-PROCESS UNIT SLUDGES
040-SUMP WASTE/SOLIDS
041-TANK SLUDGES
042-WASTEWATER TREATMENT PLANT SLUDGES

FILTERS.FILTER MEDIA

043-FILTER CAKE
044-FILTER MEDIA/FILTERS

AQUEOUS WASTES

045-ACID/BASE WASTE (NEUTRALIZED)
046-ANTIFREEZE
047-API SEPARATOR SUPERNATANT (MIDDLE LIQUID)
048-BRINE (RAW)
049-CLEANERS (SPENT NEUTRALIZED)
050-COOLING TOWER BLOWDOWN
051-LEACHATE
052-SLURRY
053-TANK WASHWATER
054-WASTEWATER, NOT OTHER SPECIFIED
055-WASTEWATER & SOLIDS/SLUDGES

7004 1160 0003 2917 1187

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

FY 2006 FSUG IDES ROSARS E

Postage	$
Certified Fee	
Return Reciept Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here
GEISMAR LA 70734
JUL 28 2006
USPS

Sent To Return to Todd Harter
Street, Apt. No.; or PO Box No.
City, State, ZIP+4

PS Form 3800, June 2002 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Department of Environmental Quality
Office of the Secretary
P. O. Box 4303
Baton Rouge, LA 70821-4303

COMPLETE THIS SECTION ON DELIVERY

A. Signature
☐ Agent
☐ Addressee

B. Received by (Printed Name) SHERLITA BRADY
C. Date of Delivery JUL 31 2006

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☒ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number
(Transfer from service label) 7004 1160 0003 2917 1187

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

ATTACHMENT 21
Financial Responsibility

The total post closure costs for 2007 as presented in the attached Honeywell transmittal dated March 30, 2007 refer to activities during the harvesting/recycling activities following the cessation of fluorogypsum disposal in the stacks.

Honeywell

Honeywell
P.O. Box 2245
Morristown, NJ 07962-2245

December 17, 2007

Dr. Mike D. McDaniel
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313
ATTENTION: Office of Environmental Services, Water and Waste Permits Division

Dear Dr. McDaniel:

On April 27, 2007, Honeywell International, Inc. ("Honeywell"), pursuant to La. Admin. Code tit. 33, pt. VII, § 727, submitted to the Louisiana Department of Environmental Quality ("the Department") a Letter of Credit and Standby Trust Agreement for the purpose of demonstrating financial assurance at Honeywell's facilities in Louisiana. On September 12, 2007, the Department notified Honeywell of an error in the financial assurance submission with respect to the Fluorogypsum Stacking Facility, located at Highways 30 & 3115 in Geismar ("the Geismar facility"). Specifically, the Department notified Honeywell that the permit number for the Geismar facility, as referenced in Honeywell's submission, was incorrect. Accordingly, the Department requested a corrected Letter of Credit and Standby Trust Agreement ("the Agreement") as a condition of renewing Honeywell's permit for the Geismar facility.

Pursuant to the Department's instructions, enclosed herein are a Letter of Credit Amendment and a fully executed Amendment to the Solid Waste Facility Standby Trust Agreement. The Amendment, drafted in accordance with Section 16 of the Agreement, provides a revised Schedule A which references the correct permit number for the Geismar facility. A copy of the original April 27 submission is also attached for your convenience.

Please contact me at (973) 455-5034 should you have any questions or concerns regarding the enclosed.

Sincerely,

Terry S. Cox

Terry S. Cox
Director, Environmental Excellence
Corporate Health, Safety, Environment and Remediation

Enclosures

Note: Only one original to this Letter of Credit Amendment is possible. We certify that all copies are true and accurate facsimiles of the original.

Copy 4 of 8 TSC

3002.3

Banca di Roma

N. 0125688 04

"As of October 1st 2007 part of the Unicredito Italiano Group, registered in the Italian Banking Group's Register no. 3135.1"
34 East 51st Street
New York, NY 10022
Telephone: (212) 407-1600

LETTER OF CREDIT AMENDMENT

Amendment No. 1 Date: October 10, 2007

L/C No. IC-80322 Dated: April 25, 2007

To:

Secretary
Department of Environmental Quality
State of Louisiana
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313
Attention : Office of Environmental Services,
Water and Waste Permits Division

Instructions Received from

Honeywell International Inc.
101 Columbia Road
Morristown, NJ 07962

Dated: October 5, 2007

Gentlemen:

In accordance with instructions received, the above mentioned Letter of Credit has been amended as follows:

- Delete text in first full paragraph end of line 6:
"IP-0270"

- Insert in its place:
"P-0216R1"

All other terms and condition of the credit remain unchanged.

Yours very truly,

Authorized Signature

Authorized Signature

AMENDMENT TO SOLID WASTE FACILITY STANDBY TRUST AGREEMENT

Pursuant to the Louisiana Administrative Code, Honeywell International Inc., as Grantor, and Deutsche Bank Trust Company Americas, as Trustee, entered into a Trust Agreement dated April 20, 2007 ("Agreement") regarding assurance that funds will be available for the closure and/or post-closure care of certain solid waste facilities.

Section 16 of the Agreement provides that the Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee and the administrative authority.

As provided in Section 2 of the Agreement, Schedule A identifies the facilities to be covered by the Agreement. Schedule A is hereby amended to reference the appropriate facility permit numbers for the facilities covered by the Agreement. Schedule A, attached to this Amendment, is the sole and complete listing of all facilities covered by the Agreement.

Except as provided in this Amendment, the terms of the Agreement are in full force and effect.

Dated this 4th day of October, 2007.

ATTEST:

Assistant Secretary

By: (Signature of Grantor)

Vice President and Treasurer

(Seal)

ATTEST:

Luigi Sacramone
Associate

(Title)

By: (Signature of Trustee)

RICHARD L. BUCKWALTER
DIRECTOR

(Title)

ACCEPTED AND AGREED TO THIS 10 day of December, 2007.

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

By: Mike D. McDaniel
(LDEQ Contact)

Attachment: Revised Schedule A

Schedule A

Site EPA ID No.	LAD000802868
Site Name	Honeywell
Site Address	Lupine & Ontario Streets Baton Rouge, LA 70821
Facility Name (if different from above)	Baton Rouge South Works
Facility Permit No. (if different from above)	GD-033-0314 P-0081
Current Closure Estimate	$1,191,075
Current Post-Closure Estimate	$210,781

Site ID No.	GD-005-0313
Site Name	Honeywell
Site Address	P.O. Box 226 Highways 30 & 3115 Geismar, LA 70734
Facility Name (if different from above)	Fluorogypsum Stacking Facility
Facility Permit No. (if different from above)	P-0216R1
Current Closure Estimate	$3,060,000
Current Post-Closure Estimate	$10,000,000

TABLE I

FACILITIES FOR WHICH HONEYWELL INTERNATIONAL INC. IS DEMONSTRATING LIABILITY COVERAGE FOR SUDDEN AND NON-SUDDEN ACCIDENTAL OCCURRENCES USING A FINANCIAL TEST

With respect to the following sites, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $4 million per occurrence and $8 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
California	CAD074644659	BBI - Newark 8333 Enterprise Drive Newark, CA 94560
	CAL000303739	BBI - San Diego 3596 California Street San Diego, CA 92101
Connecticut	CTD001149582	Skinner Valve Division 95 Edgewood Avenue New Britain, CT 06051
Florida	OGC- Case 93-0341	Former Honeywell Facility Waters Avenue Site Tampa, FL
Illinois	ILD006278170	Metropolis Works Route 45 North Metropolis, IL 62960
	ILR000042127	Garrett Aviation (Paint Hangar) 2951 J. David Jones Pkwy. Capitol Airport Springfield, IL 62707
	ILD 051937068	Former Baron-Blakslee Inc. 1634 South Laramie Avenue Cicero, IL 60650
Oregon	ORD061483384	5920 NE 87th Street Portland, OR 97220

TABLE 1

FACILITIES FOR WHICH HONEYWELL INTERNATIONAL INC. IS DEMONSTRATING LIABILITY COVERAGE FOR SUDDEN AND NON-SUDDEN ACCIDENTAL OCCURRENCES USING A FINANCIAL TEST

Pennsylvania	PAD002386761 ACO RCRA-III-079-CA	(former) Honeywell Inc. 1100 Virginia Drive Ft. Washington, PA 19034
Virginia	VAD065385296	Honeywell Hopewell Plant Route 10 Hopewell, VA 23860

With respect to the following sites, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $1 million per occurrence and $1 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
Louisiana (solid waste)	GD-033-0314 P-0081	Honeywell Baton Rouge South Works Lupine & Ontario Streets Baton Rouge, LA 70821
	GD-005-0313 P-0216R1	Honeywell P.O. Box 226 Highways 30 & 3115 Geismar, LA 70734

With respect to the following site, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $5.5 million per occurrence and $11 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
New York	DEC No. 9-1402-00016/00001	Honeywell Buffalo Research Laboratory 20 Peabody Street Buffalo, NY 14210

Honeywell

Honeywell
P.O. Box 2245
Morristown, NJ 07962-2245

BY OVERNIGHT DELIVERY

April 27, 2007

Dr. Mike D. McDaniel
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313
ATTENTION: Office of Environmental Services, Water and Waste Permits Division

Dear Secretary:

In compliance with La. Admin. Code tit. 33, pt. VII, § 727A.1.d.ii we enclose an Irrevocable Standby Letter of Credit No. IC-80322 issued by Banca di Roma on April 25, 2007 for the purpose of demonstrating financial assurance at the following facilities:

Honeywell **Baton Rouge South Works** **Lupine & Ontario Streets** **Baton Rouge, LA 70821** **GD-033-0314, P-0081**	**Honeywell** **P.O. Box 226** **Highways 30 & 3115** **Geismar, LA 70734** **GD-005-0313, IP-0270**

The amount of funds assured by this letter of credit for closure care of these facilities is $14,461,856.

Also enclosed is an executed Solid Waste Facility Standby Trust Agreement dated April 20, 2007.

Please contact me at (973) 455-5034 should you have any questions or concerns regarding the enclosed.

Sincerely,

Terry S. Cox

Terry S. Cox
Director, Environmental Excellence
Corporate Health, Safety, Environment and Remediation

SOLID WASTE FACILITY STANDBY TRUST AGREEMENT

Trust Agreement, the "Agreement" entered into as of April 20, 2007 by and between Honeywell International Inc., a Delaware corporation, the "Grantor," and Deutsche Bank Trust Company Americas, a New York banking corporation, the "Trustee."

WHEREAS, the Department of Environmental Quality of the State of Louisiana, an agency of the state of Louisiana, has established certain regulations applicable to the Grantor, requiring that a permit holder or applicant for a permit of a solid waste processing or disposal facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility;

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facility identified herein;

WHEREAS, the Grantor, acting through its duly authorized officers, has selected Deutsche Bank Trust Company Americas to be the trustee under this Agreement, and Deutsche Bank Trust Company Americas is willing to act as trustee.

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

SECTION 1.DEFINITIONS

As used in this Agreement:

(a). The term "Grantor" means the permit holder or applicant who enters into this Agreement and any successors or assigns of the Grantor.

(b). The term "Trustee" means the Trustee who enters into this Agreement and any successor trustee.

(c). The term "Secretary" means the Secretary of the Louisiana Department of Environmental Quality.

(d). The term "administrative authority" means the Secretary or a person designated by him to act therefor.

SECTION 2.IDENTIFICATION OF FACILITIES AND COST ESTIMATES

This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

SECTION 3.ESTABLISHMENT OF FUND

The Grantor and the Trustee hereby establish a trust fund, the "Fund", for the benefit of the Louisiana Department of Environmental Quality. The Grantor and the Trustee intend that no third party shall have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B

attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, in trust, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the administrative authority.

SECTION 4.PAYMENT FOR CLOSURE AND/OR POST-CLOSURE CARE OR LIABILITY COVERAGE

The Trustee shall make payments from the Fund as the administrative authority shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facility covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the administrative authority from the Fund for closure and/or post-closure expenditures in such amounts as the administrative authority shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the administrative authority specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

SECTION 5.PAYMENTS COMPRISED BY THE FUND

Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

SECTION 6.TRUSTEE MANAGEMENT

The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of like character and with like aims, except that:

(a). Securities or other obligations of the Grantor, or any owner of the facilities or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. § 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the federal or a state government.

(b). The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the federal or state government; and

(c). The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

SECTION 7.COMMINGLING AND INVESTMENT

The Trustee is expressly authorized, at its discretion:

(a). To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b). To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. § 80a-1, et seq., including one which may be created, managed, or underwritten, or one to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares at its discretion.

SECTION 8.EXPRESS POWERS OF TRUSTEE

Without in any way limiting the powers and discretion conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a). To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b). To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c). To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve Bank, but the books and records of the Trustee shall at all times show that all securities are part of the Fund;

(d). To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or state government; and

(e). To compromise or otherwise adjust all claims in favor of, or against, the Fund.

SECTION 9.TAXES AND EXPENSES

All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and other proper charges and disbursements of the Trustee shall be paid from the Fund.

SECTION 10.ANNUAL VALUATION

The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the administrative authority a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee, within 90 days after the statement has been furnished to the Grantor and the administrative authority, shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

SECTION 11.ADVICE OF COUNSEL

The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any questions arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

SECTION 12.TRUSTEE COMPENSATION

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

SECTION 13.SUCCESSOR TRUSTEE

The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor or trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall in writing specify to the Grantor, the administrative authority, and the present Trustee by certified mail 10 days before such change becomes effective the date on which it assumes administration of the trust. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

SECTION 14.INSTRUCTIONS TO THE TRUSTEE

All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by the persons designated in the attached Exhibit A or such other persons as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the administrative authority to the Trustee shall be in writing and signed by the administrative authority. The Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or termination of the authority of any person to act on behalf of the Grantor or administrative authority hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or administrative authority, except as provided for herein.

SECTION 15.NOTICE OF NONPAYMENT

The Trustee shall notify the Grantor and the administrative authority, by certified mail, within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

SECTION 16.AMENDMENT OF AGREEMENT

This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the administrative authority, or by the Trustee and the administrative authority, if the Grantor ceases to exist.

SECTION 17.IRREVOCABILITY AND TERMINATION

Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the administrative authority, or by the Trustee and the administrative authority, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

SECTION 18.IMMUNITY AND INDEMNIFICATION

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any direction by the Grantor or the administrative authority issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all reasonable expenses incurred in its defense in the event that the Grantor fails to provide such defense.

SECTION 19.CHOICE OF LAW

This Agreement shall be administered, construed, and enforced according to the laws of the state of Louisiana.

SECTION 20.INTERPRETATION

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested to as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in LAC 33:VII.727.A.2.d.ix, on the date first written above.

GRANTOR:

By: John J. Tus

Its: Vice President and Treasurer

Witness: Jacqueline Williams

Witness: Thomas Bergeron

[Seal]

THUS DONE AND PASSED in my office in Morristown, NJ, on the 20th day of April, 2007, in the presence of Jacqueline Williams and Tom Bergeron, competent witnesses, who hereunto sign their names with the said appearer and me, Notary, after reading the whole.

Notary Public

TAMMY L. VASQUEZ
A Notary Public of New Jersey
My Commission Expires
11/29/2011

TRUSTEE:

By: Richard L. Buckwalter

Its: Director

Witness:

Witness:

[Seal]

THUS DONE AND PASSED in my office in New York, NY on the 24 day of April, 20 07, in the presence of Annie Jaghatspanyan and Lisa Campanella, competent witnesses, who hereunto sign their names with the said appearer and me, Notary, after reading the whole.

Notary Public

ANGEL E. MILANES JR.
Notary Public - State of New York
No. 01MI6137333
Qualified in New York County
My Comm. Expires Nov. 21, 2009

Schedule A

Site EPA ID No.	LAD000802868
Site Name	Honeywell
Site Address	Lupine & Ontario Streets Baton Rouge, LA 70821
Facility Name (if different from above)	Baton Rouge South Works
Facility Permit No. (if different from above)	GD-033-0314 P-0081
Current Closure Estimate	$1,191,075
Current Post-Closure Estimate	$210,781

Site EPA ID No.	LAD041519067
Site Name	Honeywell
Site Address	P.O. Box 226 Highways 30 & 3115 Geismar, LA 70734
Facility Name (if different from above)	Fluorogypsum Stacking Facility
Facility Permit No. (if different from above)	GD-005-0313 IP-0270
Current Closure Estimate	$3,060,000
Current Post-Closure Estimate	$10,000,000

Schedule B

This Agreement is not presently funded, but shall be funded by the irrevocable standby letter of credit number IC-80322 issued by Banca di Roma used by the Grantor in accordance with the terms of those documents.

Exhibit A

The following persons are authorized to act on behalf of the Grantor:

Jim Colby Assistant Treasurer	
John J. Tus VP. Treasurer	

STATE OF NEW JERSEY

COUNTY OF MORRIS

BE IT KNOWN, that on this 20th day of April, 2007, before me, the undersigned Notary Public, duly commissioned and qualified within the State and County aforesaid, and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared John J. Tus, to me well known, who declared and acknowledged that he had signed and executed the foregoing instrument as his act and deed, and as the act and deed of Honeywell International Inc., a corporation, for the consideration, uses, and purposes and on terms and conditions therein set forth.

And the said appearer, being by me first duly sworn, did depose and say that he is the Vice President and Treasurer of said corporation and that he signed and executed said instrument in his said capacity, and under authority of the Board of Directors of said corporation.

Thus done and passed in the State and County aforesaid, on the day and date first hereinabove written, and in the presence of Jacqueline Whorms and Tom Byrne, competent witnesses, who have hereunto subscribed their name as such, together with said appearer and me, said authority, after due reading of the whole.

WITNESSES:

Jacqueline Whorms

Tom Byrne

NOTARY PUBLIC

TAMMY L. VASQUEZ
A Notary Public of New Jersey
My Commission Expires
11/29/2011

STATE OF NEW YORK

COUNTY OF NEW YORK

BE IT KNOWN, that on this 24 day of April, 2007, before me, the undersigned Notary Public, duly commissioned and qualified within the State and County aforesaid, and in the presence of the witnesses hereinafter named and undersigned, personally came and appeared Richard L. Buckwalter, to me well known, who declared and acknowledged that he had signed and executed the foregoing instrument as his act and deed, and as the act and deed of Deutsche Bank Trust Company Americas, a corporation, for the consideration, uses, and purposes and on terms and conditions therein set forth.

And the said appearer, being by me first duly sworn, did depose and say that he is the Director of said corporation and that he signed and executed said instrument in his said capacity, and under authority of the Board of Directors of said corporation.

Thus done and passed in the State and County aforesaid, on the day and date first hereinabove written, and in the presence of Annie Jaghatspanyan and Lisa Campanella, competent witnesses, who have hereunto subscribed their name as such, together with said appearer and me, said authority, after due reading of the whole.

WITNESSES:

NOTARY PUBLIC

ANGEL E. MILANES JR.
Notary Public - State of New York
No. 01MI6137333
Qualified in New York County
My Comm. Expires Nov. 21, 2009

3002.3

Banca di Roma

N. 0119123 04

IRREVOCABLE STANDBY LETTER OF CREDIT

Secretary
Department of Environmental Quality
State of Louisiana
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

Attention: Office of Environmental Services, Water and Waste Permits Division

Dear Sir:

We hereby establish our Irrevocable Standby Letter of Credit No. IC-80322 in favor of the Department of Environmental Quality of the State of Louisiana at the request and for the account of Honeywell International Inc., 101 Columbia Road, Morristown, New Jersey 07962, for the closure and post-closure fund for its Baton Rouge South Works facility (GD-033-0314, P-0081) at Baton Rouge, Louisiana, and for the closure and post-closure fund for its Specialty Materials – Chemicals Division facility (GD-005-0313, IP-0270) at Geismar, Louisiana, for any sum or sums up to the aggregate amount of Fourteen Million Four Hundred Sixty One Thousand Eight Hundred Fifty Six and 00/100 U.S. Dollars ($14,461,856.00), available upon presentation of:

1. A sight draft, bearing reference to the Letter of Credit No. IC-80322 drawn by the administrative authority, together with;

2. A statement signed by the administrative authority, declaring that the amount of the draft is payable into the standby trust fund pursuant to the Louisiana Environmental Quality Act, R.S. 30:2001, et seq.

This Letter of Credit is effective as of April 30, 2007, and will expire on April 30, 2008, but such expiration date will be automatically extended for a period of at least 1 year on the above expiration date (April 30, 2008) and on each successive expiration date thereafter, unless, at least 120 days before the then-current expiration date, we notify both the administrative authority and Honeywell International Inc., by certified mail (return receipt requested) that we have decided not to extend this Letter of Credit beyond the then-current expiration date. In the event that we give such notification, any unused portion of this Letter of Credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both the Department of Environmental Quality and Honeywell International Inc., as shown on the signed return receipts.

Continued on page 2

Banca di Roma

N. 0119124 05

Whenever this Letter of Credit is drawn under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, at Banca di Roma, 34 East 51st Street, New York, N.Y. 10022, and we shall deposit the amount of the draft directly into the standby trust fund of Honeywell International Inc. in accordance with the administrative authority's instructions.

We certify that the wording of this Letter of Credit is identical to the wording specified in Louisiana Administrative Code, title 33, part VII, section 727.A.2.g.viii, effective on the date shown immediately below.

Except to the extent otherwise expressly agreed to, the Uniform Customs and Practice for Documentary Letter of Credits (1993), International Chamber of Commerce Publication No. 500, shall apply to this Letter of Credit.

Date: April 25, 2007

Yours Very truly,

Vice President, Authorized Signature

L Ballantoni

Assistant Treasurer, Authorized Signature

Banca di Roma

N. 0119123 04

IRREVOCABLE STANDBY LETTER OF CREDIT

Secretary
Department of Environmental Quality
State of Louisiana
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

Attention: Office of Environmental Services, Water and Waste Permits Division

Dear Sir:

We hereby establish our Irrevocable Standby Letter of Credit No. IC-80322 in favor of the Department of Environmental Quality of the State of Louisiana at the request and for the account of Honeywell International Inc., 101 Columbia Road, Morristown, New Jersey 07962, for the closure and post-closure fund for its Baton Rouge South Works facility (GD-033-0314, P-0081) at Baton Rouge, Louisiana, and for the closure and post-closure fund for its Specialty Materials – Chemicals Division facility (GD-005-0313, IP-0270) at Geismar, Louisiana, for any sum or sums up to the aggregate amount of Fourteen Million Four Hundred Sixty One Thousand Eight Hundred Fifty Six and 00/100 U.S. Dollars ($14,461,856.00), available upon presentation of:

1. A sight draft, bearing reference to the Letter of Credit No. IC-80322 drawn by the administrative authority, together with;

2. A statement signed by the administrative authority, declaring that the amount of the draft is payable into the standby trust fund pursuant to the Louisiana Environmental Quality Act, R.S. 30:2001, et seq.

This Letter of Credit is effective as of April 30, 2007, and will expire on April 30, 2008, but such expiration date will be automatically extended for a period of at least 1 year on the above expiration date (April 30, 2008) and on each successive expiration date thereafter, unless, at least 120 days before the then-current expiration date, we notify both the administrative authority and Honeywell International Inc., by certified mail (return receipt requested) that we have decided not to extend this Letter of Credit beyond the then-current expiration date. In the event that we give such notification, any unused portion of this Letter of Credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both the Department of Environmental Quality and Honeywell International Inc., as shown on the signed return receipts.

Continued on page 2

Banca di Roma

N. 0119124 05

Whenever this Letter of Credit is drawn under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, at Banca di Roma, 34 East 51st Street, New York, N.Y. 10022, and we shall deposit the amount of the draft directly into the standby trust fund of Honeywell International Inc. in accordance with the administrative authority's instructions.

We certify that the wording of this Letter of Credit is identical to the wording specified in Louisiana Administrative Code, title 33, part VII, section 727.A.2.g.viii, effective on the date shown immediately below.

Except to the extent otherwise expressly agreed to, the Uniform Customs and Practice for Documentary Letter of Credits (1993), International Chamber of Commerce Publication No. 500, shall apply to this Letter of Credit.

Date: April 25, 2007

Yours Very truly,

Vice President, Authorized Signature

L Ballantoni

Assistant Treasurer, Authorized Signature

Società per azioni - Sede legale in Roma, Via G. Tupini, 180 - 00144 Roma - Capitale sociale Euro 2.262.882.921,00
Iscritta al registro delle imprese di Roma C.F. e P. Iva 00774151005 - Aderente al Fondo Interbancario di Tutela dei Depositi
La società è iscritta all'Albo delle banche al n. 5526 ed appartiene al Gruppo Bancario Capitalia, iscritto all'Albo dei Gruppi Bancari
sito internet: www.bancadiroma.it - Società soggetta all'attività di direzione e coordinamento di Capitalia S.p.A.

Honeywell

Honeywell
P.O. Box 2245
Morristown, NJ 07962-2245

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 30, 2007

Dr. Mike D. McDaniel
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313
ATTENTION: Office of Environmental Services, Water and Waste Permits Division

Re: Honeywell Facility, Baton Rouge South Works (GD-033-0314, P-0081), Lupine & Ontario Streets, Baton Rouge, LA 70821; Honeywell Facility (GD-005-0313, IP-0270), Highways 30 & 3115, Geismar, LA 70734

Dear Secretary:

In March 2006, Honeywell International, Inc. ("Honeywell") demonstrated its financial responsibility for hazardous waste activity at the above referenced sites by using the financial tests set forth in La. Admin. Code tit. 33, pt. VII, §§ 727.A.1.iii and 727.A.2.i.

Pursuant to La. Admin. Code tit. 33, pt. VII, § 727.A.1.vii, Honeywell hereby notifies the Department of Environmental Quality of its intent to establish an alternate financial assurance mechanism for the above referenced sites encompassing closure and post-closure care costs as follows:

Site Identification Number	Site Name and Address	Total Closure Costs for 2007	Total Post-Closure Costs for 2007
GD-033-0314 P-0081	Honeywell Baton Rouge South Works Lupine & Ontario Streets Baton Rouge, LA 70821	$1,191,075	$210,781
GD-005-0313 IP-0270	Honeywell P.O. Box 226 Highways 30 & 3115 Geismar, LA 70734	$3,060,000	$10,000,000
TOTAL		$4,251,075	$10,210,781
TOTAL CLOSURE AND POST-CLOSURE COSTS FOR 2007:		**$14,461,856**	

The alternate mechanism shall be provided to the Department of Environmental Protection within thirty days, as required by La. Admin. Code tit. 33, pt. VII, § 727.A.1.vii.

Honeywell continues to use the financial test set forth in La. Admin. Code tit. 33, pt. VII, §§ 727.A.1.iii to demonstrate financial responsibility for liability coverage. Materials in support of the use of that test are submitted separately to the appropriate regulator.

Please contact me at (973) 455-5034 should you have any questions or concerns regarding this notice.

Sincerely,

Terry S. Cox

Terry S. Cox
Director, Environmental Excellence
Corporate Health, Safety, Environment and Remediation

Honeywell

Honeywell
P.O. Box 2245
Morristown, NJ 07962-2245

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 30, 2007

Dr. Mike D. McDaniel
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313
ATTENTION: Office of Environmental Services, Water and Waste Permits Division

Re: Honeywell Facility, Baton Rouge South Works (GD-033-0314, P-0081), Lupine & Ontario Streets, Baton Rouge, LA 70821; Honeywell Facility (GD-005-0313, IP-0270), Highways 30 & 3115, Geismar, LA 70734

Dear Secretary:

Honeywell International Inc. is submitting to your office proof of financial assurance for liability coverage for the above referenced facilities. The documentation is in the form of the financial test as prescribed in La. Admin. Code tit. 33, pt. VII, §§ 727.A.1.iii and 727.A.2.i.

The following items are attached:

1. A letter signed by David J. Anderson, Senior Vice President and Chief Financial Officer of Honeywell International Inc., worded as specified in La. Admin. Code tit. 33, pt. VII, § 727.A.2.i.iv(e).

2. A copy of a report on examination of Honeywell International Inc.'s financial statements for the latest completed fiscal year, prepared by PricewaterhouseCoopers LLP, an independent certified public accountant.

3. A special report from PricewaterhouseCoopers LLP as required.

Should you have any questions, please contact the undersigned.

Sincerely,

Terry S. Cox

Terry S. Cox
Director, Environmental Excellence
Corporate Health, Safety, Environment and Remediation
973-455-5034

Attachments

Honeywell

David J. Anderson
Senior Vice President and
Chief Financial Officer

Honeywell Global Headquarters
Honeywell
101 Columbia Road
Morristown, New Jersey 07962

973-455-3472
973-455-3821 Fax

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 30, 2007

Dr. Mike D. McDaniel
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4313
Baton Rouge, LA 70821-4313
ATTENTION: Office of Environmental Services, Water and Waste Permits Division

Dear Secretary:

I am the Chief Financial Officer of Honeywell International Inc., 101 Columbia Road, Morris Township, New Jersey 07962. This letter is in support of this firm's use of the financial test to demonstrate financial responsibility for liability coverage as specified in LAC 33:VII.727.A.1.

1. The firm identified above is the permit holder of the following solid waste facilities, whether in Louisiana or not, for which liability coverage is being demonstrated through the financial test specified in LAC 33:VII.727.A.1. The amount of annual aggregate liability coverage covered by the test is shown for each facility: SEE TABLE 1.

2. The firm identified above is the permit holder of the following solid waste facilities, whether in Louisiana or not, for which financial assurance for closure and post-closure is demonstrated through the financial test similar to that specified in LAC 33:VII.727.A.2 or other forms of self insurance. The current closure and post-closure cost estimates covered by the test are shown for each facility: NONE.

3. This firm guarantees, through a corporate guarantee similar to that specified in LAC 33:VII.727.A.2, liability coverage, closure and post-closure care of the following solid waste facilities, whether in Louisiana or not, which are a subsidiary of this firm. The amount of annual aggregate liability coverage covered by the guarantee for each facility and/or the current cost estimates for the closure and/or post-closure care so guaranteed are shown for each facility: NONE.

4. This firm is the owner or operator of the following solid waste facilities, whether in Louisiana or not, for which financial assurance for liability coverage, closure and/or post-closure care is not demonstrated either to the U.S. Environmental Protection Agency or to a State through a financial test or any other financial assurance mechanism similar to those specified in LAC 33:VII.727.A.1 and/or 2. The current

closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: NONE.

This firm is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firms independently audited year-end financial statements for the latest completed year, ended December 31, 2006.

ALTERNATIVE II

1.	Amount of annual aggregate liability coverage to be demonstrated	$	1,000,000
2.	Current bond rating of most recent issuance and name of rating service		"A," Standard & Poor's
3.	Date of issuance of bond		3/15/2007
4.	Date of maturity of bond		3/15/2017
5.	*Tangible net worth	$	70,000,000
6.	*Total assets in U.S. (required only if less than 90% of assets are located in the U.S.)	$	20,346,000,000

		YES	NO
7.	Is line 5 at least $10 Million?	X	
8.	Is line 5 at least 6 times line 1?	X	
9.	Are at least 90% of assets located in the U.S.? If not, complete line 10.		X
10.	Is line 6 at least 6 times line 1?	X	

I hereby certify that the wording of this letter is identical to the wording specified in LAC 33:VII.727.A.2.i.iv.(e).

David J. Anderson
Honeywell International Inc.
Senior Vice President and Chief Financial Officer
March 30, 2007

TABLE I

FACILITIES FOR WHICH HONEYWELL INTERNATIONAL INC. IS DEMONSTRATING LIABILITY COVERAGE FOR SUDDEN AND NON-SUDDEN ACCIDENTAL OCCURRENCES USING A FINANCIAL TEST

With respect to the following sites, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $4 million per occurrence and $8 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
California	CAD074644659	BBI - Newark 8333 Enterprise Drive Newark, CA 94560
	CAL000303739	BBI - San Diego 3596 California Street San Diego, CA 92101
Connecticut	CTD001149582	Skinner Valve Division 95 Edgewood Avenue New Britain, CT 06051
Florida	OGC- Case 93-0341	Former Honeywell Facility Waters Avenue Site Tampa, FL
Illinois	ILD006278170	Metropolis Works Route 45 North Metropolis, IL 62960
	ILR000042127	Garrett Aviation (Paint Hangar) 2951 J. David Jones Pkwy. Capitol Airport Springfield, IL 62707
	ILD 051937068	Former Baron-Blakslee Inc. 1634 South Laramie Avenue Cicero, IL 60650
Oregon	ORD061483384	5920 NE 87th Street Portland, OR 97220

TABLE I

FACILITIES FOR WHICH HONEYWELL INTERNATIONAL INC. IS DEMONSTRATING LIABILITY COVERAGE FOR SUDDEN AND NON-SUDDEN ACCIDENTAL OCCURRENCES USING A FINANCIAL TEST

Pennsylvania	PAD002386761 ACO RCRA-III-079-CA	(former) Honeywell Inc. 1100 Virginia Drive Ft. Washington, PA 19034
Virginia	VAD065385296	Honeywell Hopewell Plant Route 10 Hopewell, VA 23860

With respect to the following sites, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $1 million per occurrence and $1 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
Louisiana (solid waste)	GD-033-0314 P-0081	Honeywell Baton Rouge South Works Lupine & Ontario Streets Baton Rouge, LA 70821
	GD-005-0313 IP-0270	Honeywell P.O. Box 226 Highways 30 & 3115 Geismar, LA 70734

With respect to the following site, Honeywell International Inc. provides multiple facility owner operator liability coverage for sudden and non-sudden accidental occurrences in the amount of $5.5 million per occurrence and $11 million in aggregate using the financial test based upon its tangible net worth.

STATE	EPA or State ID NUMBER	PLANT NAME AND ADDRESS
New York	DEC No. 9-1402-00016/00001	Honeywell Buffalo Research Laboratory 20 Peabody Street Buffalo, NY 14210

PRICEWATERHOUSECOOPERS

PricewaterhouseCoopers LLP
400 Campus Drive
P. O. Box 988
Florham Park NJ 07932
Telephone (973) 236 4000
Facsimile (973) 236 5000

Report of Independent Accountants

To the Board of Directors of
Honeywell International Inc.

We have performed the procedures enumerated below, which were agreed to by Company management, relating to the accompanying letter dated March 30, 2007 from Mr. David J. Anderson, Senior Vice President and Chief Financial Officer of the Company, addressed to the Louisiana Department of Environmental Quality in compliance with the financial requirements of the Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities promulgated by the Environmental Protection Agency (Subpart H of 40 CFR Parts 264 and 265) (the "Letter") solely to assist you in evaluating the financial data that the Letter specifies as having been derived from the audited consolidated financial statements for the year ended December 31, 2006 in the Company's Current Report on Form 10-K dated February 16, 2007. Company management is responsible for the Letter. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

The procedures we performed are summarized as follows:

- We recalculated the amount shown as "Tangible net worth" in Item 5 in the Alternative II section of the Letter utilizing balances contained within the audited consolidated financial statements for the year ended December 31, 2006 in the Company's Current Report on Form 10-K dated February 16, 2007.

- We compared the amount shown as "Total assets in U.S." in Item 6 in the Alternative II section of the Letter to reporting schedules prepared by the Company from which the audited consolidated financial statements for the year ended December 31, 2006 in the Company's Current Report on Form 10-K dated February 16, 2007 were prepared and found the amount to be in agreement.

- We obtained the amount of the Company's total assets from the audited consolidated financial statements for the year ended December 31, 2006 in the Company's Current Report on Form 10-K dated February 16, 2007 and calculated ninety percent of such amount. We compared the calculated amount to the amount shown as "Total assets in U.S" in Item 6 in the Alternative II section of the Letter and noted the calculated amount was greater.

PRICEWATERHOUSECOOPERS

We were not engaged to and did not conduct an examination, the objective of which would be the expression of an opinion on the specified elements. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of the Board of Directors and management of the Company and the Louisiana Department of Environmental Quality, and is not intended to be and should not be used by anyone other than these specified parties.

PricewaterhouseCoopers LLP

March 30, 2007

ATTACHMENT 22
2006 Annual Report

Honeywell

Performance

2006

Annual Report

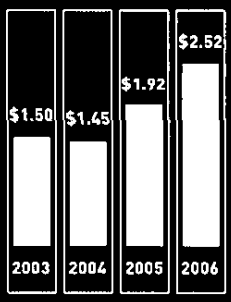
Financial Highlights

(Dollars and Shares in Millions, Except Per Share Amounts)	**2006**	2005	2004
Sales	**$31,367**	$ 27,652	$ 25,593
Net Income	**$ 2,083**	$ 1,638	$ 1,246
Diluted Earnings Per Common Share	**$ 2.52**	$ 1.92	$ 1.45
Cash Dividends Per Common Share	**$0.9075**	$ 0.825	$ 0.75
Book Value Per Common Share	**$ 12.13**	$ 12.98	$ 12.68
Total Assets	**$30,941**	$ 31,633	$ 30,570
Cash Flows from Operating Activities	**$ 3,211**	$ 2,442	$ 2,253
Common Shares Outstanding at Year-End	**801**	829	850
Employees at Year-End	**118,000**	116,000	109,000

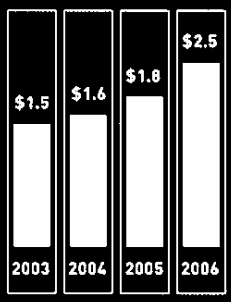
Sales

(in U.S.$ Billions)

EPS



Free Cash Flow [1]

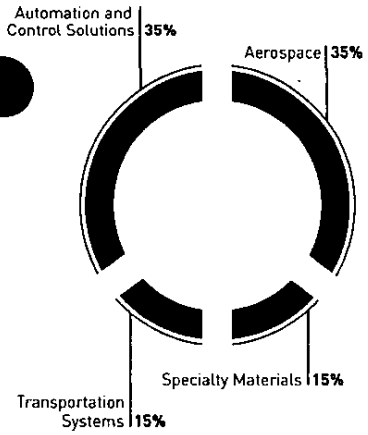


(in U.S.$ Billions)

(1) We define free cash flow as cash provided by operating activities, less cash expenditures for property, plant and equipment.

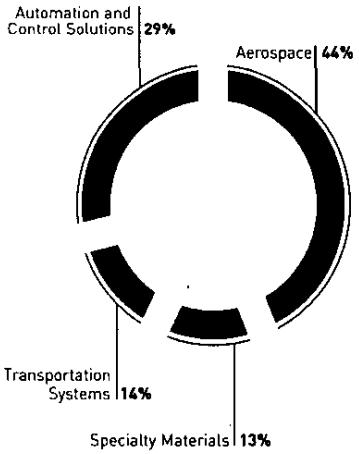
Sales by Business Segment

(percent)



Profits by Business Segment

(percent)



- Great positions in good industries with technologies aligned with global mega-trends that matter to customers.
- Consistent and sustainable financial performance in sales, margin expansion, earnings per share and free cash flow.
- Disciplined and balanced cash deployment that returned more than $2.6 billion to shareowners in 2006 through dividends and share repurchases.
- Growth initiatives and common operational processes have improved quality, delivery, value and technology for customers, while strengthening our financial performance.
- A One Honeywell culture that attracts and retains the best and brightest people around the world.

Performance

Honeywell made great progress this year in executing our growth strategy. We reached a new financial performance threshold by surpassing $31 billion in sales, delivering 31% growth in earnings per share, and increasing free cash flow by 41%. Our focus on One Honeywell, the Five Initiatives, having great positions in good industries, a customer-first mindset, and value-driven technologies have resulted in consistent financial performance and a solid track record.

To our Shareowners

Another great year ... with more to come!

Financial performance was terrific with sales up 13% to $31.4 billion, 7% organic sales growth, and earnings per share up 31% to $2.52. Free cash flow (cash flow from operations less capital expenditures) at $2.5 billion was also strong, allowing us to increase our dividend by 10%, repurchase 45.4 million shares of stock ($1.9 billion), and complete three acquisitions for approximately $750 million, adding over $500 million in annualized sales. All in all, another year of impressive results.

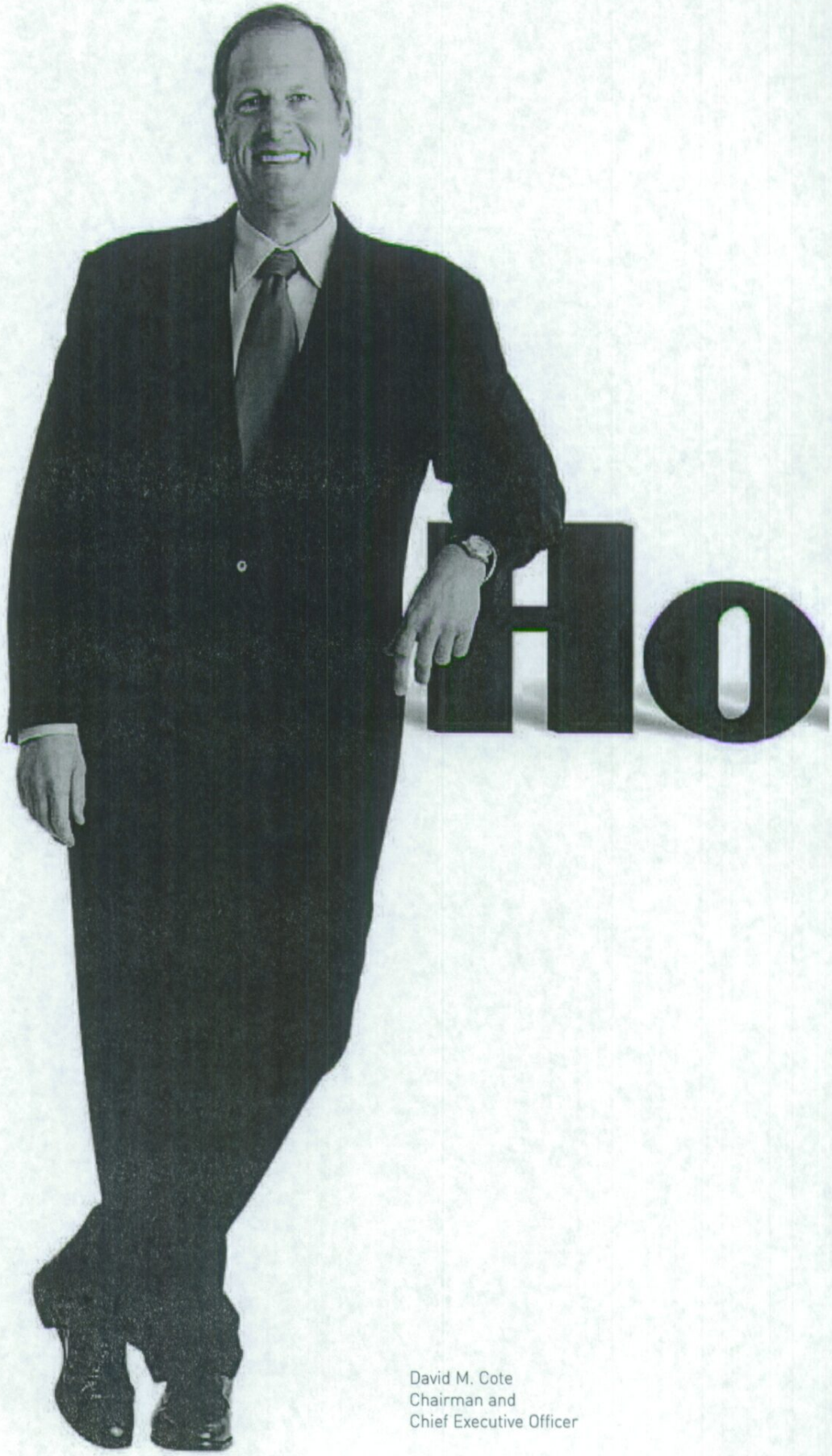
We expect continued strong performance at Honeywell. Over the past few years, we've worked hard to develop great positions in good industries, create a One Honeywell culture, and reinforce our Five Initiatives and Twelve Behaviors. And it works. We have a wonderful foundation for sustained performance.

Great Positions in Good Industries

This makes a big difference. Being in good industries provides a tailwind for growth. Having a leadership position accelerates that growth because of the critical mass in differentiators like sales coverage and research and development. We have also been active these past few years with acquisitions and divestitures to further improve what was already a very competitive portfolio of businesses. Our acquisition process – standardizing best practices company-wide for identification, valuation, due diligence, and especially integration – has been extremely effective. Our businesses are in terrific shape to grow, both organically and through acquisitions.

The aerospace industry should continue to perform well. Commercial air travel should grow as the world becomes wealthier, allowing businesses to become more global and families more dispersed. Travel is very elastic with declines in ticket prices leading to greater growth in passenger traffic. The business jet segment is expected to continue to be strong, as evidenced by the annual industry-standard Honeywell Business Aviation Outlook showing strong demand for at least the next 10 years. As commercial travel grows and time for everyone becomes more valuable, we expect this trend to continue. Defense spending is high by historical norms, but at the same time the threats faced by every country are high. While growth may moderate or priorities shift, an abrupt and large decline seems unlikely.

Our product portfolio in aerospace is terrific and provides lots of opportunity. We are well positioned to meet increasing OEM production requirements with engines such as the TFE731-50, HTF7000, and the HTF10000 (Honeywell Turbo Fan with 10,000 pounds of thrust).



David M. Cote
Chairman and
Chief Executive Officer

Our redesigned auxiliary power units and accompanying maintenance service agreements are doing very well because of the cost and reliability advantage they provide airlines. Avionics should also continue to do well as safety requirements in crowded airspace become more pronounced and software advances cause more intelligence to be put on the plane. With Primus Epic® we have a totally integrated digital cockpit for business jets. We also have the most comprehensive, advanced suite of safety avionics with our Enhanced Ground Proximity Warning System (EGPWS), designed to eliminate controlled flights into terrain; our Runway Awareness Advisory System (RAAS), which can do the same for airport/runway accidents; and our vertical separation Control Display System/Retrofit (CDS/R), allowing stacked planes to safely operate within shorter distances.

Automation and Control Solutions (ACS) has grown significantly both organically and with its demonstrated capability to execute and integrate acquisitions. Increased security and fire detection needs are evident worldwide. We identified gas detection as a logical adjacent space with great growth potential, and through our acquisitions of Zellweger in 2005 and First Technology in 2006, we are now the industry leader. Sensors are becoming ubiquitous as semiconductor costs come down and our technology advances. The global need for energy expands our process controls business, while the need for more energy efficiency expands our building/residential controls and energy performance contracting businesses. Good industries all around, and we have leading positions in each.

The ACS team has excellent capabilities in managing sales/distribution networks, driving productivity, developing new products at an accelerating rate, and delivering acquisition synergies. We continue to win industry awards for our new products. Thermostats, building controls, surface acoustic wave sensors (for applications like tire pressure monitoring), Tridium® software allowing different types of controls to talk to each other,

"We expect continued strong performance at Honeywell. Over the past few years, we've worked hard to develop great positions in good industries, create a One Honeywell culture, and reinforce our Five Initiatives and Twelve Behaviors. And it works."

Experion® PKS that provides a huge advantage in process controls for sophisticated process plants, the ability to detect over 100 kinds of gases, ExitPoint® that allows buildings to be evacuated based on human reactions to sound, advanced security devices ... a lot of great stuff to grow with!

Transportation Systems operates in two industries with turbochargers and retail auto aftermarket products. A turbocharger allows an engine that is about a third smaller to provide the same power as a full-size engine. That means about 20-25% less fuel usage and emissions while still providing consumers with cars that go when they hit the accelerator; a valuable contribution in today's energy conscious world! The biggest benefit occurs on diesel engines, and in Europe half of all new autos are diesel powered because of these advantages. It's an excellent industry and with our cost and technology advantage, we recorded a 60% win rate on all passenger vehicle platforms and a greater than 70% win rate on all commercial vehicle platforms awarded worldwide in 2006. The retail aftermarket is a slower growth segment but with our FRAM®, Autolite®, Prestone®, Bendix®, and Holts® brands, we have strong positions. This business is being invigorated by new product ideas that will advance future growth.

Specialty Materials (SM) has undergone incredible change over the last few years and now makes a big contribution. Fluorines look good, especially with our non-ozone-depleting hydrofluorocarbons (HFCs), spray foam insulation that reduces home energy usage 20% while improving structural integrity, and the recent announcement of our low Global Warming Potential (GWP) HFC. In our Resins and Chemicals business, caprolactam demand is also on the rise. With all the changes made in this business over the past four years, we're in a great position.

Demand for our semiconductor products, Spectra® fiber (material 10 times stronger than steel and it floats!), and process additives continue to

Senior Management Team Robert J. Gillette | Roger Fradin | Thomas W. Weidenkopf | Adriane M. Brown | Larry E. Kittelberger

increase. UOP focuses on refinery and petrochemical plant design and also supplies key catalysts and adsorbents. The need for energy provides a strong tailwind for this excellent business.

With growth in the global economy, especially in emerging markets, energy demand is expanding quickly. Both energy generation and efficiency provide tremendous opportunities for our ACS and SM businesses. In fact, nearly 50% of our product portfolio company-wide is linked to energy efficiency. We estimate the global economy could operate on 10-25% less energy just by using today's existing Honeywell technologies! Turbocharged diesel vehicles, smart controls for buildings and houses, and a new air traffic control system relying more on avionics to eliminate inefficient flight paths and stacking, could provide a huge advantage. The possibilities are exciting and they are all in the Honeywell product portfolio!

One Honeywell

We have worked hard over the last few years to build a One Honeywell culture and it's working. Creating a common culture and vernacular, a single brand image, and shared processes does a lot to bring us together with a unified focus on the customer. It all helps to build glue, to help us recognize we're all in it together; to get away from the idea of "whew ... I'm glad the leak is on your side of the boat and not mine."

It's elusive to measure ... but it's there and it's important. We try to touch One Honeywell in all we do. Establishing awards and benefit plans; communications, whether written, oral, or employee town hall meetings; real estate initiatives to bring all our people together while reducing costs; and Honeywell Hometown Solutions where employees come together to help each other and their community ... all of these create that One Honeywell bond.

An example of this glue in 2006 was our inaugural Technology Symposium. We brought together our top 400 scientists and engineers from around the world for a three-day event to share the latest advances,

Peter M. Kreindler | Nance K. Dicciani | David J. Anderson | Rhonda Germany | Shane Tedjarati

new technologies and capabilities. They weren't chosen by level, rather by knowledge and technical ability, and they worked hard to help each other develop ideas and establish relationships. It was a big success and we intend to do it again in 2007.

Five Initiatives

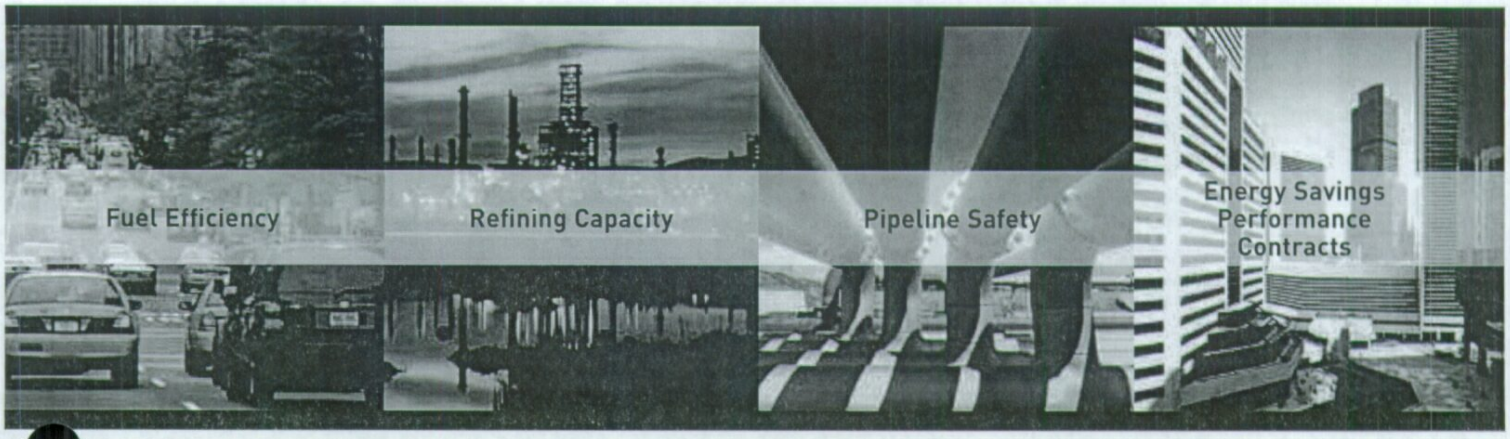
The focus on Growth, Productivity, Cash, People, and Our Enablers has worked to give us direction and performance. They will continue. Growth is really clicking as we concentrate on doing a superb job for customers every day, sales and marketing excellence, globalization, and new products and services. Productivity is interdependent with growth and we continue funding it with new ideas. Cash flow continues to grow. The focus on people is essential because it's the ultimate differentiator.

Our Enablers in particular will generate increased performance and more One Honeywell. Six Sigma tools are of considerable benefit in improving every one of Our Enablers. The Honeywell Operating System (HOS) began full-scale deployment in 34 manufacturing sites in 2006, representing about $1.4 billion, or 30% of our manufacturing cost base. HOS standardizes work, empowers front-line people, and eliminates unnecessary process steps. Importantly, it institutionalizes the need for change, and the changes made so we're not fixing the same thing tomorrow that we fixed yesterday. With over 250 manufacturing operations, this will provide a great source of future productivity.

Functional Transformation is similar to HOS but applied to the administrative functions of Finance, Systems, HR, Legal, and Purchasing. We can improve internal service levels considerably while reducing costs. The progress has been significant and there's lots more opportunity.

Velocity Product Development™ (VPD™) focuses on bringing the products and services that customers want to market faster. Having a terrific understanding of customer

"Nearly 50% of our product portfolio company-wide is linked to energy efficiency. We estimate the global economy could operate on 10-25% less energy just by using today's existing Honeywell technologies."



needs is just as important as the innovation itself. VPD is tougher to measure, but you can see it in the new product/service outflow that's contributing to our organic growth.

Working capital ($5.8 billion at year-end) is a continuing area of focus and one we didn't do as well with in 2006. We improved, but not enough. Working capital is important not just for the cash lock-up, but also because the only way we can get lower working capital while improving customer and supplier relationships is by improving operating practices. In other words, we have to become a better business. We made good progress initially, then stalled, and have now reinvigorated our focus. We'll continue to drive progress here because it is so important in making us better for ourselves, our customers, and our suppliers.

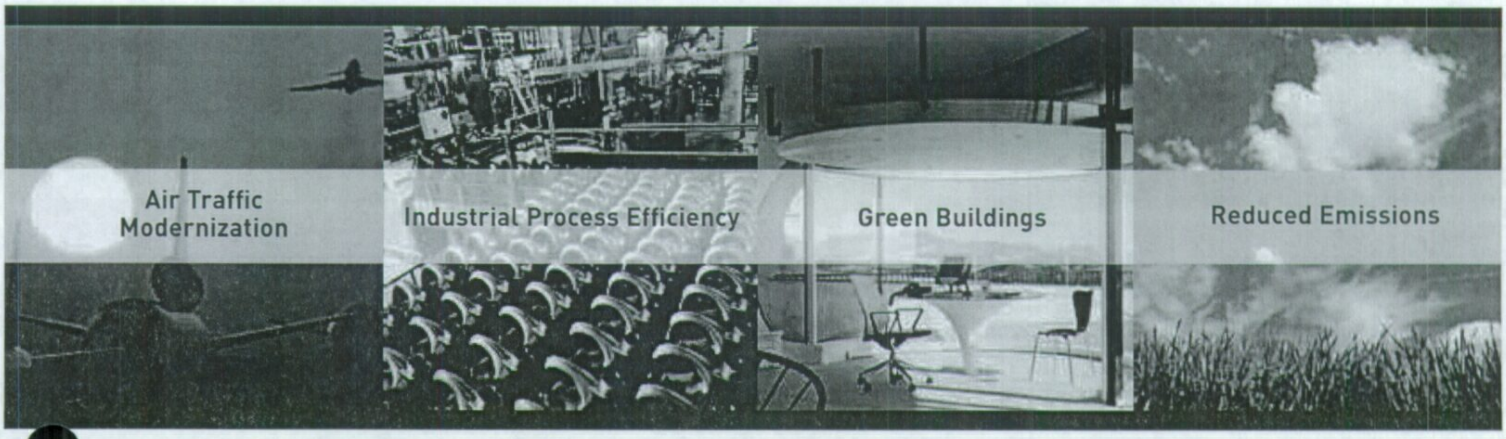
During the year, we added Linnet Deily to the Board of Directors. With her experience in banking and world trade as a U.S. Trade Representative (USTR), Linnet is already providing valuable expertise. Bruce Karatz, a director for seven years, voluntarily resigned. Bruce was a wonderful, helpful director, both independent and supportive. We were sad to see him leave. Our Board is a marvelous asset for the company.

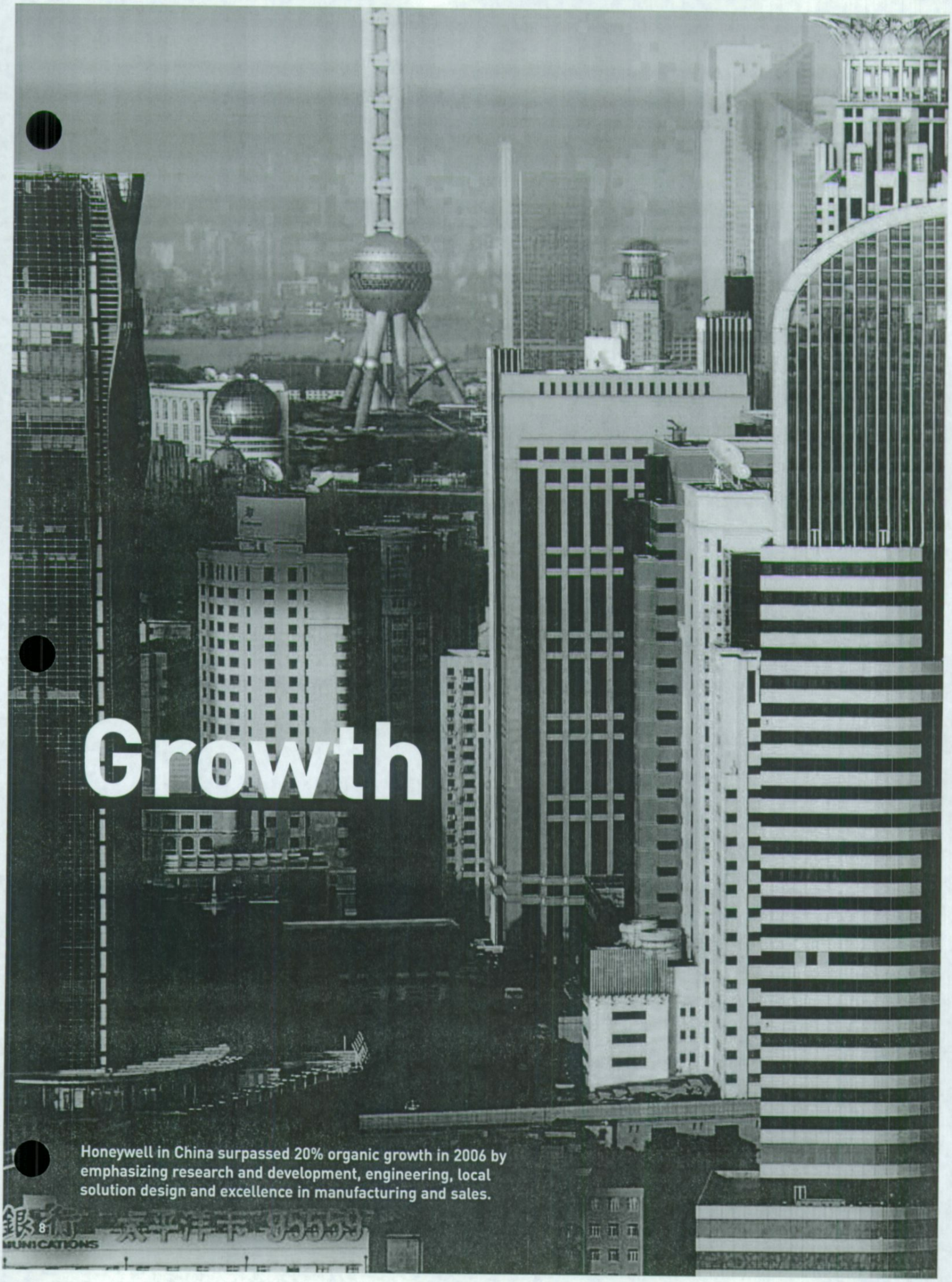
Summary

It has been another eventful and performance-driven year. The Five Initiatives and One Honeywell focus bring us together. We're doing a better job for our customers every day. And, as well as we've done, we can see even more potential ahead. We have a lot of terrific stuff going!

It's been another great year ... and there are more to come.

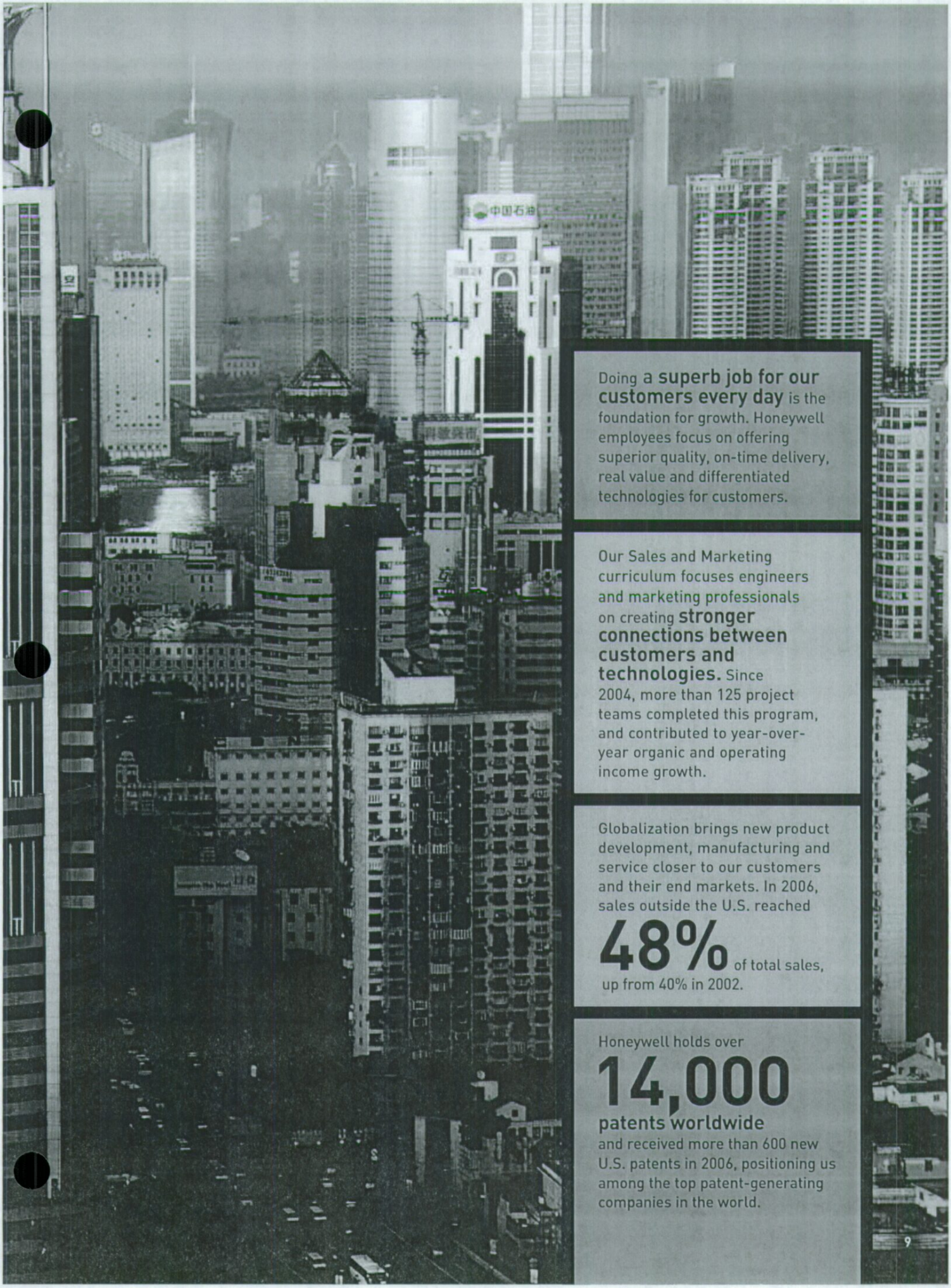
David M. Cote
Chairman and
Chief Executive Officer





Growth

Honeywell in China surpassed 20% organic growth in 2006 by emphasizing research and development, engineering, local solution design and excellence in manufacturing and sales.



Doing **a superb job for our customers every day** is the foundation for growth. Honeywell employees focus on offering superior quality, on-time delivery, real value and differentiated technologies for customers.

Our Sales and Marketing curriculum focuses engineers and marketing professionals on creating **stronger connections between customers and technologies.** Since 2004, more than 125 project teams completed this program, and contributed to year-over-year organic and operating income growth.

Globalization brings new product development, manufacturing and service closer to our customers and their end markets. In 2006, sales outside the U.S. reached

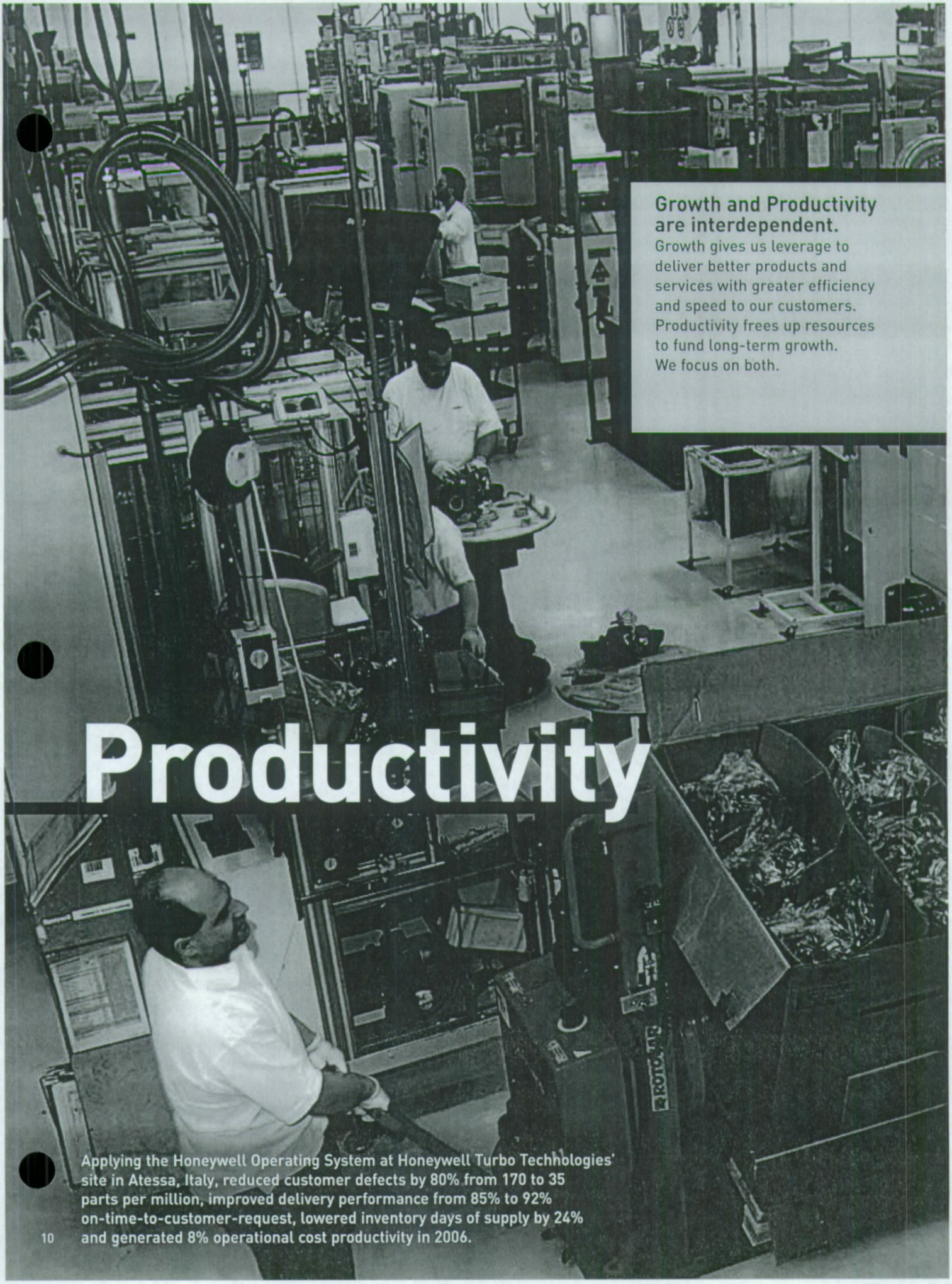
48% of total sales, up from 40% in 2002.

Honeywell holds over

14,000

patents worldwide

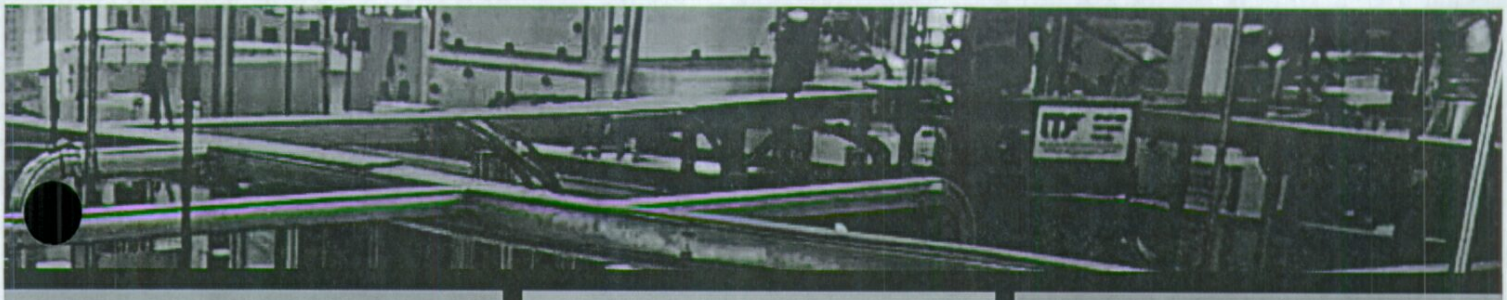
and received more than 600 new U.S. patents in 2006, positioning us among the top patent-generating companies in the world.



Productivity

Growth and Productivity are interdependent.
Growth gives us leverage to deliver better products and services with greater efficiency and speed to our customers. Productivity frees up resources to fund long-term growth. We focus on both.

Applying the Honeywell Operating System at Honeywell Turbo Technologies' site in Atessa, Italy, reduced customer defects by 80% from 170 to 35 parts per million, improved delivery performance from 85% to 92% on-time-to-customer-request, lowered inventory days of supply by 24% and generated 8% operational cost productivity in 2006.



Honeywell improved its quality performance

54%

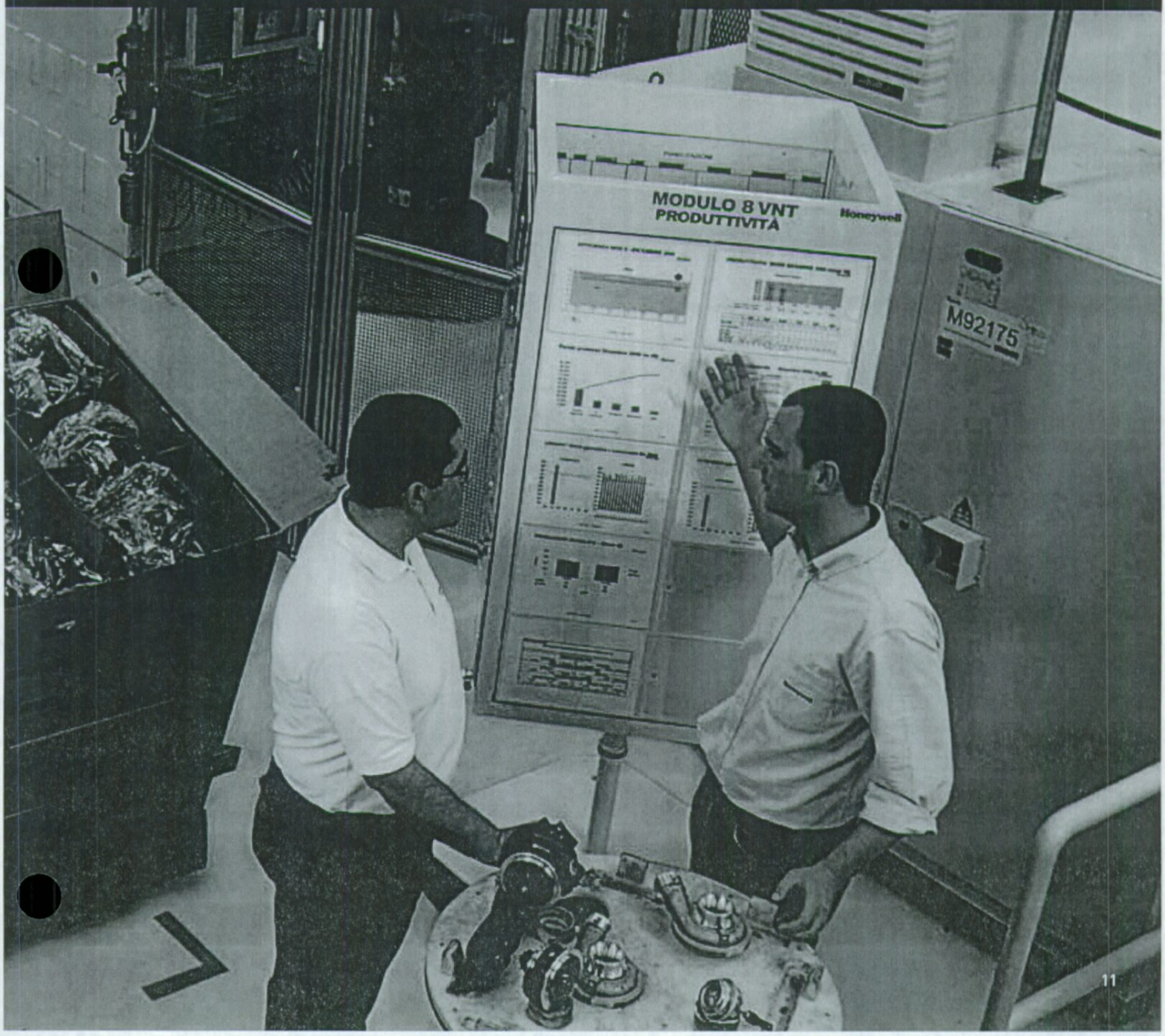
by reducing defects from 3,010 parts per million in 2005 to 1,376 in 2006 – 99.9% of products shipped had zero defects.

