APPENDIX 20
STORM WATER RETENTION POND AND SOLAR EVAPORATION POND INSPECTION REPORTS

APPENDIX 20.1
POND INSPECTION REPORTS

EXIDE TECHNOLOGIES World Leader in Electrical Energy Solutions

Exide Technologies
Frisco Recycling Center
P.O. Box 250
Frisco, TX 75034
Tel (972) 335-2121

Certified Mail

November 09, 2011

Mr. Dan Siebeneicher
TCEQ, Water Quality Division
Storm Water & Pretreatment Team (MC-148)
P.O. Box 13087
Austin, TX 78711-3087

Re: Exide Technologies, FRC
7471 South 5th Street, Frisco, TX
TPDES Permit No. WQ0002964000
Request for Storm Water Detention Pond Construction Verification

Mr. Siebeneicher:

The attached document is being provided per your request to W&M Environmental Group, Inc. (WM) on October 19, 2011. The storm water pond was constructed during 1988. Historical records, documentation and more recent surveying conducted by W&M were reviewed to provide you the requested information.

If you should require additional information please contact me at (225) 614-4977 or via email edward.hardy@exide.com or Mr. Frank Clark, P.E. of W&M Environmental, at (972) 509-9611.

Sincerely;

Edward M. Hardy II
Interim Environmental Manager
Exide Technologies

Enclosure

cc: Frank Clark, W&M Environmental Group, Inc

November 9, 2011

Mr. Edward M. Hardy II
Exide Technologies
7471 South Fifth Street
Frisco, Texas

RE: Storm Water Detention Pond Liner Specifications
Exide Technologies
7471 South Fifth Street
Frisco, Texas
TPDES Permit No. WQ0002964000 (TX0103292)
W&M Project No. 112.034

Dear Mr. Hardy:

W&M Environmental Group, Inc. (W&M) performed surveying and soil liner characterization analysis to document the as-installed condition of the storm water detention pond located at the Exide Technologies (Exide) facility located at 7471 South Fifth Street in Frisco, Collin County, Texas (Site). The Site location is presented on **Figure 1**.

STORM WATER POND SURVEYING ACTIVITIES

W&M subcontracted Doug Connally and Associates, Inc. (DCA), a Texas Registered Professional Land Surveyor (RPLS), to perform the surveying activities around the detention pond. Surveying activities were conducted on July 17, 2008. DCA surveyed in the sides, slopes and bottom of the retention pond as well as the sump pump and influent pipe. The elevation survey conducted by DCA is presented on **Figure 2**. The elevation of the top of the storm water pond rim varies from 635.67 feet above mean sea level (MSL) in the northwest corner of the pond to 636.54 feet above MSL in the southwest corner of the pond. The surface area of the detention pond was determined to be 88,893 square feet or 2.04 acres.

W&M calculated the volume of the storm water pond to be 6,540,596 gallons based on the survey conducted by DCA. The capacity of the storm water pond to the top of the 3-foot diameter concrete pipe inlet (elevation 633.3 feet above MSL) was determined to be 4,570,721 gallons. The 8-foot wide by 16-feet long by 2.7 feet deep collection sump located in the middle of the pond has an additional capacity of 2,681 gallons.

STORM WATER POND LINER EVALUATION

W&M evaluated the storm water pond liner on September 19, 2008, to determine its compliance with the Texas Pollutant Discharge Elimination System Permit Number WQ002964000 (Permit) which states:

"Subsequent to this permit issuance date, all new wastewater or storm water ponds shall be lined in compliance with one of the following requirements:

a. <u>Soil Liner</u>: The soil liner should contain at least 3 feet of clay-rich (liquid limit greater than or equal to 30 and plasticity index greater than or equal to 15) soil material along the sides and bottom of the pond compacted in lifts of no more than 9 inches, to 95% standard proctor density at the optimum moisture content to achieve a permeability equal or less than 1 x 10^{-7} cm/sec.

b. <u>Plastic/Rubber Liner</u>: The liner shall be either a plastic or rubber membrane at least 30 mils in thickness which completely covers the sides and the bottom of the pond and which is not subject to degradation due to reaction with wastewater with which it comes into contact. If this lining material is vulnerable to ozone or ultraviolet deterioration it should be covered with a protective layer of soil of at least 6 inches. A leak detection system is also required.

c. <u>Alternate Liner</u>: The permittee shall submit plans for any other pond lining method. Pond liner plans must be approved in writing by the Executive Director of the Texas Commission on Environmental Quality prior to pond construction."

Exide provided W&M with a Texas Water Commission (TWC, predecessor to the TCEQ Water Quality Board) submittal dated June 2, 1987. The submittal was made by Lake Engineering on behalf of GNB Incorporated (now Exide). The submittal includes a "Concept Design Report" that specifies that the intended composition of the storm water detention pond was to be "double lined with 30 mil. PVC underliner and a 36 mil. overliner". The original conceptual designed not include a leak detection system. It is presumed that GNB proposed the "double-lined" specifications to the TWC in order to meet a Criteria C (Alternate) liner. Response from the TWC has not been located but it is assumed that the specifications were agreed upon by GNB and the TWC.

W&M reviewed design drawings prepared by Lake Engineering & Development, Inc. (Lake Engineering) for the detention basin pond dated December 15, 1987, and issued as "As-Built" drawings in December 1988. The design called for two high-density polyethylene (HDPE) liners, each with a minimum thickness of 40 mils (0.040 inches), underlain by Geotextile fabrics and separated by a 6-inch sand layer. The native soils in the area are high plasticity clays, and it is believed the clays were compacted to form a soil liner below the two HDPE liners. A leak detection system was incorporated into the final design. The Lake Engineering drawings are presented in **Attachment A**.

Additionally, an As-built drawing created by Gundle dated August 13, 1988 indicates that the detention pond was constructed of two 40 mil. liners.

At some point in the early 1990's, a severe storm event damaged the exposed pond liner system. According to Exide, a 60-mil liner was placed across the entire pond area at that time to replace the damaged portions and act as a more robust liner system.

W&M's evaluation involved a review of the pond design and field documentation of the liner, drainage layer and underlying soil to verify the liner system satisfies the requirements of the permit. The field activities conducted in 2008 indicate that the overall condition of the liner was good and no evidence of photo-degradation was visible to the naked eye. Over the years, small punctures observed in the HDPE liner were repaired as they were identified by professional liner repair companies.

High-Density Polyethylene Liner Evaluation

Three areas of the pond liner, designated SS-01 through SS-03, were evaluated to assess the location, thickness and condition of the HDPE membranes, and the density and physical characteristics of the underlying compacted soil. Sample locations are presented on **Figure 3**. During investigation of the pond liner system, it was observed that at least two layers of HDPE were overlaying the soil liner. The liner was cut using a box-cutter knife equipped with a hook-shaped blade. The uppermost liner was comprised of 60 mil HDPE and subsequent layers were determined to be 40 mil HDPE. The presence of the 60 mil liner directly above the 40 mil liner is consistent with the information provided by Exide regarding the repair of the entire liner system after a storm in the early 1990s. Both the 60 mil and 40 mil HDPE liners meet the required thickness of a plastic/rubber liner outlined in the TPDES permit. The HDPE liners located below the uppermost 60 mil liner are not believed to be exposed to the elements, ozone, or ultraviolet rays.

Two sections of the liner in the base of the pond were inspected corresponding to the locations of SS-01 and SS-03. In both instances, the uppermost HDPE liner layer was comprised of 60-mil HDPE. Underlying the 60-mil HDPE was a layer of 40-mil HDPE, underlain by a six to eight inch layer of fill sand. Underlying the layer of sand was a 40-mil HDPE layer lined with a geotextile liner. Beneath the final competent layer of HDPE in the area of SS-01 were two more layers of 40-mil HDPE; however, it is believed that these layers were overlap from the nearby seams. Underneath the HDPE liners was a clay liner. The clay liner was determined to be at least 2.5 feet thick in each of the three sampled areas. A photographic log is presented in **Attachment B** and a representative cross-section of the HDPE and clay liner for the areas around SS-01 and SS-03 are presented on **Figures 4 and 6**.

One section of the sidewall liner was inspected in the area corresponding to the location of SS-02. The uppermost layer of HDPE was also a 60 mil layer of HDPE directly underlain by geotextile liner underlain by a layer of 40-mil HDPE liner and another geotextile liner. Directly below the geotextile liner was the clay liner. The gray clay was dry and compacted. Small rock and gravel inclusions were documented. The gray clay transitioned into a lighter brown clay with depth. A representative cross section of the HDPE and clay liner around SS-02 is presented on **Figure 5**.

Soil Liner Evaluation

Two surface soil samples, SS-01 and SS-03, were collected from the bottom of the detention pond. Once the layers of HDPE liner were removed from the area, W&M utilized a shovel and Shelby tube to collect representative samples of the clay liner. Approximately four two-gallon buckets and one Shelby tube was collected from each sampling area. The shelby tubes were advanced using a sledge hammer before any soil was disturbed with the shovel in order to collect an “intact” sample of the clay liner. A shovel was used to advance the opening to a depth of 2.5 feet to determine the thickness of the clay liner. The clay liner was at least 2.5 feet in thickness at each sampling location.

One surface soil sample, SS-02, was collected from the sidewall of the retention pond using methods similar to those used in the pond bottom. The sample was collected midway up the sidewall on the north side of the retention pond. The soil liner underlies two layers of HDPE liner and two layers of geotextile liner.

The recovered soil sample containers were sealed with a lid and the Shelby tubes were maintained in a horizontal position prior to delivery to Rone Engineering in Dallas, Texas, for geotechnical analyses including Standard Proctor Test, Atterberg Limits, lab permeability, unit weight, and percent passing through a #200 sieve.

Sampling locations were filled with bentonite chips to match grade and the HDPE liners were repaired by Lone Star Lining Company, an experienced liner installation and repair company, using extrusion welding methods with two layers of 40-mil HDPE liner.

Sample Analysis and Results

Geotechnical analytical results are summarized in **Table 1** and the laboratory analytical data package is presented in **Attachment C**. The geotechnical results indicate that the soils observed underlying the HDPE liner were sufficiently clayey to use as a clay liner. Each soil sample collected exceeded the Permit requirements for “clay-rich soil material” (liquid limit greater than or equal to 30 and a plasticity index greater than or equal to 15). However, Proctor testing and in-place density measurements on Shelby tube samples indicate the soils were not compacted to 95% of the Proctor density (values varied from 88.3% to 90.7% of maximum dry density). Laboratory permeability results also indicate that surface soil sample SS-02 satisfied the permeability requirements of a soil liner (permeability $<1 \times 10^{-7}$ cm/sec), while surface soil samples SS-01 and SS-03 did not meet the soil liner requirements of the Permit.

EVALUATION

The liner evaluation indicates that there are multiple artificial membranes, varying in thickness from 40 mils to 60 mils, overlying a clay layer at least 2.5 feet in thickness.

Physical testing on the clay liner in three representative locations indicates that, although the soil has satisfactory physical properties to meet the Permit requirements, it may not have been compacted adequately. As a result, the clay liner alone does not satisfy the Permit requirements for density or permeability that would apply to a clay liner system.

Because the detention pond was designed and installed with redundant liners consisting of at least two artificial membranes in addition to the clay soil, W&M evaluated this as an alternate liner system as allowed in the Permit. The HDPE membrane liners, if installed alone, each exceed the required 30 mil thickness outlined in the Permit. The composite liner system was evaluated using the procedures developed by Giroud & Bonaparte[1], which consider the nature of the clay liner, the estimated number and size of defects in the artificial liner, the head of liquid on the liner system, and the contact between the liner and clay layer.

To simplify the evaluation, it was assumed that a single HDPE membrane is present above the clay soil liner, and the detention basin was nearly full, with approximately 10 feet of standing water on the liner system. In actuality, the basin is typically not full, and the second HDPE liner was not considered in the calculations.

The analysis was completed assuming approximately two defects per acre, with sizes of 0.1 square centimeter each (0.1 cm^2), a typical value for liners installed under supervision, and 1.0 cm^2 each, a conservative value indicative of more frequent or larger imperfections.

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[1] Giroud, J.P. and Bonaparte, R., 1989, “Leakage Through Liners Constructed with Geomembranes - Parts I and II”, *Geotextiles and Geomembranes*.

CONDITION	DESIGN CRITERIA	DESIGN UNIT LEAKAGE RATE (gpd/ft^2)
TCEQ Design Criteria	3' clay $k=1 \times 10^{-7}$ cm/sec	0.009
Exide Clay Soil Liner Only	3' clay Average permeability ($k=25 \times 10^{-7}$ cm/sec) Lowest permeability ($k=7.3 \times 10^{-6}$ cm/sec)	 0.228* 0.640*
Exide Soil Liner System (Clay Liner with one artificial HDPE membrane)	3' clay Average permeability ($k=25 \times 10^{-7}$ cm/sec) Average defects (two 0.1 cm^2 defects per acre) Average defects (two 1.0 cm^2 defects per acre)	 0.0005 0.0006
	3' clay Lowest permeability ($k=7.3 \times 10^{-6}$ cm/sec) Average defects (two 0.1 cm^2 defects per acre) Average defects (two 1.0 cm^2 defects per acre)	 0.0012 0.0015

*value exceeds unit design leakage rate in Permit

The evaluation indicates that the clay/HDPE liner system satisfies the Permit requirements, with estimated leakage rates within the design criteria. The analysis is conservative because the second HDPE liner and the drainage layer were not considered; both features would further reduce the volume of water that would seep through the basin under assumed conditions.

CONCLUSIONS

DCA performed surveying activities to determine the dimensions and capacity of the storm water detention pond located on the Exide facility located at 7471 South Fifth Street in Frisco, Texas. Based upon the DCA drawings, the capacity of the storm water retention pond was determined to be 6,540,596 gallons. The capacity of the storm water detention pond from the bottom of the pond to the top of the inlet pipe was determined to be 4,570,721 gallons.

The storm water detention pond is lined with at least two layers of HDPE liner separated by fill sand. The top layer of the HDPE liner was determined to be 60 mils thick and the lower layers were determined to be 40 mils thick. Underlying the HDPE liners is a compacted clay soil liner at least 2.5 feet thick. Three samples were collected from the clay liner and submitted for geotechnical analysis to determine the physical properties and permeability of the soil liner. The physical testing indicates that, although the soil has satisfactory physical properties to meet the permit requirements, it may not have been compacted adequately, and as a result, does not satisfy the permit requirements for density or permeability that would apply to a clay liner system.

Because the detention pond was designed and installed with redundant HDPE membrane liners in addition to the clay soil, W&M evaluated this as an alternate liner system using industry-established procedures. The evaluation, using reasonable and conservative input parameters, indicates that the clay/HDPE liner system satisfies t he Permit requirements, with estimated leakage rates within the design criteria.

W&M appreciates the opportunity to be of service to you on this project. If you have any questions or need additional information, please feel free to contact us.

