TASWA DISPOSAL AND RECYCLING FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW 2290A

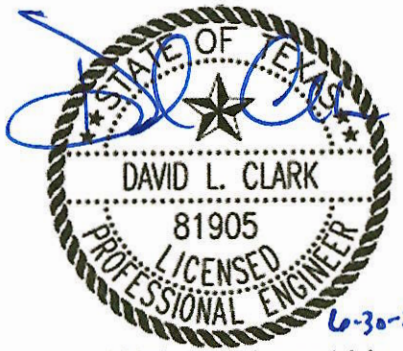
PERMIT AMENDMENT APPLICATION

VOLUME 3 OF 4

Prepared for

TEXOMA AREA SOLID WASTE AUTHORITY, INC.

February 2025
Revised March 2025
Revised June 2025



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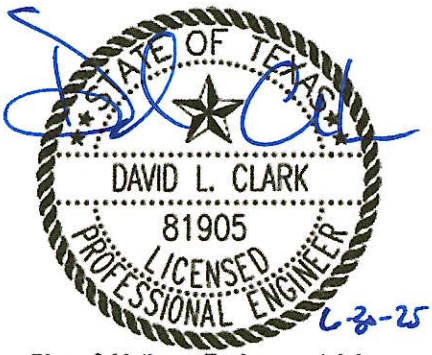

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PART III – SITE DEVELOPMENT PLAN
ATTACHMENT E
GEOLOGY REPORT

Prepared for:

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February 2025
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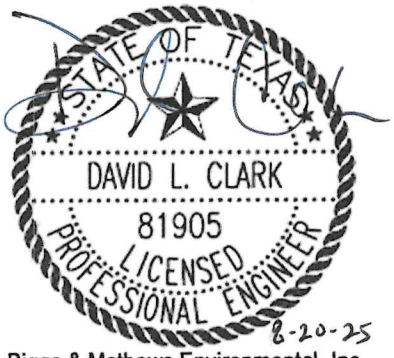

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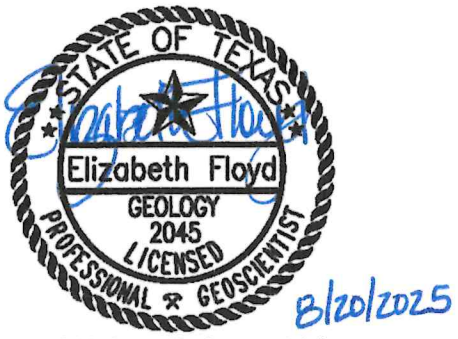

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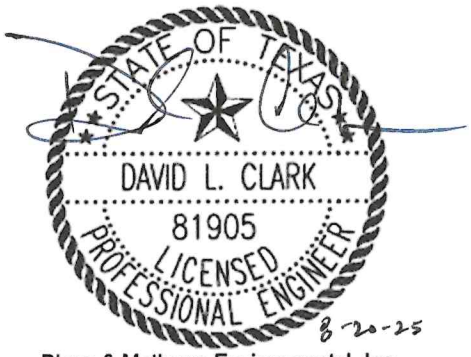

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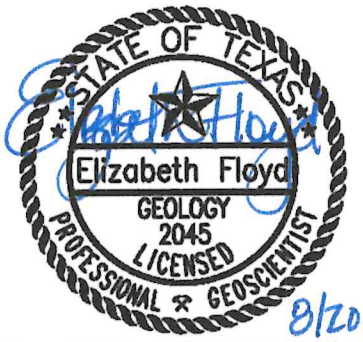

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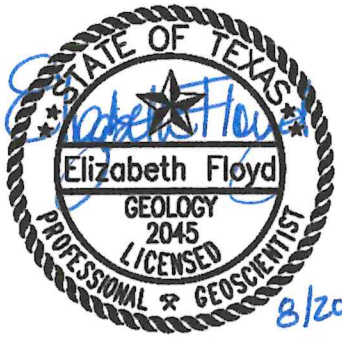

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1 REGIONAL GEOLOGIC/HYDROGEOLOGIC INFORMATION

30 TAC §§330.57(f)(2), 330.63(e)(1)

This geology and technical report has been prepared by Elizabeth Floyd, P.G., a qualified groundwater scientist, for the TASWA Disposal and Recycling Facility (TASWA DRF) consistent with 30 Texas Administrative Code (TAC) §330.57(f)(2) and 330.63(e). Some of Sections 1, 2, and 3 of this report have been adopted in whole or part from the previously approved geology report. The purpose of this report is to provide the geologic and hydrogeologic information and interpretations necessary to design a groundwater monitoring system.

1.1 Regional Physiography and Topography

The gently north sloping topography of the site is interrupted by gentle north-northwest trending topographic high areas on the western and eastern portions of the site. The low areas between the topographic highs form a north trending drainage feature in the central portion of the site and an east trending drainage feature in the southwest corner of the site. Surface water run-on drains from the south of the site onto the site through culverts beneath Utley Road. The topographic high area on the east side of the site directs runoff to the east. Surface elevations on the site range from about 810 feet above mean sea level (ft/msl) on the topographic highs to about 725 ft/msl in the lowest intermittent stream channels.