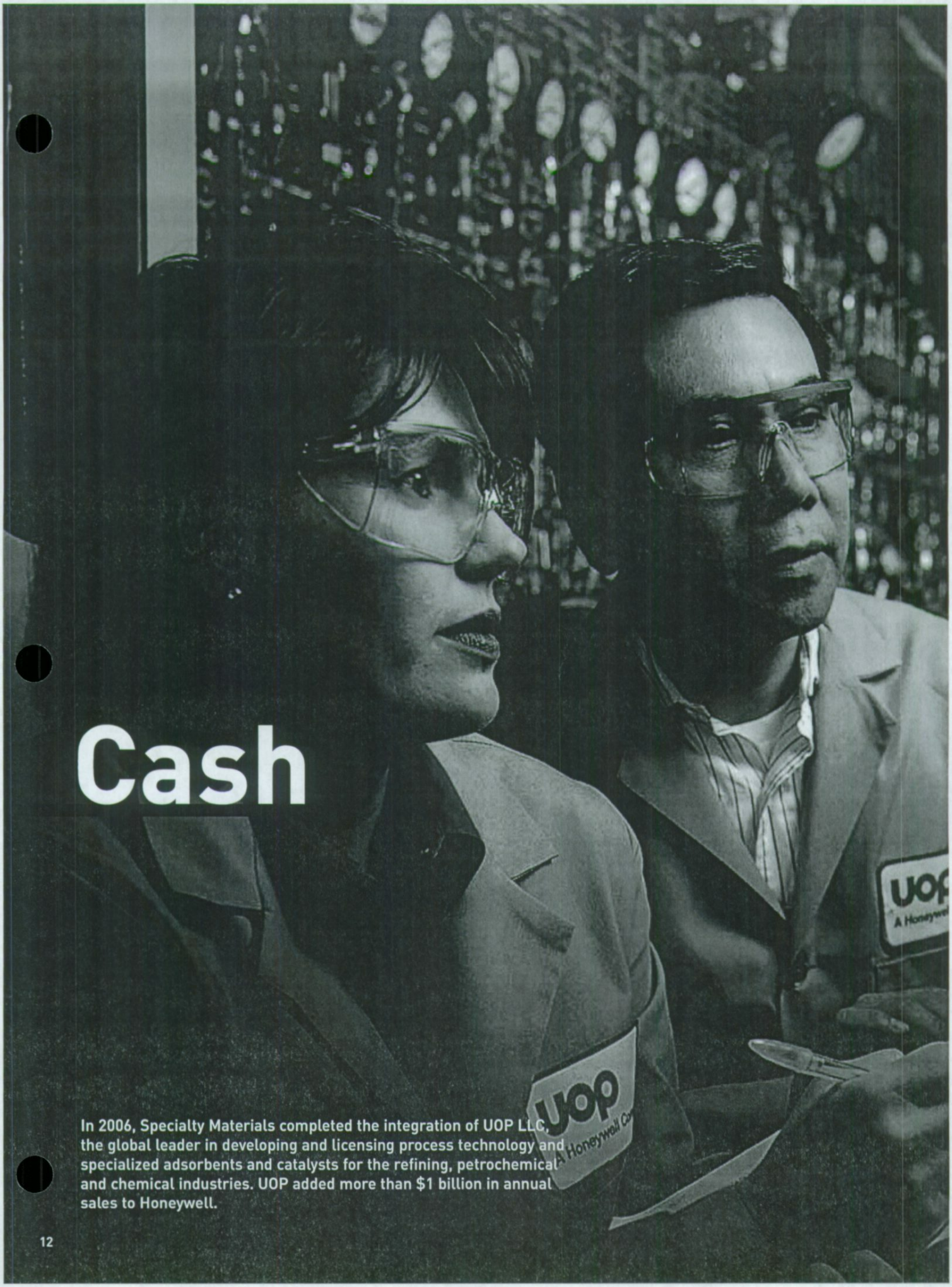
The Honeywell Operating System (HOS) accelerates improvements in manufacturing operations to produce **exceptional performance in safety, quality, delivery, cost and inventory.**

HOS is deployed in 34 manufacturing sites, representing about

$1.4 billion,

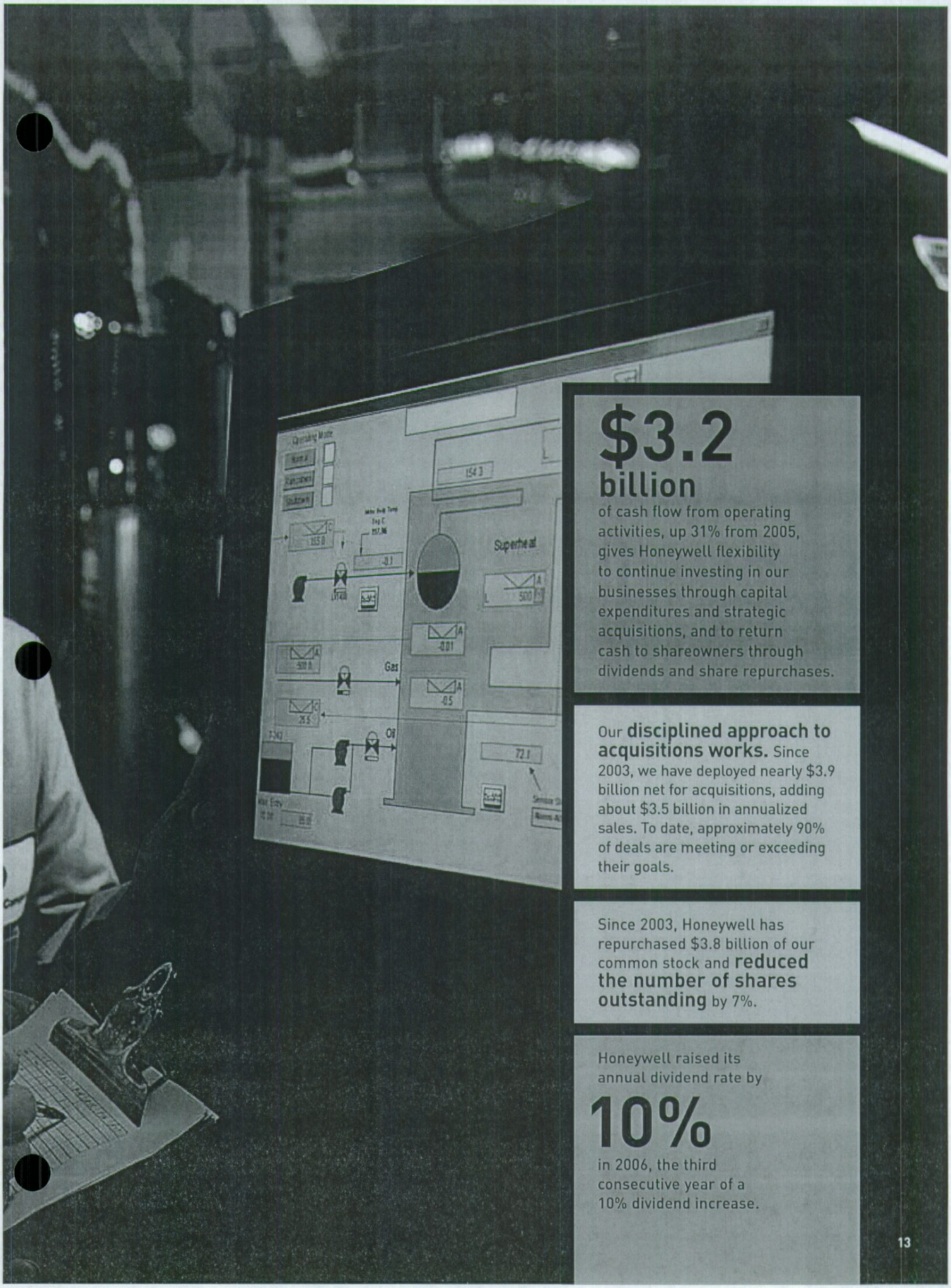
or 30%, of Honeywell's manufacturing cost base.





Cash

In 2006, Specialty Materials completed the integration of UOP LLC, the global leader in developing and licensing process technology and specialized adsorbents and catalysts for the refining, petrochemical and chemical industries. UOP added more than $1 billion in annual sales to Honeywell.



$3.2 billion

of cash flow from operating activities, up 31% from 2005, gives Honeywell flexibility to continue investing in our businesses through capital expenditures and strategic acquisitions, and to return cash to shareowners through dividends and share repurchases.

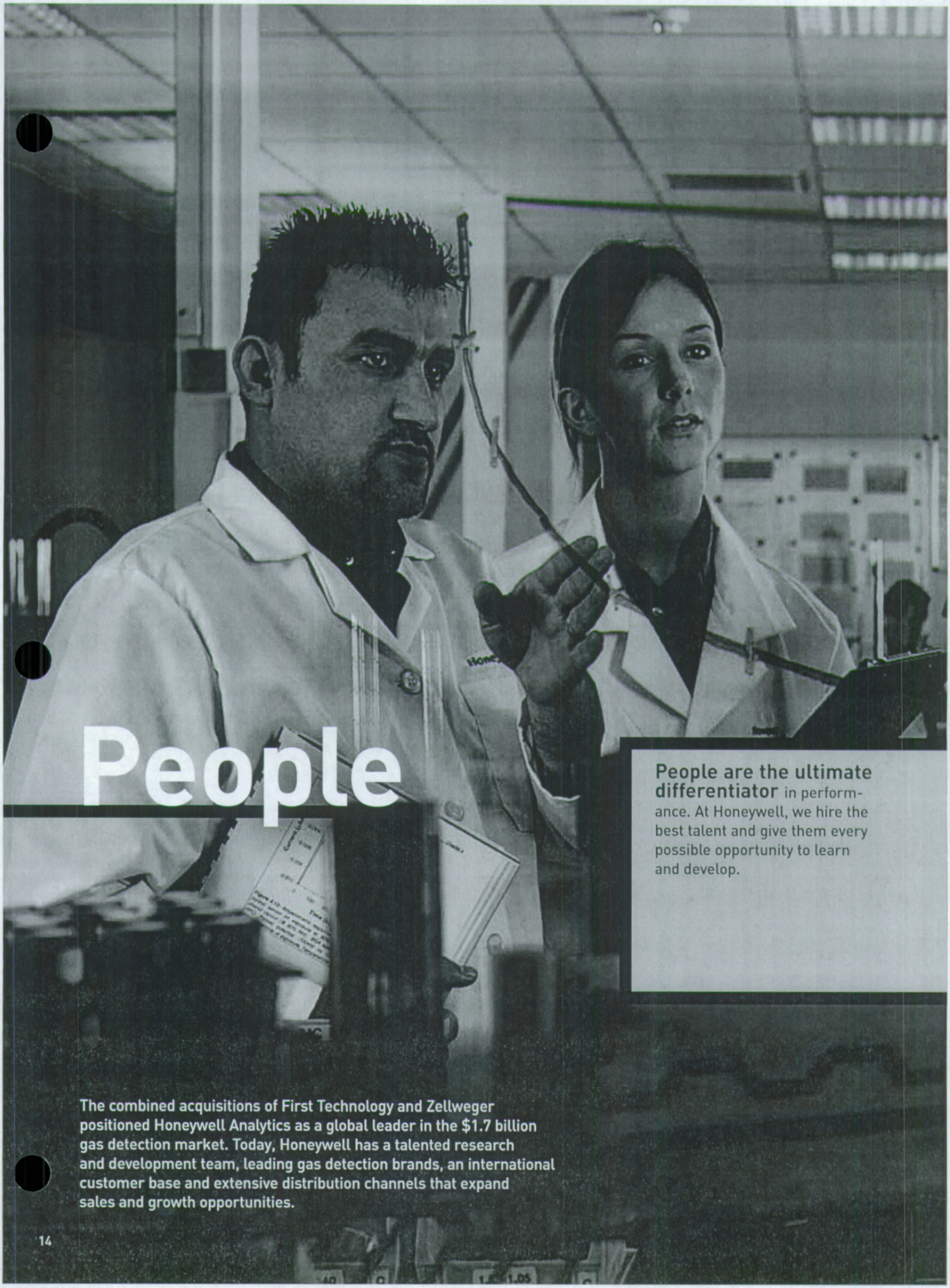
Our **disciplined approach to acquisitions works.** Since 2003, we have deployed nearly $3.9 billion net for acquisitions, adding about $3.5 billion in annualized sales. To date, approximately 90% of deals are meeting or exceeding their goals.

Since 2003, Honeywell has repurchased $3.8 billion of our common stock and **reduced the number of shares outstanding** by 7%.

Honeywell raised its annual dividend rate by

10%

in 2006, the third consecutive year of a 10% dividend increase.



People

People are the ultimate differentiator in performance. At Honeywell, we hire the best talent and give them every possible opportunity to learn and develop.

The combined acquisitions of First Technology and Zellweger positioned Honeywell Analytics as a global leader in the $1.7 billion gas detection market. Today, Honeywell has a talented research and development team, leading gas detection brands, an international customer base and extensive distribution channels that expand sales and growth opportunities.

Career development is a big deal at Honeywell. In 2006, more than

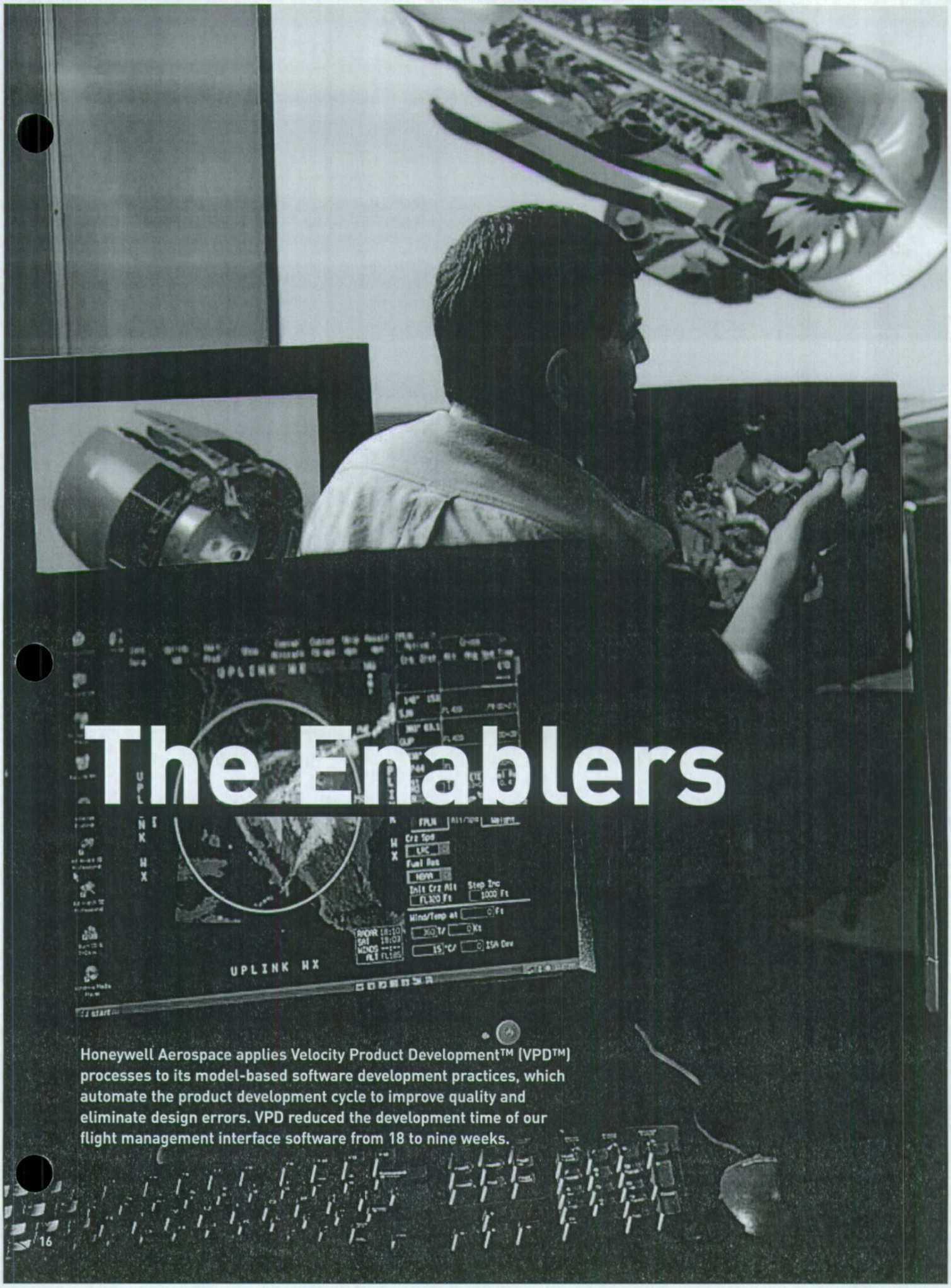
41,000

course registrants participated in contemporary, job-relevant learning from over 4,000 classroom-led and online courses.

Our employees are **rewarded for great work.** Our philosophy links rewards directly to business and individual performance. Managers give employees candid, constructive and actionable feedback to plan their career paths.

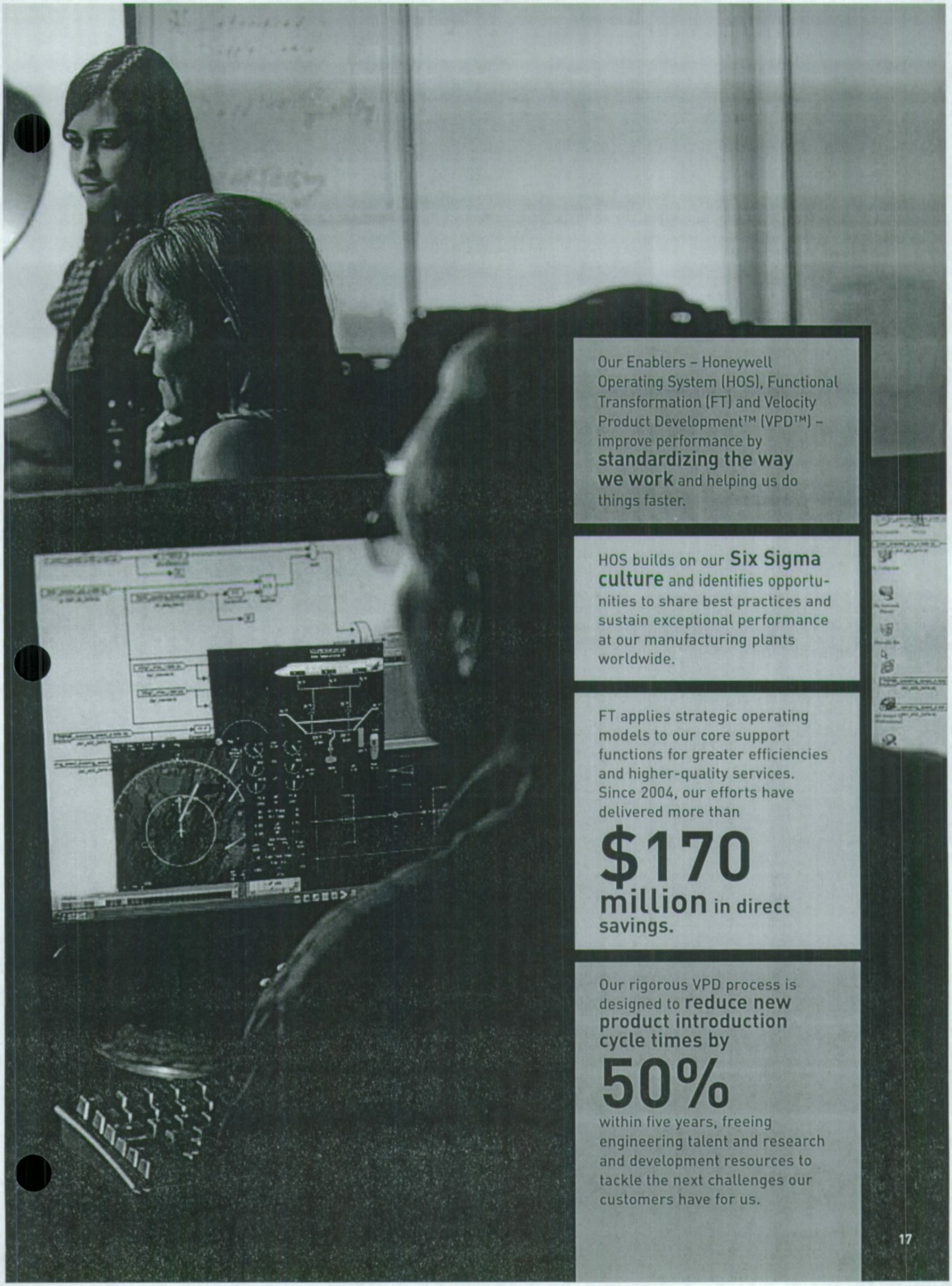
Challenging work that matters inspires our employees to think and perform beyond expectations every day. We give our employees career-growth opportunities, and it shows ... more than

65% **of Honeywell's top positions** are filled with internal candidates.



The Enablers

Honeywell Aerospace applies Velocity Product Development™ (VPD™) processes to its model-based software development practices, which automate the product development cycle to improve quality and eliminate design errors. VPD reduced the development time of our flight management interface software from 18 to nine weeks.



Our Enablers – Honeywell Operating System (HOS), Functional Transformation (FT) and Velocity Product Development™ (VPD™) – improve performance by **standardizing the way we work** and helping us do things faster.

HOS builds on our **Six Sigma culture** and identifies opportunities to share best practices and sustain exceptional performance at our manufacturing plants worldwide.

FT applies strategic operating models to our core support functions for greater efficiencies and higher-quality services. Since 2004, our efforts have delivered more than

$170 million in direct savings.

Our rigorous VPD process is designed to **reduce new product introduction cycle times by**

50%

within five years, freeing engineering talent and research and development resources to tackle the next challenges our customers have for us.

Photo below:
Howard University in Washington, D.C., is among the universities participating in the Honeywell – Nobel Initiative, a global education program connecting university students with Nobel Laureates in chemistry and physics.

Honeywell Hometown Solutions works on issues that make a difference and deliver life-changing results in our communities around the world.

Working with leading public and non-profit institutions, such as the National Aeronautics and Space Administration, the National Center for Missing & Exploited Children® and The Nobel Foundation, we develop powerful programs that inspire students, protect families, rebuild homes and help save lives. Our focused, disciplined approach addresses four vital societal areas: Science and Math Education; Family Safety and Security; Housing and Shelter; and Humanitarian Relief. In 2006, Honeywell Hometown Solutions earned 19 corporate social responsibility and cause-marketing industry awards.

Science and Math Education

Our future depends on a talented global workforce of engineers, scientists and technologists. To inspire the next generation of innovators, we develop programs for students from middle school through university. Our traveling science education program, FMA Live!, engages middle school students through hip-hop music and real-life science demonstrations. Honeywell Scholars @ Presidential Classroom brings high school students from around the world to Washington, D.C., to understand the interrelationships of public policy, scientific discovery and technological innovation. The Honeywell – Nobel Initiative enables university students worldwide to learn directly from Nobel Laureates through on-campus events, Web content and broadcast programming.

Honeywell Hometown

FMA Live! reached its **100,000th student** and 300th middle school since its launch in 2004.

450 teachers from 19 countries and 43 U.S. states have graduated from Honeywell Educators @ Space Academy, reaching an estimated 50,000 students annually.

329 high school students from **24 countries and 29 U.S. states** have participated in Honeywell Scholars @ Presidential Classroom to get a behind-the-scenes look at the relationship between technology and public policy.

Honeywell Educators @ Space Academy gives teachers new tools to bring science to life in their classrooms.

Family Safety and Security

Teaching safety skills children can use in their everyday lives has never been more important. Our Got 2B Safe! program teaches elementary students critical and potential life-saving lessons to protect against abduction. In 2006, Honeywell launched a partnership with Safe Kids to raise awareness of home safety practices and prevention against common childhood accidents, as well as a safety program with Child Find to deliver abduction-prevention education to first-grade students in Canada.

Housing and Shelter

Helping our neighbors live in the safety and comfort of their own homes is a priority for Honeywell. With Rebuilding Together®, our employee volunteers revitalize the homes of low-income, elderly and disabled homeowners in our communities.

Humanitarian Relief

Unique in the world of charitable giving, our Honeywell Humanitarian Relief Fund gives 100 percent of our employees' contributions to those who need the most help at their time of greatest need. Since 2005, our relief efforts have rebuilt more than 750 homes in Southeast Asia and four medical centers in Pakistan, and supported nearly 500 employees in the U.S. Gulf Coast and Mexico.

Photo below:
Our Safe Kids @ Home education campaign to raise awareness of home safety practices against common childhood accidents reached 80 schools and 60,000 students in Chengdu and Xi'an, China.

Solutions

Honeywell launched the Buddy System safety program with Child Find to teach abduction prevention to **every first-grade student** in Canada.

Through our partnership with Rebuilding Together®, more than 2,000 Honeywell volunteers have completed 115 rehabilitation projects, delivering **$5.6 million** in market value repairs.

After heavy rains and floods displaced thousands in Juarez, Mexico, the Honeywell Humanitarian Relief Fund helped **rebuild 130 homes** and provided monetary support for our employee disaster relief effort.

Aerospace

Honeywell Aerospace products can be found on virtually every type of commercial, business, general, military and spacecraft. Our primary focus is to make flight safer, more reliable and cost-effective through technology leadership, engineering excellence and customer-driven development.

Market Drivers

- Global flying hours increased by more than 5% in 2006, a trend expected to continue in 2007.
- Orders from business jet manufacturers remain strong with industry backlog approaching 2,500 aircraft; for the first time in history, global business jet deliveries are expected to exceed 1,000 in 2007.
- Over the next 20 years, nearly $80 billion worth of production value in our strategic markets is projected to open for competition, including guidance and navigation, integrated avionics and propulsion.

Honeywell won a

$404 million

contract for the Total InteGrated Engine Revitalization (TIGER) program to extend the life of engines used to power the Abrams family of vehicles.

Performance Highlights

- Sales increased 6% to $11.1 billion and segment profit was up 13% to $1.9 billion.
- Expanded long-term partner agreements, including a $230 million strategic supplier arrangement with US Airways; a 10-year exclusive service agreement with JetBlue; and selection of the Honeywell Runway Awareness and Advisory System by Air France for up to 248 Airbus and Boeing aircraft in its fleet.
- Continued growth in the defense and space segment with 2006 sales of more than $4.4 billion, including a $36 million agreement with Lockheed Martin and the Turkish and Greek Air Forces for F-16 displays; and Honeywell is a key partner in the Lockheed Martin team selected by NASA to build the Orion spacecraft, allowing us to serve U.S. space exploration well into the future.

Honeywell introduced Integrated Primary Flight Display (IPFD), a new family of synthetic vision safety products. Building on the 500 million operational flight hours of Honeywell's Enhanced Ground Proximity Warning System database, IPFD improves pilot situational awareness and decision-making. IPFD's first application will be the Gulfstream SV-PFD, available in 2007 on all Gulfstream PlaneView® equipped aircraft.

With more than 100 years of experience, a strong distributor network and our global team, Honeywell products and solutions optimize more than five million buildings. Many of the world's buildings and landmarks are managed using Honeywell security systems, energy services, and fire and life safety solutions.

Automation and Control Solutions

Honeywell Automation and Control Solutions (ACS) improves energy efficiency, life safety, climate control, air quality and productivity in homes, buildings, industrial sites and government facilities worldwide. Our sensing technologies enhance the performance and safety of medical, automotive, aviation, technology and consumer appliance applications. Our automated control processes improve productivity and profitability in some of the world's largest refineries and industrial settings.

Market Drivers

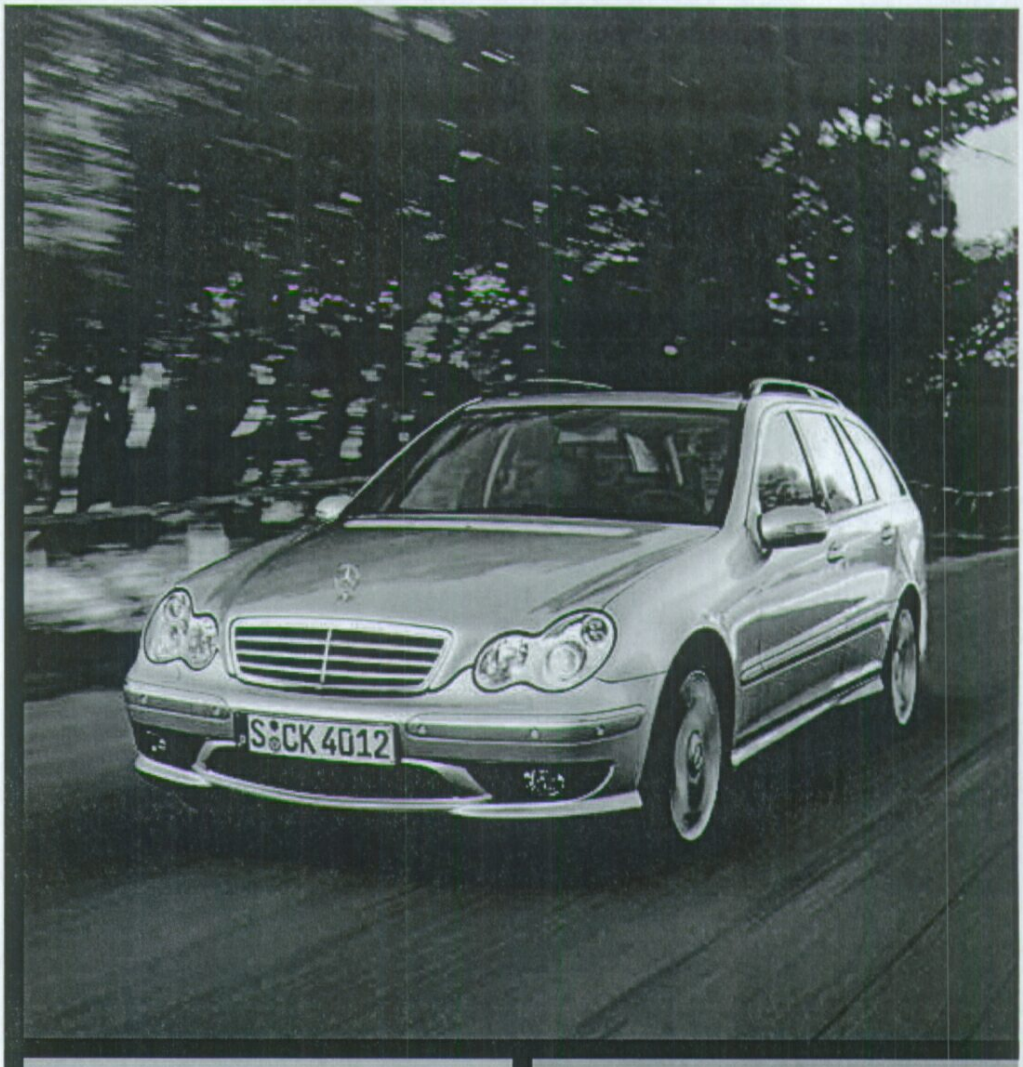
- Safety and security remain top priorities for individuals and institutions around the world.
- Rising energy costs and more stringent emissions standards are creating new opportunities to deliver greater efficiencies to industrial and commercial customers, as well as consumers.
- Growing populations and improved quality of life are accelerating infrastructure development in high-growth geographies, including China, the Middle East and India.

Relentless focus on customers, superior sales and marketing and differentiated technologies resulted in **206 new product introductions** in 2006.

Performance Highlights

- Sales increased 17% to $11.0 billion and segment profit was up 15% to $1.2 billion.
- Established Honeywell Analytics as a global leader in the growing gas sensing and detection industry.
- Achieved 10% organic growth driven by continued investments in differentiated technologies. Introduced significant new products across the fire detection, home comfort, building controls and industrial automation industries in 2006.
- Reached globalization milestones by opening our first office in Vietnam, securing a $16 million fire and gas system contract in India, and winning our first energy performance contract in China valued at $1.3 million.

Mercedes is one of several automakers introducing turbo diesel vehicle models in the U.S. over the next few years. Mercedes plans to increase its U.S. fleet of turbo diesel models to five starting in 2007, including its E320 Bluetec. Boosted by Honeywell turbochargers, the E320 Bluetec gets nearly 700 miles per tank without compromising on the performance that drivers demand.



Transportation Systems

Honeywell Transportation Systems technologies improve the efficiency, performance and appearance of cars, trucks and other vehicles. Turbo Technologies is a global leader in engine boosting systems, providing auto manufacturers around the world with solutions to improve fuel economy and reduce emissions without sacrificing performance. Honeywell's Consumer Products Group (CPG) has four top-selling consumer car care brands – FRAM®, Prestone®, Autolite® and Holts® – and is one of the world's largest suppliers of brake friction materials and products under the Bendix® and Jurid® brands.

Market Drivers

- Increasingly stringent emissions regulations and high fuel costs continue to drive consumer demand for greater fuel economy.
- Turbo boosting is expected to expand three times faster than the global automotive industry growth rate, representing a third of all vehicles produced worldwide by 2010.
- Car ownership in China and India is expected to grow at a double-digit pace annually.
- Consumers are keeping their vehicles longer, increasing demand for aftermarket car care and performance solutions.

Turbo Technologies had a **win rate greater than 60%** on all passenger vehicle platforms and a win rate greater than 70% on all commercial vehicle platforms awarded worldwide.

Performance Highlights

- Sales increased 2% to $4.6 billion and segment profit was up 3% to $574 million.
- Turbo Technologies introduced the world's first parallel sequential dual-stage turbo application, delivering up to 30% more torque than conventional turbodiesel engines. The application will be launched on the Peugeot 407 and 607 and the Citroën C5 and C6 passenger vehicles.
- Turbo Technologies was awarded new platforms from Audi, BMW, Caterpillar, DaimlerChrysler, Deere, Fiat, Ford, General Motors, Nissan, Renault, Tata and Toyota in 2006.
- CPG is test marketing Honeywell Automotive Service Centers in China. The centers will sell and install Honeywell's oil and air filters, antifreeze, spark plugs and brake pads, among other products.

Specialty Materials

Honeywell Specialty Materials is a global leader in developing and manufacturing high-purity, high-quality and high-performance chemicals and materials. Our technologies help solve customers' toughest challenges, from refrigerants that replace ozone-depleting CFCs and HCFCs, fibers that stop bullets and films that extend food shelf-life to research chemicals that speed drug discovery, electronic materials that improve semiconductor production and refining technologies that address growing energy demands.

Market Drivers

- High refinery capacity utilization is increasing investment in refining process technologies; rising petroleum costs and stricter government environmental mandates are driving emphasis on alternative and renewable energy sources.
- The Montreal Protocol continues to drive the global phase-out of ozone-depleting substances such as CFCs and HCFCs.
- Greater microchip complexity, growth in consumer electronics and flat panel displays are expanding opportunities for our Electronic Materials business.

20% of 2006 sales across the Specialty Materials' portfolio derived from products introduced in the past five years.

Performance Highlights

- Sales increased 43% to $4.6 billion and segment profit was up 121% to $568 million in 2006.
- UOP established a new business dedicated to developing innovative technologies for converting renewable bio-feedstocks into fuel and chemicals.
- Specialty Materials will triple its laboratory space in its Asia Technology Center to boost research and development capabilities and meet increasing customer needs in Asian markets.
- Fluorine Products announced a patented developmental refrigerant for automotive air-conditioning applications that will meet 2011 European Union environmental standards for reducing the use of substances with global warming potential.

The new 9.7-acre roof for the Louisiana Superdome in New Orleans was constructed using closed-cell polyurethane spray foam insulation formulated with Honeywell Enovate® blowing agent. The 70,000-seat venue was severely damaged by Hurricane Katrina in 2005. The new roof is guaranteed to resist hurricane-force winds by the manufacturer, BaySystems North America, a subsidiary of Bayer MaterialScience LLC.

Board of Directors ***(from left to right)***

Front: David M. Cote, Linnet F. Deily
Middle: Lord Clive R. Hollick, Ivan G. Seidenberg, D. Scott Davis, General Eric K. Shinseki
Back: James J. Howard, Jaime Chico Pardo, Michael W. Wright, Bradley T. Sheares, Ph.D., John R. Stafford, Gordon M. Bethune, Russell E. Palmer

Form 10-K

Board of Directors

David M. Cote
Chairman and
Chief Executive Officer
Honeywell International Inc.
Age: 54; elected in 2002

Gordon M. Bethune[2, 3]
Chairman of the Board
Aloha Airgroup, Inc.
(a privately held Honolulu-based airline)
Age: 65; elected in 1999

Jaime Chico Pardo[2, 4]
Chairman of the Board
Telefonos de Mexico S.A. de C.V. (TELMEX) (telecommunications)
Age: 57; elected in 1999

D. Scott Davis[1, 4]
Vice Chairman and
Chief Financial Officer
UPS (package delivery, transportation and logistics services)
Age: 55; elected in 2005

Linnet F. Deily[1, 4]
Former Deputy
United States Trade Representative (USTR)
Age: 61; elected in 2006

Lord Clive R. Hollick[3, 4]
Partner
Kohlberg Kravis Roberts & Co. (private equity firm)
Age: 61; elected in 2003

James J. Howard[1, 4]
Chairman Emeritus
Xcel Energy Inc.
(energy company)
Age: 71; elected in 1999

Russell E. Palmer[1, 2]
Chairman and
Chief Executive Officer
The Palmer Group (private investment firm)
Age: 72; elected in 1987

Ivan G. Seidenberg[2, 3]
Chairman and
Chief Executive Officer
Verizon Communications Inc.
(telecommunications and information services provider)
Age: 60; elected in 1995

Bradley T. Sheares, Ph.D.[3, 4]
Chief Executive Officer
Reliant Pharmaceuticals, Inc.
(pharmaceutical)
Age: 50; elected in 2004

General Eric K. Shinseki[1, 2]
Retired U.S. Army Chief of Staff
(U.S. military)
Age: 64; elected in 2003

John R. Stafford[1, 3]
Retired Chairman of the Board
Wyeth (pharmaceutical, health care and animal health products)
Age: 69; elected in 1993

Michael W. Wright[1, 4]
Retired Chairman, President and
Chief Executive Officer
SUPERVALU INC. (food distributor and retailer)
Age: 68; elected in 1999

Committees of the Board

1. Audit Committee
   D. Scott Davis, Chair

2. Corporate Governance and Responsibility Committee
   Russell E. Palmer, Chair

3. Management Development and Compensation Committee
   John R. Stafford, Chair

4. Retirement Plans Committee
   Michael W. Wright, Chair

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Form 10-K

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2006

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission file number 1-8974

Honeywell International Inc.

(Exact name of registrant as specified in its charter)

DELAWARE	22-2640650
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
101 Columbia Road Morris Township, New Jersey	07962
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (973)455-2000

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, par value $1 per share*	New York Stock Exchange Chicago Stock Exchange
Zero Coupon Serial Bonds due 2009	New York Stock Exchange
9½% Debentures due June 1, 2016	New York Stock Exchange

* The common stock is also listed for trading on the London Stock Exchange.

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes X No _

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes _ No X

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes X No _

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer. See definition of "accelerated filer and large accelerated filer" in Rule 12b-2 of the Exchange Act. (Check One):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes _ No X

The aggregate market value of the voting stock held by nonaffiliates of the Registrant was approximately $33.0 billion at June 30, 2006.

There were 799,927,635 shares of Common Stock outstanding at January 31, 2007.

Documents Incorporated by Reference

Part III: Proxy Statement for Annual Meeting of Shareowners to be held April 23, 2007.

TABLE OF CONTENTS

	Item		Page
Part I.	1.	Business	1
	1A.	Risk Factors	10
	1B.	Unresolved Staff Comments	14
	2.	Properties	14
	3.	Legal Proceedings	15
	4.	Submission of Matters to a Vote of Security Holders	16
		Executive Officers of the Registrant	17
Part II.	5.	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	18
	6.	Selected Financial Data	20
	7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	20
	7A.	Quantitative and Qualitative Disclosures About Market Risk	44
	8.	Financial Statements and Supplementary Data	45
	9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	98
	9A.	Controls and Procedures	98
	9B.	Other Information	99
Part III.	10.	Directors and Executive Officers of the Registrant	99
	11.	Executive Compensation	99
	12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	99
	13.	Certain Relationships and Related Transactions	99
	14.	Principal Accounting Fees and Services	99
Part IV.	15.	Exhibits and Financial Statement Schedules	100
Signatures			101

PART I.

Item 1. Business

Honeywell International Inc. (Honeywell) is a diversified technology and manufacturing company, serving customers worldwide with aerospace products and services, control, sensing and security technologies for buildings, homes and industry, turbochargers, automotive products, specialty chemicals, electronic and advanced materials, and process technology for refining and petrochemicals. Honeywell was incorporated in Delaware in 1985.

We maintain an internet website at http://www.honeywell.com. Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to those reports, are available free of charge on our website under the heading "Investor Relations" (see "SEC Filings & Reports") immediately after they are filed with, or furnished to, the Securities and Exchange Commission (SEC). In addition, in this Form 10-K, the Company incorporates by reference certain information from parts of its proxy statement for the 2007 Annual Meeting of Stockholders, which we expect to file with the SEC on or about March 12, 2007, and which will also be available free of charge at our website.

Information relating to corporate governance at Honeywell, including Honeywell's Code of Business Conduct, Corporate Governance Guidelines and Charters of the Committees of the Board of Directors are also available, free of charge, on our website under the heading "Investor Relations" (see "Corporate Governance"), or by writing to Honeywell, 101 Columbia Road, Morris Township, New Jersey 07962, c/o Vice President and Corporate Secretary. Honeywell's Code of Business Conduct applies to all Honeywell directors, officers (including the Chief Executive Officer, Chief Financial Officer and Controller) and employees.

The certifications of our Chief Executive Officer and Chief Financial Officer pursuant to Section 302 and Section 906 of the Sarbanes-Oxley Act of 2002 about the disclosure contained in this Annual Report on Form 10-K are included as Exhibits 31.1, 31.2, 32.1 and 32.2 to this Annual Report and are available free of charge on our website under the heading "Investor Relations" (see "SEC Filings & Reports"). Our Chief Executive Officer certified to the New York Stock Exchange (NYSE) on May 23, 2006, pursuant to Section 303A.12 of the NYSE's listing standards, that he was not aware of any violation by Honeywell of the NYSE's corporate governance listing standards as of that date.

Major Businesses

We globally manage our business operations through four businesses that are reported as operating segments: Aerospace, Automation and Control Solutions, Specialty Materials and Transportation Systems. Financial information related to our operating segments is included in Note 23 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data."

The major products/services, customers/uses and key competitors of each of our operating segments follows:

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Aerospace			
Turbine propulsion engines	TFE731 turbofan TFE1042 turbofan ATF3 turbofan F124 turbofan ALF502 turbofan LF507 turbofan CFE738 turbofan HTF 7000 turbofan T53, T55 turboshaft T800 turboshaft TF40B/50A HTS9000 LT101-650/750/850 HTF5000 AGT1500 turboshaft Repair, overhaul and spare parts	Business, regional, general aviation and military trainer aircraft Commercial and military helicopters Military vehicles	United Technologies Rolls Royce/Allison Turbomeca Williams

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Auxiliary power units (APUs)	Airborne auxiliary power units Jet fuel starters Secondary power systems Ground power units Repair, overhaul and spare parts	Commercial, regional, business and military aircraft Ground power	United Technologies
Environmental control systems	Air management systems: Air conditioning Bleed air Cabin pressure control Air purification and treatment Gas Processing Heat Exchangers Turbo Systems Repair, overhaul and spare parts	Commercial, regional and general aviation aircraft Military aircraft Ground vehicles Spacecraft	Auxilec Barber Colman Dukes Eaton-Vickers Goodrich Liebherr Pacific Scientific Parker Hannifin Smiths TAT United Technologies
Electric power systems	Generators Power distribution & control Power conditioning Repair, overhaul and spare parts	Commercial, regional, business and military aircraft	Goodrich Safran Smiths United Technologies
Engine systems and accessories	Electronic and hydromechanical fuel controls Engine start systems Electronic engine controls Sensors Valves Electric and pneumatic power generation systems Thrust reverser actuation, pneumatic and electric	Commercial, regional and general aviation aircraft Military aircraft	BAE Controls Goodrich Parker Hannifin United Technologies
Aircraft hardware distribution	Fasteners, including nuts, bolts, rivets, clamps and pins Bearings, including ball, roller, spherical, needle and ceramic Electrical hardware, including connectors, components, lighting products, terminals, and wire and wiring accessories Seals, including seals, o-rings, gaskets and packings Value-added services, repair and overhaul kitting and point-of-use replenishment	Commercial, regional, business and military aviation aircraft	Anixter Arrow Pemco Avnet BE Aerospace (M&M Aerospace) Fairchild Direct Satair Wencor Wesco Aircraft
Avionics systems	Flight safety systems: Enhanced Ground Proximity Warning Systems (EGPWS) Traffic Alert and Collision Avoidance Systems (TCAS) Windshear detection systems Flight data and cockpit voice recorders Weather radar Communication, navigation and surveillance systems: Navigation & communication radios Global positioning systems Satellite systems Integrated systems	Commercial, business and general aviation aircraft Government aviation	BAE Boeing/Jeppesen Garmin Goodrich Kaiser L3 Lockheed Martin Northrop Grumman Rockwell Collins Smiths Thales Trimble/Terra Universal Avionics Universal Weather

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Avionics systems (continued)	Flight management systems Cockpit display systems Data management and aircraft performance monitoring systems Aircraft information systems Network file servers Wireless network transceivers Weather information network Navigation database information Cabin management systems Vibration detection and monitoring Mission management systems Tactical data management systems		
Aircraft and Obstruction lighting	Inset lights Regulators Tower and obstruction lights Interior and exterior aircraft lighting	Commercial, regional, business, helicopter and military aviation aircraft (operators, OEMs, parts distributors and MRO service providers) General contractors (building and tower manufacturers), cell phone companies	Bruce Hella/Goodrich LSI Luminator Siemens Whelen
Inertial sensor	Inertial sensor systems for guidance, stabilization, navigation and control Gyroscopes, accelerometers, inertial measurement units and thermal switches	Military and commercial vehicles Commercial spacecraft and launch vehicles Commercial, regional, business and military aircraft Transportation Missiles Munitions	Astronautics-Kearfott BAE Ball GEC L3 Com KVH Northrop Grumman Rockwell Smiths
Control products	Radar altimeters Pressure products Air data products Thermal switches Magnetic sensors	Military aircraft Missiles, UAVs Commercial applications	Ball Brothers BAE Druck Goodrich NavCom Northrop Grumman Rosemount Solarton
Space products and subsystems	Guidance subsystems Control subsystems Processing subsystems Radiation hardened electronics and integrated circuits GPS-based range safety systems	Commercial and military-spacecraft DoD FAA NASA	BAE Ithaco L3 Northrop Grumman Raytheon
Management and technical services	Maintenance/operation and provision of space systems, services and facilities Systems engineering and integration Information technology services Logistics and sustainment	U.S. government space (NASA) DoD (logistics and information services) FAA DoE Local governments Commercial space ground segment systems and services	Bechtel Boeing Computer Sciences Dyncorp ITT Lockheed Martin Raytheon SAIC The Washington Group United Space Alliance

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Landing systems	Wheels and brakes Wheel and brake repair and overhaul services	Commercial airline, regional, business and military aircraft High performance commercial vehicles USAF, DoD, DoE Boeing, Airbus, Lockheed Martin	Dunlop Standard Aerospace Goodrich K&F Industries Messier-Bugatti NASCO
Automation and Control Solutions			
Environmental combustion controls; sensing controls	Heating, ventilating and air conditioning controls and components for homes and buildings Indoor air quality products including zoning, air cleaners, humidification, heat and energy recovery ventilators Controls plus integrated electronic systems for burners, boilers and furnaces Consumer household products including humidifiers and thermostats Electrical devices and switches Water controls Sensors, measurement, control and industrial components	Original equipment manufacturers (OEMs) Distributors Contractors Retailers System integrators Commercial customers and homeowners served by the distributor, wholesaler, contractor, retail and utility channels Package and materials handling operations Appliance manufacturers Automotive companies Aviation companies Food and beverage processors Medical equipment Heat treat processors Computer and business equipment manufacturers	Bosch Cherry Danfoss Eaton Emerson Endress & Hauser Holmes Invensys Johnson Controls Motorola Schneider Siemens United Technologies Yamatake
Security and life safety products and services	Security products and systems Fire products and systems Access controls and closed circuit television Home health monitoring and nurse call systems Gas detection products and systems Emergency lighting	OEMs Retailers Distributors Commercial customers and homeowners served by the distributor, wholesaler, contractor, retail and utility channels Health care organizations Security monitoring service providers	Bosch Draeger GE Mine Safety Appliances Pelco Phillips Riken Keiki Siemens SPX Tyco United Technologies
Process automation products and solutions	Advanced control software and industrial automation systems for control and monitoring of continuous, batch and hybrid operations Production management software Communications systems for Industrial Control equipment and systems Consulting, networking engineering and installation Process control instrumentation Field instrumentation Analytical instrumentation Recorders Controllers Critical environment control solutions and services Aftermarket maintenance, repair and upgrade	Refining and petrochemical companies Chemical manufacturers Oil and gas producers Food and beverage processors Pharmaceutical companies Utilities Film and coated producers Pulp and paper industry Continuous web producers in the paper, plastics, metals, rubber, non-wovens and printing industries Mining and mineral industries	ABB AspenTech Emerson Invensys Siemens Yokogawa

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Building solutions and services	HVAC and building control solutions and services Energy management solutions and services Security and asset management solutions and services Enterprise building integration solutions Building information services Airport lighting and systems, visual docking guidance systems	Building managers and owners Contractors, architects and developers Consulting engineers Security directors Plant managers Utilities Large global corporations Public school systems Universities Local governments Public housing agencies Airports	Ameresco GroupMac Ingersoll Rand Invensys Johnson Controls Local contractors and utilities Safegate Schneider Siemens Trane Thorn United Technologies
Specialty Materials			
Resins & chemicals	Nylon polymer Caprolactam Ammonium sulfate Cyclohexanone Cyclophexanol (KA Oil)	Nylon for carpet fibers, engineered resins and packaging Fertilizer ingredients Specialty chemicals	BASF DSM
Hydrofluoric acid (HF)	Anhydrous and aqueous hydrofluoric acid	Fluorocarbons Steel Oil refining Chemical intermediates	Ashland E. Merck Hashimoto Norfluor Quimica Fluor
Fluorocarbons	Genetron® refrigerants, aerosol and insulation foam blowing agents Genesolv® solvents Oxyfume sterilant gases Ennovate 3000 blowing agent for refrigeration insulation	Refrigeration Air conditioning Polyurethane foam Precision cleaning Optical Appliances Hospitals Medical equipment manufacturers	Arkema Dupont Solvay-Solexis Ineos
Fluorine specialties	Sulfur hexafluoride (SF_6) Iodine pentafluoride (IF_5) Antimony pentafluoride (SbF_5)	Electric utilities Magnesium gear manufacturers	Air Products Asahi Glass Solvay-Solexis
Nuclear services	UF_6 conversion services	Nuclear fuel Electric utilities	Cameco Comurhex Rosatom
Research and fine chemicals	Oxime-based fine chemicals Fluoroaromatics High-purity solvents	Agrichemicals Biotech	Avecia Degussa DSM E. Merck Thermo Fisher Scientific Lonza Sigma-Aldrich
Performance chemicals Imaging chemicals Chemical processing Sealants	HF derivatives Fluoroaromatics Catalysts Oxime-silanes	Diverse by product type	Atotech BASF DSM
Advanced fibers & composites	High modulus polyethylene fiber and shield composites Aramid shield composites	Bullet resistant vests, helmets and other armor applications Cut-resistant gloves Rope & cordage	DuPont DSM Teijin
Specialty films	Cast nylon film Bi-axially oriented nylon film Fluoropolymer film	Food and pharmaceutical packaging	American Biaxis CFP Daikin Kolon Unitika
Specialty additives	Polyethylene waxes Paraffin waxes and blends PVC lubricant systems Processing aids Luminescent pigments	Coatings and inks PVC pipe, siding & profiles Plastics Reflective coatings Safety & security applications	BASF Clariant Eastman

Product/Service Classes	Major Products/Services	Major Customers/Uses	Key Competitors
Electronic chemicals	Ultra high-purity HF Inorganic acids Hi-purity solvents	Semiconductors	Air Products Arch E. Merck
Semiconductor materials and services	Interconnect-dielectrics Interconnect-metals Semiconductor packaging materials Advanced polymers Sapphire substrates Anti-reflective coatings Thermo-couples	Semiconductors Microelectronics Telecommunications	BASF Brewer Dow Corning Foxconn Japan Energy Kyocera Shinko
Catalysts, adsorbents and specialties	Catalysts Molecular sieves Adsorbents Customer catalyst manufacturing	Petroleum, refining, petrochemical, and manufacturing industries	Akzo Nobel Axens BASF Davison Grace Haldor Shell/Criterion Sud Chemie
Process technology and equipment	Design of process units and systems Engineered products Proprietary equipment Technical personnel and training development	Petroleum refining, petrochemical, and gas processing	ABB Lummus Axens Exxon-Mobil Haldor Koch Glitch Phillips Shell/Criterion Stratco
Transportation Systems			
Charge-air systems	Turbochargers for gasoline and diesel engines	Passenger car, truck and off-highway OEMs Engine manufacturers Aftermarket distributors and dealers	Borg-Warner Holset IHI MHI
Thermal systems	Exhaust gas coolers Charge-air coolers Aluminum radiators Aluminum cooling modules	Passenger car, truck and off-highway OEMs Engine manufacturers Aftermarket distributors and dealers	Behr Modine Valeo
Aftermarket filters, spark plugs, electronic components and car care products	Oil, air, fuel, transmission and coolant filters PCV valves Spark plugs Wire and cable Antifreeze/coolant Windshield washer fluids Waxes, washes and specialty cleaners	Automotive and heavy vehicle aftermarket channels, OEMs and Original Equipment Service Providers (OES) Auto supply retailers Specialty installers Mass merchandisers	AC Delco Bosch Champion Mann & Hummel NGK Peak/Old World Industries Purolator STP/ArmorAll Turtle Wax Zerex/Valvoline
Brake hard parts and other friction materials	Disc brake pads and shoes Drum brake linings Brake blocks Disc and drum brake components Brake hydraulic components Brake fluid Aircraft brake linings Railway linings	Automotive and heavy vehicle OEMs, OES, brake manufacturers and aftermarket channels Mass merchandisers Installers Railway and commercial/ military aircraft OEMs and brake manufacturers	Akebono Federal-Mogul ITT Galfer JBI TMD

Aerospace Sales

Our sales to aerospace customers were 35 percent of our total sales in 2006 and 38 percent of our total sales in each of 2005 and 2004. Our sales to commercial aerospace original equipment manufacturers were 10, 9 and 8 percent of our total sales in 2006, 2005 and 2004, respectively. In addition, our sales to commercial aftermarket customers of aerospace products and services were 11, 15 and 16 percent of our total sales in 2006, 2005 and 2004, respectively. Our Aerospace results of operations can be impacted by various industry and economic conditions. See "Item 1A. Risk Factors."

U.S. Government Sales

Sales to the U.S. Government (principally by our Aerospace segment), acting through its various departments and agencies and through prime contractors, amounted to $3,688, $3,719 and $3,464 million in 2006, 2005 and 2004, respectively, which included sales to the U.S. Department of Defense, as a prime contractor and subcontractor, of $3,052, $2,939 and $2,808 million in 2006, 2005 and 2004, respectively. U.S. defense spending increased in 2006 and is also expected to increase in 2007. We do not expect to be significantly affected by any proposed changes in 2007 federal spending due principally to the varied mix of the government programs which impact us (OEM production, engineering development programs, aftermarket spares and repairs and overhaul programs). Our contracts with the U.S. Government are subject to audits, investigations, and termination by the government. See "Item 1A. Risk Factors."

Backlog

Our total backlog at December 31, 2006 and 2005 was $10,674 and $9,327 million, respectively. We anticipate that approximately $8,162 million of the 2006 backlog will be filled in 2007. We believe that backlog is not necessarily a reliable indicator of our future sales because a substantial portion of the orders constituting this backlog may be canceled at the customer's option.

Competition

We are subject to active competition in substantially all product and service areas. Competition is expected to continue in all geographic regions. Competitive conditions vary widely among the thousands of products and services provided by us, and vary country by country. Depending on the particular customer or market involved, our businesses compete on a variety of factors, such as price, quality, reliability, delivery, customer service, performance, applied technology, product innovation and product recognition. Brand identity, service to customers and quality are generally important competitive factors for our products and services, and there is considerable price competition. Other competitive factors for certain products include breadth of product line, research and development efforts and technical and managerial capability. While our competitive position varies among our products and services, we believe we are a significant competitor in each of our major product and service classes. However, a number of our products and services are sold in competition with those of a large number of other companies, some of which have substantial financial resources and significant technological capabilities. In addition, some of our products compete with the captive component divisions of original equipment manufacturers.

International Operations

We are engaged in manufacturing, sales, service and research and development mainly in the United States, Europe, Canada, Asia and Latin America. U.S. exports and foreign manufactured products are significant to our operations. U.S. exports comprised 11, 10 and 9 percent of our total sales in 2006, 2005 and 2004, respectively. Foreign manufactured products and services, mainly in Europe, were 37, 35 and 35 percent of our total sales in 2006, 2005 and 2004, respectively.

Approximately 19 percent of total 2006 sales of Aerospace-related products and services were exports of U.S. manufactured products and systems and performance of services such as aircraft repair and overhaul. Exports were principally made to Europe, Canada, Asia and Latin America. Foreign manufactured products and systems and performance of services comprised approximately 14 percent of total 2006 Aerospace sales. The principal manufacturing facilities outside the U.S. are in Europe, with less significant operations in Canada and Asia.

Approximately 2 percent of total 2006 sales of Automation and Control Solutions products were exports of U.S. manufactured products. Foreign manufactured products and performance of services accounted for 55 percent of total 2006 sales of Automation and Control Solutions. The principal manufacturing facilities outside the U.S. are in Europe with less significant operations in Asia, Canada and Latin America.

Approximately 25 percent of total 2006 sales of Specialty Materials products were exports of U.S. manufactured products. Exports were principally made to Asia, Europe, Latin America and Canada.

Foreign manufactured products comprised 22 percent of total 2006 sales of Specialty Materials. The principal manufacturing facilities outside the U.S. are in Europe, with less significant operations in Asia and Canada.

Exports of U.S. manufactured products comprised 1 percent of total 2006 sales of Transportation Systems products. Foreign manufactured products accounted for 63 percent of total 2006 sales of Transportation Systems. The principal manufacturing facilities outside the U.S. are in Europe, with less significant operations in Asia, Latin America and Canada.

Financial information including net sales and long-lived assets related to geographic areas is included in Note 24 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data". Information regarding the economic, political, regulatory and other risks associated with international operations is included in "Item 1A. Risk Factors."

Raw Materials

The principal raw materials used in our operations are generally readily available. We experienced no significant or unusual problems in the purchase of key raw materials and commodities in 2006. We are not dependent on any one supplier for a material amount of our raw materials, except related to phenol, a raw material used in our Specialty Materials segment. We purchase phenol under a supply agreement with one supplier. We have no reason to believe there is any material risk to this supply.

We are highly dependent on our suppliers and subcontractors in order to meet commitments to our customers. In addition, many major components and product equipment items are procured or subcontracted on a sole-source basis with a number of domestic and foreign companies. We maintain a qualification and performance surveillance process to control risk associated with such reliance on third parties. While we believe that sources of supply for raw materials and components are generally adequate, it is difficult to predict what effects shortages or price increases may have in the future.

The costs of certain key raw materials, including natural gas, benzene (the key component in phenol) and fluorspar in our Specialty Materials' business, steel and nickel in our Transportation Systems business, and nickel, titanium and other metals in our Aerospace business, were at historically high levels in 2006 and are expected to remain at high price levels. In addition, in 2006 certain large long-term fixed supplier price agreements expired, primarily relating to components used by our Aerospace business, which in the aggregate, subjected us to higher volatility in certain component costs. We will continue to attempt to offset raw material cost increases with formula price agreements, price increases and hedging activities where feasible. We have no reason to believe a shortage of raw materials will cause any material adverse impact during 2007. See "Item 1A. Risk Factors" for further discussion.

Patents, Trademarks, Licenses and Distribution Rights

Our reportable segments are not dependent upon any single patent or related group of patents, or any licenses or distribution rights. We own, or are licensed under, a large number of patents, patent applications and trademarks acquired over a period of many years, which relate to many of our products or improvements to those products and which are of importance to our business. From time to time, new patents and trademarks are obtained, and patent and trademark licenses and rights are acquired from others. We also have distribution rights of varying terms for a number of products and services produced by other companies. In our judgment, those rights are adequate for the conduct of our business. We believe that, in the aggregate, the rights under our patents, trademarks and licenses are generally important to our operations, but we do not consider any patent, trademark or related group of patents, or any licensing or distribution rights related to a specific process or product, to be of material importance in relation to our total business. See "Item 1A. Risk Factors" for further discussion.

We have registered trademarks for a number of our products and services, including Honeywell, UOP, Prestone, FRAM, Autolite, Bendix, Jurid, Holts, Garrett, Ademco, Fire-Lite, Notifier, System Sensor, MK, Novar, Genetron, Enovate, Spectra, Aclar, Simoniz and Redex.

Research and Development

Our research activities are directed toward the discovery and development of new products, technologies and processes and the development of new uses for existing products. The Company has research and development activities in the U.S., Europe, India and China.

Research and development (R&D) expense totaled $1,411, $1,072 and $917 million in 2006, 2005 and 2004, respectively. The increase in R&D expense in 2006 compared to 2005 of 32 percent was primarily due to the impact of additional R&D expense for UOP in Specialty Materials as well as product, design and development costs in Aerospace and Automation and Control Solutions. The increase in research and development expense in 2005 compared with 2004 of 17 percent resulted primarily from design and developments costs associated with new aircraft platforms in Aerospace and new product development costs in Automation and Control Solutions. Customer-sponsored (principally the U.S. Government) R&D activities amounted to an additional $777, $694 and $593 million in 2006, 2005 and 2004, respectively.

Environment

We are subject to various federal, state, local and foreign government requirements regulating the discharge of materials into the environment or otherwise relating to the protection of the environment. It is our policy to comply with these requirements, and we believe that, as a general matter, our policies, practices and procedures are properly designed to prevent unreasonable risk of environmental damage, and of resulting financial liability, in connection with our business. Some risk of environmental damage is, however, inherent in some of our operations and products, as it is with other companies engaged in similar businesses.

We are and have been engaged in the handling, manufacture, use and disposal of many substances classified as hazardous or toxic by one or more regulatory agencies. We believe that, as a general matter, our policies, practices and procedures are properly designed to prevent unreasonable risk of environmental damage and personal injury, and that our handling, manufacture, use and disposal of these substances are in accord with environmental and safety laws and regulations. It is possible, however, that future knowledge or other developments, such as improved capability to detect substances in the environment or increasingly strict environmental laws and standards and enforcement policies, could bring into question our current or past handling, manufacture, use or disposal of these substances.

Among other environmental requirements, we are subject to the federal superfund and similar state and foreign laws and regulations, under which we have been designated as a potentially responsible party that may be liable for cleanup costs associated with current and former operating sites and various hazardous waste sites, some of which are on the U.S. Environmental Protection Agency's superfund priority list. Although, under some court interpretations of these laws, there is a possibility that a responsible party might have to bear more than its proportional share of the cleanup costs if it is unable to obtain appropriate contribution from other responsible parties, we have not had to bear significantly more than our proportional share in multi-party situations taken as a whole.

Further information, including the current status of significant environmental matters and the financial impact incurred for remediation of such environmental matters, if any, is included in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations," in Note 21 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data," and in "Item 1A. Risk Factors."

Employees

We have approximately 118,000 employees at December 31, 2006, of which approximately 56,000 were located in the United States.

Item 1A. Risk Factors

Cautionary Statement about Forward-Looking Statements

We have described many of the trends and other factors that drive our business and future results in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations", including the discussion of economic and other factors and areas of focus for 2007 for the Company and/or each of our segments. These sections and other parts of this report (including this Item 1A) contain "forward-looking statements" within the meaning of Section 21E of the Securities Exchange Act of 1934.

Forward-looking statements are those that address activities, events or developments that management intends, expects, projects, believes or anticipates will or may occur in the future. They are based on management's assumptions and assessments in light of past experience and trends, current conditions, expected future developments and other relevant factors. They are not guarantees of future performance, and actual results, developments and business decisions may differ significantly from those envisaged by our forward-looking statements. We do not undertake to update or revise any of our forward-looking statements. Our forward-looking statements are also subject to risks and uncertainties that can affect our performance in both the near-and long-term. These forward-looking statements should be considered in light of the information included in this Form 10-K, including, in particular, the factors discussed below.

Risk Factors

Our business, operating results, cash flows and financial condition are subject to various risks and uncertainties, including, without limitation, those set forth below, any one of which could cause our actual results to vary materially from recent results or from our anticipated future results.

Industry and economic conditions may adversely affect the market and operating conditions of our customers, which in turn can affect demand for our products and services and our results of operations.

The operating results of our segments are impacted by general industry and economic conditions that can cause changes in spending and capital investment patterns, demand for our products and services and the level of our manufacturing costs. The operating results of our Aerospace segment, which generated 35 percent of our consolidated revenues in 2006, are directly tied to cyclical industry and economic conditions, including global demand for air travel as reflected in new aircraft production and/or the retirement of older aircraft, global flying hours, and business and general aviation aircraft utilization rates, as well as the level and mix of U.S. Government appropriations for defense and space programs (as further discussed in other risk factors below). The challenging operating environment faced by the commercial airline industry is expected to continue and may be influenced by a wide variety of factors including aircraft fuel prices, labor issues, airline consolidation, airline insolvencies, terrorism and safety concerns, and changes in regulations. Future terrorist actions or pandemic health issues could dramatically reduce both the demand for air travel and our Aerospace aftermarket sales and margins. The operating results of our Automation and Control Solutions (ACS) segment, which generated 35 percent of our consolidated revenues in 2006, are impacted by the level of global residential and commercial construction (including retrofits and upgrades), capital spending on building and process automation, industrial plant capacity utilization and expansion, and material price inflation. Specialty Materials' operating results, which generated 15 percent of our consolidated revenues in 2006, are impacted by global gross domestic product and capacity utilization for chemical, industrial, refining and petrochemical plants. Transportation Systems' operating results, which generated 15 percent of our consolidated revenues in 2006, are impacted by global production and demand for automobiles and trucks equipped with turbochargers, regulatory changes regarding automobile and truck emissions and consumer spending for automotive aftermarket and car care products.

Raw material price fluctuations and the ability of key suppliers to meet quality and delivery requirements can increase the cost of our products and services and impact our ability to meet commitments to customers.

The cost of raw materials is a key element in the cost of our products, particularly in our Specialty Materials (fluorspar, benzene (the key component in phenol) and natural gas), Transportation Systems (nickel and steel) and Aerospace (nickel, titanium and other metals) segments. Our inability to offset material price inflation through increased prices to customers, long-term fixed price contracts with suppliers, productivity actions or through commodity hedges could adversely affect our results of operations.

Our manufacturing operations are also highly dependent upon the delivery of materials by outside suppliers and their assembly of major components and subsystems used in our products in a timely manner and in full compliance with purchase order terms and conditions, quality standards, and applicable laws and regulations. We also depend in limited instances on sole source suppliers. Our suppliers may fail to perform according to specifications as and when required and we may be unable to identify alternate suppliers or to otherwise mitigate the consequences of their non-performance. The supply chains for our businesses could also be disrupted by external events such as natural disasters, pandemic health issues, terrorist actions, labor disputes or governmental actions. Our inability to fill our supply needs would jeopardize our ability to fulfill obligations under commercial and government contracts, which could, in turn, result in reduced sales and profits, contract penalties or terminations, and damage to customer relationships.

Our future growth is largely dependent upon our ability to develop new technologies that achieve market acceptance with acceptable margins.

Our businesses operate in global markets that are characterized by rapidly changing technologies and evolving industry standards. Accordingly, our future growth rate depends upon a number of factors, including our ability to (i) identify emerging technological trends in our target end-markets, (ii) develop and maintain competitive products, (iii) enhance our products by adding innovative features that differentiate our products from those of our competitors, and (iv) develop, manufacture and bring products to market quickly and cost-effectively.

Our ability to develop new products based on technological innovation can affect our competitive position and requires the investment of significant resources. These development efforts divert resources from other potential investments in our businesses, and they may not lead to the development of new technologies or products on a timely basis or that meet the needs of our customers as fully as competitive offerings. In addition, the markets for our products may not develop or grow as we currently anticipate. The failure of our technologies or products to gain market acceptance due to more attractive offerings by our competitors could significantly reduce our revenues and adversely affect our competitive standing and prospects.

Protecting our intellectual property is critical to our innovation efforts. We own or are licensed under a large number of U.S. and foreign patents and patent applications, trademarks and copyrights. Our intellectual property rights may be challenged, invalidated or infringed upon by third parties or we may be unable to maintain, renew or enter into new licenses of third party proprietary intellectual property on commercially reasonable terms. In some non-U.S. countries, laws affecting intellectual property are uncertain in their application, which can affect the scope or enforceability of our patents and other intellectual property rights. Any of these events or factors could diminish or cause us to lose the competitive advantages associated with our intellectual property, subject us to judgments, penalties and significant litigation costs, and/or temporarily or permanently disrupt our sales and marketing of the affected products or services.

An increasing percentage of our sales and operations is in non-U.S. jurisdictions and is subject to the economic, political, regulatory and other risks of international operations.

Our international operations, including U.S. exports, comprise a growing proportion of our operating results and our strategy calls for increasing sales to and operations in overseas markets, including developing markets such as China, India and the Middle East. In 2006, 48 percent of our total sales

(including products manufactured in the U.S. and in international locations) were outside of the U.S. including 28 percent in Europe and 10 percent in Asia. Risks related to international operations include exchange control regulations, wage and price controls, employment regulations, foreign investment laws, import and trade restrictions (including embargoes), changes in regulations regarding transactions with state-owned enterprises, nationalization of private enterprises, government instability and our ability to hire and maintain qualified staff in these regions. The cost of compliance with increasingly complex and often conflicting regulations worldwide can also impair our flexibility in modifying product, marketing, pricing or other strategies for growing our businesses, as well as our ability to improve productivity and maintain acceptable operating margins.

As we continue to grow our businesses internationally, our operating results could be effected by the relative strength of the European and Asian economies and the impact of exchange rate fluctuations. We do have a policy to reduce the risk of volatility through hedging activities, but such activities bear a financial cost and may not always be available to us and may not be successful in eliminating such volatility.

We may be required to recognize impairment charges for our long-lived assets.

At December 31, 2006, the net carrying value of long-lived assets (property, plant and equipment, goodwill and other intangible assets) totaled approximately $14.5 billion. In accordance with generally accepted accounting principles, we periodically assess our long-lived assets to determine if they are impaired. Significant negative industry or economic trends, disruptions to our business, unexpected significant changes or planned changes in use of the assets, divestitures and market capitalization declines may result in impairments to goodwill and other long-lived assets. Future impairment charges could significantly affect our results of operations in the periods recognized. Impairment charges would also reduce our consolidated shareowners' equity and increase our debt-to-total-capitalization ratio, which could negatively impact our access to the public debt and equity markets.

A change in the level of U.S. Government defense and space funding or the mix of programs to which such funding is allocated could adversely impact sales of Aerospace's defense and space-related product and services.

Sales of our defense and space-related products and services are largely dependent upon government budgets, particularly the U.S. defense budget. Sales as a prime contractor and subcontractor to the U. S. Department of Defense comprised approximately 27 and 10 percent of Aerospace and total sales, respectively, for the year ended December 31, 2006. Although U.S. defense spending increased in 2006 and is expected to increase again in 2007, we cannot predict the extent to which funding for individual programs will be included, increased or reduced as part of the 2008 and subsequent budgets ultimately approved by Congress, or be included in the scope of separate supplemental appropriations. We also cannot predict the impact of potential changes in priorities due to military transformation and planning and/or the nature of war-related activity on existing, follow-on or replacement programs. A shift in defense spending to programs in which we do not participate and/or reductions in funding for or termination of existing programs could adversely impact our results of operations.

As a supplier of military and other equipment to the U. S. Government, we are subject to unusual risks, such as the right of the U.S. Government to terminate contracts for convenience and to conduct audits and investigations of our operations and performance.

In addition to normal business risks, companies like Honeywell that supply military and other equipment to the U.S. Government are subject to unusual risks, including dependence on Congressional appropriations and administrative allotment of funds, changes in governmental procurement legislations and regulations and other policies that reflect military and political developments, significant changes in contract scheduling, complexity of designs and the rapidity with which they become obsolete, necessity for constant design improvements, intense competition for U.S. Government business necessitating increases in time and investment for design and development, difficulty of forecasting costs and schedules when bidding on developmental and highly sophisticated technical work, and other factors characteristic of the

industry. Changes are customary over the life of U.S. Government contracts, particularly development contracts, and generally result in adjustments of contract prices.

Our contracts with the U.S. Government are subject to audits. Like many other government contractors, we have received audit reports that recommend downward price adjustments to certain contracts to comply with various government regulations. We have made adjustments and paid voluntary refunds in appropriate cases and may do so in the future.

U.S. Government contracts are subject to termination by the government, either for the convenience of the government or for our failure to perform under the applicable contract. In the case of a termination for convenience, we are typically entitled to reimbursement for our allowable costs incurred, plus termination costs and a reasonable profit. If a contract is terminated by the government for our failure to perform we could be liable for additional costs incurred by the government in acquiring undelivered goods or services from any other source and any other damages suffered by the government.

We are also subject to government investigations of business practices and compliance with government procurement regulations. If Honeywell or one of its businesses were charged with wrongdoing as a result of any such investigation or other government investigations (including violations of certain environmental or export laws), it could be suspended from bidding on or receiving awards of new government contracts pending the completion of legal proceedings. The U.S. Government also reserves the right to debar a contractor from receiving new government contracts for fraudulent, criminal or other egregious misconduct. Debarment generally does not exceed three years.

Changes in legislation or government regulations or policies can have a significant impact on our results of operations.

The sales and margins of each of our segments are directly impacted by government regulations. Safety and performance regulations (including mandates of the Federal Aviation Administration and other similar international regulatory bodies requiring the installation of equipment on aircraft), product certification requirements and government procurement practices can impact Aerospace sales, research and development expenditures, operating costs and profitability. The demand for and cost of providing Automation and Control Solutions products, services and solutions can be impacted by fire, security, safety, health care and energy efficiency standards and regulations. Specialty Materials' results of operations can be affected by environmental (e.g. government regulation of fluorocarbons), safety and energy efficiency standards and regulations, while emissions and energy efficiency standards and regulations can impact the demand for turbochargers in our Transportation Systems segment.

Completed acquisitions may not perform as anticipated or be integrated as planned, and divestitures may not occur as planned.

We regularly review our portfolio of businesses and pursue growth through acquisitions and seek to divest non-core businesses. We may not be able to complete transactions on favorable terms, on a timely basis or at all. In addition, our results of operations and cash flows may be adversely impacted by (i) the failure of acquired businesses to meet or exceed expected returns, (ii) the discovery of unanticipated issues or liabilities, (iii) the failure to integrate acquired businesses into Honeywell on schedule and/or to achieve synergies within the plan and timeframe, and/or (iv) the inability to dispose of non-core assets and businesses on satisfactory terms and conditions and within the expected time frame.

We cannot predict with certainty the outcome of litigation matters, government proceedings and other contingencies and uncertainties.

We are subject to a number of lawsuits, investigations and disputes (some of which involve substantial amounts claimed) arising out of the conduct of our business, including matters relating to commercial transactions, government contracts, product liability (including asbestos), prior acquisitions and divestitures, employment, employee benefits plans, and environmental, health and safety matters. Resolution of these matters can be prolonged and costly, and the ultimate results or judgments are uncertain due to the inherent uncertainty in litigation and other proceedings. Moreover, our potential liabilities are subject to change over time due to new developments, changes in settlement strategy or the

impact of evidentiary requirements, and we may be required to pay damage awards or settlements, or become subject to damage awards or settlements, that could have a material adverse effect on our results of operations, cash flows and financial condition. While we maintain insurance for certain risks, the amount of our insurance coverage may not be adequate to cover the total amount of all insured claims and liabilities. It also is not possible to obtain insurance to protect against all our operational risks and liabilities. The incurrence of significant liabilities for which there is no or insufficient insurance coverage could adversely affect our results of operations, cash flows, liquidity and financial condition.

Our operations and the prior operations of predecessor companies expose us to the risk of material environmental liabilities.

Mainly because of past operations and operations of predecessor companies, we are subject to potentially material liabilities related to the remediation of environmental hazards and to personal injuries or property damages that may be caused by hazardous substance releases and exposures. We have incurred remedial response and voluntary clean-up costs for site contamination and are a party to lawsuits and claims associated with environmental and safety matters, including past production of products containing toxic substances. Additional lawsuits, claims and costs involving environmental matters are likely to continue to arise in the future. We are subject to various federal, state, local and foreign government requirements regulating the discharge of materials into the environment or otherwise relating to the protection of the environment. These laws and regulations can impose substantial fines and criminal sanctions for violations, and require installation of costly equipment or operational changes to limit emissions and/or decrease the likelihood of accidental hazardous substance releases. We incur, and expect to continue to incur capital and operating costs to comply with these laws and regulations. In addition, changes in laws, regulations and enforcement of policies, the discovery of previously unknown contamination or new technology or information related to individual sites, or the imposition of new clean-up requirements or remedial techniques could require us to incur costs in the future that would have a negative effect on our financial condition or results of operations.

Our expenses include significant costs related to employee health and retiree health and income benefits.

With approximately 118,000 employees, including 56,000 in the U.S, our expenses relating to employee health and retiree health and income benefits are significant. In recent years, we have experienced significant increases in certain of these costs, largely as a result of economic factors beyond our control, in particular, ongoing increases in health care costs well in excess of the rate of inflation. Continued increasing health-care costs, and changes in other assumptions used to calculate retiree health and income benefit expenses, may affect our future profitability.

Additional tax expense or additional tax exposures could affect our future profitability

We are subject to income taxes in both the United States and various foreign jurisdictions, and our domestic and international tax liabilities are dependent upon the distribution of income among these different jurisdictions. In 2006, our tax expense represented 25.7 percent of our income before tax, and includes estimates of additional tax which may be incurred for tax exposures and reflects various estimates and assumptions, including assessments of future earnings of the Company that could effect the valuation of our deferred tax assets. Our future results could be adversely affected by changes in the effective tax rate as a result of a change in the mix of earnings in countries with differing statutory tax rates, changes in the overall profitability of the Company, changes in tax legislation, changes in the valuation of deferred tax assets and liabilities, and continuing assessments of our tax exposures.

Item 1B. Unresolved Staff Comments

Not Applicable

Item 2. Properties

We have approximately 1,300 locations consisting of plants, research laboratories, sales offices and other facilities. Our headquarters and administrative complex is located at Morris Township, New Jersey. Our plants are generally located to serve large marketing areas and to provide accessibility to raw materials

and labor pools. Our properties are generally maintained in good operating condition. Utilization of these plants may vary with sales to customers and other business conditions; however, no major operating facility is significantly idle. We own or lease warehouses, railroad cars, barges, automobiles, trucks, airplanes and materials handling and data processing equipment. We also lease space for administrative and sales staffs. Our properties and equipment are in good operating condition and are adequate for our present needs. We do not anticipate difficulty in renewing existing leases as they expire or in finding alternative facilities.

Our principal plants, which are owned in fee unless otherwise indicated, are as follows:

Aerospace

Anniston, AL	South Bend, IN	Albuquerque, NM
Glendale, AZ	Olathe, KS	Urbana, OH
Phoenix, AZ	Minneapolis, MN	Greer, SC
Tempe, AZ	Plymouth, MN	Redmond, WA (leased)
Tucson, AZ	Rocky Mount, NC	Toronto, Canada
Torrance, CA (partially leased)	Teterboro, NJ	Raunheim, Germany
Clearwater, FL		Singapore
		Yeovil, UK

Automation and Control Solutions

Phoenix, AZ	Golden Valley, MN	Chihuahua, Mexico
San Diego, CA (leased)	Murfreesboro, TN (leased)	Juarez, Mexico (partially leased)
Northford, CT	Pleasant Prairie, WI (leased)	Tijuana, Mexico (leased)
Freeport, IL	Neuss, Germany	Emmen, Netherlands
		Newhouse, Scotland

Specialty Materials

Mobile, AL	Geismar, LA	Colonial Heights, VA
Metropolis, IL	Pottsville, PA	Hopewell, VA
Baton Rouge, LA	Orange, TX	Spokane, WA
	Chesterfield, VA	Seelze, Germany
		Chonburi, Thailand

Transportation Systems

Stratford, Canada	Thaon-Les-Vosges, France	Atessa, Italy
	Glinde, Germany	Ansan, Korea (leased)
		Mexicali, Mexico
		Bucharest, Romania

Item 3. Legal Proceedings

We are subject to a number of lawsuits, investigations and claims (some of which involve substantial amounts) arising out of the conduct of our business. See a discussion of environmental, asbestos and other litigation matters in Note 21 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data."

Environmental Matters Involving Potential Monetary Sanctions in Excess of $100,000

As previously reported, three incidents occurred during 2003 at Honeywell's Baton Rouge, Louisiana chemical plant, including a release of chlorine, a release of antimony pentachloride (which resulted in an employee fatality), and an employee exposure to hydrofluoric acid. The United States Environmental Protection Agency and the United States Department of Justice have conducted investigations of these incidents, including a federal grand jury convened to investigate the employee fatality. As a result of that investigation, we have signed a plea agreement with the U.S. Attorney under which Honeywell will plead guilty to a misdemeanor charge and pay $12 million in combined restitution and fines. The plea agreement has been filed, but the plea and the sentence still are subject to Court acceptance, which we expect to receive. Honeywell has been served with several civil lawsuits

regarding these incidents, for which we believe we have adequate insurance coverage to the extent that there is any liability. We are also engaged in discussions with the Louisiana Department of Environmental Quality (LADEQ) to resolve alleged civil environmental violations at our Baton Rouge and Geismar, Louisiana facilities that, in part, overlap with the subject of the federal investigation.

Although we cannot predict the outcome of the matters described below, we believe that sufficient provisions have been made in our financial statements for these matters. We do not believe that the matters described below will have a material adverse effect on our consolidated financial position, results of operations or operating cash flows.