Very truly yours,

W&M ENVIRONMENTAL GROUP, INC.	W&M ENVIRONMENTAL GROUP, INC.
Nick Foreman Environmental Scientist II	Frank W. Clark, P.E., P.G. Senior Consultant

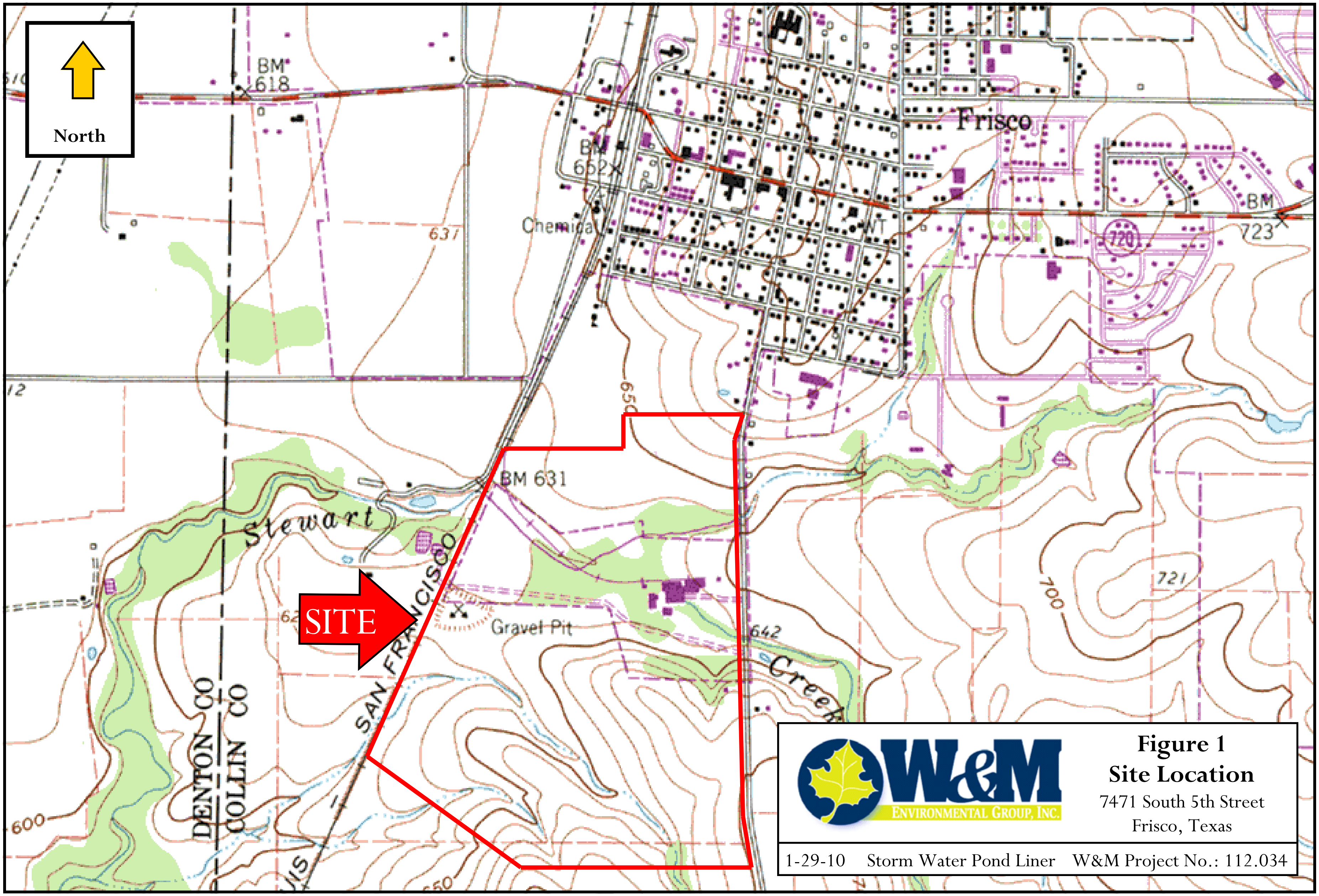
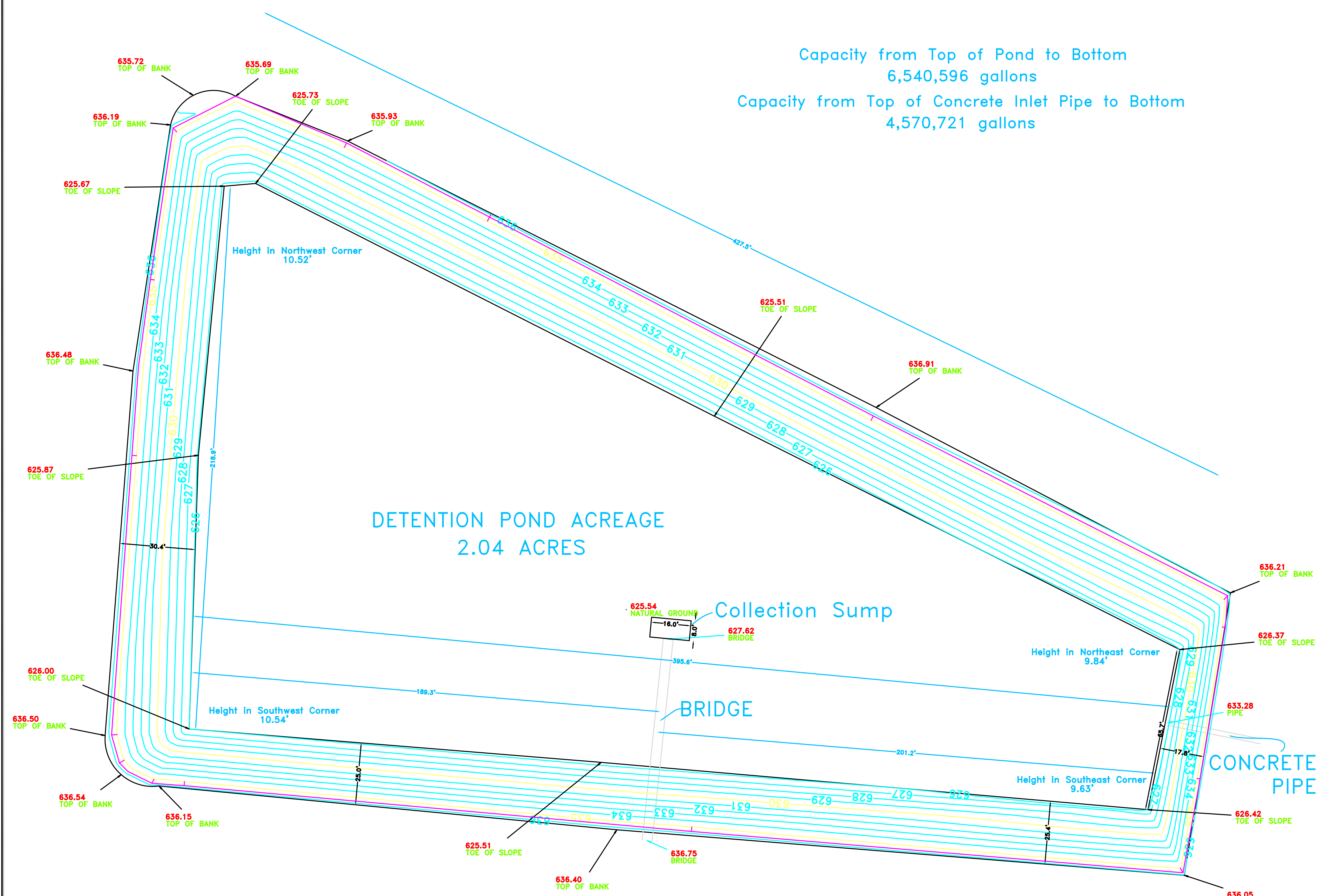


Figure 1
Site Location
7471 South 5th Street
Frisco, Texas

W&M ENVIRONMENTAL GROUP, INC.

1-29-10 Storm Water Pond Liner W&M Project No.: 112.034



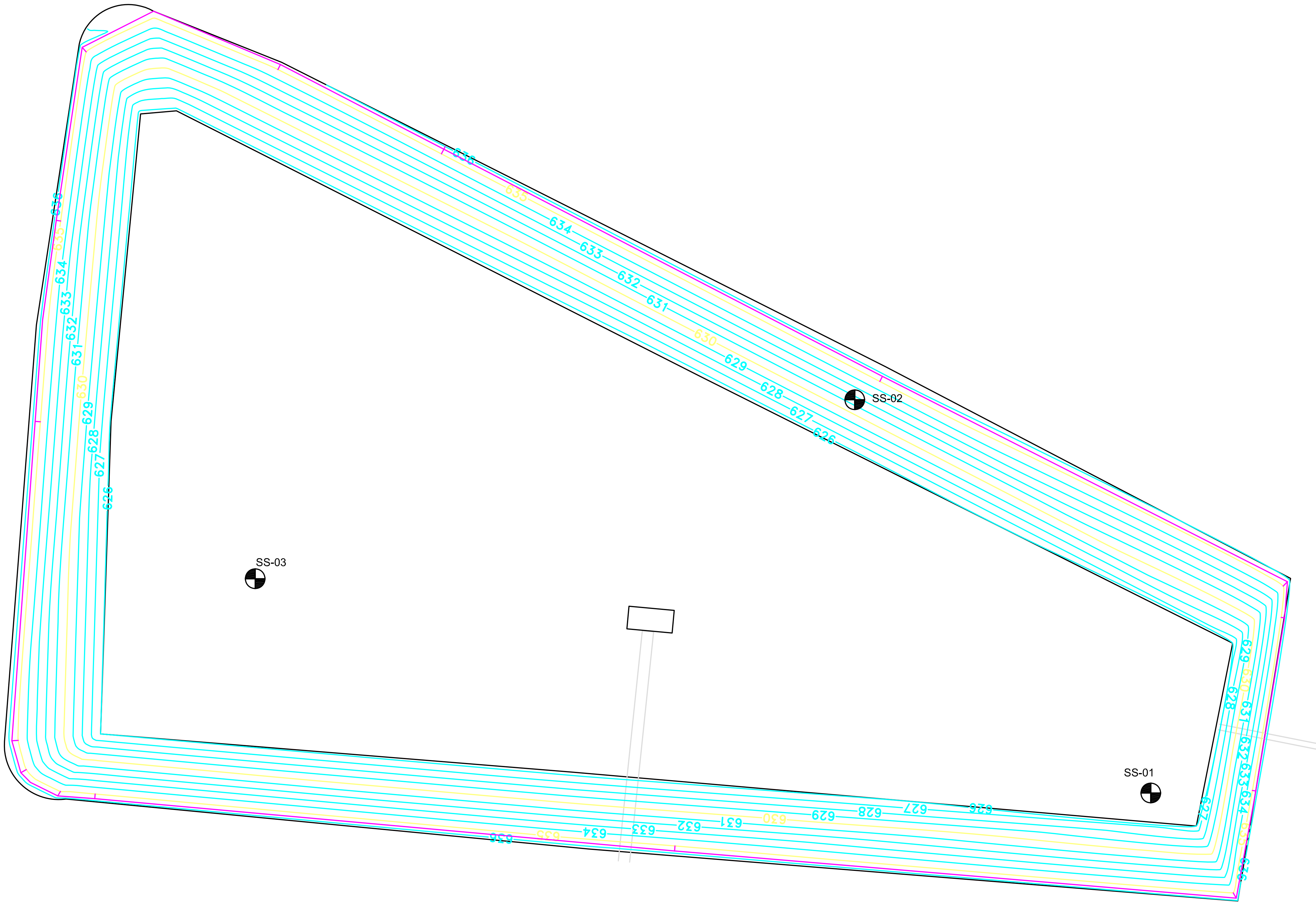
LEGEND

0' 25' 50'
APPROXIMATE SCALE

Figure 2
Storm Water Pond Liner
Elevation Survey
7471 South Fifth Street
Frisco, Texas

W&M ENVIRONMENTAL GROUP, INC.
www.wh-m.com

1-28-10	W&M Project No. 112.034	Check By: FWC	Drawn: DCA	Revised: NF (1-28-10)



LEGEND

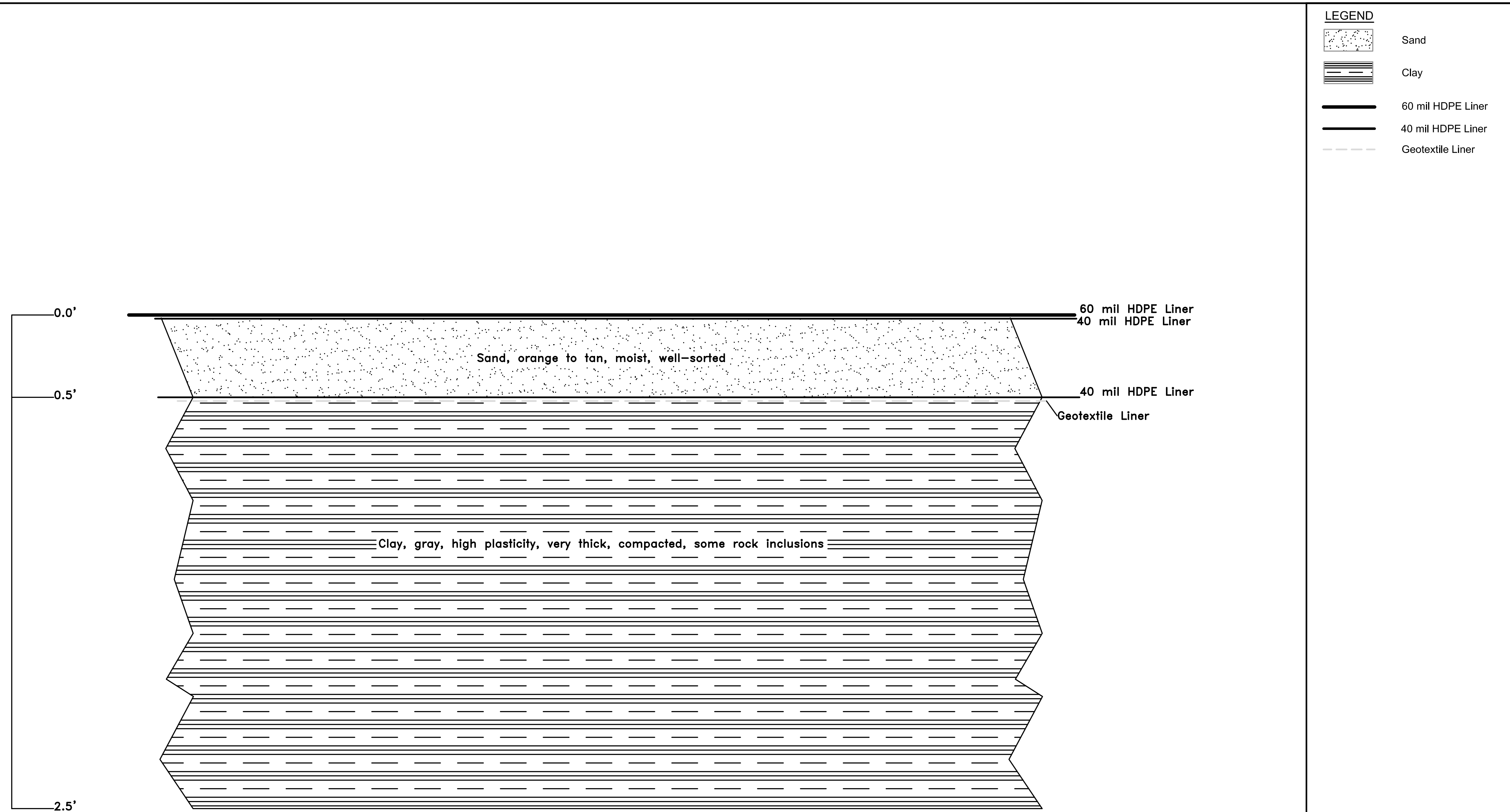
Sample Location

0' 25' 50'
APPROXIMATE SCALE

1-28-10 | W&M Project No. 112.034 | Check By: FWC | Drawn: DCA | Revised: NF (1-28-10)

Figure 3
Storm Water Pond Liner
Sample Locations
7471 South Fifth Street
Frisco, Texas