1.2 Regional Geology and Lithology

The TASWA DRF lies on the western edge of the northern extent of the physiographic province known as the Blackland Prairie. The Blackland Prairie consists of weathered outcrops of Cretaceous shale, marl, and chalk formations including the Eagle Ford Shale, the Austin Chalk, and the Taylor and Navarro Marls. Blackland Prairie terrain typically has undulating surfaces and fertile soils that have been cleared of most natural vegetation and cultivated for farm crops. Immediately west of the northern part of the Blackland Prairie is the Grand Prairie. The Grand Prairie in this area has low, undulating hills formed on the sandy soils of the Woodbine Formation outcrop. The sandy soils west of the site typically support tree growth better than the Blackland Prairie soils that are on the project site. (Wermund, 1996)

The site is located near the upper reaches of the Red River Basin watershed. In the site vicinity the surface slopes gently to the north and is bisected by shallow intermittent features that convey surface water runoff to the north and west into tributaries of Mustang Creek. These tributaries are the nearest surface water bodies to the site when they contain water. Mustang Creek is a large intermittent stream that flows north to join Big Mineral Creek before it flows into Lake Texoma about 4½ miles north-northeast of the site. Lake Texoma resulted from the impoundment of the Red River. Local impoundments of some small intermittent streams form small stock tanks north and west of the site. A regional drainage divide separating the Trinity River Watershed from the Red River Watershed occurs about ¼ mile south of the site. North of that divide, surface water drains generally north to the Red River. South of the divide surface water drains generally south to the

Trinity River. The maximum elevation on the site is approximately 810 ft/msl near the center of the site. The minimum elevation is approximately 725 on the north central portion of the site. The site slopes generally to the north at approximately 100 feet per mile (approximately 1.9 percent). Natural internal relief on the site displays slopes with gradients ranging from 1.5 percent to 5 percent.

1.3 Regional Geology

1.3.1 Geologic History

The northern area of the Blackland Prairie is made up of the outcrops of Cretaceous-age sedimentary rock. The Cretaceous rocks unconformably overlie Paleozoic sediments. The geologic formations of the Cretaceous System (65-150 million years ago) were deposited by the northward-advancing Cretaceous seas. Marine deposition ceased near the end of the Cretaceous Period as a result of a general uplift to the west, resulting in a general tilting of the land surface to the east-southeast and a regression of the seas toward the Gulf of Mexico. The existing topographic expression is a result of the subsequent erosion of the exposed Cretaceous rocks (Bullard, 1931; Adkins, 1932).

1.3.2 Regional Stratigraphy and Structure

Regional stratigraphic units that outcrop in the Texoma area include formations of the Lower Cretaceous Comanche Series west of the site and those of the Upper Cretaceous Gulf Series at and east of the site. The stratigraphic relationships of these formations are shown in the table at the end of this section. The site is on the outcrop of the Eagle Ford Shale as shown in Drawing E1.1 (Barnes, 1991).

A regional cross-section across the Texoma area (Nordstrom, 1982) is shown in Drawing E1.2. The geologic units of the Cretaceous System are an east-southeastward dipping wedge of sediments that thicken toward the Gulf of Mexico. Outcrops of the Cretaceous formations in southern Grayson and Cooke Counties generally trend north-south. In the northeastern part of Grayson County and northern Fannin County the northern flank of the East Texas Embayment is bounded by the Ouachita Uplift causing the Cretaceous outcrops to have a more east-west trend that reflects dip of those formations southward into the Gulf of Mexico.

Stratigraphy of Part of the Cretaceous of North Texas (modified from Barnes, 1991)

<table>
<tr><th>System</th><th>Series</th><th colspan="3">Group, Formation</th><th>Member</th></tr>
<tr><td rowspan="11">Cretaceous</td><td rowspan="5">Gulf</td><td colspan="3">Navarro</td><td rowspan="4"></td></tr>
<tr><td colspan="3">Taylor
(Ozan Formation)</td></tr>
<tr><td colspan="3">Austin</td></tr>
<tr><td colspan="3">Eagle Ford</td></tr>
<tr><td colspan="3" rowspan="4">Woodbine</td><td>Templeton</td></tr>
<tr><td>Lewisville</td></tr>
<tr><td>Red Branch</td></tr>
<tr><td>Dexter</td></tr>
<tr><td rowspan="6">Comanche</td><td colspan="3">Washita</td><td rowspan="6"></td></tr>
<tr><td colspan="3">Fredericksburg</td></tr>
<tr><td rowspan="3">Trinity</td><td>Paluxy</td><td rowspan="3">Antlers</td></tr>
<tr><td>Glen Rose</td></tr>
<tr><td>Twin Mountains</td></tr>
</table>

Outcrop at TASWA site.

2 GEOLOGIC PROCESSES

30 TAC §§330.63(e)(2), 330.61(j)(2)

2.1 Fault Areas

The property on which the TASWA DRF is located was examined for the presence of faulting according to §330.555 criteria.

An experienced geologist conducted a site walkover familiar with faulting and solid waste disposal facilities. No unusual scarps or topographic breaks were interpreted within 200 feet of the site. No evidence of faulting was found associated with formation outcrops; no evidence of faulting was found by examination of the area roadways; no structural influence of stream courses was found, and no unusual relief or topographic features, such as sag ponds or truncated alluvial spurs were observed on the site. There is no significant oil production on or near the property. No evidence of structural damage to buildings on the property was identified.

Cores retrieved from exploration borings revealed no evidence of faulting. Fractures seen in the cores showed no evidence of displacement.

In summary, no fault scarps were observed at the surface within 200 feet of the site and there was no evidence of vertical subsidence on any outcrops of geologic materials. No vertical displacement or stratigraphic offsets indicative of faults was observed in outcrops or in any of the cores from the site borings. A detailed subsurface study using geophysically logged borings showed no indications of faulting on the site.