Honeywell is a defendant in a lawsuit filed by the Arizona Attorney General's office on behalf of the Arizona Department of Environmental Quality (ADEQ). The complaint alleges failure to make required disclosures, as well as unrelated environmental violations. Honeywell believes that the allegations in this matter are without merit and intends to vigorously defend against this lawsuit. ADEQ's most significant allegations have been dismissed over the course of the proceedings.

In February 2007, ADEQ has demanded penalties for alleged violations by Honeywell of the state's underground storage tank regulations at the aircraft engines plant in Phoenix, Arizona. Negotiations regarding the penalty are ongoing.

In the third quarter of 2006, Honeywell was advised that the State of Arizona intended to seek penalties for alleged failures of a facility located in Kingman, Arizona to comply with various provisions of the Resource Conservation and Recovery Act. We expect to resolve this matter with the State.

Honeywell received Notices of Violation from the Maricopa County Air Quality Department in July 2006 with respect to various air permitting compliance matters at one of its facilities located in Phoenix, Arizona. Honeywell believes it has taken appropriate corrective and preventive actions to address the concerns raised by the County.

The State of Illinois has brought a claim against Honeywell for penalties and past costs relating to releases of chlorinated solvents at a facility owned by a third party. The State claims that a predecessor company to Honeywell delivered solvents to the third party from 1969 until 1992; that spills occurred during those deliveries; and that Honeywell should pay a share of the penalties and state response costs connected with those spills. Honeywell believes it has strong defenses to the State's claims (including that the contamination arose primarily from releases unrelated to the predecessor's deliveries). We are engaged in discussions with the State regarding a negotiated resolution of this matter.

Item 4. Submission of Matters to a Vote of Security Holders

Not Applicable.

Executive Officers of the Registrant

The executive officers of Honeywell, listed as follows, are elected annually by the Board of Directors. There are no family relationships among them.

Name, Age, Date First Elected an Executive Officer	Business Experience
David M. Cote (a), 54 2002	Chairman of the Board and Chief Executive Officer since July 2002. President and Chief Executive Officer from February 2002 to June 2002. Chairman of the Board, President and Chief Executive Officer of TRW (manufacturer of aerospace and automotive products) from August 2001 to February 2002.
Adriane M. Brown, 48 2005	President and Chief Executive Officer Transportation Systems since January 2005. Vice President and General Manager of Engine Systems & Accessories from September 2001 to December 2004.
Dr. Nance K. Dicciani, 59 2001	President and Chief Executive Officer Specialty Materials since November 2001.
Roger Fradin, 53 2004	President and Chief Executive Officer Automation and Control Solutions since January 2004. President of Automation and Control Products from June 2002 to December 2003. President and Chief Executive Officer of Security and Fire Solutions from February 2000 to May 2002.
Robert J. Gillette, 46 2001	President and Chief Executive Officer Aerospace since January 2005. President and Chief Executive Officer Transportation Systems from July 2001 to December 2004.
David J. Anderson, 57 2003	Senior Vice President and Chief Financial Officer since June 2003. Senior Vice President and Chief Financial Officer of ITT Industries (global manufacturing company) from December 1999 to June 2003.
Larry E. Kittelberger, 58 2001	Senior Vice President Technology and Operations since October 2006. Senior Vice President Administration and Chief Information Officer from August 2001 to October 2006.
Peter M. Kreindler, 61 1992	Senior Vice President and General Counsel since January 1992.
Thomas W. Weidenkopf, 48 2002	Senior Vice President Human Resources and Communications since April 2002. Vice President of Human Resources, Aerospace, from March 1999 to March 2002.

(a) Also a Director.

Part II.

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market and dividend information for Honeywell's common stock is included in Note 26 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data."

The number of record holders of our common stock at December 31, 2006 was 74,473.

The following table summarizes Honeywell's purchases of its common stock, par value $1 per share, for the quarter ending December 31, 2006, under its previously reported $3 billion authorized share repurchase program. Honeywell purchased a total of 45,440,000 shares of common stock in 2006:

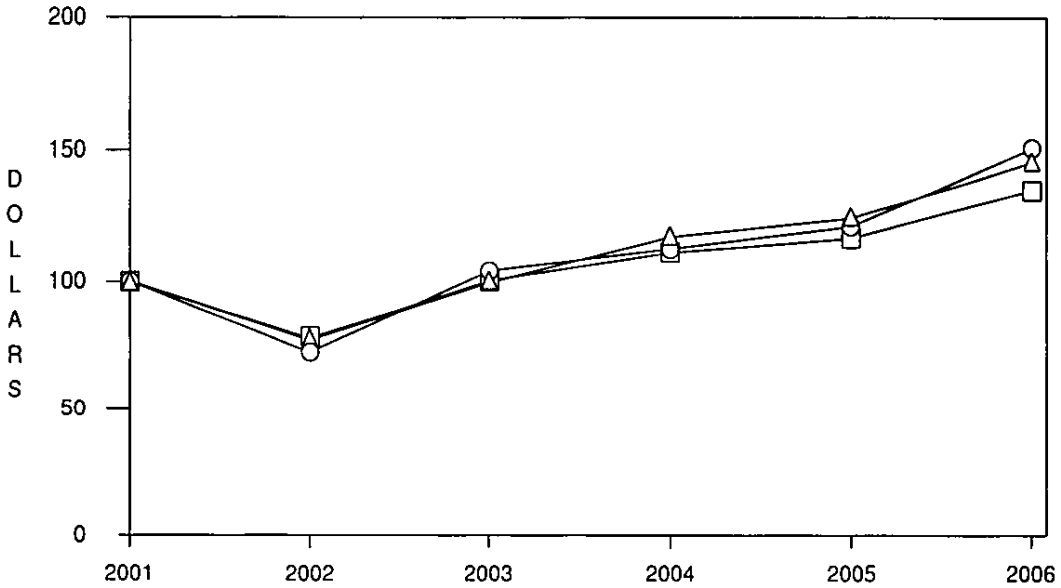
Issuer Purchases of Equity Securities

Period	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	(d) Approximate Dollar Value of Shares that May Yet be Purchased Under Plans or Programs (Dollars in millions)
October 2006	2,000,000	$42.70	2,000,000	$1,500
November 2006	8,975,000	$42.67	8,975,000	$1,118
December 2006	9,365,000	$43.60	9,365,000	$ 709

In February 2007, the Board of Directors authorized the repurchase of shares of up to $3 billion of Honeywell common stock. Honeywell intends to repurchase outstanding shares from time to time in the open market using cash flow generated by operations. The amount and timing of repurchases may vary depending on market conditions and the level of other investing activities.

Performance Graph

The following graph compares the five-year cumulative total return on our Common Stock to the total returns on the Standard & Poor's 500 Stock Index and a composite of Standard & Poor's Aerospace and Defense and Industrial Conglomerates indices, on an equally weighted basis (the "Composite Index"). The selection and weighting of the Aerospace and Defense component of the Composite Index was deemed appropriate in light of the fact that Honeywell's Aerospace segment has accounted for, on average, approximately 50% of our aggregate segment profits over the past three completed fiscal years. The selection and weighting of the Industrial Conglomerates component of the Composite Index reflects the diverse and distinct range of non-aerospace businesses conducted by Honeywell and their contribution to our overall segment profits. The annual changes for the five-year period shown in the graph are based on the assumption that $100 had been invested in Honeywell stock and each index on December 31, 2001 and that all dividends were reinvested.



		Dec 2001	Dec 2002	Dec 2003	Dec 2004	Dec 2005	Dec 2006
Honeywell	-O-	100	72.62	104.03	112.58	121.07	150.33
S&P 500®	-□-	100	77.90	100.25	111.15	116.61	135.03
Composite Index	-△-	100	77.17	99.54	117.14	124.24	145.22

Item 6. Selected Financial Data

	Years Ended December 31,				
	2006	2005	2004	2003	2002
	(Dollars in millions, except per share amounts)				
Results of Operations					
Net sales	$31,367	$27,652	$25,593	$23,095	$22,261
Income (loss) from continuing operations	2,078	1,564	1,246	1,309	(254)
Per Common Share					
Earnings (loss) from continuing operations:					
Basic	2.53	1.85	1.45	1.52	(0.31)
Assuming dilution	2.51	1.84	1.45	1.52	(0.31)
Dividends	0.9075	0.825	0.75	0.75	0.75
Financial Position at Year-End					
Property, plant and equipment—net	4,797	4,658	4,331	4,295	4,055
Total assets	30,941	31,633	30,570	28,767	27,160
Short-term debt	1,154	2,024	1,204	199	370
Long-term debt	3,909	3,082	4,069	4,961	4,719
Total debt	5,063	5,106	5,273	5,160	5,089
Shareowners' equity(1)	9,720	10,762	10,777	10,289	8,520

(1) For the year ended December 31, 2006 shareowners' equity includes a reduction of $1,512 related to the adoption of SFAS No. 158, "Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans".

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") is intended to help the reader understand the results of operations and financial condition of Honeywell International Inc. ("Honeywell") for the three years ended December 31, 2006. All references to Notes relate to Notes to the Financial Statements in "Item 8—Financial Statements and Supplementary Data".

CONSOLIDATED RESULTS OF OPERATIONS

Net Sales

	2006	2005	2004
	(Dollars in millions)		
Net sales	$31,367	$27,652	$25,593
% change compared with prior year	13%	8%	

The change in net sales in 2006 and 2005 is attributable to the following:

	2006 Versus 2005	2005 Versus 2004
Acquisitions	7 %	5 %
Divestitures	(1)	(2)
Price	1	1
Volume	6	4
Foreign Exchange	—	—
	13 %	8 %

A discussion of net sales by reportable segment can be found in the Review of Business Segments section of this MD&A.

Cost of Products and Services Sold

	2006	2005	2004
	(Dollars in millions)		
Cost of products and services sold	$24,096	$21,524	$20,752
Gross margin %	23.2%	22.2%	18.9%

Gross margin increased by 1 percentage point in 2006 compared with 2005 due primarily to higher margins in our Specialty Materials segment following our acquisition of full ownership of UOP (1.3 percentage points), and lower pension and other postretirement benefits expense of 0.5 percentage points, partially offset by higher repositioning costs of 0.2 percentage points. Gross margin increased by 3.3 percentage points in 2005 compared with 2004 primarily due to an increase of 1.2 percentage points in gross margin for our reportable segments, lower repositioning and other charges of 0.8 percentage points and lower pension and other postretirement benefits expense of 0.5 percentage points. For further discussion of segment results, see "Review of Business Segments".

Selling, General and Administrative Expenses

	2006	2005	2004
	(Dollars in millions)		
Selling, general and administrative expenses	$4,210	$3,707	$3,316
Percent of sales	13.4%	13.4%	13.0%

Selling, general and administrative expenses as a percentage of sales was flat in 2006 compared with 2005 due primarily to a reduction in expenses in our Aerospace segment, which reflects the benefit of prior restructuring actions, offsetting higher expenses in Automation and Control Solutions (ACS) and Specialty Materials as a result of acquisitions. A reduction of repositioning and pension costs of 0.2 percentage points offset the 0.2 percentage point increase for expenses of $77 million relating to stock-based compensation expense following the adoption of FAS No. 123R (see Note 20, Stock-Based Compensation Plans). Selling, general and administrative expenses as a percentage of sales increased by 0.4 percentage points in 2005 compared with 2004 due primarily to the impact of the acquisition of NOVAR and higher spending for information technology systems (primarily ERP system in Aerospace) of 0.3 percentage points and higher repositioning and other charges of 0.1 percentage points.

Pension and Other Postretirement Benefits

	2006	2005	2004
	(Dollars in millions)		
Pension expense	$313	$404	$412
Other postretirement benefits expense	146	157	216
Total pension and other postretirement benefits expense (included in costs of products and services sold and selling, general and administrative expenses)	$459	$561	$628

Pension expense decreased by 23 percent in 2006 compared to 2005 due principally to a decrease in the amortization of net losses, principally in our U.S. plans. Pension expense decreased by 2 percent in 2005 compared with 2004 due principally to a decrease in the amortization of net losses partially offset by pension expense for NOVAR, which was acquired in 2005.

Other postretirement benefits expense decreased by 7 percent in 2006 compared to 2005, due primarily to favorable demographic experience in the plan, and by 27 percent in 2005 compared with 2004, due primarily to the effect of implementing the Medicare Prescription Drug, Improvement and Modernization Act of 2003. See Note 22 to the financial statements for further discussion.

Other (Income)/Expense

	2006	2005	2004
	(Dollars in millions)		
Gain on sale of non-strategic businesses and assets	$ (30)	$ (36)	$(255)
Equity (income)/loss of affiliated companies	(13)	(134)	(82)
Interest income	(94)	(84)	(100)
Foreign exchange	18	21	28
Other (net)	8	2	(20)
Total	$(111)	$(231)	$(429)

Other income decreased by $120 million, or 52 percent in 2006 compared to 2005 primarily due to a $121 million reduction in equity income of affiliated companies primarily related to UOP, following our acquisition of full ownership of UOP in November 2005. In 2005, other income decreased by $198 million compared to 2004, or 46 percent compared to 2004 primarily as a result of pretax gains on the sales of our Security Monitoring and VCSEL Optical Products businesses of $215 and $36 million, respectively, and recognition of a gain of $27 million related to the favorable settlement of a patent infringement lawsuit.

Interest and Other Financial Charges

	2006	2005	2004
	(Dollars in millions)		
Interest and other financial charges	$374	$356	$331
% change compared with prior year	5%	8%	

Interest and other financial charges increased by 5 percent in 2006 compared with 2005 due to higher debt balances and higher borrowing costs, and increased by 8 percent in 2005 compared with 2004 due to both higher average short-term debt outstanding and higher interest rates in 2005.

Tax Expense

	2006	2005	2004
	(Dollars in millions)		
Tax expense	$720	$732	$377
Effective tax rate	25.7%	31.9%	23.2%

The effective tax rate decreased by 6.2 percentage points in 2006 compared with 2005, due principally to the absence of the 2005 one-time tax charge of $155 million for the repatriation of foreign earnings under the American Jobs Creation Act of 2004, offset, in part, by $64 million of tax benefits associated with the 2005 sale of our Industrial Wax business which had a higher tax basis than book basis. In addition, in 2006, there were benefits recognized from the favorable resolution of certain tax audits offset by a tax charge for an up-front licensing of certain in-process research and development. The effective tax rate was lower than the statutory rate of 35 percent due in part to tax benefits derived from export sales, lower foreign taxes, and benefits from tax planning strategies. The effective tax rate increased by 8.7 percentage points in 2005 compared with 2004 due principally to the tax impact of the repatriation of approximately $2.7 billion of foreign earnings, of which $2.2 billion was subject to a significantly reduced tax under the American Jobs Creation Act of 2004, offset in part by the higher effective tax benefit rate for repositioning and other charges that were incurred in 2004. See Note 6 to the financial statements for further information on taxes including a detailed effective tax rate reconciliation.

In 2007, the effective tax rate could change based upon the Company's operating results and the outcome of tax positions taken regarding previously filed tax returns currently under audit by various Federal, State and foreign tax authorities, several of which may be finalized in the foreseeable future. The Company believes that it has adequate reserves for these matters, the outcome of which could materially impact the results of operations and operating cash flows in the period that they are resolved.

Income From Continuing Operations

	2006	2005	2004
	(Dollars in millions, except per share amounts)		
Income from continuing operations	$2,078	$1,564	$1,246
Earnings per share of common stock—assuming dilution	$ 2.51	$ 1.84	$ 1.45

The increase of $0.67 in earnings (diluted) per share for continuing operations in 2006 compared with 2005 primarily relates to an increase in segment profit in Aerospace and Automation and Control Solutions and income generated from our acquisition of full ownership of UOP in Specialty Materials, reduced repositioning and pension costs and a reduction in the number of shares outstanding due to the previously announced stock repurchase program, offset by the impact of adopting FAS No. 123R ("Share-Based Payment") for stock-based compensation expense of $77 million in 2006. In addition, in 2005 there was a one-time tax charge of $155 million for the repatriation of foreign earnings under the American Jobs Creation Act of 2004, which decreased earnings and earnings per share in 2005. The increase of $0.39 earnings (diluted) per share for continuing operations in 2005 compared with 2004 relates primarily to an increase in segment profit for our reportable segments. For further discussion of segment results, see "Review of Business Segments".

Income From Discontinued Operations

Income from discontinued operations of $5 million, or $0.01 earnings per share (diluted) in 2006 relates to the operating results of the Indalex business which was sold in February 2006 to Sun Capital Partners, Inc. Income from discontinued operations of $95 million, or $0.11 earnings per share, in 2005 relates to the operating results of the Indalex and Security Printing businesses, that were part of our NOVAR acquisition that were subsequently divested. In December 2005, the Security Printing business was sold to M&F Worldwide Corp. See Note 2 to the financial statements for further discussion of these sales.

BUSINESS OVERVIEW

This Business Overview provides a summary of Honeywell's four reportable operating segments (Aerospace, Automation and Control Solutions, Specialty Materials and Transportation Systems), including how they generate income, the relevant economic and other factors impacting their results, a discussion of each segment's results for the three years ended December 31, 2006 and the areas of focus for 2007 for the Company and each of its operating segments. Each of these segments is comprised of various product and service classes that serve multiple end markets. See Note 23 to the financial statements for further information on our reportable segments and our definition of segment profit.

Areas of Focus for 2007

The areas of focus for 2007, which are generally applicable to each of our operating segments, include:

- Driving profitable growth by building innovative products that address customer needs;
- Achieving sales growth, technological excellence and manufacturing capability through global expansion, especially focused on emerging regions in China, India and the Middle East;
- Continuing to grow through disciplined acquisition and rigorous integration processes;
- Proactively managing raw material cost increases with formula price agreements, price increases and hedging activities, where feasible;
- Driving free cash flow through increased net income and effective working capital management enabling continued investment in our businesses, strategic acquisitions, returning value to shareholders through share repurchases and increased dividend payments;
- Utilizing our enablers Honeywell Operating System (HOS), Functional Transformation and Velocity Product Development (VPD)™ to standardize the way we work, increase quality and reduce the costs of product manufacturing, reduce costs and enhance the quality of our

administrative functions and improve business operations through investments in systems and process improvements; and

- Managing Corporate costs, including costs incurred for asbestos and environmental matters, pension and other post-retirement expenses and our tax expense.

Review of Business Segments

	2006	2005	2004
	(Dollars in millions)		
Net Sales			
Aerospace	$11,124	$10,496	$ 9,740
Automation and Control Solutions	11,020	9,416	8,031
Specialty Materials	4,631	3,234	3,497
Transportation Systems	4,592	4,505	4,323
Corporate	—	1	2
	$31,367	$27,652	$25,593
Segment Profit			
Aerospace	$ 1,892	$ 1,676	$ 1,422
Automation and Control Solutions	1,223	1,065	894
Specialty Materials	568	257	184
Transportation Systems	574	557	575
Corporate	(177)	(173)	(158)
	$ 4,080	$ 3,382	$ 2,917

A reconciliation of segment profit to income from continuing operations before taxes follows:

	2006	2005	2004
	(Dollars in millions)		
Segment profit	$ 4,080	$ 3,382	$ 2,917
Other income (expense)	111	231	429
Interest and other financial charges	(374)	(356)	(331)
Stock option expense(1)	(77)	—	—
Pension and other postretirement benefits (expense)(1)	(459)	(561)	(628)
Repositioning and other charges(1)	(483)	(400)	(764)
Income from continuing operations before taxes	$ 2,798	$ 2,296	$ 1,623

(1) Amounts included in cost of products and services sold and selling, general and administrative expenses.

Aerospace

Overview

Aerospace is a leading global supplier of aircraft engines, avionics, and related products and services for aircraft manufacturers, airlines, aircraft operators, military services, and defense and space contractors. Our Aerospace products and services include auxiliary power units, propulsion engines, environmental control systems, engine controls, flight safety, communications, navigation, radar and surveillance systems, aircraft lighting, management and technical services, advanced systems and instruments, aircraft wheels and brakes and repair and overhaul services. Aerospace sells its products to original equipment (OE) manufacturers in the air transport, regional, business and general aviation aircraft segments, and provides spare parts and repair and maintenance services for the aftermarket (principally to aircraft operators). The United States Government is also a major customer for our defense and space products.

Economic and Other Factors

Aerospace operating results are principally driven by:

- Global demand for air travel as reflected in new aircraft production, as well as the demand for spare parts and maintenance and repair services for aircraft currently in use;
- Aircraft production by commercial air transport, regional jet, business and general aviation OE manufacturers, as well as global flying hours and airline profitability;
- The level and mix of U.S. Government appropriations for defense and space programs and military activity; and
- Pricing, volatility in pricing and availability of raw materials.

Results of Operations

	2006	2005	2004
	(Dollars in millions)		
Net sales	$11,124	$10,496	$9,740
% change compared with prior year	6%	8%	
Segment profit	$ 1,892	$ 1,676	$1,422
% change compared with prior year	13%	18%	

Aerospace sales increased by 6 percent and 8 percent in 2006 and 2005, respectively, due primarily to strong growth in new aircraft deliveries and increased global flying hours. Aerospace sales by major customer end-markets were as follows:

	% of Aerospace Sales			% Change in Sales	
Customer End-Markets	2006	2005	2004	2006 Versus 2005	2005 Versus 2004
Commercial:					
Air transport and regional original equipment	16%	15%	15%	14%	9%
Air transport and regional aftermarket	22	23	24	4	3
Business and general aviation original equipment	12	11	8	16	42
Business and general aviation aftermarket	10	10	10	1	10
Defense and Space	40	41	43	3	2
Total	100%	100%	100%	6%	8%

Details regarding the net increase in sales by customer end-markets for both 2006 and 2005 are as follows:

- Air transport and regional original equipment (OE) sales increased by 14 percent in 2006 and 9 percent in 2005 primarily driven by increased deliveries to air transport customers primarily due to higher aircraft production rates.
- Air transport and regional aftermarket sales increased by 4 percent in 2006 as a result of increased sales of spare parts and maintenance activity relating to a more than 5 percent increase in global flying hours which more than offset the anticipated decline in the sales of upgrades and retrofits of avionics equipment to meet certain mandated regulatory standards. In 2005, sales increased by 3 percent due primarily to a 7 percent increase in flying hours which was partially offset by a decrease in the level of FAA-mandated safety avionics equipment upgrades and retrofits and the impact of the phase-out of regional aircraft with turboprop engines.
- Business and general aviation OE sales increased by 16 percent in 2006 and by 42 percent in 2005 due primarily to the continued demand in the business jet end market as evidenced by an increase in new business jet deliveries and high demand in the fractional ownership market. These sales primarily relate to sales of Primus Epic integrated avionics systems, and the TFE 731 and HTF 7000 engines, which generated sales commencing in 2005.
- Business and general aviation aftermarket sales increased by 1 percent in 2006, due to increased sales of spare parts and increased maintenance activity resulting in part from higher

engine utilization, partially offset by lower sales of mandated upgrades and retrofits of avionics equipment required in the prior year to meet certain mandated regulatory standards. In 2005, sales increased by 10 percent due to these mandates, and as a result of increased engine utilization for corporate aircraft.

- Defense and space sales increased by 3 percent in 2006 primarily due to higher sales of surface systems and sales of spare parts for helicopters that offset lower volume of space sales due to delays in project funding. In 2005, defense and space sales increased by 2 percent, primarily driven by platform upgrades for war-related activities, growth in precision munitions and increased spending on restricted space programs. These factors lower replenishment demand for spare parts from the US military in both 2005 and 2006.

Aerospace segment profit increased by 13 percent in 2006 compared with 2005 due primarily to sales volume growth, increased prices and productivity savings (including benefits from prior restructuring actions) that were partially offset by inflation and the impact of stronger OE sales that typically have lower margins than aftermarket sales. Segment profit increased by 18 percent in 2005 compared to 2004 due primarily to volume growth and the effect of productivity actions, partially offset by an increase in spending for information technology systems.

2007 Areas of Focus

Aerospace's primary areas of focus for 2007 include:

- Continuing to grow the sales and profitability of the commercial aerospace aftermarket in the highly competitive and cost focused airline industry;
- Securing Honeywell product content on new aircraft platforms;
- Continuing to design equipment that enhances the safety, performance and durability of aerospace and defense equipment, while reducing weight and operating costs; and
- Developing differentiated, affordable products and services for the defense and space end-market.

Automation and Control Solutions (ACS)

Overview

ACS provides innovative solutions that make homes, buildings, industrial sites, airport facilities and infrastructure more efficient, safe and comfortable. Our ACS products and services include controls for heating, cooling, indoor air quality, ventilation, humidification and home automation; advanced software applications for home/building control and optimization; sensors, switches, control systems and instruments for measuring pressure, air flow, temperature and electrical current; security, fire and gas detection; access control; video surveillance; remote patient monitoring systems; installation, maintenance and upgrades of systems that keep buildings safe, comfortable and productive; and automation and control solutions for industrial plants, including advanced software and automation systems that integrate, control and monitor complex processes in many types of industrial settings.

Economic and Other Factors

ACS's operating results are principally driven by:

- The growth of global commercial construction (including retrofits and upgrades);
- Demand for residential retrofits and upgrades;
- Industrial production;
- U.S. and European economic conditions;
- The strength of capital spending on process and building automation; and
- Changes to fire, security, health care and safety concerns and regulations.

Results of Operations

	2006	2005	2004
	(Dollars in millions)		
Net sales	$11,020	$9,416	$8,031
% change compared with prior year	17%	17%	
Segment profit	$ 1,223	$1,065	$ 894
% change compared with prior year	15%	19%	

ACS sales increased by 17 percent in 2006 compared with 2005 due to organic sales growth of 10 percent and 7 percent growth from acquisitions, net of divestitures. All of ACS businesses contributed to organic growth in the year. In 2005 sales increased by 17 percent compared to 2004, which was primarily due to growth from acquisitions of 13 percent and organic growth of 4 percent.

Organic sales growth in ACS products businesses increased by 8 percent in 2006 compared to 2005, primarily due to strong customer demand for new products in our security and life safety products and increased sales to customers in emerging markets for environmental, combustion, sensing and control products. In 2005, organic sales for products increased by 5 percent compared to 2004, primarily due to strong sales of fire solutions and security products, and the favorable effects of foreign exchange.

Organic sales in ACS solutions businesses increased by 11 percent in 2006 compared to 2005 driven by continued strong orders growth, strong conversion to sales from our order backlog and increased sales in emerging markets and strong revenue from energy projects. In 2005, organic sales growth for the solutions businesses was 3 percent compared to 2004 due primarily to favorable foreign exchange and increased capital spending.

Sales from acquisitions, net of divestitures, increased by 7 percent in 2006 compared with 2005, largely representing revenues in ACS products businesses relating to NOVAR (primarily environmental, combustion, building controls and life safety products) for the first quarter of 2006, Zellweger (gas detection) for the first two quarters of 2006 and revenues from our Gardiner Groupe (security distribution) and First Technology (gas detection) acquisitions in the last three quarters of 2006. In 2005, sales from acquisitions net of divestitures increased by 13 percent compared to 2004, due primarily to the acquisition of NOVAR, partially offset by the loss of sales due to the divestiture of our Security Monitoring business.

ACS segment profit increased by 15 percent in 2006 compared with 2005 due principally to increased sales volume and productivity savings (including net integration savings from our acquisitions) that more than offset continued inflation. Segment profit was also negatively impacted in 2006 by a contract loss experienced on a Building Solutions project, and by ERP implementation costs. ACS segment profit in 2005 increased by 19 percent compared with 2004 as the favorable effects of productivity actions, acquisitions (NOVAR) and higher sales volume more than offset the unfavorable effects of lower prices and investments in sales and marketing initiatives.

2007 Areas of Focus

ACS's primary areas of focus for 2007 include:

- Extending technology leadership: lowest total installed cost and integrated product solutions;
- Defending and extending our installed base through customer productivity and globalization;
- Sustaining strong brand recognition through our brand and channel management; and
- Centralization and standardization of global software development capabilities.

Specialty Materials

Overview

Specialty Materials develops and manufactures high-purity, high-quality and high-performance chemicals and materials for applications in the automotive, healthcare, agricultural, packaging, carpet fibers, refrigeration, appliance, housing, semiconductor, wax and adhesives segments. Specialty

Materials also provides process technology, products and services for the petroleum refining, petrochemical, and other industries. Specialty Materials' product portfolio includes fluorocarbons, caprolactam, ammonium sulfate for fertilizer, specialty films, advanced fibers, customized research chemicals and intermediates, electronic materials and chemicals, catalysts, and adsorbents.

Economic and Other Factors

Specialty Materials operating results are principally driven by:

- The degree of volatility in natural gas, benzene (the key component in phenol) and fluorspar prices;
- The impact of environmental and energy efficiency regulations;
- The extent of change in order rates from global semiconductor customers;
- The global demand for non-ozone depleting Hydro fluorocarbons (HFC's);
- The extent of the slowdown of the US residential housing industry; and
- The level of investment in refining and petrochemical capacity, utilization and/or expansion.

Results of Operations

	2006	2005	2004
	(Dollars in millions)		
Net sales	$4,631	$3,234	$3,497
% change compared with prior year	43%	(8)%	
Segment profit	$ 568	$ 257	$ 184
% change compared with prior year	121%	40%	

Specialty Materials sales increased by 43 percent in 2006 compared to 2005 due to organic sales growth of 7 percent and 36 percent growth due to our UOP acquisition, net of divestitures. Sales decreased by 8 percent in 2005 compared with 2004, due to the loss of sales from divested businesses of 16 percent, which was offset by organic growth of 4 percent and growth from acquisitions (UOP) of 4 percent.

Organic growth was 7 percent in 2006 primarily due to higher volume and prices. Organic sales in our Fluorine Products business increased by 9 percent due to continued strong demand for non-ozone depleting HFC products, and organic growth in our Resins and Chemicals business was 4 percent, primarily due to price increases to recover increased raw material costs. Both of these businesses experienced lower sales growth in the fourth quarter of 2006 due to the slowdown in the US residential housing industry. Our Resins and Chemicals business was also negatively impacted by a partial facility outage in the second half of 2006. Specialty Products organic sales increased by 10 percent due to higher sales to our customers in the semiconductor industry and increased sales of our specialty additives and our advanced fiber body armor. In 2005, organic sales increased by 4 percent, largely as a result of higher prices of 7 percent primarily in our Resins and Chemicals and Fluorine businesses, offsetting lower volumes in Specialty Products businesses.

Sales from acquisitions, net of divestitures grew by 36 percent in 2006 compared to 2005. This was due to a 44 percent growth in sales from UOP, which was consolidated into the Specialty Materials segment following our acquisition of the remaining 50 percent interest in UOP in November 2005. Prior to that date, UOP results were included in other income. UOP sales have grown due to continued strength in the petrochemical and refining industries. This growth was offset by the loss of sales of 8 percent principally from the divestiture of our Industrial Wax and North American Nylon Fiber businesses.

Specialty Materials segment profit increased by 121 percent in 2006 compared with 2005 due principally to the impact of the UOP acquisition, net of divestitures, and increased organic growth and productivity savings (net of the lost margin from the partial facility outage). Price increases (including benefits from formula based pricing contracts) offset the impact of continued inflation in raw material costs. Specialty Materials segment profit in 2005 increased by 40 percent compared with 2004 due principally to price increases and the favorable effect of productivity actions partially offset by higher raw material costs and lower sales volumes.

2007 Areas of Focus

Specialty Materials primary areas of focus for 2007 include:

- Increasing resources and market penetration in Asia;
- Developing new products that address energy efficiency, global warming and security regulations;
- Increasing product differentiation in order to continue to expand margins; and
- Continued contract wins in the petrochemical and refining industries.

Transportation Systems

Overview

Transportation Systems provides automotive products that improve the performance, efficiency, and appearance of cars, trucks, and other vehicles through state-of-the-art technologies, world class brands and global solutions to customers needs. Transportation Systems' products include Garrett(R) turbochargers and charge-air and thermal systems; car care products including anti-freeze (Prestone(R)), filters (Fram(R)), spark plugs (Autolite(R)), and cleaners, waxes and additives (Holts(R)); and brake hard parts and other friction materials (Bendix(R) and Jurid(R)). Transportation Systems sells its products to OE automotive and truck manufacturers (e.g., BMW, Caterpillar, Daimler-Chrysler, Ford, and Volkswagen), wholesalers and distributors and through the retail aftermarket.

Economic and Other Factors

Transportation Systems operating results are principally driven by:

- Global demand for automobile and truck production;
- Diesel penetration rates for new platforms;
- Global consumer preferences for diesel passenger cars;
- Demand for North American truck production in conjunction with new lower emission regulations;
- The degree of volatility in raw material prices including nickel and steel; and
- Changes in consumer spending for automotive aftermarket and car care products.

Results of Operations

	2006	2005	2004
	(Dollars in millions)		
Net sales	$4,592	$4,505	$4,323
% change compared with prior year	2%	4%	
Segment profit	$ 574	$ 557	$ 575
% change compared with prior year	3%	(3)%	

Transportation Systems sales increased 2 percent in 2006 compared with 2005, primarily due to increased sales in our Turbo Technologies business, offset by lower sales in our Consumer Products Group. In 2005, sales increased by 4 percent compared with 2004 due primarily to favorable sales mix of 2 percent, the favorable effect of foreign exchange of 1 percent and the impact of higher prices of 1 percent.

Sales for our Turbo Technologies business were 6 percent higher in 2006 compared to 2005 primarily due to new product introductions in Europe and Asia, a slight increase in diesel penetration in Europe and relatively flat sales in the U.S. Sales were 5 percent higher in 2005 compared to 2004 due to higher volumes in our North American truck segment, offset by lower volumes in Europe due to a shift in consumer demand among automotive platforms partially offset by a slight increase in diesel penetration.

Sales for our Consumer Products Group business decreased by 4 percent in 2006 as a result of reduced consumer spending in North America on automotive aftermarket products and our exit of the North America Friction Materials OE business. Sales increased by 8 percent in 2005 compared to 2004

largely due to higher prices, offset by the impact of our exit in late 2005 from the North American Friction Materials OE business.

Transportation Systems segment profit increased by 3 percent in 2006 compared with 2005 due primarily to increased Turbo Technologies volume and productivity savings including the benefits of prior year restructuring actions, which offset higher material and labor inflation and increased warranty expense. Transportation Systems segment profit in 2005 decreased by 3 percent compared with 2004 due primarily to the impact of higher raw material costs (mainly steel and nickel) and operating costs associated with the exit from North American Friction Materials OE business in late 2005, partially offset by the effects of higher prices and productivity actions.

2007 Areas of Focus

Transportation Systems primary areas of focus in 2007 include:

- Sustaining superior turbocharger technology;
- Increasing global market penetration and share of diesel and gasoline turbocharger OEM demand; and
- Expanding and strengthening established strong product brands in our Consumer Products Group business, including expansion into new geographic and demographic segments.

Repositioning and Other Charges

A summary of repositioning and other charges follows:

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Severance	$102	$248	$ 85
Asset impairments	15	5	21
Exit costs	7	14	10
Reserve adjustments	(22)	(25)	(28)
Total net repositioning charge	102	242	88
Asbestos related litigation charges, net of insurance	126	10	76
Probable and reasonably estimable environmental liabilities	210	186	536
Business impairment charges	12	23	42
Arbitration award related to phenol supply agreement	(18)	(67)	—
Other	51	18	33
Total net repositioning and other charges	$483	$412	$775

The following table summarizes the pretax distribution of total net repositioning and other charges by income statement classification.

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Cost of products and services sold	$472	$357	$739
Selling, general and administrative expenses	11	43	25
Other (income) expense	—	12	11
	$483	$412	$775

The following tables provide details of the pretax impact of total net repositioning and other charges by reportable segment.

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Aerospace			
Net repositioning charge	$ 10	$ 96	$ 5
Other	—	—	(10)
	$ 10	$ 96	$ (5)

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Automation and Control Solutions			
Net repositioning charge	$ 39	$ 84	$ 15
Other	—	1	13
	$ 39	$ 85	$ 28

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Specialty Materials			
Net repositioning charge	$ 11	$ 14	$ 36
Business impairment charges	12	23	42
Arbitration award related to phenol supply agreement	(18)	(67)	—
Other	—	(4)	12
	$ 5	$ (34)	$ 90

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Transportation Systems			
Net repositioning charge	$ 32	$ 49	$ 26
Asbestos related litigation charges, net of insurance	261	31	120
Other	—	2	1
	$293	$ 82	$147

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Corporate			
Net repositioning charge	$ 10	$ (1)	$ 6
Asbestos related litigation charges, net of insurance	(135)	(21)	(44)
Probable and reasonably estimable environmental liabilities	210	186	536
Other	51	19	17
	$136	$183	$515

In 2006, we recognized repositioning charges totaling $124 million primarily for severance costs related to workforce reductions of 2,253 manufacturing and administrative positions across all of our reportable segments. Also, $22 million of previously established accruals, primarily for severance at our Aerospace, Transportation Systems and Specialty Materials reportable segments, were returned to income in 2006 due mainly to changes in the scope of previously announced severance programs and due to fewer employee separations than originally planned associated with prior Aerospace severance actions.

In 2005, we recognized repositioning charges totaling $267 million primarily for severance costs related to workforce reductions of 5,269 maufacturing and administrative positions across all of our reportable segments including the implementation of a new organizational structure in our Aerospace reportable segment (substantially implemented in the third quarter of 2005) which reorganized our Aerospace businesses to better align with customer segments. Also, $25 million of previously established accruals, primarily for severance at our Corporate, Specialty Materials and Automation and Control Solutions reportable segments were returned to income in 2005. The reversal of severance liabilities related to changes in the scope of previously announced severance programs, excise taxes related to an executive severance amount previously paid which were determined to no longer be payable, and severance amounts previously paid to an outside service provider as part of an outsourcing arrangement which were refunded to Honeywell.

In 2004, we recognized repositioning charges totaling $116 million primarily for severance costs related to workforce reductions of 2,272 manufacturing and administrative positions across all of our

reportable segments. Also, $28 million of previously established accruals, primarily for severance, were returned to income in 2004, due to fewer employee separations than originally planned associated with certain prior repositioning actions, resulting in reduced severance liabilities principally in our Automation and Control Solutions reportable segment.

Our 2006 repositioning actions are expected to generate incremental pretax savings of approximately $100 million in 2007 compared with 2006 principally from planned workforce reductions. Cash expenditures for severance and other exit costs necessary to execute our repositioning actions were $142, $171 and $164 million in 2006, 2005 and 2004, respectively. Such expenditures for severance and other exit costs have been funded principally through operating cash flows. Cash expenditures for severance and other exit costs necessary to execute the remaining actions will approximate $125 million in 2007 and will be funded through operating cash flows.

In 2006, we recognized a charge of $210 million for environmental liabilities deemed probable and reasonably estimable during the year. We recognized asbestos related litigation charges, net of insurance, of $126 million which are discussed in more detail in Note 21 to the financial statements. We recognized other charges of $51 million related to our Corporate segment primarily for the settlement of a property damage claim litigation matter in Brunswick, GA and our entrance into a plea agreement related to an environmental matter at our Baton Rouge, LA. facility (see Note 21 to the financial statements). We recognized impairment charges of $12 million related to the write-down of property, plant and equipment held for sale in Specialty Materials. We also recognized a credit of $18 million in connection with an arbitration award for overcharges by a supplier of phenol to Specialty Materials for 2005 transactions.

In 2005, we recognized a charge of $186 million for environmental liabilities deemed probable and reasonably estimable during the year. We recognized asbestos related litigation charges, net of insurance, of $10 million which are discussed in more detail in Note 21 to the financial statements. We recognized a credit of $67 million in connection with an arbitration award for overcharges by a supplier of phenol to our Specialty Materials business from June 2003 through the end of 2004. We recognized impairment charges of $23 million related to the write-down of property, plant and equipment held and used in our Specialty Materials reportable segment. We also recognized other charges of $18 million principally related to the modification of a lease agreement for the Corporate headquarters facility ($10 million) and for various legal settlements ($7 million).

In 2004, we recognized a charge of $536 million for probable and reasonably estimable environmental liabilities primarily related to the estimated costs of the court-ordered excavation and transport for offsite disposal of approximately one million tons of chromium residue present at a predecessor Honeywell site located in Jersey City, New Jersey, and environmental conditions in and around Onondaga Lake in Syracuse, New York. Both of these environmental matters are discussed in further detail in Note 21 to the financial statements. We recognized asbestos related litigation charges, net of insurance, of $76 million which are discussed in Note 21. We recognized an impairment charge of $42 million in the second quarter of 2004 related principally to the write-down of property, plant and equipment of our Performance Fibers business in our Specialty Materials reportable segment. This business was sold in December 2004. We also recognized other charges of $33 million consisting of $29 million for various legal settlements including property damage claims in our Automation and Control Solutions reportable segment, $14 million for the write-off of receivables, inventories and other assets net of a reversal of a reserve of $10 million established in the prior year for a contract settlement.

LIQUIDITY AND CAPITAL RESOURCES

The Company continues to manage its businesses to maximize operating cash flows as the primary source of liquidity. We supplement operating cash with short-term debt from the commercial paper market and with long-term borrowings. We continue to balance our cash and financing uses through investment in our existing core businesses, acquisition activity, share repurchases and dividends.

Cash Flow Summary

Our cash flows from operating, investing and financing activities, as reflected in the Consolidated Statement of Cash Flows for the years ended December 31. 2006, 2005 and 2004 are summarized as follows:

	2006	2005	2004
Cash provided by (used for):			
Operating activities	$ 3,211	$ 2,442	$ 2,253
Investing activities	(614)	(2,010)	(584)
Financing activities	(2,649)	(2,716)	(1,223)
Effect of exchange rate changes on cash	42	(68)	190
Net (decrease)/increase in cash and cash equivalents	$ (10)	$(2,352)	$ 636

Cash provided by operating activities increased by $769 million during 2006 compared with 2005 primarily due to increased earnings, lower cash payments for asbestos of $331 million, receipt of $100 million from the sale of an insurance receivable, an increase in customer advances and deferred income (net of acquisitions) of $115 million and $93 million receipt of an arbitration award relating to raw material pricing in Specialty Materials, partially offset by increased working capital usage (accounts and other receivables (net of tax receivables), inventory and accounts payable) of $263 million (including proceeds of $58 million from the sale of a long-term receivable), higher cash tax payments (net of tax receipts) of $236 million and higher pension and postretirement payments of $154 million. Cash provided by operating activities increased by $189 million during 2005 compared to 2004 primarily due to increased earnings, working capital improvements, net of tax receivables, of $258 million, offset by higher cash payments for asbestos of $232 million and higher cash tax payments (net of tax receipts) of $57 million.

Cash used for investing activities decreased by $1,396 million during 2006 compared with 2005 due primarily to lower spending for acquisitions, partially offset by lower proceeds of $285 million from maturities of investment securities. In 2006, cash paid for acquisitions, net of cash acquired was $633 million primarily for First Technologies and Gardiner Groupe, compared to $2,679 million in 2005, primarily for our acquisitions of NOVAR and UOP. Sale proceeds from divestitures was $665 million in the 2006 primarily due to the sale of Indalex in February for $425 million, First Technology Safety & Analysis business (FTSA) for $93 million in May 2006 and the sale of First Technology Automotive Business in December 2006 for $90 million. Cash used for investing activities increased by $1,426 million during 2005 compared with 2004 due primarily to the acquisition of NOVAR and UOP.

Cash used for financing activities decreased by $67 million during 2006 compared 2005 primarily due to a $356 million reduction for the payment of debt assumed with acquisitions, an increase in net proceeds from debt of $258 million, and increased proceeds from issuance of common stock primarily related to stock option exercises of $229 million, offset by increases in repurchases of common stock of $763 million and increased dividend payments. Cash used for financing activities increased by $1,493 million during 2005 compared 2004, primarily due payment of debt assumed with acquisition of $702 million, increased net repayments of debt of $418 million and an increase in repurchases of common stock of $409 million.

Liquidity

Each of our businesses is focused on implementing strategies to improve working capital turnover in 2007 to increase operating cash flows. Considering the current economic environment in which each of our businesses operate and our business plans and strategies, including our focus on growth, cost reduction and productivity initiatives, we believe that our cash balances and operating cash flows will remain our principal source of liquidity. In addition to our available cash and operating cash flows, additional sources of liquidity include committed credit lines, access to the public debt and equity markets, as well as our ability to sell trade accounts receivables.

A source of liquidity is our ability to issue short-term debt in the commercial paper market. Commercial paper notes are sold at a discount and have a maturity of not more than 270 days from date of issuance. Borrowings under the commercial paper program are available for general corporate purposes as well as for financing potential acquisitions. There was $669 million of commercial paper outstanding at December 31, 2006.

Our ability to access the commercial paper market, and the related cost of these borrowings, is affected by the strength of our credit ratings and our $2.5 billion of committed bank revolving credit facilities (Revolving Credit Facilities). Our credit ratings are periodically reviewed by the major independent debt-rating agencies. In 2006, Standard and Poor's, Fitch's and Moody's Rating Services affirmed their corporate ratings on our long-term debt of A and A+ and A2 respectively, and short-term debt of A-1, F1 and P-1 respectively, and maintained Honeywell's ratings outlook as "stable".

On April 27, 2006 Honeywell entered into a $2.3 billion Five-Year Credit Agreement ("Credit Agreement") with a syndicate of banks. Commitments under the Credit Agreement can be increased pursuant to the terms of the Credit Agreement to an aggregated amount not to exceed $3 billion. This credit facility contains a $500 million sub-limit for the issuance of letters of credit. The $2.3 billion credit agreement is maintained for general corporate purposes, including support for the issuance of commercial paper. We had no borrowings and have issued $145 million of letters of credit under the credit facility at December 31, 2006. The Credit Agreement replaces the previous $1 billion five year credit agreement dated as of October 22, 2004, and $1.3 billion five year credit agreement dated as of November 26, 2003 (the "Prior Agreements"). The Credit Agreement does not restrict Honeywell's ability to pay dividends, nor does it contain financial covenants.

In September 2006, the Company renewed its 364-day Canadian Dollar (CAD) credit facility for 220 million CAD. This facility was established for general corporate purposes, including support for the issuance of commercial paper in Canada. There are no borrowings outstanding under this credit facility at December 31, 2006.

In March 2006, the Company issued $300 million of floating rate (Libor + 6 bps) Senior Notes due 2009, $400 million 5.40% Senior Notes due 2016 and $550 million 5.70% Senior Notes due 2036 (collectively, the "Notes"). The Notes are senior unsecured and unsubordinated obligations of Honeywell and rank equally with all of Honeywell's existing and future senior unsecured debt and senior to all Honeywell's subordinated debt. The offering resulted in gross proceeds of $1,250 million, offset by $11 million in discount and closing costs relating to the offering. Proceeds from the notes were used to repay commercial paper and debt.

During the first quarter of 2006, the Company made a cash tender offer and repurchased $225 million of its $500 million 5.125% Notes due November 2006. The costs relating to the early redemption of the Notes were immaterial.

In the fourth quarter of 2006, the Company repaid $360 million (Euro 275 million) of its 5.27% Notes, primarily through issuance of commercial paper.

We also have a current shelf registration statement filed with the Securities and Exchange Commission which allows us to issue up to $3 billion in debt securities, common stock and preferred stock that may be offered in one or more offerings on terms to be determined at the time of the offering. Net proceeds of any offering would be used for general corporate purposes, including repayment of existing indebtedness, capital expenditures and acquisitions.

We also sell interests in designated pools of trade accounts receivables to third parties. The sold receivables were over-collateralized by $171 million at December 31, 2006 and we retain a subordinated interest in the pool of receivables representing that over-collateralization as well as an undivided interest in the balance of the receivables pools. New receivables are sold under the agreement as previously sold receivables are collected. The retained interests in the receivables are reflected at the amounts expected to be collected by us, and such carrying value approximates the fair value of our retained interests. The sold receivables were $500 million at both December 31, 2006 and 2005.

In addition to our normal operating cash requirements, our principal future cash requirements will be to fund capital expenditures, debt repayments, dividends, employee benefit obligations, environmental remediation costs, asbestos claims, severance and exit costs related to repositioning actions, share repurchases and any strategic acquisitions.

Specifically, we expect our primary cash requirements in 2007 to be as follows:

- Capital expenditures—we expect to spend approximately $800 million for capital expenditures in 2007 primarily for growth, replacement, production capacity expansion, cost reduction and maintenance.
- Debt repayments—there are $423 million of scheduled long-term debt maturities in 2007. We expect to refinance substantially all of these maturities in the debt capital markets during 2007.
- Share repurchases—We intend to continue to repurchase outstanding shares from time to time in the open market using cash generated from operations. In February 2007, the Board of Directors authorized the repurchase of shares of up to $3 billion of Honeywell common stock. Honeywell intends to repurchase outstanding shares from time to time in the open market using cash flow generated by operations. The amount and timing of repurchases may vary depending on market conditions and the level of other investing activities.
- Dividends—we expect to pay approximately $800 million in dividends on our common stock in 2007, reflecting the 10 percent increase in the dividend rate announced by Honeywell's Board of Directors in December 2006.
- Asbestos claims—we expect our cash spending for asbestos claims and our cash receipts for related insurance recoveries to be approximately $557 and $157 million, respectively, in 2007. See Asbestos Matters in Note 21 to the financial statements for further discussion.
- Pension contributions—assuming that actual pension plan returns are consistent with our expected rate of return of 9 percent in 2007 and beyond and that interest rates remain constant, we would not be required to make any contributions to our U.S. pension plans to satisfy minimum statutory funding requirements for the foreseeable future. However, we expect to make voluntary contributions of approximately $52 million to our U.S. pension plans in 2007 for government contracting purposes. We also expect to make contributions to our non-U.S. plans of approximately $155 million in 2007. See Note 22 to the financial statements for further discussion of pension contributions.
- Repositioning actions—we expect that cash spending for severance and other exit costs necessary to execute the remaining repositioning actions will approximate $125 million in 2007.
- Environmental remediation costs—we expect to spend approximately $250 million in 2007 for remedial response and voluntary clean-up costs. See Environmental Matters in Note 21 to the financial statements for additional information.

We continuously assess the relative strength of each business in our portfolio as to strategic fit, market position, profit and cash flow contribution in order to upgrade our combined portfolio and identify business units that will most benefit from increased investment. We identify acquisition candidates that will further our strategic plan and strengthen our existing core businesses. We also identify businesses that do not fit into our long-term strategic plan based on their market position, relative profitability or growth potential. These businesses are considered for potential divestiture, restructuring or other repositioning actions subject to regulatory constraints. In 2006, we realized $665 million in cash proceeds from sales of non-strategic businesses.

Based on past performance and current expectations, we believe that our operating cash flows will be sufficient to meet our future cash needs. Our available cash, committed credit lines, access to the

public debt and equity markets as well as our ability to sell trade accounts receivables, provide additional sources of short-term and long-term liquidity to fund current operations, debt maturities, and future investment opportunities. Based on our current financial position and expected economic performance, we do not believe that our liquidity will be adversely impacted by an inability to access our sources of financing.

Contractual Obligations and Probable Liability Payments

Following is a summary of our significant contractual obligations and probable liability payments at December 31, 2006:

		Payments by Period			
	Total	2007	2008-2009	2010-2011	Thereafter
		(Dollars in millions)			
Long-term debt, including capitalized leases(1)	$ 4,332	$ 423	$ 927	$1,656	$ 1,326
Minimum operating lease payments	1,078	304	377	174	223
Purchase obligations(2)	3,446	863	1,361	704	518
Estimated environmental liability payments(3)	831	250	346	221	14
Asbestos related liability payments(4)	1,819	557	926	298	38
	11,506	2,397	3,937	3,053	2,119
Asbestos insurance recoveries(5)	(1,257)	(157)	(83)	(98)	(919)
	$10,249	$2,240	$3,854	$2,955	$ 1,200

(1) Assumes all long-term debt is outstanding until scheduled maturity.

(2) Purchase obligations are entered into with various vendors in the normal course of business and are consistent with our expected requirements.

(3) The amounts in the table do not reflect any significant environmental liability payments after 2011. See Note 21 to the financial statements for additional information.

(4) These amounts are estimates of asbestos related cash payments for NARCO and Bendix. NARCO estimated payments are based on the terms and conditions, including evidentiary requirements, specified in the definitive agreements or agreements in principle and pursuant to Trust Distribution Procedures. Bendix payments are based on our estimate of pending and future claims. Projecting future events is subject to many uncertainties that could cause asbestos liabilities to be higher or lower than those projected and recorded. See Asbestos Matters in Note 21 to the financial statements for additional information.

(5) These amounts represent probable insurance recoveries through 2018. See Asbestos Matters in Note 21 to the financial statements.

The table excludes our pension and other postretirement benefits (OPEB) obligations. We made voluntary contributions of $68 and $40 million to our U.S. pension plans in 2006 and 2004, respectively. Future plan contributions are dependent upon actual plan asset returns and interest rates. Assuming that actual plan asset returns are consistent with our expected plan return of 9 percent in 2007 and beyond, and that interest rates remain constant, we would not be required to make any contributions to our U.S. pension plans to satisfy minimum statutory funding requirements for the foreseeable future. We expect to make voluntary contributions of approximately $52 million to our U.S. plans in 2007 for government contracting purposes. We expect to make contributions to our non-U.S. plans of approximately $155 million in 2007. Payments due under our OPEB plans are not required to be funded in advance, but are paid as medical costs are incurred by covered retiree populations, and are principally dependent upon the future cost of retiree medical benefits under our plans. We expect our OPEB payments to approximate $189 million in 2007 net of the benefit of approximately $22 million from the Medicare prescription subsidy. See Note 22 to the financial statements for further discussion of our pension and OPEB plans.

Off-Balance Sheet Arrangements

Following is a summary of our off-balance sheet arrangements:

Guarantees—We have issued or are a party to the following direct and indirect guarantees at December 31, 2006:

	Maximum Potential Future Payments (Dollars in millions)
Operating lease residual values	$38
Other third parties' financing	6
Unconsolidated affiliates' financing	9
Customer financing	22
	$75

We do not expect that these guarantees will have a material adverse effect on our consolidated results of operations, financial position or liquidity.

In connection with the disposition of certain businesses and facilities we have indemnified the purchasers for the expected cost of remediation of environmental contamination, if any, existing on the date of disposition. Such expected costs are accrued when environmental assessments are made or remedial efforts are probable and the costs can be reasonably estimated.

Retained Interests in Factored Pools of Trade Accounts Receivables—As a source of liquidity, we sell interests in designated pools of trade accounts receivables to third parties. The sold receivables ($500 million at December 31, 2006) are over-collateralized and we retain a subordinated interest in the pool of receivables representing that over-collateralization as well as an undivided interest in the balance of the receivables pools. The over-collateralization provides credit support to the purchasers of the receivable interest by limiting their losses in the event that a portion of the receivables sold becomes uncollectible. At December 31, 2006, our retained subordinated and undivided interests at risk were $171 and $579 million, respectively. Based on the underlying credit quality of the receivables placed into the designated pools of receivables being sold, we do not expect that any losses related to our retained interests at risk will have a material adverse effect on our consolidated results of operations, financial position or liquidity.

Environmental Matters

We are subject to various federal, state, local and foreign government requirements relating to the protection of the environment. We believe that, as a general matter, our policies, practices and procedures are properly designed to prevent unreasonable risk of environmental damage and personal injury and that our handling, manufacture, use and disposal of hazardous or toxic substances are in accord with environmental and safety laws and regulations. However, mainly because of past operations and operations of predecessor companies, we, like other companies engaged in similar businesses, have incurred remedial response and voluntary cleanup costs for site contamination and are a party to lawsuits and claims associated with environmental and safety matters, including past production of products containing toxic substances. Additional lawsuits, claims and costs involving environmental matters are likely to continue to arise in the future.

With respect to environmental matters involving site contamination, we continually conduct studies, individually or jointly with other responsible parties, to determine the feasibility of various remedial techniques to address environmental matters. It is our policy (see Note 1 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data") to record appropriate liabilities for environmental matters when remedial efforts or damage claim payments are probable and the costs can be reasonably estimated. Such liabilities are based on our best estimate of the undiscounted future costs required to complete the remedial work. The recorded liabilities are adjusted periodically as remediation efforts progress or as additional technical or legal information becomes available. Given

the uncertainties regarding the status of laws, regulations, enforcement policies, the impact of other potentially responsible parties, technology and information related to individual sites, we do not believe it is possible to develop an estimate of the range of reasonably possible environmental loss in excess of our accrual. We expect to fund expenditures for these matters from operating cash flow. The timing of cash expenditures depends on a number of factors, including the timing of litigation and settlements of remediation liability, personal injury and property damage claims, regulatory approval of cleanup projects, execution timeframe of projects, remedial techniques to be utilized and agreements with other parties.

Remedial response and voluntary cleanup payments were $264, $247 and $248 million in 2006, 2005, and 2004, respectively, and are currently estimated to be approximately $250 million in 2007. We expect to fund such expenditures from operating cash flow.

Remedial response and voluntary cleanup costs charged against pretax earnings were $210, $186 and $536 million in 2006, 2005 and 2004, respectively. At December 31, 2006 and 2005, the recorded liability for environmental matters was $831 and $879 million, respectively. In addition, in 2006 and 2005 we incurred operating costs for ongoing businesses of approximately $101 and $87 million, respectively, relating to compliance with environmental regulations.

Although we do not currently possess sufficient information to reasonably estimate the amounts of liabilities to be recorded upon future completion of studies, litigation or settlements, and neither the timing nor the amount of the ultimate costs associated with environmental matters can be determined, they could be material to our consolidated results of operations or operating cash flows in the periods recognized or paid. However, considering our past experience and existing reserves, we do not expect that environmental matters will have a material adverse effect on our consolidated financial position.

See Note 21 to the financial statements for a discussion of our commitments and contingencies, including those related to environmental matters and toxic tort litigation.

Financial Instruments

As a result of our global operating and financing activities, we are exposed to market risks from changes in interest and foreign currency exchange rates and commodity prices, which may adversely affect our operating results and financial position. We minimize our risks from interest and foreign currency exchange rate and commodity price fluctuations through our normal operating and financing activities and, when deemed appropriate, through the use of derivative financial instruments. We do not use derivative financial instruments for trading or other speculative purposes and do not use leveraged derivative financial instruments. A summary of our accounting policies for derivative financial instruments is included in Note 1 to the financial statements.

We conduct our business on a multinational basis in a wide variety of foreign currencies. Our exposure to market risk from changes in foreign currency exchange rates arises from international financing activities between subsidiaries, foreign currency denominated monetary assets and liabilities and anticipated transactions arising from international trade. Our objective is to preserve the economic value of non-functional currency cash flows. We attempt to have all transaction exposures hedged with natural offsets to the fullest extent possible and, once these opportunities have been exhausted, through foreign currency forward and option agreements with third parties. Our principal currency exposures relate to the U.S. dollar, Euro, British pound, the Canadian dollar, the Hong Kong dollar, the Chinese renminbi and the Singapore dollar.

Our exposure to market risk from changes in interest rates relates primarily to our debt and pension obligations. As described in Notes 14 and 16 to the financial statements, we issue both fixed and variable rate debt and use interest rate swaps to manage our exposure to interest rate movements and reduce overall borrowing costs.

Financial instruments, including derivatives, expose us to counterparty credit risk for nonperformance and to market risk related to changes in interest or currency exchange rates. We manage our exposure to counterparty credit risk through specific minimum credit standards, diversification of counterparties, and procedures to monitor concentrations of credit risk. Our counterparties are substantial investment and commercial banks with significant experience using such derivative

instruments. We monitor the impact of market risk on the fair value and expected future cash flows of our derivative and other financial instruments considering reasonably possible changes in interest and currency exchange rates and restrict the use of derivative financial instruments to hedging activities.

The following table illustrates the potential change in fair value for interest rate sensitive instruments based on a hypothetical immediate one-percentage-point increase in interest rates across all maturities, the potential change in fair value for foreign exchange rate sensitive instruments based on a 10 percent weakening of the U.S. dollar versus local currency exchange rates across all maturities, and the potential change in fair value of contracts hedging commodity purchases based on a 20 percent decrease in the price of the underlying commodity across all maturities at December 31, 2006 and 2005.

	Face or Notional Amount	Carrying Value(1)	Fair Value(1)	Estimated Increase (Decrease) In Fair Value
		(Dollars in millions)		
December 31, 2006				
Interest Rate Sensitive Instruments				
Long-term debt (including current maturities)	$(4,329)	$(4,332)	$(4,521)	$(194)
Interest rate swap agreements	700	3	3	(31)
Foreign Exchange Rate Sensitive Instruments				
Foreign currency exchange contracts(2)	2,572	—	—	8
Commodity Price Sensitive Instruments				
Forward commodity contracts(3)	60	(9)	(9)	(10)
December 31, 2005				
Interest Rate Sensitive Instruments				
Long-term debt (including current maturities)	$(4,070)	$(4,077)	$(4,291)	$ (88)
Interest rate swap agreements	681	9	9	(5)
Foreign Exchange Rate Sensitive Instruments				
Foreign currency exchange contracts(2)	1,998	(2)	(2)	(36)
Commodity Price Sensitive Instruments				
Forward commodity contracts(3)	141	17	17	(12)

(1) Asset or (liability).

(2) Changes in the fair value of foreign currency exchange contracts are offset by changes in the fair value or cash flows of underlying hedged foreign currency transactions.

(3) Changes in the fair value of forward commodity contracts are offset by changes in the cash flows of underlying hedged commodity transactions.

The above discussion of our procedures to monitor market risk and the estimated changes in fair value resulting from our sensitivity analyses are forward-looking statements of market risk assuming certain adverse market conditions occur. Actual results in the future may differ materially from these estimated results due to actual developments in the global financial markets. The methods used by us to assess and mitigate risk discussed above should not be considered projections of future events.

CRITICAL ACCOUNTING POLICIES

The preparation of our consolidated financial statements in accordance with generally accepted accounting principles is based on the selection and application of accounting policies that require us to make significant estimates and assumptions about the effects of matters that are inherently uncertain. We consider the accounting policies discussed below to be critical to the understanding of our financial statements. Actual results could differ from our estimates and assumptions, and any such differences could be material to our consolidated financial statements.

We have discussed the selection, application and disclosure of these critical accounting policies with the Audit Committee of our Board of Directors and our Independent Registered Public

Accountants. New accounting standards effective in 2006 which had a material impact on our consolidated financial statements are described in the Recent Accounting Pronouncements section in Note 1 to the financial statements.

Contingent Liabilities—We are subject to a number of lawsuits, investigations and claims (some of which involve substantial dollar amounts) that arise out of the conduct of our global business operations or those of previously owned entities. These contingencies relate to product liabilities (including asbestos), contractual matters, and environmental, health and safety matters. We recognize a liability for any contingency that is probable of occurrence and reasonably estimable. We continually assess the likelihood of any adverse judgments or outcomes to our contingencies, as well as potential amounts or ranges of probable losses, and recognize a liability, if any, for these contingencies based on a careful analysis of each matter with the assistance of outside legal counsel and, if applicable, other experts. Such analysis includes making judgments concerning matters such as the costs associated with environmental matters, the outcome of negotiations, the number and cost of pending and future asbestos claims, and the impact of evidentiary requirements. Because most contingencies are resolved over long periods of time, liabilities may change in the future due to new developments (including new discovery of fact, changes in legislation and outcomes of similar cases through the judicial system), changes in assumptions or changes in our settlement strategy. For a discussion of our contingencies related to environmental, asbestos and other matters, including management's judgment applied in the recognition and measurement of specific liabilities, see Notes 1 and 21 to the financial statements.

Asbestos Related Contingencies and Insurance Recoveries—We are a defendant in personal injury actions related to asbestos containing products (refractory products and friction products). We recognize a liability for any asbestos related contingency that is probable of occurrence and reasonably estimable. Regarding North American Refractories Company (NARCO) asbestos related claims, we accrue for pending claims based on terms and conditions, including evidentiary requirements, in definitive agreements or agreements in principle with current claimants. We have also accrued for the probable value of future NARCO asbestos related claims through 2018 based on the disease criteria and payment values contained in the NARCO trust as described in Note 21 to the financial statements. In light of the inherent uncertainties in making long term projections regarding claims filing rates and disease manifestation, we do not believe that we have a reasonable basis for estimating NARCO asbestos claims beyond 2018 under Statement of Financial Accounting Standards No. 5, "Accounting for Contingencies" (SFAS No. 5). Regarding Bendix asbestos related claims, we accrue for the estimated value of pending claims based on expected claim resolution values and dismissal rates. In the fourth quarter of 2006, the Company accrued a liability for the estimated cost of future anticipated claims related to Bendix through 2011 based on our assessment of additional claims that may be brought against us and anticipated resolution values in the tort system. In December 2006, we also changed our methodology for valuing Bendix pending and future claims from using average resolution values of the previous five years to using average resolution values of the previous two years. For additional information relating to Bendix related claims see Note 21 to the financial statements. We continually assess the likelihood of any adverse judgments or outcomes to our contingencies, as well as potential ranges of probable losses and recognize a liability, if any, for these contingencies based on an analysis of each individual issue with the assistance of outside legal counsel and, if applicable, other experts.

In connection with recognition of liabilities for asbestos related matters, we record asbestos related insurance recoveries that are deemed probable. In assessing the probability of insurance recovery, we make judgments concerning insurance coverage that we believe are reasonable and consistent with our historical experience with our insurers, our knowledge of any pertinent solvency issues surrounding insurers, various judicial determinations relevant to our insurance programs and our consideration of the impacts of any settlements with our insurers. At December 31, 2006, we have recorded insurance receivables of $955 million that can be specifically allocated to NARCO related asbestos liabilities. We also have $1.9 billion in coverage remaining for Bendix related asbestos liabilities although there are gaps in our coverage due to insurance company insolvencies, certain uninsured periods and insurance settlements, resulting in approximately 50 percent of these claims on a cumulative historical basis being reimbursable by insurance. Our insurance is with both the domestic insurance market and the London excess market. While the substantial majority of our insurance carriers are solvent, some of

our individual carriers are insolvent, which has been considered in our analysis of probable recoveries. Projecting future events is subject to various uncertainties that could cause the insurance recovery on asbestos related liabilities to be higher or lower than that projected and recorded. Given the inherent uncertainty in making future projections, we reevaluate our projections concerning our probable insurance recoveries in light of any changes to the projected liability, our recovery experience or other relevant factors that may impact future insurance recoveries. See Note 21 to the financial statements for a discussion of management's judgments applied in the recognition and measurement of insurance recoveries for asbestos related liabilities.

Defined Benefit Pension Plans—We maintain defined benefit pension plans covering a majority of our employees and retirees. For financial reporting purposes, net periodic pension expense is calculated based upon a number of significant actuarial assumptions, including a discount rate for plan obligations and an expected long-term rate of return on plan assets. We consider current market conditions, including changes in investment returns and interest rates, in making these assumptions. We determine the expected long-term rate of return on plan assets utilizing historic and expected plan asset returns over varying long-term periods combined with current market conditions and broad asset mix considerations (see Note 22 to the financial statements for actual and targeted asset allocation percentages for our pension plans). The discount rate reflects the market rate on December 31 (measurement date) for high-quality fixed-income investments with maturities corresponding to our benefit obligations and is subject to change each year. Further information on all our major actuarial assumption is included in Note 22 to the financial statements.

The key assumptions used in developing our 2006, 2005 and 2004 net periodic pension expense for our U.S. plans included the following:

	2006	2005	2004
Discount rate	5.75%	5.875%	6.00%
Assets:			
Expected rate of return	9%	9%	9%
Actual rate of return	14%	8%	13%
Actual 10 year average annual compounded rate of return	10%	10%	11%

The reduction in the discount rate in both 2006 and 2005 reflects the lower market interest rate environment for high-quality fixed income debt instruments. The discount rate is also volatile from year to year because it is determined based upon the prevailing rate as of the measurement date. We will use a 6.00 percent discount rate in 2007, reflecting the increase in the market interest rate environment. We plan to continue to use an expected rate of return on plan assets of 9 percent for 2007 based principally on our historical experience of actual plan returns. The net losses for our pension plans were $2.4 billion at December 31, 2006 compared with $3.4 billion at December 31, 2005. This decrease of $1.0 billion is due primarily to lower net losses in our U.S. plans due to a higher discount rate at December 31, 2006, an actual plan asset return of 14% in 2006 in our U.S. plans which was higher than the expected rate of return of 9%, and loss amortization in 2006. The net losses at December 31, 2006 principally result from the decline each year in the discount rate for the period 2001 through 2005 and from actual plan asset returns below expected rates of return during 2000, 2001, 2002 and 2005. Such net losses were recognized as of December 31, 2006 on our consolidated balance sheet and as a component of other comprehensive income (loss), net of tax, in accordance with SFAS No. 158, "Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans (SFAS No. 158) which is discussed in detail in Notes 1 and 22 to the financial statements. In the future we will continue to systematically recognize such net losses in net periodic pension expense in accordance with Statement of Financial Accounting Standards No. 87, 'Employers Accounting for Pensions' (SFAS No. 87). Under SFAS No. 87, we use the market-related value of plan assets reflecting changes in the fair value of plan assets over a three-year period. Further, net losses in excess of 10 percent of the greater of the market-related value of plan assets or the plans projected benefit obligation are recognized over a six-year period.

Changes in net periodic pension expense may occur in the future due to changes in our expected rate of return on plan assets and discount rate resulting from economic events. The following table

highlights the sensitivity of our U.S. pension obligations and expense to changes in these assumptions, assuming all other assumptions remain constant:

Change in Assumption	Impact on Annual Pension Expense	Impact on PBO
0.25 percentage point decrease in discount rate ..	Increase $50 million	Increase $345 million
0.25 percentage point increase in discount rate ...	Decrease $50 million	Decrease $330 million
0.25 percentage point decrease in expected rate of return on assets	Increase $30 million	—
0.25 percentage point increase in expected rate of return on assets	Decrease $30 million	—

Net periodic pension expense for our pension plans is expected to be approximately $200 million in 2007, a $113 million decrease from 2006 due principally to a decrease in the amortization of net losses. The decline in the amortization of net losses results principally from an increase in the discount rate at December 31, 2006 and actual plan asset returns higher than the expected rate of return in 2004 and 2006.

In 2006, 2005 and 2004 we were not required to make a contribution to satisfy minimum statutory funding requirements in our U.S. pension plans. We made voluntary contributions of $68 and $40 million to our U.S. pension plans in 2006 and 2004, respectively, mainly for government contracting purposes. Future plan contributions are dependent upon actual plan asset returns and interest rates. Assuming that actual plan returns are consistent with our expected plan return of 9 percent in 2007 and beyond, and that interest rates remain constant, we would not be required to make any contributions to our U.S. pension plans to satisfy minimum statutory funding requirements for the foreseeable future. However, we expect to make voluntary contributions of approximately $52 million in cash in 2007 to certain of our U.S. pension plans for government contracting purposes. We also expect to contribute approximately $155 million in cash in 2007 to our non-U.S. defined benefit pension plans to satisfy regulatory funding standards.

Long-Lived Assets (including Tangible and Definite-Lived Intangible Assets)—To conduct our global business operations and execute our business strategy, we acquire tangible and intangible assets, including property, plant and equipment and definite-lived intangible assets. At December 31, 2006, the net carrying amount of these long-lived assets totaled $5.9 billion. The determination of useful lives (for depreciation/amortization purposes) and whether or not these assets are impaired involves the use of accounting estimates and assumptions, changes in which could materially impact our financial condition or operating performance if actual results differ from such estimates and assumptions. We periodically evaluate the recoverability of the carrying amount of our long-lived assets whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset group may not be fully recoverable. The principal factors we consider in deciding when to perform an impairment review are as follows:

- significant under-performance (i.e., declines in sales, earnings or cash flows) of a business or product line in relation to expectations;
- annual operating plans or five-year strategic plans that indicate an unfavorable trend in operating performance of a business or product line;
- significant negative industry or economic trends; and
- significant changes or planned changes in our use of the assets.

Once it is determined that an impairment review is necessary, recoverability of assets is measured by comparing the carrying amount of the asset grouping to the estimated future undiscounted cash flows. If the carrying amount exceeds the estimated future undiscounted cash flows, the asset grouping is considered to be impaired. The impairment is then measured as the difference between the carrying amount of the asset grouping and its fair value. We use the best information available to determine fair value, which are usually either market prices (if available) or an estimate of the future discounted cash flow. The key estimates in our discounted cash flow analysis include expected industry growth rates, our assumptions as to volume, selling prices and costs, and the discount rate selected. As described in more detail in the repositioning and other charges section of our MD&A, we have recorded impairment charges related to long-lived assets of $12 and $23 million in 2006 and 2005, respectively, principally related to businesses in our Specialty Materials reportable segment. These businesses were

significantly under-performing or were in industries with negative economic trends and subsequently these businesses were significantly restructured, sold or are in the process of being sold.

Goodwill Impairment Testing—Goodwill represents the excess of acquisition costs over the fair value of the net tangible assets and identifiable intangible assets acquired in a business combination. Goodwill is not amortized, but is subject to impairment testing. Our Goodwill balance, $8.4 billion as of December 31, 2006, is subject to impairment testing annually as of March 31, or whenever events or changes in circumstances indicate that the carrying amount may not be fully recoverable, using the guidance and criteria described in Statement of Financial Accounting Standards No. 142, (SFAS No. 142) "Goodwill and Other Intangible Assets". This testing compares carrying values to fair values and, when appropriate, the carrying value is reduced to fair value. The fair value of our reporting units is estimated utilizing a discounted cash flow approach incorporating historic and projected future operating performance. This impairment test involves the use of accounting estimates and assumptions, changes in which could materially impact our financial condition or operating performance if actual results differ from such estimates and assumptions. We completed our annual impairment test as of March 31, 2006 and determined that there was no impairment as of that date.

Income Taxes—Deferred tax assets and liabilities are determined based on the difference between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Our provision for income taxes is based on domestic and international statutory income tax rates and tax planning opportunities in the jurisdictions in which we operate. Significant judgment is required in determining income tax provisions as well as deferred tax asset and liability balances, including the estimation of valuation allowances and the evaluation of tax positions.

As of December 31, 2006, we recognized a net deferred tax asset of $2,414 million, less a valuation allowance of $516 million. Net deferred tax assets are primarily comprised of net deductible temporary differences, net operating loss carryforwards and tax credit carryforwards that are available to reduce taxable income in future periods. The determination of the amount of valuation allowance to be provided on recorded deferred tax assets involves estimates regarding (1) the timing and amount of the reversal of taxable temporary differences, (2) expected future taxable income, and (3) the impact of tax planning strategies. A valuation allowance is required when it is more likely than not that all or a portion of a deferred tax asset will not be realized. In assessing the need for a valuation allowance, we consider all available positive and negative evidence, including past operating results, projections of future taxable income and the feasibility of ongoing tax planning strategies. The projections of future taxable income include a number of estimates and assumptions regarding our volume, pricing and costs. Additionally, valuation allowances related to deferred tax assets can be impacted by changes to tax laws.

Our net deferred tax asset of $2,414 million is comprised of $1,624 million related to U.S. operations and $790 million related to non-U.S. operations. The U.S. net deferred tax asset of $1,624 million is comprised of net deductible temporary differences, tax credit carryforwards and state tax net operating losses which we believe will more likely than not be realized through the generation of future taxable income in the U.S. and tax planning strategies. We maintain a valuation allowance of $35 million against such asset related to state tax net operating losses. The non-U.S. net deferred tax asset of $790 million is comprised principally of net operating and capital loss carryforwards, mainly in Germany, France and the United Kingdom. We maintain a valuation allowance of $481 million against these deferred tax assets reflecting our historical experience and lower expectations of taxable income over the applicable carryforward periods. As more fully described in Note 6 to the financial statements, our valuation allowance increased by $39, $139 and $39 million in 2006, 2005 and 2004, respectively. In the event we determine that we will not be able to realize our net deferred tax assets in the future, we will reduce such amounts through a charge to income in the period such determination is made. Conversely, if we determine that we will be able to realize net deferred tax assets in excess of the carrying amounts, we will decrease the recorded valuation allowance through a credit to income or a credit to goodwill in the period that such determination is made. If a valuation allowance is recognized for the net deferred tax asset for an acquired entity's deductible temporary differences, operating loss, capital loss, or tax credit carryforwards at the acquisition date, the tax benefits for those items recognized after the acquisition date shall be applied first to reduce to zero goodwill related to the

acquisition, second to reduce to zero other non-current intangible assets related to the acquisition, and third to reduce income tax expense.

Significant judgment is required in determining income tax provisions under Statement of Financial Accounting Standards No. 109 "Accounting for Income Taxes" (SFAS No. 109) and in evaluating tax positions. We establish additional provisions for income taxes when, despite the belief that tax positions are fully supportable, there remain certain positions that are likely to be challenged and that may not be sustained on review by tax authorities. In the normal course of business, the Company and its subsidiaries are examined by various Federal, State and foreign tax authorities. We regularly assess the potential outcomes of these examinations and any future examinations for the current or prior years in determining the adequacy of our provision for income taxes. We continually assess the likelihood and amount of potential adjustments and adjust the income tax provision, the current tax liability and deferred taxes in the period in which the facts that give rise to a revision become known.

As described in further detail in the Recent Accounting Pronouncements section in Note 1 of Notes to Financial Statements in "Item 8. Financial Statements and Supplementary Data", FASB Interpretation ("FIN") No. 48 "Accounting for Uncertainty in Income Taxes—an interpretation of FASB Statement 109" is effective beginning January 1, 2007. FIN 48 establishes a single model to address accounting for uncertainty in tax positions. FIN 48 clarifies the accounting for income taxes by prescribing a minimum recognition threshold a tax position is required to meet before being recognized in the financial statements. FIN 48 also provides guidance on derecognition, measurement, classification, interest and penalties, accounting in interim periods, disclosure and transition. FIN 48 is effective for fiscal years beginning after December 15, 2006. Honeywell will adopt FIN 48 as of January 1, 2007 as required. Based on our current assessment, and subject to any changes that may result from additional technical guidance being issued, the adoption of FIN 48 on January 1, 2007 is expected to reduce our existing reserves for uncertain tax positions by approximately $130 million, to be recorded as a cumulative effect adjustment to equity, largely relating to state income tax matters.