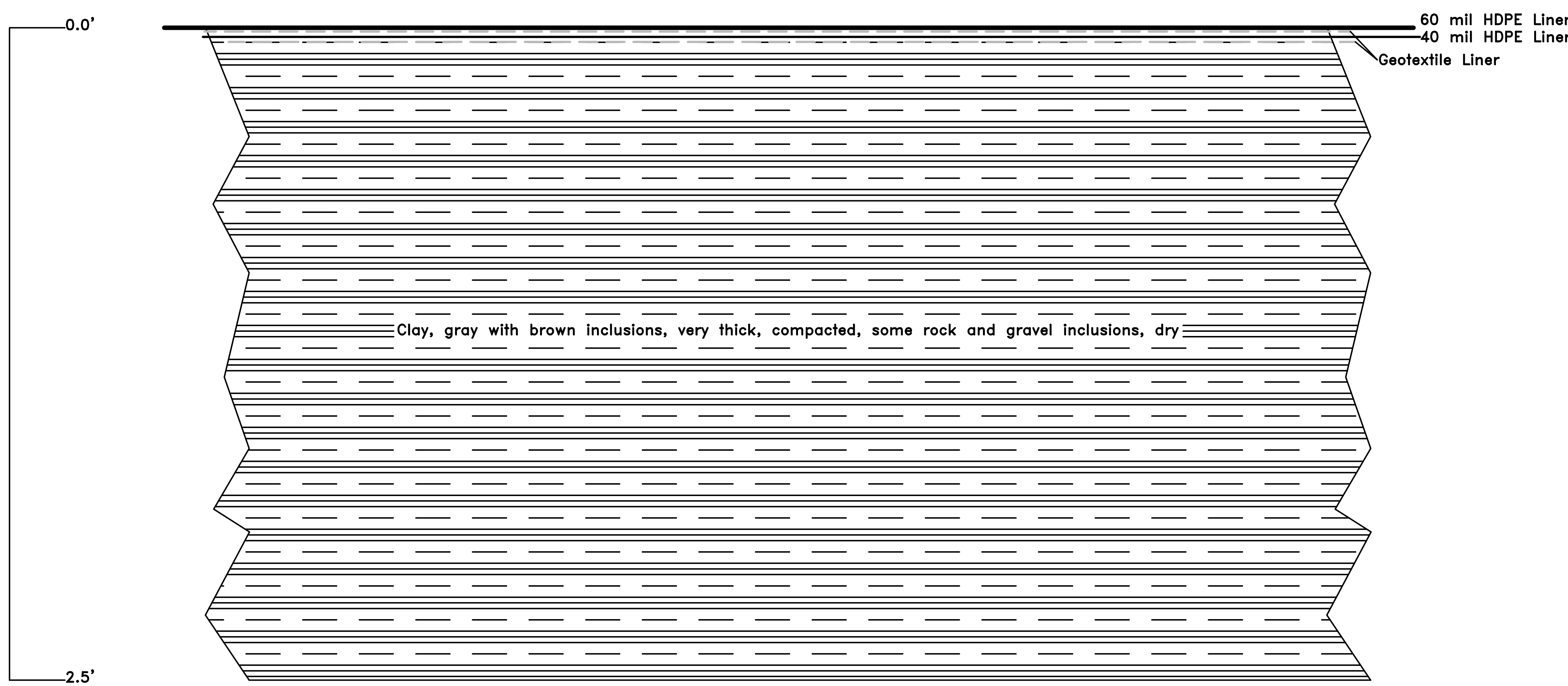
W&M ENVIRONMENTAL GROUP, INC.
www.wh-m.com



1-28-10	W&M Project No. 112.034	Check By: FWC	Drawn: NF	Revised: NF (1-28-10)

Figure 4
Storm Water Pond Liner
Cross-Section - SS-01
7471 South Fifth Street
Frisco, Texas

W&M ENVIRONMENTAL GROUP, INC.
www.wh-m.com



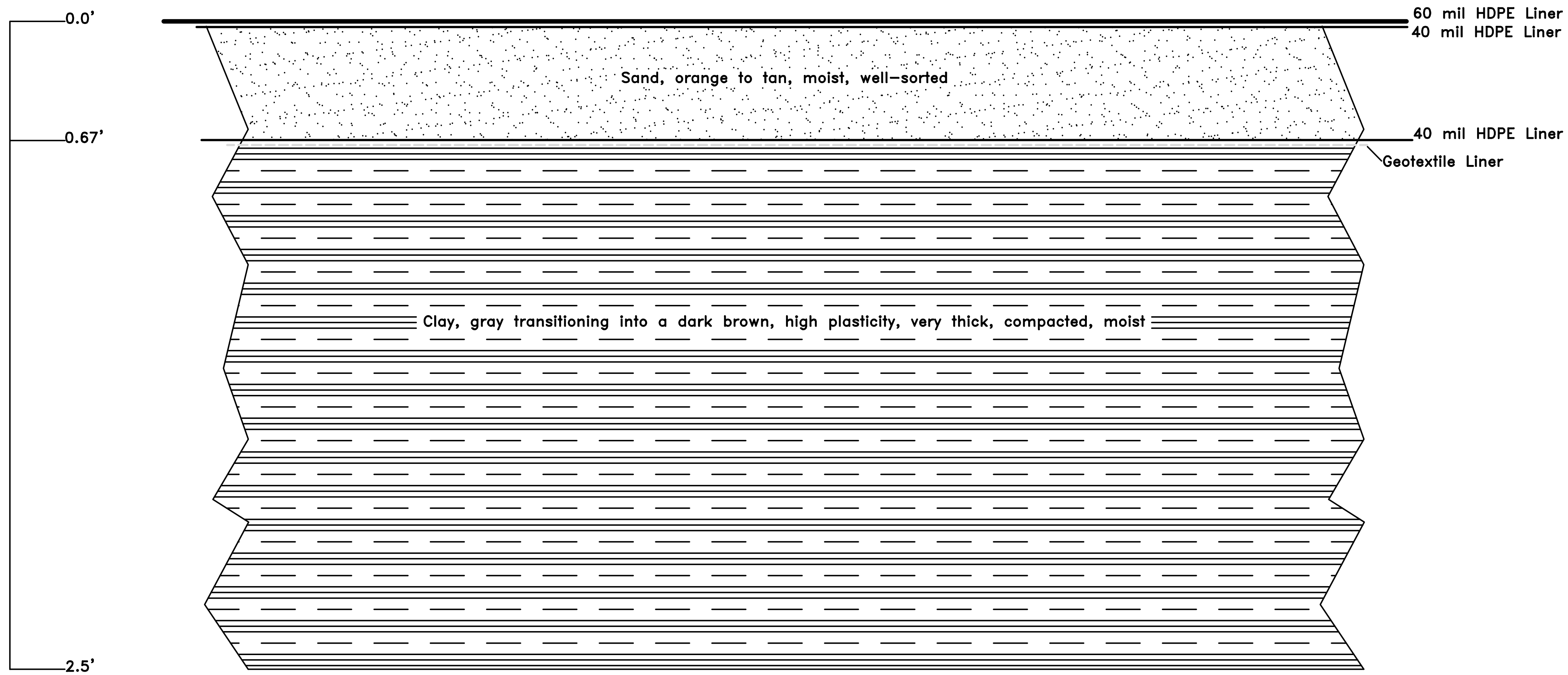
LEGEND

Clay
60 mil HDPE Liner
40 mil HDPE Liner
Geotextile Liner

1-28-10	W&M Project No. 112.034	Check By: FWC	Drawn: NF	Revised: NF (1-28-10)

Figure 5
Storm Water Pond Liner
Cross-Section - SS-02
7471 South Fifth Street
Frisco, Texas

W&M Environmental Group, Inc.
www.wh-m.com



LEGEND

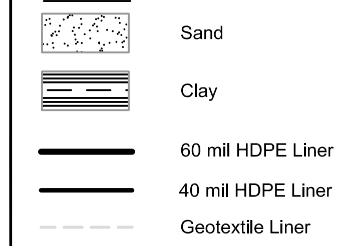


Figure 6
Storm Water Pond Liner
Cross-Section - SS-03
7471 South Fifth Street
Frisco, Texas

W&M ENVIRONMENTAL GROUP, INC.
www.wh-m.com

1-28-10	W&M Project No. 112.034	Check By: FWC	Drawn: NF	Revised: NF (1-28-10)

TABLE 1
SOIL LINER GEOTECHNICAL DATA SUMMARY TABLE

Exide Technologies
Frisco, TX

Sample ID[1]	Date Collected	Max Dry Density[2]	Optimum Moisture Content[2]	Liquid Limit[2]	Plastic Limit[2]	Plasticity Index[2]	Passing #200[2]	Dry Unit Weight[2]	Moisture Content[2]	Permeability[2]
		(pcf)[3]	(%)	(Unitless)	(Unitless)	(Unitless)	(%)	(pcf)	(%)	(cm/sec)
SS-01 (Bulk)	9/19/08	97.0	21.4	65.0	23.0	42.0	71.3	-	-	-
SS-01 (0'-1')	9/19/08	-	-	-	-	47	-	84.4	28.3	-
SS-01 (1'-2')	9/19/08	-	-	-	-	-	-	87.8	32.8	$1.4*10^{-07}$
SS-02 (Bulk)	9/19/08	101.4	21.6	63.0	22.0	41.0	77.5	-	-	-
SS-02 (0'-1')	9/19/08	-	-	-	-	49	-	107.7	22.2	-
SS-02 (1'-2')	9/19/08	-	-	-	-	-	-	92.0	29.2	$1.7*10^{-08}$
SS-03 (Bulk)	9/19/08	91.5	26.0	72.0	26.0	46.0	74.5	-	-	-
SS-03 (0'-1')	9/19/08	-	-	-	-	53	-	84.5	29.1	-
SS-03 (1'-2')	9/19/08	-	-	-	-	-	-	80.8	35.5	$7.3*10^{-06}$

Notes:

[1]Samples collected on September 19, 2008 were collected by W&M Environmental Group, Inc, and analyzed by Rone Engineering.

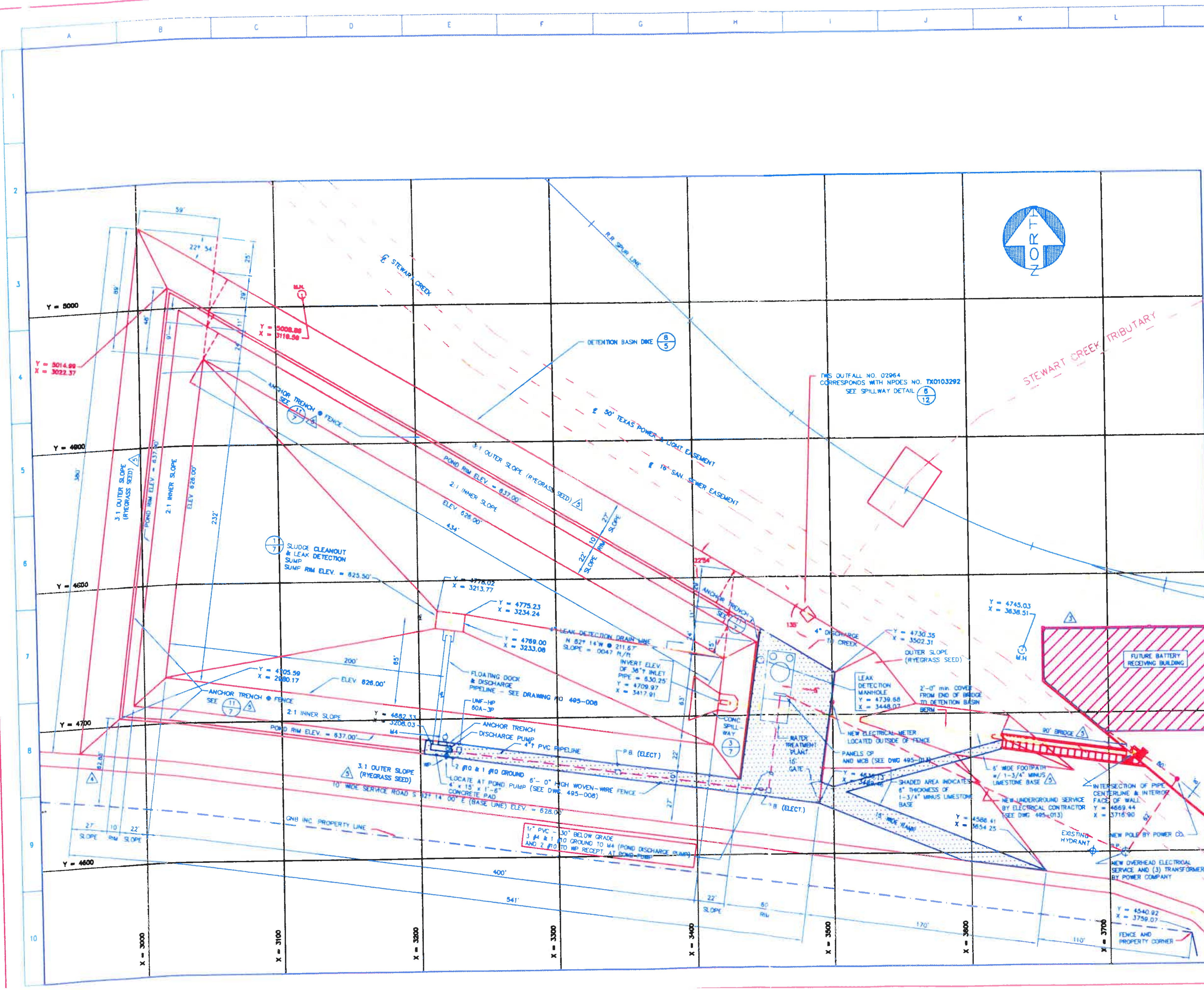
[2]Geotechnical analysis performed in accordance with ASTM D-4318 and ASTM-D-698 Method-A.

[3]pcf - pounds per cubic foot

(-) - not applicable

LAKE ENGINEERING DRAWINGS

ATTACHMENT A



GENERAL NOTES:

REFER TO DRAWING NO. 495-008, SHEET NO. 11 OF 18 FOR FLOATING DOCK DETAILS

REFER TO DRAWING NO. 495-009, SHEET NO. 12 OF 18 FOR WATER TREATMENT PLANT DETAILS

REFER TO DRAWING NO. 495-002, SHEET NO. 2 OF 18 FOR BARRIER WALL LAYOUT

REFER TO DRAWING NO. 495-006, SHEET NO. 8 OF 18 FOR PIPE CROSSING BRIDGE DETAILS

SECTION OR DETAIL NUMBER
SHEET LOCATION (SHEET NUMBER)

NO.	DATE	DESCRIPTION	BY
5	12-15-88	AS-BUILT DRAWINGS	G.E.S.
4	5-12-88	GENERAL REVISIONS	R.C.W
3	2/19/88	ADDENDUM #3	G.E.S.