Consistent with §330.61(j)(2) and §330.555, a fault evaluation was prepared by a professional geologist as part of this application to demonstrate that the TASWA DRF meets the location restriction for fault areas.

The property on which the TASWA DRF is located was examined for the presence of faulting according to §330.555 criteria. A fault study was conducted, reviewing aerial photographs for the site, reviewing available geologic literature and maps of the area, conducting site reconnaissance, and examining the subsurface boring data from the site.

The site and the immediate area were investigated for:

- Structural damage to constructed facilities (roadways, railways, and buildings).
- Scarps in natural ground.
- Presence of surface depressions (sag ponds and ponded water).
- Presence of lineations on aerial maps and topographic sheets. The following historical imagery (aerial photographs) were reviewed:

12/1985	7/2008	1/2014 (2)	1/2016	11/2018
3/1995	7/2010	11/2014	1/2017	1/2022
10/2005	3/2012	7/2015	12/2017 (2)	1/2024

In addition, a site walkover, and an investigation by driving streets and roads in the landfill area was conducted by an experienced geologist familiar with faulting and solid waste disposal facilities to identify possible physical evidence caused by faulting. The facility was examined for indications of faulting in accordance with §330.555(b)(1-12). No unusual scarps or topographic breaks were interpreted within 200 feet of the site. No evidence of faulting was found by examination of area roadways. No evidence of faulting was found by inspection of open excavations on the site. No unusual relief or topographic features, such as sag ponds, and no vegetation changes were observed on the site. No evidence of structural damage to buildings on the property was identified.

The streets within a half-mile of the site were driven to look for evidence of repairs, sags, or abrupt changes of grade that could indicate subsidence faulting in the site vicinity. The streets were asphalt-paved and were in good condition. No evidence of subsidence faulting was observed. In addition, facades of buildings and houses in the same area were viewed for structural damage that could have resulted from subsidence faulting. None was observed.

In summary, based on the review of regional data, aerial photographs, and subsurface geologic structure maps, there are no geologic faults with Holocene-age displacements within 200 feet of the landfill boundaries and there is no faulting activity or differential subsidence that could adversely affect the landfill. There is no active faulting within 200 feet of the site; therefore, the site complies with §330.555.

2.2 Seismic Impact Zones

Consistent with §330.61(j)(3) and §330.557, seismic impact zones documentation was prepared as part of this application to demonstrate that the TASWA DRF meets the location restriction for seismic impact zones.

TCEQ regulations state that no new municipal solid waste landfill (MSWLF) units or lateral expansions shall be located in seismic impact zones unless the owner or operator demonstrates that all containment structures, including liners, leachate collection systems, and surface water control systems are designed to resist the maximum horizontal acceleration in lithified earth for the site.

The seismic impact zone as defined by §330.557 is an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earthen material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 250 years. The facility lies in an area where the peak gravitational acceleration, with a 2% probability of being exceeded in 50 years, is less than 10% of gravity (less than 0.1g). This is equivalent to a 10% probability in 250 years. Appendix E4, Drawing E4.1 shows the site location on the USGS 2014 Seismic Hazard Maps. The existing TASWA DRF and the proposed expansion area are not located within a seismic impact zone.

2.3 Unstable Areas

Consistent with §§ 330.63(e)(2), 330.61(j)(4), and 330.559, unstable areas documentation was prepared as part of this application to demonstrate that the TASWA DRF meets the location restriction for unstable areas.

TCEQ regulations require that owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area shall demonstrate that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted.

An unstable area is defined by the TCEQ as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill's structural components responsible for preventing releases from a landfill. An unstable area can exhibit poor foundation conditions, areas susceptible to mass movement, and karst terrains.

The determination of potential unstable areas at the landfill site is based on site observations and a review of existing documentation for the site. Based on this review, the foundation conditions and the geological formations are stable. In addition, there is no evidence to suspect mass movement of natural formations of earthen material on or in the vicinity of this site. The proposed landfill components were evaluated with respect to settlement, heave, and slope stability. The detailed analysis is included in Part III, Attachment D5. Based on the results of these analyses, the existing and proposed human-made features have been predicted to have adequate factors of safety with respect to stability.

Based on site observations, a review of existing geological data, and geotechnical analysis of the structural components of the landfill development, the site is not located in an unstable area and the integrity of the landfill is not expected to become impaired by natural or human-induced events.

3 REGIONAL AQUIFERS

30 TAC §330.63(e)(3)

The Woodbine Formation and the Trinity Group aquifers are the only defined regional aquifers. They are described in the following section, (Langley, 1999).

3.1 Woodbine Aquifer

The Woodbine Aquifer is classified by the State of Texas as a minor aquifer. The outcrop of the Templeton Shale Member of the Woodbine Formation lies immediately west of the existing permit boundary of this facility . The recharge zone of the sandy portions of the Woodbine aquifer trends generally from north to south in a band that stretches from about five miles east of Gainesville in Cook County to about ½ mile west of the site. Depth to the Woodbine sandstone beneath the site ranges from about 70 feet below the ground surface on the western portions of the site to as deep as 130 feet on the eastern portions of the site. The thickness of the Woodbine varies from about 50 feet in the western parts of the recharge zone to more than 400 feet in the eastern parts of the region (Bergquist, 1949).