Sales Recognition on Long-Term Contracts—In 2006, we recognized approximately 12 percent of our total net sales using the percentage-of-completion method for long-term contracts in our Automation and Control Solutions, Aerospace and Specialty Materials reportable segments. These long-term contracts are measured on the cost-to-cost basis for engineering-type contracts and the units-of-delivery basis for production-type contracts. Accounting for these contracts involves management judgment in estimating total contract revenue and cost. Contract revenues are largely determined by negotiated contract prices and quantities, modified by our assumptions regarding contract options, change orders, incentive and award provisions associated with technical performance and price adjustment clauses (such as inflation or index-based clauses). Contract costs are incurred over a period of time, which can be several years, and the estimation of these costs requires management judgment. Cost estimates are largely based on negotiated or estimated purchase contract terms, historical performance trends and other economic projections. Significant factors that influence these estimates include inflationary trends, technical and schedule risk, internal and subcontractor performance trends, business volume assumptions, asset utilization, and anticipated labor agreements. Revenue and cost estimates are regularly monitored and revised based on changes in circumstances. Anticipated losses on long-term contracts are recognized when such losses become evident. We maintain financial controls over the customer qualification, contract pricing and estimation processes to reduce the risk of contract losses.

OTHER MATTERS

Litigation

See Note 21 to the financial statements for a discussion of environmental, asbestos and other litigation matters.

Recent Accounting Pronouncements

See Note 1 to the financial statements for a discussion of recent accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Information relating to market risk is included in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" under the caption "Financial Instruments".

Item 8. Financial Statements and Supplementary Data

HONEYWELL INTERNATIONAL INC.

CONSOLIDATED STATEMENT OF OPERATIONS

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions, except per share amounts)		
Product sales	$25,165	$22,257	$20,400
Service sales	6,202	5,395	5,193
Net sales	31,367	27,652	25,593
Costs, expenses and other			
Cost of products sold	19,649	17,681	17,071
Cost of services sold	4,447	3,843	3,681
	24,096	21,524	20,752
Selling, general and administrative expenses	4,210	3,707	3,316
Other (income)/expense	(111)	(231)	(429)
Interest and other financial charges	374	356	331
	28,569	25,356	23,970
Income from continuing operations before taxes	2,798	2,296	1,623
Tax expense	720	732	377
Income from continuing operations	2,078	1,564	1,246
Income from discontinued operations, net of taxes	5	95	—
Cumulative effect of accounting change, net of taxes	—	(21)	—
Net income	$ 2,083	$ 1,638	$ 1,246
Earnings (loss) per share of common stock—basic:			
Income from continuing operations	$ 2.53	$ 1.85	$ 1.45
Income from discontinued operations	0.01	0.11	—
Cumulative effect of accounting change	—	(0.03)	—
Net income	$ 2.54	$ 1.93	$ 1.45
Earnings (loss) per share of common stock—assuming dilution:			
Income from continuing operations	$ 2.51	$ 1.84	$ 1.45
Income from discontinued operations	0.01	0.11	—
Cumulative effect of accounting change	—	(0.03)	—
Net income	$ 2.52	$ 1.92	$ 1.45

The Notes to Financial Statements are an integral part of this statement.

HONEYWELL INTERNATIONAL INC.

CONSOLIDATED BALANCE SHEET

	December 31, 2006	December 31, 2005
	(Dollars in millions)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 1,224	$ 1,234
Accounts, notes and other receivables	5,740	5,017
Inventories	3,588	3,401
Deferred income taxes	1,215	1,243
Other current assets	470	542
Assets held for disposal	67	525
Total current assets	12,304	11,962
Investments and long-term receivables	382	370
Property, plant and equipment—net	4,797	4,658
Goodwill	8,403	7,660
Other intangible assets—net	1,247	1,173
Insurance recoveries for asbestos related liabilities	1,100	1,302
Deferred income taxes	1,075	730
Prepaid pension benefit cost	695	2,716
Other assets	938	1,062
Total assets	$30,941	$31,633
LIABILITIES		
Current liabilities:		
Accounts payable	$ 3,518	$ 2,886
Short-term borrowings	62	275
Commercial paper	669	754
Current maturities of long-term debt	423	995
Accrued liabilities	5,455	5,359
Liabilities related to assets held for disposal	8	161
Total current liabilities	10,135	10,430
Long-term debt	3,909	3,082
Deferred income taxes	352	334
Postretirement benefit obligations other than pensions	2,090	1,786
Asbestos related liabilities	1,262	1,549
Other liabilities	3,473	3,690
CONTINGENCIES		
SHAREOWNERS' EQUITY		
Capital—common stock—Authorized 2,000,000,000 shares (par value $1 per share):		
—issued 957,599,900 shares	958	958
—additional paid-in capital	3,845	3,626
Common stock held in treasury, at cost:		
2006—157,008,412 shares; 2005—128,116,854 shares	(6,339)	(5,027)
Accumulated other comprehensive income (loss)	(1,307)	(25)
Retained earnings	12,563	11,230
Total shareowners' equity	9,720	10,762
Total liabilities and shareowners' equity	$30,941	$31,633

The Notes to Financial Statements are an integral part of this statement.

HONEYWELL INTERNATIONAL INC.

CONSOLIDATED STATEMENT OF CASH FLOWS

	Years Ended December 31,		
	2006	2005	2004
	(Dollars in millions)		
Cash flows from operating activities:			
Net income	$2,083	$1,638	$1,246
Adjustments to reconcile net income to net cash provided by operating activities:			
Cumulative effect of accounting change	—	21	—
Depreciation and amortization	794	653	614
Repositioning and other charges	483	412	775
Payments of repositioning and other charges	(559)	(1,008)	(863)
Pension and other postretirement expense	459	561	628
Pension and other postretirement benefit payments	(353)	(199)	(247)
Stock option expense	77	—	—
Deferred income taxes	450	42	201
Excess tax benefits from share based payment arrangements	(31)	—	—
Other	20	(56)	(358)
Changes in assets and liabilities, net of the effects of acquisitions and divestitures:			
Accounts, notes and other receivables	(573)	(94)	(470)
Inventories	(128)	37	(84)
Other current assets	(11)	61	(77)
Accounts payable	516	181	408
Accrued liabilities	(16)	193	480
Net cash provided by operating activities	3,211	2,442	2,253
Cash flows from investing activities:			
Expenditures for property, plant and equipment	(733)	(684)	(629)
Proceeds from disposals of property, plant and equipment	87	71	38
Proceeds from investments	—	285	80
Increase in investments	—	—	(115)
Cash paid for acquisitions, net of cash acquired	(633)	(2,679)	(384)
Proceeds from sales of businesses, net of fees paid	665	997	426
Net cash (used for) investing activities	(614)	(2,010)	(584)
Cash flows from financing activities:			
Net (decrease)/increase in commercial paper	(86)	534	220
Net (decrease)/increase in short-term borrowings	(224)	100	(121)
Payment of debt assumed with acquisitions	(346)	(702)	—
Proceeds from issuance of common stock	396	167	74
Proceeds from issuance of long-term debt	1,239	—	—
Payments of long-term debt	(1,019)	(982)	(29)
Excess tax benefits from share based payment arrangements	31	—	—
Repurchases of common stock	(1,896)	(1,133)	(724)
Cash dividends paid on common stock	(744)	(700)	(643)
Net cash (used for) financing activities	(2,649)	(2,716)	(1,223)
Effect of foreign exchange rate changes on cash and cash equivalents	42	(68)	190
Net (decrease)/increase in cash and cash equivalents	(10)	(2,352)	636
Cash and cash equivalents at beginning of period	1,234	3,586	2,950
Cash and cash equivalents at end of period	$1,224	$1,234	$3,586

The Notes to Financial Statements are an integral part of this statement.

HONEYWELL INTERNATIONAL INC.

CONSOLIDATED STATEMENT OF SHAREOWNERS' EQUITY

	Common Stock Issued		Additional Paid-in Capital	Common Stock Held in Treasury		Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Shareowners' Equity
	Shares	Amount		Shares	Amount			
	(In millions, except per share amounts)							
Balance at December 31, 2003	957.6	$958	$3,486	(95.3)	$(3,655)	$ (189)	$ 9,689	$10,289
Net income							1,246	1,246
Foreign exchange translation adjustments						351		351
Minimum pension liability adjustment						(15)		(15)
Change in fair value of effective cash flow hedges						(9)		(9)
Other Comprehensive Income (Loss)								1,573
Common stock issued for employee savings and option plans (including related tax benefits of $19)			79	7.5	162			241
Repurchases of common stock				(20.1)	(699)			(699)
Cash dividends on common stock ($0.75 per share)							(643)	(643)
Other owner changes			9	.3	7			16
Balance at December 31, 2004	957.6	958	3,574	(107.6)	(4,185)	138	10,292	10,777
Net income							1,638	1,638
Foreign exchange translation adjustments						(147)		(147)
Minimum pension liability adjustment						(16)		(16)
Other Comprehensive Income (Loss)								1,475
Common stock issued for employee savings and option plans (including related tax benefits of $17)			50	9.7	283			333
Repurchases of common stock				(30.6)	(1,133)			(1,133)
Cash dividends on common stock ($0.825 per share)							(700)	(700)
Other owner changes			2	.4	8			10
Balance at December 31, 2005	957.6	958	3,626	(128.1)	(5,027)	(25)	11,230	10,762
Net income							2,083	2,083
Foreign exchange translation adjustments						233		233
Change in fair value of effective cash flow hedges						(3)		(3)
Minimum pension liability adjustment						196		196
Other Comprehensive Income (Loss)								2,509
Pension and other postretirement benefits (including related tax benefits of $912)						(1,708)		(1,708)
Common stock issued for employee savings and option plans (including related tax benefits of $31)			29	16.2	573			602
Stock based compensation expense			77					77
Reclassification to equity of obligations settled in stock			112					112
Repurchases of common stock				(45.4)	(1,896)			(1,896)
Dividends on common stock ($0.9075 per share)							(750)	(750)
Other owner changes			1	.3	11			12
Balance at December 31, 2006	957.6	$958	$3,845	(157.0)	$(6,339)	$(1,307)	$12,563	$ 9,720

The Notes to Financial Statements are an integral part of this statement.

Note 1—Summary of Significant Accounting Policies

Accounting Principles—The financial statements and accompanying notes are prepared in accordance with accounting principles generally accepted in the United States of America. The following is a description of the significant accounting policies of Honeywell International Inc.

Principles of Consolidation—The consolidated financial statements include the accounts of Honeywell International Inc. and all of its subsidiaries and entities in which a controlling interest is maintained. Our consolidation policy requires the consolidation of entities where a controlling financial interest is obtained as well as consolidation of variable interest entities in which we bear a majority of the risk to the entities' potential losses or stand to gain from a majority of the entities' expected returns. All intercompany transactions and balances are eliminated in consolidation.

Cash and Cash Equivalents—Cash and cash equivalents include cash on hand and on deposit and highly liquid, temporary cash investments with an original maturity of three months or less.

Inventories—Inventories are valued at the lower of cost or market using the first-in, first-out or the average cost method and the last-in, first-out (LIFO) method for certain qualifying domestic inventories.

Investments—Investments in affiliates over which we have a significant influence, but not a controlling interest, are accounted for using the equity method of accounting. Other investments are carried at market value, if readily determinable, or cost. All equity investments are periodically reviewed to determine if declines in fair value below cost basis are other-than-temporary. Significant and sustained decreases in quoted market prices or a series of historic and projected operating losses by investees are strong indicators of other-than-temporary declines. If the decline in fair value is determined to be other-than-temporary, an impairment loss is recorded and the investment is written down to a new carrying value.

Property, Plant and Equipment—Property, plant and equipment are recorded at cost less accumulated depreciation. For financial reporting, the straight-line method of depreciation is used over the estimated useful lives of 10 to 50 years for buildings and improvements and 2 to 15 years for machinery and equipment. Statement of Financial Accounting Standards No. 143, "Accounting for Asset Retirement Obligations" (SFAS No. 143) and FASB Interpretation No. 47 ("FIN 47") require recognition of the fair value of obligations associated with the retirement of tangible long-lived assets when there is a legal obligation to incur such costs. Upon adoption of FIN 47 on December 31, 2005, we recorded an increase of $14 million to property, plant and equipment and recognized an asset retirement obligation liability of $46 million. This resulted in the recognition of a non-cash charge of $32 million ($21 million after tax) that was reported as a cumulative effect of an accounting change. Upon initial recognition of a liability the cost is capitalized as part of the related long-lived asset and depreciated over the corresponding asset's useful life. See Note 17 for additional details.

Goodwill and Indefinite-Lived Intangible Assets—Goodwill represents the excess of acquisition costs over the fair value of tangible net assets and identifiable intangible assets of businesses acquired. Goodwill and certain other intangible assets deemed to have indefinite lives are not amortized. Intangible assets determined to have definite lives are amortized over their useful lives. Goodwill and indefinite lived intangible assets are subject to impairment testing annually as of March 31, or whenever events or changes in circumstances indicate that the carrying amount may not be fully recoverable, using the guidance and criteria described in Statement of Financial Accounting Standards No. 142, "Goodwill and Other Intangible Assets". This testing compares carrying values to fair values and, when appropriate, the carrying value of these assets is reduced to fair value. We completed our annual goodwill impairment test as of March 31, 2006 and determined that there was no impairment as of that date. See Note 12 for additional details on goodwill balances.

Other Intangible Assets with Determinable Lives—Other intangible assets with determinable lives consist of customer lists, technology, patents and trademarks and other intangibles and are amortized over their estimated useful lives, ranging from 2 to 24 years.

Long-Lived Assets—We periodically evaluate the recoverability of the carrying amount of long-lived assets (including property, plant and equipment, and intangible assets with determinable lives) whenever events or changes in circumstances indicate that the carrying amount of an asset may not be fully recoverable. We evaluate events or changes in circumstances based on a number of factors including operating results, business plans and forecasts, general and industry trends and, economic projections and anticipated cash flows. An impairment is assessed when the undiscounted expected future cash flows derived from an asset are less than its carrying amount. Impairment losses are measured as the amount by which the carrying value of an asset exceeds its fair value and are recognized in earnings. We also continually evaluate the estimated useful lives of all long-lived assets and periodically revise such estimates based on current events.

Sales Recognition—Product and service sales are recognized when persuasive evidence of an arrangement exists, product delivery has occurred or services have been rendered, pricing is fixed or determinable, and collection is reasonably assured. Service sales, principally representing repair, maintenance and engineering activities in our Aerospace and Automation and Control Solutions reportable segments, are recognized over the contractual period or as services are rendered. Sales under long-term contracts in the Aerospace, Automation and Control Solutions and Specialty Materials reportable segments are recorded on a percentage-of-completion method measured on the cost-to-cost basis for engineering-type contracts and the units-of-delivery basis for production-type contracts. Provisions for anticipated losses on long-term contracts are recorded in full when such losses become evident. Revenues from contracts with multiple element arrangements are recognized as each element is earned based on the relative fair value of each element provided the delivered elements have value to customers on a standalone basis. Amounts allocated to each element are based on its objectively determined fair value, such as the sales price for the product or service when it is sold separately or competitor prices for similar products or services.

Environmental Expenditures—Environmental expenditures that relate to current operations are expensed or capitalized as appropriate. Expenditures that relate to an existing condition caused by past operations, and that do not provide future benefits, are expensed as incurred. Liabilities are recorded when environmental remedial efforts or damage claim payments are probable and the costs can be reasonably estimated. Such liabilities are based on our best estimate of the undiscounted future costs required to complete the remedial work. The recorded liabilities are adjusted periodically as remediation efforts progress or as additional technical or legal information becomes available. Given the uncertainties regarding the status of laws, regulations, enforcement policies, the impact of other potentially responsible parties, technology and information related to individual sites, we do not believe it is possible to develop an estimate of the range of reasonably possible environmental loss in excess of our accruals.

Asbestos Related Contingencies and Insurance Recoveries—Honeywell is a defendant in personal injury actions related to asbestos containing products (refractory products and friction products). We recognize a liability for any asbestos related contingency that is probable of occurrence and reasonably estimable. Regarding North American Refractories Company (NARCO) asbestos related claims, we accrue for pending claims based on terms and conditions, including evidentiary requirements, in definitive agreements or agreements in principle with current claimants. We also accrued for the probable value of future NARCO asbestos related claims through 2018 based on the disease criteria and payment values contained in the NARCO trust as described in Note 21. In light of the inherent uncertainties in making long term projections regarding claims filing rates and disease manifestation, we do not believe that we have a reasonable basis for estimating NARCO asbestos claims beyond 2018 under Statement of Financial Accounting Standards No. 5, "Accounting for Contingencies" (SFAS No. 5). Regarding Bendix asbestos related claims, we accrue for the estimated value of pending claims based on expected claim resolution values and dismissal rates. In the fourth

quarter of 2006, the Company accrued a liability for the estimated cost of future anticipated claims related to Bendix through 2011 based on our assessment of additional claims that may be brought against us and anticipated resolution values in the tort system. In December 2006, we also changed our methodology for valuing Bendix pending and future claims from using average resolution values of the previous five years to using average resolution values of the previous two years. For additional information see Note 21. We continually assess the likelihood of any adverse judgments or outcomes to our contingencies, as well as potential ranges of probable losses and recognize a liability, if any, for these contingencies based on an analysis of each individual issue with the assistance of outside legal counsel and, if applicable, other experts.

In connection with the recognition of liabilities for asbestos related matters, we record asbestos related insurance recoveries that are deemed probable. In assessing the probability of insurance recovery, we make judgments concerning insurance coverage that we believe are reasonable and consistent with our historical experience with our insurers, our knowledge of any pertinent solvency issues surrounding insurers, various judicial determinations relevant to our insurance programs and our consideration of the impacts of any settlements with our insurers.

Aerospace Sales Incentives—The Company provides sales incentives to commercial aircraft manufacturers and airlines in connection with their selection of our aircraft wheel and braking system hardware and auxiliary power units for installation on commercial aircraft. These incentives principally consist of free or deeply discounted products but also include credits for future purchases of product and upfront cash payments. These costs are expensed as provided. For aircraft manufacturers, incentives are recorded when the products are delivered; for airlines, incentives are recorded when the associated aircraft are delivered by the aircraft manufacturer to the airline.

Research and Development—Research and development costs for company-sponsored research and development projects are expensed as incurred. Such costs are principally included in Cost of Products Sold and were $1,411, $1,072 and $917 million in 2006, 2005 and 2004, respectively.

Stock-Based Compensation Plans—Effective January 1, 2006, we adopted SFAS No. 123 (revised 2004), "Share-Based Payment" (SFAS No. 123R) requiring that compensation cost relating to share-based payment awards made to employees and directors be recognized in the financial statements. The principal awards issued under our stock-based compensation plans, which are described in Note 20, "Stock-Based Compensation Plans" include non-qualified stock options and restricted stock units (RSUs). The cost for such awards is measured at the grant date based on the calculated fair value of the award. The value of the portion of the award that is ultimately expected to vest is recognized as expense over the requisite service periods (generally the vesting period of the equity award) in our Consolidated Statement of Operations.

Prior to January 1, 2006, we accounted for share-based compensation cost using the intrinsic value method in accordance with Accounting Principles Board No. 25, "Accounting for Stock Issued to Employees" (APB No. 25), and related interpretations. We also followed disclosure requirements of SFAS No. 123, "Accounting for Stock-Based Compensation", as amended by SFAS No. 148, "Accounting for Stock-Based Compensation-Transition and Disclosure". Under APB No. 25 there was no compensation cost recognized in our Consolidated Statement of Operations for our stock option awards. Compensation cost for RSUs is recognized in our Consolidated Statement of Operations and is included in selling, general and administrative expenses, and was not affected by our adoption of FAS No. 123R.

We adopted SFAS No. 123R using the modified prospective method and, accordingly, the Consolidated Statement of Operations for prior years has not been restated to reflect the fair value method of recognizing compensation cost relating to stock options. Share-based compensation cost relating to stock options recognized in 2006 is based on the value of the portion of the award that is ultimately expected to vest. SFAS No. 123R requires forfeitures to be estimated at the time of grant in

order to estimate the portion of the award that will ultimately vest. The estimate is based on our historical rates of forfeiture. In our pro forma information required under SFAS No. 123 for the years prior to 2006, we accounted for forfeitures as they occurred.

Compensation cost related to stock options recognized in operating results (included in selling, general and administrative expenses) under SFAS No. 123R in 2006 was $77 million on a pre-tax basis and the associated future income tax benefit recognized was $28 million. Compensation cost related to stock options recognized in our Consolidated Statement of Operations in 2006 includes (1) compensation cost for stock option awards granted prior to, but not yet vested as of December 31, 2005, based on the grant-date fair value estimated in accordance with the pro forma provisions of SFAS No. 123 and (2) compensation cost for stock option awards granted subsequent to December 31, 2005, based on the grant-date fair value estimated in accordance with the provisions of SFAS No. 123R.

The following table illustrates the effect on net income and earnings per share as if we had applied the fair value recognition provisions of SFAS No. 123 in the years prior to the adoption of FAS No. 123R.

	2005	2004
Net income, as reported	$1,638	$1,246
Deduct: Total stock-based employee compensation cost determined under fair value method for fixed stock option plans, net of related tax effects	(53)	(42)
Pro forma net income	$1,585	$1,204
Earnings per share of common stock:		
Basic—as reported	$ 1.93	$ 1.45
Basic—pro forma	$ 1.87	$ 1.40
Earnings per share of common stock:		
Assuming dilution—as reported	$ 1.92	$ 1.45
Assuming dilution—pro forma	$ 1.86	$ 1.40

The following table sets forth fair value per share information, including related assumptions, used to determine compensation cost consistent with the requirements of SFAS No. 123.

	2005	2004
Weighted average fair value per share of options granted during the year(1)	$10.67	$10.97
Assumptions:		
Expected annual dividend yield	2.4%	2.1%
Expected volatility	34.8%	37.9%
Risk-free rate of return	3.7%	3.3%
Expected option term (years)	5.0	5.0

(1) Estimated on date of grant using Black-Scholes option-pricing model.

Foreign Currency Translation—Assets and liabilities of subsidiaries operating outside the United States with a functional currency other than U.S. dollars are translated into U.S. dollars using year-end exchange rates. Sales, costs and expenses are translated at the average exchange rates in effect during the year. Foreign currency translation gains and losses are included as a component of Accumulated Other Nonowner Changes in Shareowners' Equity. For subsidiaries operating in highly inflationary environments, inventories and property, plant and equipment, including related expenses, are remeasured at the exchange rate in effect on the date the assets were acquired, while monetary

assets and liabilities are remeasured at year-end exchange rates. Remeasurement adjustments for these subsidiaries are included in earnings.

Derivative Financial Instruments—As a result of our global operating and financing activities, we are exposed to market risks from changes in interest and foreign currency exchange rates and commodity prices, which may adversely affect our operating results and financial position. We minimize our risks from interest and foreign currency exchange rate and commodity price fluctuations through our normal operating and financing activities and, when deemed appropriate through the use of derivative financial instruments. Derivative financial instruments are used to manage risk and are not used for trading or other speculative purposes and we do not use leveraged derivative financial instruments. Derivative financial instruments used for hedging purposes must be designated and effective as a hedge of the identified risk exposure at the inception of the contract. Accordingly, changes in fair value of the derivative contract must be highly correlated with changes in fair value of the underlying hedged item at inception of the hedge and over the life of the hedge contract.

All derivatives are recorded on the balance sheet as assets or liabilities and measured at fair value. For derivatives designated as hedges of the fair value of assets or liabilities, the changes in fair values of both the derivatives and the hedged items are recorded in current earnings. For derivatives designated as cash flow hedges, the effective portion of the changes in fair value of the derivatives are recorded in Accumulated Other Comprehensive Income (Loss) and subsequently recognized in earnings when the hedged items impact earnings.

Transfers of Financial Instruments—Sales, transfers and securitization of financial instruments are accounted for under Statement of Financial Accounting Standards No. 140, "Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities". We sell interests in designated pools of trade accounts receivables to third parties. The receivables are removed from the Consolidated Balance Sheet at the time they are sold. The value assigned to our subordinated interests and undivided interests retained in trade receivables sold is based on the relative fair values of the interests retained and sold. The carrying value of the retained interests approximates fair value due to the short-term nature of the collection period for the receivables.

Income Taxes—Deferred tax liabilities or assets reflect temporary differences between amounts of assets and liabilities for financial and tax reporting. Such amounts are adjusted, as appropriate, to reflect changes in tax rates expected to be in effect when the temporary differences reverse. A valuation allowance is established to offset any deferred tax assets if, based upon the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. The determination of the amount of a valuation allowance to be provided on recorded deferred tax assets involves estimates regarding (1) the timing and amount of the reversal of taxable temporary differences, (2) expected future taxable income, and (3) the impact of tax planning strategies. In assessing the need for a valuation allowance, we consider all available positive and negative evidence, including past operating results, projections of future taxable income and the feasibility of ongoing tax planning strategies. The projections of future taxable income include a number of estimates and assumptions regarding our volume, pricing and costs. Additionally, valuation allowances related to deferred tax assets can be impacted by changes to tax laws.

Significant judgment is required in determining income tax provisions under Statement of Financial Accounting Standards No. 109 "Accounting for Income Taxes" (SFAS No. 109) and in evaluating tax positions. We establish additional provisions for income taxes when, despite the belief that tax positions are fully supportable, there remain certain positions that are likely to be challenged and that may not be sustained on review by tax authorities. In the normal course of business, the Company and its subsidiaries are examined by various Federal, State and foreign tax authorities. We regularly assess the potential outcomes of these examinations and any future examinations for the current or prior years in determining the adequacy of our provision for income taxes. We continually assess the likelihood

and amount of potential adjustments and adjust the income tax provision, the current tax liability and deferred taxes in the period in which the facts that give rise to a revision become known.

Earnings Per Share—Basic earnings per share is based on the weighted average number of common shares outstanding. Diluted earnings per share is based on the weighted average number of common shares outstanding and all dilutive potential common shares outstanding.

Use of Estimates—The preparation of consolidated financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts in the financial statements and related disclosures in the accompanying notes. Actual results could differ from those estimates. Estimates and assumptions are periodically reviewed and the effects of revisions are reflected in the consolidated financial statements in the period they are determined to be necessary.

Reclassifications—Certain prior year amounts have been reclassified to conform to the current year presentation.

Recent Accounting Pronouncements—In June 2006, the FASB issued FASB Interpretation ("FIN") No. 48 "Accounting for Uncertainty in Income Taxes—an interpretation of FASB Statement 109". FIN 48 establishes a single model to address accounting for uncertainty in tax positions. FIN 48 clarifies the accounting for income taxes by prescribing a minimum recognition threshold a tax position is required to meet before being recognized in the financial statements. FIN 48 also provides guidance on derecognition, measurement, classification, interest and penalties, accounting in interim periods, disclosure and transition. FIN 48 is effective for fiscal years beginning after December 15, 2006. Honeywell will adopt FIN 48 as of January 1, 2007 as required. Based on our current assessment, and subject to any changes that may result from additional technical guidance being issued, the adoption of FIN 48 is expected to reduce our existing reserves for uncertain tax positions by approximately $130 million, to be recorded as a cumulative effect adjustment to equity, largely relating to state income tax matters.

In September 2006, the FASB issued SFAS No. 157, "Fair Value Measurements" (SFAS No. 157). SFAS No. 157 establishes a common definition for fair value to be applied to US GAAP requiring use of fair value, establishes a framework for measuring fair value, and expands disclosure about such fair value measurements. SFAS No. 157 is effective for fiscal years beginning after November 15, 2007. The Company is currently assessing the impact of SFAS No. 157 on its consolidated financial position and results of operations.

In September 2006, the FASB issued SFAS No. 158, "Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans" (SFAS No. 158). SFAS No. 158 requires that employers recognize on a prospective basis the funded status of their defined benefit pension and other postretirement benefit plans on their consolidated balance sheet and recognize as a component of other comprehensive income (loss), net of tax, the gains or losses and prior service costs or credits that arise during the period but are not recognized as components of net periodic benefit cost. We adopted SFAS No. 158 as of December 31, 2006. See Note 22—Pensions and Other Postretirement Benefits for additional disclosures required by SFAS No. 158 and the effects of adoption.

In February, 2007, the FASB issued SFAS No. 159 "The Fair Value Option for Financial Assets and Financial Liabilities (SFAS No. 159). SFAS No. 159 permits entities to choose to measure many financial assets and financial liabilities at fair value. Unrealized gains and losses on items for which the fair value option has been elected are reported in earnings. SFAS No. 159 is effective for fiscal years beginning after November 15, 2007. The Company is currently assessing the impact of SFAS No. 159 on its consolidated financial position and results of operations.

In September 2006, the FASB issued FASB Staff Position ("FSP") AUG AIR-1 "Accounting for Planned Major Maintenance Activities" (FSP AUG AIR-1). FSP AUG AIR-1 amends the guidance on

the accounting for planned major maintenance activities; specifically it precludes the use of the previously acceptable "accrue in advance" method. FSP AUG AIR-1 is effective for fiscal years beginning after December 15, 2006. The implementation of this standard will not have a material impact on our consolidated financial position or results of operations.

In September 2006, the SEC staff issued Staff Accounting Bulletin ("SAB") 108 "Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements" (SAB 108). SAB 108 requires that public companies utilize a "dual-approach" to assessing the quantitative effects of financial misstatements. This dual approach includes both an income statement focused assessment and a balance sheet focused assessment. The guidance in SAB 108 must be applied to annual financial statements for fiscal years ending after November 15, 2006. The adoption of SAB 108 did not have a material effect on our consolidated financial position or results of operations.

Note 2—Acquisitions and Divestitures

We acquired businesses for an aggregate cost of $979, $3,500 and $396 million in 2006, 2005 and 2004, respectively. All of our acquisitions were accounted for under the purchase method of accounting, and accordingly, the assets and liabilities of the acquired businesses were recorded at their estimated fair values at the dates of acquisition. Significant acquisitions made in these years are discussed below.

In May 2006, the Company purchased Gardiner Groupe, a privately held company. The purchase price for the acquisition was allocated to the tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair values and lives at the acquisition date. The Company has assigned $47 million to identifiable intangible assets, predominantly customer relationships and trademarks. These intangible assets are being amortized over their estimated lives which range from 3 to 15 years using straight-line and accelerated amortization periods. The excess of the purchase price over the estimated fair values of net assets acquired approximating $129 million, was recorded as goodwill. This goodwill is non-deductible for tax purposes. This acquisition was accounted for by the purchase method, and, accordingly, results of operations are included in the consolidated financial statements from the date of acquisition. The results from the acquisition date through December 31, 2006 are included in the Automation and Control Solutions segment and were not material to the consolidated financial statements.

In March 2006, the Company purchased First Technology plc, a U.K publicly listed company. The aggregate value of the purchase price was $723 million, including the assumption of approximately $217 million of outstanding debt and $23 million of transaction costs. The purchase price for the acquisition was allocated to the tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair values at the acquisition date. The Company has assigned $155 million to identifiable intangible assets, predominantly customer relationships, existing technology and trademarks. These intangible assets are being amortized over their estimated lives which range from 3 to 15 years using straight-line and accelerated amortization periods. The excess of the purchase price over the estimated fair values of net assets acquired approximating $439 million, was recorded as goodwill. This goodwill is non-deductible for tax purposes. This acquisition was accounted for by the purchase method, and, accordingly, results of operations are included in the consolidated financial statements from the date of acquisition. The results from the acquisition date through December 31, 2006 are included in the Automation and Control Solutions segment and were not material to the consolidated financial statements. During the year the Company completed the sales of the First Technology Safety & Analysis business for $93 million and First Technology Automotive for $90 million which were accounted for as part of the purchase price allocation.

In November 2005, the Company acquired the remaining 50 percent of UOP LLC giving Honeywell full ownership of the entity. The aggregate value of the purchase price was approximately $825 million, including the assumption of approximately $115 million of outstanding debt. The purchase price for the acquisition was allocated to the tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair values at the acquisition date. The Company has assigned $339 million to identifiable intangible assets, predominantly existing technology, which is being amortized over 15 years on a straight-line basis and trade names, which are not amortized. The excess of the purchase price over the estimated fair values of net assets acquired approximating $336 million, was recorded as goodwill. This goodwill is non-deductible for tax purposes. Following this acquisition, which is being accounted for by the purchase method, results of operations have been included into the Specialty Materials segment. Prior to that date, UOP results for the 50 percent share that the Company owned was included in equity income of affiliated companies.

On March 31, 2005, the Company purchased 100% of the issued and ordinary preference share capital of NOVAR plc (NOVAR) for $1.7 billion, net of cash acquired, which represented $2.4 billion for consideration of all outstanding shares and outstanding options to be exercised, net of the assumption of debt of $0.7 billion. Transaction costs related to this acquisition were $49 million. In December 2005, we completed the sale of the Security Printing business to M&F Worldwide Corp. for $800 million in cash. In February 2006, we completed the sale of Indalex to an affiliate of private investment firm Sun Capital Partners, Inc. for approximately $425 million in cash. The Indalex business was classified as held for sale in our December 31, 2005 Consolidated Balance Sheet and both the Indalex and Security Printing businesses have been presented as discontinued operations in our Statement of Operations for all periods presented. Goodwill of approximately $1.3 billion was recognized and we allocated $261 million to other intangible assets (contractual customer relationships, existing technology and trademarks). These intangible assets are being amortized over their estimated useful lives which range from 5 to 15 years using straight-line and accelerated amortization methods. In addition, accrued liabilities included $76 million of restructuring costs related to the integration of the NOVAR operations.

As of December 31, 2006, the purchase accounting for both First Technology and Gardiner Groupe is still subject to final adjustment primarily for amounts related to the businesses that were sold and pre-acquisition contingencies.

In connection with all acquisitions in 2006, 2005 and 2004, except for the First Technology and NOVAR acquisitions as described above, the amounts recorded for transaction costs and the costs of integrating the acquired businesses into Honeywell were not material. The results of operations of all acquired businesses have been included in the consolidated results of Honeywell from their respective acquisition dates.

The pro forma results for 2006, 2005 and 2004, assuming these acquisitions had been made at the beginning of the year, would not be materially different from consolidated reported results.

Note 3—Repositioning and Other Charges

A summary of repositioning and other charges follows:

	Years Ended December 31,		
	2006	2005	2004
Severance	$102	$248	$ 85
Asset impairments	15	5	21
Exit costs	7	14	10
Reserve adjustments	(22)	(25)	(28)
Total net repositioning charge	102	242	88
Asbestos related litigation charges, net of insurance	126	10	76
Probable and reasonably estimable environmental liabilities	210	186	536
Business impairment charges	12	23	42
Arbitration award related to phenol supply agreement	(18)	(67)	—
Other	51	18	33
Total net repositioning and other charges	$483	$412	$775

The following table summarizes the pretax distribution of total net repositioning and other charges by income statement classification.

	Years Ended December 31,		
	2006	2005	2004
Cost of products and services sold	$472	$357	$739
Selling, general and administrative expenses	11	43	25
Other (income) expense	—	12	11
	$483	$412	$775

The following table summarizes the pretax impact of total net repositioning and other charges by reportable segment.

	Years Ended December 31,		
	2006	2005	2004
Aerospace	$ 10	$ 96	$ (5)
Automation and Control Solutions	39	85	28
Specialty Materials	5	(34)	90
Transportation Systems	293	82	147
Corporate	136	183	515
	$483	$412	$775

In 2006, we recognized repositioning charges totaling $124 million primarily for severance costs related to workforce reductions of 2,253 manufacturing and administrative positions across all of our reportable segments. Also, $22 million of previously established accruals, primarily for severance at our Aerospace, Transportation Systems and Specialty Materials reportable segments were returned to income in 2006 due mainly to changes in the scope of previously announced severance programs and due to fewer employee separations than originally planned associated with prior Aerospace severance programs.

In 2005, we recognized repositioning charges totaling $267 million primarily for severance costs related to workforce reductions of 5,269 manufacturing and administrative positions across all of our reportable segments including the implementation of a new organizational structure in our Aerospace reportable segment (substantially implemented in the third quarter of 2005) which reorganized our Aerospace businesses to better align with customer segments. Also, $25 million of previously established accruals, primarily for severance at our Corporate, Specialty Materials and Automation and Control Solutions reportable segments were returned to income in 2005. The reversal of severance liabilities related to changes in the scope of previously announced severance programs, excise taxes

related to an executive severance amount previously paid which were determined to no longer be payable, and severance amounts previously paid to an outside service provider as part of an outsourcing arrangement which were refunded to Honeywell.

In 2004, we recognized repositioning charges totaling $116 million primarily for severance costs related to workforce reductions of 2,272 manufacturing and administrative positions across all of our reportable segments. Also, $28 million of previously established accruals, primarily for severance, were returned to income in 2004, due to fewer employee separations than originally planned associated with certain prior repositioning actions, resulting in reduced severance liabilities principally in our Automation and Control Solutions reportable segment.

The following table summarizes the status of our total repositioning reserves.

	Severance Costs	Asset Impairments	Exit Costs	Total
Balance at December 31, 2003	$ 171	$ —	$ 42	213
2004 charges	85	21	10	116
2004 usage	(138)	(21)	(26)	(185)
Adjustments	(21)	—	(7)	(28)
Balance at December 31, 2004	97	—	19	116
2005 charges	248	5	14	267
2005 usage	(156)	(5)	(15)	(176)
Adjustments	(21)	—	(4)	(25)
Balance at December 31, 2005	168	—	14	182
2006 charges	102	15	7	124
2006 usage	(134)	(15)	(8)	(157)
Adjustments	(18)	—	(4)	(22)
Balance at December 31, 2006	$ 118	$ —	$ 9	$ 127

In 2006, we recognized a charge of $210 million for environmental liabilities deemed probable and reasonably estimable during the year. We recognized asbestos related litigation charges, net of insurance, of $126 million which are discussed in Note 21. We recognized other charges of $51 million related to our Corporate segment primarily for the settlement of a property damage claim litigation matter in Brunswick, GA and our entrance into a plea agreement related to an environmental matter at our Baton Rouge, LA facility. See Note 21 for discussion of these matters. We recognized impairment charges of $12 million related to the write-down of property, plant and equipment held for sale in our Specialty Materials reportable segment. We also recognized a credit of $18 million in connection with an arbitration award for overcharges by a supplier of phenol to our Specialty Materials business for 2005 transactions.

In 2005, we recognized a charge of $186 million for environmental liabilities deemed probable and reasonably estimable during the year. We recognized asbestos related litigation charges, net of insurance, of $10 million which are discussed in Note 21. We recognized a credit of $67 million in connection with an arbitration award for overcharges by a supplier of phenol to our Specialty Materials business from June 2003 through the end of 2004. We recognized impairment charges of $23 million related to the write-down of property, plant and equipment held and used in our Specialty Materials reportable segment. We also recognized other charges of $18 million principally related to the modification of a lease agreement for the Corporate headquarters facility ($10 million) and for various legal settlements ($7 million).

In 2004, we recognized a charge of $536 million for probable and reasonably estimable environmental liabilities primarily related to the estimated costs of the court-ordered excavation and transport for offsite disposal of approximately one million tons of chromium residue present at a predecessor Honeywell site located in Jersey City, New Jersey, and environmental conditions in and around Onondaga Lake in Syracuse, New York. Both of these environmental matters are discussed in

further detail in Note 21. We recognized asbestos related litigation charges, net of insurance, of $76 million which are discussed in Note 21. We recognized an impairment charge of $42 million in the second quarter of 2004 related principally to the write-down of property, plant and equipment of our Performance Fibers business in our Specialty Materials reportable segment. This business was sold in December 2004. We also recognized other charges of $33 million consisting of $29 million for various legal settlements including property damage claims in our Automation and Control Solutions reportable segment, $14 million for the write-off of receivables, inventories and other assets net of a reversal of a reserve of $10 million established in the prior year for a contract settlement.

Note 4—Other (Income)/Expense

	Years Ended December 31,		
	2006	2005	2004
Gain on sale of non-strategic businesses and assets	$ (30)	$ (36)	$(255)(1)
Equity (income)/loss of affiliated companies	(13)	(134)(2)	(82)(2)
Interest income	(94)	(84)	(100)
Foreign exchange	18	21	28
Other (net)	8	2	(20)(3)
	$(111)	$(231)	$(429)

(1) Includes pretax gains on the sales of our Security Monitoring and VCSEL Optical Products businesses of $215 and $36 million, respectively.

(2) Includes equity income of $107 million in 2005 and $71 million in 2004 from UOP (acquisition to full ownership in November 2005).

(3) Includes recognition of a gain of $27 million related to the settlement of a patent infringement lawsuit.

Note 5—Interest and Other Financial Charges

	Years Ended December 31,		
	2006	2005	2004
Total interest and other financial charges	$396	$373	$349
Less—capitalized interest	(22)	(17)	(18)
	$374	$356	$331

The weighted average interest rate on short-term borrowings and commercial paper outstanding at December 31, 2006 and 2005 was 5.67 percent and 4.48 percent, respectively.

Note 6—Income Taxes

Income from continuing operations before taxes

	Years Ended December 31,		
	2006	2005	2004
United States	$1,882	$1,530	$ 821
Foreign	916	766	802
	$2,798	$2,296	$1,623

Tax expense

	Years Ended December 31,		
	2006	2005	2004
United States	$ 412	$ 427	$ 148
Foreign	308	305	229
	$ 720	$ 732	$ 377

	Years Ended December 31,		
	2006	2005	2004
Tax expense consist of:			
Current:			
United States	$ (39)	$ 395	$ 26
State	26	19	16
Foreign	283	276	134
	270	690	176
Deferred:			
United States	376	19	90
State	49	(6)	16
Foreign	25	29	95
	450	42	201
	$ 720	$ 732	$ 377

	Years Ended December 31,		
	2006	2005	2004
The U.S. statutory federal income tax rate is reconciled to our effective income tax rate as follows:			
Statutory U.S. federal income tax rate	35.0%	35.0%	35.0%
Taxes on foreign earnings below U.S. tax rate (1)	(4.0)	(1.4)	(7.4)
Asset basis differences	—	(3.6)	(.6)
Nondeductible amortization	—	.6	1.1
State income taxes (1)	1.7	.7	1.3
Tax benefits on export sales	(1.9)	(3.3)	(4.6)
ESOP dividend tax benefit	(.7)	(.9)	(1.2)
Tax credits	(.7)	(.5)	(.6)
Equity income	—	(.5)	(.6)
Repatriation expense related to American Jobs Creation Act of 2004	—	6.8	—
Audit Settlements	(2.9)	(.6)	—
All other items—net	(.8)	(.4)	.8
	25.7%	31.9%	23.2%

(1) Net of changes in valuation allowance.

Deferred tax assets (liabilities)

Deferred income taxes represent the future tax effects of transactions which are reported in different periods for tax and financial reporting purposes. The tax effects of temporary differences and tax carryforwards which give rise to future income tax benefits and payables are as follows:

	December 31,	
	2006	2005
Property, plant and equipment basis differences	$ (608)	$ (582)
Postretirement benefits other than pensions and postemployment benefits	747	771
Investment and other asset basis differences	(396)	(31)
Other accrued items	1,567	642
Net operating and capital losses	786	841
Tax credits	315	408
Undistributed earnings of subsidiaries	(40)	(40)
All other items—net	43	8
	2,414	2,017
Valuation allowance	(516)	(477)
	$1,898	$1,540

The Company's effective tax rate decreased by 6.2 percentage points in 2006 compared with 2005, due principally to the absence of the 2005 one-time tax charge of $155 million for the repatriation of foreign earnings under the American Jobs Creation Act of 2004 (the "Act"), offset, in part, by $64 million of tax benefits associated with the 2005 sale of our Industrial Wax business which had a higher tax basis than book basis. In addition, in 2006, there were benefits recognized from the favorable resolution of certain tax audits offset by a tax charge for an up-front licensing of certain in-process research and development.

The amount of U.S. federal tax net operating losses available for carryforward at December 31, 2006 was $35 million that were generated by certain subsidiaries prior to their acquisition and have expiration dates through 2024. The use of pre-acquisition operating losses is subject to limitations imposed by the Internal Revenue Code. We do not anticipate that these limitations will affect utilization of the carryforwards prior to their expiration. Various subsidiaries have state tax net operating loss carryforwards of $3.2 billion at December 31, 2006 with varying expiration dates through 2025. We also have foreign net operating and capital losses of $2.4 billion which are available to reduce future income tax payments in several countries, subject to varying expiration rules. Included in these losses is $32 million of loss carryforwards related to businesses purchased by Honeywell in 2006.

We have U.S. tax credit carryforwards of $94 million at December 31, 2006, including carryforwards of $41 million with various expiration dates through 2026 and tax credits of $53 million which are not subject to expiration. In addition, we have $221 million of foreign tax credits available for carryback or carryforward on the U.S. federal tax return at December 31, 2006 with varying expiration dates through 2015.

The valuation allowance against deferred tax assets was increased by $39, $139 and $39 million in 2006, 2005 and 2004, respectively. The 2006 increase in the valuation allowance was primarily due to an increase in foreign net operating losses attributable to acquired businesses not expected to be realized and a partial valuation allowance against a deferred tax asset established in connection with the adoption of SFAS No. 158 partially offset by a decrease in state tax net operating loss carryforwards (net of federal impact). The 2005 increase in the valuation allowance was primarily due to an increase in foreign net operating and capital losses and net deferred tax assets attributable to

acquired businesses not expected to be realized, that was partially offset by a decrease in state tax net operating loss carryforwards (net of federal impact) and the disallowance of foreign net operating losses for which a valuation allowance had previously been provided. The 2004 increase in the valuation allowance was primarily due to an increase in state tax net operating loss carryforwards (net of federal impact) and foreign net operating and capital losses that are not expected to be realized, partially offset by a decrease for foreign tax credits which we now believe will be utilized due to the extension of the foreign tax credit carryforward period from five to 10 years under the Act.

Federal income taxes have not been provided on undistributed earnings of the majority of our international subsidiaries as it is our intention to reinvest these earnings into the respective businesses. At December 31, 2006 Honeywell has not provided for U.S. federal income and foreign withholding taxes on approximately $2.9 billion of such earnings of our non-U.S. operations. It is not practicable to estimate the amount of tax that might be payable if some or all of such earnings were to be remitted, and foreign tax credits would be available to reduce or eliminate the resulting U.S. income tax liability.

In 2005, the Company was effected by actions taken relating to certain provisions in the Act which was signed into law in October 2004 and provides for a variety of changes in the tax law including incentives to repatriate undistributed earnings of foreign subsidiaries, a phased elimination of the extra-territorial income exclusion, and a domestic manufacturing benefit. More specifically, the Act created a temporary incentive for U.S. corporations to repatriate accumulated income earned outside the U.S. by providing an 85 percent dividends received deduction for certain dividends from controlled foreign corporations. In 2005, we repatriated approximately $2.7 billion of foreign earnings, of which $2.2 billion received the benefit under the Act, with an income tax provision of $155 million. No additional amounts were repatriated under the Act in 2006.

Note 7—Earnings (Loss) Per Share

The following table sets forth the computations of basic and diluted earnings (loss) per share:

	2006		2005		2004	
	Basic	Assuming Dilution	Basic	Assuming Dilution	Basic	Assuming Dilution
Income						
Income from continuing operations	$ 2,078	$ 2,078	$ 1,564	$ 1,564	$ 1,246	$ 1,246
Income from discontinued operations, net of taxes	5	5	95	95	—	—
Cumulative effect of accounting change, net of taxes	—	—	(21)	(21)	—	—
Net income	$ 2,083	$ 2,083	$ 1,638	$ 1,638	$ 1,246	$ 1,246
Average shares						
Average shares outstanding	820,845,838	820,845,838	848,740,395	848,740,395	858,857,721	858,857,721
Dilutive securities issuable in connection with stock plans	—	5,432,435	—	3,594,592	—	3,475,613
Total average shares	820,845,838	826,278,273	848,740,395	852,334,987	858,857,721	862,333,334
Earnings (loss) per share of common stock						
Income from continuing operations	$ 2.53	$ 2.51	$ 1.85	$ 1.84	$ 1.45	$ 1.45
Income from discontinued operations, net of taxes	0.01	0.01	0.11	0.11	—	—
Cumulative effect of accounting change, net of taxes	—	—	(0.03)	(0.03)	—	—
Net income	$ 2.54	$ 2.52	$ 1.93	$ 1.92	$ 1.45	$ 1.45

In 2006, 2005 and 2004, the diluted earnings per share calculation excludes the effect of stock options when the options' exercise prices exceed the average market price of the common shares during the period. In 2006, 2005 and 2004, the number of stock options not included in the computation were 22,749,056, 17,793,385 and 41,656,606, respectively. These stock options were outstanding at the end of each of the respective years.

Note 8—Accounts, Notes and Other Receivables

	December 31,	
	2006	2005
Trade	$5,373	$4,623
Other	584	573
	5,957	5,196
Less—Allowance for doubtful accounts	(217)	(179)
	$5,740	$5,017

Trade Accounts Receivable includes $808 and $565 million of unbilled balances under long-term contracts as of December 31, 2006 and 2005, respectively. These amounts are billed in accordance with the terms of the customer contracts to which they relate.

We sell interests in designated pools of trade accounts receivables to third parties. The sold receivables are over-collateralized by $171 million at December 31, 2006 and we retain a subordinated interest in the pool of receivables representing that over-collateralization as well as an undivided interest in the balance of the receivables pools. New receivables are sold under the agreement as previously sold receivables are collected. Losses are recognized when our interest in the receivables are sold. The retained interests in the receivables are shown at the amounts expected to be collected by us, and such carrying value approximates the fair value of our retained interests. We are compensated for our services in the collection and administration of the receivables.

	December 31,	
	2006	2005
Designated pools of trade receivables	$1,250	$1,251
Interest sold to third parties	(500)	(500)
Retained interest	$ 750	$ 751

Losses on sales of receivables were $27, $18 and $9 million in 2006, 2005 and 2004, respectively. No credit losses were incurred during those years.

Note 9—Inventories

	December 31,	
	2006	2005
Raw materials	$1,625	$1,438
Work in process	808	695
Finished products	1,342	1,427
	3,775	3,560
Less—		
Progress payments	(17)	(14)
Reduction to LIFO cost basis	(170)	(145)
	$3,588	$3,401

Inventories valued at LIFO amounted to $205 and $258 million at December 31, 2006 and 2005, respectively. Had such LIFO inventories been valued at current costs, their carrying values would have been approximately $170 and $145 million higher at December 31, 2006 and 2005, respectively.

Note 10—Investments and Long-Term Receivables

	December 31, 2006	December 31, 2005
Investments	$ 49	$ 64
Long-term trade and other receivables	333	306
	$ 382	$ 370

Long-Term Trade and Other Receivables includes $68 and $137 million of unbilled balances under long-term contracts as of December 31, 2006 and 2005, respectively. These amounts are billed in accordance with the terms of the customer contracts to which they relate.

Note 11—Property, Plant and Equipment

	December 31, 2006	December 31, 2005
Land and improvements	$ 408	$ 352
Machinery and equipment	9,888	9,381
Buildings and improvements	2,056	2,120
Construction in progress	447	433
	12,799	12,286
Less—Accumulated depreciation and amortization	(8,002)	(7,628)
	$ 4,797	$ 4,658

Depreciation expense was $650, $578 and $572 million in 2006, 2005 and 2004, respectively.

Note 12—Goodwill and Other Intangibles—Net

The change in the carrying amount of goodwill for the years ended December 31, 2006 and 2005 by reportable segment are as follows:

	December 31, 2005	Acquisitions	Divestitures	Currency Translation Adjustment	December 31, 2006
Aerospace	$1,723	$ —	$ —	$22	$1,745
Automation and Control Solutions	4,333	572	—	54	4,959
Specialty Materials	1,066	80	(4)	9	1,151
Transportation Systems	538	—	—	10	548
	$7,660	$652	$ (4)	$95	$8,403

	December 31, 2004	Acquisitions	Divestitures	Currency Translation Adjustment	December 31, 2005
Aerospace	$1,721	$ 11	$ —	$ (9)	$1,723
Automation and Control Solutions	2,954	1,407	—	(28)	4,333
Specialty Materials	779	353	(48)	(18)	1,066
Transportation Systems	559	—	—	(21)	538
	$6,013	$1,771	$ (48)	$ (76)	$7,660

Intangible assets are comprised of:

	December 31, 2006			December 31, 2005		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Intangible assets with determinable lives:						
Patents and technology	$ 895	$(395)	$ 500	$ 821	$(329)	$ 492
Customer relationships	462	(60)	402	260	(15)	245
Trademarks	101	(16)	85	75	(6)	69
Other	418	(265)	153	505	(245)	260
	1,876	(736)	1,140	1,661	(595)	1,066
Trademarks with indefinite lives	107	—	107	107	—	107
	$1,983	$(736)	$1,247	$1,768	$(595)	$1,173

Intangible assets amortization expense was $144, $75 and $42 million in 2006, 2005 and 2004, respectively. Estimated intangible assets amortization expense for each of the next five years approximates $150 million in 2007, $140 million in 2008, $140 million in 2009, $130 million in 2010 and $120 million in 2011.

Note 13—Accrued Liabilities

	December 31, 2006	December 31, 2005
Compensation, benefit and other employee related	$1,138	$ 996
Customer advances and deferred income	1,067	932
Income taxes	418	633
Environmental costs	251	237
Asbestos related liabilities	557	520
Product warranties and performance guarantees	347	322
Restructuring	127	182
Other taxes (payroll, sales, VAT etc.)	124	102
Insurance	110	127
Accrued interest	116	110
Other (primarily operating expenses)	1,200	1,198
	$5,455	$5,359

Note 14—Long-term Debt and Credit Agreements

	December 31, 2006	December 31, 2005
8⅝% debentures due 2006	$ —	$ 100
5.25% notes due 2006	—	336
5⅛% notes due 2006	—	500
7.0% notes due 2007	350	350
7⅛% notes due 2008	200	200
6.20% notes due 2008	200	200
Floating rate notes due 2009	300	—
Zero coupon bonds and money multiplier notes, 13.0%–14.26%, due 2009	100	100
Floating rate notes due 2009-2011	239	249
7.50% notes due 2010	1,000	1,000
6⅛% notes due 2011	500	500
5.40% notes due 2016	400	—
Industrial development bond obligations, floating rate maturing at various dates through 2037	65	65
6⅝% debentures due 2028	216	216
9.065% debentures due 2033	51	51
5.70% notes due 2036	550	—
Other (including capitalized leases), 0.53%–16.40%, maturing at various dates through 2016	161	210
	4,332	4,077
Less—current portion	(423)	(995)
	$3,909	$3,082

The schedule of principal payments on long-term debt is as follows:

	At December 31, 2006
2007	$ 423
2008	416
2009	511
2010	1,130
2011	526
Thereafter	1,326
	4,332
Less—current portion	(423)
	$3,909

We maintain a $2.3 billion five year revolving credit facility with a group of banks, arranged by Citigroup Global Markets Inc. and J.P.Morgan Securities Inc. This credit facility contains a $500 million sub-limit for the issuance of letters of credit. The $2.3 billion credit facility is maintained for general corporate purposes, including support for the issuance of commercial paper. We had no borrowings outstanding under the credit facility at December 31, 2006. We have issued $145 million of letters of credit under the credit facility at December 31, 2006.

The credit agreement does not restrict our ability to pay dividends and contains no financial covenants. The failure to comply with customary conditions or the occurrence of customary events of default contained in the credit agreement would prevent any further borrowings and would generally

require the repayment of any outstanding borrowings under the credit agreement. Such events of default include: (a) non-payment of credit agreement debt, interest or fees; (b) non-compliance with the terms of the credit agreement covenants; (c) cross-default to other debt in certain circumstances; (d) bankruptcy; and (e) defaults upon obligations under Employee Retirement Income Security Act. Additionally, each of the banks has the right to terminate its commitment to lend additional funds or issue letters of credit under the agreement if any person or group acquires beneficial ownership of 30 percent or more of our voting stock, or, during any 12-month period, individuals who were directors of Honeywell at the beginning of the period cease to constitute a majority of the Board of Directors (the Board).

Loans under the $2.3 billion credit facility are required to be repaid no later than April 27, 2011. We have agreed to pay a facility fee of 0.06 percent per annum on the aggregate commitment.

Interest on borrowings under the $2.3 billion credit facility would be determined, at Honeywell's option, by (a) an auction bidding procedure; (b) the highest of the floating base rate publicly announced by Citibank, N.A., 0.5 percent above the average CD rate, or 0.5 percent above the Federal funds rate; or (c) the Eurocurrency rate plus 0.14 percent (applicable margin).

The facility fee, the applicable margin over the Eurocurrency rate and the letter of credit issuance fee, are subject to change, based upon a grid determined by our long term debt ratings. The credit agreement is not subject to termination based upon a decrease in our debt ratings or a material adverse change.

A 364-Day Canadian dollar credit facility arranged by Citibank, N.A., Canadian Branch was renewed on September 8, 2006, for 220 million Canadian dollars. The facility was established for general corporate purposes, including support for the issuance of commercial paper in Canada. There are no borrowings outstanding under this credit facility at December 31, 2006. We have agreed to pay a facility fee of 0.06 percent per annum on the commitment amount. Interest on borrowings under this facility would be determined, at Honeywell's option, by (a) the highest of the floating base rate publicly announced by Citibank, N.A., 0.5 percent above the average CD rate, or 0.5 percent above the Federal funds rate; (b) the highest of the Canadian dollar prime rate publicly announced by Citibank, N.A. or 0.5 percent above the Canadian dollar bankers' acceptance; or (c) the Eurocurrency rate or bankers' acceptance plus 0.24 percent (applicable margin).

In March 2006, the Company issued $300 million of floating rate (LIBOR + 6 bps) Senior Notes due 2009, $400 million 5.40% Senior Notes due 2016 and $550 million 5.70% Senior Notes due 2036 (collectively, the "Notes"). The Notes are senior unsecured and unsubordinated obligations of Honeywell and rank equally with all of Honeywell's existing and future senior unsecured debt and senior to all Honeywell's subordinated debt. The offering resulted in gross proceeds of $1,250 million, offset by $11 million in discount and closing costs relating to the offering.

During the first quarter of 2006, the Company made a cash tender offer and repurchased $225 million of its $500 million 5.125% Notes due November 2006. The costs relating to the early redemption of the Notes were immaterial.

Note 15—Lease Commitments

Future minimum lease payments under operating leases having initial or remaining noncancellable lease terms in excess of one year are as follows:

	At December 31, 2006
2007	$ 304
2008	222
2009	155
2010	100
2011	74
Thereafter	223
	$1,078

We have entered into agreements to lease land, equipment and buildings. Principally all our operating leases have initial terms of up to 25 years, and some contain renewal options subject to customary conditions. At any time during the terms of some of our leases, we may at our option purchase the leased assets for amounts that approximate fair value. We do not expect that any of our commitments under the lease agreements will have a material adverse effect on our consolidated results of operations, financial position or liquidity.

Rent expense was $341, $326 and $321 million in 2006, 2005 and 2004, respectively.

Note 16—Financial Instruments

Credit and Market Risk—Financial instruments, including derivatives, expose us to counterparty credit risk for nonperformance and to market risk related to changes in interest or currency exchange rates. We manage our exposure to counterparty credit risk through specific minimum credit standards, diversification of counterparties, and procedures to monitor concentrations of credit risk. Our counterparties in derivative transactions are substantial investment and commercial banks with significant experience using such derivative instruments. We monitor the impact of market risk on the fair value and cash flows of our derivative and other financial instruments considering reasonably possible changes in interest and currency exchange rates and restrict the use of derivative financial instruments to hedging activities.

We continually monitor the creditworthiness of our customers to which we grant credit terms in the normal course of business. While concentrations of credit risk associated with our trade accounts and notes receivable are considered minimal due to our diverse customer base, a significant portion of our customers are in the commercial air transport industry (aircraft manufacturers and airlines) accounting for approximately 21 percent of our consolidated sales in 2006. The terms and conditions of our credit sales are designed to mitigate or eliminate concentrations of credit risk with any single customer. Our sales are not materially dependent on a single customer or a small group of customers.

Foreign Currency Risk Management—We conduct our business on a multinational basis in a wide variety of foreign currencies. Our exposure to market risk for changes in foreign currency exchange rates arises from international financing activities between subsidiaries, foreign currency denominated monetary assets and liabilities and anticipated transactions arising from international trade. Our objective is to preserve the economic value of non-functional currency denominated cash flows. We attempt to have all transaction exposures hedged with natural offsets to the fullest extent possible and, once these opportunities have been exhausted, through foreign currency forward and option agreements with third parties. Our principal currency exposures relate to the U.S. dollar, Euro,

the British pound, the Canadian dollar, the Hong Kong dollar, the Chinese renminbi, and the Singapore dollar.

We hedge monetary assets and liabilities denominated in non-functional currencies. Prior to conversion into U.S dollars, these assets and liabilities are remeasured at spot exchange rates in effect on the balance sheet date. The effects of changes in spot rates are recognized in earnings and included in Other/(Income) Expense. We hedge our exposure to changes in foreign exchange rates principally with forward contracts. Forward contracts are marked-to-market with the resulting gains and losses similarly recognized in earnings offsetting the gains and losses on the non-functional currency denominated monetary assets and liabilities being hedged.

We partially hedge forecasted 2007 sales and purchases denominated in non-functional currencies with currency forward contracts. When a functional currency strengthens against non-functional currencies, the decline in value of forecasted non-functional currency cash inflows (sales) or outflows (purchases) is partially offset by the recognition of gains (sales) and losses (purchases), respectively, in the value of the forward contracts designated as hedges. Conversely, when a functional currency weakens against non-functional currencies, the increase in value of forecasted non-functional currency cash inflows (sales) or outflows (purchases) is partially offset by the recognition of losses (sales) and gains (purchases), respectively, in the value of the forward contracts designated as hedges. Market value gains and losses on these contracts are recognized in earnings when the hedged transaction is recognized. All open forward contracts mature by December 31, 2007.

At December 31, 2006 and 2005, we had contracts with notional amounts of $2,572 and $1,998 million, respectively, to exchange foreign currencies, principally in the Euro countries and Great Britain.

Commodity Price Risk Management—Our exposure to market risk for commodity prices can result in changes in our cost of production. We primarily mitigate our exposure to commodity price risk through the use of long-term, fixed-price contracts with our suppliers and formula price agreements with suppliers and customers. We also enter into forward commodity purchase agreements with third parties designated as hedges of anticipated purchases of several commodities. Forward commodity purchase agreements are marked-to-market, with the resulting gains and losses recognized in earnings when the hedged transaction is recognized.

Interest Rate Risk Management—We use a combination of financial instruments, including long-term, medium-term and short-term financing, variable-rate commercial paper, and interest rate swaps to manage the interest rate mix of our total debt portfolio and related overall cost of borrowing. At December 31, 2006 and 2005, interest rate swap agreements designated as fair value hedges effectively changed $700 and $681 million, respectively, of fixed rate debt at an average rate of 6.38 and 6.15 percent, respectively, to LIBOR based floating rate debt. Our interest rate swaps mature through 2028.

Fair Value of Financial Instruments—The carrying value of cash and cash equivalents, trade accounts and notes receivables, payables, commercial paper and short-term borrowings contained in the Consolidated Balance Sheet approximates fair value. Summarized below are the carrying values and fair values of our other financial instruments at December 31, 2006 and 2005. The fair values are based on the quoted market prices for the issues (if traded), current rates offered to us for debt of the same remaining maturity and characteristics, or other valuation techniques, as appropriate.

	December 31, 2006		December 31, 2005	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Assets				
Long-term receivables	$ 333	$ 306	$ 306	$ 285
Interest rate swap agreements	3	3	9	9
Foreign currency exchange contracts	3	3	3	3
Forward commodity contracts	—	—	18	18
Liabilities				
Long-term debt and related current maturities	$(4,332)	$(4,521)	$(4,077)	$(4,291)
Foreign currency exchange contracts	(3)	(3)	(5)	(5)
Forward commodity contracts	(9)	(9)	(1)	(1)

Note 17—Other Liabilities

Other liabilities consist of the following:

	December 31,	
	2006	2005
Pension and other employee related	$1,748	$2,010
Environmental	580	642
Income taxes	575	569
Insurance	134	55
Asset retirement obligations (1)	92	88
Deferred income	56	28
Other	288	298
	$3,473	$3,690

(1) Asset retirement obligations primarily relate to costs associated with the future retirement of nuclear fuel conversion facilities in our Specialty Materials reportable segment and the future retirement of facilities in our Automation and Control Solutions reportable segment.

A reconciliation of our liability for asset retirement obligations for the year ended December 31, 2006, is as follows:

Balance at December 31, 2005	$ 88
Liabilities settled	(3)
Adjustments	2
Accretion expense	5
Balance at December 31, 2006	$ 92

Note 18—Capital Stock

We are authorized to issue up to 2,000,000,000 shares of common stock, with a par value of one dollar. Common shareowners are entitled to receive such dividends as may be declared by the Board, are entitled to one vote per share, and are entitled, in the event of liquidation, to share ratably in all the assets of Honeywell which are available for distribution to the common shareowners. Common shareowners do not have preemptive or conversion rights. Shares of common stock issued and outstanding or held in the treasury are not liable to further calls or assessments. There are no restrictions on us relative to dividends or the repurchase or redemption of common stock.

In November 2005, Honeywell's Board authorized the Company to repurchase up to $3 billion of its common stock. As of December 31, 2006, $709 million of additional shares may yet be purchased under this program. The amount and timing of repurchases may vary depending on market conditions and the level of other investing activities.

We are authorized to issue up to 40,000,000 shares of preferred stock, without par value, and can determine the number of shares of each series, and the rights, preferences and limitations of each series. At December 31, 2006, there was no preferred stock outstanding.

Note 19—Accumulated Other Comprehensive Income (Loss)

Total accumulated other comprehensive income (loss) is included in the Consolidated Statement of Shareowners' Equity. The changes in Accumulated Other Comprehensive Income (Loss) are as follows:

	Pretax	Tax	After-Tax
Year Ended December 31, 2006			
Foreign exchange translation adjustments	$ 233	$ —	$ 233
Change in fair value of effective cash flow hedges	(5)	2	(3)
Minimum pension liability adjustment	268	(72)	196
Pension and postretirement benefit adjustment	(2,620)	912	(1,708)
	$(2,124)	$842	$(1,282)
Year Ended December 31, 2005			
Foreign exchange translation adjustments	$ (147)	$ —	$ (147)
Minimum pension liability adjustment	(26)	10	(16)
	$ (173)	$ 10	$ (163)
Year Ended December 31, 2004			
Foreign exchange translation adjustments	$ 351	$ —	$ 351
Change in fair value of effective cash flow hedges	(15)	6	(9)
Minimum pension liability adjustment	(19)	4	(15)
	$ 317	$ 10	$ 327

The components of Accumulated Other Comprehensive Income (Loss) are as follows:

	December 31,	
	2006	2005
Cumulative foreign exchange translation adjustments	$ 575	$ 342
Fair value of effective cash flow hedges	5	8
Pension and postretirement benefit adjustment	(1,887)	—
Minimum pension liability	—	(375)
	$(1,307)	$ (25)

Note 20—Stock-Based Compensation Plans

We have stock-based compensation plans available to grant non-qualified stock options, incentive stock options, stock appreciation rights, restricted units and restricted stock to key employees. Under the 2006 Stock Incentive Plan of Honeywell International Inc. and its Affiliates (the Plan), which was approved by the shareowners at the Annual Meeting of Shareowners and became effective on April 24, 2006, a maximum of 43 million shares of common stock may be awarded. We expect that common stock awarded on an annual basis will be between 1.0 and 1.5 percent of total common stock outstanding. Following approval of the Plan on April 24, 2006, we will not grant any new awards under any previously existing stock-based compensation plans. Additionally, under the 2006 Stock Plan for Non-Employee Directors of Honeywell International Inc. (the Directors Plan), which was approved by the shareowners at the Annual Meeting of Shareowners and became effective on April 24, 2006, 500,000 shares of Honeywell common stock may be awarded. The Directors Plan replaces the 1994 Stock Plan for Non-Employee Directors of Honeywell International Inc.

Stock Options—The exercise price, term and other conditions applicable to each option granted under our stock plans are generally determined by the Management Development and Compensation Committee of the Board. The exercise price of stock options is set on the grant date and may not be less than the fair market value per share of our stock on that date. The fair value is recognized as an expense over the employee's requisite service period (generally the vesting period of the award). Options have generally vested over a three-year period and expire after ten years. Starting with 2007 option grants the vesting period will be extended to four years.

The fair value of each option award is estimated on the date of grant using the Black-Scholes option-pricing model. Expected volatility is based on implied volatilities from traded options on Honeywell stock. We used a Monte Carlo simulation model to derive an expected term. Such model uses historical data to estimate option exercise activity and post-vest termination behavior. The expected term represents an estimate of the time options are expected to remain outstanding. The risk-free rate for periods within the contractual life of the option is based on the U.S. treasury yield curve in effect at the time of grant.

The fair value of each stock option grant made during 2006 was estimated on the grant-date using the Black-Scholes model using the following weighted-average assumptions consistent with the requirements of SFAS No. 123R.

	Year Ended December 31, 2006
Expected volatility	22.32%
Expected annual dividend yield	2.15%
Risk-free rate of return	4.63%
Expected option term (years)	5.0

The following table summarizes information about stock option activity for the three years ended December 31, 2006:

	Number of Options	Weighted Average Exercise Price
Outstanding at December 31, 2003	54,444,346	$37.68
Granted	9,469,800	35.49
Exercised	(2,955,232)	21.20
Lapsed or canceled	(2,433,985)	39.41
Outstanding at December 31, 2004	58,524,929	38.09
Granted	10,327,350	36.75
Exercised	(5,372,501)	29.07
Lapsed or canceled	(4,261,523)	40.46
Outstanding at December 31, 2005	59,218,255	38.50
Granted	9,193,200	42.35
Exercised	(11,466,491)	33.61
Lapsed or canceled	(2,712,287)	42.27
Outstanding at December 31, 2006	54,232,677	$39.98
Vested and expected to vest at December 31, 2006(1)	52,076,411	$39.76
Exercisable at December 31, 2006	37,902,956	$40.16

(1) The expected to vest options are the result of applying the pre-vesting forfeiture rate assumption to total outstanding options.

The following table summarizes information about stock options outstanding and exercisable at December 31, 2006:

	Options Outstanding				Options Exercisable		
Range of exercise prices	Number Outstanding	Weighted Average Life(1)	Weighted Average Exercise Price	Aggregate Intrinsic Value	Number Exercisable	Weighted Average Exercise Price	Aggregate Intrinsic Value
$21.75–$32.63	5,197,055	6.07	$24.07	$111	5,151,345	$24.03	$110
$33.00–$49.50	42,845,669	6.08	38.66	295	26,561,771	38.08	200
$49.97–$74.95	6,189,953	2.79	62.60	—	6,189,840	62.60	—
	54,232,677	5.70	39.98	$406	37,902,956	40.16	$310

(1) Average remaining contractual life in years.

There were 42,416,585 and 43,343,099 options exercisable at weighted average exercise prices of $40.01 and $40.36 at December 31, 2005 and 2004, respectively. There were 43,341,460 shares available for future grants under the terms of our stock option plans at December 31, 2006.

The weighted average fair value of options granted in 2006 was $9.44. The total intrinsic value of options (which is the amount by which the stock price exceeded the exercise price of the options on the date of exercise) exercised during 2006 was $92 million. During 2006, the amount of cash received from the exercise of stock options was $385 million with an associated tax benefit realized of $34 million. Consistent with the requirements of SFAS No. 123R, we classified $31 million of this benefit as a financing cash inflow in the Consolidated Statement of Cash Flows, and the balance was classified as cash from operations.

At December 31, 2006, there was $90 million of total unrecognized compensation cost related to non-vested stock option awards which is expected to be recognized over a weighted-average period of 1.59 years. The total fair value of options vested during 2006 was $70 million.

Restricted Stock Units—Restricted stock unit (RSU) awards entitle the holder to receive one share of common stock for each unit when the units vest. RSU's are issued to certain key employees at fair market value at the date of grant as compensation. RSUs typically become fully vested over periods ranging from three to seven years and are payable in Honeywell common stock upon vesting.

The following table summarizes information about RSU activity for the three years ended December 31, 2006:

	Number of Restricted Stock Units	Weighted Average Grant Date Fair Value Per Share
Non-vested at December 31, 2003	3,103,513	$30.10
Granted	980,706	$35.63
Vested	(205,463)	$34.91
Forfeited	(187,200)	$32.14
Non-vested at December 31, 2004	3,691,556	$31.20
Granted	1,163,984	$37.39
Vested	(424,175)	$32.84
Forfeited	(465,834)	$30.11
Non-vested at December 31, 2005	3,965,531	$32.97
Granted	1,948,650	$39.11
Vested	(759,015)	$30.04
Forfeited	(403,167)	$34.25
Non-vested at December 31, 2006	4,751,999	$35.85

As of December 31, 2006, there was approximately $113 million of total unrecognized compensation cost related to non-vested RSUs granted under our stock plans which is expected to be recognized over a weighted-average period of 2.36 years. Compensation expense related to RSUs was $29, $24 and $24 million in 2006, 2005 and 2004, respectively. At December 31, 2006, the Company reclassified $112 million of obligations to equity for restricted and deferred stock awards that are settled in equity.

Non-Employee Directors' Plan—Under the Directors' Plan each new director receives a one-time grant of 3,000 shares of common stock, subject to specific restrictions.

The Directors' Plan also provides for an annual grant to each director of options to purchase 5,000 shares of common stock at the fair market value on the date of grant. Options have generally become exercisable over a three-year period and expire after ten years. Starting with 2007 option grants the vesting period will be extended to four years.

Note 21—Commitments and Contingencies

Environmental Matters

We are subject to various federal, state, local and foreign government requirements relating to the protection of the environment. We believe that, as a general matter, our policies, practices and procedures are properly designed to prevent unreasonable risk of environmental damage and personal injury and that our handling, manufacture, use and disposal of hazardous or toxic substances are in accordance with environmental and safety laws and regulations. However, mainly because of past operations and operations of predecessor companies, we, like other companies engaged in similar businesses, have incurred remedial response and voluntary cleanup costs for site contamination and

are a party to lawsuits and claims associated with environmental and safety matters, including past production of products containing toxic substances. Additional lawsuits, claims and costs involving environmental matters are likely to continue to arise in the future.

With respect to environmental matters involving site contamination, we continually conduct studies, individually or jointly with other potentially responsible parties, to determine the feasibility of various remedial techniques to address environmental matters. It is our policy to record appropriate liabilities for environmental matters when remedial efforts or damage claim payments are probable and the costs can be reasonably estimated. Such liabilities are based on our best estimate of the undiscounted future costs required to complete the remedial work. The recorded liabilities are adjusted periodically as remediation efforts progress or as additional technical or legal information becomes available. Given the uncertainties regarding the status of laws, regulations, enforcement policies, the impact of other potentially responsible parties, technology and information related to individual sites, we do not believe it is possible to develop an estimate of the range of reasonably possible environmental loss in excess of our accruals. We expect to fund expenditures for these matters from operating cash flow. The timing of cash expenditures depends on a number of factors, including the timing of remedial investigations and feasibility studies, the timing of litigation and settlements of remediation liability, personal injury and property damage claims, regulatory approval of cleanup projects, remedial techniques to be utilized and agreements with other parties. The following table summarizes information concerning our recorded liabilities for environmental costs:

	Years Ended December 31,		
	2006	2005	2004
Beginning of year	$ 879	$ 895	$593
Accruals for environmental matters deemed probable and reasonably estimable	218	186	536
Environmental liability payments	(264)	(247)	(248)
Other adjustments(1)	(2)	45	14
End of year	$ 831	$ 879	$895

(1) In 2005, $45 million principally relates to reclassification of the carrying value of land to property, plant and equipment with a corresponding increase to environmental liabilities.

Environmental liabilities are included in the following balance sheet accounts:

	December 31,	
	2006	2005
Accrued liabilities	$251	$237
Other liabilities	580	642
	$831	$879

Although we do not currently possess sufficient information to reasonably estimate the amounts of liabilities to be recorded upon future completion of studies, litigation or settlements, and neither the timing nor the amount of the ultimate costs associated with environmental matters can be determined, they could be material to our consolidated results of operations or operating cash flows in the periods recognized or paid. However, considering our past experience and existing reserves, we do not expect that these environmental matters will have a material adverse effect on our consolidated financial position.

New Jersey Chrome Sites—Provisions have been made in our financial statements for the estimated costs of the court-ordered excavation and transport for offsite disposal of approximately one million tons of chromium residue present at a predecessor Honeywell site located in Jersey City, New Jersey, which are expected to be incurred evenly over a five-year period that started in April 2006. We do not expect implementation of this remedy to have a material adverse effect on our future consolidated results of operations, operating cash flows or financial position. Provision also has been made in our financial statements for the estimated costs of implementing groundwater and sediment remedial plans, which have been proposed for the site and are presently under review by the court in which litigation concerning the site is pending. The ultimate cost of remediating the river sediments may be reduced as numerous third parties could be responsible for an as yet undetermined portion of these costs.

The above-referenced site is the most significant of the twenty-one sites located in Hudson County, New Jersey which are the subject of an Administrative Consent Order (ACO) entered into with the New Jersey Department of Environmental Protection (NJDEP) in 1993. Remedial investigations and activities consistent with the ACO have been conducted and are underway at the other sites (the "Honeywell ACO Sites"). We have recorded reserves for the Honeywell ACO Sites where appropriate under the accounting policy described above.

On May 3, 2005, NJDEP filed a lawsuit in New Jersey Superior Court against Honeywell and two other companies seeking declaratory and injunctive relief, unspecified damages, and the reimbursement of unspecified total costs relating to sites in New Jersey allegedly contaminated with chrome ore processing residue. The claims against Honeywell relate to the activities of a predecessor company which ceased its New Jersey manufacturing operations in the mid-1950's. While the complaint is not entirely clear, it appears that approximately 100 sites are at issue, including 17 of the Honeywell ACO Sites, sites that the other two companies have agreed to remediate under separate administrative consent orders, as well as approximately 53 other sites (identified in the complaint as the "Publicly Funded Sites") for which none of the three companies has signed an administrative consent order. In addition to claims specific to each company, NJDEP claims that all three companies should be collectively liable for all the chrome sites based on a "market share" theory. In addition, NJDEP is seeking treble damages for all costs it has incurred or will incur at the Publicly Funded Sites. Honeywell believes that it has no connection with the sites covered by the other companies' administrative consent orders and, therefore, has no responsibility for those sites. At the Honeywell ACO Sites, we are conducting remedial investigations and activities consistent with the ACO; thus, we do not believe the lawsuit will significantly change our obligations with respect to the Honeywell ACO Sites. Lawsuits have also been filed against Honeywell in the District Court under the Resource Conservation and Recovery Act (RCRA) by two New Jersey municipal utilities seeking the cleanup of chromium residue at two Honeywell ACO sites and by a citizens' group against Honeywell and thirteen other defendants with respect to contamination on about a dozen of the Honeywell ACO Sites. Discovery is underway in these cases. For the reasons stated above, we do not believe these lawsuits will significantly change our obligations with respect to the Honeywell ACO sites.

Although it is not possible at this time to predict the outcome of the litigation and administrative proceedings discussed above, we believe that the allegations are without merit and we intend to vigorously defend against these lawsuits. We do not expect these matters to have a material adverse effect on our consolidated financial position. While we expect to prevail, an adverse litigation outcome could have a material adverse impact on our consolidated results of operations and operating cash flows in the periods recognized or paid.