REVISIONS

LAKE ENGINEERING & DEVELOPMENT, INC.
6000 LAKE FORREST DR. SUITE 350
ATLANTA, GEORGIA 30328

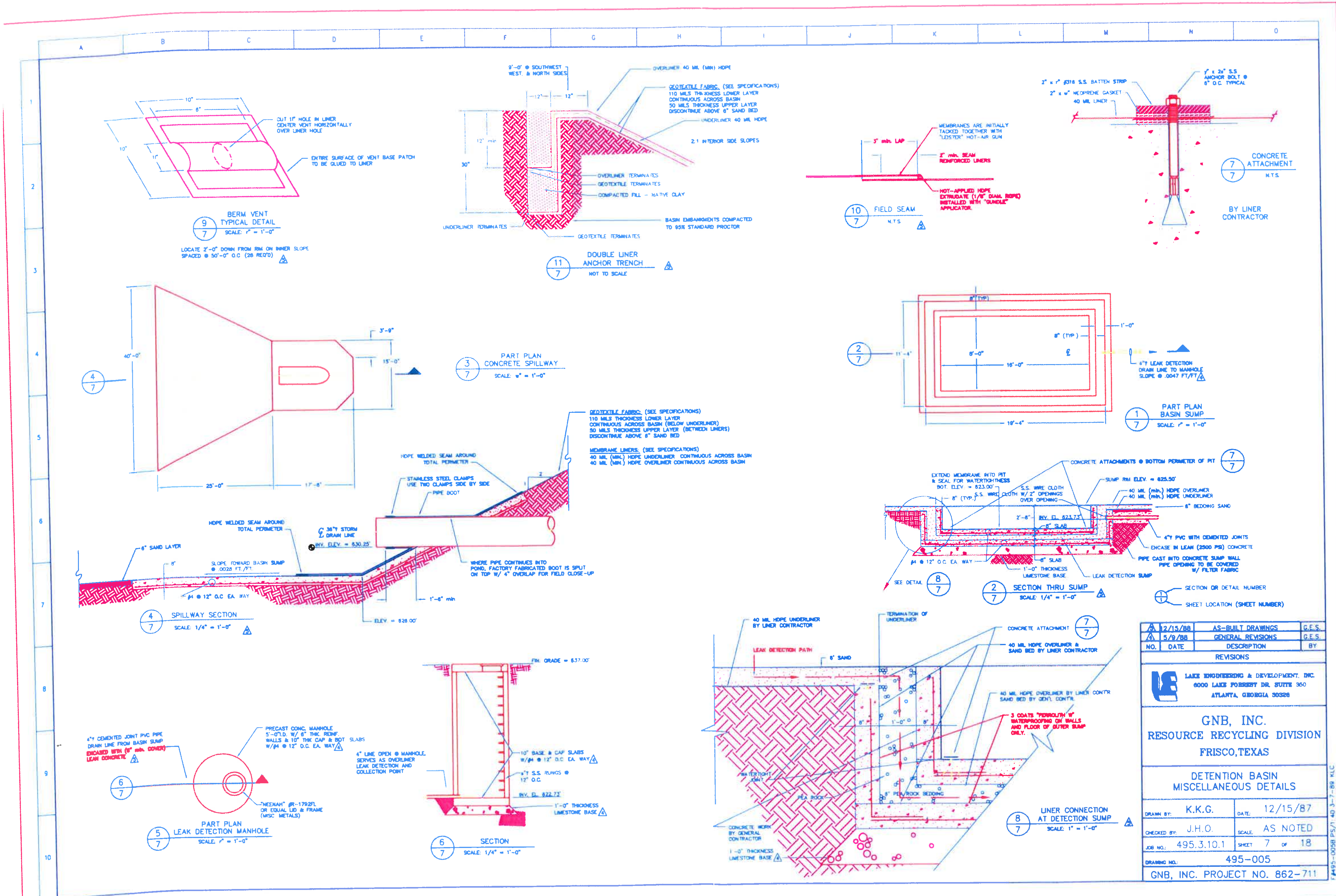
GNB, INC.
RESOURCE RECYCLING DIVISION
FRISCO, TEXAS

DETENTION BASIN
PART PLAN

DRAWN BY	K.K.G.	DATE	12/15/87
CHECKED BY	J.H.O.	SCALE	1" = 30'
JOB NO.	495.3.10.1	SHEET	6 OF 18
DRAWING NO.	495-004		

GNB, INC. PROJECT NO. 862-711

495-0040 1=1 3-17-89 G.A.D



BERM VENT TYPICAL DETAIL
SCALE: 1" = 1'-0"
LOCATE 2'-0" DOWN FROM RIM ON INNER SLOPE SPACED @ 50'-0" O.C. (28 REQ'D)
CUT 11" HOLE IN LINER CENTER VENT HORIZONTALLY OVER LINER HOLE
ENTIRE SURFACE OF VENT BASE PATCH TO BE GLUED TO LINER
DOUBLE LINER ANCHOR TRENCH
NOT TO SCALE
OVERLINER 40 MIL (MIN) HDPE
UNDERLINER 40 MIL HDPE
2:1 INTERIOR SIDE SLOPES
OVERLINER TERMINATES
GEOTEXTILE TERMINATES
COMPACTED FILL - NATIVE CLAY
BASIN EMBANKMENTS COMPACTED TO 95% STANDARD PROCTOR
UNDERLINER TERMINATES
FIELD SEAM
N.T.S.
MEMBRANES ARE INITIALLY TACKED TOGETHER WITH "LEISTER" HOT-AIR GUN
CONCRETE ATTACHMENT
N.T.S.
BY LINER CONTRACTOR
PART PLAN CONCRETE SPILLWAY
SCALE: 1/8" = 1'-0"
PART PLAN BASIN SUMP
SCALE: 1" = 1'-0"
SPILLWAY SECTION
SCALE: 1/4" = 1'-0"
SECTION THRU SUMP
SCALE: 1/4" = 1'-0"
PART PLAN LEAK DETECTION MANHOLE
SCALE: 1" = 1'-0"
SECTION
SCALE: 1/4" = 1'-0"
LINER CONNECTION AT DETECTION SUMP
SCALE: 1" = 1'-0"
SECTION OR DETAIL NUMBER
SHEET LOCATION (SHEET NUMBER)
12/15/88 AS-BUILT DRAWINGS G.E.S.
5/9/88 GENERAL REVISIONS G.E.S.
NO. DATE DESCRIPTION BY
REVISIONS
LAKE ENGINEERING & DEVELOPMENT, INC.
6000 LAKE FORREST DR. SUITE 360
ATLANTA, GEORGIA 30328
GNB, INC.
RESOURCE RECYCLING DIVISION
FRISCO, TEXAS
DETENTION BASIN MISCELLANEOUS DETAILS
DRAWN BY: K.K.G. DATE: 12/15/87
CHECKED BY: J.H.O. SCALE: AS NOTED
JOB NO.: 495.3.10.1 SHEET 7 OF 18
DRAWING NO.: 495-005
GNB, INC. PROJECT NO. 862-711

PHOTOGRAPHIC LOG

ATTACHMENT B

Photo 1: Exide facility storm water detention pond on the morning of September 19, 2009. Photo taken facing north-west.

Photo 2: Second layer of HDPE liner (40 mil) revealed after the top HDPE liner (60 mil) was removed in the area of soil sample SS-01 located in the southeast corner of the pond.

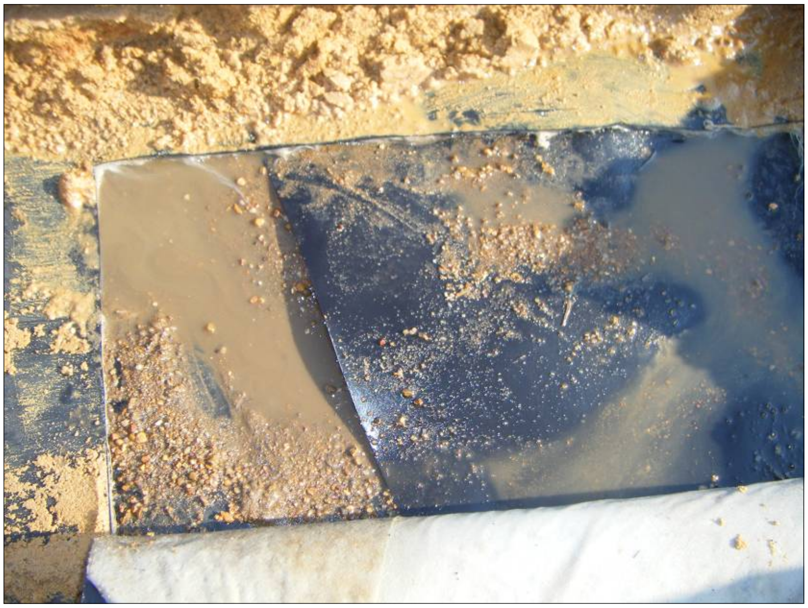


Photo 3: Photograph depicting the layers of lining at surface soil sample SS-01. Six-inches of fill sand underlying the top two layer of HDPE and underlain by a 40 mil HDPE layer, a geotextile layer, and two more HDPE layers.

Photo 4: Shelby tube advanced to a depth of two feet to collect SS-01. Four two-gallon buckets and a shelby tube were collected at each soil sample

Photo 5: Photograph depicting the layers of lining at surface soil sample SS-02 located on the north sidewall. A layer of 60 mil HDPE lining underlain by a geotextile fabric, underlain by a 40 mil liner, underlain by a geotextile fabric, underlain by a clay liner.

Photo 6: Shelby tube advanced to a depth of 1.5 feet to collect SS-02. This sample location was advanced to a depth of 2.5 feet into the clay soil liner.

Photo 7: Photograph depicting a 60 mil HDPE layer underlain by a 40 mil layer, underlain by an 8 inch layer of fill sand, underlain by another 40 mil HDPE layer.

Photo 8: Plugging the open holes in the pond liner with bentonite chips prior to covering it with fill sand and sealing it with two layers of 40 mil HDPE using extrusion welding methods.

Photo 9: Photograph depicting a new layer of 40 mil HDPE installed on the east end of the storm water detention pond and the pond liner repair crew repairing the liner at soil sample SS-03.

Photo 10: North sidewall of pond showing repair of the liner breached to collect soil sample SS-02.

LABORATORY
ANALYTICAL DATA

ATTACHMENT C

Rone Engineering

8908 Ambassador Row, Dallas, TX 75247
7701 W Little York, Ste 600, Houston, TX 77040
4421 Freidrich, Ste 195, Austin, TX 78744
Corporate Phone: (214) 630-9745

Report of Moisture Density Relationship

Client: W&M Environmental Group, Inc.
906 E. 18th Street
Plano, TX 75074

Report No.: 334208
Project No.: 0814889
Date of Service: 09/25/2008
Report Date: 10/08/2008

Project: W & M Enviromental Services
Dallas, TX.

Services: Obtain a sample of material from the jobsite, bring the sample back to the laboratory and perform a moisture density relationship test in accordance with ASTM Standards.

PROJECT DATA

Contractor:
Test For: Storm Water Pond (Bulk Sample)
Material: Dark Brown Fat Clay with Sand
Classification: Storm Water Pond (Bulk Sample)
Test Method: ASTM D-4318
ASTM D-698 Method-A

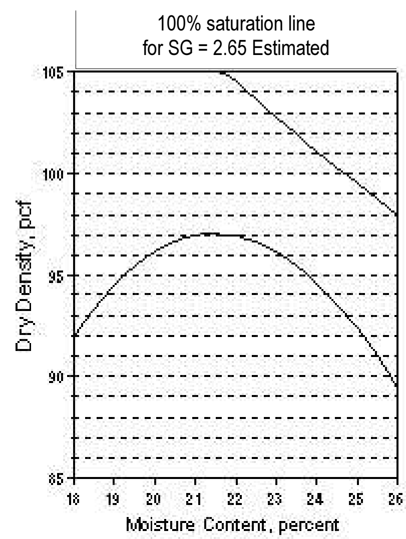
Date Sampled: 09/25/2008
Material Preparation: Dry
Rammer Type: Mechanical
Sampled By: Cox, Debera
Sample Location:
Exide SS-01

REPORT OF TEST

Maximum Dry Density, pcf: 97.0
Optimum Moisture Content, %: 21.4

Liquid Limit: 65
Plastic Limit: 23
Plasticity Index: 42

% Passing #200: 71.3



Technician: Debera Cox
Report Distribution:
Charge: W&M Environmental Group, Inc. Attn: Mr. Nick Foreman
Orig: W&M Environmental Group, Inc. (Plano, TX)
Attn: Mr. Nick Foreman (1-ec copy)
1-ec Rone Project Manager Attn: Mr. K. Scott Watson AET

Rone Engineering

K. Scott Watson, AET
Project Manager

(DC/KW)

Rone Engineering

8908 Ambassador Row, Dallas, TX 75247
7701 W Little York, Ste 600, Houston, TX 77040
4421 Freidrich, Ste 195, Austin, TX 78744
Corporate Phone: (214) 630-9745

Report of Moisture Density Relationship

Client: W&M Environmental Group, Inc.
906 E. 18th Street
Plano, TX 75074

Report No.: 334209
Project No.: 0814889
Date of Service: 09/25/2008
Report Date: 10/08/2008

Project: W & M Enviromental Services
Dallas, TX.

Services: Obtain a sample of material from the jobsite, bring the sample back to the laboratory and perform a moisture density relationship test in accordance with ASTM Standards.

PROJECT DATA

Contractor:
Test For: Storm Water Pond (Bulk Sample)
Material: Dark Brown & Tan Fat Claywith Sand & Trace Gravel
Classification: Storm Water Pond (Bulk Sample)
Test Method: ASTM D-4318
ASTM D-698 Method-B

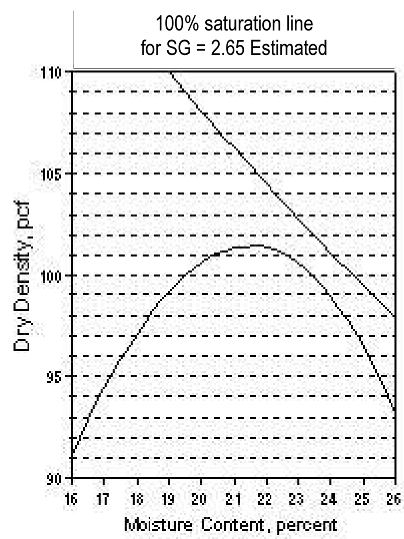
Date Sampled: 09/25/2008
Material Preparation: Dry
Rammer Type: Mechanical
Sampled By: Cox, Debera
Sample Location:
Exide SS-02

REPORT OF TEST

Maximum Dry Density, pcf: 101.4
Optimum Moisture Content, %: 21.6

Liquid Limit: 63
Plastic Limit: 22
Plasticity Index: 41

% Passing #200: 77.5



Technician: Debera Cox
Report Distribution:
Charge: W&M Environmental Group, Inc. Attn: Mr. Nick Foreman
Orig: W&M Environmental Group, Inc. (Plano, TX)
Attn: Mr. Nick Foreman (1-ec copy)
1-ec Rone Project Manager Attn: Mr. K. Scott Watson AET

Rone Engineering

K. Scott Watson, AET
Project Manager

LIMITATIONS: The test results presented herein were prepared based upon the specific samples provided for testing. We assume no responsibility for variation in quality (composition, appearance, etc.) or any other feature of similar subject matter provided by persons or conditions over which we have no control. Our letters and reports are for the exclusive use of the clients to whom they are addressed and shall not be reproduced except in full without the written approval of Rone Engineering Services, Ltd.
(KW/KW)

Rone Engineering
8908 Ambassador Row, Dallas, TX 75247
7701 W Little York, Ste 600, Houston, TX 77040
4421 Freidrich, Ste 195, Austin, TX 78744
Corporate Phone: (214) 630-9745

Report of Moisture Density Relationship

Client: W&M Environmental Group, Inc.
906 E. 18th Street
Plano, TX 75074

Report No.: 334210
Project No.: 0814889
Date of Service: 09/25/2008
Report Date: 10/08/2008

Project: W & M Enviromental Services
Dallas, TX.

Services: Obtain a sample of material from the jobsite, bring the sample back to the laboratory and perform a moisture density relationship test in accordance with ASTM Standards.

PROJECT DATA

Contractor:
Test For: Storm Water Pond (Bulk Sample)
Material: Dark Brown Fat Clay with Sand
Classification: Storm Water Pond (Bulk Sample)
Test Method: ASTM D-4318
ASTM D-698 Method-A

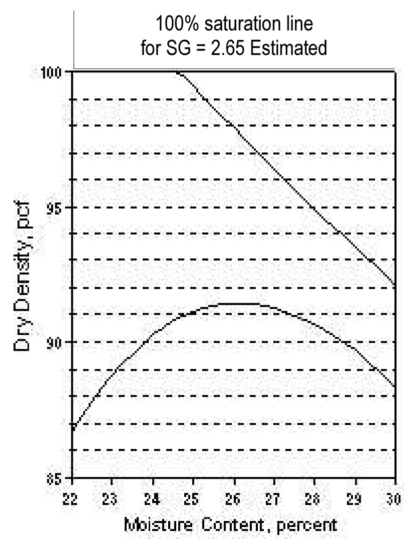
Date Sampled: 09/25/2008
Material Preparation: Dry
Rammer Type: Mechanical
Sampled By: Cox, Debera
Sample Location:
Exide SS-03

REPORT OF TEST

Maximum Dry Density, pcf: 91.5
Optimum Moisture Content, %: 26.0

Liquid Limit: 72
Plastic Limit: 26
Plasticity Index: 46

% Passing #200: 74.5



Technician: Debera Cox
Report Distribution:
Charge: W&M Environmental Group, Inc. Attn: Mr. Nick Foreman
Orig: W&M Environmental Group, Inc. (Plano, TX)
Attn: Mr. Nick Foreman (1-ec copy)
1-ec Rone Project Manager Attn: Mr. K. Scott Watson AET

Rone Engineering

K. Scott Watson, AET
Project Manager

(DC/KW)

Rone Engineering

8908 Ambassador Row, Dallas, TX 75247
7701 W Little York, Ste 600, Houston, TX 77040
4421 Freidrich, Ste 195, Austin, TX 78744
Corporate Phone: (214) 630-9745

Report of Permeability Testing

Client: W&M Environmental Group, Inc.
906 E. 18th Street
Plano, TX 75074

Report No.: 334208A
Project No.: 0814889
Date of Service: 09/25/2008
Report Date: 11/25/2008

Project: W & M Enviromental Services
Dallas, TX.