The Woodbine aquifer consists of sandstone, siltstone, and shaly sand interbedded with non-aquifer-quality shale and sandy clay. The Woodbine generally dips to the east at about 60 feet per mile (Nordstrom, 1982; Barnes, 1991; and Langley, 1999). The Woodbine aquifer is confined by the overlying Eagle Ford Shale in western Grayson County and the Eagle Ford Shale and Austin Chalk in the eastern parts of Grayson County.

The primary recharge to the Woodbine is by rainfall on the outcrop area and from infiltration from lakes and streams on the outcrop. Woodbine groundwater occurs in unconfined, water-table conditions near the outcrop. And becomes confined downdip. Groundwater within the Woodbine moves east-southeast from the recharge zones on the outcrop. Based on published, regional data, the average rate of groundwater movement in the Woodbine in the Texoma Area is estimated to be about 10 to 20 feet per year depending on the local gradient and permeability, (Nordstrom, 1982; and Langley, 1999). Drawing E1.3 is a regional potentiometric surface of the Woodbine aquifer. Water quality of the Woodbine near the outcrop typically has high iron concentrations but is otherwise fresh and of good quality. As the Woodbine groundwater migrates downgradient, the water quality deteriorates with increases in sodium, chloride, and bicarbonate. Total dissolved solids typically range from 250 to 1500 milligrams per liter in groundwater withdrawn from Woodbine wells in the area (Nordstrom, 1982 and Langley, 1999). Hydraulic properties of the Woodbine aquifer are summarized in the Hydraulic Properties of Regional Aquifers table.

3.2 Washita Group

The Woodbine Formation is separated from the deeper Trinity aquifer by sediments of the Washita Group. The Washita Group consists of, from oldest to youngest, Kiamichi Limestone, Fort Worth Limestone and Duck Creek Marl, Denton Clay, Weno Limestone, Paw Paw Sandstone and Clay, Main Street and Bennington Limestones, and the Grayson Marl (Main Street and Grayson are largely undivided in Texas). The Washita Group consists mostly of limestone, dense marl, clay, and some sand. The sediments of the Washita Group are not considered aquifer quality, however, will yield small quantities of water in shallow wells near their outcrop (Barnes, 1991 and Nordstrom, 1982).

3.3 Trinity Aquifer

The Trinity aquifer is classified as a major aquifer by the State of Texas. Regionally, the Trinity consists of, from oldest to youngest, the Twin Mountains, the Glen Rose, and the Paluxy. In the Texoma area, the Trinity aquifer is collectively known as the Antlers Formation (Nordstrom, 1982; Barnes, 1991). The Antlers crops out in western Cooke County and consists of sandstone, sand, and clay. The thickness of the Antlers in Cooke and Grayson counties ranges from 400 to 800 feet and deepens from the outcrop area to more than 1400 feet deep in eastern Grayson County (Drawing E1.2).

The potentiometric surface of confined groundwater in the Antlers is about 450 feet below ground surface (bgs) in the general area of the site. A regional potentiometric surface map of the Trinity Antlers aquifer is on Drawing E1.4. Nordstrom (1982) estimates a groundwater velocity for the Antlers of one to two feet per year. Groundwater moves slowly to the east-southeast in the Antlers.

Hydraulic properties of the sand units that comprise the Trinity aquifer are given in Nordstrom (1982) and Langley (1999) are summarized in the Hydraulic Properties of Regional Aquifers table. Transmissivities range from 5,000 to 10,000 gallons per day per foot. Hydraulic conductivity ranges from 25 to 53 gallons per day per square foot.

Recharge to the Trinity Antlers is by precipitation on the outcrop as well as seepage from the lakes and streams on the outcrop. Groundwater in the Antlers near the outcrop I unconfined and under water table conditions. Downdip from the outcrop, the groundwater is confined by the lower permeability rocks above and below the Antlers. The nearest outcrop for the Trinity is more than 25 miles west of the site.

The development of the Antlers as a public water supply source began in the City of Sherman in 1889. The original well is 2,300 feet deep and produced 200 gallons per minute. Additional wells were drilled in 1921 and 1923. By 1912, the cities of Gainesville and Valley View had producing Antlers wells. By 1940, most of the larger towns in Cooke and Grayson counties were using Antlers' groundwater. Antlers' groundwater near the outcrop is mostly hard to very hard and becomes generally softer downdip. Typical groundwater withdrawn from Antlers wells in the area has total dissolved solids of 200 to 1,000 milligrams per liter (Nordstrom, 1982).

Hydraulic Properties of Regional Aquifers
Compiled from Nordstrom, 1982 and Langley, 1999

Parameters	Woodbine Aquifer	Antlers Aquifer
Composition	Sandstone, siltstone, shaly sand	Sandstone, sand, limestone
Transmissivity	Average 4,700 gal/day/ft	Average range 5,000 to 10,000 gal/day/ft
Hydraulic Conductivity	Average 44 gal/day/ft²	Average range 25 to 53 gal/day/ft²
Water Table / Confined	Confined	Confined
Groundwater Flow Rate	10 to 20 feet per year	1 to 2 feet per year
Water Quality Total Dissolved Solids Other	 250 to 1500 mg/L High Iron, High Sulfate	 200 to 1000 mg/L -
Recharge Zones	Outcrop area west of the site	Outcrop area west in Cook County
Regional Water Table	See Drawing E1.3	See Drawing E1.4
Present Use of Water	Public supply, industrial, irrigation, some domestic. High iron causes problems for all uses.	Public water supply and domestic.
identification of Water Wells Within 1 Mile	See Drawing E1-5 and Water Wells Within One Mile Table and Historic Water Well Summary	See Drawing E1.5 and Water Wells Within One Mile Table and Historic Water Well Summary