Onondaga Lake, Syracuse, NY—A predecessor company to Honeywell operated a chemical plant which is alleged to have contributed mercury and other contaminants to the Lake. In July 2005, the New York State Department of Environmental Conservation (the DEC) issued its Record of

Decision with respect to remediation of industrial contamination in the Lake. In October 2006, Honeywell entered into a Consent Decree with the State of New York to implement the remedy set forth in the Record of Decision. In January 2007, the Consent Decree was approved by the United States District Court for the Northern District of New York.

The Record of Decision calls for a combined dredging/capping remedy generally in line with the approach recommended in the Feasibility Study submitted by Honeywell in May 2004. Based on currently available information and analysis performed by our engineering consultants, we have accrued for our estimated cost of implementing the remedy set forth in the Record of Decision. Our estimating process considered a range of possible outcomes and the amounts recorded reflect our best estimate at this time. Given the scope and complexity of this project, it is possible that actual costs could exceed estimated costs by an amount that could have a material adverse impact on our consolidated results of operations and operating cash flows in the periods recognized or paid. At this time, however, we cannot identify any legal, regulatory or technical reason to conclude that a specific alternative outcome is more probable than the outcome for which we have made provisions in our financial statements. The DEC's aggregate cost estimate, which is higher than the amount reserved, is based on the high end of the range of potential costs for major elements of the Record of Decision and includes a contingency. The actual cost of the Record of Decision will depend upon, among other things, the resolution of certain technical issues during the design phase of the remediation. We do not believe that this matter will have a material adverse impact on our consolidated financial position. In December 2006, the United States Fish and Wildlife Service published notice of its intent to pursue natural resource damages related to the site. It is not possible to predict the outcome or timing of its assessments, which are typically lengthy processes lasting several years, or the amounts of or responsibility for these damages.

Dundalk Marine Terminal, Baltimore–Chrome residue from legacy chrome plant operations in Baltimore was deposited as fill at the Dundalk Marine Terminal ("DMT"), which is owned and operated by the Maryland Port Administration ("MPA"). Honeywell and the MPA have been sharing costs to investigate and mitigate related environmental issues, and have entered into a cost sharing agreement under which Honeywell will bear a 77 percent share of the costs of developing and implementing permanent remedies for the DMT facility. The investigative phase (which began in April 2006) is expected to take approximately 18 to 36 months, after which the appropriate remedies will be identified and chosen. We have negotiated a Consent Decree with the MPA and Maryland Department of the Environment ("MDE") with respect to the investigation and remediation of the DMT facility, and that Consent Decree was filed with the Maryland state court for Baltimore County, Maryland. BUILD, a Baltimore community group, together with a local church and two individuals, have intervened and are challenging the Consent Decree. We do not believe that this matter will have a material adverse impact on our consolidated financial position or operating cash flows. Given the scope and complexity of this project, it is possible that the cost of remediation, when determinable, could have a material adverse impact on our results of operations in the periods recognized.

Asbestos Matters

Like many other industrial companies, Honeywell is a defendant in personal injury actions related to asbestos. We did not mine or produce asbestos, nor did we make or sell insulation products or other construction materials that have been identified as the primary cause of asbestos related disease in the vast majority of claimants. Products containing asbestos previously manufactured by Honeywell or by previously owned subsidiaries primarily fall into two general categories: refractory products and friction products.

Refractory Products—Honeywell owned North American Refractories Company (NARCO) from 1979 to 1986. NARCO produced refractory products (high temperature bricks and cement) that were

sold largely to the steel industry in the East and Midwest. Less than 2 percent of NARCO'S products contained asbestos.

When we sold the NARCO business in 1986, we agreed to indemnify NARCO with respect to personal injury claims for products that had been discontinued prior to the sale (as defined in the sale agreement). NARCO retained all liability for all other claims. On January 4, 2002, NARCO filed for reorganization under Chapter 11 of the U.S Bankruptcy Code.

As a result of the NARCO bankruptcy filing, all of the claims pending against NARCO are automatically stayed pending the reorganization of NARCO. In addition, the bankruptcy court enjoined both the filing and prosecution of NARCO-related asbestos claims against Honeywell. Although the stay has remained in effect continuously since January 4, 2002, there is no assurance that such stay will remain in effect. In connection with NARCO's bankruptcy filing, we paid NARCO's parent company $40 million and agreed to provide NARCO with up to $20 million in financing. We also agreed to pay $20 million to NARCO's parent company upon the filing of a plan of reorganization for NARCO acceptable to Honeywell (which amount was paid in December 2005 following the filing of NARCO's Third Amended Plan of Reorganization), and to pay NARCO's parent company $40 million, and to forgive any outstanding NARCO indebtedness to Honeywell, upon the effective date of the plan of reorganization.

We believe that, as part of NARCO plan of reorganization, a trust will be established for the benefit of all asbestos claimants, current and future, pursuant to Trust Distribution Procedures negotiated with the NARCO Asbestos Claimants Committee and the Court-appointed legal representative for future asbestos claimants. If the trust is put in place and approved by the Court as fair and equitable, Honeywell as well as NARCO will be entitled to a permanent channeling injunction barring all present and future individual actions in state or federal courts and requiring all asbestos related claims based on exposure to NARCO products to be made against the federally-supervised trust. Honeywell has reached agreement with the representative for future NARCO claimants and the Asbestos Claimants Committee to cap its annual contributions to the trust with respect to future claims at a level that would not have a material impact on Honeywell's operating cash flows.

The vast majority of the asbestos claimants have voted in favor of NARCO's Third Amended Plan Of Reorganization (NARCO Plan). The court conducted its evidentiary hearing on confirmation issues on June 5 and 6, 2006. All objections to the NARCO Plan have either been resolved or dismissed by the Bankruptcy Court. The Court's confirmation order for the NARCO Plan may be delayed, however, due to additional evidentiary requirements relating to the confirmation of a plan of reorganization for one of NARCO's affiliates. Although we expect the NARCO Plan and the NARCO trust to be ultimately approved by the Court, no assurances can be given as to the Court's ruling or the time frame for resolving any appeals of such ruling.

Our consolidated financial statements reflect an estimated liability for settlement of pending and future NARCO-related asbestos claims as of December 31, 2006 and 2005 of $1.3 and $1.8 billion, respectively. The estimated liability for pending claims is based on terms and conditions, including evidentiary requirements, in definitive agreements with approximately 260,000 current claimants, and an estimate of the unsettled claims pending as of the time NARCO filed for bankruptcy protection. Substantially all settlement payments with respect to current claims are expected to be completed by the end of 2007. Approximately $90 million of payments due pursuant to these settlements is due only upon establishment of the NARCO trust.

The estimated liability for future claims represents the estimated value of future asbestos related bodily injury claims expected to be asserted against NARCO through 2018 and the aforementioned obligations to NARCO's parent. In light of the uncertainties inherent in making long-term projections we do not believe that we have a reasonable basis for estimating asbestos claims beyond 2018 under

SFAS No. 5, "Accounting for Contingencies". The estimate is based upon the disease criteria and payment values contained in the NARCO Trust Distribution Procedures negotiated with the NARCO Asbestos Claimants Committee and the NARCO future claimants' representative. Honeywell projected the probable number and value, including trust claim handling costs, of asbestos related future liabilities based upon historical experience with similar trusts. The methodology used to estimate the liability for future claims has been commonly accepted by numerous courts and is the same methodology that is utilized by an expert who is routinely retained by the asbestos claimants committee in asbestos related bankruptcies. The valuation methodology includes an analysis of the population likely to have been exposed to asbestos containing products, epidemiological studies to estimate the number of people likely to develop asbestos related diseases, NARCO claims filing history, the pending inventory of NARCO asbestos related claims and payment rates expected to be established by the NARCO trust. In December 2006, (as a result of significantly varying experiences of asbestos claims filing rates in the tort system and in certain operating asbestos trusts) and the changing claims experience in those forums (as a result of more clearly defined proof requirements and possible enactment of state medical criteria bills), we updated the range of estimated liability for future NARCO-related claims. Such update resulted in a range of estimated liability for future claims of $743 to $961 million. We believe that no amount within this range is a better estimate than any other amount. Accordingly, we recorded the minimum amount in the range which resulted in a reduction of $207 million in our estimated liability for future NARCO-related asbestos claims.

As of December 31, 2006 and 2005, our consolidated financial statements reflect an insurance receivable corresponding to the liability for settlement of pending and future NARCO-related asbestos claims of $955 million and $1.1 billion, respectively. This coverage reimburses Honeywell for portions of the costs incurred to settle NARCO related claims and court judgments as well as defense costs and is provided by a large number of insurance policies written by dozens of insurance companies in both the domestic insurance market and the London excess market. At December 31, 2006, a significant portion of this coverage is with insurance companies with whom we have agreements to pay full policy limits based on corresponding Honeywell claims costs. We conduct analyses to determine the amount of insurance that we estimate is probable of recovery in relation to payment of current and estimated future claims. While the substantial majority of our insurance carriers are solvent, some of our individual carriers are insolvent, which has been considered in our analysis of probable recoveries. We made judgments concerning insurance coverage that we believe are reasonable and consistent with our historical dealings with our insurers, our knowledge of any pertinent solvency issues surrounding insurers and various judicial determinations relevant to our insurance programs.

In the second quarter of 2006, Travelers Casualty and Insurance Company ("Travelers") filed a lawsuit against Honeywell and other insurance carriers in the Supreme Court of New York, County of New York, disputing obligations for NARCO-related asbestos claims under high excess insurance coverage issued by Travelers and other insurance carriers. Approximately $370 million of coverage under these policies is included in our NARCO-related insurance receivable at December 31, 2006. Honeywell believes it is entitled to the coverage at issue and has filed counterclaims in the Superior Court of New Jersey seeking, among other things, declaratory relief with respect to this coverage. Although Honeywell expects to prevail in this matter, an adverse outcome could have a material impact on our results of operations in the period recognized but would not be material to our consolidated financial position or operating cash flows.

Projecting future events is subject to many uncertainties that could cause the NARCO related asbestos liabilities or assets to be higher or lower than those projected and recorded. There is no assurance that a plan of reorganization will be confirmed, that insurance recoveries will be timely or whether there will be any NARCO related asbestos claims beyond 2018. Given the inherent uncertainty in predicting future events, we review our estimates periodically, and update them based on

our experience and other relevant factors. Similarly we will reevaluate our projections concerning our probable insurance recoveries in light of any changes to the projected liability or other developments that may impact insurance recoveries.

Friction Products—Honeywell's Bendix friction materials (Bendix) business manufactured automotive brake pads that contained chrysotile asbestos in an encapsulated form. There is a group of existing and potential claimants consisting largely of individuals that allegedly performed brake replacements.

From 1981 through December 31, 2006, we have resolved approximately 105,000 Bendix related asbestos claims including trials covering 124 plaintiffs, which resulted in 116 favorable verdicts. Trials covering eight individuals resulted in adverse verdicts; however, two of these verdicts were reversed on appeal, three are or shortly will be on appeal, and the remaining three claims were settled. The following tables present information regarding Bendix related asbestos claims activity:

Claims Activity	Years Ended December 31, 2006	2005
Claims Unresolved at the beginning of year	79,502	76,348
Claims Filed	4,391	7,520
Claims Resolved	(26,785)	(4,366)(a)
Claims Unresolved at the end of year	57,108	79,502

Disease Distribution of Unresolved Claims	December 31, 2006	2005
Mesothelioma and Other Cancer Claims	4,843	4,810
Other Claims	52,265	74,692
Total Claims	57,108	79,502

(a) Excludes 2,524 claims which were inadvertently included in resolved claims as of December 31, 2005 which had no impact on the recorded values for such claims and has been corrected for purposes of this presentation.

Approximately 45 percent of the approximately 57,000 pending claims at December 31, 2006 are on the inactive, deferred, or similar dockets established in some jurisdictions for claimants who allege minimal or no impairment. The approximately 57,000 pending claims also include claims filed in jurisdictions such as Texas, Virginia, and Mississippi that historically allowed for consolidated filings. In these jurisdictions, plaintiffs were permitted to file complaints against a pre-determined master list of defendants, regardless of whether they have claims against each individual defendant. Many of these plaintiffs may not actually have claims against Honeywell. Based on state rules and prior experience in these jurisdictions, we anticipate that many of these claims will ultimately be dismissed. During 2006 approximately 16,000 cases were dismissed. More than 85 percent of these dismissals occurred in Mississippi as a result of judicial rulings relating to non-resident filings and venue. We anticipate additional dismissals in this jurisdiction.

Honeywell has experienced average resolution values per claim excluding legal costs as follows:

	Years Ended December 31, 2006	2005	2004
	(in whole dollars)		
Malignant claims	$33,000	$58,000	$90,000
Nonmalignant claims	$ 250	$ 600	$ 1,600

It is not possible to predict whether resolution values for Bendix related asbestos claims will increase, decrease or stabilize in the future.

Our consolidated financial statements reflect an estimated liability for resolution of pending and future Bendix related abestos claims at December 31, 2006 of $528 million. Prior to December 2006, we only accrued for the estimated cost of pending Bendix related abestos claims as we could not reasonably estimate losses which could arise from future Bendix related abestos claims. Due to the steady three-year decline in the rate of Bendix related asbestos claims filed and reduced volatility in those rates, we believe that it is now possible to determine a reasonable estimate of the costs that will be incurred for claims filed over the next five years. Accordingly during the fourth quarter of 2006, we recorded a reserve of $335 million for the estimated cost of future Bendix related asbestos claims based on the number of pending claims at December 31, 2006, disease classifications, and expected resolution values and historic dismissal rates. Prior to December 2006, we have historically valued Bendix claims at the average resolution value of the previous five years. In December 2006, based on the Bendix related experience over the last five years we now believe that the average of the prior two years is a more accurate indicator of future resolution values, and accordingly, we have applied this two-year resolution value in calculating both the reserves for pending and future Bendix related asbestos claims. This change resulted in a reduction of $118 million in the reserve for pending Bendix claims in the fourth quarter of 2006. We will update the expected resolution values used to estimate the cost of pending and future Bendix claims during the fourth quarter each year.

The estimated liability for future claims represents the estimated value of future asbestos related bodily injury claims expected to be asserted against Bendix through 2011. In light of the uncertainties inherent in making long-term projections, as well as certain factors unique to friction product asbestos claims, we do not believe that we have a reasonable basis for estimating asbestos claims beyond 2011 under SFAS No. 5, "Accounting for Contingencies". The estimate is based upon Bendix historical experience in the tort system for the two years ended December 31, 2006 with respect to claims filing and resolution. The methodology used to estimate the liability for future claims has been commonly accepted by numerous courts. It is substantially similar to that used to estimate the future NARCO related asbestos claims liability, with the exception that the valuation methodology for Bendix includes payment rates based on Bendix resolution history, rather than expected trust payment rates.

Honeywell currently has approximately $1.9 billion of insurance coverage remaining with respect to pending and potential future Bendix related asbestos claims, of which $302 and $377 million are reflected as receivables in our consolidated balance sheet at December 31, 2006 and 2005, respectively. This coverage is provided by a large number of insurance policies written by dozens of insurance companies in both the domestic insurance market and the London excess market. Insurance receivables are recorded in the financial statements simultaneous with the recording of the liability for the estimated value of the underlying asbestos claims. The amount of the insurance receivable recorded is based on our ongoing analysis of the insurance that we estimate is probable of recovery. This determination is based on our analysis of the underlying insurance policies, our historical experience with our insurers, our ongoing review of the solvency of our insurers, our interpretation of judicial determinations relevant to our insurance programs, and our consideration of the impacts of any settlements reached with our issuers. Insurance receivables are also recorded when structured insurance settlements provide for future fixed payment streams that are not contingent upon future claims or other events. Such amounts are recorded at the net present value of the fixed payment stream.

On a cumulative historical basis, Honeywell has recorded insurance receivables equal to approximately 50 percent of the value of the underlying asbestos claims recorded. However, because there are gaps in our coverage due to insurance company insolvencies, certain uninsured periods, and insurance settlements, this rate is expected to decline for any future Bendix related asbestos liabilities that may be recorded. Future recoverability rates may also be impacted by numerous other factors, such as future insurance settlements, insolvencies and judicial determinations relevant to our coverage program, which are difficult to predict. Assuming continued defense and indemnity spending at current

levels, we estimate that the cumulative recoverability rate could decline over the next five years to approximately 40 percent.

Honeywell believes it has sufficient insurance coverage and reserves to cover all pending Bendix related asbestos claims and Bendix related asbestos claims estimated to be filed within the next five years. Although it is impossible to predict the outcome of either pending or future Bendix related asbestos claims, we do not believe that such claims would have a material adverse effect on our consolidated financial position in light of our insurance coverage and our prior experience in resolving such claims. If the rate and types of claims filed, the average resolution value of such claims and the period of time over which claim settlements are paid (collectively, the "Variable Claims Factors") do not substantially change, Honeywell would not expect future Bendix related asbestos claims to have a material adverse effect on our results of operations or operating cash flows in any fiscal year. No assurances can be given, however, that the Variable Claims Factors will not change.

Refractory and Friction Products—The following tables summarize information concerning NARCO and Bendix asbestos related balances:

Asbestos Related Liabilities

	Year Ended December 31, 2006			Year Ended December 31, 2005			Year Ended December 31, 2004		
	Bendix	NARCO	Total	Bendix	NARCO	Total	Bendix	NARCO	Total
Beginning of year	$ 287	$1,782	$2,069	$ 355	$2,395	$2,750	$ 249	$2,760	$3,009
Accrual for claims filed and defense costs incurred	125	—	125	170	—	170	186	—	186
Accrual for estimated cost of future claims	335	—	335	—	—	—	—	—	—
Reduction in estimated cost of future claims	—	(207)	(207)	—	—	—	—	—	—
Asbestos related liability payments	(103)	(316)	(419)	(153)	(597)	(750)	(153)	(365)	(518)
Settlement with plaintiff firms of certain pending asbestos claims(1)	—	32	32	—	(21)	(21)	—	—	—
Update of expected resolution values for pending claims	(118)	—	(118)	(85)	—	(85)	73	—	73
Other	2	—	2	—	5	5	—	—	—
End of year	$ 528	$1,291	$1,819	$ 287	$1,782	$2,069	$ 355	$2,395	$2,750

(1) In 2006, charge of $32 million reflects a settlement of certain pending asbestos claims. In 2005, consists of a charge of $52 million to reflect a settlement of certain pending asbestos claims during the year and a credit of $73 million related to a re-estimation of asbestos reserves in connection with an additional settlement.

Insurance Recoveries for Asbestos Related Liabilities

	Year Ended December 31, 2006			Year Ended December 31, 2005			Year Ended December 31, 2004		
	Bendix	NARCO	Total	Bendix	NARCO	Total	Bendix	NARCO	Total
Beginning of year	$ 377	$1,096	$1,473	$336	$1,226	$1,562	$209	$1,238	$1,447
Probable insurance recoveries related to claims filed	11	—	11	34	—	34	96	—	96
Probable insurance recoveries related to annual update of expected resolution values for pending claims	39	—	39	(15)	—	(15)	39	—	39
Insurance receipts for asbestos related liabilities	(166)	(100)	(266)	(33)	(127)	(160)	(8)	(59)	(67)
Insurance receivables settlements and write-offs(1)	34	(41)	(7)	41	—	41	—	—	—
Other(2)	7	—	7	14	(3)	11	—	47	47
End of year	$ 302	$ 955	$1,257	$377	$1,096	$1,473	$336	$1,226	$1,562

(1) In 2006, $34 million reflects gains from settlements with two Bendix insurance carriers and $41 million represents the write-down of the NARCO insurance receivable to reflect the reduction in the estimated cost of future claims. In 2005, consists of gains from insurance settlements of $172 million principally related to a structured insurance settlement with a carrier which converted a policy into a future, fixed, non-contingent payment stream, and charges of $131 million for write-offs of certain amounts due from insurance carriers.

(2) In 2004, $47 million related to additional probable insurance recoveries identified in the second quarter of 2004 based on our ongoing evaluation of the enforceability of our rights under the various insurance policies.

NARCO and Bendix asbestos related balances are included in the following balance sheet accounts:

	December 31, 2006	December 31, 2005
Other current assets	$ 157	$ 171
Insurance recoveries for asbestos related liabilities	1,100	1,302
	$1,257	$1,473
Accrued liabilities	$ 557	$ 520
Asbestos related liabilities	1,262	1,549
	$1,819	$2,069

Other Matters

Baton Rouge, LA—As previously reported, three incidents occurred during 2003 at Honeywell's Baton Rouge, Louisiana chemical plant, including a release of chlorine, a release of antimony pentachloride (which resulted in an employee fatality), and an employee exposure to hydrofluoric acid. The United States Environmental Protection Agency and the United States Department of Justice have conducted investigations of these incidents, including a federal grand jury convened to investigate the employee fatality. As a result of that investigation, we have signed a plea agreement with the U.S. Attorney under which Honeywell will plead guilty to a misdemeanor charge and pay $12 million in combined restitution and fines. The plea agreement has been filed, but the plea and the sentence still are subject to Court acceptance, which we expect to receive. Honeywell has been served with several civil lawsuits regarding these incidents, for which we believe we have adequate insurance coverage to the extent that there is any liability. We are also engaged in discussions with the Louisiana Department

of Environmental Quality (LADEQ) to resolve alleged civil environmental violations at our Baton Rouge and Geismar, Louisiana facilities that, in part, overlap with the subject of the federal investigation.

Brunswick, GA—Honeywell has reached settlements with Glynn County, Georgia and with a group of private individuals who own or owned properties near the Allied Chemical (a predecessor company) chlor-alkali plant, in Brunswick, Georgia in various related cases. The plaintiffs had alleged that mercury and PCB discharges from the plant devalued their property, and caused them loss of use and enjoyment of that property. They were seeking compensatory, injunctive and punitive damages. The settlement with Glynn County was for $25 million and that amount has been paid. The settlement with the private property owners was also for $25 million and the money has been placed into the plaintiffs' attorney trust account pending confirmation that none of the private landowners have opted out of the settlement and allocation of the proceeds among the parties by a special master appointed by the court. Honeywell and the private landowners will ask the court to confirm the settlement as final in a hearing set for April 6, 2007.

Allen, et, al. v. Honeywell Retirement Earnings Plan—This represents a class action lawsuit in which plaintiffs seek unspecified damages relating to allegations that, among other things, Honeywell impermissibly reduced the pension benefits of employees of Garrett Corporation (a predecessor entity) when the plan was amended in 1983 and failed to calculate certain benefits in accordance with the terms of the plan. In the third quarter of 2005, the U.S. District Court for the District of Arizona ruled in favor of the plaintiffs on these claims and in favor of Honeywell on virtually all other claims. We strongly disagree with, and intend to appeal, the Court's adverse ruling. A class was certified by the Court in September 2006. In light of the merits of our arguments on appeal and our substantial affirmative defenses which have not yet been considered by the Court, we continue to expect to prevail in this matter. Accordingly, we do not believe that a liability is probable of occurrence and reasonably estimable and have not recorded a provision for this matter in our financial statements. Given the uncertainty inherent in litigation and the wide range of potential remedies, it is not possible to estimate the range of possible loss that might result from an adverse resolution of this matter. Although we expect to prevail in this matter, an adverse outcome could have a material adverse effect on our results of operations or operating cash flows in the periods recognized or paid. We do not believe that an adverse outcome in this matter would have a material adverse effect on our consolidated financial position.

We are subject to a number of other lawsuits, investigations and disputes (some of which involve substantial amounts claimed) arising out of the conduct of our business, including matters relating to commercial transactions, government contracts, product liability, prior acquisitions and divestitures, employee benefit plans, and health and safety matters. We recognize a liability for any contingency that is probable of occurrence and reasonably estimable. We continually assess the likelihood of adverse judgments of outcomes in these matters, as well as potential ranges of probable losses (taking into consideration any insurance recoveries), based on a careful analysis of each matter with the assistance of outside legal counsel and, if applicable, other experts.

Given the uncertainty inherent in litigation, we do not believe it is possible to develop estimates of the range of reasonably possible loss in excess of current accruals for these matters. Considering our past experience and existing accruals, we do not expect the outcome of these matters, either individually or in the aggregate, to have a material adverse effect on our consolidated financial position. Because most contingencies are resolved over long periods of time, potential liabilities are subject to change due to new developments, changes in settlement strategy or the impact of evidentiary requirements, which could cause us to pay damage awards or settlements (or become subject to equitable remedies) that could have a material adverse effect on our results of operations or operating cash flows in the periods recognized or paid.

Warranties and Guarantees—We have issued or are a party to the following direct and indirect guarantees at December 31, 2006:

	Maximum Potential Future Payments
Operating lease residual values	$38
Other third parties' financing	6
Unconsolidated affiliates' financing	9
Customer financing	22
	$75

We do not expect that these guarantees will have a material adverse effect on our consolidated results of operations, financial position or liquidity.

In connection with the disposition of certain businesses and facilities we have indemnified the purchasers for the expected cost of remediation of environmental contamination, if any, existing on the date of disposition. Such expected costs are accrued when environmental assessments are made or remedial efforts are probable and the costs can be reasonably estimated.

In the normal course of business we issue product warranties and product performance guarantees. We accrue for the estimated cost of product warranties and performance guarantees based on contract terms and historical experience at the time of sale. Adjustments to initial obligations for warranties and guarantees are made as changes in the obligations become reasonably estimable. The following table summarizes information concerning our recorded obligations for product warranties and product performance guarantees:

	Years Ended December 31,		
	2006	2005	2004
Beginning of year	$ 347	$ 299	$ 275
Accruals for warranties/guarantees issued during the year	268	203	236
Adjustment of pre-existing warranties/guarantees	(22)	17	1
Settlement of warranty/guarantee claims	(230)	(172)	(213)
End of year	$ 363	$ 347	$ 299

Product warranties and product performance guarantees are included in the following balance sheet accounts:

	December 31,	
	2006	2005
Accrued liabilities	$347	$322
Other liabilities	16	25
	$363	$347

Note 22—Pension and Other Postretirement Benefits

We sponsor both funded and unfunded U.S. and non-U.S. defined benefit pension plans covering the majority of our employees and retirees. Pension benefits for substantially all U.S. employees are provided through non-contributory, qualified and non-qualified defined benefit pension plans. U.S. defined benefit pension plans comprise 74 percent of our projected benefit obligation. Non-U.S. employees, who are not U.S. citizens, are covered by various retirement benefit arrangements, some of which are considered to be defined benefit pension plans for accounting purposes. Non-U.S. defined benefit pension plans comprise 26 percent of our projected benefit obligation.

We also sponsor postretirement benefit plans that provide health care benefits and life insurance coverage to eligible retirees. Our retiree medical plans mainly cover U.S. employees who retire with pension eligibility for hospital, professional and other medical services. All non-union hourly and salaried employees joining Honeywell after January 1, 2000 are not eligible to participate in our retiree medical and life insurance plans. Most of the U.S. retiree medical plans require deductibles and copayments, and virtually all are integrated with Medicare. Retiree contributions are generally required based on coverage type, plan and Medicare eligibility. Honeywell has limited its subsidy of its retiree medical plans to a fixed-dollar amount for substantially all future retirees and for almost half of its current retirees. This cap of retiree medical benefits under our plans limits our exposure to the impact of future health care cost increases. The retiree medical and life insurance plans are not funded. Claims and expenses are paid from our operating cash flow.

As discussed in Note 1—Summary of Significant Accounting Policies, we adopted SFAS No. 158 as of December 31, 2006. SFAS No. 158 requires that we recognize on a prospective basis the funded status of our defined benefit pension and other postretirement benefit plans on the consolidated balance sheet and recognize as a component of accumulated other comprehensive income (loss), net of tax, the gains or losses and prior service costs or credits that arise during the period but are not recognized as components of net periodic benefit cost. Additional minimum pension liabilities and related intangible assets are also derecognized upon adoption of the new standard. The adjustment for SFAS No. 158 affected our Consolidated Balance Sheet as follows:

Decrease in prepaid pension benefit cost	$(2,071)
Decrease in intangible asset	(79)
Decrease in accrued and minimum pension liability	138
Increase in postretirement benefit obligations other than pensions	(340)
Increase in accumulated other comprehensive loss, pre-tax	(2,352)
Increase in income tax benefit	840
Increase in accumulated other comprehensive loss, net of tax(1)	$(1,512)

(1) Represents $1,708 million reduction of shareowners' equity including a $196 million adjustment related to our additional minimum liability.

The following tables summarize the balance sheet impact, including the benefit obligations, assets and funded status associated with our significant pension and other postretirement benefit plans at December 31, 2006 and 2005.

	Pension Benefits		Other Postretirement Benefits	
	2006	2005	2006	2005
Change in benefit obligation:				
Benefit obligation at beginning of year	$16,168	$13,587	$ 2,318	$ 2,353
Service cost	274	236	17	17
Interest cost	908	815	122	120
Plan amendments	7	(2)	(11)	(20)
Actuarial (gains) losses	(183)	685	(14)	(74)
Acquisitions	75	1,940	—	121
Benefits paid	(1,070)	(965)	(186)	(199)
Settlements and curtailments	(15)	(1)	—	—
Other	844	(127)	19	—
Benefit obligation at end of year	17,008	16,168	2,265	2,318
Change in plan assets:				
Fair value of plan assets at beginning of year	14,653	13,070	—	—
Actual return on plan assets	1,897	1,229	—	—
Company contributions	347	105	—	—
Acquisitions	65	1,317	—	—
Benefits paid	(1,070)	(965)	—	—
Other	686	(103)	—	—
Fair value of plan assets at end of year	16,578	14,653	—	—
Funded status of plans	$ (430)	(1,515)	$(2,265)	(2,318)
Net obligation at transition(1)	—	9	—	—
Net loss(1)	—	3,444	—	552
Prior service cost (credit)(1)	—	119	—	(175)
Net amount recognized(1)	—	$ 2,057	—	$(1,941)
Amounts recognized in Consolidated Balance Sheet consist of:				
Prepaid pension benefit cost	$ 685	$ 2,716	$ —	$ —
Intangible asset(2)	—	79	—	—
Accrued liabilities	—	—	(197)	(197)
Postretirement benefit obligations other than pensions(3)	—	—	(2,068)	(1,744)
Accrued pension liability(4)	(1,115)	(767)	—	—
Additional minimum liability(4)	—	(518)	—	—
Accumulated other comprehensive income (loss)	—	547	—	—
Net amount recognized	$ (430)	$ 2,057	$(2,265)	$(1,941)

(1) Disclosure is not applicable in 2006 as a result of SFAS No. 158.

(2) Included in Other Assets—Non-Current on Consolidated Balance Sheet.

(3) Excludes Non-U.S. plans of $22 and $42 million in 2006 and 2005, respectively.

(4) Included in Other Liabilities—Non-Current on Consolidated Balance Sheet.

	Pension Benefits 2006	Other Postretirement Benefits 2006
Amounts recognized in Accumulated Other Comprehensive Income (loss) at December 31, 2006		
Transition obligation	$ 11	$ —
Prior service cost or (benefit)	98	(146)
Actuarial losses	2,423	486
Net amount recognized	$2,532	$ 340

The accumulated benefit obligation for our defined benefit pension plans was $16.2 and $15.4 billion at December 31, 2006 and 2005, respectively.

Net periodic pension and other postretirement benefit costs for our significant plans include the following components:

	Pension Benefits Years Ended December 31,		
	2006	2005	2004
Service cost	$ 274	$ 236	$ 222
Interest cost	908	815	755
Expected return on plan assets	(1,251)	(1,104)	(1,042)
Amortization of prior service cost	27	30	38
Recognition of actuarial losses	348	392	413
Settlements and curtailments	(13)	—	—
Net periodic benefit cost	$ 293	$ 369	$ 386

	Other Postretirement Benefits Years Ended December 31,		
	2006	2005	2004
Service cost	$ 17	$ 17	$ 17
Interest cost	122	120	138
Amortization of prior service (credit)	(40)	(39)	(37)
Recognition of actuarial losses	52	63	101
Net periodic benefit cost	$ 151	$ 161	$ 219

The estimated net loss and prior service cost for pension benefits that will be amortized from accumulated other comprehensive income (loss) into net periodic benefit cost over the next fiscal year are expected to be $193 and $27 million, respectively. The estimated net loss and prior service credit for other postretirement benefits that will be amortized from accumulated other comprehensive income (loss) into net periodic benefit cost over the next fiscal year are expected to be $45 and $(40) million, respectively.

Major actuarial assumptions used in determining the benefit obligations and net periodic benefit cost for our U.S. benefit plans are presented in the following table. For non-U.S. benefit plans, no one of which was individually material, assumptions reflect economic assumptions applicable to each country.

	Pension Benefits			Other Postretirement Benefits		
	2006	2005	2004	2006	2005	2004
Actuarial assumptions used to determine benefit obligations as of December 31:						
Discount rate	6.00%	5.75%	5.875%	5.70%	5.50%	5.50%
Expected annual rate of compensation increase	4.00%	4.00%	4.00%	—	—	—
Actuarial assumptions used to determine net periodic benefit cost for years ended December 31:						
Discount rate	5.75%	5.875%	6.00%	5.50%	5.50%	6.00%
Expected rate of return on plan assets	9.00%	9.00%	9.00%	—	—	—
Expected annual rate of compensation increase	4.00%	4.00%	4.00%	—	—	—

To select a discount rate for our retirement benefit plans, we use a modeling process that involves matching the expected cash outflows of our benefit plans to a yield curve constructed from a portfolio of double A rated fixed-income debt instruments. We use the average yield of this hypothetical portfolio as a discount rate benchmark. The discount rate used to determine the other postretirement benefit obligation is lower due to a shorter expected duration of other postretirement plan obligations as compared to pension plan obligations.

Our expected rate of return on plan assets of 9 percent is a long-term rate based on historic plan asset returns over varying long-term periods combined with current market conditions and broad asset mix considerations. The expected rate of return is a long-term assumption and generally does not change annually. For our U.S. pension plans, we use the market-related value of plan assets reflecting changes in the fair value of plan assets over a three-year period.

For our U.S. benefit plans, actuarial losses in excess of 10 percent of the greater of the market-related value of plan assets or the plans projected benefit obligation are amortized over a six-year period.

Mortality assumptions for our U.S. benefit plans were updated as of December 31, 2005 using the RP2000 Mortality table for all participants.

Pension Benefits

Pension plans with accumulated benefit obligations exceeding the fair value of plan assets were as follows:

	December 31,	
	2006	2005
Projected benefit obligation	$2,055	$2,746
Accumulated benefit obligation	1,875	2,541
Fair value of plan assets	1,321	1,511

Our U.S. pension plans assets were $12.8 and $12.0 billion and our non-U.S. pension plans assets were $3.8 and $2.6 billion at December 31, 2006 and 2005, respectively. Our asset allocation and target allocation for our pension plans assets are as follows:

Asset Category	Percentage of Plans Assets at December 31, 2006	2005	Long-term Target Allocation
Equity securities	63%	63%	40-65%
Debt securities, including cash	29	31	25-45
Real estate	5	4	2-8
Other	3	2	2-6
	100%	100%	

Our asset investment strategy focuses on maintaining a diversified portfolio using various asset classes in order to achieve our long-term investment objectives on a risk adjusted basis. Our actual invested positions in various securities change over time based on short and longer-term investment opportunities. To achieve our objectives, our U.S. investment policy requires that our U.S. Master Retirement Trust be invested as follows: (a) no less than 25 percent be invested in fixed income securities; (b) no more than 10 percent in high-yield securities; (c) no more than 10 percent in private real estate investments; and (d) no more than 6 percent in other investment alternatives involving limited partnerships of various types. There is no stated limit on investments in publically-held U.S. and international equity securities. Our non-U.S. investment policies are different for each country, but the long-term investment objectives remain the same.

Our general funding policy for qualified pension plans is to contribute amounts at least sufficient to satisfy regulatory funding standards. In 2006 and 2004, we made voluntary contributions of $68 and $40 million, respectively, to our U.S. defined benefit pension plans primarily for government contracting purposes. Assuming that actual plan asset returns are consistent with our expected rate of 9 percent in 2007 and beyond, and that interest rates remain constant, we would not be required to make any contributions to our U.S. pension plans for the foreseeable future. We expect to make voluntary contributions of approximately $52 million in cash in 2007 to certain of our U.S. plans for government contracting purposes. We also expect to contribute approximately $155 million in cash in 2007 to our non-U.S. defined benefit pension plans to satisfy regulatory funding standards. These contributions do not reflect benefits to be paid directly from Company assets.

Benefit payments, including amounts to be paid from Company assets, and reflecting expected future service, as appropriate, are expected to be paid as follows:

2007	$1,074
2008	1,083
2009	1,092
2010	1,100
2011	1,111
2012-2016	6,327

Other Postretirement Benefits

Effective December 31, 2004, we adopted FASB Staff Position No. 106-2 "Accounting and Disclosure Requirements Related to the Medicare Prescription Drug, Improvement and Modernization Act of 2003" (FSP No. 106-2). FSP No. 106-2 provides guidance on accounting for the effects of the

Medicare Prescription Drug, Improvement and Modernization Act of 2003 (the Act) for employers that sponsor postretirement health care plans that provide prescription drug coverage that is at least actuarially equivalent to that offered by Medicare Part D. The impact of the Act reduced other postretirement benefits expense by approximately $37 and $45 million in 2006 and 2005, respectively.

	December 31,	
	2006	2005
Assumed health care cost trend rate:		
Health care cost trend rate assumed for next year	9.0%	9.0%
Rate that the cost trend rate gradually declines to	5.5%	5.0%
Year that the rate reaches the rate it is assumed to remain at	2014	2010

The assumed health care cost trend rate has a significant effect on the amounts reported. A one-percentage-point change in the assumed health care cost trend rate would have the following effects:

	1 percentage point	
	Increase	Decrease
Effect on total of service and interest cost components	$ 6	$ (5)
Effect on postretirement benefit obligation	$87	$(78)

Benefit payments reflecting expected future service, as appropriate, are expected to be paid as follows:

	Without Impact of Medicare Subsidy	Net of Medicare Subsidy
2007	$ 211	$189
2008	212	192
2009	214	193
2010	214	193
2011	215	195
2012-2016	1,016	930

Employee Savings Plans—We sponsor employee savings plans under which we match, in the form of our common stock, savings plan contributions for certain eligible U.S. employees. Shares issued under the stock match plans were 4.5, 4.1 and 4.3 million at a cost of $179, $153 and $151 million in 2006, 2005 and 2004, respectively.

Note 23—Segment Financial Data

We globally manage our business operations through four reportable segments serving customers worldwide with aerospace products and services, control, sensing and security technologies for buildings, homes and industry, automotive products and chemicals. Segment information is consistent with how management reviews the businesses, makes investing and resource allocation decisions and assesses operating performance. Our four reportable segments are as follows:

- Aerospace is organized by customer end-market (Air Transport and Regional, Business and General Aviation and Defense and Space) and provides products and services which include auxiliary power units; propulsion engines; environmental control systems; engine controls; repair and overhaul services; hardware; logistics; electric power systems; flight safety, communications, navigation, radar and surveillance systems; aircraft lighting; management and technical services; advanced systems and instruments; and aircraft wheels and brakes.
- Automation and Control Solutions includes Products (controls for heating, cooling, indoor air quality, ventilation, humidification and home automation; advanced software applications for home/building control and optimization; sensors, switches, control systems and instruments for measuring pressure, air flow, temperature and electrical current; security, fire and gas detection; access control; video surveillance; and remote patient monitoring systems); Building Solutions (installs, maintains and upgrades systems that keep buildings safe, comfortable and productive); and Process Solutions (provides a full range of automation and control solutions for industrial plants, offering advanced software and automation systems that integrate, control and monitor complex processes in many types of industrial settings).
- Specialty Materials includes fluorocarbons, specialty films, advanced fibers, customized research chemicals and intermediates, electronic materials and chemicals, and catalysts and adsorbents.
- Transportation Systems includes Honeywell Turbo Technologies (turbochargers and charge-air and thermal systems); and the Consumer Products Group (car care products including anti-freeze, filters, spark plugs, and cleaners, waxes and additives; and brake hard parts and other friction materials).

The accounting policies of the segments are the same as those described in Note 1. Honeywell's senior management evaluates segment performance based on segment profit. Segment profit is business unit income (loss) before taxes excluding general corporate unallocated expenses, other income (expense), interest and other financial charges, pension and other postretirement benefits (expense), stock option expense, repositioning and other charges and accounting changes. Intersegment sales approximate market prices and are not significant. Reportable segment data follows:

	Years Ended December 31,		
	2006	2005	2004
Net sales			
Aerospace	$11,124	$10,496	$ 9,740
Automation and Control Solutions	11,020	9,416	8,031
Specialty Materials	4,631	3,234	3,497
Transportation Systems	4,592	4,505	4,323
Corporate	—	1	2
	$31,367	$27,652	$25,593
Depreciation and amortization			
Aerospace	$ 195	$ 188	$ 199
Automation and Control Solutions	240	202	159
Specialty Materials	221	137	141
Transportation Systems	101	93	80
Corporate	37	33	35
	$ 794	$ 653	$ 614
Segment profit			
Aerospace	$ 1,892	$ 1,676	$ 1,422
Automation and Control Solutions	1,223	1,065	894
Specialty Materials	568	257	184
Transportation Systems	574	557	575
Corporate	(177)	(173)	(158)
	$ 4,080	$ 3,382	$ 2,917
Capital expenditures			
Aerospace	$ 178	$ 178	$ 168
Automation and Control Solutions	165	136	106
Specialty Materials	186	155	156
Transportation Systems	109	143	137
Corporate	95	72	62
	$ 733	$ 684	$ 629

	December 31,		
	2006	2005	2004
Total assets			
Aerospace	$ 7,914	$ 7,696	$ 7,949
Automation and Control Solutions	11,287	10,080	8,128
Specialty Materials	4,674	4,732	3,239
Transportation Systems	3,038	2,880	3,131
Corporate	4,028	6,245	8,123
	$30,941	$31,633	$30,570

A reconciliation of segment profit to consolidated income from continuing operations before taxes is as follows:

	Years Ended December 31,		
	2006	2005	2004
Segment profit	$4,080	$3,382	$2,917
Other income (expense)	111	231	429
Interest and other financial charges	(374)	(356)	(331)
Stock option expense(1)	(77)	—	—
Pension and other postretirement benefits (expense)(1)	(459)	(561)	(628)
Repositioning and other charges(1)	(483)	(400)	(764)
Income from continuing operations before taxes	$2,798	$2,296	$1,623

(1) Amounts included in cost of products and services sold and selling, general and administrative expenses.

Note 24—Geographic Areas—Financial Data

	Net Sales(1)			Long-lived Assets(2)		
	Years Ended December 31,			Years Ended December 31,		
	2006	2005	2004	2006	2005	2004
United States	$19,821	$17,956	$16,625	$11,438	$10,842	$ 8,307
Europe	7,781	6,552	6,097	2,161	1,958	2,044
Other International	3,765	3,144	2,871	848	691	458
	$31,367	$27,652	$25,593	$14,447	$13,491	$10,809

(1) Sales between geographic areas approximate market and are not significant. Net sales are classified according to their country of origin. Included in United States net sales are export sales of $3,493, $2,780 and $2,399 million in 2006, 2005 and 2004, respectively.

(2) Long-lived assets are comprised of property, plant and equipment, goodwill and other intangible assets.

Note 25—Supplemental Cash Flow Information

	Years Ended December 31,		
	2006	2005	2004
Payments for repositioning and other charges:			
Severance and exit cost payments	$(142)	$ (171)	$(164)
Environmental payments	(264)	(247)	(248)
Proceeds from sale of insurance receivable	100	—	—
Insurance receipts for asbestos related liabilities	166	160	67
Asbestos related liability payments	(419)	(750)	(518)
	$(559)	$(1,008)	$(863)
Interest paid, net of amounts capitalized	$ 361	$ 397	$ 330
Income taxes paid, net of refunds	471	235	178
Non-cash investing and financing activities:			
Common stock contributed to U.S. savings plans	179	153	151

Note 26—Unaudited Quarterly Financial Information

	2006					2005				
	Mar. 31	June 30	Sept. 30	Dec. 31	Year	Mar. 31	June 30	Sept. 30	Dec. 31	Year
Net sales	$ 7,241	$ 7,898	$ 7,952	$ 8,276	$31,367	$6,449	$7,028	$6,900	$7,275	$27,652
Gross profit	1,641	1,871	1,841	1,918	7,271	1,367	1,525	1,598	1,638	6,128
Income from continuing operations	431	521	541	585	2,078	358	274	427	505	1,564
Income from discontinued operations	5	—	—	—	5	—	28	37	30	95
Cumulative effect of accounting change(1)	—	—	—	—	—	—	—	—	(21)	(21)
Net income	436	521	541	585	2,083	358	302	464	514	1,638
Earnings per share—basic:										
Income from continuing operations	.51	.63	.66	.72	2.53	.42	.33	.50	.60	1.85
Income from discontinued operations	.01	—	—	—	.01	—	.03	.04	.04	.11
Cumulative effect of accounting change	—	—	—	—	—	—	—	—	(.03)	(.03)
Net income	.52	.63	.66	.72	2.54	.42	.36	.54	.61	1.93
Earnings per share—assuming dilution:										
Income from continuing operations	.51	.63	.66	.72	2.51	.42	.33	.50	.60	1.84
Income from discontinued operations	.01	—	—	—	.01	—	.03	.04	.04	.11
Cumulative effect of accounting change	—	—	—	—	—	—	—	—	(.03)	(.03)
Net income	.52	.63	.66	.72	2.52	.42	.36	.54	.61	1.92
Dividends paid	.226875	.226875	.226875	.226875	.9075	.20625	.20625	.20625	.20625	.8250
Market price(2)										
High	42.85	44.16	41.37	45.46	45.46	39.30	38.12	39.29	37.96	39.30
Low	35.84	37.62	36.21	41.35	35.84	34.00	35.17	35.41	33.21	33.21

(1) Represents the net of tax effect of adopting FIN 47 as of December 31, 2005.

(2) From composite tape-stock is primarily traded on the New York Stock Exchange.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

TO THE BOARD OF DIRECTORS AND SHAREOWNERS OF
HONEYWELL INTERNATIONAL INC.:

We have completed integrated audits of Honeywell International Inc.'s consolidated financial statements and of its internal control over financial reporting as of December 31, 2006, in accordance with the standards of the Public Company Accounting Oversight Board (United States). Our opinions, based on our audits, are presented below.

Consolidated financial statements and financial statement schedule

In our opinion, the consolidated financial statements listed in the index appearing under Item 15(a)(1.) present fairly, in all material respects, the financial position of Honeywell International Inc. and its subsidiaries at December 31, 2006 and 2005, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2006 in conformity with accounting principles generally accepted in the United States of America. In addition, in our opinion, the financial statement schedule listed in the index appearing under Item 15(a)(2.) presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements. These financial statements and financial statement schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and financial statement schedule based on our audits. We conducted our audits of these statements in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit of financial statements includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

As discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for stock-based compensation and defined benefit pension and other postretirement plans in 2006 and the manner in which it accounts for conditional asset retirement obligations in 2005.

Internal control over financial reporting

Also, in our opinion, management's assessment, included in Management's Report on Internal Control Over Financial Reporting appearing under Item 9A, that the Company maintained effective internal control over financial reporting as of December 31, 2006 based on criteria established in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), is fairly stated, in all material respects, based on those criteria. Furthermore, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2006, based on criteria established in *Internal Control—Integrated Framework* issued by the COSO. The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting. Our responsibility is to express opinions on management's assessment and on the effectiveness of the Company's internal control over financial reporting based on our audit. We conducted our audit of internal control over financial reporting in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. An audit of internal control over financial reporting includes obtaining an understanding of internal control over financial reporting, evaluating management's assessment, testing and evaluating the design and operating effectiveness of internal control, and performing such other procedures as we consider necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Florham Park, New Jersey
February 15, 2007

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

Not Applicable.

Item 9A. Controls and Procedures

Honeywell management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. Based upon that evaluation, the Chief Executive Officer and the Chief Financial Officer concluded that such disclosure controls and procedures were effective as of the end of the period covered by this Annual Report on Form 10-K in alerting them on a timely basis to material information relating to Honeywell required to be included in Honeywell's periodic filings under the Exchange Act. There have been no changes that have materially affected, or are reasonably likely to materially affect, Honeywell's internal control over financial reporting that have occurred during the period covered by this Annual Report on Form 10-K.

Management's Report on Internal Control Over Financial Reporting

Honeywell management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934. Honeywell's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Honeywell's internal control over financial reporting includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of Honeywell's assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of Honeywell's management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of Honeywell's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of Honeywell's internal control over financial reporting as of December 31, 2006. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control-Integrated Framework.*

Based on this assessment, management determined that Honeywell maintained effective internal control over financial reporting as of December 31, 2006.

Management's assessment of the effectiveness of Honeywell's internal control over financial reporting as of December 31, 2006 has been audited by PricewaterhouseCoopers LLP, an independent registered public accouting firm, as stated in their report which is included in "Item 8. Financial Statements and Supplementary Data."

Item 9B. Other Information

Not Applicable.

Part III.

Item 10. Directors and Executive Officers of the Registrant

Information relating to the Directors of Honeywell, as well as information relating to compliance with Section 16(a) of the Securities Exchange Act of 1934, will be contained in our definitive Proxy Statement involving the election of the Directors which will be filed with the SEC pursuant to Regulation 14A not later than 120 days after December 31, 2006, and such information is incorporated herein by reference. Certain other information relating to the Executive Officers of Honeywell appears in Part I of this Annual Report on Form 10-K under the heading "Executive Officers of the Registrant".

The members of the Audit Committee of our Board of Directors are: Scott Davis (Chair), Linnet Deily, James J. Howard, Russell E. Palmer, Eric K. Shinseki, John R. Stafford, and Michael W. Wright. The Board has determined that Mr. Davis is the "audit committee financial expert" as defined by applicable SEC rules and that Mr. Davis and Mr. Palmer satisfy the "accounting or related financial management expertise" criteria established by the NYSE. All members of the Audit Committee are "independent" as that term is defined in applicable SEC Rules and NYSE listing standards.

Honeywell's Code of Business Conduct is available, free of charge, on our website under the heading "Investor Relations" (see "Corporate Governance"), or by writing to Honeywell, 101 Columbia Road, Morris Township, New Jersey 07962, c/o Vice President and Corporate Secretary. Honeywell's Code of Business Conduct applies to all Honeywell directors, officers (including the Chief Executive Officer, Chief Financial Officer and Controller) and employees. Amendments to or waivers of the Code of Business Conduct granted to any of Honeywell's directors or executive officers will be published on our website within five business days of such amendment or waiver.

Item 11. Executive Compensation

Information relating to executive compensation is contained in the Proxy Statement referred to above in "Item 10. Directors and Executive Officers of the Registrant," and such information is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Information relating to security ownership of certain beneficial owners and management, equity compensation plans and related stockholder matters is contained in the Proxy Statement referred to above in "Item 10. Directors and Executive Officers of the Registrant," and such information is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions

Information relating to certain relationships and related transactions is contained in the Proxy Statement referred to above in "Item 10. Directors and Executive Officers of the Registrant," and such information is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

Information relating to fees paid to and services performed by PricewaterhouseCoopers LLP in 2006 and 2005 and our Audit Committee's pre-approval policies and procedures with respect to non-audit services are contained in the Proxy Statement referred to above in "Item 10. Directors and Executive Officers of the Registrant," and such information is incorporated herein by reference.

Part IV.

Item 15. Exhibits and Financial Statement Schedules

(a)(1.) Consolidated Financial Statements:	Page Number in Form 10-K
Consolidated Statement of Operations for the years ended December 31, 2006, 2005 and 2004	45
Consolidated Balance Sheet at December 31, 2006 and 2005	46
Consolidated Statement of Cash Flows for the years ended December 31, 2006, 2005 and 2004	47
Consolidated Statement of Shareowners' Equity for the years ended December 31, 2006, 2005 and 2004	48
Notes to Financial Statements	49
Report of Independent Registered Public Accounting Firm	96

(a)(2.) Consolidated Financial Statement Schedules:	Page Number in Form 10-K
Schedule II—Valuation and Qualifying Accounts	107

All other financial statement schedules have been omitted because they are not applicable to us or the required information is shown in the consolidated financial statements or notes thereto.

(a)(3.) Exhibits

See the Exhibit Index on pages 102 through 106 of this Annual Report on Form 10-K.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this annual report to be signed on its behalf by the undersigned, thereunto duly authorized.

HONEYWELL INTERNATIONAL INC.

February 15, 2007

By: /s/ THOMAS A. SZLOSEK
Thomas A. Szlosek
Vice President and Controller

Pursuant to the requirements of the Securities Exchange Act of 1934, this annual report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated:

Name	Name
*	*
David M. Cote Chairman of the Board, Chief Executive Officer and Director	James J. Howard Director
*	*
Gordon M. Bethune Director	Russell E. Palmer Director
*	*
Jaime Chico Pardo Director	Ivan G. Seidenberg Director
*	*
D. Scott Davis Director	Bradley T. Sheares, Ph.D. Director
*	*
Linnet F. Deily Director	Eric K. Shinseki Director
*	*
Clive R. Hollick Director	John R. Stafford Director
	*
	Michael W. Wright Director
/s/ DAVID J. ANDERSON	/s/ THOMAS A. SZLOSEK
David J. Anderson Senior Vice President and Chief Financial Officer (Principal Financial Officer)	Thomas A. Szlosek Vice President and Controller (Principal Accounting Officer)

*By: /s/ DAVID J. ANDERSON
(David J. Anderson
Attorney-in-fact)

February 15, 2007

EXHIBIT INDEX

Exhibit No.	Description
2	Omitted (Inapplicable)
3(i)	Restated Certificate of Incorporation of Honeywell International Inc., as amended April 25, 2005 (incorporated by reference to Exhibit 3(i) to Honeywell's Form 10-K for the year ended December 31, 2005)
3(ii)	By-laws of Honeywell, as amended December 8, 2006 (incorporated by reference to Exhibit 3(ii) to Honeywell's Form 8-K filed December 11, 2006)
4	Honeywell International Inc. is a party to several long-term debt instruments under which, in each case, the total amount of securities authorized does not exceed 10% of the total assets of Honeywell and its subsidiaries on a consolidated basis. Pursuant to paragraph 4(iii)(A) of Item 601(b) of Regulation S-K, Honeywell agrees to furnish a copy of such instruments to the Securities and Exchange Commission upon request.
9	Omitted (Inapplicable)
10.1*	2003 Stock Incentive Plan of Honeywell International Inc., and its Affiliates (incorporated by reference to Honeywell's Proxy Statement, dated March 17, 2003, filed pursuant to Rule 14a-6 of the Securities and Exchange Act of 1934 and amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by the attached amendment (filed herewith))
10.2*	Deferred Compensation Plan for Non-Employee Directors of Honeywell International Inc., as amended and restated (incorporated by reference to Exhibit 10.2 to Honeywell's Form 10-Q for quarter ended June 30, 2003, amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by Exhibit 10.2 to Honeywell's Form 10-K for the year ended December 31, 2005)
10.3*	Stock Plan for Non-Employee Directors of AlliedSignal Inc., as amended (incorporated by reference to Exhibit 10.3 to Honeywell's Form 10-Q for the quarter ended June 30, 2003)
10.4*	1985 Stock Plan for Employees of AlliedSignal Inc. and its Subsidiaries, as amended (incorporated by reference to Exhibit 19.3 to Honeywell's Form 10-Q for the quarter ended September 30, 1991)
10.5*	AlliedSignal, Inc. Incentive Compensation Plan for Executive Employees, as amended (incorporated by reference to Exhibit B to Honeywell's Proxy Statement, dated March 10, 1994, filed pursuant to Rule 14a-6 of the Securities and Exchange Act of 1934, and amended by Exhibit 10.5 to Honeywell's Form 10-Q for the quarter ended June 30, 1999)
10.6*	Supplemental Non-Qualified Savings Plan for Highly Compensated Employees of Honeywell International Inc. and its Subsidiaries as amended and restated (incorporated by reference to Exhibit 10.6 to Honeywell's Form 10-Q for the quarter ended September 30, 2005 and by the attached amendment (filed herewith))
10.7*	Honeywell International Inc. Severance Plan for Senior Executives, as amended and restated (incorporated by reference to Exhibit 10.7 to Honeywell's Form 10-K for the year ended December 31, 2003, and amended by Exhibit 10.7 to Honeywell's Form 10-Q for the quarter ended June 30, 2004)

Exhibit No.	Description
10.8*	Salary and Incentive Award Deferral Plan for Selected Employees of Honeywell International Inc., and its Affiliates, as amended and restated (incorporated by reference to Exhibit 10.8 to Honeywell's Form 10-Q for the quarter ended September 30, 2005 and by the attached amendments (filed herewith))
10.9*	1993 Stock Plan for Employees of Honeywell International Inc. and its Affiliates, as amended (incorporated by reference to Exhibit A to Honeywell's Proxy Statement, dated March 10, 1994, filed pursuant to Rule 14a-6 of the Securities and Exchange Act of 1934, and amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by the attached amendment (filed herewith))
10.10*	Honeywell International Inc. Supplemental Pension Plan, as amended and restated (incorporated by reference to Exhibit 10.13 to Honeywell's Form 10-K for the year ended December 31, 2000, and amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by Exhibit 10.2 to Honeywell's Form 10-Q for the quarter ended September 30, 2006)
10.11*	Employment Separation Agreement and Release between J. Kevin Gilligan and Honeywell International Inc. dated February 10, 2004 (incorporated by reference to Honeywell's Form 10-K for year ended December 31, 2003)
10.12*	Honeywell International Inc. Supplemental Executive Retirement Plan for Executives in Career Band 6 and Above (incorporated by reference to Exhibit 10.14 to Honeywell's Form 10-Q for the quarter ended June 30, 2004, and amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by Exhibit 10.2 to Honeywell's Form 10-Q for the quarter ended September 30, 2006)
10.13*	Honeywell Supplemental Defined Benefit Retirement Plan, as amended and restated (incorporated by reference to Exhibit 10.15 to Honeywell's Form 10-Q for the quarter ended June 30, 2004, and amended by Exhibit 10.1 to Honeywell's Form 8-K filed December 21, 2004 and by Exhibit 10.2 to Honeywell's Form 10-Q for the quarter ended September 30, 2006)
10.14*	Letter between David J. Anderson and Honeywell International Inc. dated June 12, 2003 (incorporated by reference to Exhibit 10.26 to Honeywell's Form 10-Q for the quarter ended June 30, 2003)
10.15*	Employment Separation Agreement and Release between Richard F. Wallman and Honeywell International Inc. dated July 17, 2003 (incorporated by reference to Exhibit 10.2 to Honeywell's Form 10-Q for the quarter ended September 30, 2003)
10.16*	Honeywell International Inc. Severance Plan for Corporate Staff Employees (Involuntary Termination Following a Change in Control), as amended and restated (incorporated by reference to Exhibit 10.19 to Honeywell's Form 10-K for the year ended December 31, 2002)
10.17*	Employment Agreement dated as of February 18, 2002 between Honeywell and David M. Cote (incorporated by reference to Exhibit 10.24 to Honeywell's Form 8-K filed March 4, 2002)
10.18*	2003 Stock Incentive Plan for Employees of Honeywell International Inc. and its Affiliates Award Agreement (incorporated by reference to Exhibit 10.1 to Honeywell's Form 8-K filed February 7, 2005)

Exhibit No.	Description
10.19*	2003 Stock Incentive Plan for Employees of Honeywell International Inc. and its Affiliates Restricted Unit Agreement (incorporated by reference to Exhibit 10.21 to Honeywell's Form 10-K for the year ended December 31, 2005)
10.20*	2003 Stock Incentive Plan for Employees of Honeywell International Inc. and its Affiliates Growth Plan Agreement (incorporated by reference to Exhibit 10.22 to Honeywell's Form 10-K for the year ended December 31, 2005)
10.21*	Stock Plan For Non-Employee Directors of Honeywell International Inc. Option Agreement (incorporated by reference to Exhibit 10.1 to Form 8-K filed April 29, 2005)
10.22*	Deferred Compensation Agreement dated August 4, 2006 between Honeywell and David M. Cote (filed herewith)
10.23*	Letter Agreement dated July 27, 2001 between Honeywell and Larry E. Kittelberger (filed herewith)
10.24*	Honeywell Supplemental Retirement Plan (filed herewith)
10.25*	Pittway Corporation Supplemental Executive Retirement Plan (filed herewith)
10.26*	2006 Stock Incentive Plan of Honeywell International Inc. and Its Affiliates (incorporated by reference to Honeywell's Proxy Statement, dated March 13, 2006, filed pursuant to Rule 14a-6 of the Securities and Exchange Act of 1934 and to Exhibit 10.2 to Honeywell's Form 10-Q for the quarter ended June 30, 2006, and amended by the attached amendment (filed herewith))
10.27*	2006 Stock Incentive Plan of Honeywell International Inc. and Its Affiliates Form of Option Award Agreement (filed herewith)
10.28*	2006 Stock Incentive Plan of Honeywell International Inc. and Its Affiliates Form of Restricted Unit Agreement (filed herewith)
10.29*	2006 Stock Incentive Plan of Honeywell International Inc. and Its Affiliates Form of Growth Plan Agreement (incorporated by reference to Exhibit 10.5 to Honeywell's Form 10-Q for the quarter ended June 30, 2006)
10.30*	2006 Stock Incentive Plan of Honeywell International Inc. and Its Affiliates Form of Performance Share Agreement (filed herewith)
10.31*	2006 Stock Plan for Non-Employee Directors of Honeywell International Inc. (incorporated by reference to Honeywell's Proxy Statement dated March 13, 2006, filed pursuant to Rule 14a-6 of the Securities and Exchange Act of 1934 and to Exhibit 10.6 to Honeywell's Form 10-Q for the quarter ended June 30, 2006, and amended by the attached amendments (filed herewith))
10.32*	2006 Stock Plan for Non-Employee Directors of Honeywell International Inc.—Form of Option Agreement (incorporated by reference to Exhibit 10.7 to Honeywell's Form 10-Q for the quarter ended June 30, 2006)
10.33*	2006 Stock Plan for Non-Employee Directors of Honeywell International Inc.—Form of Restricted Stock Agreement (incorporated by reference to Exhibit 10.8 to Honeywell's Form 10-Q for the quarter ended June 30, 2006)

Exhibit No.	Description
10.34	$2.3 Billion Five-Year Credit Agreement dated as of April 27, 2006 among Honeywell International Inc., the initial lenders therein, Citicorp USA, Inc., as administrative agent, Citibank International PLC, as swing line agent, JPMorgan Chase Bank, N.A., as syndication agent, Bank of America N.A., Barclays Bank PLC, Deutsche Bank AG New York Branch and UBS Securities LLC, as documentation agents and Citigroup Global Markets Inc. and J.P. Morgan Securities Inc., as joint lead arrangers and co-book managers (incorporated by reference to Exhibit 10.1 to Honeywell's Form 10-Q for the quarter ended June 30, 2006)
10.35	364-Day Canadian Dollar Credit Agreement dated as of September 9, 2005 among Honeywell, Honeywell AsCa Inc., Honeywell Limited/Honeywell Limitee, and Honeywell Aerospatiale Inc. as borrowers, and the initial lenders named therein, Citibank, N.A., Canadian branch as administrative agent and Citigroup Global Markets Inc. and Royal Bank of Canada as joint lead arrangers and co-book managers (incorporated by reference to Exhibit 10.24 to Honeywell's Form 10-K for the year ended December 31, 2005)
10.36	Amendment No. 1 to the 364-Day Canadian Dollar Credit Agreement dated as of September 8, 2006 among Honeywell, Honeywell ASCa Inc., Honeywell Limited Honeywell Limitee and Honeywell Aerospatiale Inc., as borrowers, the lenders named therein and Citibank, N.A., Canadian Branch, as agent (incorporated by reference to Exhibit 10.1 to Honeywell's Form 10-Q for the quarter ended September 30, 2006)
10.37	Purchase and Sale Agreement between Catalysts, Adsorbents and Process Systems, Inc., and Honeywell Specialty Materials, LLC, dated September 30, 2005 (incorporated by reference to Exhibit 10.23 to Honeywell's Form 10-Q for the quarter ended September 30, 2005)
10.38	Stock Purchase Agreement by and between Honeywell International Inc. and M&F Worldwide Corp. (incorporated by reference to Exhibit 2.1 to Honeywell's Form 8-K filed November 1, 2005.)
11	Omitted (Inapplicable)
12	Statement re: Computation of Ratio of Earnings to Fixed Charges (filed herewith)
16	Omitted (Inapplicable)
18	Omitted (Inapplicable)
21	Subsidiaries of the Registrant (filed herewith)
22	Omitted (Inapplicable)
23	Consent of PricewaterhouseCoopers LLP (filed herewith)
24	Powers of Attorney (filed herewith)
31.1	Certification of Principal Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
31.2	Certification of Principal Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
32.1	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (filed herewith)

Exhibit No.	Description
32.2	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (filed herewith)
99	Omitted (Inapplicable)

The Exhibits identified above with an asterisk(*) are management contracts or compensatory plans or arrangements.

HONEYWELL INTERNATIONAL INC

SCHEDULE II—VALUATION AND QUALIFYING ACCOUNTS

Three Years Ended December 31, 2006
(In millions)

Allowance for Doubtful Accounts:

Balance December 31, 2003	$ 150
Provision charged to income	100
Deductions from reserves(1)	(113)
Balance December 31, 2004	137
Provision charged to income	83
Deductions from reserves(1)	(71)
Acquisitions	30
Balance December 31, 2005	179
Provision charged to income	111
Deductions from reserves(1)	(77)
Acquisitions	4
Balance December 31, 2006	$ 217

(1) Represents uncollectible accounts written off, less recoveries, translation adjustments and reserves acquired.

Deferred Tax Assets—Valuation Allowance

Balance December 31, 2003	$ 299
Additions charged to income tax expense	145
Reductions credited to income tax expense	(108)
Additions charged to goodwill, due to acquisitions	2
Balance December 31, 2004	338
Additions charged to income tax expense	46
Reductions credited to income tax expense	(126)
Additions charged to goodwill, due to acquisitions	219
Balance December 31, 2005	477
Additions charged to income tax expense	40
Reductions credited to income tax expense	(3)
Reductions charged to goodwill, due to acquisitions	(24)
Additions charged to other comprehensive income (loss), upon adoption of SFAS No. 158	28
Reductions charged to deferred tax asset, due to expired NOL	(2)
Balance December 31, 2006	$ 516

Leadership Team and Corporate Officers

David M. Cote
Chairman and
Chief Executive Officer

Robert J. Gillette
President and
Chief Executive Officer
Aerospace

Roger Fradin
President and
Chief Executive Officer
Automation and
Control Solutions

Adriane M. Brown
President and
Chief Executive Officer
Transportation Systems

Nance K. Dicciani
President and
Chief Executive Officer
Specialty Materials

David J. Anderson
Senior Vice President and
Chief Financial Officer

Larry E. Kittelberger
Senior Vice President
Technology and Operations

Peter M. Kreindler
Senior Vice President and
General Counsel

Thomas W. Weidenkopf
Senior Vice President
Human Resources and
Communications

Rhonda Germany
Vice President
Strategy and Business
Development

Shane Tedjarati
President
Honeywell China

Timothy J. Keating
Senior Vice President
Government Relations

Thomas L. Buckmaster
Vice President
Corporate Communications
and President
Honeywell Hometown
Solutions

Thomas F. Larkins
Vice President
Corporate Secretary and
Deputy General Counsel

Harsh Bansal
Vice President
Investments

John J. Tus
Vice President and
Treasurer

Shareowner Information

Annual Meeting
The Annual Meeting of Shareowners will be held at 10:30 a.m. on Monday, April 23, 2007, at Honeywell's corporate headquarters, 101 Columbia Road, Morristown, NJ 07962.

Dividends/Shareowners Matters
Honeywell's Dividend Reinvestment and Share Purchase Plan provides for automatic reinvestment of common stock dividends at market price. Participants also may add cash for the purchase of additional shares of common stock without payment of any brokerage commission or service charge. Honeywell offers Direct Registration, or paperless stock ownership. This means that instead of getting a paper stock certificate to represent your shares, your shares are held in your name and tracked electronically in our records.

The company has established a Direct Deposit of Dividends service enabling registered shareowners to have their quarterly dividend payments sent electronically to their bank accounts on the payment date.

For more information on these services or for answers to questions about dividend checks, stock transfers, or other shareowner matters, please contact Honeywell's transfer agent and registrar:

American Stock Transfer & Trust Co.
59 Maiden Lane
New York, NY 10038
1-800-647-7147
http://www.amstock.com
E-mail: info@amstock.com

Honeywell International Inc.
Corporate Publications
P.O. Box 2245
Morristown, NJ 07962-2245
973-455-5402

Stock Exchange Listings
Honeywell's Common Stock is listed on the New York and Chicago stock exchanges under the symbol HON. It is also listed on the London Stock Exchange. Shareowners of record as of December 31, 2006, totaled 74,473.

General Inquiries
For additional shareowner inquiries, please contact Honeywell's Shareowner Services at 1-800-647-7147 or Honeywell Investor Relations at 1-973-455-2222.

People and Performance: 2006 Recognition and Awards

At Honeywell, our employees strive to achieve great results for our customers every day. Top-performing sites, teams and individuals are recognized by leaders, managers and their colleagues through various global award programs.

Premier Achievement and Senior Leadership Awards

"Premier Achievement" and the "Senior Leadership Award" are our highest annual honors for individuals, recognizing outstanding achievements in our Five Initiatives.

Premier Achievement

Aerospace:
Toni Albers, Carl Esposito

Automation and Control Solutions:
Jim Keesling, Rich Simonetti, Paul Towne

Specialty Materials:
Art Foutsitzis, Richard Winick

Transportation Systems:
Rick Degen, J.K. Yoo

Corporate:
Glenn Stellingwerf, Paul Zurawski

Senior Leadership Award

Mike Cuff, Aerospace (grand-prize winner)

Pasquale Abruzzese, Transportation Systems

Tom Dalton, Automation and Control Solutions

Timothy J. Keating, Corporate

Dmitry Shashkov, Specialty Materials

Velocity Product Development™ Award

The "Velocity Product Development™ Award" recognizes the individual who fundamentally changes processes to improve new product introductions.

Daryll Fogal, Automation and Control Solutions

Best-Performing Large Site

Bucharest, Romania – Transportation Systems

Best-Performing Small Site

Burgess Hill, England – Automation and Control Solutions

Most Improved Sites

Mexicali, Mexico – Transportation Systems

Newhouse, Scotland – Automation and Control Solutions

Top 10 Sites for Quality

The following sites achieved the best quality metrics in 2006 with zero defects in all products shipped:

Aerospace
Clearwater Space, Florida
El Monte, California
Plymouth, Minnesota
Subic Bay Aftermarket Services, Philippines

Automation and Control Solutions
Lugoj, Romania

Transportation Systems
Green Island, New York
Mexico Distribution Center
New Zealand Distribution Center
Treforest Distribution Center, Wales

Specialty Materials
Shanghai, China

Top 10 Sites for Delivery

The following sites achieved the best metrics for delivery with on-time-to-request rates of 99.23 percent or higher:

Aerospace
Glendale, Arizona
Kansas City, Missouri (FM&T)
Luton Aftermarket Services, United Kingdom
Nanjing OEM, China
Suzhou OEM, China

Automation and Control Solutions
Acton, Massachusetts (HPS)
Shelby, North Carolina

Transportation Systems
Treforest Distribution Center, Wales

Specialty Materials
Hopewell, Virginia
Shanghai, China

Chairman's Award for Everyday Heroes

Our "Chairman's Award for Everyday Heroes" rewards one employee each week for contributions that drive company growth.

Aerospace
Gary Davey
Mark Foley
Vicki Frahm
Randy Hanson
Timothy Healy
Marleen Houlihan
Giorgio Isella
Bruce Jespersen
Steve McKnight
Steve Patterson
Denise Reitan
W. Bruce Schneck
Timothy Smith

Automation and Control Solutions
Marty Barrows
Steve Berry
Sudhakar Bhooramoorthy
Beth A. Brauer
Kevin Burrows
Tan Wei Chee
Alex Chu
Tom Conwell
Guo Gang Gong
Hiro Iwagaya
Jim Jennion
Michael Keogh
Marcia M. Kiser
Donald Kmack
Lucy Liu
Stefan Orf
Helder Nuno
Veera Raghavan
Paula Routson
John Storey
Ann Studnicka

Transportation Systems
Yasuhiro Kamiuchi
Gary Louthan
Douglas Milliken
Paul Murray
Samson Protin
Ramon Rios
Yoshihisa Taguchi
Simon Yang

Specialty Materials
Paul Apen
Matthew Capeci
Diane Dmitrovich
Cheryl Dwyre
Mariann Miller
Lin Murray
Joerg Schoenfelder
Dr. Wolfgang J. Sievert
Ke Zhang

Corporate
Brian Cantoni

Team Performance Award

This program recognizes teams that delivered significant, measurable results in support of Honeywell's major initiatives during the past year, such as the Honeywell Operating System, Velocity Product Development™, Marketing/Growth and Functional Transformation.

Aerospace
Honeywell Boeing Process Team

Micro Air Vehicle (MAV) Team

Orion Crew Exploration Vehicle (CEV) Pursuit Team

US Airways Auxiliary Power Unit (APU) Retrofit Team

Automation and Control Solutions
PopUP™ Filter Team

Honeywell Building Solutions Total Assets Management Team

Transportation Systems
North American Gas Boosting Team

Turbo Shaft Motion Simulation Team

Specialty Materials
Jamnagar Export Refinery Project (JERP) Team

Spectra® Fiber and Rope Handling System Team

BDH Solvent Line Implementation Team

Automation and Control Solutions and Specialty Materials
North America Spray Foam Insulation Team

Designed and produced by Taylor & Ives, Inc., NYC

ATTACHMENT 23

Honeywell, Geismar Facility Plans and Procedures

1. PURPOSE

The purpose of this Hazardous Waste Contingency Plan is to minimize hazards to human health of the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

The provisions of this plan must be implemented immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents, which could threaten human health or the environment.

2. SCOPE

This plan applies to all areas of the Geismar facility were hazardous waste or hazardous waste constituents are generated and/or stored. This plan shall be made available to any response personnel or organization responding to a fire, explosion, or release of hazardous waste or hazardous waste constituents, which could threaten human health or the environment at the Geismar facility.

3. DEFINITIONS

3.1 Contingency Plan – A document setting out an organized, planned, and coordinated course of action to be followed in case of fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

3.2 Emergency Coordinator – The employee of the Geismar facility with the responsibility of coordinating all emergency response measures as they pertain to hazardous waste or hazardous waste constituents which could threaten human health or the environment.

3.3 Hazardous Waste – A Hazardous Waste as defined in 40 CFR 261.3.

3.4 Hazardous Waste Constituents – A constituent that caused the EPA Administrator to list a hazardous waste in 40 CFR 261 Subpart D or a constituent listed in Table 1 of 40 CFR 261.24.

4. AUTHORITY AND RESPONSIBILITY

4.1 All employees shall be responsible for immediately reporting any emergency or potential emergency in accordance with this plan.

4.2 The Health Safety and Environmental (HSE) Department shall be responsible for ensuring the readiness of emergency personnel and plant emergency response equipment.

4.3 Area Managers shall be responsible for ensuring the readiness of emergency systems installed in processes within their areas.

4.4 Incident Commander shall be responsible for the proper implementation of the emergency response measures in the event of an emergency.

4.5 The Emergency Coordinator shall be responsible for proper coordination of the emergency response measures and commitment of resources as they pertain to hazardous waste or hazardous waste constituents which could threaten human health or the environment.

5. EMERGENCY RESPONSE

5.1 Activation of the contingency plan can be performed by anyone in the facility observing a fire, explosion, or release of hazardous waste constituents, which could threaten human health or the environment.

5.2 Immediately after activation of the contingency plan, the Emergency Coordinator or Alternate Emergency Coordinator shall be notified.

5.2.1 The Health Safety and Environmental Manager shall serve as the Emergency Coordinator. See Appendix B of the Emergency Notification Procedure (SAF-ERP-004).

5.2.2 The Safety Leader shall serve as the Alternate Emergency Coordinator. See Appendix B of the Emergency Notification Procedure (SAF-ERP-004).

5.3 The Emergency Response Plan contains all emergency response measures of the contingency plan. The Emergency Response Plan in divided into the following emergency response functions which, depending on the emergency, may or may not be activated:

5.3.1 Activation of the Emergency Response Plan - (SAF-ERP-002) - this section includes the proper guidelines for reporting emergencies and activating the complex emergency alarm system.

5.3.2 First Actions of an Emergency Response - (SAF-ERP-003) - an outline of emergency functions which need to be addressed during the initial phase of the emergency.

5.3.3 Emergency Notification Procedure - (SAF-ERP-004) - pre-emergency planning and coordination with outside parties, and notifications to plant personnel, local, state and federal authorities.

5.3.4 Organization of the Emergency Response System - (SAF-ERP-005) - the emergency response organization structure within the plant, personnel roles, lines of authority, training requirements, and communication responsibilities with the media.

5.3.5 Emergency Recognition and Prevention - (SAF-ERP-006) - an overview for recognition of plant emergencies and preventive measures to mitigate potential emergencies.

5.3.6 Emergency Action Plan - (SAF-ERP-007) - the evacuation routes and procedures for all plant personnel, sheltering in place guidelines, and employee accountability procedures.

5.3.7 Site Security and Control - (SAF-ERP-008) - the guidelines for preventing all non-essential personnel from entering the emergency area, and traffic control.

5.3.8 Emergency Response Procedure - (SAF-ERP-009) - the procedures for personnel responding to and mitigating an emergency situation.

5.3.9 Personal Protective Equipment and Emergency Equipment - (SAF-ERP-010) - the PPE and emergency equipment required for a respond to or evacuation from an emergency, and the maintenance requirements of this equipment.

5.3.10 Decontamination Procedures - (SAF-ERP-011) - the decontamination guidelines for emergency response personnel and equipment following an emergency.

5.3.11 Emergency Medical Treatment and Medical Surveillance - (SAF-ERP-012) - the guidelines for emergency medical treatment and to provide a medical surveillance program for emergency first responders.

5.3.12 Critique of Emergency Response and Follow-up - (SAF-ERP-013) - the guideline for emergency response critiques and follow-up after all emergencies.

5.3.13 Severe Weather Plan - (SAF-ERP-014) - the guidelines to be followed in the event of severe weather (i.e, tornado, hurricane).

5.3.14 Oil Spill and Hazardous Chemical Spill Prevention and Control - (SOP-ENV-700) - the guidelines to be followed in the event of an oil spill within the plant.