Services: Permeability Testing

Report of Tests

On this date, a Rone Engineering Services, Ltd. representative(s) received shelby tube soil samples for laboratory testing. The results are given below.

Sample ID: SS01 EXIDE (Shelby Tube 0' - 1')
Material Description: Dark Brown Clay with Iron Ore
Plasticity Index: 47
Percent Passing No. 200 Sieve: 90.01%
Moisture Content: 28.3%
Dry Unit Weight: 84.4 pcf

Sample ID: SS02 EXIDE (Shelby Tube 0' - 1')
Material Description: Dark Brown Clay with Trace Gravel
Plasticity Index: 49
Percent Passing No. 200 Sieve: 89.22%
Moisture Content: 22.2%
Dry Unit Weight: 107.7 pcf

Sample ID: SS03 EXIDE (Shelby Tube 0' - 1')
Material Description: Dark Brown Clay
Plasticity Index: 53
Percent Passing No. 200 Sieve: 98.79%
Moisture Content: 29.1%
Dry Unit Weight: 84.5 pcf

(KW/KW)

Rone Engineering

8908 Ambassador Row, Dallas, TX 75247
7701 W Little York, Ste 600, Houston, TX 77040
4421 Freidrich, Ste 195, Austin, TX 78744
Corporate Phone: (214) 630-9745

Report of Permeability Testing

Client: W&M Environmental Group, Inc.
906 E. 18th Street
Plano, TX 75074

Report No.: 334208A
Project No.: 0814889
Date of Service: 09/25/2008
Report Date: 11/25/2008

Project: W & M Enviromental Services
Dallas, TX.

Services: Permeability Testing

Report of Tests

Sample ID: SS01 EXIDE (Shelby Tube 1' - 2')
Material Description: Dark Brown Clay with Iron Ore
Moisture Content: 32.8%
Dry Unit Weight: 87.8 pcf
Permeability: 1.4E-07 cm/sec

Sample ID: SS02 EXIDE (Shelby Tube 1' - 2')
Material Description: Dark Brown Clay with Trace Gravel
Moisture Content: 29.2%
Dry Unit Weight: 92.0 pcf
Permeability: 1.7E-08 cm/sec

Sample ID: SS03 EXIDE (Shelby Tube 1' - 2')
Material Description: Dark Brown Clay
Moisture Content: 35.5%
Dry Unit Weight: 80.8 pcf
Permeability: 7.3E-06 cm/sec

Technician: Debera Cox
Report Distribution:
Charge: W&M Environmental Group, Inc. Attn: Mr. Nick Foreman
Orig: W&M Environmental Group, Inc. (Plano, TX)
Attn: Mr. Nick Foreman (1-ec copy)
1-ec Rone Project Manager Attn: Mr. K. Scott Watson AET

Rone Engineering

K. Scott Watson, AET
Project Manager

(KW/KW)

APPENDIX 20.2
LINER INSPECTION REPORT

MEMORANDUM

Date:	March 20, 2014	**Project No.:**	130-2086
To:	Matt Love	**Company:**	Exide Technologies
From:	David E. Poe, P.E., Jay Winters, P.G.		
cc:		**Email:**	Jay_Winters@golder.com

RE: INSPECTION OF LINER SYSTEMS FOR THE STORMWATER RETENTION POND AND SOLAR EVAPORATION POND – EXIDE TECHNOLOGIES, FRISCO, TEXAS

1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this memorandum summarizing the field inspections of the Stormwater Retention Pond (SWRP) and the Solar Evaporation Pond (SEP) at the Exide facility in Frisco, Texas. David Poe, P.E., of Golder performed the field inspections in December 2013. The following report summarizes the field inspection findings.

Review of the report titled “Stormwater Detention Pond Liner Specifications”, as prepared by W&M Environmental Group, Inc. (November 9, 2011), indicates that the SWRP was constructed in 1988 and originally was comprised of two 40-mil high density polyethylene liners, underlain by a geotextile fabrics and separated by a 6-inch thick sand drainage layer (pg. 2). The report further states that at some point in the early 1990’s, a severe storm damaged and exposed the pond liner system, and a 60-mil HDPE liner was placed over the pond (pg. 2).

Both the SWRP and SEP appear to have been lined with 60 mil HDPE liner.

1.1 Scope of Inspections

The inspections were limited to visual observations of the membrane liners from the top of the pond slopes. The lower portions of the sideslopes and the bottom of the ponds could not be observed as the ponds currently impound water. The depth of impounded water was not determined during the field observations.

The perimeters of the ponds were traversed twice, slowly, as the liner was visually inspected. Photographs of the pond liners were taken from various perspectives along the perimeters of the ponds, and are attached as Exhibit A.

2.0 STORMWATER RETENTION POND (SWRP) INSPECTION

2.1 BACKGROUND

The SWRP is a membrane-lined pond with approximate dimensions of 300 feet and 125 feet (west and east slopes, respectively) by approximately 450 feet (north and south slopes), and an approximate area of

2.2 acres. The SWRP is located near the southwest corner of the Exide property, immediately north of the Crystallization Unit.

The liner system is comprised of fusion-welded high density polyethylene (HDPE) membrane. The liner material appears to be 60 mil in thickness (approximately 0.06 inches). Observations indicate the liner was originally welded using double fusion welding (for seams) and extrusion welding (for patches at sample locations and repairs). The HDPE is black in color, indicating that it was manufactured with carbon black, which facilitates the liner being exposed to ultraviolet sunlight without damage.

The pond appears to have been constructed with 1.5H:1V or steeper interior slopes. The liner is anchored around the perimeter in what appears to be a concrete-filled anchor trench.

Photographs (PHOTOS 1 through 8) of the SWRP are included in the attached Exhibit A.

2.2 INSPECTION FINDINGS

2.2.1 Observations of Liner Condition and Maintenance

Overall, the liner was observed to be in excellent condition. A few minor abrasions were observed in the liner material, as well as several surficial gouges or indentations. However, no liner penetrations below the crest of the pond liner and above the waterline were observed. Welding (both fusion and extrusion welds) appear to be consistent with industry standards. No excessive displacement, folds, fishmouths, shoving, or excessive movement were observed in the liner or underlying liner foundation. The inlet culvert liner appeared intact and in excellent condition. The bands securing the liner to the inlet culvert appeared to be in good condition and functioning as designed. Overall, the liner condition is assessed to be excellent.

2.2.2 Observed Liner Defects

Two defects were observed in the liner material, although neither exists below the crest elevation of the liner, and can be addressed in the future as maintenance items.

The first defect is located near the southeast corner of the pond, in the anchor trench. A perforation appears to have been caused by maintenance or vegetation removal from the anchor trench. The perforation is at a location beyond the pond crest, and does not represent an environmental risk or a risk to the stability of the pond liner.

The second defect appears to be a cut in the HDPE liner that may be a remnant from the original liner installation. As shown on Photo 6, a cut immediately adjacent to a fusion-welded patch exists in the northwest corner of the pond. The cut appears to be approximately 6 inches in length, and is located immediately adjacent to a fusion weld on the patch. The patch is located beyond the crest of the pond liner, and does not represent an environmental risk or a risk to the stability of the pond liner.

2.2.3 Anchor Trench Observations

As shown in a number of photographs, a separation has opened between the liner and the concrete backfill believed to have originally been placed within the anchor trench around the perimeter of the pond liner. Vegetation was observed to have become established at several locations between the liner and the concrete, although it is apparent the vegetation has now been cut and removed. Root systems were observed still existing in the opening between the liner and concrete.

Golder understands that the SWRP will be decommissioned over the next several years as a component of ongoing remediation being performed at the site. The opening between the concrete and liner does not appear to pose any short-term environmental risk or structural risk to the pond liner or slopes, and can remain in its current state until decommissioning. In the event future plans call for maintaining the pond indefinitely, then repairs might include backfilling the opening with concrete or compacted sand. Removal and replacement of the existing concrete backfill is not recommended, as potential damage to the liner or foundation soils is possible.

2.2.4 Perimeter Fencing

As shown in the attached photographs, the perimeter fencing at the SWRP is intact and appears to be well maintained.

2.2.5 Additional Observations

<u>Sacrificial Rub Sheets or Other Protective Covering over Metal Pipe and Hose Fixtures</u>

Golder observed one hose with a metal connector lying on the top of the HDPE liner. Golder recommends that metal fixtures or connectors be wrapped in a plastic sacrificial sheet or other measures to eliminate direct contact of metal fixtures or connectors onto the HDPE liner. While no damage was observed on the liner from the metal connector, using rub sheets or other protective measures over the liner represents good practices for protection of membrane liner systems.

3.0 SOLAR EVAPORATION POND (SEP) INSPECTION

3.1 BACKGROUND

The SEP is a membrane-lined pond with approximate dimensions of 150 feet by approximately 260 feet, and an approximate area of 0.9 acres. The SEP is located near the northwest corner of the Exide property, immediately southwest of the Class 2 Landfill.

MEMORANDUM

The liner system is comprised of fusion-welded high density polyethylene (HDPE) membrane. The liner material appears to be 60 mil in thickness (approximately 0.06 inches). Observations indicate the liner was originally welded using double fusion welding (for seams) and extrusion welding (for patches at sample locations and repairs). The HDPE is black in color, indicating that it was manufactured with carbon black, which facilitates the liner being exposed to ultraviolet sunlight without damage.

The pond appears to have been constructed with 2H:1V or steeper interior slopes. The liner is anchored around the perimeter in what appears to be a concrete filled anchor trench.

Photographs (PHOTOS 9 through 15) of the SEP are included in the attached Exhibit A.

3.2 INSPECTION FINDINGS

3.2.1 Observations of Liner Condition and Maintenance

Overall, the liner was observed to be in excellent condition. A few minor abrasions were observed in the liner material. However, no liner penetrations below the crest of the pond liner and above the waterline were observed. Welding (both fusion and extrusion welds) appear to be consistent with industry standards. No excessive displacement, folds, fishmouths, shoving, or excessive movement were observed in the liner or underlying liner foundation. The inlet culvert liner appeared intact and in excellent condition. The bands securing the liner to the inlet culvert appeared to be in good condition and functioning as designed. Overall, the liner condition is assessed to be excellent.

3.2.2 Observed Liner Defects

A single defect/damage was observed in the liner material, although the liner damage exists above the crest elevation of the liner, and can be addressed in the future as a maintenance item.

The defect is located at the southeast corner of the pond, immediately adjacent to the anchor trench. The liner appears to have been torn, potentiallly by maintenance equipment (see PHOTO 14). The tear is at a location beyond the pond crest, and does not represent an environmental risk or a risk to the stability of the pond liner.

3.2.3 Anchor Trench Observations

The liner appears to be anchored in a soil trench. Vegetation is well established over the anchor trench, and the liner appears to be secure within the anchor.

3.2.4 Perimeter Fencing

As shown in the attached photographs, the perimeter fencing at the SEP is intact and appears to be well maintained. No action required.

3.2.5 Additional Observations

Sacrificial Rub Sheets or Other Protective Covering over Metal Pipe and Hose Fixtures

Golder observed several hoses with metal connectors lying on the top of the HDPE liner. Golder recommends that metal fixtures or connectors be wrapped in a plastic sacrificial sheet or other measures to eliminate direct contact of metal fixtures or connectors onto the HDPE liner. While no damage was observed on the liner from the metal connector, using rub sheets or other protective measures over the liner represents good practices for protection of membrane liner systems.

4.0 LIMITATIONS

Golder's inspection was limited to visual inspection of the pond liners above the waterline, as observed from the crest of the lined pond slopes. Due to the steepness of the pond sideslopes, traversing the slopes as a component of the inspection was not possible. The integrity or soundness of the welds (both fusion and extrusion) at the ponds were not evaluated for this inspection. Golder's conclusion that the pond liners appear to be in excellent condition is based on the described visual observations only.

EXHIBITS

A - Photographs

Project Title: Stormwater Retention Pond (SWRP)	
PHOTO 1 - SWRP Looking West.	
PHOTO 2 - SWRP Eastern Slope of Pond with Inlet.	

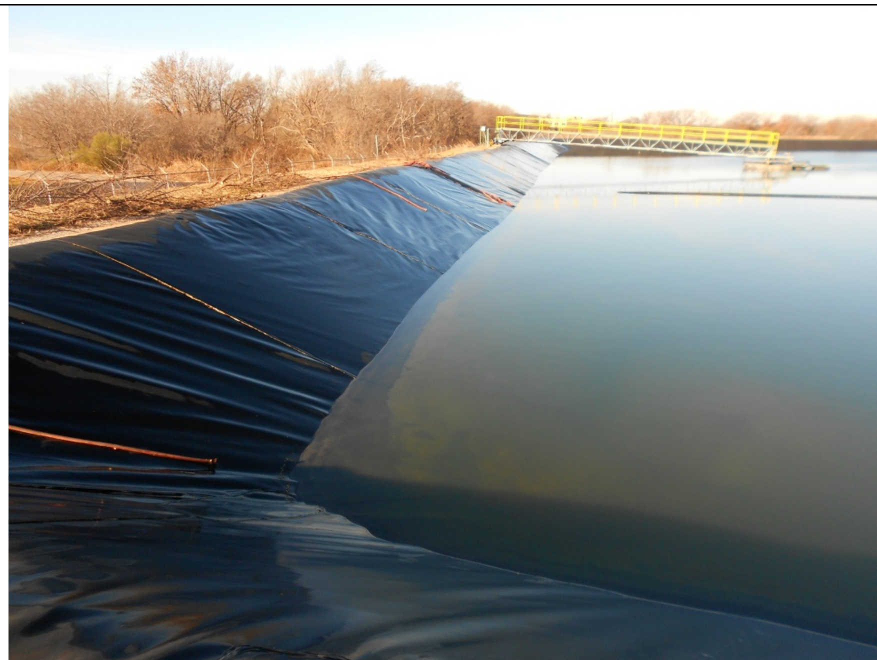
PHOTO 3 - SWRP Southern Slope of Pond.	
PHOTO 4 - SWRP Pond Inlet on Eastern Slope.	

PHOTO 5 - SWRP

Northern Slope of Pond

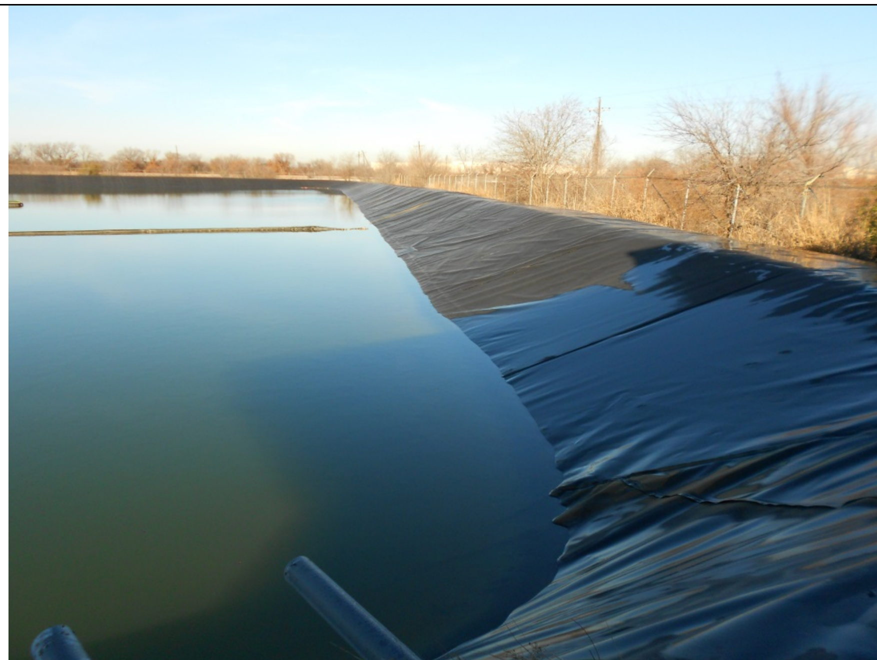


PHOTO 6 - SWRP

Cut in Liner at Patch (located above Crest of Pond Liner at Northwest Corner of Pond). Note damage (6-in cut) at toe of boot, along extrusion weld.