3.4 Water-Well Locations

3.4.1 Wells Within One Mile

A search was conducted in 2024 and 2025 to identify water wells within a one-mile radius around the site. The water well search included the following sources:

- Texas Water Development Board (TWDB) Water Data Interactive (https://www3.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer)
- TCEQ Water Well Report Viewer
  Plotted Water Wells by Grid Number: 18-18-8, 18-18-7, 18-26-1, 18-26-2
  (https://www.tceq.texas.gov/gis/waterwellview)
- Biggs and Mathews Environmental 2003 Permit Application
- Red River Groundwater Conservation District
- A windshield search for potential water well locations

The 2024 and 2025 database search identified four modern water wells within one mile of the site. One water well (1826102) is shown twice in the table below because it was reported by both the TWDB and the Red River Groundwater Conservation District (RRGCD). Each of the wells, and possible wells, are identified in Drawing E1.5. Four wells that are located on or just outside the one-mile radius are also shown, including well numbers 1826101 and 1826102 which are public drinking water supply wells operated by the Two-Way Water Corporation. An additional nine water wells that could possibly be located within one mile of the site were identified through the TCEQ database.

An attempt was made to locate wells within one mile of the proposed facility. The windshield survey identified 64 other sites that are likely to be water wells based on the visual identification of the surface equipment, such as houses, pump handles, etc. No attempt was made to contact the individuals occupying the property where these wells were identified.

The information about each of the wells is summarized in the table below. Water wells located as part of the 2003 permit are shown in the Historic Water Well Summary table. All located wells are shown on Drawing E1.5.

Water Wells Within One Mile

The well type abbreviations are: A - Agriculture, D - Domestic, G - Plugged or Destroyed, Ind - Industrial, Irr - Irrigation, M - Monitoring Well, O - Other, P - Public, U - Unused

Source	State ID or Grid Number	Map ID	Latitude	Longitude	Date	Depth (ft)	Well Use	Completion Formation
Texas Water Development Board Groundwater Database (TWDB GW)								
TWDB GW	1826101	1826101	33.621667	-96.864167	5/15/1973	446	P	Woodbine
TWDB GW	1826102	1826102	33.6222222	-96.8644444	10/5/1978	1575	P	Trinity
State of Texas Well Reports- State Drilling Report (SDR)								
SDR	232359	232359	33.6083333	-96.8372222	3/8/2007	360	Irr	Woodbine
SDR	246583	246583	33.6416667	-96.8569444	11/17/2009	400	Irr	Woodbine
Red River Groundwater Conservation District (RRGCD)								
RRGCD	1826102	1826102	33.622086	-96.864325	Unk	1575	P	Trinity
Possible Water Wells								
Windshield Survey	N/A	1	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	2	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	3	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	4	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	5	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	6	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	7	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	8	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	9	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	10	Unk	Unk	Unk	Unk	Unk	Unk

Water Wells Within One Mile (Continued)

The well type abbreviations are: A - Agriculture, D - Domestic, G - Plugged or Destroyed, Ind - Industrial, Irr - Irrigation, M - Monitoring Well, O - Other, P - Public, U - Unused

Source	State ID or Grid Number	Map ID	Latitude	Longitude	Date	Depth (ft)	Well Use	Completion Formation
Possible Water Wells (continued)								
Windshield Survey	N/A	11	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	12	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	13	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	14	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	15	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	16	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	17	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	18	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	19	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	20	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	21	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	22	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	23	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	24	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	25	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	26	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	27	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	28	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	29	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	30	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	31	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	32	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	33	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	34	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	35	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	36	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	37	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	38	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	39	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	40	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	41	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	42	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	43	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	44	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	45	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	46	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	47	Unk	Unk	Unk	Unk	Unk	Unk

Water Wells Within One Mile (Continued)

The well type abbreviations are: A - Agriculture, D - Domestic, G - Plugged or Destroyed, Ind - Industrial, Irr - Irrigation, M - Monitoring Well, O - Other, P - Public, U - Unused

Source	State ID or Grid Number	Map ID	Latitude	Longitude	Date	Depth (ft)	Well Use	Completion Formation
Possible Water Wells (continued)								
Windshield Survey	N/A	48	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	49	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	50	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	51	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	52	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	53	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	54	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	55	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	56	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	57	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	58	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	59	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	60	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	61	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	62	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	63	Unk	Unk	Unk	Unk	Unk	Unk
Windshield Survey	N/A	64	Unk	Unk	Unk	Unk	Unk	Unk
Wells likely within 1 mile but not clearly located from the TCEQ Well Reports by Grid Number								
TCEQ	18-18-8	N/A	Unk	Unk	12/14/1973	195	D	Unk
TCEQ	18-18-8	N/A	Unk	Unk	9/12/1978	214	D	Woodbine
TCEQ	18-18-8	N/A	Unk	Unk	5/5/1979	236	D	Woodbine
TCEQ	18-18-8	N/A	Unk	Unk	9/8/1994	200	D	Unk
TCEQ	18-18-7	N/A	Unk	Unk	10/3/1997	250	D	Unk
TCEQ	18-18-7	N/A	Unk	Unk	9/11/1980	230	D	Woodbine
TCEQ	18-26-1	N/A	Unk	Unk	8/28/1990	833	D	Unk
TCEQ	18-26-2	N/A	Unk	Unk	8/20/1997	320	D	Unk
TCEQ	18-26-2	N/A	Unk	Unk	7/8/1984	180	D	Unk