6. PRE-EMERGENCY PLANNING AND COORDINATION WITH OUTSIDE PARTIES

6.1 Honeywell-Geismar is prepared to respond to most emergency situations at this facility; however, some emergency situations may require assistance from outside parties.

6.2 Any predetermined outside party which may potentially be requested to provide assistance during an emergency situation at this facility shall be provided a copy of the emergency response plan and any other information necessary.

6.3 The following outside parties may have the potential to provide assistance during an emergency situation (See Appendix B of the Notifications of an Emergency - (SAF-ERP-004) for phone numbers):

Ascension Parish Sheriff's Department
Iberville Parish Sheriff's Department
St. Gabriel Fire Department
Acadian Ambulance Service

7. PROCEDURE OWNER

7.1 Environmental Leader

8. REFERENCES

8.1 SOP-ENV-106 Satellite Waste Accumulation Area Procedure

8.2 SAF-ERP-001 Emergency Response Plan

9. REVISIONS

9.1 This plan will be reviewed and immediately amended, if necessary, whenever a facility permit is revised; the plan fails in an emergency; applicable regulations are revised; the facility changes its design, construction, operation, maintenance, of other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency; the list of emergency coordinators changes; or the list of emergency equipment changes.

Revision 1: Revised employee titles and phone numbers. Training is not required on procedure revisions. Revised 07/15/99.

Revision 2: Revised procedure in its entirety. Training is required on procedure revisions. Revised 10/03/03.

Revision 3: Revised procedure in its entirety. Training is required on procedure revisions. Revised 10/26/05.

Revision 4: Revised procedure due to annual review. Training is not required on procedure revisions. Revised 10/19/06.

Revision 5: Revised procedure due to annual review. Training is not required on procedure revisions. Revised 08/22/07.

1. PURPOSE

The purpose of this plan is to minimize personnel injury and damage to property, respond to and mitigate the emergency situations, provide for the notification and protection of the surrounding community, control the release of information, and assign responsibilities for individuals and groups.

2. SCOPE

2.1 This plan shall be activated anytime an emergency situation exist within or surrounding the Honeywell-Geismar facility.

2.2 This plan shall be followed by all personnel within the facility during an emergency.

3. DEFINITIONS

3.1 Emergency - a situation in which injury to employees or major damage to property of Honeywell or other Plants in the Geismar facility (PCS, Williams, or InnoPhos) has occurred or might reasonably be expected to occur. Such situations may arise from a number of causes, including but not limited to, fire, explosion, release of toxic chemicals, forces of nature, and exposure to hazards from neighboring plants.

3.2 Incident Commander - the Leadership person responsible for command at the scene of an emergency.

4. AUTHORITY AND RESPONSIBILITIES

4.1 All employees shall be responsible for immediately reporting any emergency or potential emergency in accordance with this plan.

4.2 HSE Department shall be responsible for ensuring the readiness of emergency personnel and plant emergency response equipment.

4.3 Area Managers shall be responsible for ensuring the readiness of emergency systems installed in processes within their areas.

4.4 Incident Commander shall be responsible for the proper implementation of the emergency response plan in the event of an emergency.

5. PROCEDURE

5.1 An emergency shall be declared at the first signs of fire, explosion, release of hazardous chemicals, forces of nature, or exposure to hazards from neighboring plants which has a potential to effect personnel within the plant.

5.2 Activation of the emergency response plan can be performed by anyone in the plant observing an emergency condition, which they are unable to mitigate by themselves.

5.3 The Emergency Response Plan in divided into the following emergency response functions which, depending on the emergency, may or may not be activated:

5.3.1 Activation of the Emergency Response Plan - (SAF-ERP-002) - this section includes the proper guidelines for reporting emergencies and activating the complex emergency alarm system.

5.3.2 First Actions of an Emergency - (SAF-ERP-003) - an outline of emergency functions which need to be addressed during the initial phase of the emergency.

5.3.3 Emergency Notification Procedure - (SAF-ERP-004) - pre-emergency planning and coordination with outside parties, and notifications to plant personnel, local, state and federal authorities.

5.3.4 Organization of the Emergency Response System - (SAF-ERP-005) - the emergency response organization structure within the plant, personnel roles, lines of authority, training requirements, and communication responsibilities with the media.

5.3.5 Emergency Recognition and Prevention Procedure - (SAF-ERP-006) - an overview for recognition of plant emergencies and preventive measures to mitigate potential emergencies.

5.3.6 Emergency Action Plan - (SAF-ERP-007) - the evacuation routes and procedures for all plant personnel, sheltering in place guidelines, and employee accountability procedures.

5.3.7 Site Security and Control - (SAF-ERP-008) - the guidelines for preventing all non-essential personnel from entering the emergency area, and traffic control.

5.3.8 Emergency Response Procedure - (SAF-ERP-009) - the procedures for personnel responding to and mitigating an emergency situation.

5.3.9 Personal Protective and Emergency Equipment - (SAF-ERP-010) - the PPE and emergency equipment required for a respond to or evacuation from an emergency, and the maintenance requirements of this equipment.

5.3.10 Decontamination Procedure - (SAF-ERP-011) - the decontamination guidelines for emergency response personnel and equipment following an emergency.

5.3.11 Emergency Medical Treatment and Medical Surveillance Procedure - (SAF-ERP-012) - the guidelines for emergency medical treatment and first aid treatment.

5.3.12 Critique of Emergency Response and Follow-up - (SAF-ERP-013) - the guideline for emergency response critiques and follow-up after all emergencies.

5.3.13 Severe Weather Plan - (SAF-ERP-014) - the guidelines to be followed in the event of a hurricane.

5.3.14 Security Breach Procedure - (SAF-ERP-015) - the guidelines to be followed in the event of a security breach within the plant.

5.3.15 Oil and Hazardous Chemical Spill Prevention Control and Countermeasure Procedure - (SOP-ENV-700) - the guidelines to be followed in the event of an oil and hazardous chemical spill within the plant.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Industrial Hygienist

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised due to annual review. Training is not required. Revised 09/14/06.

Revision 4: Revised Approval Authority from R. Hofmann to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

Revision 5: Revised procedure due to audit finding. Training is not required on procedure revisions. Revised 11/07/07.

1. PURPOSE

The purpose of this procedure is to define the proper guidelines for reporting an emergency and activating the emergency response plan.

2. SCOPE

This procedure shall apply to any emergency situation within the Honeywell-Geismar facility or any emergency situation that may arise from a neighboring plant which has a potential to impact this facility.

3. DEFINITIONS

3.1. Emergency warning system - a siren and public address system strategically located throughout the Geismar facility which is used to notify personnel of an emergency.

3.2. Emergency telephone number - the in-plant phone extension **#444** in guard gate #1. This number is used to report any emergency within the plant. The phone is monitored 24 hours per day by the site security personnel.

4. AUTHORITY AND RESPONSIBILITIES

4.1. All personnel within the Honeywell-Geismar facility shall be responsible for immediate reporting any emergency or potential emergency.

4.2. The Shift supervisor/leader shall be responsible for the activation of the emergency response plan immediately upon notification of an emergency in their area.

4.3. The board operator in the affected area shall be responsible for activation of the emergency warning system immediately upon notification of an emergency.

4.4. The HSE department shall be responsible for ensuring the readiness of the emergency warning system.

5. PROCEDURE

5.1. Reporting

5.1.1. The individual discovering the emergency will call the emergency telephone extension # **444** in guard gate #1. The individual reporting shall state "emergency response call". In order that the security personnel may

obtain the necessary information, the individual reporting the emergency shall provide the following information:

5.1.1.1. Name;

5.1.1.2. Extension from where the call is being made;

5.1.1.3. Location of the emergency situation;

5.1.1.4. Nature of the emergency situation; and

5.1.1.5. Whether there has been any injury to personnel.

5.1.2. Individuals, with a plant radio, discovering the emergency can report the emergency and necessary information to the affected process area control room.

5.2. Activation of the Emergency Warning System by the Process Areas

5.2.1. Upon notification of an emergency, the control board operator shall activate the local emergency warning system in order to evacuate personnel from the process area.

5.2.2. If the emergency has the potential to impact other plants within the Geismar Complex, the control board operator shall activate the emergency warning system plantwide.

5.2.3. All personnel evacuating from the process shall muster at the appropriate shelter in place location or assembly area and scan their Honeywell I.D. Badge.

5.2.4. Based on the severity of the emergency, the control board operator shall either issue one the following codes to notify affected plant personnel and/or summons the Complex Emergency Brigade:

5.2.4.1. **ALERT CONDITION -** Release confined to the process unit and will not affect other complex areas.

5.2.4.2. **DANGEROUS CONDITION -** Release may migrate outside the fence line of complex and affect public.

5.2.4.3. **ALL SECURE -** Incident over.

5.2.5. If the control board operator is unable to activate the emergency warning system due to equipment failure. The security officer at Gate 1 shall be notified to activate the emergency warning system.

5.2.6. Upon notification of an emergency, the security officer at Gate # 1 shall activate the emergency warning system based on the instructions given by the person reporting the emergency.

5.2.7. When activating the emergency warning system, the employee will activate a siren followed by a P.A. message. The P.A. message shall state the following:

5.2.7.1. The type of the emergency.

5.2.7.2. Location of the emergency.

5.2.7.3. Emergency instructions for plant personnel (i.e., shelter in place, evacuate, etc.)

5.3. Activation of the Emergency Response Plan

5.3.1. The initial Honeywell employee responding to an emergency shall become Incident Commander until relieved by a higher Honeywell Authority.

Note: As more senior Honeywell emergency response members arrive at the scene, the position may be passed up the line of authority, which has been previously established.

5.3.2. Based on the emergency conditions, the Incident Commander shall activate either part or all the Emergency Response Plan.

5.3.3. All emergency responders and their communications shall be coordinated and controlled through the Incident Command System.

5.3.4. If necessary, the Complex Emergency Brigade shall be notified to respond to the emergency. The Complex Emergency Brigade may be dispatched by the emergency warning system.

5.4. Activation of the Community Warning System

5.4.1. If an emergency situation has off-site impact that may affect the public, the Community Warning System shall be activated.

5.4.2. The senior Honeywell emergency response official or the site security officer at Gate #1 (as directed) shall activate the community warning

system by notifying the Ascension or Iberville Sheriff's offices by phone or by the GAMA radio.

5.5. All Secure

5.5.1. After the emergency situation is mitigated, the Incident Commander shall inspect the site for dangerous conditions.

5.5.2. The Incident Commander shall eliminate or control any identified hazardous condition and assure the emergency scene has been decontaminated.

5.5.3. The Incident Commander shall notify all plant personnel that they may return to normal activity via the emergency warning system, All Secure.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised procedure due to Site HSE Change. Training is required on procedure revisions. Revised 03/03/05.

Revision 4: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

The purpose of this procedure is to provide a guideline to be used as a quick reference in the event of an emergency at the Honeywell-Geismar Plant.

2. SCOPE

2.1 This procedure shall include any emergency situation occurring at the Honeywell-Geismar Plant.

2.2 This procedure does not include emergency situation occurring at one of the other Plants within the Geismar facility.

3. DEFINITIONS

4. AUTHORITY AND RESPONSIBILITIES

4.1 The HSE Department shall be responsible for maintaining and updating this procedure.

5. PROCEDURE

5.1 Activate of Emergency Response Plan

5.1.1 Activate Emergency Warning System

5.1.1.1. Local

5.1.1.2. Plantwide

5.1.1.3. Community

5.1.2 Notify Plant Personnel

5.1.2.1. Evacuate, or

5.1.2.2. Shelter in Place

5.2 Address Injured Personnel

5.2.1 Remove from danger, if possible

5.2.2 Notify Plant Medical First Responders

5.2.3 Transport to Hospital, if required

5.3 Emergency Response

5.3.1 Establish Incident Command System

5.3.2 Determine Level of Response

5.3.3 Establish Emergency Control Center

5.3.4 Identify Hot Zone

5.3.5 Identify Staging Area

5.3.6 Identify PPE and Emergency Equipment required

5.3.7 Establish Decontamination Procedure

5.4 Account for Plant Personnel

5.4.1 Emergency Assembly Area

5.4.2 Shelter in Place Locations

5.5 Site Security

5.5.1 Perimeter Control

5.5.2 Traffic Control

5.6 Notification

5.6.1 Plant Leadership

5.6.2 Local, State and Federal Authorities

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

The purpose of this procedure is to provide notification guidelines to be followed in the event of an incident involving the release or potential release of hazardous materials from the Honeywell facility. In the interest of public safety, Honeywell has an obligation to notify local, state, and federal agencies of all incidents which could reasonably be expected to cause injuries or any fatality, result in fire or explosion, endanger the health and safety of the public, cause significant adverse impacts to the land, water or air environment, or cause severe damage to property.

2. SCOPE

This procedure shall include all courtesy and required notifications to facility, complex, and corporate personnel, as well as regulatory and public safety agencies following an incident and release or incident involving a hazardous material at the Honeywell, Geismar Facility. Emergency reporting and activation of the emergency warning system shall be performed in accordance with procedure SAF-ERP-002 -"ACTIVATION OF THE EMERGENCY RESPONSE PLAN".

3. DEFINITIONS

3.1. Environmental Release – a release of a hazardous material which has the potential to cause personal injury or property damage within or surrounding the plant site, or a release of a hazardous material above the reportable quantity, or a release of a hazardous material from a loaded shipping vessel.

3.2. Emergency Condition – any condition which could reasonably be expected to cause injuries requiring hospitalization or fatalities, results in fire or explosion, endanger the health and safety of the public, cause significant adverse impacts to the land, water or air environment, or cause severe damage to property.

3.3. Escape Beyond Facility – for the purposes of release reporting, a release is considered off-site when the hazardous material is released into the air, or into a drainage ditch such that the released hazardous material could reasonably be expected to escape the confinement of the facility, or released into the Mississippi River.

3.4. Facility – The physical premises utilized by Honeywell to manufacture, use, store, and transport hazardous materials.

3.5. Geismar Complex - The physical premises utilized by Honeywell, Williams Olefins, PCS Nitrogen, Innophos, and BCS Terminal to manufacture, use, store, and transport hazardous materials.

3.6. Hazardous Material – any substance deemed a hazardous material or hazardous substance.

3.7. Hospitalization – the admission into a hospital as a patient. Emergency room services does not constitute hospitalization.

3.8. Incident – any release, fire, explosion, or event which is other than any normal operational activity, and which results in an unusual or emergency condition. (Note: Actual release of hazardous material is not required.)

3.9. Loaded Shipping Vessel – a shipping vessel (railcar, tank truck, drum, barge, ship etc.) is considered loaded when all loading hoses have been disconnected, all valves have been secured, and/or the dome lid or valve box doors have been closed and secured or sealed.

3.10. Release – any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous material. However, the term release shall not include state or federal permitted releases.

3.11. Reportable Quantity – the threshold value, usually in pounds, at which a release of a hazardous material becomes reportable to governmental agencies. See Appendix A for a list of chemicals with assigned reportable quantities.

3.12. Reportable Release – a release of regulated hazardous material which involves one or more of the following criteria:

- The release directly causes any injury requiring hospitalization or any fatality.
- The release results in a fire or explosion which could reasonably be expected to affect the public safety beyond the boundaries of the facility.
- The release (other than an application of a pesticide or fertilizer) exceeds the reportable quantity during any continuous 24 hour period when that reportable quantity (RQ) could be reasonably expected to escape beyond the site of the facility.
- The incident, accident or cleanup within a facility could reasonably be expected to affect the public safety beyond the boundaries of the facility (Examples: a facility evacuating its personnel as a result of an incident, an incident resulting in a vapor release to the atmosphere, a train derailment

involving railcars or a tank truck accident loaded with hazardous material inside the boundaries of a facility).

- The owner or operator knows a protective action beyond the facility has been initiated (Examples: road closure, shelter-in-place).

- A reportable release may be based on the quantity of hazardous material discharged continuously, intermittently, or as a one-time discharge within any twenty-four hour period. However, or in the absence of quantity data for the hazardous materials released, the area shift leader/supervisor (Incident Commander) shall report all incidents which could reasonably be expected to cause injuries or any fatality, result in fire or explosion, endanger the health and safety of the public, cause significant adverse impacts to the land, water or air environment, or cause severe damage to property. Calculations that quantify the material released are routinely performed as part of the incident investigation.

3.13. Reportable Transportation Related Incident – a transportation related incident which involves one or more of the following criteria:

- The hospitalization of any person or a fatality due to fire, explosion, or exposure to any hazardous material.

- A continuing danger to life, health, or property at the place of the incident under the following circumstances:

  - The incident results in a release of hazardous material.

  - As a result of the incident, a bulk package of hazardous material comes to rest at an angle forty-five degree or more from the upright position.

  - It is deemed necessary to transfer a hazardous material from one bulk package to another bulk package on a public highway or within 500 feet of an inhabited building.

- An estimated property damage of more than ten thousand dollars.

3.14. Transportation Related Incident – an incident, accident, or cleanup of an incident or accident during the transportation, loading, unloading, or storage related to transportation.

3.15. Transportation Related Operation – any operation conducted outside the boundaries of the facility and involving the transportation, loading, unloading or storage related to transportation, of hazardous materials where the hazardous

materials are moving under active shipping papers and have not reached the ultimate consignee.

4. AUTHORITY AND RESPONSIBILITIES

4.1. The Honeywell HF drivers shall be responsible for assuring that immediate notifications are made to the HF Control Room in the event of a transportation related operation incident.

4.2. The area shift leader/supervisor (Incident Commander) shall be responsible for assuring that timely notifications are made, if required, to the Parish Local Emergency Response Commissions (LEPC's), the Louisiana Emergency Hazardous Materials Hotline and facility management personnel.

4.3. The Environmental Leader shall be responsible for assuring that all other required notifications are made.

5. HONEYWELL FACILITY EMERGENCY NOTIFICATION PROCEDURE

Local, State, Federal and Company guidelines require specific notifications to be made in the event of an emergency condition and/or incident. This procedure shall assume all chemical related emergency conditions are incidents.

Upon identification of an incident at the Honeywell facility, the shift leader / supervisor (or designee) in the owning area shall ensure the following immediate notification guidelines are followed:

5.1. The first notification following an incident shall be made within the facility and complex to the following personnel and emergency response units by activating the Emergency Warning System from the control room as indicated in SAF-ERP-002 "ACTIVATION OF THE EMERGENCY RESPONSE PLAN" or DIALING 444.

Honeywell Emergency Response Team
Honeywell Facility and Geismar Complex Personnel
Geismar Complex Emergency Brigade (If Necessary)

If an incident involves a reportable release (**Note: any incident resulting in a release to the air shall be reportable**) or reportable transportation related incident at the Honeywell Facility, the following regulatory and public safety agencies shall be notified immediately (See Appendix B for phone numbers):

Ascension Parish Local Emergency Planning Commission (LEPC)
Louisiana State Police Emergency Hazardous Materials Hotline

If there is any potential for the reportable release to impact in Iberville Parish

(Vapor release which could be carried by wind across Hwy. 3115 or Mississippi River), also notify:

Iberville Parish Local Emergency Planning Commission (LEPC)

5.2. The shift leader/supervisor (or designee) must document the notifications on the facility Environmental Release Notification Form (form **Q-HSE-003** in the HS&E / HS&E Forms menu).

5.3. The following information is required when providing a notification to regulatory and public safety agencies:

5.3.1. The name and telephone number, and employer of the contact person;

5.3.2. The company or responsible party's name;

5.3.3. Where the incident occurred (mailing address and physical location);

5.3.4. The date and time the incident began and ended;

5.3.5. The identity of the hazardous material released or involved (this would include proper chemical name if available, an indication of whether it is an extremely hazardous substance and whether it is a solid, liquid or gas);

5.3.6. The actual amount or an estimate of the amount released; or in the absence of quantity data for the hazardous materials released, one of the following incident classifications may be used.

5.3.6.1. Unusual Event - This is an incident that is out of the ordinary but does not present a current threat to persons or property. It will not have any adverse affect on public safety. The incident may have the potential to escalate to a more serious emergency, but it is not expected to do so. In this case, no protective action is necessary and none will be recommended.

5.3.6.2. Site Emergency - This is an incident or emergency which may affect the near-site population but it is generally located within the boundaries of the facility or transport vehicle. Normal operations of the facility or transport vehicle have been adversely impacted. The incident or emergency is either secured, in the recovery mode, or ongoing, but generally confined to the facility or transport vehicle. The on-site incident or emergency may have the potential to escalate to other areas of the facility or transport vehicle. This classification is used during emergencies in which a limited number of people have

been affected but the potential exists to affect a much larger portion of the population. The facility or transporter may request the closure of adjacent roadways as precautionary action. A protective action of road closure, shelter-in-place, evacuation, or no protective action necessary must be provided.

5.3.6.3. General Emergency - This is an emergency which goes beyond the facility or transport vehicle. It has either affected or will affect the general population. The facility or transport vehicle experiences a large release which will impact beyond its boundaries. This occurs when there is an explosion or fire at the facility which may not be under control. The emergency situation is beyond the resources of the facility or transporter. The facility response personnel are unable to contain the event and it may escalate before coming under control. In order to protect the public safety, a protective action of road closure, shelter-in-place, or evacuation must be issued immediately.

5.3.7. Whether the material released escaped or could reasonably be expected to escape beyond the site of the facility;

5.3.8. If available, the substance's hazard class and any other identifier (e.g., U.N. number, CHRIS code, etc.);

5.3.9. Medium into which the hazardous materials was released (e.g. air, water, land);

5.3.10. Whether the release resulted in a fire or explosion;

5.3.11. Injury to personnel, or a fatality resulting from the release or incident;

5.3.12. Details regarding wind direction, wind speed, temperature, and precipitation;

5.3.13. Any need or a recommendation for an offsite protective action (road closure, shelter-in-place, evacuation, or none);

5.3.14. Details of the release or incident; and

5.3.15. Whether other responsible state and local agencies such as the local emergency planning committee has been notified.

5.4. After the immediate notifications are made to the required regulatory and public safety agencies, the HSE on-call representative shall be contacted.

5.5. Upon notification of an incident from the shift leader/supervisor (or designee) in the owning area, the HSE on-call representative shall ensure the following notification guidelines are followed:

5.5.1. If the incident or reportable release involves a CERCLA Hazardous Substance (See Appendix A for covered chemicals) that escapes the boundaries of the facility in an amount above the RQ, HSE on-call representative shall notify:

National Response Center

5.5.2. If the incident or reportable release impacts the Mississippi River, the HSE on-call representative shall notify:

U.S. Coast Guard
Lower Mississippi Waterworks Warning Network

5.5.3. Within 1 business day after any incident or reportable release, the HSE on-call representative shall notify:

Honeywell SBU HSE Leader

5.6. After the immediate notifications are made to the HSE on-call representative, the shift leader/supervisor (or designee) in the owning area shall ensure that the following facility management personnel are notified following any incident, reportable release, or medical emergency requiring off-site care. (See Appendix B for Phone numbers):

- Site Leader
- Area Manager (HF, MPP/125, 245, and/or Aclon)
- HSE Manager
- HR Manager, as necessary
- Maintenance Manager, as necessary
- Logistics Manager, as necessary or a loaded shipping vessel is involved

5.7. The HS&E Department must file a written follow up letter with all concerned agencies within five business days.

6. HONEYWELL TRANSPORTATION RELATED OPERATION EMERGENCY NOTIFICATION PROCEDURE

Upon notification of an offsite Honeywell transportation related incident, The HF Shift Supervisor (or designee) shall ensure that the following immediate notification guidelines are followed:

6.1. The HF Shift Supervisor (or designee) shall document the information from the caller on the facility Environmental Release Notification Form (form Q-HSE-003 in the HS&E / HS&E Forms menu).

The following information is required when providing a notification to regulatory and public safety agencies:

6.1.1. The name and telephone number, and employer of the caller;

6.1.2. Where the incident occurred (physical location);

6.1.3. The date and time the incident began and ended;

6.1.4. The identity of the hazardous material released or involved (this would include proper chemical name if available, an indication of whether it is an extremely hazardous substance and whether it is a solid, liquid or gas);

6.1.5. If available, the substance's hazard class and any other identifier (e.g., U.N. number, CHRIS code, etc.);

6.1.6. Medium into which the hazardous materials was released (e.g. air, water, land);

6.1.7. Whether the release resulted in a fire or explosion;

6.1.8. Injury to personnel, or a fatality resulting from the release or incident;

6.1.9. Details regarding wind direction, wind speed, temperature, and precipitation;

6.1.10. Any need or a recommendation for an offsite protective action (road closure, shelter-in-place, evacuation, or none);

6.1.11. Details of the release or incident; and

6.1.12. Whether other responsible state and local agencies such as the local emergency planning committee has been notified.

6.2. After the notification information is received, HSE on-call representative shall be notified immediately.

6.3. Upon notification of a reportable transportation related incident from the HF Shift Supervisor (or designee), the HSE on-call representative shall ensure the following notification guidelines are followed:

6.3.1. If the incident occurs within Louisiana, the HSE on-call representative shall immediately notify:

Louisiana State Police Emergency Hazardous Materials Hotline

6.3.2. If the incident occurs outside of Louisiana, the HSE on-call representative shall immediately notify:

Affected State Emergency Response Commission

6.3.3. If the incident involves a hazardous material or CERCLA Hazardous Substance (See Appendix A for covered chemicals), the HSE on-call representative shall notify:

National Response Center

6.3.4. If the incident occurs in the Mississippi River, the HSE on-call representative shall notify:

U.S. Coast Guard

6.3.5. Within 1 business day after any incident or reportable release, the HSE on-call representative shall notify:

Honeywell SBU HSE Leader

6.4. After the immediate notifications are made to the HSE on-call representative, the HF Shift Supervisor (or designee) shall ensure that the following facility management personnel are notified following any transportation related operation incident (See Appendix B for Phone numbers):

- Site Leader
- HSE Manager
- Logistics Manager

6.5. The HS&E Department must file a written follow up letter with all concerned agencies within five business days.

7. PRE-EMERGENCY PLANNING AND COORDINATION WITH OUTSIDE PARTIES

7.1. Honeywell-Geismar is prepared to respond to most emergency situations at this facility; however, some emergency situations may require assistance from outside parties.

7.1.1. Any predetermined outside party which may potentially be requested to provide assistance during an emergency situation at this facility shall be provided a copy of the emergency response plan and any other information necessary.

7.1.2. The following outside parties may have the potential to provide assistance during an emergency situation (See Appendix B for phone numbers):

Ascension Parish Sheriff's Department
Iberville Parish Sheriff's Department
St. Gabriel Fire Department
Acadian Ambulance Service

8. FLOWCHART

8.1. Environmental Release Notification Flowchart

9. PROCEDURE OWNER

9.1. HSE Manager

10. REFERENCES

11. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised procedure to update names of personnel. Training is not required on procedure revisions. Revised 05/05/00.

Revision 3: Revised procedure in its entirety. Combined procedure ENV-128; Reporting of Environmental Incidents, and ERP-004; Emergency Notification Procedure. Training is not required on procedure revisions. Revised 12/14/00.

Revision 4: Revised Appendix B to update Plant Management Personnel. Training is not required on procedure revisions. Revised 07/09/01.

Revision 5: Revised Appendix A to add the DOT Hazard Class to the table, Revised Appendix B to update Emergency Agency phone numbers, Revised Flowchart Phone numbers and added the Environmental Release Notification Form. Training is not required on procedure revisions. Revised 09/24/01.

Revision 6: Revised Appendix B to update Plant Management Personnel. Training is not required on procedure revisions. Revised 04/08/02.

Revision 7: Revised Procedure in its entirety. Training is required. Revised 07/09/02.

Revision 8: Revised Phone Numbers throughout procedure. Training is not required on procedure revisions. Revised 06/26/03.

Revision 9: Revised the reportable quantities for CTFE, VF2 and Flammable gases from 100 pounds to 1000 pounds. Training is required on procedure revisions. Revised 11/10/03.

Revision 10: Revised procedure to add Transportation Improvements. Site Wide Training is required on procedure revisions. Revised 06/23/04.

Revision 11: Revised procedure throughout due to changes to reportable quantities and changes that affect transportation related operations. Additional revisions were made to phone numbers on Appendix B due to personnel changes. Training is required on procedure revisions. Revised 08/11/04.

Revision 12: Revised procedure to update chemicals to include Chloroform, and Updated contact information due to changes in Leadership. Training is required on procedure revisions. Revised 01/23/06.

Revision 13: Revised Appendix B to update Plant Management Personnel. Training is not required on procedure revisions. Revised 06/15/06.

Revision 14: Revised Appendix B to update Plant Management Personnel. Training is not required on procedure revisions. Revised 09/29/06.

Revision 15: Revised procedure throughout. Training is required on procedure revisions. Revised 01/22/07.

Revision 16: Revised Appendix A to add Arsenic Acid to the Chemical Release Guidelines. Training is required on procedure revisions. Revised 03/15/07.

Revision 17: Revised procedure due to HSE Process Change. Training is not required on procedure revisions. Revised 06/14/07.

Revision 18: Revised procedure to remove requirements for only RQ quantities and report all incidents to agencies which could reasonably be expected to cause injuries or any fatality, result in fire or explosion, endanger the health and safety of the public, cause significant adverse impacts to the land, water or air environment, or cause severe damage to property. Training is required on procedure revisions. Revised 07/09/07.

Revision 19: Deleted reference to Safety Leader "Ritchie Hofmann". Training is not required on procedure revisions. Revised 11/27/07.

APPENDIX A

Honeywell, Geismar Plant
Chemical Release Guidelines

CHEMICAL	RQ	DOT Hazard Class
Antimony Compounds	100 lbs.	6.1
Arsenic Acid	1 lb.	8 (6.1)
**Chlorine	10 lbs.	2.3
**Chloroform	10 lbs.	6.1
Chlorotrifluoroethylene (CTFE)	1000 lbs.	2.3
Chromium Compounds	100 lbs.	6.1
HCC-240fa	1000 lbs.	6.1
**Hydrogen Chloride - Vapor Release to Atmosphere Only	1000 lbs.	8
Total Release to All Media (Air, Water, Ground, Etc.)	5000 lbs.	
**Hydrogen Fluoride - Vapor Release to Atmosphere Only	10 lbs.	8
Total Release to All Media (Air, Water, Ground, Etc.)	100 lbs.	
Hydrogen Peroxide (Conc. > 50%)	1000 lbs	5.1 (8)
Propylene Glycol and Ethylene Glycol	500 lbs.	NA
*Sodium Hypochlorite	100 lbs.	8
**Sulfuric Acid (Including Oleum)	1000 lbs.	8
*Trichloroethylene (TCE)	100 lbs.	6.1
*Tetrachloroethylene (PCE)	100 lbs.	6.1
Vinylidene Fluoride (VF_2)	1000 lbs.	2.1
Flammable gases (i.e. natural gas, LPG, and Butadiene from dock) per DOT (Flash Point < 140°F)	1000 lbs.	2.1
Flammable liquids (i.e. gasoline, diesel, and DAC from dock) per DOT (Flash Point < 140°F)	100 lbs.	3
Liquid Process Chemicals requiring MSDS's per OSHA	1000 lbs.	Chemical Specific
All Other Process Chemicals requiring MSDS's per OSHA (Refrigerants, Genetrons, Fluorospar, etc.)	5000 lbs.	Chemical Specific

* CERCLA Hazardous Substance
** CERCLA Hazardous Substance and OSHA Extremely Hazardous Substance (EHS)

APPENDIX B

Honeywell, Geismar Plant
Emergency Contact List

Regulatory / Public Safety / Emergency Agencies

Agency	Phone
Acadian Ambulance / Air Med® (Direct Line)	(800) 259-1111
Ascension Parish Local Emergency Planning Commission	(225) 621-8300
Ascension Parish Sheriff / Emergency Services	(225) 621-8300
Employee Assistance Program	1-800-446-7560
Iberville Parish Local Emergency Planning Commission	(225) 687-5140
Iberville Parish Sheriff / Emergency Services	911
LA State Police Emergency Hazardous Materials Hotline	(225) 925-6595
Louisiana Department of Health & Hospitals – Infectious Disease Control	(225) 925-3611
Louisiana Poison Control Center	1-800-256-9822
Lower Mississippi Waterworks Warning Network	(225) 925-7230
National Response Center	(800) 424-8802
Our Lady of the Lake Hospital	(225) 765-6565
St. Elizabeth Hospital	(225) 647-6363
St. Gabriel Fire / Police Department	911
U.S. Coast Guard, New Orleans	(504) 589-6261

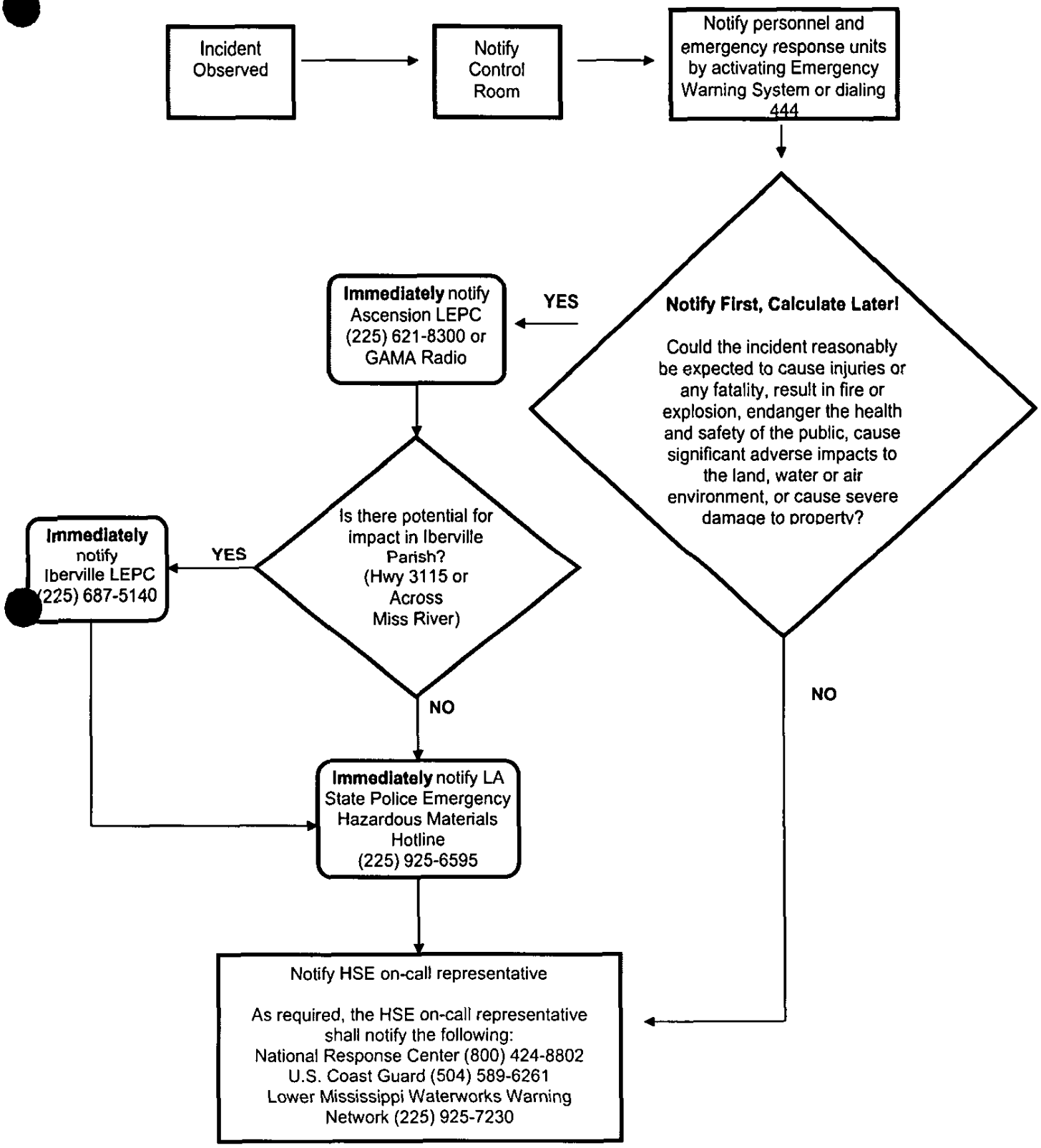
APPENDIX B - CONTINUED

Honeywell, Geismar Plant
Emergency Contact List

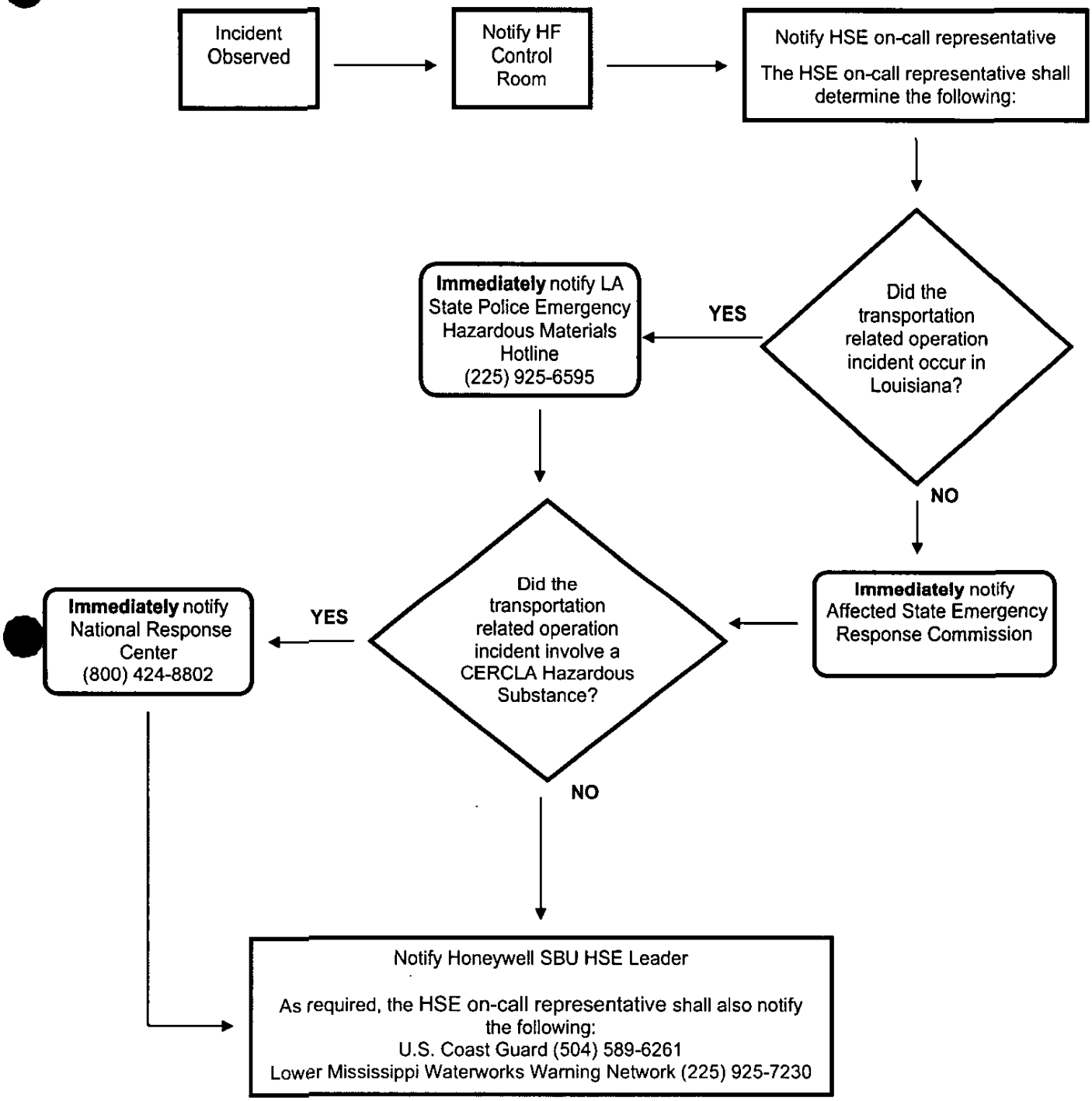
Facility Management Personnel

Position	Name	Phone
Site Leader	Chris Toups	642-3538 Office 715-9358 Cellular 751-3451 Home
HF/Aclon Operations Manager	Randall Jones	642-2722 Office 235-6260 Cellular 677-8001 Home
Fluorocarbons Operations Manager	Ron Snell	642-2703 Office 235-7874 Cellular 673-6641 Home
HSE Manager	Brad Campesi	642-2768 Office 936-0310 Cellular 768-8801 Home
Human Resources Leader	Mike Williams	642-4499 Office 717-6685 Cellular 755-1565 Home
Maintenance Manager	Sam Black	642-7606 Office 362-2777 Cellular 622-2866 Home
Logistics Manager	Pat Williams	642-2729 Office 937-0915 Cellular 766-8027 Home
Quality Systems Leader	Bob Wilson	642-3559 Office 324-9867 Cellular 664-6890 Home

Honeywell, Geismar Facility
Environmental Release Notification Flowchart



Honeywell, Geismar Facility
Transportation Related Operation Notification Flowchart



Honeywell, Geismar Plant
HSE Agency Notification Form

Courtesy Call ( ) Reportable ( ) Parish: **Ascension** Release Date / Time

Caller's Name:_____ Caller's Phone #:_____ Occurred: _____/_____

Incident Location: **Honeywell, 5525 HWY 3115, Carville, LA 70721** Secured: _____/_____

Company Address: **Honeywell, P.O. Box 226, Geismar, LA 70734**

Chemical(s) Released:_____ Estimated Quantity Released (lbs): _____

Incident Classification: Unusual Event ( ) Site Emergency ( ) General Emergency ( )

Reportable Quantity (lbs): _____ Hazard Classification (DOT): _____ OSHA EHS ( )

Solid ( ) Liquid ( ) Gas ( ) Did the Material Go Offsite? Yes / No Released to: Land ( ) Water ( ) Air ( )

Any offsite protective actions? Yes / No Road Closure ( ) Shelter-in-Place ( ) Evacuation ( )

Emergency Conditions: Fires ( ) _____ Injuries ( ) # _____ Fatalities ( ) #_____

Wind Direction: _____ Wind Speed: _____ Temp: _____°F Precipitation: Rain ( ) Other ( ) _____

Details of event:_____

Agency	Phone	Date / Time	Person Contacted	Incident No.	Comments
Ascension Parish (LEPC)	(225) 621-8300				
Iberville Parish (LEPC)	(225) 687-5140				
Louisiana State Police Hotline	(225) 925-6595				
Lower Mississippi Waterworks Warning Network	(225) 925-7230				
National Response Center	(800) 424-8802				
U.S. Coast Guard, New Orleans	(504) 589-6261				

1. PURPOSE

The purpose of this procedure is to assign personnel responsibilities and provide a detailed organizational structure to be followed in the event of a response to an emergency situation at the Geismar facility.

2. SCOPE

This procedure shall cover any emergency response activity within the plant or surrounding the Honeywell-Geismar facility.

3. DEFINITIONS

4. AUTHORITY AND RESPONSIBILITIES

4.1. All plant personnel shall be responsible for following their roles documented by this procedure in the event of an emergency situation.

4.2. The HSE Department shall be responsible for maintaining and revising this procedure.

5. PROCEDURE

5.1. Organizational Structure/Line of Authority

5.1.1. Upon activation of the emergency response plan, the Site Manager will assume the role of Chief Emergency Officer on site.

5.1.2. During the absence of the Site Manager, the following will act for him in the order named:

5.1.2.1. Operations Leader (depending on location);

5.1.2.2. Production Supervisor (depending on location);

5.1.2.3. Maintenance Manager; or

5.1.2.4. Safety Leader

5.1.3. The Shift Supervisor (depending on location) shall assume the role of Incident Commander in the event of an emergency situation.

5.1.3.1. During the absence of the Shift Supervisor, the first emergency response employee to arrive on the incident scene shall assume the role of Incident Commander until the role has been passed up the line of authority.

5.1.4. The Safety Leader shall assume the role of Site Emergency Coordinator in the event of an emergency situation.

5.1.4.1. During the absence of the Safety Leader, the following will act for him in the order named:

5.1.4.1.1. Safety Technician

5.1.4.1.2. Industrial Hygienist

5.1.5. All Honeywell Operating Technicians on site at the time of an emergency shall assume the role of emergency response personnel and back-up personnel.

5.1.6. The Complex Emergency Brigade personnel shall assume the role of back-up personnel, if the emergency situation warrants.

5.1.7. All Honeywell Laboratory Technicians on site at the time of an emergency situation shall assume the role of medical first responders.

5.1.8. The following Departments shall make available, if necessary, skilled support personnel to aid in the emergency response operations:

5.1.8.1. HSE;

5.1.8.2. Maintenance;

5.1.8.3. Human Resources; and

5.1.8.4. Materials Management.

5.2. Roles and Responsibilities of Emergency Response Personnel

5.2.1. Chief Emergency Officer

5.2.1.1. The Chief Emergency Officer shall have the overall responsibility to protect personnel, site facilities, and the community. During the emergency he/she will be available for counsel and overall guidance.

5.2.1.2. He/she shall inform Corporate Management as to the status of the emergency situation.

5.2.1.3. He/she shall also approve the release of all information to the news media and the employee's families.

5.2.2. Incident Commander

5.2.2.1. The Incident Commander shall be responsible for immediate assessment of the emergency situation, implementation of the appropriate emergency operations, assure the proper personal protective equipment is worn, and implementation of decontamination procedures.

5.2.3. Site Emergency Coordinator

5.2.3.1. The Site Emergency Coordinator shall be responsible for the coordination of the overall emergency response effort.

5.2.3.2. He/she shall initiate an inspection of the incident scene, determine when it is safe to return to normal operations, and assure an incident investigation is conducted.

5.2.3.3. He/she also initiates a critique of the emergency response efforts and documents the findings.

5.2.4. Emergency Response Personnel

5.2.4.1. Emergency Response Personnel shall be responsible to respond to all on-site emergency situations, wear the proper personal protective equipment during emergency activities, and remain on scene until dismissed by the Incident Commander or formally relieved by backup personnel.

5.2.5. Complex Emergency Brigade Personnel

5.2.5.1. Complex Emergency Brigade Personnel shall be responsible for responding to an emergency when notified and serving as support and backup for initial emergency response personnel.

5.2.6. Medical First Responder

5.2.6.1. Medical First Responders shall have the responsibility to be on alert during any on-site emergency situation and provide initial medical care, if necessary.

5.2.7. Safety Officer

5.2.7.1. The Incident Commander shall designate a safety officer, who is knowledgeable in the emergency response activities, from available personnel. The Safety Officer shall have the responsibility to identify and evaluate hazards at the emergency scene, and immediately inform the Incident Commander of any actions needed to correct identified hazards

5.2.8. HSE

5.2.8.1. The Safety Leader or Environmental Leader shall assure all necessary regulatory agency notifications are made.

5.2.8.2. He/she shall assure that necessary environmental and/or personnel sampling is conducted to determine the extent of possible exposures.

5.2.8.3. He/she also serves as a liaison with any parish or state agencies responding to the emergency situation.

5.2.9. Human Resource Leader

5.2.9.1. The Human Resource Leader or designee shall assure that information is not released to either the public or news media without authorization from the Chief Emergency Officer.

5.2.9.2. He/she shall establish a temporary press room in the large conference room and assure members of the news media remain in this room.

5.2.9.3. He/she shall maintain a record of information released, time of release, and to whom furnished.

5.2.9.4. Also he/she shall assure information regarding injuries of individuals are not released until the next of kin has been notified.

5.2.10. Maintenance Manager

5.2.10.1. The Maintenance Manager or designee shall supervise the use of powered industrial equipment necessary for rehabilitation or other required work.

5.2.10.2. He/she shall provide the necessary personnel to operate the equipment and aid in rehabilitation efforts.

5.3. Training

5.3.1. Incident Commanders shall receive 40 hours of initial training and at least 8 hours of refresher training annually. The training shall include the following information: how to implement the Emergency Response Plan and this Plan's incident command system; the hazards and risks associated with the emergency response personal protective equipment; understanding of the decontamination procedures; and implementation of the local emergency response plan.

5.3.2. Honeywell Emergency Response Personnel shall receive 40 hours of initial training and 8 hours of refresher training annually. The training shall include the following information: how to implement the Emergency Response Plan; the use of field survey instruments and equipment; knowledge of the Incident Command system; selection and use of emergency response personal protective equipment; be able to perform advance control, containment and /or confinement operations; implementation of decontamination procedures; knowledge of plant chemicals.

5.3.3. Complex Emergency Response Brigade shall receive 40 hours of initial training equivalent to the hazardous materials specialist level and 32 hours of refresher training annually. Training shall include the same information as the Honeywell Emergency Response Personnel and the following information: confined space rescue; fire fighting; incident command; and hazards associated with the other Complex Plants.

5.3.4. Medical First Responders shall receive 40 hours of initial training, 8 hours of refresher training annually and 16 hours of refresher training bi-annually. The training shall include CPR/AED, First Aid, and Bloodborne Pathogen.

5.4. Media Communications

5.4.1. During a major emergency at the Honeywell-Geismar Plant, our public relations objective is to first gather the facts and then report them to legitimate news sources.

5.4.2. Media Control should be handled politely but firmly during an emergency.

5.4.3. Any statement to the press shall be made with prior approval of the Chief Emergency Officer or his designee.

5.4.4. Requests from the members of the news media to enter the plant should be handled by informing them that for safety reasons they are not to enter the plant; the Chief Emergency Officer or Site Manager is being notified of their presence; and a statement will be given as soon as possible.

5.4.5. If possible, all news media members should be invited to wait in the large conference room for information regarding the emergency situation.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure throughout due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised procedure to better describe current practices. Training is not required on procedure revisions. Revised 07/08/04.

Revision 4: Revised procedure due to HSE Process Change. Training is not required on procedure revisions. Revised 06/14/07.

1. PURPOSE

The purpose of this procedure is to provide guidelines to recognize emergency situations and measures to mitigate potential emergencies within the Honeywell-Geismar Plant.

2. SCOPE

2.1. This procedure shall include any potential emergency situation occurring at the Honeywell-Geismar Plant.

2.2. This procedure does not include any emergency situation occurring at one of the other Plants within the Geismar facility.

3. DEFINITIONS

3.1. Emergency – a situation in which injury or major damage to property has occurred or might reasonably be expected to occur. Such situations may arise from numerous causes including, but not limited to, fire, explosion, release of hazardous materials, and forces of nature.

4. AUTHORITY AND RESPONSIBILITIES

4.1. Production technicians shall be responsible for categorizing any emergency situation that they discover.

4.2. Shift Supervisor/Leader shall responsible for assuring the emergency situation has been properly categorize upon notification.

4.3. The HSE Department shall be responsible for maintaining and revising this procedure, if necessary.

5. PROCEDURE

5.1. Honeywell Emergency Response Plan shall be activated for any emergency situation, except for some situations involving the release of a hazardous substance.

5.2. Production personnel shall categorize any situation involving the release of a hazardous substance to determine if emergency response is necessary.

5.3. The release of hazardous substances shall be categorized into one of the following groups:

5.3.1. Releases that are clearly incidental regardless of the circumstances,

5.3.2. Releases that may be incidental or may require an emergency response depending on the circumstances, and

5.3.3. Releases that clearly require an emergency response regardless of the circumstances.

5.4. Releases That are Clearly Incidental Regardless of the Circumstances

5.4.1. An incidental release of hazardous substances, which do not pose a significant safety or health hazard to employees in the immediate vicinity or to the employee cleaning it up, nor does it have the potential to become an emergency within a short time frame, do not require an emergency response.

5.4.2. An incidental release may only be mitigated by employees familiar with the hazards of the chemicals with which they are working.

5.5. Releases That May Be Incidental or Require an Emergency Response Depending on the Circumstances

5.5.1. The release of a hazardous substance in which certain considerations exist shall be evaluated to determine if the release is incidental or requires an emergency response.

5.5.2. The following considerations shall be evaluated to determine if the release can be handled safely or an emergency response is necessary:

5.5.2.1. The property of the hazardous substance (i.e. toxicity, volatility, flammability, explosiveness, corrosiveness, etc.),

5.5.2.2. The particular circumstances of the release itself (i.e. quantity, confined space considerations, ventilation, etc.), and

5.5.2.3. The mitigating factors in the work area (i.e. knowledge of the employee in the immediate work area, personal protective equipment at hand, pre-established standard operating procedures, engineering control measures, etc.).

5.6. Releases that Require an Emergency Response Regardless of the Circumstances

5.6.1. The release of hazardous substances that pose sufficient threat to health or safety shall require an emergency response regardless of the circumstances surrounding the release or the mitigating factors.

5.7. An emergency response shall include, but not limited to, the following situations:

5.7.1. A response which comes from outside the immediate release area;

5.7.2. A release that requires the evacuation of employees in the area;

5.7.3. A release that poses, or has the potential to pose, conditions that are immediately dangerous to life and health (IDLH),

5.7.4. A release that poses a serious threat of fire or explosion (exceeds or may potentially exceed the lower explosive limit),

5.7.5. A release that requires immediate attention because of an imminent dangerous condition,

5.7.6. A release that may cause high levels of exposure to toxic substances,

5.7.7. There is uncertainty that the employee in the work area can handle the severity of the hazard with the PPE and equipment that has been provided and the exposure limit could easily be exceeded, and

5.7.8. The situation is unclear, or the lack of data on important factors.

5.8. Information of Hazardous Substances

5.8.1. Information on all hazardous substances used at this plant is contained in the material safety data sheets that are maintained by the HSE Department.

5.8.2. The information regarding the quantities in which major hazardous substances are stored is maintained by Operations.

5.9. If emergency conditions warrant, the emergency shutdown of process equipment may be necessary to prevent the emergency situation from increasing in severity. (See Emergency Shutdown Procedures)

5.10. Process operators, who have adequate PPE and who employ the buddy system, may take limited action in the danger area (i.e. turning a valve) before the emergency response team arrives.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

The purpose of this procedure is to provide evacuation or shelter-in-place guidelines to all Honeywell Geismar Plant personnel if an emergency condition warrants.

2. SCOPE

2.1. This procedure shall include all personnel working at or visiting the Honeywell Geismar Plant that do not have emergency response responsibilities.

2.2. This procedure does not include any personnel working at one of the other Plants within the Geismar facility.

3. DEFINITIONS

3.1. Shelter-in-place – the process of seeking a safe shelter during a chemical release, when evacuation may pose a greater hazard.

3.2. Emergency Assembly Areas – areas strategically located throughout the facility that serves as the assembly points for an evacuation.

3.3. Muster Reader - an access control reader located at all "Shelter in Place" locations and Emergency Assembly Areas used only for employee accountability in the event of an emergency.

4. AUTHORITY AND RESPONSIBILITIES

4.1. Plant personnel shall be responsible for scanning their Honeywell I.D. Badge at the "Shelter in Place" location or assembly area immediately upon notification of an emergency.

4.2. The Incident Commander shall be responsible for communication with the "Shelter in Place" locations or emergency assembly areas to assure personnel well being.

4.3. The Incident Commander shall be responsible for assuring all plant personnel are accounted for.

4.4. The HSE Department shall be responsible for maintaining and revising this procedure.

5. PROCEDURE

5.1. In the event of an emergency that may adversely impact plant personnel, notification shall be made via the complex emergency warning system.

5.2. The notification to plant personnel shall include:

5.2.1. The type of the emergency.

5.2.2. Location of the emergency.

5.2.3. Emergency instructions for plant personnel (i.e., "Shelter In Place", evacuate, etc.)

5.3. Fire Emergency

5.3.1. In the event of a fire, all personnel in the affected area shall immediately evacuate their location and report to the nearest outdoor Emergency Assembly Area.

5.3.2. The following emergency assembly areas have been strategically located throughout the plant allowing employees safe locations to assemble and be accounted for:

* (#1) Gate 1,

* (#2) Store St. between Stores and the Machine Shop,

* (#3) Northeast corner of the Spar Building,

* (#4) HF Maintenance Shop,

* (#5) I&E Shop

* (#6) Gate #7.

5.3.3. Immediately upon reporting to the Emergency Assembly Area, all personnel shall scan their Honeywell I.D. Badge at the muster reader located in that area.

5.3.4. Plant personnel should proceed cross wind or upwind to one of the six emergency assembly areas not impacted by the emergency.

5.3.5. The Incident Commander shall request an Accountability Report from the Security Officer at Gate 1 and assure all personnel are accounted for

5.3.6. All personnel shall remain at the Emergency Assembly Area until given an "All Clear" from the Incident Commander.

5.4. Chemical Emergency

5.4.1. In the event of a chemical emergency, plant personnel shall be notified by the emergency warning system.

5.4.2. The notification shall include siren tone followed by a P.A. message that includes:

5.4.2.1. The type of the emergency.

5.4.2.2. Location of the emergency.

5.4.2.3. Emergency instructions for plant personnel (i.e., "Shelter In Place", evacuate, etc.)

5.4.3. The type of emergencies and personnel instructions shall include the following:

5.4.3.1. Alert Condition – a chemical release confined to the process unit that will not affect other complex areas. Personnel in the affect area shall "Shelter in Place" or proceed to nearest Emergency Assembly Area. Personnel not in affect area shall remain alert to possible changing condition.

5.4.3.2. Dangerous Condition – a chemical release that may migrate out of the process area and affect neighboring process units. All plant personnel shall proceed to the nearest "Shelter in Place" location or Emergency Assembly Area.

5.4.4. The following "Shelter in Place" locations have been strategically located throughout the plant allowing employee safe locations to assemble and be accounted for:

5.4.4.1. Main Office Building – Large Conference Room,

5.4.4.2. Stores Building – Receiving Area/File Room,

5.4.4.3. Central Maintenance Shop – Lunch Room,

5.4.4.4. HF Administration Building – HF Conference Room,

5.4.4.5. Central Maintenance Office – Store's Supervisor's Office,

5.4.4.6. HF Maintenance Shop – Conference Room,

5.4.4.7. HF Control Room – Control Room,

5.4.4.8. Aclon Control Room – Lunch Room,

5.4.4.9. I & E Shop – File Room,

5.4.4.10. MPP/125/245fa Control Room – Conference Room,

5.4.4.11. Refrigerants Lab – Break Room,

5.4.4.12. Refrigerant Administration Building – Large Conference Room,

5.4.4.13. Refrigerant Maintenance Shop – Lunch Room,

5.4.5. Plant personnel may also proceed crosswind or upwind to one of the Emergency Assembly Areas listed in section 5.3.2., if the "Shelter In Place" locations can not be safely accessed.

5.4.6. Immediately upon reporting to the "Shelter in Place" location, all personnel shall scan their Honeywell I.D. Badge at the muster reader located in that location.

5.4.7. The first Honeywell employee arriving at the Shelter-in-place room shall immediately shut off the building ventilation system (i.e. air condition or heating, lab hoods, etc.), and close air intakes (including windows, lab hood sashes, etc.). Once all personnel enter the shelter-in-place room the door shall be closed, but not locked. For Shelter-in-place rooms that require additional activities to isolate the room specific instructions shall be posted in that room.

5.4.8. The Incident Commander shall request an accountability report from the security officer at Gate 1 and assure all personnel are accounted for.

5.4.9. All personnel shall remain in the "Shelter in Place" locations until given an "All Clear" from the Incident Commander.

5.5. Employee Accountability

5.5.1. All personnel entering the Honeywell-Geismar Plant shall be required to scan their Honeywell I.D. Badge via the Access Control system when entering any locations with a card reader.

5.5.2. In the event of an emergency situation, all personnel reporting to an emergency assembly area or "Shelter-In-Place" location must scan their

Honeywell I.D. Badge at the muster reader.

5.5.3. An employee accountability report will be generated by the security officer at the Main Gate and made available to the Incident Commander upon request

5.5.4. The employee accountability report shall be updated by the security officer at the Main Gate every five minutes until all employees are accounted for.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised procedure to better describe current practices due to annual review. Training is required on procedure revisions. Revised 09/12/03.

Revision 3: Added Standard Work Document Shelter-in-Place Instructions to procedure. Training is not required on procedure revisions. Revised 09/26/03.

Revision 4: Revised procedure due to annual review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 5: Revised procedure due to Site HSE Change. Training is required on procedure revisions. Revised 03/03/05.

Revision 6: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

Standard Work Document
Shelter-in-Place Instructions

Step	Description
1.	The first employee arriving at the Shelter-in Place room shall immediately shut off the building ventilation system (i.e. air condition) and close air intakes (i.e. windows, doors).
2.	Once all personnel enters the Shelter-in-Place room, the door shall be closed (Do not lock the door).
3.	Immediately upon reporting to the "Shelter In Place" location, all personnel shall scan their Honeywell I.D. Badge at the muster reader located in that location.
4.	Personnel within the Shelter-in-Place room shall continuously monitor the HSE channel on the plant radio throughout the emergency for directions from the Incident Commander. Do not use the plant telephones or communicate non pertinent information over the HSE channel.
5.	All personnel shall remain in the Shelter-in-Place room until the "All Secure" is sounded over the complex emergency warning system or directed by the Incident Commander.

1. PURPOSE

The purpose of this procedure is to provide guidelines prohibiting unauthorized personnel from entering dangerous areas during emergency situations at the Honeywell-Geismar Plant.

2. SCOPE

2.1 This procedure shall cover any emergency situations in which hazardous conditions may exist at the Honeywell-Geismar Plant.

2.2 This procedure may also include any emergency situation occurring at one of the other Plants within the Geismar Complex.

3. DEFINITIONS

3.1 Hot Zone – the area surrounding the emergency scene where hazards associates with the emergency may exist.

3.2 Unauthorized personnel – any personnel not part of the Honeywell Emergency Response organizational structure or not trained as an emergency response technician.

4. AUTHORITY AND RESPONSIBILITIES

4.1 The Incident Commander shall be responsible for assuring the hazardous area surrounding the emergency scene is secured.

4.2 All Plant personnel shall be responsible for adhering to the site controls established during an emergency situation.

4.3 Plant Security Officers shall be responsible establishing perimeter and traffic controls during emergency situations.

4.4 The HSE Department shall be responsible for maintaining and revising this procedure when necessary.

5. PROCEDURE

5.1 Hot Zone

5.1.1 The area surrounding the dangerous area need to be controlled during emergencies by prohibiting unauthorized personnel from entering the hot zone.

5.1.2 The Incident Commander shall assure a hot zone is set up surrounding the emergency scene in such a matter that secures the dangers associated with the emergency.

5.1.3 Only Honeywell Emergency Response personnel shall be allowed to set up a hot zone during an emergency situation.

5.1.4 The hot zone shall be barricaded or personally attended so that not to allow unauthorized personnel into the dangerous area.

5.1.5 Only Honeywell Emergency Response personnel shall be allowed to control entry and exit into the hot zone.

5.1.6 The hot zone shall remain secured until the emergency has been mitigated and the dangerous conditions eliminated.

5.2 Perimeter Control

5.2.1 Upon activation of the Emergency Response Plan, the Security Officers shall immediately close and secure all plant gates that may be use.

5.2.2 The Security Officers at the gates shall prohibit any unauthorized personnel and vehicles from entering the Plant.

5.2.3 Only Plant Emergency Response personnel and equipment shall be admitted into the Plant.

5.2.4 Personnel and vehicles shall be allowed to exit the plant during an emergency, but should not leave the site until accounted for.

5.2.5 Outside responders (i.e. fire department, police, hazmat teams, emergency medical service personnel, and other pertinent components of the local, state, and federal emergency response system) shall not be allowed in the plant without prior permission from the Incident Commander.

5.3 Traffic Control

5.3.1 The Incident Commander shall determine the necessity of controlling traffic within and outside the Geismar Complex.

5.3.2 Security Officers shall be used only to control traffic within the Geismar Complex.

5.3.3 The Ascension and/or Iberville Parish Police Departments shall be notified, if traffic control is required outside the Geismar Complex.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

The purpose of this procedure is to provide guidelines for personnel responding to and mitigating an emergency situation at the Honeywell-Geismar Facility.

2. SCOPE

2.1 This procedure shall include all Honeywell employees responding to an emergency situation within or surrounding the Geismar Facility.

2.2 The guidelines specified in this procedure shall also be complied with for any outside personnel responding to an emergency situation at this Plant.

3. DEFINITIONS

3.1 Incident Command System – Universally recognized system used during emergency response activities to effectively control personnel, facilities, equipment and communications in a safe manner.

3.2 Emergency Control Center – the location from which all incident operations are directed. The emergency control center will normally be located in the control room where the incident occurs.

3.3 Hot Zone – the area surrounding the emergency scene where the hazards associated with the emergency exist.

4. AUTHORITY AND RESPONSIBILITIES

4.1 The Incident Commander shall be responsible for assuring the guidelines specified in this procedure are followed during an emergency situation.

4.2 Emergency Response Personnel shall be responsible for knowing and following this procedure during an emergency situation.

4.3 The HSE Department shall be responsible for maintaining and revising this procedure as needed.

5. PROCEDURE

5.1 The two most important objectives of any emergency response operation are life safety and incident stabilization. Only after the appropriate precautions for life safety are assured, then shall activities directed at incident stabilization occur.

5.2 Emergency Identification and Notification

5.2.1 Any individual witnessing or discovering an emergency situation shall initiate an emergency response sequence by notifying the proper Plant authorities. Notification can occur by dialing #444 or direct notification to a process control room.

5.2.2 The individual discovering the emergency situation shall take no further action beyond notification unless he/she is a member of the Honeywell Emergency Response Team.

5.2.3 If the individual discovering the emergency situation is a member of the Honeywell Emergency Response Team, he/she may attempt to mitigate the emergency only after the proper notification is made and if the mitigation may be performed without the individual being subjected to the hazards associate with the emergency.

5.2.4 If necessary, the complex emergency warning system or Plant radios shall be used to notify the Honeywell Emergency Response Team to respond to the emergency.

5.3 Establishment of an Incident Command System

5.3.1 The first Honeywell Emergency Response Team member arriving at the incident scene shall become the Incident Commander in charge of the Incident Command System.

5.3.2 The initial incident commander may pass the position up the line of authority that has been established in SAF-ERP-005.

5.3.3 All emergency responders and their communications shall be coordinated and controlled through the Incident Commander.

5.3.4 The Incident Commander shall identify, to the extent possible, the emergency situation and immediately determine the need to shut down, shed or secure process operations.

5.3.5 Based the conditions present, the Incident Commander shall implement the appropriate emergency operations and assure that the personal protective equipment worn is appropriate for the hazards to be encountered.

5.3.6 The Incident Commander may delegate functional authority for any emergency operation; however, he/she always retains responsibility for the incident.

5.3.7 The Incident Commander shall assure all plant personnel are accounted for in accordance with Honeywell Emergency Action Plan (SAF-ERP-007).

5.3.8 The Safety Officer, designated by the Incident Commander from available personnel, shall be responsible to identify and evaluate hazards and to provide direction with the respect to the safe operations for the emergency situation.

5.4 Establishment of an Emergency Control Center

5.4.1 The Incident Commander shall establish an Emergency Control Center in a safe location from which all emergency operations will be directed.

5.4.2 If an emergency situation occurs in the HF Process area, the pre-determined Emergency Control Center shall be the HF Control room.

5.4.3 If an emergency situation occurs in the MPP Process area, the pre-determined Emergency Control Center shall be the MPP Control room.

5.4.4 If an emergency situation occurs which prohibits the use of a pre-determined Emergency Control Center, an Emergency Control Center will be established in a location safe from the emergency conditions (i.e. Gate #1).

5.4.5 Only one Emergency Control Center shall be established unless the severity of the emergency situation requires more and shall be equipped with the appropriate communication (i.e. telephone, radio, etc.).

5.4.6 Communications with the Emergency Control Center shall be limited to personnel with emergency response functions.

5.5 Establishment of a Staging Area

5.5.1 The Incident Commander shall establish a staging area, if necessary, in a location safe from the emergency conditions. The Emergency Assembly Areas may be used as staging areas.

5.5.2 The staging area shall be used as a location to gather resources that may be needed for the emergency response operations. The resources may include, but are not limited to, emergency response personnel and equipment (i.e. fire truck, ambulance, etc.).

5.5.3 If necessary, the Complex Emergency Brigade shall be notified by the emergency warning system or Plant radio and report to the staging area determined by the Incident Commander.

5.5.4 The staging area shall be equipped with communications to the Emergency Control Center.

5.5.5 The Incident Commander shall determine what resources and when the resources are to be brought to the emergency scene.

5.5.6 All resources shall remain at the staging area until released by the Incident Commander.

5.6 Emergency Response Activities

5.6.1 The Incident Commander shall develop a plan to mitigate the emergency situation with the emergency response personnel.

5.6.2 The Incident Commander shall establish a hot zone around the emergency scene and develop a decontamination station for emergency response personnel exiting the hot zone. (See the Honeywell Decontamination Procedure, SAF-ERP-011).

5.6.3 The Incident Commander shall limit the number of emergency response personnel at the emergency scene; however, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

5.6.4 Back-up emergency personnel, with the same or greater level of personal protective equipment, shall be standing by with equipment ready to provide assistance or rescue.

5.6.5 The Incident Commander shall determine the level of personnel protective equipment appropriate for emergency response personnel. If no air monitoring had been conducted, the atmosphere shall be considered IDLH and Self-Contained-Breathing-Apparatus (SCBA) shall be required.

5.6.6 Communications shall be maintained between the emergency response personnel entering the hot zone and the Emergency Control Center.

5.6.7 During emergency response operations, Medical First Responders shall be standing by at the staging area with medical equipment and ambulance.

5.7 Termination of an Emergency Response

5.7.1 The Incident Commander shall determine when the emergency situation has been properly mitigated.

5.7.2 The Incident Commander shall assure all hazardous conditions are mitigated or secured prior to activating Code 4 - "All Secured".

5.7.3 If necessary, the Site Emergency Coordinator shall evaluate the emergency scene prior to start-up of the process.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

The purpose of this procedure is to provide guidelines for the selection, use and maintenance of equipment used during emergency situations at the Honeywell-Geismar Plant.

2. SCOPE

2.1. This procedure shall include all emergency equipment that is required during emergency situations at the Honeywell-Geismar Plant.

2.2. This procedure does not include emergency equipment at one of the other Plants within the Geismar facility.

3. DEFINITIONS

3.1. IDLH – an atmosphere Immediately Danger to Life and Health.

4. AUTHORITY AND RESPONSIBILITIES

4.1. All emergency response personnel shall be responsible following the personal protective equipment guidelines outlined in this procedure.

4.2. The Incident Commander shall be responsible knowing the emergency equipment available in the event of an emergency situation.

4.3. HSE Department shall be responsible for maintaining and revising this procedure if necessary.

5. PROCEDURE

5.1. Personal Protective Equipment

5.1.1. Emergency escape respirators shall be used by personnel to escape from inhalation hazards created by the emergency situation.

5.1.2. Emergency escape respirators are located in green boxes and are available throughout the plant.

5.1.3. Emergency personnel responding to an emergency situation shall wear the appropriate personal protective equipment for the hazards to be encountered.

5.1.4. The Incident Commander shall make a determination of the level of personal protective equipment required to respond to an emergency situation.

5.1.5. The following levels of personal protective equipment shall be used during an emergency situation:

5.1.5.1. Level A – fully encapsulated gas tight suit, outer gloves and boots, and an SCBA respirator;

5.1.5.2. Level B – acid suit, hood, gloves, boots, and an supplied-air respirator;

5.1.5.3. Level C – acid suit, hood, gloves, boots, and a full face gas mask respirator (optional); and

5.1.5.4. Level D – normal working attire, hard hat, safety glasses, steel toe shoes, and hearing protection (optional).

5.1.6. The level of personal protective equipment shall be determined based of the following information:

5.1.6.1. Level A – IDLH atmospheres or atmospheres with an unknown concentration or chemical;

5.1.6.2. Level B – known atmosphere which requires highest level of respiratory protection and a lesser degree of skin protection;

5.1.6.3. Level C – known atmosphere which requires a lesser degree of respiratory and skin protection;

5.1.6.4. Level D – normal working atmosphere.

5.1.7. The breathing air compressor located at the Safety Trailer shall be used to fill SCBA cylinders.

5.1.8. Inspection and Maintenance of Personal Protective Equipment

5.1.8.1. Inspection of emergency response personal protective equipment shall be conducted monthly and documentation maintained by the HSE Department.

5.1.8.2. Maintenance of emergency response personal protective equipment shall be performed under the supervision of the HSE Department.

5.1.9. An inventory of the emergency response personal protective equipment and storage locations is listed in Appendix A.

5.2. Emergency Equipment

5.2.1. Chemical

5.2.1.1. The following emergency equipment shall be available for the mitigation of chemical releases:

5.2.1.1.1. "B" kit – a capping kit used to mitigate a chemical release on plugs, valves or side walls of one ton cylinders;

5.2.1.1.2. "C" kit – a capping kit used to mitigate a chemical release on relief or angle valves inside the dome of railcars and HF trailers.

5.2.2. Fire

5.2.2.1. The following emergency equipment shall be available for the mitigation of fires:

5.2.2.1.1. Fire truck – mobile fire extinguishing equipment with 500 gallons of 3% or 6% afff., 2000 lbs. of dry chemical, hose, nozzles, and other associated equipment;

5.2.2.1.2. Fire hose house – stationary fire extinguishing equipment that includes hose, nozzles, gated "Y", and other associated equipment;

5.2.2.1.3. Fire extinguishers – hand held portable fire extinguishing units located throughout the plant.

5.2.3. Confined Space Rescue

5.2.3.1. The following equipment is available for confined space rescue:

5.2.3.1.1. Confined space rescue kit (See Honeywell Confined Space Procedure for contents);

5.2.3.1.2. Rope extrication equipment – used to remove victim that can not be carried.

5.2.4. Medical

5.2.4.1. The following medical equipment shall be available in the event of injury to personnel:

5.2.4.1.1. Ambulance – mobile emergency medical unit equipped with basic life support equipment;

5.2.4.1.2. Medical Office – equipped with first aid and basic life support equipment.

5.2.4.1.3. Satellite medical office – equipped with first aid equipment.

5.2.5. Communications

5.2.5.1. The following equipment is available for communications during emergency situations:

5.2.5.1.1. Emergency warning system – a siren and public address system that is able to be activated from Gate #1 and, the HF and MPP control rooms;

5.2.5.1.2. Plant radio – portable radios used by plant personnel equipped with a designated emergency frequency;

5.2.5.1.3. Cellular phone – portable phones that may be used in emergency situations.

5.2.6. Inspection and Maintenance of Emergency Equipment

5.2.6.1. Inspections of emergency equipment shall be conducted monthly and documentation maintained by the HSE Department.

5.2.6.2. Maintenance of emergency equipment shall be performed under the supervision of the HSE Department.

5.2.7. An inventory of the Plant's emergency equipment and location is listed in Appendix A.

5.3. Support Equipment

5.3.1. If necessary, addition emergency equipment shall be made available by other Geismar Complex Plants and/or Geismar Area Mutual Aid members.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Industrial Hygienist

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Issued Date and Appendix A due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

APPENDIX A

PERSONAL PROTECTIVE EQUIPMENT	LOCATION
SCBA (4) and Spare Cylinders (4)	HF Control Room
SCBA (8) and Spare Cylinders (8)	Refrigerants Control Room
SCBA (4) and Spare Cylinders (4)	Aclon Control Room
SCBA (2) and Spare Cylinders (2)	Dock
SCBA (2) and Spare Cylinders (2)	Fire Truck
SCBA (2) and Spare Cylinders (2)	Safety Trailer
Breathing Air Compressor (4000 psi. & 4500 psi.)	Safety Trailer
Level A Chemical Protective Suit (4)	HF Control Room
Level A Chemical Protective Suit (4)	Aclon Control Room
Level A Chemical Protective Suit (8)	Refrigerants Control Room
Emergency Escape Respirator	HF Process Unit
Emergency Escape Respirator	Aclon Control Room
Emergency Escape Respirator	MPP Process Unit

EMERGENCY EQUIPMENT	LOCATION
"B" Kit (1)	Spar Dryer Control Room
"B" Kit (1)	Refrigerants Control Room
"B" Kit (1)	TESAC Trailer
"C" Kit (1)	TESAC Trailer
Fire Truck	Machine Shop
Hose House	HF Process Unit
Hose House	Refrigerants Process Unit
Hose House	Dock

APPENDIX A - Continued

EMERGENCY EQUIPMENT	LOCATION
Hose House	Aclon Process Unit
Fire Extinguisher	HF Process Unit
Fire Extinguisher	Refrigerants Process Unit
Fire Extinguisher	Aclon Process Unit
Confined Space Rescue Kit (5)	Plant Wide
Ambulance	Machine Shop
Medical Office	Administration
Satellite First Aid Station	HF Laboratory
Satellite First Aid Station	Refrigerants Laboratory
Emergency Warning System (Controls)	HF Control Room
Emergency Warning System (Controls)	Aclon Control Room
Emergency Warning System (Controls)	Refrigerants Control Room
Emergency Warning System (Controls)	Gate #1
Plant Radio	Plant Personnel
Cellular Phone (1)	Gate #1
Cellular Phone (1)	Ambulance

1. PURPOSE

This procedure provides guidelines for minimizing chemical exposure and the decontamination of persons responding to emergency situations.

2. SCOPE

This procedure applies primarily to decontamination occurring as a result of response to emergency situations but may be used for any decontamination activity.

3. DEFINITIONS

3.1 Hot Zone or Exclusion Zone- the area in which exposure to chemicals or hazards during an emergency are likely to occur.

3.2 Contamination Reduction Zone - the area immediately outside the hot zone.

3.3 Contamination reduction corridor - a designated pathway through the contamination reduction zone through which entry/egress to/from the hot zone is allowed.

3.4 Support Zone - area outside both the exclusion zone and the contamination reduction zone in which authorized personnel are stationed to support the entry and decontamination teams.

4. AUTHORITY AND RESPONSIBILITIES

4.1 The Incident Commander is responsible for ensuring the proper decontamination guidelines are followed during emergency response activities.

5. PROCEDURE

5.1 Personnel and equipment in emergency response activities may become exposed to chemicals. ·Requirements for prevention of exposure to personnel is provided in Personal Protective Equipment SAF-ERP-010. PPE and equipment may become contaminated in several ways including:

5.1.1 contacting chemicals directly through immersion, splash, spray, vapor or mist,

5.1.2 walking through puddles or contaminated soil, or

5.1.3 contacting equipment, instruments or tools which may be contaminated.