PHOTO 7 - SWRP Separation of Concrete Anchor Trench Fill and Liner at Southern Slope of Pond	
PHOTO 8 - SWRP Separation of Concrete Anchor Trench Fill and Liner at Northern Slope of Pond	

Project Title: Solar Evaporation Pond (SEP)	
PHOTO 9 - SEP Looking Northwest from Southeast Corner.	
PHOTO 10 - SEP Southern Slope of Pond.	

PHOTO 11 - SEP Western Slope of Pond.	
PHOTO 12 - SEP Northern Slope of Pond.	

PHOTO 13 - SEP

Eastern Slope of Pond.

PHOTO 14 - SEP

Liner Damage in Southeast Corner of Pond (Note: Damage Located at Elevation above Eastern Crest of Pond).

PHOTO 15 - SEP Transfer Pump Station.	

APPENDIX 21
DOCUMENTATION FROM FORMER FRC PERSONNEL REGARDING FILL MATERIAL BELOW THE BATTERY RECEIVING/STORAGE BUILDING

AFFIDAVIT OF BILLY J. KING

STATE OF TEXAS §
§
COUNTY OF COLLINS §

BEFORE ME, the undersigned authority, on this day personally appeared Billy J. King, known to me to be the person whose name is ascribed below who being by me first duly sworn, upon his oath, stated as follows:

1. My name is Billy J. King. I am over the age of 21 years and have never been convicted of a crime. I am under no disability, and I am fully competent to make this affidavit. I have personal knowledge of the facts stated here, and they are true and correct.

2. I am currently employed by Exide Technologies ("Exide") as Director of Technologies, a corporate position.

3. From August of 1983 until the present, I have been employed by the owners of the Frisco Battery Recycling Center located at 7471 South Fifth Street in Frisco, Collin County, Texas, including Exide and GNB Technologies, Inc.

4. From August 1983 to the present, my positions were based at, and I was regularly present at, the Frisco Battery Recycling Center.

5. In my positions as Quality Control Manager, Environmental and Quality Control Manager, Production Manager, Division Metallurgist, Technical Services Manager, Corporate Metallurgist, and Director of Technologies held during these time frames, I was involved in or familiar with the site conditions and waste management and disposal practices at the Frisco Battery Recycling Center.

6. When I began working at the Frisco Battery Recycling Center in August 1983, I became familiar with the Frisco Battery Recycling Center site conditions and past on-site disposal practices.

7. From August 1983 to the present and, to the best of my knowledge from at least November 16, 1980 forward, hazardous waste was not disposed of or otherwise used as fill on-site, other than in the instances of treatment failure associated with waste deposited in the on-site Class 2 Landfill.

8. Further, for clarity, no hazardous waste was used as fill when the Battery Receiving/Storage Building was constructed in the late 1980s.

9. I conveyed this information in a telephone call with Ms. Aileen Hooks in May 2013 for use in development of the Affected Property Assessment Report for the Frisco Battery Recycling Center.

FURTHER AFFIANT sayeth not.

Billy J King
Affiant

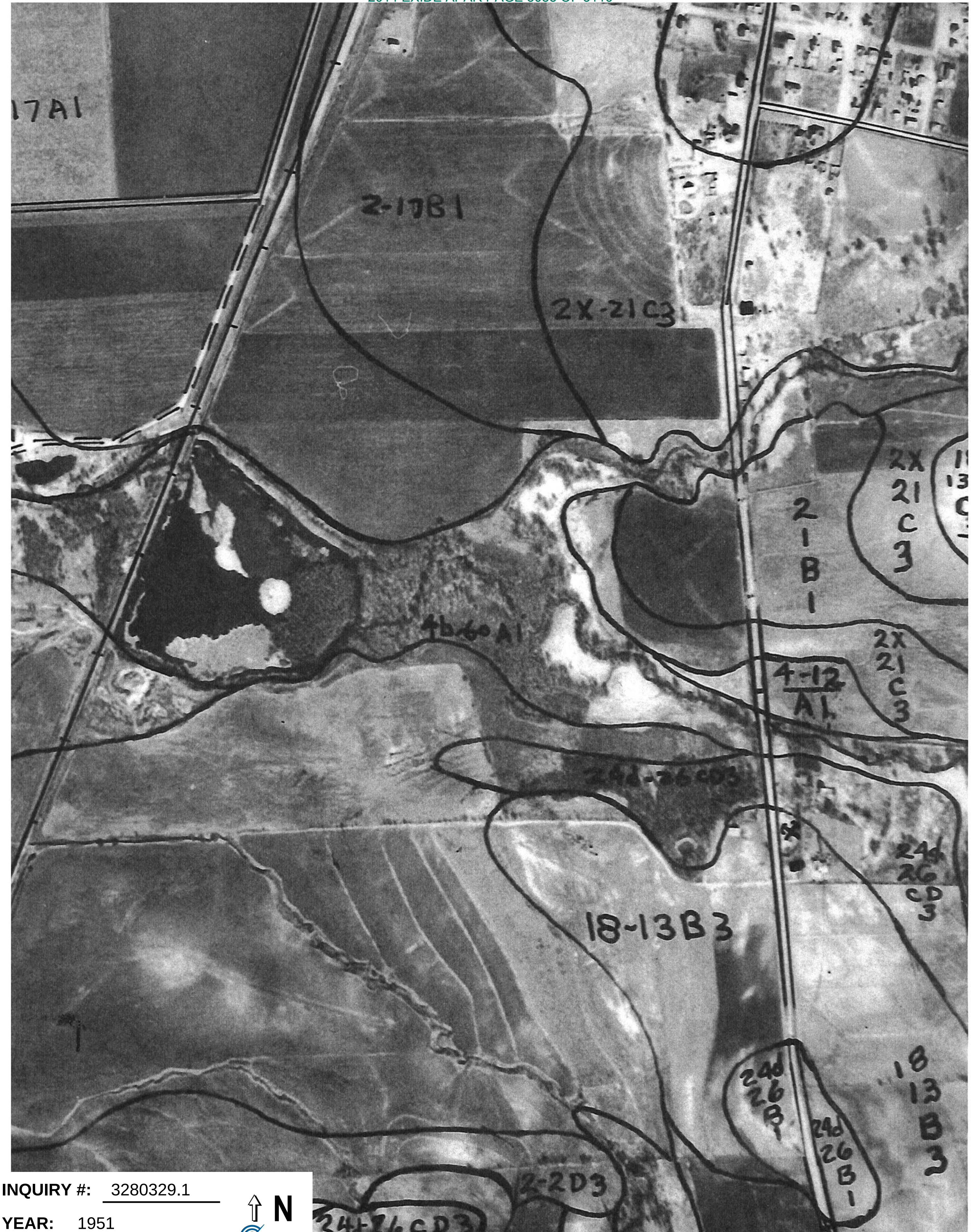
SUBSCRIBED AND SWORN to before me by Billy J. King on this 21st day of February, 2014, to which witness my hand and seal of office.

NOTARY PUBLIC STATE OF TEXAS
BROOKE R VANAMAN
My Commission Expires
February 19, 2017

Brooke R. Vanaman
Notary Public in and for the State of Texas

My Commission Expires: 2.19.17

APPENDIX 22
HISTORICAL AERIAL PHOTOGRAPHS



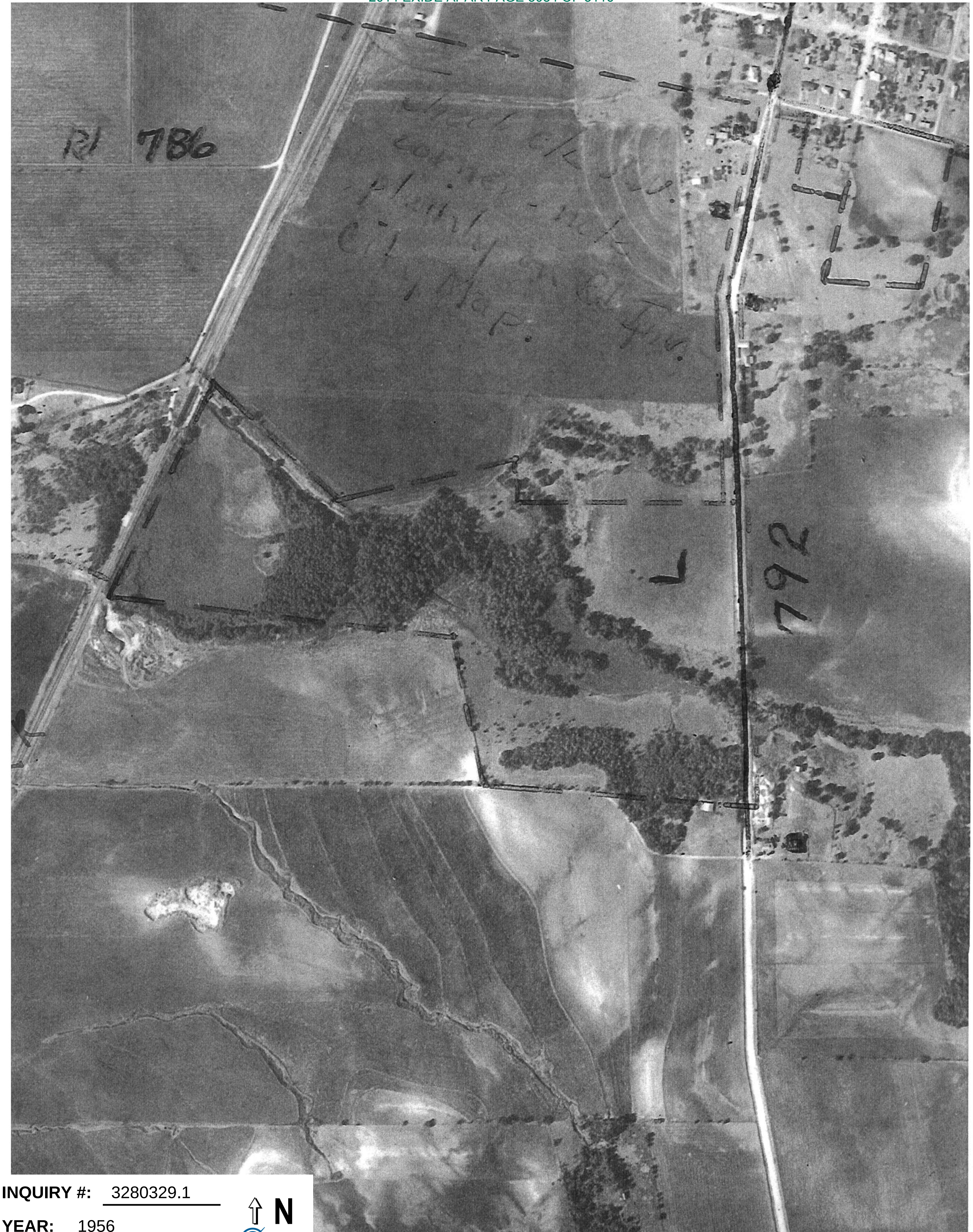
INQUIRY #: 3280329.1

YEAR: 1951

= 500'

N

EDR Environmental Data Resources Inc



INQUIRY #: 3280329.1

YEAR: 1956

= 500'


INQUIRY #: 3280329.1
YEAR: 1968
= 500'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3280329.1

YEAR: 1972

= 500'

N

EDR Environmental Data Resources Inc


INQUIRY #: 3280329.1
YEAR: 1984
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3280329.1
YEAR: 1995
= 500'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3280329.1

YEAR: 2004

= 500'

N

EDR Environmental Data Resources Inc


INQUIRY #: 3280329.1
YEAR: 2005
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3280329.1
YEAR: 2006
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3280329.1
YEAR: 2008
= 500'
N

APPENDIX 23
FRC FEED DOCUMENTATION

Table A23-1
2011 Feed Materials
Frisco Recycling Center
Frisco, Texas

Description of Feed Material	Weight (lbs.)	Overall Percentage of Feed Material
Scrap junk batteries	627,718,280	88.27%
Industrial plates	17,414,916	2.45%
Reverb slag	16,180,560	2.28%
Remelt lead/ingot	10,407,857	1.46%
Scrap oxide wet	9,565,285	1.35%
Scrap plates & separators	4,021,011	0.57%
Industrial cells/ D	3,991,684	0.56%
Pot dross	3,766,945	0.53%
Scrap acid tank sump	3,625,269	0.51%
Gel cell plastic batteries	2,753,386	0.39%
Industrial batteries	2,394,622	0.34%
Scrap lead	1,639,791	0.23%
Scrap pasted grids	1,574,896	0.22%
Wheel weights	1,535,492	0.22%
Baghouse dust	891,582	0.13%
Battery tops/top lead	721,216	0.10%
Scrap dross	671,024	0.09%
Scrap oxide dry	549,425	0.08%
Industrial cells/ W	545,396	0.08%
Telephone batteries	413,760	0.06%
Golf cart batteries	256,042	0.04%
Scrap junks drained	237,052	0.03%
Scrap lead shot	143,169	0.02%
Antimonial skim	40,980	0.01%
Floor sweepings	28,720	0.00%
Expanded metal punch	11,386	0.00%
Miscellaneous non-auto lead-A	10,040	0.00%
Scrap cable strips/ S	9,790	0.00%
Scrap plates dry	9,412	0.00%
Scrap lead anodes	3,420	0.00%
TOTAL	711,132,408	1

Notes:
1. Information provided by Exide February 13, 2013.

EXIDE TECHNOLOGIES

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

MANUFACTURER
Exide Technologies
13000 Deerfield Parkway, Bldg. 200
Milton, GA 30004

FOR INFORMATION
Primary: MACTEC Engineering and Consulting, Inc.
Telephone: (770) 421-3485
Secondary: Environmental, Safety & Health
Attention: Eric Murray (800) 523-4622
Fred Ganster (610) 921-4052

FOR EMERGENCY
CHEMTREC (800) 424-9300
24-hour Emergency Response Contact
Ask for Environmental Coordinator

CHEMICAL/TRADE NAME (as used on label): Lead-Acid Battery

CHEMICAL FAMILY/ CLASSIFICATION: Electric Storage Battery

DATE ISSUED: February 1, 2011

Page 1 of 5

CHEMTREC INTERNATIONAL (703) 527-3887 – Collect

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

			Approximate Air Exposure Limits ($\mu g/m^3$)		
Components	CAS Number	% by Wt.	OSHA	ACGIH	NIOSH
Inorganic compounds of:					
Lead	7439-92-1	54-62	50	50	50
Antimony	7440-36-0	0.4	500	500	500
Tin	7440-31-5	0.16	2000	2000	2000
Calcium	7440-70-2	0.02	-	-	-
Arsenic	7440-38-2	0.01	10	10	2
Electrolyte (sulfuric acid/water/solution)	7664-93-9	26-40	1000	200	1000
Case Material:					
Polypropylene	9003-07-0	5-12	N/A	N/A	N/A
Hard Rubber	--				
Plate separator material:					
Polyethylene	9002-88-4	1-2	N/A	N/A	N/A

NOTE: Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by Exide Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type. Polypropylene is the principal case material of automotive and commercial batteries.