Historic Water Well Summary

Well No.	Depth (Ft)	Well Use	Completion Formation
Water Wells Within 1 Mile			
1(1)	833	Domestic	Trinity
7(1)	227	Domestic	Woodbine
7E	120	Domestic	Woodbine
U(1)	403	Domestic	Woodbine
A	Unk	Unk	Unk
B	Unk	Unk	Unk
C	Unk	Unk	Unk
D	Unk	Unk	Unk
E	Unk	Unk	Unk
F	Unk	Unk	Unk
G	Unk	Unk	Unk
H	Unk	Unk	Unk
I	Unk	Unk	Unk
J	Unk	Unk	Unk
K	Unk	Unk	Unk
L	Unk	Unk	Unk
M	Unk	Unk	Unk
N	Unk	Unk	Unk
O	Unk	Unk	Unk
U	240	Domestic	Woodbine
41GS135W	Unk	Unk	Unk
Possible Wells Within 1 Mile			
P	Unk	Unk	Unk
Q	Unk	Unk	Unk
R	Unk	Unk	Unk
S	Unk	Unk	Unk
T	Unk	Unk	Unk
Cisterns			
1	Unk	Unk	Unk
2	Unk	Unk	Unk
Wells Just Outside 1 Mile			
7B	420	Domestic	Woodbine

3.4.2 Oil and Gas Well Locations

An oil and gas well search of state records was conducted in February 2024 to identify locations of any existing or abandoned on-site crude oil or natural gas wells, or other wells

associated with mineral recovery that are under the jurisdiction of the Railroad Commission (RRC). A total of eight oil well locations were observed with a 500-foot radius of the site. Three dry holes are located within the waste footprint and have been properly plugged, prior to construction of waste cells. Three additional dry holes are identified on the property outside of the waste permit but within the boundary. One permitted well location is shown on the property within the limit of waste; the well was never drilled, and the permit expired in 2002. One oil well was identified outside the permit boundary but within a 500-foot radius of the site. A Public Information Request was submitted to the RRC in an effort to gain information about the oil well identified as 181 and seen on Drawing E4.3. Despite an exhaustive search performed by the RRC, no records or data pertaining to oil well 181 were located. The RRC was able to locate records for the two most adjacent wells with respect to oil well 181; both adjacent wells are considered dry and were plugged in 1966. Due to the lack of records for oil well 181 and the exclusive presence of documented dry holes within the permit boundary, oil well 181 should not be considered an active crude oil or natural gas production well or a well associated with mineral recovery. The locations of oil and gas wells are depicted on Drawing E4.3.

4 SUBSURFACE INVESTIGATION REPORT

0 TAC §330.63(e)(4)(A)-(H)

4.1 Recent Drilling Activities

The current and previous site characterization investigations of the geology, geotechnical properties, and hydrogeology of the site have resulted in over 100 borings, piezometers, and monitoring wells. Based on the site characterization, a sufficient number of borings were drilled to establish subsurface site stratigraphy and to determine the geotechnical properties of the soils beneath the site. Geologic strata have been characterized to depths of more than 180 feet. Based on correlation of strata identified in the borings, the uppermost aquifer and lower confining unit were identified.

Although borings were previously drilled as part of the original permit and subsequent permit amendments, additional borings were drilled in accordance with the approved boring plan in the expansion area. Data and interpretations from these recent borings were lithologically consistent with the previous borings and generally confirm the previous stratigraphic and hydrogeologic interpretations

Borings were drilled in accordance with TCEQ approved boring plans and established field exploration methods. Installation, abandonment, and plugging of borings was performed in accordance with the TCEQ rules in effect at the time.

4.1.1 Soil Boring Plan

A soil boring plan was originally approved by the TCEQ with a letter dated February 18, 2022. The field work for that site investigation was completed in February 2023 A revised soil boring plan was submitted to the TCEQ on September 27, 2023, for additional expansion acreage to the north. The field work for that site investigation was completed in November and December 2023. Drilling activities for both expansion investigations were performed in accordance with the approved boring plans and in compliance with 30 TAC §330.63(e)(4). The boring plan approval letters are included in as Drawings E2.1a through E2.2b. A boring location map is included on Drawing E2.3. The depths of borings range from 101 ft. to 182 ft. A summary of the borings is provided in the Historical Boring Details table.

4.1.2 Biggs & Mathews Environmental 2022 and 2023 Site Investigation

Field drilling and sampling of fourteen borings in 2022 was started in December 2021 and completed in March 2022; field drilling and sampling of six borings in 2023 was completed in November 2023 (see Historical Boring Details table). Both site investigations were performed using thin-walled tube and mud-rotary drilling techniques in accordance with TCEQ approved boring plan and established field exploration methods.

2022 and 2023 site investigation borings were continuously sampled from the surface to total depth. Shallow, highly weathered soils were sampled by hydraulically pushing 3-inch-diameter, thin-walled tubes from the surface to refusal (where the drill rig can no longer push the sample tubes) or to a depth conducive to core sampling. Coring then proceeded to total depth. Coring was accomplished using 5-foot length, double-tube core barrels with mud rotary techniques.

This field exploration program was under the direct supervision of a certified professional geologist.

Borings were field logged by a qualified geologist at the time of drilling in general accordance with ASTM D 2488. The field logs, in conjunction with field and laboratory testing, were used to prepare the final boring logs. The data generated during the field exploration program are presented on the final logs of borings provided in Appendix E2. General notes supplementing the logs are included in Appendix E2.