5.2 Critical to decontamination is the prevention and/or minimization of exposures to chemicals. Effective preventative techniques can reduce or eliminate the need for decontamination. These include:

5.2.1 Wearing of disposable outer gloves and boots,

5.2.2 Covering equipment, instruments and tools with plastic,

5.2.3 Restricting the number of persons and equipment in the hot zone,

5.2.4 Partial egress (incomplete egress with re-entry), and

5.2.5 Surveying and monitoring to delineate contaminated areas.

5.3 Prior to entry or personnel into the hot zone, the contamination reduction corridor (CRC) must be established. This corridor must be clearly marked and should include as a minimum, the following (see Attachment 2):

5.3.1 Entry lane,

5.3.2 Egress lane,

5.3.3 Tool/equipment drop(s), and

5.3.4 One or more decontamination station(s).

5.4 Personnel manning the decontamination station(s) must be in the same or one level less level of PPE.

5.5 Proper cleaning techniques and solutions or reagents must be used to ensure adequate decontamination. Attachment 1 provides information on decontamination actions, solutions and reagents.

5.6 Personnel decontamination involves a described sequence of steps. Adherence to these steps ensures effective removal of contaminants and minimizes exposure of personnel to chemical agents. A flowchart of a proper personnel decontamination is shown in Attachment 2.

5.7 All non-disposable equipment, tools and instruments shall be thoroughly decontaminated before removal from the response activity site. Preferably, all large equipment should be decontaminated within the exclusion zone once the incident is secured and site cleanup has been completed.

5.8 All disposable equipment, tools, instruments, articles and personnel protective equipment shall be properly containerized and labeled. The HSE Department shall ensure proper disposal of all such materials.

5.9 The HSE Department shall determine the required level of cleanup and/or remediation for the incident site.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Industrial Hygienist

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

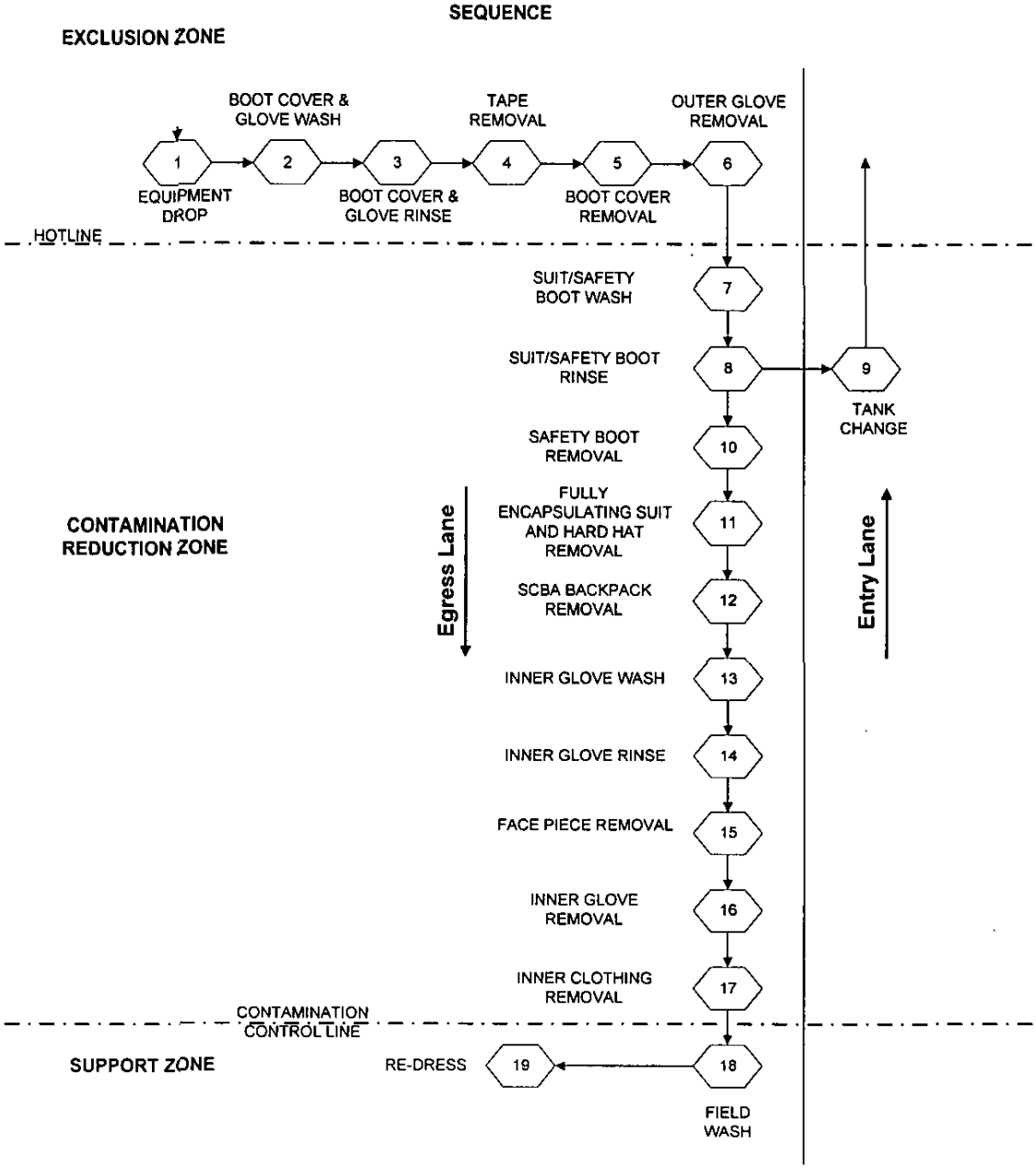
Revision 2: Revised Issue Date due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

ATTACHMENT 1
Decontamination Solutions/Reagents

Contaminant	Primary Decontamination Action	Secondary Decontamination Action
Acids (Hydrogen fluoride, sulfuric, oleum, pondwater, etc.	Scrub with mild caustic solution such as soda ash in water	Wash with detergent solution with water rinse
Petroleum compounds, oils, greases	Scrub with Mild solvent or degreaser (preferably citric based)	Wash with detergent solution with water rinse
Petroleum-based solvents	Scrub with detergent solution	Rinse with water
Halogenated solvents	Scrub with detergent solution	
Inert solids and dusts (Fluorospar)	Dust off	Rinse with water if required
Caustic solids or dusts	Dust off	Rinse with water

ATTACHMENT 2
Contamination Reduction Corridor Diagram



1. PURPOSE

The purpose of this procedure is to provide guidelines for emergency medical treatment of personnel and to provide a medical surveillance program for emergency first responders at the Honeywell-Geismar Plant.

2. SCOPE

2.1. This procedure shall include all personnel trained as a medical first responder at the Honeywell-Geismar Plant.

2.2. This procedure shall include any injuries occurring at the Geismar Plant in which the injured person requires immediate medical attention.

3. DEFINITIONS

3.1. Medical First Responder – personnel trained to provide initial medical care to an employee injured at the Plant.

4. AUTHORITY AND RESPONSIBILITIES

4.1. Medical first responders shall be responsible for providing initial medical care to employees injured during an emergency situation.

4.2. The HSE Department shall be responsible for maintaining and revising this procedure when necessary.

5. PROCEDURE

5.1. Medical First Responders during emergency situations

5.1.1. Upon notification of an emergency situation, all Plant Medical First Responders shall be on stand-by to first, provide medical care to injured employees, then to monitor the physical condition of emergency response personnel.

5.1.2. The Medical First Responders shall report to the emergency control center or staging area during an emergency, if they can do so without being subjected to health or safety hazards.

5.1.3. Any employee injured during the emergency shall be removed from the hot zone immediately, if the emergency conditions pose additional danger to that employee.

5.1.4. Prior to the removal of an injured employee from a hot zone, the employee shall be decontaminated, if necessary.

5.1.5. The primary triage site shall be at the Medical Department in the main Administration building and the secondary site shall be at the Laboratory (HF or Refrigerants) where the accident occurred.

5.1.6. The Medical First Responder shall provide initial medical care to the injured employee and determine if additional medical care is required.

5.1.7. Standing orders identifying the appropriate care for specific exposures and potential injuries at this site shall be maintained in the Medical Department, approved by the site physician and communicated through training sessions to all Medical First Responders.

5.1.8. If additional medical care is required, the injured employee shall be transported to a predetermined hospital under the guidance of the Medical First Responder.

5.1.9. After all injured employees have been cared for, the Medical First Responder shall provide evaluations of the emergency responders physical conditions prior to and upon existing the hot zone.

5.1.10. The emergency contact list is located in Appendix B of SAF-ERP-004, Emergency Notification Procedure.

5.2. Medical Surveillance of Emergency First Responders

5.2.1. Emergency First Responders shall be evaluated medically to determine whether they are capable of working with hazardous materials.

5.2.2. Medical evaluations shall include a baseline physical and a Physicians written opinion on the employee's capabilities.

5.2.3. Emergency First Responders shall receive medical evaluations initially upon assignment and annually thereafter.

5.2.4. Emergency First Responders shall receive medical consultation following the development of signs or symptoms resulting from exposure to hazardous substances during an emergency incident.

5.2.5. Medical evaluation and consultation reports shall be considered medical records and shall be maintained by the Medical Departments.

5.2.6. These medical records shall be made available to employees according to the Honeywell Access to Medical Records Procedure.

5.3. Coordination with Hospitals

5.3.1. Employees requiring additional medical treatment shall be transported to one of the following Medical facilities:

5.3.1.1. Dr. Steven L. Holmes M.D.;

5.3.1.2. Our Lady of the Lake Hospital in Baton Rouge;

5.3.1.3. St. Elizabeth Hospital in Gonzales;

5.3.1.4. Baton Rouge General Hospital in Baton Rouge.

5.3.2. The medical facilities listed above shall receive information on the treatment of HF exposure and shall be supplied with a HF treatment kit, if necessary.

5.3.3. The information and kits provided to these facilities shall be updated annually.

6. FLOWCHART

7. PROCEDURE OWNER

7.1. Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised procedure due to HSE Process Change. Training is not required on procedure revisions. Revised 08/23/06.

Revision 4: Revised procedure due to HSE Process Change. Training is not required on procedure revisions. Revised 06/14/07.

1. PURPOSE

The purpose of this procedure is to provide guidelines to evaluate the effectiveness of any emergency response activity at the Honeywell-Geismar Plant.

2. SCOPE

2.1 This procedure shall cover any emergency response activity involving an emergency or simulated emergency at the Honeywell-Geismar Plant.

2.2 This procedure does not include any emergency response activity occurring at one of the other Plants within the Geismar facility.

3. DEFINITIONS

3.1 Emergency Drill – simulated emergency response activity used to determine the effectiveness of the Honeywell Emergency Response Plan (SAF-ERP-001).

4. AUTHORITY AND RESPONSIBILITIES

4.1 Emergency Response personnel shall be required, when requested, to participate in an emergency response critique.

4.2 The Site Emergency Coordinator (Safety and Health Supervisor) shall be responsible to perform a critique of any emergency response activity.

4.3 HSE Department shall be responsible to maintain and revised this procedure.

5. PROCEDURE

5.1 The Incident Commander shall notify the Site Emergency Coordinator of any emergency response activity occurring at this Plant.

5.2 After the emergency operations have been terminated, the Site Emergency Coordinator shall initiate a critique of the emergency response activity.

5.3 The Site Emergency Coordinator shall assemble an emergency response critique team minimally consisting of the following personnel:

5.3.1 Site Emergency Coordinator,

5.3.2 Incident Commander,

5.3.3 Emergency Response Team (at least one member),

5.3.4 Gate #1 Security Officer, and

5.3.5 Medical First Responder (if injury involved).

5.4 The Site Emergency Coordinator shall add additional members to the emergency response critique team, as necessary.

5.5 The emergency response critique team shall evaluate the effectiveness of the emergency response activities the following elements (if applicable):

5.5.1 Notification of the emergency,

5.5.2 Organization of the emergency response system,

5.5.3 Emergency Action Plan,

5.5.4 Site Security and Control,

5.5.5 Emergency Response Procedures,

5.5.6 Personal Protective Equipment and Other Emergency Equipment,

5.5.7 Decontamination Procedures,

5.5.8 Emergency Medical Treatment and First Aid,

5.5.9 Severe Weather Plan,

5.5.10 Chemical Spill, and

5.5.11 Oil Spill

5.6 The team shall document their findings for each element, if applicable.

5.7 The team shall make recommendations for any finding that identifies a deficiency in the Emergency Response Plan.

5.8 The team shall assign a responsible person and target date for completion to all recommendations.

5.9 The Site Emergency Coordinator shall develop a critique report consisting of the team findings, recommendations and target dates, and distribute to effected Department Heads and responsible persons.

5.10 The Site Coordinator shall track the status all recommendations through completion, at which time the critique for that emergency will be closed.

5.11 The HSE Department shall maintain the emergency response critique files.

5.12 Emergency Response Drill

5.12.1 Emergency response drills shall be conducted periodically to determine the effectiveness of the Honeywell Emergency Response Plan.

5.12.2 Emergency response drills shall be critique according to the guidelines outlined in this procedure.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Revised Procedure Owner due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 3: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

1. PURPOSE

This plan has been prepared to minimize the effects that anticipated severe weather events have on the Geismar operation and to reduce the exposure of personnel and equipment to the forces of these storms.

2. SCOPE

This plan covers preparations for and activities during anticipated severe weather events. This plan does not cover extreme weather events which occur suddenly or unanticipatedly.

3. DEFINITIONS

3.1 Hurricane - a tropical storm with a defined circulation whose winds exceed 74 miles per hour.

3.2 Tornado - a funnel cloud with defined circulation.

4. AUTHORITY AND RESPONSIBILITIES

4.1 The authority and responsibility for this procedure is outlined in the steps of the procedure.

5. PROCEDURE

5.1 During potentially severe weather, security personnel will continuously monitor the weather radio for postings of severe weather.

5.2 **HURRICANE** Tropical Storms (hurricanes) that may affect our area are most commonly generated in the North Atlantic and Caribbean during the months of June through November. A large storm will measure several hundred miles across. The winds blow around the center in a counterclockwise direction. The center of the storm travels from ten to thirty miles per hour, much less swiftly than the winds that whirl around it. Generally, the center moves slowly westward, but as the hurricane grows in size and strength, it often picks up speed and moves north. After the storm reaches cooler air, it begins to turn eastward. One to two storms per year can occur that have the potential to cause some destruction along the Gulf Coast. The hurricane center (or eye) is a calm area up to twenty miles across that has little wind and is relatively clear. After the center of the storm has passed, the winds will change direction and may last for several hours accompanied by heavy rainfall. It is important that personnel are aware of this storm characteristic and control their activities accordingly.

5.3 The hurricane conditions are based on predictions by the National Weather Service and serve to describe the time interval remaining before hurricane force winds are possible in the New Orleans area. Listed below are the hurricane threat conditions.

5.4 The actions listed below and their timing are minimum requirements deemed necessary to provide protection to the employees and process units. Additional steps beyond those listed as well as early activation of actions may be implemented by supervisors are authorized in order to provide adequate protection.

5.5 **Condition Five**: An alert condition automatically set annually on June 1st which remains in effect though November 30th.

5.5.1 Upon the setting of Condition Five, all department heads will review their areas for hurricane preparedness. The review will include:

5.5.1.1 General housekeeping including the removal or securing of all loose objects which are not slated for immediate use,

5.5.1.2 A review of supplies, equipment and materials required to actively prepare for a hurricane.

5.6 **Condition Four**: An alert condition in which hurricane force winds are possible within 72 hours.

5.6.1 The Site Manager will assemble department heads to review storm preparation and shutdown plans.

5.6.2 The HSE Department will start plotting map and notify department heads.

5.6.3 The HSE Department will conduct a thorough check of safety, fire protection and emergency equipment. Portable generators will be fueled and tested.

5.6.4 The HSE Department will review emergency communications, equipment and needs.

5.6.5 The Maintenance Department will initiate plant-wide housekeeping pickup.

5.6.6 The Materials Management Department will review the Hurricane Preparation Bill of Materials and begin to develop procurement plans.

5.6.7 The Maintenance Department will dismantle and secure any scaffold no longer needed.

5.6.8 The Stores Department will review emergency supplies and replenish as required - batteries, lights, rope, fuel, etc.

5.6.9 Each area will prepare a job list to secure their respective location. This list should include any drainage problems.

5.6.10 The production areas will check supplies of raw materials. Work for maximum inventory - up to two week supply.

5.6.11 The production areas will make thorough check of diesel driven pumps, compressors, generators, radio equipment, emergency lights and standby equipment.

5.6.12 The production areas will review emergency shutdown procedures and update as necessary.

5.6.13 The Maintenance Department will review any construction work and its "storm worthiness".

5.6.14 Plant vehicles will be fueled.

5.7 **Condition Three**: A readiness condition in which hurricane force winds are possible within 48 hours.

5.7.1 The Site Manager will assemble department heads for a report of status of storm preparation and shutdown plans.

5.7.2 The Site Manager will establish plan of action.

5.7.3 The HSE Department will maintain the hurricane plot.

5.7.4 The Purchasing Department will obtain extraordinary supplies.

5.7.5 The HSE Department will maintain adequate communications (24 hour basis).

5.7.6 All departments will continue with "securing job lists" mentioned in Condition Four.

5.7.7 The HSE Department will arrange for emergency drinking water and rations.

5.7.8 The Purchasing and Maintenance Departments will check and coordinate fuel supply.

5.7.9 Under the Site Manager's instructions, carry out operating plan as dictated by storm direction, speed and intensity.

5.8 **Condition Two**: A warning condition in which hurricane force winds are possible within 24 hours.

5.8.1 The Site Manager will assemble department heads for a status report of storm plans.

5.8.2 The HSE Department will maintain hurricane plot.

5.8.3 All departments will complete all work on "securing job lists".

5.8.4 All managers will review shutdown plans.

5.8.5 The HSE Department will maintain communication with all department heads.

5.8.6 The Materials Management Department will designate primary and secondary contacts.

5.9 **Condition One**: A danger condition in which hurricane force winds are possible within 12 hours.

5.9.1 The Site Manager will assemble department heads to review the following:

5.9.1.1 When to secure construction or similar work.

5.9.1.2 When to release office, clerical, and other non-essential personnel.

5.9.1.3 When to release non-essential maintenance employees.

5.9.1.4 Plant shutdown progress and update schedule.

5.9.2 The HSE Department will establish control center at Gate 1. The control center will have representatives of the following functions:

5.9.2.1 Plant leadership

5.9.2.2 HSE Department

5.9.2.3 Maintenance

5.9.3 Each department head should be prepared to advise personnel to remain in plant when hurricane force winds arrive.

5.10 Prepare messages via email and voice mail advising employees when released how they will be contacted to return to work, etc. Employees should be advised to use the Honeywell Employee Emergency Line (1-866-515-7285) in case of a natural disaster such as a hurricane.

5.11 The HSE Department will maintain a system of internal and external communications, i.e., radio, portable Cellular phones.

5.12 Complete preparations mentioned above.

5.13 The Maintenance Department will establish coverage for power distribution system.

5.14 All departments will carry out shutdown plan coordinated by managers of production as dictated by storm direction, speed and intensity. Shutdown criteria is as follows:

5.14.1 Sustained winds of 35 miles per hour - shutdown and tag out MultiProducts and G-125/245 structure elevator.

5.14.2 Sustained winds of 50 miles per hour - shutdown all process units.

5.15 The Site Manager will release non-essential personnel as soon as possible.

Storm in Geismar area:

5.16 Overall direction and communications to be carried out from control center.

5.17 The HSE Departments will maintain a record of all personnel in the plant.

5.18 The Maintenance Department will maintain coverage for power distribution system.

Restoration of operation:

5.19 The HSE and Maintenance Departments will assess damage and prepare plan for each area.

5.20 The department managers will re-establish manning as required.

United States Coast Guard Hurricane Readiness Plan:

5.21 The Geismar dock operation is under Coast Guard Jurisdiction. Special requirements in the event of a hurricane shall be outlined by the Coast Guard Marine Safety Bulletins.

6. PROCEDURE - SEVERE THUNDERSTORMS OR TORNADO

6.1 Severe Thunderstorms

6.1.1 If the Weather Service posts a **Severe Thunderstorm Watch or Warning**, security personnel will immediately advise the HSE Departments of all Geismar Complex companies.

6.2 Tornado Watch

6.2.1 A **Tornado Watch** is announced by the Weather Service when conditions are favorable for tornado formation.

6.2.2 If the weather service posts a **Tornado Watch**, security personnel will immediately advise the HSE Departments of all Geismar Complex companies.

6.3 Tornado Warning

6.3.1 A **Tornado Warning** is announced by the Weather Service when a tornado has been observed in the area.

6.3.2 Upon receipt of a **Tornado Warning**, the security personnel will immediately announce the notice over the complex emergency warning system.

6.3.3 Upon declaration of a tornado warning, all personnel shall seek appropriate shelter in substantial plant structure. All discretionary work activities shall be secured.

6.3.4 Once the weather condition is lifted, security personnel will cancel the alert using the complex emergency warning system. Normal plant activities may then resume.

7. FLOWCHART

8. PROCEDURE OWNER

8.1 Safety Leader

9. REFERENCES

9.1 Department of Transportation - United States Coast Guard - Hurricane Readiness Plan

10. REVISIONS

Revision 1: Deleted AlliedSignal and replaced with Honeywell throughout procedure. Training is not required on procedure revisions. Revised 01/28/00.

Revision 2: Deleted wording "attached" and changed to "referenced Coast Guard Hurricane Readiness Plan. Training is not required on procedure revisions. Revised 06/16/00.

Revision 3: Revised Procedure Owner due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 4: Revised section 5.5.1.2 to delete to words "Attachment 1 of this plan". Training is not required on procedure revisions. Revised 09/08/04.

Revision 5: Revised procedure to better describe current practices. Training is not required on procedure revisions. Revised 09/16/04.

Revision 6: Revised procedure due to annual review. Training is not required on procedure revisions. Revised 07/07/05.

Revision 7: Revised procedure to update the Honeywell Disaster Recovery Hotline Phone number (1-866-515-7285). Training is required on procedure revisions. Revised 07/13/07.

Revision 8: Revised Section 5.2 Hurricane Season "June through October" to "June through November". Training is not required on procedure revisions. Revised 01/22/08.

1. PURPOSE

The purpose of this procedure is to provide guidelines for plant personnel in the event or potential event of a breach in security at the Honeywell International-Geismar site.

2. SCOPE

2.1 This procedure shall cover any security breach at this facility that may potentially cause harm to personnel, equipment or property.

2.2 This procedure shall also be activated for security breaches occurring at one of the other Plants within the Geismar facility or within the surrounding community.

3. DEFINITIONS

3.1 Security breach – an event or potential event that may compromise the security at this facility causing harm to personnel, equipment or property. Examples include, bomb threats, disgruntled person, suspected terrorist activities or demonstrations by anti-industry organizations.

4. AUTHORITY AND RESPONSIBILITIES

4.1 All personnel shall be responsible to report any suspected activity immediately to site security.

4.2 Site Security Officers shall be responsible for the activation of this procedure immediately upon notification of a potential security breach.

4.3 HSE Department shall be responsible to maintain and revised this procedure.

5. PROCEDURE

5.1 Bomb Threat

5.1.1 The most popular method of making bomb threats is by telephone. It is important that as much information as possible be received from the caller. All bomb threats shall be taken seriously.

5.1.2 In the context of a bomb threat, panic is the ultimate achievement of the caller not taking every step necessary to meet the threat. Therefore, essential plant personnel must remain calm and reduce the threat of

panic. Panic will only increase the potential of injury and property damage.

5.1.3 A calm response to the bomb threat caller could result in obtaining additional information. If told that the facility is occupied or cannot be evacuated in time, the bomber may be willing to give more specific information on the bomb's location, components, or method of initiation.

5.1.4 Threats By Phone

5.1.4.1 All employees who could receive a telephone bomb threat shall be taught how to handle the situation effectively. In the event a call is received, the following procedure shall be followed.

5.1.4.1.1. Stay calm, be courteous, and do not display fear.

5.1.4.1.2. Listen carefully. During or immediately after the conversation, take notes of the exact time of the call was received, the exact words of the caller, and all details such as sex of caller, accent, attitude, background noise and motives. Use the bomb threat checklist (Appendix A) to record the incident.

5.1.4.1.3. Advise the caller that the building, plant or facility may be occupied and the explosion could result in the death or serious injury to many innocent people.

5.1.4.1.4. Keep the caller taking; the more he or she says, the more helpful information. If the caller does not indicate time and location, ask what time is it to go off and where is it located.

5.1.4.1.5. After the phone call, the employee receiving the threat shall notify his/her supervisor immediately.

5.1.5 Threat by Mail

5.1.5.1 In the event a bomb threat is received by mail, the following guidelines shall applied:

5.1.5.1.1. Place all papers and envelopes associated with the threat in a large bag;

5.1.5.1.2. Do not handle the written threat any more than absolutely necessary;

5.1.5.1.3. Do not allow anyone else to touch the note unless specifically authorized; and

5.1.5.1.4. The employee receiving the threat shall immediately report the incident to their supervisor.

5.1.6 Notification

5.1.6.1 The Supervisor of the employee receiving the threat shall assure the following notifications are made to the appropriate plant personnel:

5.1.6.1.1. Plant Manager;

5.1.6.1.2. Department Head;

5.1.6.1.3. Safety Leader; and

5.1.6.1.4. Security Supervisor.

5.1.6.2 The HSE Department shall assure the following regulatory agencies are notified immediately:

5.1.6.2.1. Louisiana State Police

5.1.6.2.2. Ascension Parish Sheriff's Office

5.1.6.3 The HSE Department shall assure the following notifications are made to the appropriate corporate contacts:

5.1.6.3.1. SBU HSER Leader (Tier 1 -Any security breach);

5.1.6.3.2. Submit Event Reporting form (Tier 2 –Potential security breach).

5.1.7 Threat Response

5.1.7.1 The Plant Manager or designee shall determine if an evacuation is necessary based on the credibility of the threat.

5.1.7.2 If an evacuation is ordered, plant personnel shall follow the evacuation guidelines stated in the Emergency Action Plan, SAF-ERP-007.

5.1.7.3 The Safety Leader shall notify Emergency Brigade personnel to be on standby.

5.1.7.4 A predetermined search shall be organized based on information received from the threat.

5.1.7.5 Each affected department shall be calmly informed about the bomb threat, the reason for the search and asked to check their areas for suspicious objects.

5.1.7.6 The search shall be systematic, thorough and calmly conducted with the most vulnerable areas searched first.

5.1.7.7 If a suspicious object is found, the area shall be immediately secured and the State Police notified.

5.1.7.8 If no suspicious object is found, the Plant Manager or designee shall determine when to return plant personnel to normal activities.

6. FLOWCHART

7. PROCEDURE OWNER

7.1 Safety Leader

8. REFERENCES

9. REVISIONS

Revision 1: Revised Procedure Owner due to Annual Review. Training is not required on procedure revisions. Revised 01/27/04.

Revision 2: Revised Approval Authority from B. Lessig to B. Campesi due to annual review. Training is not required on procedure revisions. Revised 08/08/07.

Appendix A

Sample Bomb Threat Telephone Card

A card like this can be printed on narrow paper and placed under telephone to help employees who receive bomb threats.

Time call received:

Date:

Exact wording of bomb threat:

Listen – do not interrupt!! After caller stops volunteering information, ask these questions, trying to keep caller on the line:

1. When is the bomb going to explode?
2. Where is the bomb right now?
3. What does the bomb look like?
4. What kind of bomb is it?
5. What will cause the bomb to explode?
6. Did you place the bomb?
7. Why?
8. What is your address?
9. What is your name?

Record the following information:
Sex of caller:
Age:
Length of call:

Telephone number at which call was received:

Report the call immediately to:

o Plant Manager
o Department Head
o Safety Leader
o Security Supervisor

Caller's voice (check the appropriate descriptors):

o Calm
o Angry
o Excited
o Slow
o Rapid
o Distinct
o Ragged
o Cracking
o Nasal
o Stutter
o Lisp
o Rasp
o Disguised
o Soft
o Loud
o Laughter
o Crying
o Normal
o Whispered
o Deep Breathing
o Accent
o Clearing Throat
o Slurred
o Deep

Familiar – if familiar who does it sound like?

Background sounds (check the appropriate descriptors):

o Street Noises
o Crockery
o PA System
o House Noises
o Motor
o Factory Machinery
o Animal Noises
o Static
o Long Distance
o Office Machinery
o Voices
o Clear
o Music
o Local
o Booth
o Other: _____

Bomb threat language (check the appropriate descriptors):

o Well-spoken (educated)
o Irrational
o Read
o Threat
o Incoherent
o Taped
o Foul

Your remarks:

Your name:

Your position:

1. INTRODUCTION

This procedure establishes requirements for contingency planning and implementation of operating procedures and best management practices to prevent and control the discharge of pollutants resulting from oil and/or hazardous chemical spill events. The Honeywell International Inc. Geismar Facility has chosen to utilize a procedure format to comply with Spill Prevention Control and Countermeasure (SPCC) Plan Requirements with site-specific information grouped in attachments. Keeping all information in separate attachments allows for amendments (additions, deletions or modifications) of such information without triggering the requirement to review and, in certain cases, re-certify the whole plan.

2. PURPOSE

To provide the minimum requirements for spill prevention and control (SPC) programs addressing oil and/or hazardous chemicals and environmental protection.

3. SCOPE

This SPCC Procedure (Plan) is intended to provide the information necessary to comply with 40 CFR 112. References to other documents are used to help simplify and streamline the process of keeping procedures and data current and user-friendly. Inspection, maintenance, operating and notification procedures, as well as personnel information and facility data often change, usually without materially affecting the potential for the facility to have a discharge.

The SPCC Rule allows the SPCC Plan to use cross-referencing rather than including all of the required information in the document itself. In accordance with the SPCC Rule, personnel are trained to rely on attachments and supporting documents and/or manuals to accomplish specific tasks.

4. HOW TO USE THIS SPCC PROCEDURE

As stated above, this Plan has been designed to be modular. The Plan is organized as follows:

The SPCC Procedure (SOP-ENV-700) contains general information and procedures that apply to the Geismar Facility.

Attachment 1 contains the Federal regulatory cross reference and the Louisiana SPC Regulatory Cross Reference.

Attachment 2 is a significant source of information in this Plan. It contains site-specific storage tank data in separate tables, including tank capacity summaries, secondary containment dimensions, containment type, and capacity.

Attachment 3 contains an inventory of the oil containing equipment.

Attachment 4 contains an area map showing the locations of tanks and other storage areas.

Attachment 5 contains an inventory of facility's Oil and Chemical Storage and Loading/Unloading Areas.

Attachment 6 contains assessment of spill potential failure types, spill rates and directions, and containment type.

Attachment 7 contains a spill history for the facility.

Attachment 8 contains the certification of applicability of the substantial harm criteria.

Attachment 9 contains the engineer's certification.

Attachment 10 contains the management approval certification.

Attachment 11 contains containment calculation spreadsheet and examples.

Attachment 12 contains emergency control procedures.

5. APPLICABILITY

Applies to all locations which store and use oil and/or hazardous chemicals.

6. DEFINITIONS

6.1 **Chemical Container** – Totes, Drums and other portable storage devices that hold oil or hazardous chemicals, excluding railcars and tank trucks.

6.2 **Chemical Container Storage Area** - A designated area for the storage of chemical containers with a total stored volume in excess of 250 gallons (1950 liters). In-use laboratory shelf chemicals are excluded.

6.3 **Hazardous Chemicals** – Organic or inorganic chemicals used as feed stocks, intermediates or products; additives such as water and boiler treatment chemicals; ancillary materials such as refrigerants, catalysts, maintenance chemicals; and wastes such as waste water and solid waste which could cause

environmental or health concerns. A chemical may be a solid or liquid at ambient temperature and pressure.

6.4 **Oil** – Material that is essentially immiscible with water, capable of causing environmental harm and derived from petroleum, coal tar, or synthetically derived from natural gas. Oil may be a fuel, lubricant, or a blended material used as a hydraulic or cutting fluid.

6.5 **Secondary Containment** – An active or passive containment system that is designed to prevent the further migration of a spill.

- Examples of passive containment systems are double walls, dikes, curbs, berms, or other physical barriers that operate without human or mechanical input.
- Examples of active containment systems are sump pumps or temporary covers for drains that require human or mechanical input to function.

6.6 **Spill** – Any abnormal or unplanned release of an oil or hazardous chemical.

6.7 **Aboveground Storage Tank** – A stationary vessel located above ground that is used to store materials, products and wastes.

6.7.1 For the purposes of this procedure an Aboveground Storage Tanks are not:

6.7.11. Electrical transformers, regulators and breakers used for the sole purpose of electrical power distribution and transmission.

6.7.12. A flow through process tank that contains a Regulated Substance or substances and that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of material during the operation of the process. Flow through process tanks include, but are not limited to surge tanks, bleed tanks, phase separator tanks, or tanks in which physical or chemical change of a material is accomplished. A flow through process tanks does not include:

6.7.13. A tank that is used for the storage of material before its introduction into a production process; or

6.7.14. A tank that is used for storage of products or by-products from the production process.

6.8 **Regulatory Threshold** – 1,320 gallons or more of aboveground storage capacity of a regulated oil or hazardous substance per facility.

6.9 **Waters of the State** – Both the surface and underground water within the State of Louisiana including all rivers, streams, lakes, estuaries, ground waters and all other water courses and all other waters within the confines of the State and all bordering water and the Gulf of Mexico.

7. AUTHORITY AND RESPONSIBILITIES

7.1 Inspection Plan Review

In accordance with 40 CFR 112.5(b) and LAC33: IX.905.F, a review and evaluation of this SPC Plan is conducted at least once every five years. As a result of this review and evaluation, the plant will amend the SPCC Plan within six months of the review to include more effective prevention and control technology if: (1) such technology will significantly reduce the likelihood of a spill event from the facility, and (2) if such technology has been field-proven at the time of review. Any amendment to the SPCC Plan shall be certified by a Professional Engineer within six months after a change in the facility design, construction, operation, or maintenance occurs which materially affects the facility's potential for the discharge of oil or hazardous material into or upon the navigable waters of the United States or adjoining shorelines.

7.2 Administrative Responsibility – The Environmental Engineer is responsible for administration and revision of this procedure.

7.3 Functional Responsibility – Plant personal are responsible for ensuring that there area met the requirements of this procedure.

7.4 Record Keeping / Logs - Required records are not necessarily kept within the Plan. Wherever recordkeeping is mentioned, it is followed with information on the actual location of the records. This is usually the file room. As stated in the rule, records normally kept for business purposes that provide the required information may be used rather than generating additional records just to meet the SPCC Rule requirements.

8. FACILITY OWNER AND OPERATOR

8.1 Facility Owner, Address, and Telephone

Honeywell International Inc.
P.O. Box 226
5525 Highway 3115
Geismar, LA 70734
(225) 642-8311

8.2 Facility Operator, Address and Telephone

Honeywell International Inc.
Specialty Chemicals
P.O. Box 226
5525 Highway 3115
Geismar, LA 70734
(225) 642-8311

8.3 Facility Contacts

During normal working hours contact:

Environmental Leader	(225) 642-2768
Environmental Engineer	(225) 642-2758
Environmental Technician	(225) 642-2792

After hours contact the Security Department at the Main Gate:

Main Gate	(225) 642-2715

8.4 Date and Year of Initial Facility Operation

The Honeywell, Geismar facility consists of five major manufacturing units, Hydrogen Fluoride, Multi-products, Aclon, HFC-245fa and HFC-125. The plants have been in service since 1967, 1994, 2000, 2002, and 2003 respectfully.

8.5 Description of Nearest Receiving Waters

The facility lies approximately one-half mile from the Mississippi River. The facility is designed to contain all materials in the event of a material release from a storage vessel. All materials are contained onsite and are physically prevented from reaching navigable waters without being routed through onsite wastewater treatment systems.

8.6 Oil and Hazardous Chemical Inventory

8.6.1 The facility shall prepare and document an inventory of oil and hazardous chemicals that includes:

- Identity and amounts of oils and hazardous chemicals in storage and/or in process.
- Type and volume of storage and/or process vessel containing oils and/or hazardous chemicals.
- Whether storage vessel is above or below ground.

- Type and capacity of secondary containment provided.

8.6.2 The Inventory shall be updated whenever a change occurs that affects its efficacy.

- Attachment 2 lists process storage areas containing covered materials;
- Attachment 3 list oil containing equipment; and
- Attachment 4 is an area map showing the locations of tanks and other storage areas
- Attachment 5 contains an inventory of facility's Oil and Chemical Storage and Loading/Unloading Areas.

8.7 Assessment of Spill Potential and Environmental Impact

8.7.1 Where appropriate secondary containment is not considered feasible or practical, alternative strategies to prevent and control spills shall be developed and detailed in the SPC plan.

8.7.2 The basis for such a determination regarding the feasibility or practicality of secondary containment shall be documented.

8.7.3 The major types of failures, quantities, rates, directions, and secondary containment provided for various areas of the facility is detailed in Attachment 6. This information represents typical releases, which might be expected from these areas of the plant.

8.8 Spill History

8.8.1 All spills of an oil or hazardous chemical shall be reported to the HS&E Department. Attachment 7 has been prepared and documents the spill history of the plant.

8.8.2 A written report shall be prepared by the HS&E Department and submitted to the USEPA when the plant has an off site discharge of an oil of no more than 42 gallons in any 12-month period or a single discharge of more than 1,000 gallons.

8.9 Substantial Harm Criteria Checklist

Certification of the applicability of the substantial harm criteria is provided in Attachment 8.

8.10 Certifications

- Certified Engineer – Attachment 9
- Site Leader – Attachment 10

9. CORRECTIVE ACTION AND COUNTERMEASURES

Onsite personnel should practice good house keeping practices and rely on spill prevention practices at all times to minimize the potential for a release of an oil or hazardous chemical.

Operating units and maintenance areas should reduce the potential for spills by reducing the volumes of oils and hazardous chemicals stored at the facility and ensure adequate physical and administrative controls are in place to prevent a spill from occurring.

9.1 The following "Best Management Practices" are recommended:

- Implement "On Time Delivery" of maintenance and process oils and hazardous chemicals;
- Utilize double walled storage tanks when storing oil or hazardous chemicals;
- Repair leaking equipment as soon as reasonably possible;
- Keep secondary containment valves closed at all times except when draining the containment area;
- Keep container lids securely fastened at all times;
- In the event a spill does occur clean up the spill promptly;
- Properly label containers as to their contents, to include labeling a container as empty;
- Ensure all oil or oil containing chemical containers and storage tanks 55 gallons and greater have the appropriate secondary containment;
- During the initial loading/unloading activities operation personal must be present;
- Do not leave portable sources unattended and return portable sources to their storage location after use;
- Use pumps, hosed, pads, drip pans, and funnels when transferring oil or hazardous chemical products from a portable container;
- Protect containers of oil and/or hazardous chemicals from damage by moving equipment;
- Store acidic and caustic materials on impervious surfaces,
- Do not store containers of oil and/or hazardous chemicals near catch basins or floor drains;
- Do not over fill containers; and
- Provide adequate lighting for nighttime operations.

10. SECONDARY CONTAINMENT AREAS AND CONTROL DEVICES

10.1 Secondary containment is required for all oil-containing equipment and/or oil-containing chemical containers having a total volume equal to or in excess of 55 gallons.

10.2 Secondary Containment is required for all hazardous chemical-containing chemical containers having a total volume equal to or in excess of 55 gallons unless the container(s) are stored on an impervious surface and drainage from the area is routed through a wastewater treatment system to a permitted outfall.

10.3 Secondary containment is required for all chemical container storage areas with a total stored volume in excess of 250 gallons.

10.4 Secondary containment or its equivalent is required for all aboveground storage tanks and loading/unloading operations involving oil or hazardous chemicals.

CAUTION: SECONDARY CONTAINMENT IS REQUIRED WHEN STORING OILS AND/OR HAZARDOUS CHEMICALS INSIDE BUILDINGS AND OUTSIDE IN PROCESS AREAS.

10.5 Secondary containment systems shall be sized to accommodate the larger of:

- 110% of the largest vessel in the containment system; or
- 10% of the aggregated capacity of all the vessels within the containment system; or
- 110% of the maximum likely spill event for loading and unloading areas.

NOTE: **Attachment 11** provides examples on how to calculate the required secondary containment area.

10.6 Secondary containments systems which do not meet the above storage criteria and which rely on transfer of spilled material from the immediate containment area must be designed to transfer at a rate equal to or greater than the most probable spill scenario throughout the entire transfer system.

10.7 At a minimum, one of the following secondary containment systems shall be used:

- Double walled storage container;
- Dikes, berms, or retaining walls;
- Curbing;
- Railcar containment pans; or
- Sumps and collection systems.

10.8 In addition to the minimum requirements, consideration should be given to providing one or more of the following control devices:

- Overfill protection;
- Alarms;
- Work practices and procedures; or
- Other systems designed to manually or automatically prevent a release from occurring.

10.9 Secondary containment areas located outdoors shall include an additional 9 vertical inches of freeboard to allow for rainfall.

10.9.1 Portable secondary containment devices that are located outdoors shall be sized to allow for 9 inches of rainfall or be equipped with a protective cover.

10.9.2 Portable secondary containment devices located outdoors shall be equipped with a drain valve to allow for drainage of spilled and or collected materials and rainwater.

10.10 Consideration should be given to the trajectory of material emanating from ruptures in vessels above the containment barrier (wall). Barriers should be sufficiently spaced from the vessels to prevent material from being ejected over the barrier.

10.11 Secondary containment systems shall be impervious to contain spills.

10.12 Storage of acidic and caustic materials in unprotected concrete secondary containment areas is not recommended. Miscellaneous spills over time deteriorate the concrete containment system.

CAUTION: CONCRETE SECONDARY CONTAINMENT AREAS HAVING VISUAL DEFECTS SUCH AS CRACKS AND UNFILLED JOINTS ARE CONSIDERED PERVIOUS TO THE MATERIALS BEING STORED.

10.13 Wherever possible, secondary containment areas should be monolithically poured concrete without joints or unnecessary penetrations.

10.14 Where expansion joints, pipe penetrations, or structural members are integral to the secondary containment structure, they should be leak tight.

10.15 The tops of conduit or pipe penetrations must be above the highest liquid level or must be sealed to prevent leakage.

10.16 The elevation of all secondary containment areas, which are interconnected through uncontrolled or gravity driven conduits must be equal.

10.17 Pumps and other critical equipment must be elevated above the highest liquid level.

10.18 Secondary containment areas shall be equipped with a drain valve or removable plug to allow for containment and drainage of spilled and or collected materials and rainwater.

10.19 Collection points, drainage sumps, etc. shall be integral to the construction.

10.20 Secondary containments equipped with gravity drain systems which DO NOT discharge to another control device or facility must be equipped with a lockable valve.

10.21 Flapper-type drain valves are prohibited from being used as a restraint device.

10.22 Secondary containment drainage valves and plugs shall remain in the closed/locked position except when the secondary containment area is being drained.

10.23 Secondary containments equipped with gravity drain systems which discharge to another control device or facility should be equipped with back flow prevention.

10.24 Sump discharge pumps may not be equipped with automatic start controls unless they discharge to a properly designed control device.

10.25 All sump systems must be equipped with a pumping system to transfer liquids from the outer concrete vault and into the sump.

10.26 Secondary containments for oil and non-miscible, non-water soluble substances with specific gravity's less than 0.95 may be equipped with an automatic, unattended gravity separation system provided that all equipment in the containment be raised on non-metal foundations above the highest possible liquid level.

10.27 The HS&E Department must approve all secondary containment systems.

11. ABOVEGROUND STORAGE TANKS

11.1 When installing a new and/or replacing an aboveground storage tank, consideration should be given for a double walled storage tank.

11.2 Storage containers shall be constructed of materials, which are compatible with their contents.

11.3 For new storage tanks where local fire codes (or other codes) prohibit above ground storage, underground double walled, non-metallic tanks with interstitial leak detection or vaulted tanks are considered acceptable.

11.4 New and old tanks installations should, as far as practical, be fail safe engineered or updated into fail-safe engineered installation to avoid spills.

11.5 Bulk storage tanks should be equipped with liquid level sensing devices. Consideration should be given to providing one or more of the following devices (optional for tanks served by adequate secondary containment systems):

- High liquid level alarms with an audible or visual signal at a constantly manned operation or surveillance station;
- High liquid level pump cutoff device set to stop flow at predetermined tank content level;
- Direct audible or code signal communication between gauger and the pumping station;
- A fast response system for determining the liquid level of each bulk storage tank such as digital computers, telepulse, or direct vision gauges or their equivalent; and
- Additional tank(s) connected to automatically receive overflow.

11.6 Storage tanks shall be properly labeled to facilitate the identification of their contents.

11.7 Mobile or portable storage tanks are prohibited from being stored in areas prone to flooding.

12. UNDERGROUND STORAGE TANKS

12.1 The installation of single-walled underground storage tanks are prohibited.

12.2 Placing a single-walled storage container within a vault of impervious material is considered acceptable.

13. PIPING

13.1 Piping shall be constructed of materials, which are compatible with their contents.

13.2 Buried metallic piping installations shall have a protective wrapping and coated or the equivalent, and should be cathodically protected if soil conditions warrant.

13.3 Pipe supports shall be properly designed to minimize abrasion and corrosion; to allow for expansion and contraction, and to adequately support thrust loadings at bends.

13.4 When a transfer line is not in service or in standby service for an extended time, the terminal connection at the transfer point should be isolated, capped, or blank-flanged as well as marked, or the on/off switch locked out.

13.5 Piping shall be properly labeled to facilitate the identification of their contents.

14. EQUIPMENT

14.1 Equipment such as motors, compressors, and pumps shall not be allowed to operate with a leak, equipment leaks shall be repaired before being placed into service.

14.2 When not in use the facilities heavy equipment fuel and lubrication truck shall be parked within the confines of a secondary containment system located at the HF Mechanics Shop.

15. LOADING AND UNLOADING OPERATIONS

15.1 Written operating instructions shall be prepared and kept updated for all loading and unloading operations involving oils or hazardous chemicals to minimize the likelihood of a spill.

15.2 A visual containment system inspection shall be conducted for each bulk loading/unloading activity. The inspection shall ensure that:

15.2.1 The containment pad or pan is free of residual liquids and is positioned properly to collect any spilled material

15.2.2 The containment sump system is pumped free of excess liquids, the pumps are in automatic position, and aligned to the proper collection vessel

15.2.3 The outer containment vault of the containment sump system is free of any liquids, which if present would indicate that a spill or leak in the sump has occurred

15.3 Loading and unloading operations are PROHIBITED from occurring, when the bulk loading/unloading containment system has accumulated storm water or spill material present in the outer containment vault.

CAUTION: IF ACCUMULATED STORM WATER IS DISCOVERED IN THE OUTER CONTAINMENT VAULT DURING THE VISUAL INSPECTION, LOADING AND UNLOADING OPERATIONS ARE TO STOP UNTIL THE OUTER CONTAINMENT VAULT HAS BEEN INSPECTED AND PROPERLY EMPTIED.

15.4 Operations personnel shall be present during the initiation of the loading/unloading transfer to ensure proper securing of transfer lines.

15.5 Tank car and tank truck loading/unloading areas shall drain into a secondary containment system designed to hold at least the maximum capacity of any single compartment of a tank car or truck.

15.6 A interlocked warning light, physical barrier system, or warning sign shall be provided in loading/unloading areas to prevent vehicular departure, before complete disconnect of flexible or fixed transfer lines.

15.7 Prior to filling and departure of any tank car or truck, the lowermost drain and all outlets of such vehicles shall be examined for leakage, and tightened, adjusted, or replaced to prevent leakage.

15.8 Measure the volume of material in the receiving vessel prior to transfer, to ensure that the receiving vessel has adequate space.

15.9 Drain and disconnect all transfer lines and tightly close all valves prior to truck or rail car departure.

15.10 Spillage and drips from transfer operations must be minimized and cleaned up immediately.

15.11 Adequate lighting shall be provided in all areas where transfer operations will take place.

15.12 Loading and unloading operations shall be performed only in areas where potential spills will not reach storm drains, gravel or earth.

15.13 Systems with automatic shut off provisions shall be considered for loading and unloading operations involving oils and hazardous chemicals.

15.14 Fill/Service connections shall not extend over or outside the containment barrier and should be sufficiently spaced from the vessels or oriented to prevent material from being ejected over the barrier unless additional containment is provided.

15.15 In addition to any valves, fill/service connections should be equipped with a cap or other positive closure device.

15.16 When a pipeline is not in service or in standby service for an extended time, the terminal connections at the transfer point should be isolated, capped, or blank-flanged as well as marked, or the on/off switch tagged as to origin.

16. CHEMICAL CONTAINER MANAGEMENT

16.1 Containers shall be sealed with adequate headspace (eight inches) to allow for thermal expansion and contraction.

16.2 Containers shall be labeled as to their contents, or labeled (or otherwise designated) as empty.

16.3 Containers should be stored on pallets to aid in spill detection.

16.4 Store containers in such a manner as to prevent damage to the container during day-to-day operations.

16.5 Containers shall be located a reasonable distance from property boundaries and storm water drains to minimize the potential for offsite impacts.

16.6 Containers are to be free of visual defects such as dents, holes, and rust.

16.7 Isolate incompatible materials from each other in accordance with good engineering practices.

16.8 Minimize the number of containers on-site. Consider alternative methods such as On-Time Delivery of materials or utilize bulk containers such as totes or tanks for receiving and shipping bulk chemicals and products.

16.9 Drums and other portable storage devices should be observed by the operator when in use. When not in use, the container shall be stored in an area with adequate secondary containment.

16.10 To dispose of empty containers contact the HS&E Department to schedule an appointment to have the empty container delivered to the Environmental Yard for disposal.

17. DRAINAGE CONTROL / DIVERSIONARY STRUCTURES

17.1 Inspection and Drainage from Secondary Containment Areas

17.1.1 Drainage from secondary containment areas shall be restrained by valves or other positive means to prevent a spill event from contaminating additional process and/or storm water.

17.1.2 Secondary containment area drainage valves shall be kept closed except when being used to drain the containment area.

17.1.3 Secondary containment areas (i.e. chemical container storage areas, aboveground storage tank containment areas, loading/unloading containment areas) shall be inspected daily by each operations department for rainfall accumulation, evidence of spills or leaks, and to ensure that containment valves are closed (See Attachment 5)

17.1.4 Prior to draining, area operations personnel shall visually inspect secondary containment areas for oily sheen and/or test the accumulated water for pH, product, or other appropriate parameter using approved analytical test methods to determine if a leak or spill has occurred or is occurring.

CAUTION: IF CONTAMINATION HAS OCCURRED THE SPILLED MATERIAL SHALL BE COLLECTED AND RECYCLED AND/OR DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE RULES AND REGULATIONS. FOR ASSISTANCE ON HOW TO PROPERLY COLLECT AND RECYCLE/DISPOSE OF A SPILLED MATERIAL CONTACT THE HS&E DEPARTMENT.

17.1.5 Spilled materials deemed "salvageable" shall be segregated and returned to the proper storage vessels.

17.1.6 Records of drainage, visual inspections, maintenance, and repairs shall be kept by the appropriate operations area.

18. FACILITY DRAINAGE SYSTEMS AND EQUIPMENT

18.1 Facility drainage shall be constructed of earthen ditches outside of process areas and concrete basins and sumps within the process areas of the facility.

18.2 Facility drainage shall be routed, collected, and discharged through permitted outfalls.

18.3 Ditch systems shall be fitted with isolation valves to control flow of water through the system

18.4 The respective plant operations department is responsible for managing the ditch system and moving water as needed.

19. FINAL DISCHARGE OF DRAINAGE

19.1 All drained materials regardless of point of generation, shall be directed through a wastewater treatment unit and/or discharged through permitted outfalls.

19.2 Master flow and drain valves and any other valves that permit direct outward flow of spilled substances to the waters of the state should be securely locked, tagged, or sealed in the closed position when not in use.

19.3 Starter control on all pumps with discharge piping open to the waters of the state should be locked in the "off" position, or accessible only to authorized personal when in nonoperating or nonstandby status.

20. EXCURSIONS AND INCIDENTS

20.1 All permit excursions and incidents (i.e. spills, releases) shall be reported to the HS&E Department.

21. SITE SECURITY

21.1 Where appropriate, security systems shall be installed to prevent spills of oil and hazardous chemicals caused by vandalism or criminal activities.

21.2 Fencing

21.2.1 The plant's perimeter system shall prohibit unauthorized entry to the facility.

21.2.2 The security force shall conduct regular patrols of plant areas, boundaries, and facilities to ensure the security of the site 24 hours a day.

21.2.3 The plant perimeter fence, where appropriate, is marked and posted.

21.3 Flow Valves Locked

21.3.1 Valves shall be installed to control the flow of product and in the event of a spill closed.

21.3.2 Where practical, warning systems and high level alarms shall be installed to detect an unauthorized opening of a manual valve.

21.4 Starter Controls Locked

21.4.1 Pumps in the facility may be started manually or automatically through the control room.

21.4.2 Facility alarms shall be installed to notify operations personnel if a pump is running and causing high level in a tank or other harmful situations.

21.5 Pipeline Loading/Unloading Connections Securely Capped

21.5.1 All loading or unloading lines shall be closed and capped when not in use.

21.5.2 Each line shall be cleared after loading or unloading operations.

21.5.3 Operations personnel shall be present during the initial loading/unloading operations to ensure proper securing of line and pipes.

21.6 Lighting Adequate to Detect Spills

21.6.1 Facility lighting shall be installed in a manner that aids the detection of a spill by plant personnel during the hours of darkness.

21.6.2 Lighting shall also be installed to provide security from potential acts of vandalism.

21.6.3 Adequate lighting shall be provided in all areas where loading/unloading and transfer operations occur.

22. PERSONNEL TRAINING AND SPILL PREVENTION PROCEDURES

22.1 The plant will provide training for employees who might be expected to:

- Handle oils or hazardous chemicals as part of their job;
- Be directly involved with the implementation of any aspect of the SPCC program; and
- Provide emergency response in the event of a fire, explosion, or spill of oils or chemicals.

22.2 Training must include procedures for proper handling of oils and hazardous chemicals to prevent a release or injury and appropriate corrective actions to be taken in the event of a release.

22.3 Emergency drills must be conducted to evaluate the adequacy of training and emergency procedures and equipment. These drills should be conducted with all appropriate personnel.

22.4 Spill Prevention Briefings

22.4.1 After every emergency drill and actual event, a response briefing and critique shall be conducted.

22.4.2 These meetings discuss the event (i.e. a spill), the response, what worked, what should be improved, etc.

22.4.3 An incident investigation is conducted after all actual emergency situations to determine root cause and prevention activities.

22.4.4 Results of drills, incidents, and investigations are posted for employees to read. In addition, spill prevention and control is a topic for monthly safety meetings for all employees and is conducted annually.

22.5 Spill Control Equipment:

The facility maintains spill control equipment including oil absorbent pads, oil booms, a three inch portable pump, a six inch portable pump, "Oil Dry" absorbent material, shovels, overpack drums, 55 gallon drums, super sacks, soda ash, vacuum wagon with pump and 1000 gallon tank. The soda ash and oil dry are kept in the stores building and the rest of the materials are stored in Environmental Yard.

23. INSPECTIONS AND RECORDKEEPING

23.1 The Reliability Department has the responsibility to perform integrity inspections on storage vessels, piping and associated structures, transfer vessels, and containment systems.

23.2 Integrity inspection records are kept in the Reliability Department. All inspection specifics (timing, methods, etc.) are contained in Reliability Department procedures.

23.3 Discrepancies discovered during an inspection shall be reported immediately to the proper facility personnel.

23.4 Storage Tank Inspections

23.4.1 The Reliability Department is responsible for scheduling, conducting, and documenting tank integrity inspections.

23.4.2 The schedule for periodic testing of aboveground storage vessels is dependent on the service of the vessel and the condition of the vessel during the last inspection. For example, vessels in hydrogen fluoride service are inspected every three years. The records are kept in hardcopy in the Reliability Department.

23.4.3 If corrosion damage is found, additional examination and corrective action shall be taken as indicated by the magnitude of the damage.

23.5 Secondary Containment System Inspection

23.5.1 Plant Areas shall visually inspect their designated secondary containment systems (i.e. sumps, dikes, etc.) **daily** for integrity, cracks, corrosion, wear and tear, and leaks and conduct performance inspections of control devices regularly for proper operation and wear and tear.

23.5.2 Secondary containment areas (i.e. sumps, dikes, etc.) shall be inspected daily by each operations department for rainfall accumulation, evidence of spills or leaks, and to ensure containment valves are closed, plugs in place, or pumps aligned properly.

23.5.3 The HS&E Department shall conducted periodic inspections of each secondary containment area to verify compliance with this procedure.

23.5.4 **Attachment 5** contains an inventory of the facilities secondary containment areas.

23.5.5 Check containers for:

- leaks, drip marks and discoloration;
- puddles containing spilled or leaked material;
- corrosion;
- cracks; and localized dead vegetation

23.5.6 Check foundation for:

- cracks;
- discoloration;
- puddles containing spilled or leaked material;
- settling;
- gaps between tank and foundation; and
- damage caused by vegetation roots.

23.5.7 Check piping for:

- droplets of stored material;
- discoloration;
- corrosion;
- bowing of pipe between supports;
- evidence of stored material seepage from valves or seals; and
- localized dead vegetation.

23.5.8 Check containment for:

- cracks;
- discoloration;
- rainwater accumulation;
- presence of spilled material;
- corrosion (if applicable);
- erosion (if applicable); and
- valve conditions (if applicable).

23.5.9 Retention and drainage ponds

- Erosion;
- Available capacity;
- Presence of spilled or leaked material;
- Debris;
- Stressed vegetation; and
- Condition/status of sumps.

23.5.10Record drainage event:

- Appearance of storm water and/or process water discharged.
- Volume of drainage event; and
- Other details (i.e. pH, organics).

24. EMERGENCY RESPONSE

The plant's emergency response plan (SAF-ERP-004) identifies facility emergency response procedures. The emergency response plan includes:

- Mechanisms to communicate with appropriate individuals or organizations.
- Evacuation of endangered personnel to safe areas.

- Steps for cleanup, storage, and appropriate disposal of hazardous materials contained and collected during the event, including arrangements with emergency response organizations and contractors.
- Mechanisms to maintain an adequate supply of spill cleanup materials and emergency response equipment.

25. EXCURSIONS AND INCIDENTS AND SUBMITTAL OF INFORMATION TO REGIONAL ADMINISTRATOR FOR QUALIFIED DISCHARGE(S)

25.1 All oil and hazardous chemical spills/releases shall be reported immediately per **EMERGENCY RESPONSE PROCEDURE SAF-ERP-009.**

25.2 In the event of a qualified discharge or discharges, official notification will be made by the HS&E Department to the Regional Administrator. If the Facility has had a discharge or discharges which meet one of the following two criteria, then this report must be submitted to the Regional Administrator within 60 days.

- This Facility has experienced a reportable spill as referenced in 40 CFR Part 112.1(b) of 1,000 gallons or more.
- This Facility has experienced two (2) reportable spills (as referenced in 40 CFR Part 112.1(b) of greater than 42 gallons each within a 12-month period.

25.3 A root cause assessment shall be initiated within five (5) days of the spill event and corrective actions gathered from the root cause implementation to prevent any reoccurrence of the spill event.

26. FLOWCHARTS

26.1 Hazardous Chemical Container Storage Area Secondary Containment Flowchart

26.2 Oil Containing Container/Equipment Storage Area Secondary Containment Flowchart

27. REFERENCES

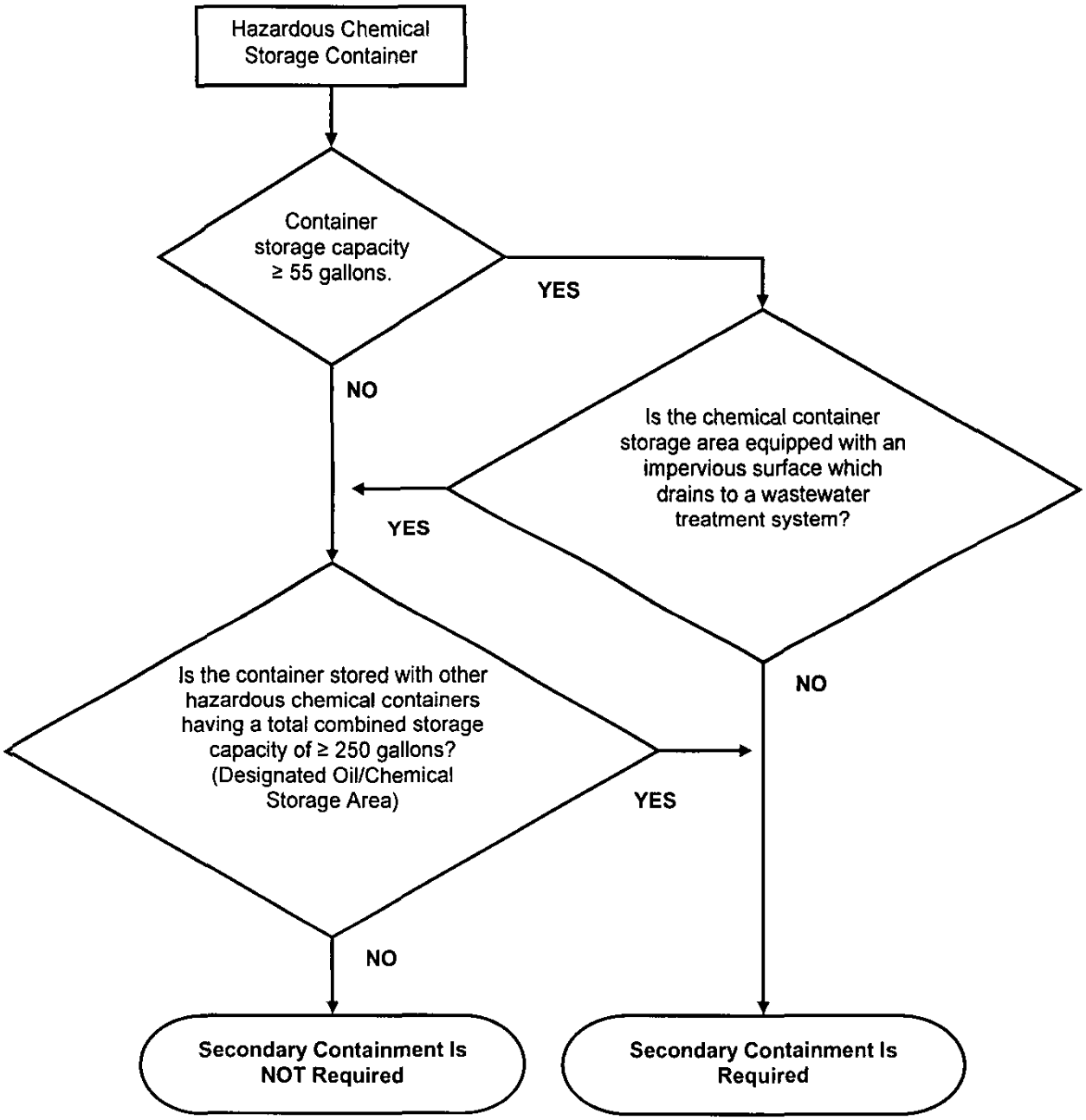
- 40 CFR Part 112, Oil Pollution Prevention and Response
- LAC 33: IX.9 Spill Prevention and Control
- Hazard Communications Program, SAF-SM-202
- Visual Inspection Procedure, SOP-MNT-458
- Guidelines for the Inspection of Atmospheric and Low-Pressure Storage Tanks in Hazardous/Toxic Chemical Service, SOP-MNT-418
- Guidelines for the Inspection of Pressure Vessels and Storage Tanks in Hazardous/Toxic Chemical Service, SOP-MNT-402
- Emergency Response Procedure, SAF-ERP-004

28. AMENDMENTS/REVISIONS

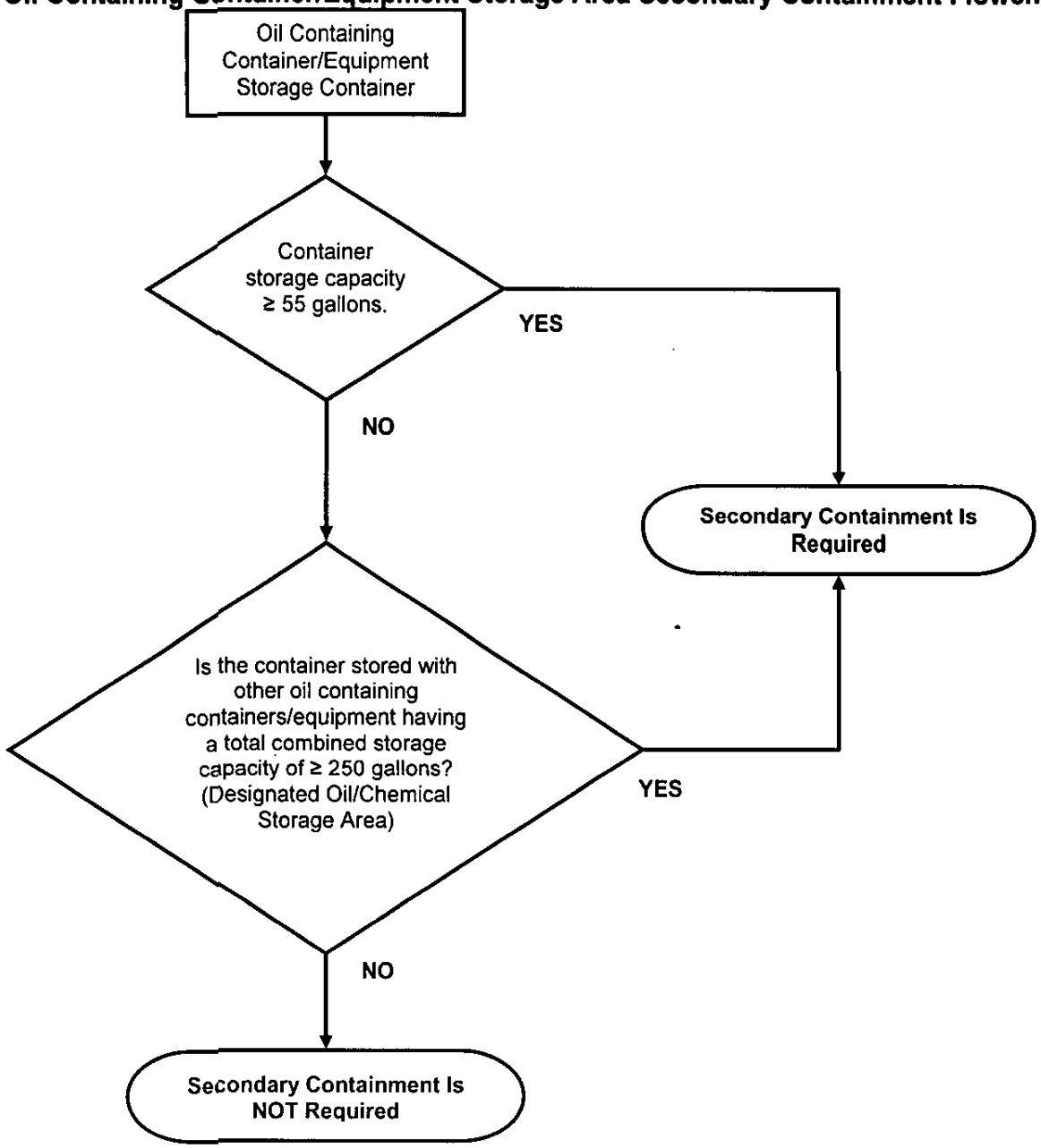
28.1 Amendments and revisions to the Plan are documented by noting revision date, as shown below. For certain technical amendments, a new P.E. certification will be required. If the amendments are related to a modification to a specific containment area, a new certification page (re-certification) corresponding by date will be placed in Attachment 8.

SPCC Plan Revised - 4/9/2005.