III. PHYSICAL DATA - ELECTROLYTE

Boiling Point	203° F-240° F (for S.G. range)	Specific Gravity (H_2O=1)	1.230 to 1.350
Melting Point	Not Applicable	Vapor Pressure (mm Hg) 77° F	17 to 11 (for S.G. range)
Solubility in Water	100%		
Evaporation Rate (Butyl acetate=1)	Less Than 1	Vapor Density (AIR=1)	Greater than 1
Appearance and Odor	A clear liquid with a sharp, penetrating, pungent odor. A battery is a manufactured article; no apparent odor.	% Volatiles by Weight	Not Applicable

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point:	Not Applicable
Flammable Limits:	LEL = 4.1% (Hydrogen Gas in air) ; UEL = 74.2%
Extinguishing media:	CO_2; foam; dry chemical

Special Fire Fighting Procedures: Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

IV. FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

Unusual Fire and Explosion Hazards: In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

V. REACTIVITY DATA

Stability: Stable _X_
Unstable ___

Conditions to Avoid: Prolonged overcharge at high current; sources of ignition.

Incompatibility: (materials to avoid)

Electrolyte: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.

Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.

Hazardous Decomposition Products:

Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.

Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

VI. HEALTH HAZARD DATA

Routes of Entry:

Electrolyte: Harmful by all routes of entry.

Lead compounds: Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Inhalation:

Electrolyte: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.

Lead compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:

Electrolyte: May cause severe irritation of mouth, throat, esophagus, and stomach.

Lead compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. This may lead rapidly to systemic toxicity.

Skin Contact:

Electrolyte: Severe irritation, burns, and ulceration.

Lead compounds: Not absorbed through the skin.

Eye Contact:

Electrolyte: Severe irritation, burns, cornea damage, blindness.

Lead compounds: May cause eye irritation.

Effects of Overexposure - Acute:

Electrolyte: Severe skin irritation, damage to cornea may cause blindness, upper respiratory irritation.

Lead compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances, and irritability.

Effects of Overexposure - Chronic:

Electrolyte: Possible erosion of tooth enamel; inflammation of nose, throat, and bronchial tubes.

VI. HEALTH HAZARD DATA (CONTINUED)

Lead compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in both males and females.

Carcinogenicity:

Electrolyte: The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) have classified "strong inorganic acid mist containing sulfuric acid" as a substance that is carcinogenic to humans. This classification does not apply to sulfuric acid solutions in static liquid state or to electrolyte in batteries. Batteries subjected to abusive charging at excessively high currents for prolonged periods of time without vent caps in place may create a surrounding atmosphere of the offensive strong inorganic acid mist containing sulfuric acid.

Lead compounds: Listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Arsenic: Listed by International Agency for Research on Cancer (IARC), OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

Medical Conditions Generally Aggravated by Exposure:

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of electrolyte (water and sulfuric acid solution) with skin may aggravate skin diseases such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

Emergency and First Aid Procedures

Inhalation: Electrolyte: Remove to fresh air immediately. If breathing is difficult, give oxygen.

Lead compounds: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion: Electrolyte: Give large quantities of water; **do not** induce vomiting; consult physician.

Lead compounds: Consult physician immediately.

Skin: Electrolyte: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.

Lead compounds: Wash immediately with soap and water.

Eyes: Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes; consult physician immediately.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storage:

Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities that may create flames, spark, or heat. Store on smooth, impervious surfaces that are provided with measures for liquid containment in the event of electrolyte spills. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit. Handle carefully and avoid tipping, which may allow electrolyte leakage. Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units.

Charging:

There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

Spill or Leak Procedures:

Stop flow of material, contain/absorb small spills with dry sand, earth, and vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. ***Do not allow discharge of un-neutralized acid to sewer.*** Neutralized acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

Waste Disposal Methods:

Spent batteries: Send to secondary lead smelter for recycling.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (CONTINUED)

Electrolyte: Place neutralized slurry into sealed acid resistant containers and dispose of as hazardous waste, as applicable. Large water diluted spills, after neutralization and testing, should be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

Precautionary Labeling:

POISON - CAUSES SEVERE BURNS	CORROSIVE - CONTAINS SULFURIC ACID
DANGER - EXPLOSIVE GASES	KEEP AWAY FROM CHILDREN

VIII. CONTROL MEASURES

Engineering Controls and Work Practices:

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.

Handle batteries cautiously, do not tip to avoid spills. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when filling, charging, or handling batteries.

Respiratory Protection:

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Protective gloves:

Rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection:

Chemical goggles or face shield.

Other Protection:

Acid-resistant apron. Under severe exposure or emergency conditions, wear acid-resistant clothing, gloves, and boots.

Emergency Flushing:

In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

IX. OTHER REGULATORY INFORMATION

NFPA Hazard Rating for sulfuric acid:

Flammability (Red)	=	0
Health (Blue)	=	3
Reactivity (Yellow)	=	2

Sulfuric acid is water-reactive if concentrated.

TRANSPORTATION: Wet (filled with electrolyte) batteries are regulated by U.S. DOT as a hazardous material, as provided in 49 CFR 173.159

Proper Shipping Name:	Battery, wet, filled with acid
Hazard Class/Division:	8
ID Number:	UN2794
Packing Group:	III
Label Required:	Corrosive

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity).

CERCLA (Superfund) and EPCRA:

(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is **1,000 lbs**. State and local reportable quantities for spilled sulfuric acid may vary.

(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of **1,000 lbs.**

(c) EPCRA Section 302 notification is required if **1,000 lbs** or more of sulfuric acid is present at one site. An average automotive/commercial battery contains approximately 5 lbs of sulfuric acid. Contact your Exide representative for additional information.

(d) EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of **500 lbs** or more and/or if lead is present in quantities of **10,000 lbs** or more.

IX. OTHER REGULATORY INFORMATION (CONTINUED)

(e) **Supplier Notification:** This product contains toxic chemicals that may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. For a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:

Toxic Chemical	CAS Number	Approximate % by Weight
Lead	7439-92-1	54-62
Sulfuric Acid/Water Solution	7664-93-9	26-40
*Antimony	7440-36-0	0.4
*Arsenic	7440-38-2	0.01

*Not present in all battery types. Contact your Exide representative for additional information.

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year.

Note: The Section 313 supplier notification requirement does not apply to batteries that are "consumer products".

CAA:

Exide Technologies supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFC's and other ozone depleting chemicals (ODC's), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, Exide established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.

TSCA:

Ingredients in Exide's batteries are listed in the TSCA Registry as follows:

	CAS NO.	TSCA Status
Electrolyte: Sulfuric acid (H_2SO_4)	7664-93-9	Listed
Inorganic Lead Compound		
Lead (Pb)	7439-92-1	Listed
Lead Oxide (PbO)	1317-36-8	Listed
Lead Sulfate ($PbSO_4$)	7446-14-2	Listed
Antimony (Sb)	7440-36-0	Listed
Arsenic (As)	7440-38-2	Listed
Calcium (Ca)	7440-70-2	Listed
Tin (Sn)	7440-31-5	Listed

CANADIAN REGULATIONS:

All chemical substances in this product are listed on the CEPA DSL/NDSL or are exempt from list requirements.

CALIFORNIA PROPOSITION 65: "WARNING: This product contains lead, a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm."

PREPARED BY: ENVIRONMENTAL, SAFETY AND HEALTH DEPARTMENT
EXIDE TECHNOLOGIES
13000 DEERFIELD PKWY., BLDG. 200
MILTON, GA 30004

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. THIS INFORMATION SHOULD BE EFFECTIVELY COMMUNICATED TO EMPLOYEES AND OTHERS WHO MIGHT COME IN CONTACT WITH THE PRODUCT.

WHILE THE INFORMATION ACCUMULATED AND SET FORTH HEREIN IS BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, EXIDE TECHNOLOGIES MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE FOR THEIR PARTICULAR CIRCUMSTANCES.

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT

From:	Larry Eagan
To:	Eric Pastor
Cc:	"Love, Matt"; Roberta Russell; Will Vienne
Subject:	RE: Frisco Feed Material
Date:	Wednesday, June 05, 2013 12:41:14 PM

Eric, Broken automotive batteries were the main feed source for the secondary lead industry. The list looks fine for the Plant. The Reverb Furnace would have received the majority of the feed materials listed. Some of the items were generated in-house i.e. the reverb slag, which was the main source of feed for the Blast Furnace plus the industrials cells and some drosses. Most of the remelt items such as scrap lead: ingots, wheel weights, lead shot, expanded grid and punch-outs, cable strips and lead anodes would be recycled in the refining kettles, but could be fed to one of the furnaces also.

If you have any questions call me 214-215-5011. Larry

From: Eric Pastor [mailto:eric.pastor@pbwllc.com]
Sent: Tuesday, June 04, 2013 6:14 PM
To: Larry Eagan (lgeagan@verizon.net)
Cc: Love, Matt; Roberta Russell; Will Vienne
Subject: Frisco Feed Material

Hi Larry –

Attached is a table listing the composition of Frisco feed materials in 2011. Could you look it over and let me know if this general composition is historically true for the Frisco operation – i.e., were scrap batteries pretty much always the primary feed material? If not, what was?

Thanks.

Eric Pastor
Pastor, Behling & Wheeler, LLC
2201 Double Creek Drive, Suite 4004
Round Rock, Texas 78664
512-671-3434

APPENDIX 24
SPLP DATA SUMMARY

Table A24-1

SPLP Data Summary (2014)

		Analyte	Cadmium	Lead
		Units	mg/L	mg/L
Location ID	Sample ID	Date Sampled		
2013-AD-3	2013-AD-03 (0-0.5)	2014-01-09	--	0.0790
2013-C2L-06	2013-C2L-06 (0-0.5)	2014-01-14	--	0.0201
2013-CUFT-5B	2013-CUFT-5B (0-0.5)	2014-01-10	--	0.101
2013-FWFS-5B	MW-33/2013-FWFS-5B (	2014-01-10	--	< 0.00290 U
2013-MB-5	2013-MB-5 (0.5-5)	2014-01-08	< 0.000350 U	--
2013-NT-02	2013-NT-02 (0-0.5)	2014-01-10	--	0.0376
2013-SDA-3B	2013-SDA-3B (0-0.5)	2014-01-09	--	0.114
SCC-5B	SCC-5B (0-0.5)	2014-01-10	--	0.209

Notes:
1. "--" - not analyzed.
2. < - analyte not detected above SDL; U - not detected.

Table A24-2
SPLP Data Summary

Sample ID	Sample Date	Sample Depth (feet bgs)	SPLP Results Cadmium (mg/L)	SPLP Results Lead (mg/L)
2012-BSA-3A(0-2')	3/23/2012	0-2	0.0125	--
2012-BSA-4a(0-1')	3/29/2012	0-1	0.0018 U	0.354
2012-BSA-4c(0-1')	3/29/2012	0-1	0.0041 U	0.706
2012-BSA-4d(0-1')	3/29/2012	0-1	0.0068	1.54

Notes:
1. "--" - not analyzed.
1. Data Qualifiers (see Section 3.5): U - blank contamination.

APPENDIX 25
SIR AND APAR SAMPLE COORDINATES

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
Soil Sample Locations		
2012-BSA-1	7102274	2480624
2012-BSA-1A	7102276	2480629
2012-BSA-2	7102274	2480735
2012-BSA-3	7102224	2480672
2012-BSA-3A	7102220	2480676
2012-BSA-4	7102173	2480639
2012-BSA-5	7102165	2480739
2012-BY-1	7102377	2479501
2012-BY-2	7102343	2479613
2012-BY-3	7102239	2479660
2012-BY-4	7102231	2479579
2012-BY-5	7102282	2479516
2012-CUFT-1	7101786	2479394
2012-CUFT-2	7101783	2479434
2012-FWCS-1	7102032	2479676
2012-FWCS-11	7102055	2479651
2012-FWCS-12	7102060	2479678
2012-FWCS-2	7101912	2479827
2012-FWCS-3	7101904	2479837
2012-FWCS-4	7101886	2479859
2012-FWCS-5	7101863	2479891
2012-FWCS-6	7101824	2479945
2012-FWCS-7	7101805	2479966
2012-FWCS-8	7101746	2480046
2012-FWCS-9	7101706	2480100
2012-FWFS-1	7101960	2479788
2012-FWFS-2	7101918	2479841
2012-FWFS-3	7101888	2479880
2012-FWFS-4	7101873	2479898
2012-FWFS-5	7101843	2479937
2012-FWFS-6	7101812	2479976
2012-FWFS-7	7101780	2480015
2012-FWFS-7A	7101767	2480012
2012-FWFS-7B	7101757	2480012
2012-FWFS-8	7101749	2480054
2012-FWFS-9	7101720	2480095
2012-NDA-1	7102386	2480119
2012-NDA-2	7102390	2480412
2012-NDA-3	7102444	2480662
2012-NDA-4	7102396	2480119
2012-NDA-5	7102460	2480666
2012-NDA-6	7102503	2480666

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2012-RMSA-1	7101962	2480182
2012/2013-RMSA-2	7101817	2480247
2012-RMSA-3	7101783	2480191
2012-RMSA-4	7101861	2480123
2012-SDA-1	7101559	2480089
2012-SDA-2	7101558	2480185
2012-SDA-3	7101553	2480292
2012-SDA-4	7101174	2479971
2012-SDA-5	7101170	2480098
2012-SL-1	7102344	2479384
2012-SL-2	7102486	2479521
2012-SL-3	7102515	2479698
2013-AD-1	7101896	2480808
2013-AD-2	7101914	2480990
2013-AD-2A	7101931	2481017
2013-B4R-A	7101415	2479943
2013-BB-1	7102007	2480117
2013-BSA-6	7102201	2480652
2013-BSA-7	7102251	2480716
2013-BSB-1	7102047	2479712
2013-BSB-2	7102035	2479771
2013-BSB-3	7102030	2479798
2013-BSB-4	7102020	2479815
2013-BSB-5	7102021	2479781
2013-BSB-6	7102031	2479850
2013-BSB-7	7102021	2479830
2013-BSB-8	7102045	2479812
2013-BSB-9	7102065	2479812
2013-BSB-10	7102050	2479884
2013-CUFT-10	7101931	2478954
2013-CUFT-3	7101738	2479345
2013-CUFT-4	7101889	2479303
2013-CUFT-5	7101906	2479178
2013-CUFT-6	7101911	2479083
2013-CUFT-7	7101923	2478975
2013-CUFT-7A	7101908	2478965
2013-CUFT-8	7101684	2479346
2013-CUFT-9	7101762	2479324
2013-FOP-1	7101872	2480549
2012-FWCS-1A	7102026	2479671
2013-FWCS-1B	7102016	2479669
2013-FWFS-1A	7101951	2479776
2013-MB-1	7101769	2480379

May 2014

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2013-MB-2	7101790	2480309
2013-MW10-1	7101995	2480989
2013-MW10-2	7101953	2480966
2013-MW10-3	7101989	2480897
2013-MW-17A	7102073	2479607
2013-RMSA-5	7101857	2480261
2013-RMSA-6	7101796	2480248
2013-RMSA-7	7101813	2480272
2013-RMSB-1	7101910	2480143
2013-RMSB-2	7101911	2480173
2013-RMSB-3	7101921	2480185
2013-RMSB-4	7101919	2480206
2013-RMSB-5	7101878	2480144
2013-RMSB-6	7101880	2480175
2013-RMSB-7	7101881	2480206
2013-RMSB-8	7101841	2480147
2013-RMSB-9	7101851	2480176
2013-RMSB-10	7101844	2480209
2013-RO-1	7102104	2479578
2013-RO-2	7102126	2479562
2013-RO-3	7102105	2479557
2013-RRS-3A	7102074	2480071
2013-RRS-4A	7102061	2480184
2013-SDA-3A	7101577	2480331
2013-SDA-4A	7101588	2480228
2013-SL-4	7102264	2479415
2013-STB-1	7101857	2480007
2013-STB-2	7101810	2480060
2013-STB-3	7101843	2480095
2013-STB-4	7101764	2480125
2013-STB-5	7101810	2480039
2013-STB-6	7101799	2480031
2013-STB-7	7101819	2480034
2013-STB-8	7101853	2479990
2013-STB-9	7101812	2479996
2013-STB-10	7101832	2479972
2013-STB-11	7101768	2480095
2013-STB-12	7101781	2480016
2013-TS-1	7102097	2480985
2013-TS-2	7102253	2480977
2013-WMU14-1	7101992	2479881
2013-WMU14-2	7101826	2480109
2013-WMU14-3	7102021	2480631
2013-WMU16-1	7101886	2480415
2013-WMU17-1	7102328	2479645