Historical Borings Table

Boring No.	Northing	Easting	Surface Elevation (ft above msl)	Total Depth of Boring (ft)	Bottom of Boring Elevation (ft above msl)	Depth Above (+) or Below (-) the EDE
2022 Borings						
BME-1	7277584.316	2471694.021	774.4	246.0	528.4	-131.6
BME-2	7277899.448	2472286.017	770.8	170.0	600.8	-59.2
BME-3	7278234.081	2473078.199	773.2	145.0	628.2	-31.8
BME-4	7277674.653	2473493.028	774.5	146.0	628.5	-31.5
BME-5	7278470.079	2474205.321	769.2	140.0	629.2	-30.8
BME-6	7277862.949	2475197.789	756.5	128.0	628.5	-31.5
BME-7	7278029.058	2476199.949	754.9	126.0	628.9	-31.1
BME-8	7278340.09	2477024.516	739.7	240.0	499.7	-160.3
BME-9	7278844.07	2476710.205	752.3	125.0	627.3	-32.7
BME-10	7279338.556	2477153.169	733.1	120.0	613.1	-46.9
BME-11	7279843.991	2476722.739	743.8	115.0	628.8	-31.2
BME-12	7280338.326	2477177.828	734.0	125.0	609.0	-51.0
BME-13	7280846.434	2476534.102	730.6	257.0	473.6	-186.4
BME-14	7277570.03	2477031.64	735.4	120.0	615.4	-44.6
2023 Borings						
BME- 15	7281913.2	2477206	721.9	93	628.9	-31.1
BME- 16	7282080.8	2476251	746.3	118	628.3	-31.7
BME- 17	7282282	2475253	746.0	117	629.0	-31.0
BME- 18	7282443.8	2474467	724.0	95	629.0	-31.0
BME- 19	7283008	2473498	732.0	103	629.0	-31.0
BME- 20	7282865.3	2472360	754.3	126	628.3	-31.7
2000 Borings						
F10	7278906.74	2471710.60	766.6	95.0	671.6	11.6
F30	7280906.58	2471735.67	746.3	72.0	674.3	14.3
F40	7281906.50	2471748.20	748.6	74.0	674.6	14.6

Historical Borings Table (Continued)

Boring No.	Northing	Easting	Surface Elevation (ft above msl)	Total Depth of Boring (ft)	Bottom of Boring Elevation (ft above msl)	Depth Above (+) or Below (-) the EDE
2000 Borings (continued)						
L15	7279399.18	2472316.82	748.1	100.0	648.1	-11.9
L25	7280399.10	2472329.35	762.9	125.0	637.9	-22.1
L35	7281399.02	2472341.89	765.3	125.0	640.3	-19.7
P10	7278894.21	2472710.52	765.4	120.0	645.4	-14.6
P20	7279894.13	2472723.05	761.6	120.0	641.6	-18.4
P30	7280894.05	2472735.59	763.8	125.0	638.8	-21.2
P40	7281893.97	2472748.12	762.0	88.0	674.0	14.0
U10	7278887.94	2473210.48	762.2	88.0	674.2	14.2
U15	7279387.90	2473216.75	747.0	120.0	627.0	-33.0
U25	7280387.82	2473229.28	765.5	120.0	645.5	-14.5
U30	7280887.78	2473235.55	758.1	85.0	673.1	13.1
U35	7281387.74	2473241.82	755.0	125.0	630.0	-30.0
Z10	7278881.67	2473710.44	764.7	133.0	631.7	-28.3
Z15	7279381.63	2473716.71	765.1	90.5	674.6	14.6
Z20	7279881.59	2473722.98	763.7	135.0	628.7	-31.3
Z25	7280381.55	2473729.24	758.2	84.0	674.2	14.2
Z30	7280881.52	2473735.51	752.1	120.0	632.1	-27.9
EE15	7279375.37	2474216.67	762.1	129.0	633.1	-26.9
EE25	7280375.29	2474229.20	752.6	130.0	622.6	-37.4
EE35	7281375.21	2474241.74	737.3	120.0	617.3	-42.7
JJ10	7278869.14	2474710.36	764.0	133.0	631.0	-29.0
JJ15	7279369.10	2474716.63	756.3	82.0	674.3	14.3
JJ20	7279869.06	2474722.90	749.6	132.0	617.6	-42.4
JJ25	7280369.02	2474729.16	739.3	65.0	674.3	14.3
JJ30	7280868.98	2474735.43	732.8	115.0	617.8	-42.2
OO10	7278862.87	2475210.32	754.6	80.0	674.6	14.6
OO15	7279362.83	2475216.59	745.9	120.0	625.9	-34.1
OO25	7280362.75	2475229.12	737.9	130.0	607.9	-52.1
OO30	7280862.71	2475235.39	740.8	66.0	674.8	14.8
OO35	7281362.67	2475241.66	740.6	120.0	620.6	-39.4
TT10	7278856.60	2475710.28	744.7	130.0	614.7	-45.3
TT20	7279856.53	2475722.82	742.4	140.0	602.4	-57.6
TT30	7280856.45	2475735.35	746.7	135.0	611.7	-48.3
YY15	7279350.30	2476216.51	748.6	138.0	610.6	-49.4
YY25	7280350.22	2476229.05	748.7	150.0	598.7	-61.3
YY35	7281350.14	2476241.58	748.1	132.0	616.1	-43.9

Historical Borings Table (Continued)