Hazardous Chemical Container Storage Area Secondary Containment Flowchart


Hazardous Chemical Storage Container
Container storage capacity ≥ 55 gallons.
YES
NO
Is the chemical container storage area equipped with an impervious surface which drains to a wastewater treatment system?
YES
NO
Is the container stored with other hazardous chemical containers having a total combined storage capacity of ≥ 250 gallons? (Designated Oil/Chemical Storage Area)
YES
NO
Secondary Containment Is NOT Required
Secondary Containment Is Required

Oil Containing Container/Equipment Storage Area Secondary Containment Flowchart



REGULATORY CROSS-REFERENCE		
Citation	Description	Location
§112..3	**Requirement to Prepare and Implement a SPCC Plan**	**SOP-ENV-700**
§112..3	Owner/operator must prepare SPCC plan	All
§112.3(d)(1)	Professional Engineer Certification	Attachment 8
§112.3(e)	Maintain complete copy of plan	All
§112..4	**Amendment of SPCC Plan by Regional Administrator**	**SOP-ENV-700**
§112.4(a)	Report to EPA after specific discharges	Section 25
§112.4(c)	Send above report to appropriate state agencies	Section 25
§112..5	**Amendment of SPCC by Owners / Operators**	Section 25
§112.5(a)	Amendment of SPCC plan by owner or operator	Section 25
§112.5(b)	Management of Five Year Review	Section 7.1
§112.5(c)	PE certification of amendments	Attachment 9
§112..7	**General Requirements for SPCC Plans**	**SOP-ENV-700**
§112.7	Management approval of plan	Attachment 10
§112.7	Cross reference table if plan does not follow sequence of regulations	Attachment 1
§112.7(a)(1)	Discussion of conformance with the requirements of SPCC	Section 1
§112.7(a)(2)	Explanation of any deviations	Section 8
§112.7(a)(3)	Physical layout of the facility including facility diagram	Attachment 4
§112.7(a)(3)(i)	Type of oil in each container and its storage capacity	Attachment 2
§112.7(a)(3)(ii)	Discharge prevention measures including procedures for routine handling of products	Section 17 - 19
§112.7(a)(3)(iii)	Discharge or drainage controls such as secondary containment around containers and other structures, equipment and procedures for control of a discharge	Attachment 2
§112.7(a)(3)(iv)	Countermeasures for discharge discovery, response and cleanup	Section 24
§112.7(a)(3)(v)	Methods of disposal of recovered materials	Section 17
§112.7(a)(3)(vi)	Contact list and phone numbers	Section 14 (SAF-ERP-004)/ Section 8.3
§112.7(a)(4)	Procedures for reporting a discharge, unless FRP has been submitted	Section 14 (SAF-ERP-004)
§112.7(b)	Discharge predication	Attachment 5
§112.7(c)	Appropriate containment or diversion:	Attachment 5
§112.7(d)	Deviations due to impracticability	**SOP-ENV-700**
§112.7(e)	Inspections, tests, and records	Section 23
§112.7(f)	Employee training and discharge prevention procedures	Section 22
§112.7(f)(1)	Oil-handling personnel training	Section 22
§112.7(f)(2)	Accountable person for discharge prevention	Section 5 and Attachment 9
§112.7(f)(3)	Discharge prevention briefings	Section 22
§112.7(g)	Security (excluding oil production facilities)	Section 21
§112.7(g)(1)	Fencing and lock/guard gates	Section 21
§112.7(g)(2)	Fail-safe valves for containers	Section 21
§112.7(g)(3)	Starter control on each pump	Section 21
§112.7(g)(4)	Loading/unloading connections of oil pipelines or facility piping when not in service	Section 21

REGULATORY CROSS-REFERENCE		
§112.7(g)(5)	Lighting	Section 21
§112.7(h)	Tank Car and Tank Truck Loading / Unloading Rack (excludes offshore facilities)	Section 15
§112.7(h)(1)	Handling discharges	Section 14 (SAF-ERP-004)
§112.7(h)(2)	Preventing early vehicle departure	Section 15
§112.7(h)(3)	Inspection for discharges prior to filling and departure	Section 15
§112.7(i)	Evaluate field-construct above ground tanks upon repair, etc.	n/a
§112.7(j)	Conformance with State requirements	Attachment 1
§112.8	**Requirements for onshore facilities (excluding Production facilities)**	**SOP-ENV-700**
§112.8(a)	General and specific requirements	**SOP-ENV-700**
§112.8(b)	Facility drainage	Section 19
§112.8(b)(1)	Restrain drainage from diked storage areas	Section 17
§112.8(b)(2)	Manual valves in diked areas	Section 17
§112.8(b)(3)	Facility drainage systems from undiked areas with a potential for a discharge	Section 17
§112.8(b)(4)	If not 8(b)(3), diversion system for ditches	Section 17
§112.8(b)(5)	If pump transfer required for drainage water treatment, provide fail-safe pumps and at least two pumps	Section 17
§112.8(c)	Bulk storage containers	Attachment 2
§112.8(c)(1)	Material and construction	Attachment 2
§112.8(c)(2)	Secondary means of containment	Attachment 2
§112.8(c)(3)	Drainage controls to storm drain or open water bodies	Section 19
§112.8(c)(4)	Protection of completely buried metallic tanks from corrosion	n/a
§112.8(c)(5)	Partially buried or bunkered metallic tanks protection from corrosion	n/a
§112.8(c)(6)	Aboveground container testing for integrity	Section 23
§112.8(c)(7)	Monitor possible leakage from defective internal heating coils	Section 23
§112.8(c)(8)	Container installation updates per good engineering practice	Section 23
§112.8(c)(9)	Observation of effluent treatment facilities	Section 19
§112.8(c)(10)	Correction of visible discharges	Section 19
§112.8(c)(11)	For mobile or portable containers provide secondary containment	Section 14
§112.8(d)	Facility transfer operations, pumping, and facility process	Section 19
§112.8(d)(1)	Buried pipe corrosion protection	Section 13
§112.8(d)(2)	Capping and marking pipe out of service	Section 13
§112.8(d)(3)	Pipe supports	Section 13
§112.8(d)(4)	Inspect aboveground valves, pipelines, appurtenances and buried piping	Section 13
§112.8(d)(5)	Vehicle warnings	n/a
§112.9	**Requirements for onshore oil production facilities**	**SOP-ENV-700**
§112.9(a)	General and specific requirements	**SOP-ENV-700**
§112.9(b)	Oil production facility drainage	**SOP-ENV-700**
§112.9(b)(1)	Restrain drainage from diked storage areas	Section 17
§112.9(b)(2)	Inspect for accumulated oil	Section 17
§112.9(c)	Oil production facility bulk storage containers	Attachment 2
§112.9(c)(1)	Material and construction	Attachment 2
§112.9(c)(2)	Secondary means of containment	Attachment 2
§112.9(c)(3)	Visually inspect containers	Section 11, 16
§112.9(c)(4)	Engineer or update new and old tank battery installations, provide one of the	**SOP-ENV-700**

REGULATORY CROSS-REFERENCE		
	following:	
§112.9(c)(4)(i)	Container capacity adequate to ensure it will not overfill if personnel is delayed in rounds	Attachment 2
§112.9(c)(4)(ii)	Overflow equalizing lines between containers	Attachment 2
§112.9(c)(4)(iii)	Vacuum protection adequate to prevent container collapse during transfer	n/a
§112.9(c)(4)(iv)	High level sensors to generate and transmit an alarm to a computer if subject to a computer production control system	Section 11
§112.9(d)	Facility transfer operations, oil production facility	Section 15
§112.9(d)(1)	Inspect all aboveground valves and piping associated with transfer operations	Section 15
§112.9(d)(2)	Inspect saltwater disposal facilities	n/a
§112.9(d)(3)	Maintain flowlines	Section 13

LOUISIANA SPC REGULATORY CROSS REFERENCE TABLE

LA Rule	Description of Section	Section	Comments*
NA	Licensed P.E. Certification of Plan	Attachment 8	No equivalent requirement in LA.
§ 901.A.	**Scope**	SOP-ENV-700	LA regulations apply to spill events that have the potential to be discharged to **"waters of the state"** instead of "waters of the U.S."
§ 903.A.	**Applicability**	SOP-ENV-700	LA regulations extend applicability beyond just oil to **hazardous substances** and **produced water.**
§ 903.H.	Conformance with State requirements.	SOP-ENV-700	§ 903.H. is sort of the reciprocal section of the introductory portion of § 112.7(e) in the Federal old rule.
§ 905	**Requirements for Preparation and Implementation of Plans**		
§ 905.A.	Requirements for Preparation/Implementation of Plans	SOP-ENV-700	
§ 905.B.	SPCC Plan Deadlines	SOP-ENV-700	
§ 905.C.	Location of SPCC Plan	SOP-ENV-700	
§ 905.D.	Amendment of SPCC Plan by Regional Administrator	SOP-ENV-700	
§ 905.E.	Amendment of SPCC Plan by Owners or Operators	SOP-ENV-700	In LA, amendments to the plan must be implemented **prior to or concurrent with** the facility modification compared to the Federal rule which allows up to 6 months to implement such amendments.
§ 905.F.	Periodic Review of Plan	SOP-ENV-700	
§ 907	**Guidelines for the Preparation and**		

	Implementation of a Plan		
§ 907.B.1	Name of facility	SOP-ENV-700	
§ 907.B.2	Name of the operator of the facility	SOP-ENV-700	
§ 907.B.3	Mailing address of the facility	SOP-ENV-700	
§ 907.B.4	Location of the facility	SOP-ENV-700	
§ 907.B.5	Date and year of initial facility operation	SOP-ENV-700	
§ 907.B.6	Description of facility	SOP-ENV-700	
§ 907.B.7	Identity amount, and location of stored substances	Attachment 2	
§ 907.B.8	Facility capacity and procedures for taking corrective actions / countermeasures when a spill occurs	Section 24	
§ 907.D.	Secondary containment - type.	Attachment 2	
§ 907.E.	Contingency planning.	SOP-ENV-700	
§ 907.F	Additional requirements	SOP-ENV-700	
§ 907.F.1	Secondary containment - amount.	Attachment 2	§ 112.7(e)(5)(iii)(8) § 112.7(e)(5)(iii)(B); § 112.7(e)(5)(iii)(D); § 112.7(e)(5)(iii)(C)
§ 907.F.2	Drainage	Section 18 -19	§ 112.7(e)(1)(i); § 112.7(e)(1)(ii)
§ 907.F.3	Fail safe engineering - (Optional for tanks w. adequate secondary containment)	n/a	§ 112.7(e)(5)(iii)(B); § 112.7(e)(5)(iii)(D); § 112.7(e)(5)(iii)(C)
§ 907.F.4	Inspection of aboveground Tanks	Section 23	§ 112.7(e)(5)(iii)(B); § 112.7(e)(5)(iii)(D); § 112.7(e)(5)(iii)(C)
§ 907.F.5	Buried metallic pipe	Section 13	
§ 907.F.6	Out-of-service pipe	n/a	
§ 907.F.7	Pipe supports	Section 13	
§ 907.F.8	Aboveground valves and pipelines	Section 13	
§ 907.F.9	Tank car and truck loading and unloading drainage	Section 15	

§ 907.F.10	Protection against premature vehicular departure	Section 15	
§ 907.F.11	Inspection of tank car or truck outlets before filling and departure	Section 15	
§ 907.G.	Drainage:	See Below	
§ 907.G.1	From undiked areas	Section 17	§ 112.7(e)(1)(i); § 112.7(e)(1)(ii)
§ 907.G.2	System adequately engineered to prevent spills	Attachment 2	
§ 907.H.	Security (excluding oil production facilities).	Section 21	
§ 907.H.1	Restricting unauthorized entry	Section 21	
§ 907.H.2	Master flow and drain valves	Section 17 -19	
§ 907.H.3	Control on all pumps	Section 19	
§ 907.H.4	Loading / unloading connections of pipelines	Section 15	
§ 907.H.5	Facility lightening	Section 21	
§ 907.I.	Employee training and discharge prevention procedures.	Section 22	
§ 907.I.1	Properly instructing personnel in the operation and maintenance of equipment	Section 22	
§ 907.I.2	Designated person accountable for spill prevention	SOP-ENV-700 and Attachment 9	
§ 907.I.3	Spill prevention briefings	Section 22	
§ 907.J.	Inspections, tests, and records.	Section 23	

Honeywell Specialty Chemicals

Miscellaneous Storage Tanks

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
	Oil Drums	Ref Oil	55	22" x 35	CYL, V	Carbon Steel	2006	Plastic Curb	82
	Satalite Accumulation Area - Contractor	Hazardous Waste	55	22" x 35	CYL, V	Carbon Steel	2006	Plastic Curb	75
	Satalite Accumulation Area - Contractor	Hazardous Waste	55	22" x 35	CYL, V	Carbon Steel	2006	Plastic Curb	75
	Satalite Accumulation Area - Contractor	Hazardous Waste	55	22" x 35	CYL, V	Carbon Steel	2006	Plastic Curb	75
	Process Water Clarifier Diesel Storage Tank	Diesel	650	48" x 90"	CYL, H	Carbon Steel	2006	Double Walled	58
	Dock Diesel Storage Tank	Diesel	1,600	5'-4" x 9'	CYL, H	Carbon Steel	1987	Concrete	1997
	Railroad Diesel Storage Tank	Diesel	2,022	5'-4" x 12'	CYL, H	Carbon Steel	1998	Concrete	1219
	Fire Pond Diesel Tank	Diesel	560	4' x 6'	CYL,H	Carbon Steel	1966	Concrete	873
	Gasoline Tank - Main Gate	Gasoline	4,000	11' x 8'	CYL,H	Carbon Steel	2006	Double Walled	130
	Used Oil Storage Tank at Mechanics Shop	Motor Oil	500	33" x 60" x 72"	RECT	Carbon Steel	2007	Double Walled	103
	Motor Oil Storage at Mechanics Shop	Motor Oil	275	28" x 67" x 44"	CYL, V	Carbon Steel	2007	Double Walled	27
	Motor Oil Storage at Mechanics Shop	Motor Oil	275	28" x 67" x 44"	CYL, V	Carbon Steel	2007	Double Walled	27
	Motor Oil Storage at Mechanics Shop	Motor Oil	275	28" x 67" x 44"	CYL, V	Carbon Steel	2007	Double Walled	27
	Used Oil Storage Tank E Side of Central Shop	Motor Oil	55	4' x 6'	CYL, H	Carbon Steel	2005	Concrete	673
V-161	Fire Water Pond Diesel Storage Tank	Diesel	564	4' x 6'	CYL, H	Carbon Steel	1982	Concrete Curb	873

Honeywell Specialty Chemicals

MPP Storage Tanks

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
	Satalite Accumulation Area	Hazardous Waste	55	22" x 35	CYL, V	Carbon Steel	2006	Plastic Curb	75
	Emergency Generator	Diesel	240	24" x 48" x 48"	RECT	Carbon Steel	1990	Concrete Dike	35
	Oil/Chemical Storage - Bay #1	Drum Storage	55	22" x 35	CYL, V	Carbon Steel	1990	Concrete Curb	613
	Oil/Chemical Storage - Bay #2	Tote Storage	250	N/A	N/A	N/A	1990	Concrete Curb	445
	Oil/Chemical Storage - Bay #3	Drum Storage	55	22" x 35	CYL, V	Carbon Steel	1990	Concrete Curb	1003
	Oil/Chemical Storage - Bay #4	Rydlyme	55	22" x 35	CYL, V	Carbon Steel	1990	Concrete Curb	1003
	Oil/Chemical Storage - Bay #5	Tote Storage	N/A	N/A	N/A	N/A	1990	Concrete Curb	446
	North Cooling Tower	Drum Storage	55	22" x 35	CYL, V	Carbon Steel	1990	Concrete Curb	1615
	North Cooling Tower	Spectrus	500	48"' x 72"	CYL,V	Polyethylene	1990	Concrete Curb	1615
	North Cooling Tower	Nalco 3DT177	500	48"' x 72"	CYL, H	Polyethylene	1990	Concrete Curb	1615
	Oil Storage	Oil	55	22" x 35	CYL, V	Carbon Steel	2002	Concrete Curb	1870
	North Cooling Tower	Nalco 3DT104	500	48"' x 72"	CYL, H	Polyethylene	1990	Concrete Curb	1615
U-100	PCE Storage	PCE	100,000	15' x 80'	CYL, H	Carbon Steel	1994	Concrete Dike	136365
U-101	TCE Storage	TCE	100,000	15' x 80'	CYL, H	Carbon Steel	1994	Concrete Dike	136365
U-120	Caustic Storage	NaOH	8,000	9'-6" x 16'	CYL, V	Carbon Steel	1994	Concrete Dike	28171
U-130	Sulfuric Storage	H_2SO_4	8,000	9'-6" x 16'	CYL, V	Carbon Steel	1994	Concrete Dike	472524
U-140	Sodium Sulfite Storage	Na_2SO_3	8,000	9'-6" x 16'	CYL, V	Carbon Steel	1994	Concrete Dike	28171
U-223	HCL Pump Tank	HCl	600	4'-6" x 5'	CYL, V	Carbon Steel	1994	Concrete Curb	25323
U-231	Primary Caustic Pump Tank	Water, NaOH	750	4' x 8'	CYL, H	Carbon Steel	1994	Concrete Curb	25323
U-232	Secondary Caustic Pump Tank	Water, NaOH	1,000	4'-6" x 8'	CYL, H	Carbon Steel	1994	Concrete Curb	25323
U-233	Sulfuric Scrubber Pump Tank	H_2SO_4	750	4'-6" x 8'	CYL, H	Carbon Steel	1994	Concrete Curb	25323
U-240	Crude Gas Surge Tank	Genetrons	4,000	7' x 15'	CYL, H	Carbon Steel	1994	None	n/a*
U-290	Slurp Sparger Tank	Water, NaOH	1,000	4'-6" x 8'	CYL,H	Carbon Steel	1994	Concrete Curb	25323
U-300	HF Feed Tank	HF	4,500	6' x 20'	CYL,H	Carbon Steel	1994	Concrete Dike	51539
U-301	MPP HF Purge Pot	HF	700	3'-11" x 7'-8"	CYL,V	Carbon Steel	1997	Concrete Dike	29304
U-305	134a Recycle Tank	Organics, HCFC's, & HF	4,500	6' x 20'	CYL,H	Carbon Steel	1994	Concrete Dike	51539
U-310	120's Recycle	HCFC's, organic, & HF	4,500	6' x 20'	CYL,H	Carbon Steel	1994	Concrete Dike	51539
U-315	Emergency Dump Tank	HCFC's, organic, & HF	4,500	6' x 20'	CYL,H	Carbon Steel	1994	Concrete Dike	51539
U-325	Crude Feed Tank	Genetrons	20,000	11' x 27'	CYL,H	Carbon Steel	1994	Concrete Dike	51539
U-330	HFC-125 Crude Temp Hold Tank	Genetrons	5,000	5'-6" x 30'	CYL,H	Carbon Steel	1994	None	n/a*
U-335	134a Crude Feed Tank	G-134a	20,000	11' x 27'	CYL,H	Carbon Steel	1994	None	n/a*
U-360A	134A Day Tank	G-134a	12,000	7' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-360B	134A Day Tank	G-134a	12,000	7' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-370A	124 Day Tank	G-124	12,000	7' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-370B	124 Day Tank	G-124	12,000	7' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-380A	125 Day Tank	G-125	4,000	4' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-380B	125 Day Tank	G-125	4,000	4' x 45'	CYL,H	Carbon Steel	1994	None	n/a*
U-390	130's Startup	Genetrons	12,000	7' x 45'	CYL,H	Carbon Steel	1994	Concrete Dike	47596*
U-391	120's Startup	Genetrons	12,000	7' x 45'	CYL,H	Carbon Steel	1994	Concrete Dike	47596*
U-410A	134a Product Storage	G-134a	40,000	10' x 75'	CYL,H	Carbon Steel	1994	None	n/a*
U-410B	134a Product Storage	G-134a	40,000	10' x 75'	CYL,H	Carbon Steel	1994	None	n/a*
U-420A	124 Product Storage	G-124	40,000	10' x 75'	CYL,H	Carbon Steel	1994	None	n/a*
U-420B	124 Product Storage	G-124	40,000	10' x 75'	CYL,H	Carbon Steel	1994	None	n/a*
U-430	125 Product Storage	G-125	16,000	6' x 75'	CYL,H	Carbon Steel	1994	None	n/a*

MPP Tank Data

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
U-432	125 Product Storage	G-125	25,000	8' x 68'	CYL,H	Carbon Steel	1994	Concrete Dike	25624*
U-460A	HCl Storage	HCl	150,000	30' x 30'	CYL,V	Carbon Steel, Rubber Lined	1994	Concrete Dike	472524
U-460B	HCl Storage	HCl	150,000	30' x 30'	CYL,V	Carbon Steel, Rubber Lined	1994	Concrete Dike	472524
U-460C	HCl Storage	HCl	150,000	30' x 30'	CYL,V	Carbon Steel, Rubber Lined	1994	Concrete Dike	472524
U-620	North Cooling Tower	Sodium Hypochlorite	2,500	7.5 X 8'	CYL, V	Double Walled Polly	2004	Concrete Dike	1615
U-825	Lime Slurry Tank	Lime & Water	1,250	11' X 7'	CYL,V	Carbon Steel	1994	None	
U-850	Sludge Hold Tank	CaF & Water	4,000	7' x 16'	CYL,V	Carbon Steel	1994	Concrete Dike	57073
U-870	Wastewater Discharge Tank	Water	600	5' x 5'	CYL,V	Carbon Steel	1994	Concrete Dike	57073
U-900	T-Ox Quench Tank	O_2, N_2, Water, Acid, CO_2	600	4' x 7'	CYL,V	FRP	1994	Concrete Curb	2700
U-902	T-Ox Gas Holder	Genetrons	40,000	9'-6" x 83'-2"	CYL,H	Carbon Steel	1994	None	n/a*
U-920	T-Ox Waste Acid Storage	HF, HCl, Water	150,000	30' x 30'	CYL,V	Carbon Steel, Rubber Lined	1994	Concrete Dike	472524
U-935	Spent Sulfuric Storage	H_2SO_4	8,000	9'-6" x 16'	CYL,V	Carbon Steel	1994	Concrete Dike	472524
U-940A	Spent Acid/Caustic Storage	Acid & Caustic	6,000	7'-6" x 20'	CYL,V	Cross Lined Poly.	1997	Concrete Dike	57073
U-940B	Spent Acid/Caustic Storage	Acid & Caustic	6,000	7'-6" x 20'	CYL,V	Cross Lined Poly.	1997	Concrete Dike	57073
U-950	Emergency Relief Scrubber Tank	Acid & Caustic	11,000	14' x 10'	CYL, H	Carbon Steel	1997	Concrete Dike	21298

* - All product storages which are not in contained areas contain materials which imediately vaporize to the atmosphere upon release.

Honeywell Specialty Chemicals

HF Storage Tanks

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
	HF Laboratory	Methonal	55	22" x 35	CYL, V	Carbon Steel	1967	Concrete Curb	168
	Satalite Accumulation Area	Hazardous Waste	55	22" x 35	CYL, V	Carbon Steel	2003	Concrete Curb	150
	Hydrolysis Waste Loading Area	Sulfuric/Arsenic Acid	6,000	N/A	CYL, H	316L Stainless Steel	2007	Conc., Drainage	24,506
	HF Plant Oil/Lube Storage Area	Oil	55	22" x 35	CYL, V	Carbon Steel	1980	Steel Dike	1,450
	HF Plant Oil/Lube Storage Area	Oil	72	21" x 22" x 36"	Square	Carbon Steel	1980	Concrete Curb	180
	HF Valve Decon Area	Sodiun Hydroxide	500	48"' x 72"	CYL, H	Polyethylene	2004	Double Walled	46
	Trailer Wash Area	SoChem H-25	500	48"' x 72"	CYL, H	Polyethylene	2004	None	0
	Trailer Wash Area	SoChem - Non Haz	500	48"' x 72"	CYL, H	Polyethylene	2004	None	-
	Emergency Gallagher Pump	Diesel	325	36' x 72"	CYL, H	Carbon Steel	1993	Steel Dike	125
	Furnace # 1 Aux Motor	Diesel	77	24" x 24" x 31"	Square	Carbon Steel	1981	None	0
	Furnace # 2 Aux Motor	Diesel	77	24" x 24" x 31"	Square	Carbon Steel	1981	None	0
	Furnace # 3 Aux Motor	Diesel	77	24" x 24" x 31"	Square	Carbon Steel	1981	None	0
	Furnace # 4 Aux Motor	Diesel	77	24" x 24" x 31"	Square	Carbon Steel	1981	None	0
	Emergency Generator	Diesel	1,500	64' x 116	CYL, H	Carbon Steel	2006	Double Walled	114
	HF Compressor Room	NALCO 8337	250	36' x 36" x 36"	RECT	310 Stainless Steel	2007	None	-
	HF Utility Area	NexGuard	250	36' x 36" x 36"	RECT	310 Stainless Steel	2007	None	-
	North Cooling Tower	Sodium Hydroxide	500	48"' x 72"	CYL,V	Polyethylene	2006	None	-
	North Cooling Tower	Nalco 3DT177	500	48"' x 72"	CYL, H	Polyethylene	1993	Conc., Drainage	1,000
	North Cooling Tower	Nalco 3DT104	500	48"' x 72"	CYL, H	Polyethylene	1993	Conc., Drainage	1,000
	HF Dump Tank	HF	95,426	13' x 91'	CYL, H	Carbon Steel	1993	Conc., Drainage	-
	HF Dump Tank Scrubber Tank	HF, Water	1,000	8' x 8'	CYL,V	Carbon Steel	1993	Conc., Drainage	-
U-3	West Feed Acid Tank	HF	2,068	7'-11" x 7'-8"	CYL,V	310 Stainless Steel	1999	Conc., Drainage	-
U-4	Spar Storage	Fluorospar	300,000	32' x 50'	CYL,V	Carbon Steel	1981	Conc., Drainage	-
U-9	South Drip Acid Tank	HF	2,856	9' x 6'-9"	CYL,V	310 Stainless Steel	1990	Conc., Drainage	-
U-13	#4 HF Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-18	#5 HF High Purity Commerical Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-19	#6 HF High Purity Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-20	#7 HF High Purity Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-51	Hydrate Storage	Out of Service	-	-	-	-	-	-	-
U-55	AlFl3 Storage	Out of Service	-	-	-	-	-	-	-
U-202	99 Sulfuric Acid Storage	Sulfuric Acid	262,095	40' x 28'	CYL,V	Carbon Steel	1998	Asphalt Dike	293,255
U-203	Oleum Storage	Oleum	130,850	32' x 22'	CYL,V	Carbon Steel	1981	Asphalt Dike	293,255
U-204	East Feed Acid Tank	HF	2,068	7'-11" x 3'-6"	CYL,V	310 Stainless Steel	1997	Conc., Drainage	-
U-205A	#1 HF Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-205B	#2 HF Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-205C	#3 HF Commercial Storage	HF	37,680	11' x 51'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-206A	#8 HF High Purity Commercial Storage	HF	132,200	14'-10" x 82'	CYL,H	Carbon Steel	1981	Conc., Drainage	-
U-211	North Drip Acid Tank	HF	423	3'-6" x 5'-8"	CYL,V	Carbon Steel, TFE Lined	1995	Conc., Drainage	-
U-212A	A Residue Neutralizer	HF/Water	25,570	16' x 12'	CYL,V	Carbon Steel	1981	Conc., Drainage	12,963
U-212B	B Residue Neutralizer	HF/Water	25,570	16' x 12'	CYL,V	Carbon Steel	1981	Conc., Drainage	12,963
U-212C	C Residue Neutralizer	HF/Water	25,570	16' x 17'	CYL,V	Carbon Steel	1981	Conc., Drainage	12,963
U-213	HF Water Scrubber Seal Tank	HF	470	4' x 5'	CYL,V	Fiberglass	1981	Acid Brick, Drain	-

HF Plant Tank Data

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
U-216	HF Scrubber Overflow Seal Tank	HF	129	2'-6" x 3'-6"	CYL,V	Fiberglass	1981	Acid Brick, Drain	-
U-301	Brine Mix Tank	Brine	212	2'-6" x 9'-6"	CYL,V	Carbon Steel	1981	Drainage	-
U-302	Brine Makeup Tank	Brine	560	4' x 6'	CYL,V	Carbon Steel	1981	Drainage	-
U-351	Relief Valve Scrubber Tank	HF	881	5' x 5'	CYL,V	Carbon Steel	1987	Conc., Drainage	-
U-501	South Aqueous Storage	HF	14,068	11'-11" x 21.5'	CYL,H	Carbon Steel	1984	Conc., Drainage	5,049
U-502	North Aqueous Storage	HF	29,087	11'-11" x 35'	CYL,H	Carbon Steel	1984	Conc., Drainage	5,049
U-503	Aqueous Purge Pot	HF	212	2'-11" x 2'-10"	CYL,V	Carbon Steel	1991	Conc., Drainage	5,049
U-607	South Cooling Tower	Sodium Hydroxide	500	48"' x 72"	CYL, H	Polyethylene	1993	Conc., Drainage	1,403
U-608A	South Cooling Tower	Nalco 3DT177	500	48"' x 72"	CYL, H	Polyethylene	1993	Conc., Drainage	1,403
U-608B	South Cooling Tower	Nalco 3DT190	500	48"' x 72"	CYL, H	Polyethylene	1993	Conc., Drainage	1,403
U-703	49% HF Day Tank	49% HF	7,050	10' x 12'	CYL,V	Polyethylene	1994	Conc., Drainage	3,379
U-704	49% HF Final Storage	49% HF	7,050	10' x 12'	CYL,V	Polyethylene	1994	Conc., Drainage	3,379
U-705	49% HF Final Storage	49% HF	7,050	10' x 12'	CYL,V	Polyethylene	1994	Conc., Drainage	3,379
U-707	Scrubber Recirculation Tank	HF/Water	3,000	8' x 8'-9"	CYL,V	Carbon Steel	1994	Conc., Drainage	-
U-710	Antifumant Storage	HF Antifuming Agent	6,000	10' x 10'	CYL,V	Carbon Steel	1996	Conc., Drainage	23,313
U-711	Modified HF Tank	HF	4,700	10' x 8'	CYL,H	Carbon Steel	1996	Conc., Drainage	23,313
U-801	High Purity Pump Tank	HF	740	2'-5" x 13'-3"	CYL,V	Carbon Steel	1986	Conc., Drainage	-
U-802	Catalyst Makeup Tank	Catalyst	225	3' x 4'	CYL,H	Stainless Steel	2007	Conc., Drainage	-
U-803	Hydrogen Peroxide Feed Tank	Hydrogen Peroxide	225	3' x 4'	CYL,H	Stainless Steel	2007	Conc., Drainage	-
U-804	Catalyst Feed Tank	Catalyst	225	3' x 4'	CYL,H	Stainless Steel	2007	Conc., Drainage	-
U-805	Hydrogen Peroxide Storage Tank	Hydrogen Peroxide	7,297	10' x 12'	CYL,H	Stainless Steel	2007	Conc., Drainage	14,383
U-810	Evaporator Seperator	Sulfuric/Arsenic Acid	470	4' x 5'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
U-811	Hydrolysis Hold Tank	Sulfuric/Arsenic Acid	560	4' x 6'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
U-821	Hydrolysis Waste Tank	Sulfuric/Arsenic Acid	6,596	108" x 166	CYL,V	Stainless Steel	2007	Conc., Drainage	8,057
U-822	Over Head Tank	Sulfuric/Arsenic Acid	700	4' x 8'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
U-840	Lime Unit Silo	Quick Lime	76,381	18'-5" x 48'	CYL,V	Carbon Steel	1976	Conc., Drainage	-
U-841	Lime Mix Tank	Lime Slurry	6,960	12'-6" x 7'-7"	CYL,V	Carbon Steel	1995	Conc., Drainage	-
U-846A	Lime Neutralization Tank	Wastewater	16,120	14' x 14'	CYL,V	Carbon Steel	1995	Conc., Drainage	-
U-846B	Lime Neutralization Tank	Wastewater	16,120	14' x 14'	CYL,V	Carbon Steel	1995	Conc., Drainage	-
V-160A	Lime Silo #1	Quick Lime	77,428	15' x 56'	CYL,V	Carbon Steel	1966	Conc., Drainage	-
V-160B	Lime Silo #2	Quick Lime	77,428	15' x 56'	CYL,V	Carbon Steel	1966	Conc., Drainage	-
R-801	Oxidation Reactor	H2O2/HF	1500	4' x 16'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
S-801	Phase Seperator	HF	560	4' x 6'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
R-820A	Hydrolyzed Liquor Tank	Sulfuric/Arsenic Acid	560	4' x 6'	CYL,H	Carbon Steel	2007	Conc., Drainage	-
R-820B	Hydrolyzed Liquor Tank	Sulfuric/Arsenic Acid	560	4' x 6'	CYL,H	CYL,H	2007	Conc., Drainage	-
E-821	Hydro Cooler	Sulfuric/Arsenic Acid	324 ft2	-	CYL,V	Carbon Steel	2007	Conc., Drainage	-

Honeywell Specialty Chemicals

Aclon Storage Tanks

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
	Waste Water Chemicals	Nalco 3DT146	200	32" x 72"	CYL, V	Polypropylene	2000	Concrete Curb	6197
	Waste Water Chemicals	Nalco 3DT146	160	24" x 60"	CYL, V	Polypropylene	2000	Concrete Curb	6197
	Waste Water Chemicals	Nalco 3DT146	160	24" x 60"	CYL, V	Polypropylene	2000	Concrete Curb	6197
Brine Tank	Brine Storage Tank	Brine	10000	12' x 12	CYL,V	Polypropylene	2000	Drainage	-
R-816	Dilution Tank	Sodium Bicarbonate	550	5' x 6' x 2.5'	CYL, V	Polypropylene	2000	Concrete Curb	6197
U-500 A,B,C	Dilution Tank	Potassium Persulfate	150	3' x 3'-6"	CYL, V	316L SS	2000	Building	-
U-501 A,B,C,D	Dilution Tank for Continuous Feed	Metabolic Sulfate	200	3' x 3'-6"	CYL, V	316L SS	2000	Building	-
U-502 A,B,C	Dilution Tank for Initiator Feed	Metabolic Sulfate	10	1'-3" x 1'-2"	CYL, V	Polypropylene	2000	Building	-
U-503 A,B,C	Flush Tank	DI Water	10	1'-3" x 1'-2"	CYL, V	Polypropylene	2000	Building	-
U-505 A,B	Dilution Tank For Caustic	Caustic	10	1'-3" x 1'-2"	CYL, V	Polypropylene	2000	Building	-
U-506	Raw Material Storage	CTFE	9,200	7' x 29'-10"	CYL, H	Carbon Steel	2000	Building	1473*
U-521	Process	Aclon Slurry	3,000	16' x 2'	CYL, V	CS Glass Lined	2000	Building	-
U-557	Reactor Vent Receiver	CTFE & VF2	14,000	9' x 26'-10"	CYL, H	Carbon Steel	2000	Drainage	-
U-560	Process Sewer Sump	Aclon, MBS,$FeSO_4$,KPS	2,444	8' x 6.5'	CYL, V	Concrete	2000	Concrete Dike	374
U-561	Process Sewer Holding Tank	Aclon, MBS,$FeSO_4$,KPS	18,610	12' x 22'	CYL, V	Carbon Steel	2000	Concrete Dike	5609
U-564	Precoat Mix and Feed Tank	Precoat	1,692	6' x 8'	CYL, V	Carbon Steel	2000	Concrete Dike	5609
U-571	DI Water Storage Tank	DI Water	20,000	16' x 16'	CYL, V	FRP	2000	Drainage	-
U-580 A	Refrigerant Receiver	134a (Future)			CYL, H	Carbon Steel			-
U-580 B	Oil Separator	Refrigerant Oil (Future)			CYL, H	Carbon Steel			-
U-581	Coolant Storage	Glycol	8,750	11'-8" x 11'-8"	CYL, V	Carbon Steel	2000	Concrete Dike	6806
U-583	Coolant Storage	Glycol	8,750	11'-8" x 11'-8"	CYL, V	Carbon Steel	2000	Concrete Dike	6806
U-815A	Aclon Wastewater Tank	Aclon, MBS,$FeSO_4$,KPS	21,000	12' x 25'	CYL,V	Carbon Steel	2001	Concrete Curb	6197
U-815B	Aclon Wastewater Tank	Aclon, MBS,$FeSO_4$,KPS	21,000	12' x 25'	CYL,V	Carbon Steel	2001	Concrete Curb	6197
U-870	Waste Water Discharge Tank	Water	800	6'-3" x 9'	CYL, V	Carbon Steel	2000	Concrete Dike	57073

* - All product storages which are not in contained areas contain materials which imediately vaporize to the atmosphere upon release.

Honeywell Specialty Chemicals

245FA Storage Tanks

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
	Emergency Generator	Diesel	1,550	1' x 23' x 9'	RECT	Carbon Steel	2002	Double Walled	2080
R-1840	East Clarifier	CaF & Water	47381	24' x 10'	CYL,V	Carbon Steel	2002	Concrete Dike	57073
R-1846	Floc Tank	CaF & Water	900	5' x 6'	CYL,V	FRP	2002	Concrete Dike	57073
U-940C	Process Waste Acid/Caustic Storage Tank #3	93% water, some HF, HCl, caustic	22000	12' x 26'-5.5"	CYL,V	FRP, Double Nexus Liner	2002	Concrete Dike	57073
U-940D	Process Waste Acid/Caustic Storage Tank #4	93% water, some HF, HCl, caustic	22000	12' x 26'-5.5"	CYL,V	FRP, Double Nexus Liner	2002	Concrete Dike	57073
U-1201	Vaporizer Dump Tank	HF/G-123/PCE	2000	6'-6" x 8'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-1223	HCl Dump Tank	35% HCl solution	675	4'-6" x 5'	CYL,V	Rubber Lined Carbon Steel	2002	Concrete Curb	20256
U-1225	HF/Organic Phase Separator	Genetrons/HF	500	4' X 6'	CYL,H	SS	2002	Concrete Curb	20256
U-1231	Caustic Scrubber Pump Tank	Weak (4%) caustic solution	1130	4'-6" x 8'	CYL,H	TFE lined Carbon Steel	2002	Concrete Curb	20256
U-1232	Regen Caustic Scrubber Pump Tank	Weak (4%) caustic solution	950	4'-6" x 8'	CYL,H	TFE lined Carbon Steel	2002	Concrete Curb	20256
U-1233	Sulfuric Scrubber Pump Tank	Strong (93-98%) sulfuric acid solution	1130	4'-6" x 8'	CYL,H	TFE lined Carbon Steel	2002	Concrete Curb	20256
U-1240	Crude Gas Surge Tank	Genetrons	5000	7' x 15'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-1241	Crude Gas Compressor A Oil /Gas Separator	Genetrons/Compressor Oil	100	1'-6" x 7'	CYL,V	Carbon Steel	2002	Building	n/a
U-1280	No. 7 Column Compressor Knock-Out Pot	HFC-125, CFC-115	1400	5' x 8'	CYL,V	316 SS	2002	None	n/a*
U-1290A	Slurp Scrubber Pump Tank	15% NaOH solution	1100	4'-10" x 8'	CYL,H	Plasite #9570 Lined Carbon Steel	2002	Concrete Dike	32232
U-1290B	Slurp Scrubber Pump Tank	15% NaOH solution	1100	4'-10" x 8'	CYL,H	Plasite #9570 Lined Carbon Steel	2002	Concrete Dike	32232
U-1300	HF Feed Tank	HF	4000	6' x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-1310	HFC-120'S ORG./HF Recycle Tank	HF/G-123/PCE	4000	6' x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-1315	Emergency Dump Tank	HF/G-123/PCE	4000	6' x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-1325	Crude 120'S Feed Tank	G-124 &125 Liquid	21800	11' x 27'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-1360	Crude HFC-134a Storage Tank No. 1	HFC-134a	30000	9' x 64'	CYL,H	Carbon Steel	2002	None	n/a*
U-1370	HCFC-124 Day Tank	HCFC-124	12000	7' x 45'	CYL,H	Carbon Steel	2002	Concrete Dike	47596
U-1380A	HFC-125 Day Tank A	HFC-125	10000	5' x 70'	CYL,H	Carbon Steel	2002	None	n/a*
U-1380B	HFC-125 Day Tank B	HFC-125	10000	5' x 70'	CYL,H	Carbon Steel	2002	None	n/a*
U-1391	Start-Up Storage Tank	HCFC-120's	12000	7' x 45'	CYL,H	Carbon Steel	2002	Concrete Dike	126153
U-1430	HFC-125 Product Storage Tank	HFC-125	50000	11' x 71'	CYL,H	Carbon Steel	2002	None	n/a*
U-1460A	HCl Storage Tank A (HFC-125)	35-36 WT % HCl SOLN	317000	30' x 60'	CYL,V	Rubber Lined Carbon Steel	2002	Concrete Dike	472524
U-1465	Scrubber Tank #2 (MPP HCl Fume Scrubber)	25 WT % NaOH SOLN	600	5' x 5'	CYL,V	FRP w/Derakane 411 w/DBL. Nexus Veil	2002	Concrete Dike	472524
U-1610	Cooling Tower	Corrosion Inhibitor- Nalco 3DT177	500	48"' x 72"	CYL, H	Polyethylene	2002	Concrete Curb	1330
U-1611	Cooling Tower	Dispersant - Nalco 3DT104	500	48"' x 72"	CYL, H	Polyethylene	2002	Concrete Curb	1330
U-1612	Cooling Tower	Sulfuric Acid	110	2' x 5'	CYL,V	Polyethylene	2002	Concrete Dike	589
U-1613	Cooling Tower	Caustic	110	2' x 5'	CYL,V	Polyethylene	2002	Concrete Dike	589
U-1619	Cooling Tower	Sodium Hypochlorite (NaOCl)	3,500	8.5 X 13'	CYL, V	Double Walled Poly	2005	Concrete Dike	4200
U-1627	Brine Storage Tank	Brine	9,500	10' x 16'	CYL,V	FRP	2000	Concrete Curb	24944
U-1628	Boiler Chemical Tank	Boiler Chemical - Neutraltizing Amine	560	48" x 72"	CYL,V	Carbon Steel	2002	Concrete Curb	24944
U-1629	Boiler Chemical Tank	Boiler Chemical	500	3'-10" x 6'-1"	CYL,V	High Density Polyethylene	2002	Concrete Curb	24944
U-1630	Steam Condensate Tank	Water	3175	6' x 13'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-1633	Softened Water Storage Tank	Water	21150	12' x 25'	CYL,V	FRP	2002	Concrete Curb	25366
U-1638	Oxygen Scavenger Tank	Oxygen Scavenger	500	3'-10" x 6'-1"	CYL,V	High Density Polyethylene	2002	Concrete Curb	24944
U-1639	Demineralized Water Storage Tank	Water	15250	12' x 18'	CYL,V	FRP	2002	None	0
U-1640	Chilled Water Tank	Water	20750	14' x 18'	CYL,V	Carbon Steel	2002	None	0
U-1660	Hot Salt Tank	Hot Salt	5750	6' x 24'-4"	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-1811	Rainwater Collection Tank	Water	530000	55' x 30'	CYL,V	Epoxy Lined Carbon Steel	2002	Concrete Curb	0
U-1900	TOx Quench Tank	97% water and HF, HCl	650	4' x 7'	CYL,V	FRP	2002	Concrete Curb	3004
U-1901	TOx Acid Hold Tank	97% water and HF, HCl	2650	8' x 7'	CYL,V	FRP	2002	Concrete Curb	3004
U-1950	Emergency Relief Scrubber Tank	15% NaOH solution	11500	14' x 10'	CYL,V	Carbon Steel	2002	Concrete Dike	14976
U-2232	Pretreat Caustic Pump Tank	Weak (4%) caustic solution	1125	4'-6" x 8'	CYL,H	TFE lined Carbon Steel	2002	Concrete Curb	25323
U-2236	HF Dehydrating Pump Tank	HF Liquid	625	4' x 6'	CYL,V	Carbon Steel	2002	Concrete Curb	25323
U-6100	Emergency Reactor Dump Tank	HF/G-240/SbCl5/SbCl3	4400	5' x 30'	CYL,V	TFE Lined Carbon Steel	2002	Concrete Curb	20256

G-125 and G-245fa Units
Tank Data

Tank #	Description	Service	Capacity (gallons)	Dimensions (Dia x L/H)	Shape	Construction Material	Construction Date	Containment Type	Containment Vol. (gallons)
U-6101	Catalyst Hold Tank	HF/G-240/SbCl5/SbCl3	4400	5' x 30'	CYL,V	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6103	HCC-240 Storage Tank	HCC-240	105000	15' x 80	CYL,H	Plasite 3070 Lined Carbon Steel	2002	Concrete Dike	73701
U-6110	HF Run Tank	AHF	6500	7'-6" x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-6111	Recycle Column Reboiler Tank	HF/G-245/G-244/G-243/HCl	2000	5'-9" x 9'-6"	CYL,H	316 SS	2002	Concrete Curb	20256
U-6112	Recycle HF Tank	HF	4500	6' x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-6114	HF Emergency Dump Tank	AHF	6500	7'-6" x 20'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-6116	Chlorine Feed Tank	Chlorine	5400	7' x 17'	CYL,H	Carbon Steel	2002	Concrete Dike	472524
U-6120	NaOH Storage No. 2	25% NaOH solution	8000	8000 gal.	CYL,V	Carbon Steel	2002	Concrete Dike	11934
U-6204	HCl Pump Tank	35% HCl Solution	1275	5' x 7'	CYL,V	Rubber Lined Carbon Steel	2002	Concrete Curb	20256
U-6205	Chlorine Removal Column Distillate Receiver	Chlorine, HF	325	3' x 5'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-6210	Circulating Sulfuric Pump Tank	HF, Sulfuric Acid, Water	1325	5' x 9'	CYL,V	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6215	High Boiler Column Feed Tank	HFC-245fa, HCFC-244 isomers, HF, Hiboilers	525	4' x 5'	CYL,V	Carbon Steel	2002	Concrete Curb	20256
U-6230	Crude Tank	HFC-245fa, HCFC-244 isomers, HF, Hiboilers	25400	12' x 26'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-6240	Batch Column Pot	HFC-245fa, HCFC-244 isomers, HF, Hiboilers	1900	5' x 12'	CYL,V	Carbon Steel	2002	Concrete Curb	20256
U-6242	Batch Column Feed Tank	HFC-245fa, HCFC-244 isomers, HF, Hiboilers	3250	7' x 9'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-6294	Catalyst Wash Tank	Water, with some caustic, solids	18000	14' x 15'	CYL,V	Coal Tar Epoxy Lined Carbon Steel	2002	Concrete Dike	32952
U-6310	Prechlorinator Caustic Pump Tank	Dilute Caustic, NaF plus dissolved fluorocarbons	1125	4'-6" x 8'	CYL,H	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6330	Postchlorinator 1st Caustic Pump Tank	Dilute Caustic, NaF plus dissolved fluorocarbons	1125	4'-6" x 8'	CYL,H	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6340	Postchlorinator 2nd Caustic Pump Tank	Dilute Caustic, NaF, Na2SO4, NaCl plus dissolved fluorocarbons	1125	4'-6" x 8'	CYL,H	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6350	Distillation Pump Tank	HFC-245fa, HCFC-244 isomers, Hiboilers	2550	6' x 10'	CYL,H	Carbon Steel	2002	Concrete Curb	20256
U-6375A	G-245fa Day Tank A	HFC-245FA	13000	7' x 45'	CYL,H	Carbon Steel	2002	Concrete Dike	126153
U-6375B	G-245fa Day Tank B	HFC-245FA	13000	7' x 45'	CYL,H	Carbon Steel	2002	Concrete Dike	126153
U-6380	Sulfuric Scrubber Pump Tank	93-99% Sulfuric Acid	1125	4'-6" x 8'	CYL,H	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6385	Sulfuric Scrubber Knockout Pot	HFC-245fa, HCFC-244 isomers, Hiboilers plus entrained Sulfuric	400	3' x 7'	CYL,V	TFE Lined Carbon Steel	2002	Concrete Curb	20256
U-6440	G-245fa Storage Tank	HFC-245FA	80000	14' x 75'	CYL,H	Carbon Steel	2002	Concrete Dike	126153
U-6445	High Boiler Storage Tank	High Boilers	20000	12' x 26'	CYL,H	Carbon Steel	2002	Concrete Dike	66960
U-6460A	HCl Storage Tank A	35-36 WT % HCl Solution	317000	30' x 60'	CYL,V	Rubber Lined Carbon Steel	2002	Concrete Dike	472524

* - All product storages which are not in contained areas contain materials which imediately vaporize to the atmosphere upon release.

Oil Containing Equipment Inventory

Equipment	Location	Total Oil Volume (gallons)	PCB Concentration (ppm)	PCB Amount (pounds)
Sub 1 (Main) Transformers Breakers		 19,800 10,500-12,000	 <550 0	 <10.89 0
Sub 2	Near Central Shop	443	695	2.26
Sub 5A	Clarifier	208	0	0
Sub 12	Dock	491	0	0
Sub 12A	Dock	157	0	0
Sub 14 Tr 1	HF Unit	292	0	0
Sub 14 Tr 2	HF Unit	226	0	0
Sub 14 Tr 3	HF Unit	226	0	0
Sub 14A	Near Spar Dryer	187	0	0
Sub 14B	Near Spar Dryer	500	0	0
Sub 14C	Near Spar Dryer	187	0	0
Sub 14 E	HF Unit	469	0	0
Sub 14	HF Unit	615	0	0
Sub 14	HF Unit	198	0	0
SUS-420, TR 425	245FA	375	0	0
SUS-420, TR422	245FA	375	0	0
SUS-412, TR-417	245FA	375	0	0
SUS-412, TR-414	245FA	375	0	0
TR-430	245FA	273	0	0
SUS-402, TR-408	245FA	808	0	0
SUS-402, TR-404	245FA	808	0	0
MCC 50-1 T-50-1	Aclon	424	0	0
MCC 50-2 T-50-2	Aclon	373	0	0
TR-16, SUB SU01	MPP	414	0	0
TR-17, SUB SU01	MPP	414	0	0
TR-18, SUB PU01	MPP	312	0	0
TR-19, SUB PU01	MPP	312	0	0

Leaks and spills from electric power substations which are located in sections other than the dock area will drain to area ditches where they will be captured within the complex fluid segregation system. This system compartmentalizes the plant ditches to provide for administrative control of ditch contents. Strategically located gate valves within the system allow for the minimization and prevention of fluid movement. Spilled oils would be captured and picked up. Substations #12 and #12A are located in the dock area and therefore containments are equipped with gravity separation drain systems which drain automatically. The separation systems are designed to effectively retain oil while releasing excess water. Collected oils will be removed as necessary by the plant environmental section. All oil containing transformers are properly contained and are inspected monthly for signs of leaks.

CARVILLE QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
LOUISIANA
QUADRANGLE LOCATION
91°02'30"
30°13'00"
MN
GN
0°58'
17 MILS
5 1/2"
98 MILS
UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
PCS NITROGEN
HONEYWELL
WILLIAMS
IBERVILLE PARISH
ASCENSION PARISH
BRAUD BAYOU
PIPELINE
BRUNS
ILLINOIS
CONVEYOR
HF PLANT
MPP/ACLON
NEW RIVER
RHODIA
BCS
CENTRAL
MISSISSIPPI
RIVER
R 1 E
R 2 E
T 9 S
T 10 S
30
3115
75
10
15
20
1 MILE
1/2
0
1000 FEET 0
1000
2000
3000
1 KILOMETER
.5
0
CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
ATP ENVIRONMENTAL ASSOCIATES, INC.®
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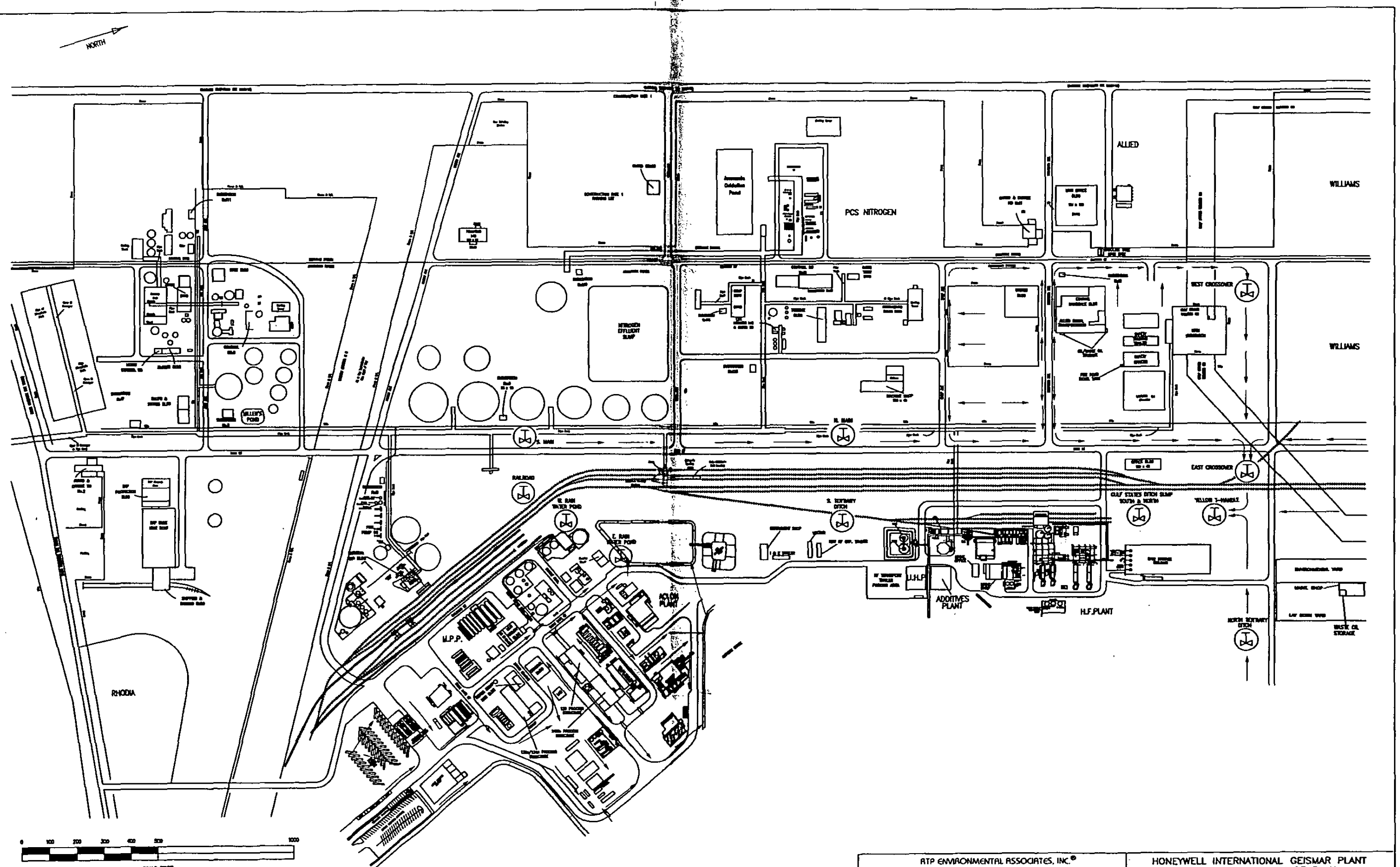
www.atpenv.com
HONEYWELL INTERNATIONAL GEISMAR PLANT
AREA MAP
DATE
7/31/02
SCALE
SHOWN
JOB NO.
2002-017
FIG. NO.
1
REV.
0
ACAD FILE: Boring Locations.dwg



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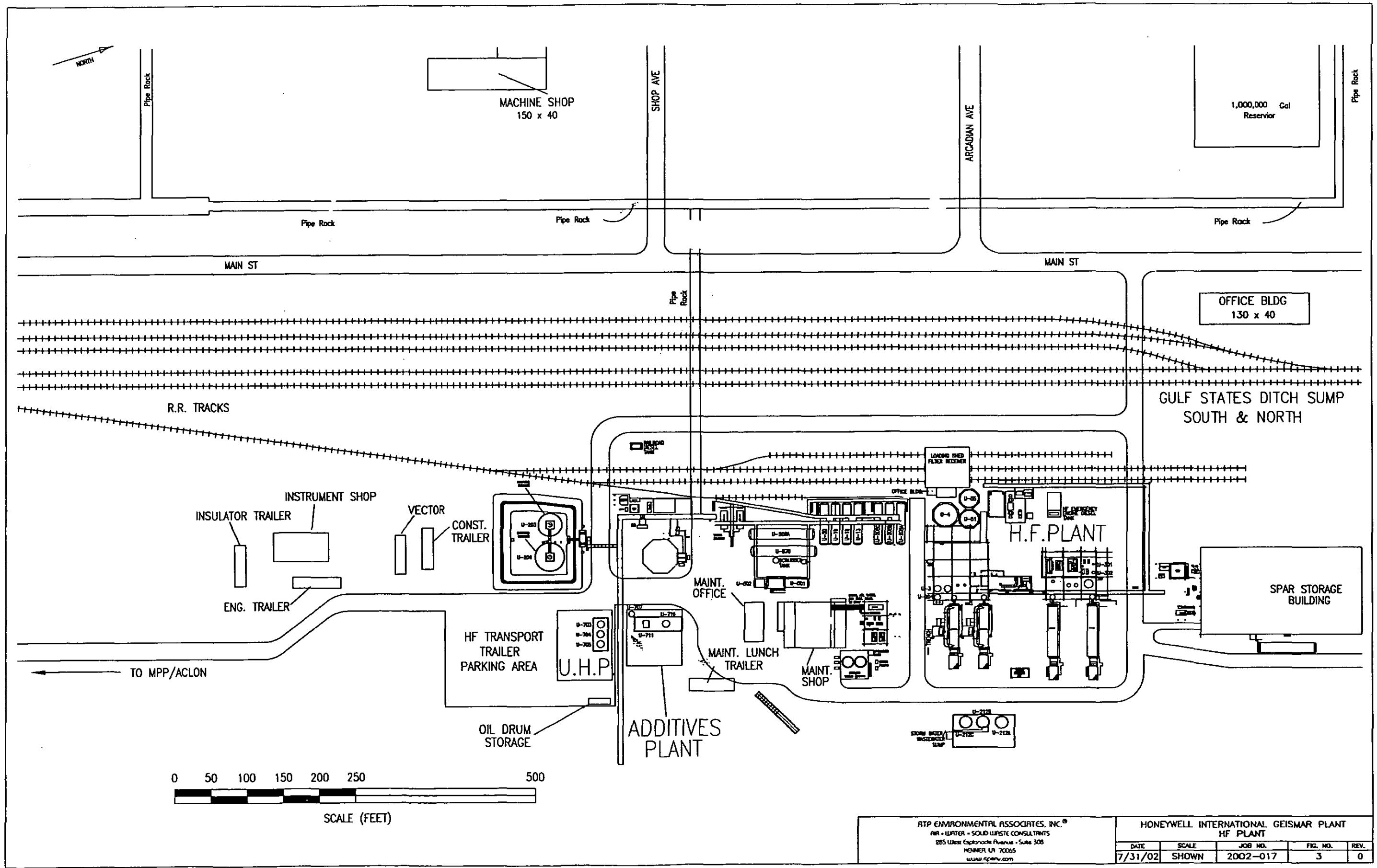
HONEYWELL INTERNATIONAL GEISMAR PLANT
SITE MAP AND DRAINAGE PLAN

DATE	SCALE	JOB NO.	FIG. NO.	REV.
7/31/02	SHOWN	2002-017	2	0

ACAD FILE: Boring Locations.dwg
PLOT DATE: 7/12/02 10:22 A.M.



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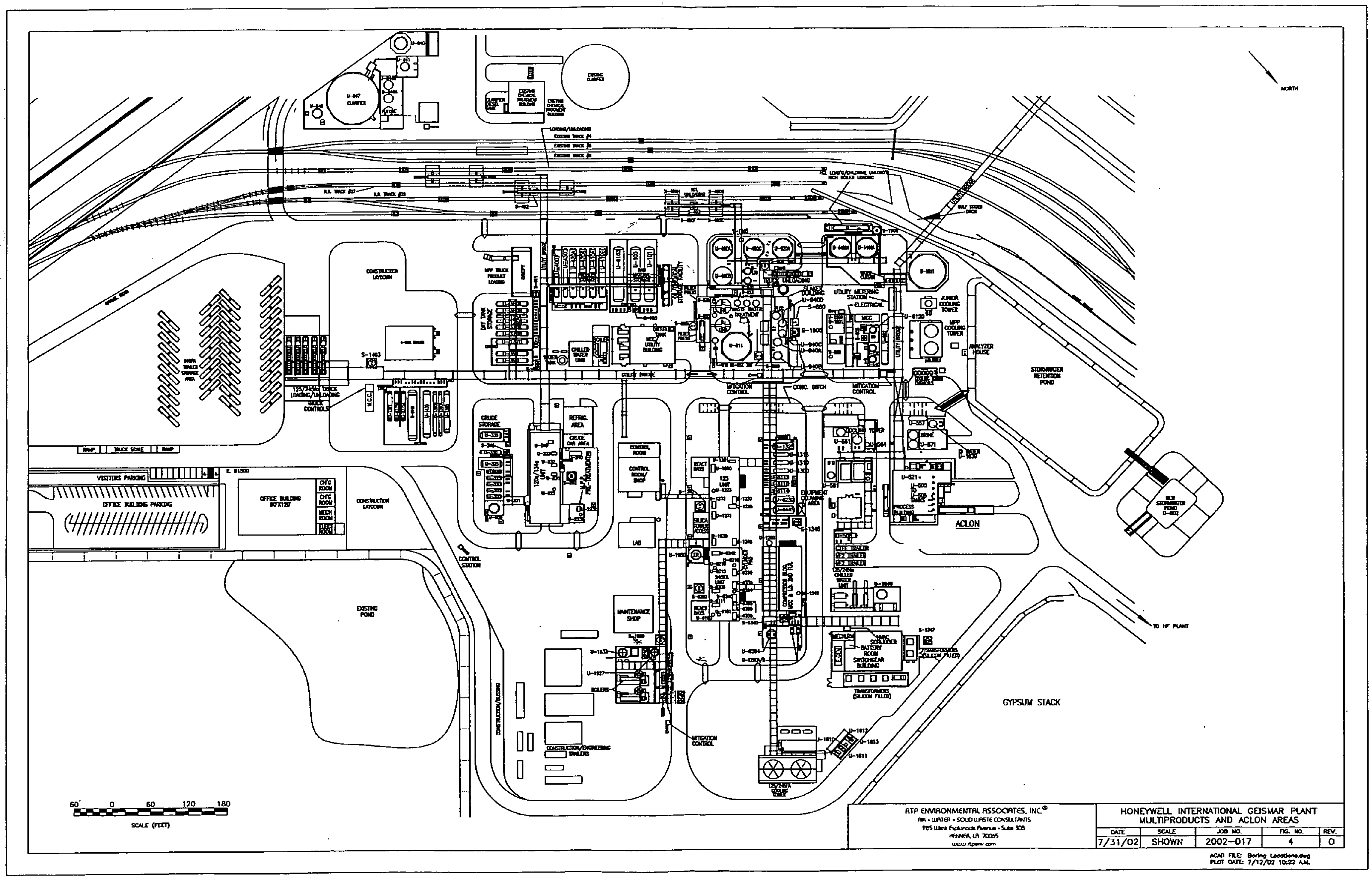
HONEYWELL INTERNATIONAL GEISMAR PLANT
HF PLANT

DATE	SCALE	JOB NO.	FIG. NO.	REV.
7/31/02	SHOWN	2002-017	3	0

ACAD FILE: Boring Locations.dwg
PLOT DATE: 7/12/02 10:22 A.M.


NORTH
TO HF PLANT
GYPSUM STACK
STORMWATER RETENTION POND
NEW STORMWATER POND U-802
ACLON
EXISTING CLARIFIER
U-847 CLARIFIER
EXISTING POND
CONSTRUCTION LAYDOWN
OFFICE BUILDING 80'X120'
OFFICE BUILDING PARKING
VISITORS PARKING
RAMP
TRUCK SCALE
CONTROL STATION
CONSTRUCTION/BUSSING
CONSTRUCTION/ENGINEERING TRAILERS
MAINTENANCE SHOP
LAB
CONTROL ROOM
CONTROL ROOM/SHOP
CRUDE STORAGE
REFRIG. AREA
CRUDE GAS AREA
DAY TANK STORAGE
MPP TRUCK PRODUCT LOADING
CANOPY
UTILITY BRIDGE
MITIGATION CONTROL
CONC. DITCH
UTILITY METERING STATION
ELECTRICAL
JUNIOR COOLING TOWER
MPP COOLING TOWER
ANALYZER HOUSE
CHILLED WATER UNIT
MCC UTILITY BUILDING
WASTE WATER TREATMENT
125 UNIT
BOILERS
TRANSFORMERS (SILICON FILLED)
BATTERY ROOM SWITCHGEAR BUILDING
PROCESS BUILDING
125/245FA TRUCK LOADING/UNLOADING
TRUCK CONTROLS
245FA TRAILER STORAGE AREA
125/245FA COOLING TOWER
SCALE (FEET)
60 0 60 120 180
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HONEYWELL INTERNATIONAL GEISMAR PLANT
MULTIPRODUCTS AND ACLON AREAS
DATE 7/31/02
SCALE SHOWN
JOB NO. 2002-017
FIG. NO. 4
REV. 0
ACAD FILE: Boring Locations.dwg
PLOT DATE: 7/12/02 10:22 A.M.

Oil & Hazardous Chemical Storage and Loading/Unloading Areas

Plant Location	Containment Type	Equipment Number	Description
HF	Aboveground Storage	N/A	Sulfuric and Oleum Storage Area
		N/A	HF Mechanic Shop Area
		N/A	49% HF Storage Area
		N/A	HF Additives Area
		N/A	Process Oil Storage Area
		N/A	Diesel Storage Tank Area
		N/A	HF Laboratory Storage Area
		N/A	Surface Coating Area
	Chemical Storage	N/A	North Cooling Tower Area
		N/A	HF Package Boiler Area
		N/A	South Cooling Tower Area
		N/A	HF Trailer Wash Rack Area
		N/A	Compressor Building
MPP	Aboveground Storage	N/A	Process Oil Storage Building
		S-1292	G-125 Process Structure Sump
		S-1345	Slurp Scrubber Area Sump
		S-6292	G-245fa Process Structure Sump
		S-1905	Acid/Caustic Storage Area Sump
		S-1906	Acid Storage Area Sump
		S-292	MPP Process Structure Sump
		S-345	Intermediate Storage Pad Sump
		S-490	Product Day Tank Storage Pad Sump
		S-865	Filter Press Sump
		S-905	Thermal Oxidizer Sump
		S-906	Acid Storage Area Sump (SUMP)
		S-890	WWT Diked Area Sump
		S-880	WWT T/T Pad Sump
	Chemical Storage	N/A	Drum Storage Area

		N/A	Cooling Tower Area
Plant Location	Containment Type	Equipment Number	Description
STORES	Chemical Storage	N/A	Bulk Oil and Chemical Storage Area
TANK FARM	Aboveground Storage	N/A	123 Storage Area
		N/A	PCE/TCE/240 Storage Area
		N/A	HCl/H2SO4/Spent H2SO4 Storage Area
		N/A	Caustic Storage Area
		N/A	Caustic/Sodium Sulfate Storage Area
		N/A	Spent Acid Storage Area
		N/A	PCE/TCE Storage Pad Sump
		N/A	Acid Storage Area Sump (CONTAINMENT)
	Loading and Unloading	S-1493	Product T/T Loading Pad Sump
		S-491	Product T/T Loading Pad Sump
		S-492	Railroad Loading Pad Sump
		S-493	HCl T/C Loading Pad Sump
125/245FA	Aboveground Storage	N/A	Catalyst Wash Tank
		N/A	High Boiler Tank/Tank Storage Area
	Chemical Storage	N/A	245 Cooling Tower Area
		N/A	Package Boilers
ACLON	Aboveground Storage	N/A	Glycol Storage Area
	Chemical Storage	N/A	Wastewater Treatment Area
CENTRAL MAINTENANCE SHOP	Aboveground Storage	N/A	New & Used Oil Storage Area

Assessment of Spill Potential and Environmental Impact

Source	Major Type of Failure	Total Quantity (gal)	Rate (gal/hr)*	Direction of Flow	Secondary Containment
HF Plant	Leak/spill	24	24	contained	concrete basin
HF Plant	Leak/spill	48	48	contained	dike/sump
HF Plant	Leak/spill	27	27	contained	above ground sump
Maintenance Shop	Leak/spill	24	24	contained	gravity separator tank
Maintenance Shop	Leak/spill	15	15	contained	concrete basin
Stores Area	Leak/spill	314 (max)	314	contained	gravity tank separator
Main Office Area	Leak/spill	95 (max)	95	contained	concrete basin
Fire Pond	Leak/spill	13	13	contained	concrete basin
Electric Power Substations	Leak/spill	--	--	contained	area ditches
Water Treatment/ Clarifiers	Leak/spill	24	24	contained	concrete basin
Dock Area	Leak/spill	36	36	contained	concrete basin
Railcar Loading Area	Leak/spill	3	3	contained	drip pans/concrete basin
Truck Loading Areas	Leak/spill	5	5	contained	concrete curbs/sump
Garage Area	Leak/spill	94	94	contained	concrete basin/sump
Multi-Product Plant	Leak/spill	6	6	contained	concrete basin
Aclon Plant	Leak/spill	208	208	contained	concrete basin
245FA Plant	Leak/Spill	808	808	contained	concrete basin
125 Plant	Leak/Spill	250	250	contained	concrete basin
MPP Oil Storage Bldg	Leak/spill	24	24	contained	concrete basin

*Total volume will leak in one hour

OIL AND HAZARDOUS CHEMICAL SPILL HISTORY							
Location/Date of Spill	Type & Amount Spilled	Cause	Affected Watercourses	Damages and Cost of Damages	Cleanup Cost	Corrective Action	Agency Response
Railcar Loading Area, 4/22/99	49%HF, 60 pounds	Tank car overfill	None	NA	NA	Spill neutralized/ contaminated soil removed	None
Drum Loading at UHP, 2/1/00	HF, 1600 pounds	Leak in loading line connection	None	NA	NA	Spill contained and sent to WWTP for neutralization and treatment	None
Honeywell Dock, 11/13/00	Sulfuric Acid, 450 pounds	Hose rupture while unloading	Mississippi River	NA	NA	Spill neutralized with soda ash and washed to river	None
Honeywell Dock, 1/25/01	Sulfuric Acid, 150 pounds	Hose rupture while unloading	Mississippi River	NA	NA	Spill neutralized with soda ash and washed to river	None
Railcar Loading Area, 2/2/01	HCl, 731 pounds	Tank car overfill	None	NA	NA	Spill neutralized with soda ash, containerized and sent offsite for disposal	None
Railcar Loading Area, 3/08/01	HCl, 13 pounds	Tank car overfill	None	NA	NA	Spill neutralized with soda ash, containerized and sent offsite for disposal	None
Honeywell Dock, 6/5/01	Sulfuric Acid, 225 pounds	Hose rupture while unloading	Mississippi River	NA	NA	Spill neutralized with soda ash and washed to river	None

OIL AND HAZARDOUS CHEMICAL SPILL HISTORY

Location/Date of Spill	Type & Amount Spilled	Cause	Affected Watercourses	Damages and Cost of Damages	Cleanup Cost	Corrective Action	Agency Response
Honeywell Dock, 6/16/01	Sulfuric Acid, 225 pounds	Hose rupture while unloading	Mississippi River	NA	NA	Spill neutralized with soda ash and washed to river	None
Aqueous HF Loading Header, 10/23/01	Aqueous HF, 1963 pounds	Lined piping rupture	None	NA	NA	Spill washed to process sump and treated in wastewater treatment area	None
Construction Area near Aclon, 11/12/01	Propylene Glycol, 132 pounds	Leak in hose connected to glycol heat exchanger in Aclon	None	NA	NA	Spill vacuumed into drums for disposal; soil removed, containerized and sent offsite for disposal.	None
Modified HF Storage, 4.8 lbs	Modified HF	Leak in weld on modified HF storage vessel	None	NA	NA	Repaired leak	LDEQ Courtesy Notification
Railcar loading Area, 2/23/2004	PCE, 28.66 lbs	Hose quick connect coupling leaked.	None	$40,000	$40,000	PCE and Associated Rainwater was collected and sent for disposal.	LDEQ Courtesy Notification
Sulfuric Acid Storage, 4/5/2004	Sulfuric Acid, 756 lbs	Leak on tank manway saddle weld on side of tan	None	NA	NA	Spill neutralized with soda ash disposed of offsite.	None

OIL AND HAZARDOUS CHEMICAL SPILL HISTORY

Location/Date of Spill	Type & Amount Spilled	Cause	Affected Watercourses	Damages and Cost of Damages	Cleanup Cost	Corrective Action	Agency Response
Aclon, 5/23/2004	CTFE, 17 lbs	Air compressor failure caused the reactor control valves to fail open venting residual CTFE to the vent stack.	None	N/A	N/A	Repaired leak	None
MPP, HCL Storage, 6/5/2004	HCL, 133 lbs	Pressure Gauge corroded through and leaked 37% HCL to the containment	None	NA	NA	Repaired leak	None
HF Mechanic Shop, 1/9/2005	Used Oil, 500 gallons	Oil water separator overflowed	None		10,000	Repaired Pump	None

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA CHECKLIST

FACILITY NAME: Honeywell Specialty Materials - Geismar Plant

FACILITY ADDRESS: P.O. Box 226

5525 Highway 3115

Geismar, LA 70734

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?
   Yes_____ No __x__

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?
   Yes_____ No __x__

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the formula in Attachment C-III, Appendix C, 40 CFR 112 or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III of DOC/NOAA's "Guidance for Facility and Vessel Response Environments" (Section 10, Appendix E, 40 CFR 112 for availability) and the applicable Area Contingency Plan.
   Yes_____ No __x__

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance as calculated using the appropriate formula (Attachment C-III, Appendix C, 40 CFR 112 or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?
   Yes_____ No __x__

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than 10,000 gallons within to last 5 years?
   Yes_____ No __x__

PROFESSIONAL ENGINEER CERTIFICTION

By means of this Professional Engineer Certification, I hereby attest to the following:

- I am familiar with the requirements of 40 CFR Part 112 and have verified that this Plan has been prepared in accordance with the requirements of this Part.
- I or my agent have visited and examined the Facility.
- I have verified that this Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards.
- I have verified that the required inspection and testing procedures have been established.
- I have verified that the Plan is adequate for the Facility.

Engineer: Arthur Willden

Signature: _____

Registration Number: 30397

State: Colorado

Date: 4/9/2005

_____

(Seal)

Engineer

RESPONSIBLE PERSON CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on by inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

Chris Toups
Name (please type or print)

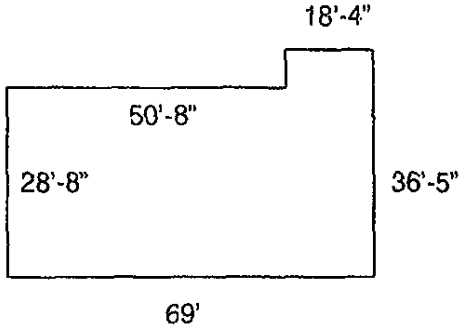
Chris Toups
Signature

Site Leader
Title

3-11-2008
Date

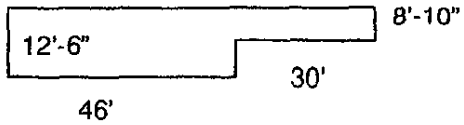
CONTAINMENT CALCULATION METHOD EXAMPLES

HF and Product Storage



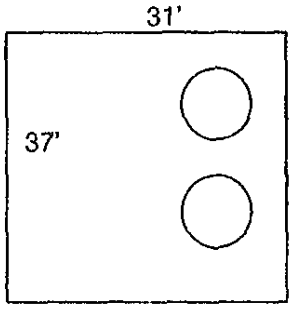
Raised horizontal tanks
Area = 28'-8" x 50'-8" + 18'-4" x 36'-5"
= 2120.3 ft^2
Depth = 3'-3"
Volume = 2120 ft^2 x 3'3"/0.1337
= 51539 gal

Tank 301 Area



Single tank in containment
Area = 8'-10" x 30' + 12'-6" x 46'
= 840 ft^2
Depth = 4'-8"
Volume = 840 ft^2 x 4'-8"/0.1337
= 29304 gal

NaOH/Sulfite Storage



Two vertical tanks in containment (9'6" dia)
Area = 31' x 37' – $\pi(9'\text{-}6")^2/4$
= 1076.12 ft^2
Depth = 3'-6"
Volume = 1076.12 ft2 x 3'-6"/0.1337
= 28170 ga

Emergency Control Equipment/Procedures

Since a potential for equipment failure exists, the following information has been developed concerning each potential source. The measure outlined will prevent a discharge of oil to navigable waters. In addition, the location of most of the sources are within established fluid segregation and containment areas which require pumping discharge and minimizes the opportunity for discharge to navigable waters.

HF and AlF_3 Plants

Leaks or spills from the six 55-gallon drums, two 150-gallon tanks and two 250-gallon tanks of lube oil will be contained by a 1,335 gallon steel sump. Captured oil will be picked up for recovery or disposal.

Leaks or spills from the 1000 gallon emergency generator diesel fuel storage will be captured in the concrete dike area. Captured oil will be picked up for recovery or disposal.

Leaks from the 2000 gallon vehicle diesel dispensing tank will be captured by a concrete dike around the dispensing pump. The hose is administratively controlled inside the dike when not in use. Captured oil will be picked up for recovery or disposal.

Maintenance Shops

Leaks or spills from a 500-gallon motor oil tank, a 500-gallon used oil tank, a used antifreeze tank and a drum containing used oil filters will be captured by a concrete curbed basin. Captured oil will be picked up for recovery or disposal.

Leaks or spills from a 500-gallon used oil tank, a 55-gallon drum of oil, a 55-gallon drum of petroleum naptha and a drum containing waste varsol will be captured by a concrete curbed basin. Captured oil will be manually pumped out of the containment area.

All vat degreasers located in the maintenance areas shall be operated normally closed. Any spills will be cleaned up with absorbent material.

Stores Area

The stores area has a concrete curbed basin for the storage of drummed oils. The basin drains to a gravity separator. Separated oil will be recovered or disposed as applicable. Oily sludge will be drummed for disposal.

Main Office Area

Leaks or spills from the vehicle fueling area near the Main Office Building will be captured by a concrete fueling pad which drains to a gravity separator. One gasoline

dispensing pump is located within this pad. Any spilled gasoline will be picked up for recovery or disposal.

Leaks or spills from the 2000-gallon gasoline tank will be captured by a concrete dike surrounding the tank. The tank is equipped with double contained pipe and a leak detection system.

Fire Pond

Leaks and spills from the 550 gallon fire pump diesel engine fuel tank will be captured by a concrete diked basin. Captured oil will be picked up for recovery or disposal.

Electric Power Substations

Leaks and spills from electric power substations which are located in sections other than the dock area will drain to area ditches where they will be captured within the complex fluid segregation system. This system compartmentalizes the plant ditches to provide for administrative control of ditch contents. Strategically located gate valves within the system allow for the minimization and prevention of fluid movement. Spilled oils would be captured and picked up. Substations #12 and #12A are located in the dock area and therefore containments are equipped with gravity separation drain systems which drain automatically. The separation systems are designed to effectively retain oil while releasing excess water. Collected oils will be removed as necessary by the plant environmental section.

Substation #1 (Main) - Two transformers owned and operated by Gulf State Utilities with capacities of 9900 gallons each. (Transformers contain less than 550 ppm PCB.) Also, five groups of three vessels comprised of circuit breakers; each vessel has capacity of approximately 700-800 gallons. (These vessels contain no PCB.)

Substation #2 (Shops and Office) - One transformer with capacity for 443 gallons insulating oil. (PCB greater than 500 ppm.)

Substation #5 (Clarifiers) - One transformer with capacity for 1195 gallons insulating oil. (PCB greater than 500 ppm.)

Substation #5A (Clarifiers) - One transformer with capacity for 175 gallons insulating oil. (PCB greater than 500 ppm.)

Substation #5B (Clarifiers) - One transformer with capacity for 167 gallons insulating oil. (PCB content unknown.)

Substation #12 (Dock) - One transformer with a capacity of 491 gallons of insulating oil. Leaks and spills are captured by a concrete curbed containment basin equipped with a gravity separation device for the discharge of excess water. Captured oil is picked up for recovery or disposal.

Substation #12A (Dock) - One transformer with a capacity of 157 gallons of insulating oil. Leaks and spills are captured by a concrete curbed containment basin equipped with a gravity separation device for the discharge of excess water. Captured oil is picked up for recovery or disposal.

Substation #14 (HF) - Three transformers with capacity for 292 gallons, 226 gallons and 226 gallons insulating oil. (PCB less than 500 ppm.)

Substation #14A (Spar Dryer) - Two transformers with capacity for 500 gallons insulating oil.

Substation #14C (Spar Dryer) - One transformer with capacity for 187 gallons insulating oil.

Nine Rowan starters with capacity of 10 gallons each of insulating oil. (PCB less than 0.1 ppm.)

Although PCB containing transformers, capacitors or switch gear are identified by distinctive labels, the potential for contamination is always present. The handling of any spills, spilled material, or any oily materials generated as a result of any transformer accident or maintenance will be performed under the guidance of the plant environmental section.

Raw Water Treatment Area (Clarifiers)

Leaks and spills from the 1000 gallon emergency electric generator diesel engine fuel tank will be captured by a concrete diked basin beneath the tank equipped with a gravity separator pipe. Captured oil will be picked up for recovery or disposal.

Leaks and spills from the oil drums near the clarified water pumps will be captured by a concrete curbed basin. Captured oil will be picked up for recovery or disposal.

Garage Area

Leaks and spills from the three 250-gallon oil storage tanks, two 55-gallon drums, a 2500 gallon separator and a 600 gallon waste oil tank will be captured by a concrete curbed basin and sump. A diaphragm pump pumps to the separator from the sump. Captured oil is held in the separator and picked up for recovery or disposal.

Hazardous Waste Pad

Leaks or spills from drummed hazardous waste will be captured by a concrete curbed basin with a sump. Captured material is manually pumped out and recovered.

Multi-Product Plant - Air Compressor/MCC Building

Leaks or spills from the 250 gallon emergency generator diesel fuel storage tank will be captured in the concrete dike area. Captured oil will be picked up for recovery or disposal.

Dock Area

Leaks and spills from the 1500 gallon emergency river water supply pump diesel engine tank will be captured by a concrete diked basin beneath the tank. The basin is equipped with a gravity separation device for the discharge of excess water. Leaks from the fuel lines to the engine will be recognized by the operator whom is present during operation. Captured oil will be picked up for recovery or disposal.
The fuel oil and DAC loading stations are located within concrete curbed areas on the concrete dock working surface. Leaks and spills from these areas are contained and routed to an inclined gravity separator located beneath the dock working surface. Captured oil is held in the separator and picked up for recovery or disposal.

Honeywell Specialty Chemicals

Stores Secondary Containment Systems

quipment Numb	Location	Description	Containment Type
	SE Corner of Store's Yard	Bulk Oil and Chemical Storage	Concrete Dike with Oil/Water Separator

Honeywell Specialty Chemicals

Central Maintenace Shop Secondary Containment Systems

Equipment Number	Location	Description	Containment Type
	SE Corner of Cent. Maint. Shop	Oil Storage	Covered Concrete Dike

Honeywell Specialty Chemicals

HF Secondary Containment Systems

Equipment Number	Location	Description	Containment Type
	North Cooling Tower Area	Water Treatment Chemicals	Concrete Dike with Valve
	HF Mechanic Shop Area	Oil Storage Area	Concrete Sump with Oil/Water Separator
	49% HF Storage Area	49% HF Product Storage	Concrete Dike with Valve
	HF Package Boiler Area	Water Treatment Chemicals	Single Walled Poly Tank
	South Cooling Tower Area	Water Treatment Chemicals	Concrete Dike with Valve
	HF Additives Area	HF Additives	Concrete Dike with Valve
	Compressor Building	Water Treatment Chemicals	N/A
	HF Trailer Wash Rack Area	Trailer Cleaning Chemicals	Single Walled Poly Tank
	Sulfuric and Oleum Storage Area	Sulfuric Acid and Oleum Storage	Asphalt Dike with Valve
	Process Oil Storage Area	Bulk Oil Storage Area	Covered Metal Containment
	HF Laboratory Storage Area	Methanol Storage	Concrete Dike with Valve
	HF Diesel Storage Tank Area	Diesel Storage Tank	Concrete Dike with Valve

Honeywell Specialty Chemicals

Aclon Secondary Containment Systems

quipment Numb	Location	Description	Containment Type
	Wastewater Treatment Area	Wastewater Treatment Chemicals	Concrete Dike with Valve
	Glycol Storage Area	Glycol Storage	Concrete Dike with Valve

Honeywell Specialty Chemicals

125/245 Secondary Containment Systems

quipment Numb	Location	Description	Containment Type
	245 Cooling Tower Area	Water Treatment Chemicals	Concrete Dike with Valve
	Catalyst Wash Tank	Catalyst Tank	Concrete Dike with Valve
	High Boier Tank/Tank Storage Area	Chemical Storage	Concrete Dike with Valve
	Package Boilers	Water Treatment Chemicals	Concrete Dike with Valve

Honeywell Specialty Chemicals

Tank Farm Secondary Containment Systems

ipment Num	Location	Description	Containment Type
	123 Storage Area	Product Storage	Concrete Dike with Valve
	PCE/TCE/240 Storage Area	Product Storage	Concrete Dike with Valve
	HCl/H2SO4/Spent H2SO4 Storage Area	Product Storage	Concrete Dike with Valve
	Caustic Storage Area	Product Storage	Concrete Dike with Valve
	Caustic/Sodium Sulfate Storage Area	Product Storage	Concrete Dike with Valve
	Spent Acid Storage Area	Spent Acid	Concrete Dike with Valve
S-100	PCE/TCE Storage Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-1493	Product T/T Loading Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-491	Product T/T Loading Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-492	Railroad Loading Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-493	HCl T/C Loading Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-906	Acid Storage Area Sump (CONTAINMENT)	Process Water Sump	Poly Sump with Outer Concrete Vault

Plant Location	Containment Type	Equipment Number	Description
125/245FA	Aboveground Storage	N/A	Catalyst Wash Tank
		N/A	High Boiler Tank/Tank Storage Area
	Chemical Storage	N/A	245 Cooling Tower Area
		N/A	Package Boilers
ACLON	Aboveground Storage	N/A	Glycol Storage Area
	Chemical Storage	N/A	Wastewater Treatment Area
CENTRAL MAINTENANCE SHOP	Aboveground Storage	N/A	New & Used Oil Storage Area
HF PLANT	Aboveground Storage	N/A	Sulfuric and Oleum Storage Area
		N/A	HF Mechanic Shop Area
		N/A	49% HF Storage Area
		N/A	HF Additives Area
		N/A	Process Oil Storage Area
		N/A	Diesel Storage Tank Area
		N/A	HF Laboratory Storage Area
	Chemical Storage	N/A	Surface Coating Area
		N/A	North Cooling Tower Area
		N/A	HF Package Boiler Area
		N/A	South Cooling Tower Area
		N/A	HF Trailer Wash Rack Area
		N/A	Compressor Building
MPP	Aboveground Storage	N/A	Process Oil Storage Building
		S-1292	G-125 Process Structure Sump
		S-1345	Slurp Scrubber Area Sump
		S-6292	G-245fa Process Structure Sump
		S-1905	Acid/Caustic Storage Area Sump
		S-1906	Acid Storage Area Sump
		S-292	MPP Process Structure Sump
		S-345	Intermediate Storage Pad Sump
		S-490	Product Day Tank Storage Pad Sump
		S-865	Filter Press Sump
		S-905	Thermal Oxidizer Sump
		S-906	Acid Storage Area Sump (SUMP)
		S-890	WWT Diked Area Sump
		S-880	WWT T/T Pad Sump
	Chemical Storage	N/A	Drum Storage Area
		N/A	Cooling Tower Area
STORES	Chemical Storage	N/A	Bulk Oil and Chemical Storage Area
TANK FARM	Aboveground Storage	N/A	123 Storage Area
		N/A	PCE/TCE/240 Storage Area
		N/A	HCl/H2SO4/Spent H2SO4 Storage Area
		N/A	Caustic Storage Area
		N/A	Caustic/Sodium Sulfate Storage Area
		N/A	Spent Acid Storage Area
		N/A	PCE/TCE Storage Pad Sump
		N/A	Acid Storage Area Sump (CONTAINMENT)
	Loading and Unloanding Area	S-1493	Product T/T Loading Pad Sump
		S-491	Product T/T Loading Pad Sump
		S-492	Railroad Loading Pad Sump
		S-493	HCl T/C Loading Pad Sump

Honeywell Specialty Chemicals

MPP Secondary Containment Systems

Equipment Number		Location	Description	Containment Type
		Process Oil Storage Building	Oil Storage	Concrete Dike with Valve
S-1292		G-125 Process Structure Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-1345		Slurp Scrubber Area Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-6292		G-245fa Process Structure Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-1905		Acid/Caustic Storage Area Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-1906		Acid Storage Area Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-292		MPP Process Structure Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-345		Intermediate Storage Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-490		Product Day Tank Storage Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-865		Filter Press Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-880		WWT T/T Pad Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-890		WWT Diked Area Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
		Drum Storage Area	Chlorx Chemical Storage Area	Covered Concrete Dike with Valve
		Cooling Tower Area	Water Treatment Chemicals	Concrete Dike with Valve
S-905		Thermal Oxidizer Sump	Process Water Sump	Poly Sump with Outer Concrete Vault
S-906		Acid Storage Area Sump (SUMP)	Process Water Sump	Poly Sump with Outer Concrete Vault