May 2014

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2013-WMU17-2	7102359	2479608
2013-WMU6-1	7101955	2479994
BS2/BS-2	7101513	2480178
BS3/BS-3	7101491	2480215
BS5/BS-5	7101472	2480114
D-11	7102885	2480148
D-12	7102903	2480324
D-13	7102912	2480533
D-14	7102922	2480738
D-15	7102934	2480891
E-11	7102766	2480144
E-11A	7102808	2480069
E-11B	7102810	2480025
E-12	7102779	2480324
E-13	7102785	2480532
E-14	7102785	2480740
E-15	7102789	2480893
E-15A	7102787	2480940
ECO-1	7101378	2481004
ECO-2	7101283	2481006
ECO-3	7101296	2480817
ECO-4	7101170	2480822
ECO-5	7101456	2480753
ECO-6	7101325	2480601
ECO-7	7101179	2480616
ECO-7A	7101171	2480616
ECO-7B	7101169	2480617
ECO-8	7101519	2480460
ECO-9	7101336	2480436
ECO-10	7101188	2480411
ECO-11	7102588	2480248
ECO-12	7102509	2480907
F-4	7102498	2478704
F-5	7102506	2478851
G-4	7102306	2478654
G4-2	7102306	2478726
G-5	7102314	2478858
G-6	7102321	2479003
H-3	7102091	2478502
H-4	7102117	2478642
H4-2	7102190	2478643
H-5	7102108	2478861

May 2014

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
H5-2	7102190	2478829
SB-VS-1	7101204	2480012
SB-VS-2	7101204	2480038
SCC-1	7101615	2480808
SCC-2	7101587	2480643
SCC-3	7101667	2480461
SCC-3A	7101642	2480461
SCC-4	7101635	2480261
SCC-5	7101681	2480057
SCC-6	7101806	2479940
SCC-7	7101888	2479772
SCC-8	7102032	2479666
SCC-9	7102060	2479550
SCC-10	7102157	2479519
SCC-10A	7102143	2479513
SCC-11	7102320	2479302
SCC-11A	7102284	2479298
SCC-12	7102415	2479175
SCC-13	7102540	2479020
SCC-14	7102630	2478907
SCC-15	7102753	2478750
SRB-VS-1	7101345	2479944
SRB-VS-2	7101305	2479958
SRB-VS-3	7101268	2479965
SRB-VS-4	7101231	2479973
SRB-VS-5	7101342	2479922
SRB-VS-6	7101302	2479921
SRB-VS-7	7101265	2479928
SRB-VS-8	7101228	2479938
SRB-VS-9	7101362	2479938
SRB-VS-9A	7101374	2479937
SRB-VS-9B	7101360	2479915
SRB-VS-9C	7101389	2479912
SRB-VS-10	7101301	2479913
SRB-VS-11	7101212	2479934
Sediment and Surface Water Sample Locations		
2012-SED/SW-1	7102703	2478733
2012-SED/SW-2	7102611	2478876
2012-SED/SW-3	7102438	2479073

May 2014

Table A25-1

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2012-SED/SW-4	7102268	2479293
2012-SED/SW-5	7102120	2479505
2012-SED/SW-6	7101898	2479807
2012-SED/SW-7	7101823	2479899
2012-SED/SW-8	7101716	2480025
2012-SED/SW-9	7101656	2480206
2012-SED/SW-10	7101633	2480422
2012-SED/SW-11	7101623	2480599
2012-SED/SW-12	7101570	2480832
2012-SED/SW-13	7101526	2481023
2012-SED/SW-14	7101533	2481101
2012-SED/SW-15	7101496	2481175
2012-SED-16/SW-NT-1	7102485	2479310
2012-SED-17/SW-NT-2	7102524	2479437
2012-SED-18/SW-NT-3	7102552	2479564
2012-SED-19/SW-NT-4	7102605	2479764
2012-SED-20/SW-NT-5	7102644	2479998
2012-SED-21/SW-NT-6	7102681	2480214
2012-SED-22/SW-NT-7	7102676	2480365
2012-SED-23/SW-NT-8	7102653	2480575
2012-SED-24/SW-NT-9	7102611	2480779
2012-SED-25/SW-NT-10	7102634	2480926

Notes:
1. Coordinate System: Texas State Plane North Central Zone, NAD 83, units in feet.

May 2014

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
Soil Sample Locations		
2013-AD-1A	7101873	2480792
2013-AD-3	7101762	2480927
2013-AD-4	7101685	2480811
2013-AD-5	7101826	2480595
2013-BSA-2A	7102283	2480731
2013-BSB-8A	7102056	2479815
2013-C2L-01	7103855	2480668
2013-C2L-02	7103459	2480901
2013-C2L-03	7103191	2480793
2013-C2L-04	7103041	2480728
2013-C2L-05	7103082	2480098
2013-C2L-06	7103315	2480135
2013-C2L-07	7103532	2480172
2013-C2L-08	7103900	2480452
2013-C2L-09	7103008	2480517
2013-C2L-10	7103062	2480295
2013-C2L-C01	7103200	2480194
2013-C2L-C02	7103142	2480386
2013-C2L-C03	7103087	2480579
2013-C2L-C04	7103369	2480255
2013-C2L-C05	7103315	2480437
2013-C2L-C06	7103260	2480631
2013-CUFT-10A	7101951	2478954
2013-CUFT-10B	7101932	2478939
2013-CUFT-10C	7101916	2478954
2013-CUFT-10D	7101931	2478954
2013-CUFT-11	7101777	2479386
2013-CUFT-14	7101786	2479526
2013-CUFT-5A	7101932	2479179
2013-CUFT-5B	7101906	2479193
2013-CUFT-5C	7101888	2479179
2013-CUFT-5D	7101906	2479178
2013-CUFT-6A	7101926	2479083
2013-CUFT-6B	7101896	2479083
2013-CUFT-6C	7101911	2479083
2013-CUFT-7B	7101932	2478969
2013-FFTA-01	7102397	2480828
2013-FFTA-02	7102378	2480781
2013-FFTA-03	7102425	2480753
2013-FFTA-03	7102425	2480753
2013-FOP-1A	7101866	2480555
2013-FWCS-12A	7102067	2479682
2013-FWFS-5A	7101833	2479918
2013-FWFS-5B	7101872	2480021
2013-MB-3	7101808	2480461
2013-MB-4	7101869	2480347
2013-MB-5	7101720	2480355

May 2014

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2013-MW-17B	7102077	2479603
2013-NDA-1A	7102386	2480106
2013-NDA-C01	7102331	2480012
2013-NDA-C02	7102332	2480098
2013-NDA-C03	7102335	2480196
2013-NDA-C04	7102337	2480288
2013-NDA-C05	7102343	2480381
2013-NDA-C06	7102349	2480475
2013-NDA-C07	7102354	2480570
2013-NDA-C08	7102258	2480573
2013-NDA-C09	7102256	2480484
2013-NDA-C10	7102255	2480392
2013-NDA-C11	7102244	2480298
2013-NDA-C12	7102252	2480193
2013-NDA-C13	7102246	2480094
2013-NDA-C14	7102244	2480006
2013-NDA-C15	7102241	2479918
2013-NDA-C16	7102237	2479823
2013-NDA-C17	7102186	2479729
2013-NDA-C18	7102178	2479813
2013-NDA-C19	7102167	2479911
2013-NDA-C20	7102165	2480009
2013-NDA-C21	7102159	2480099
2013-NDA-C22	7102156	2480184
2013-NDA-C23	7102163	2480295
2013-NDA-C24	7102162	2480383
2013-NDA-C25	7102160	2480582
2013-NT-01	7102698	2480314
2013-NT-02	7102697	2480580
2013-RMSB-5A	7101885	2480146
2013-RRS-4A-A	7102058	2480186
2013-SDA-3B	7101606	2480328
2013-SDA-4B	7101638	2480213
2013-SDA-C01	7101429	2480080
2013-SDA-C02	7101339	2479968
2013-SDA-C03	7101239	2479989
2013-SDA-C04	7101328	2480068
2013-SDA-C05	7101319	2480177
2013-SDA-C06	7101309	2480289
2013-SL-C01	7102204	2479607
2013-SL-C02	7102284	2479441
2013-SL-C03	7102291	2479507
2013-SL-C04	7102302	2479601
2013-SL-C05	7102312	2479697
2013-SL-C06	7102323	2479791
2013-SL-C07	7102378	2479383
2013-SL-C08	7102385	2479501
2013-SL-C09	7102401	2479591

May 2014

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2013-SL-C10	7102415	2479684
2013-SL-C11	7102433	2479775
2013-SL-C12	7102448	2479862
2013-SL-C13	7102470	2479962
2013-SL-C14	7102504	2479765
2013-SL-C15	7102535	2479858
2013-SL-C16	7102547	2479954
2013-STB-4A	7101776	2480135
2013-WMU14-1A	7101992	2479883
2014-AD-3A	7101762	2480926
2014-AD-6	7101642	2480942
2014-C2L-06A	7103401	2480137
2014-C2L-06B	7103303	2480058
2014-C2L-06C	7103214	2480124
2014-C2L-C01A	7103242	2480193
2014-C2L-C01B	7103200	2480225
2014-C2L-C01C	7103137	2480206
2014-CUFT-15	7101943	2478859
2014-CUFT-16	7101951	2478764
2014-CUFT-17	7101984	2478621
2014-CUFT-18	7101940	2479079
2014-CUFT-5B-A	7101909	2479204
2014-FFTA-04	7102336	2480847
2014-FFTA-05	7102439	2480779
2014-FFTA-06	7102418	2480618
2014-FFTA-07	7102435	2480573
2014-FFTA-08	7102462	2480620
2014-NDA-7	7102403	2480551
2014-NDA-8	7102410	2480359
2014-NDA-9	7102398	2480108
2014-NT-3	7102635	2479788
2014-NT-4	7102580	2479519
2014-SDA-6	7101659	2479999
2014-SDA-7	7101210	2480015
2014-SL-5	7102602	2479957
2014-SL-6	7102477	2479401
2014-SL-7	7102412	2479287
2014-TS-3	7102166	2480979
B3RA	7101497	2479989
D-11A	7102905	2480145
D-11B	7102980	2480129
D-12A	7102914	2480333
D-13A	7102922	2480530
E-11C	7102811	2480050
E-11C-A	7102807	2480052
E-11D	7102709	2480121
E-11E	7102720	2480119
E-12A	7102758	2480294

May 2014

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
E-13A	7102771	2480548
E-14A	7102778	2480731
ECO-10A	7101182	2480399
ECO-1A	7101375	2481023
ECO-2A	7101290	2481023
ECO-4A	7101154	2480847
ECO-4B	7101151	2480940
ECO-7C	7101203	2480611
ECO-7D	7101170	2480614
ECO-8A	7101537	2480457
ECO-8B	7101601	2480466
F-5A	7102507	2478846
F-5B	7102527	2478845
F-5C	7102506	2478867
F-5D	7102487	2478845
F-5E	7102507	2478825
MW-27A	7101688	2480187
MW-27B	7101682	2480227
MW-27C	7101680	2480293
MW-27D	7101691	2480338
MW-27E	7101667	2480260
MW-29A	7101747	2480032
MW-30A	7102080	2480016
MW-35	7101736	2480191
MW-36	7101815	2480274
MW-41	7102693	2480074
MW-42	7102696	2480712
MW-43	7102422	2480782
MW-44	7101660	2480550
MW-45	7103915	2480303
SCC-10B	7102140	2479514
SCC-5A	7101692	2480025
SCC-5B	7101661	2480068
SRB-VS-11A	7101205	2479919
SRB-VS-11B	7101204	2479918
SRB-VS-9E	7101364	2479894
Sediment and Surface Water Sample Locations		
2014-SED-001	7094272	2469837
2014-SED-002	7094341	2470034
2014-SED-003	7094406	2470197
2014-SED-004	7094388	2470469
2014-SED-005	7094626	2470501
2014-SED-006	7094599	2470929
2014-SED-007	7094816	2471058
2014-SED-008	7094981	2470996
2014-SED-009	7095244	2470959
2014-SED-010	7095333	2471402
2014-SED-011	7095376	2471620

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2014-SED-012	7095458	2471848
2014-SED-013	7095512	2472092
2014-SED-014	7102921	2477121
2014-SED-015	7102713	2477774
2014-SED-016	7102573	2478098
2014-SED-017	7102643	2478190
2014-SED-018	7102744	2478446
2014-SED-019	7099687	2475555
2014-SED-020	7100378	2475633
2014-SED-021	7100827	2475202
2014-SED-022	7101161	2475484
2014-SED-023	7101930	2475557
2014-SED-024	7102142	2475875
2014-SED-025	7102460	2476418
2014-SED-026	7101538	2481113
2014-SED-027	7101510	2481179
2014-SED-028	7101509	2481276
2014-SED-029	7101464	2481348
2014-SED-030	7101396	2481497
2014-SED-031	7101422	2481635
2014-SED-032	7101386	2481701
2014-SED-033	7101380	2481872
2014-SED-034	7101319	2481962
2014-SED-035	7101086	2481993
2014-SED-036	7095636	2472938
2014-SED-037	7095691	2472893
2014-SED-038	7096271	2472678
2014-SED-039	7096895	2472966
2014-SED-040	7096832	2473273
2014-SED-041	7097178	2473274
2014-SED-042	7097608	2473069
2014-SED-043	7098004	2473321
2014-SED-044	7098004	2473575
2014-SED-045	7097650	2474067
2014-SED-046	7097962	2473985
2014-SED-047	7094457	2469692
2014-SED-048	7098955	2474796
2014-SED-049	7099300	2475300
2014-SED-050	7091118	2462190
2014-SED-051	7091778	2462666
2014-SED-052	7092026	2463392
2014-SED-053	7091875	2463748
2014-SED-054	7091982	2464347
2014-SED-055	7092012	2464874
2014-SED-056	7091865	2465881
2014-SED-057	7092230	2466095
2014-SED-058	7092759	2466988
2014-SED-059	7092820	2467759

May 2014

Table A25-2

Coordinate Data Summary
SIR and APAR Phase I Soil Sample and Surface Water/Sediment Sample Locations

Location ID	Northing	Easting
2014-SED-060	7092788	2468312
2014-SED-061	7093301	2468570
2014-SED-062	7093738	2468733
2014-SED-063	7093577	2468996
2014-SW-001	7094816	2471058
2014-SW-002	7101538	2481113
2014-SW-003	7102573	2478098
2014-SW-004	7102643	2478190
2014-SW-005	7102744	2478446
2014-SW-006	7099687	2475555
2014-SW-007	7101510	2481179
2014-SW-008	7101509	2481276
2014-SW-009	7101464	2481348
2014-SW-010	7101396	2481497
2014-SW-011	7101422	2481635
2014-SW-012	7101386	2481701
2014-SW-013	7101380	2481872
2014-SW-014	7101319	2481962
2014-SW-015	7101086	2481993
2014-SW-016	7101554	2481002
2014-SW-017	7101900	2479818
2014-SW-018	7102140	2479505
2014-SW-019	7102261	2479330
2014-SW-020	7102412	2479117
2014-SW-021	7102731	2478732
2014-SW-022	7095691	2472893
2014-SW-023	7097608	2473069
2014-SW-024	7094457	2469692
2014-SW-025	7099300	2475300
2014-SW-026	7091778	2462666
2014-SW-027	7092026	2463392
2014-SW-028	7092230	2466095
2014-SW-029	7092788	2468312

Notes:
1. Coordinate System: Texas State Plane North Central Zone, NAD 83, units in feet.