Boring No.	Northing	Easting	Surface Elevation (ft above msl)	Total Depth of Boring (ft)	Bottom of Boring Elevation (ft above msl)	Depth Above (+) or Below (-) the EDE
1998 Boring						
EB-6	7281640.31	2475032.55	739.0	150.0	589.0	-71.0
Monitoring Wells						
MW-1	7281892.1	2472373.8	765.0	32.0	733.0	73.0
MW-2	7281906.7	2472978.3	760.2	22.5	737.7	77.7
MW-3	7281864.3	2473576.5	749.4	26.5	722.9	62.9
MW-4	7281871.4	2474173.9	739.6	18.5	721.1	61.1
MW-5	7281753.1	2474763.4	729.5	12.5	717.0	57.0
MW-6	7281632.5	2475342.3	744.7	32.5	712.2	52.2
MW-7	7281490.5	2476068.1	747.3	32.9	714.4	54.4
MW-12	7280247.1	2471785.4	759.7	20.5	739.2	79.2
MW-13	7281751.4	2474773.7	729.5	89.5	640.0	-20.0
MW-14	7281631.2	2475356.7	744.7	107.5	637.2	-22.9
MW-15	7281485.9	2476085.4	747.4	114.5	632.9	-27.1
MW-16	7281388.8	2476506.8	742.1	106.0	636.1	-23.9
MW-17	7280804.2	2476498.5	749.8	32.0	717.8	57.8
MW-18	7280021.6	2476476.7	747.9	130.5	617.4	-42.7
MW-19	7279424.2	2476467.0	749.3	32.0	717.3	57.3
MW-26	7280247.1	2471785.4	759.8	90.5	669.3	9.3
2000 Piezometers						
L35(S)	3502.30	1007.90	765.6	25.0	740.6	-80.6
L35(D)	3490.00	992.30	765.3	96.0	669.3	-9.3
P10	992.70	1486.60	766.3	109.0	657.3	2.7
P20(S)	2003.10	1514.90	761.9	46.0	715.9	-55.9
P20(D)	2003.90	1492.70	761.8	99.0	662.8	-2.8
U30	3000.70	1990.10	757.9	45.0	712.9	-52.9
Z20	1989.50	2500.30	763.7	113.5	650.2	9.8
EE15	1489.70	3005.40	762.8	122.0	640.8	19.2
EE25	2481.70	3002.20	753.0	117.0	636.0	24.0
EE35(S)	3518.17	2995.00	737.3	21.0	716.3	-56.3
EE35(D)	3494.70	2993.10	737.2	101.0	636.2	23.8
JJ10(S)	1010.00	3506.60	764.4	40.5	723.9	-63.9
JJ10(D)	1002.60	3492.80	764.6	119.0	645.6	14.4
OO15	1472.50	4000.50	748.6	112.0	636.6	23.4
TT10	1011.60	4500.50	745.2	105.0	640.2	19.8
TT20	2005.80	4511.20	742.9	51.0	691.9	-31.9

Historical Borings Table (Continued)

Boring No.	Northing	Easting	Surface Elevation (ft above msl)	Total Depth of Boring (ft)	Bottom of Boring Elevation (ft above msl)	Depth Above (+) or Below (-) the EDE
Piezometers (continued)						
TT30	2988.70	4499.90	747.2	47.0	700.2	-40.2
YY25	2498.20	5011.70	749.1	137.0	612.1	47.9
YY35	3487.00	5000.20	746.8	120.2	626.6	33.4
2022 & 2023 Piezometers						
P-1D	2471696.30	7277561.50	774.3	146.0	628.3	31.7
P-1S	2471706.69	7277572.34	774.3	38.0	736.3	-76.3
P-4D	2473465.33	7277657.96	775.2	125.0	650.2	9.8
P-6D	2475204.48	7277891.29	755.6	112.0	643.6	16.4
P-6S	2475194.04	7277881.65	755.9	30.5	725.4	-65.4
P-7D	2476192.95	7278056.29	754.8	114.0	640.8	19.2
P-8D	2477023.59	7278295.66	738.6	124.0	614.6	45.4
P-8-S	2477020.04	7278310.74	738.9	37.5	701.4	-41.4
P-10D	2477154.78	7279360.74	732.8	115.0	617.8	42.2
P-10S	2477169.59	7279365.85	732.1	46.0	686.1	-26.1
P-12D	2477149.98	7280327.80	734.1	121.0	613.1	47.0
P-12S	2477163.78	7280332.28	734.1	34.5	699.6	-39.6
P-13D	2477208.55	7280876.82	730.4	119.5	610.9	49.1
P-13S	2477211.06	7280859.86	730.5	38.0	692.5	-32.5
P-16S	2476269.75	7282092.55	746.3	41	705.3	45.3
P-16D	2476251.91	7282080.68	746.33	103	643.33	-16.67
P-17S	2475259.21	7282269.4	746.15	50.5	695.65	35.65
P-18D	2474475.83	7282445.52	746.15	81	665.15	5.15
P-20S	2472385.98	7282855.8	754.27	44	710.27	50.27
P-20D	2472366.13	7282866.8	754.45	111	643.45	-16.55

4.2 Previous Site Exploration

Subsurface investigations conducted at the site in the past are described below. Borings were drilled in accordance with established field exploration methods. The horizontal location and ground surface elevation for each boring was determined in the field prior to drilling. Installation, abandonment, and plugging of borings was performed in accordance with the TCEQ rules in effect at the time. Drawing E2.2 illustrates the locations of all soil borings, piezometers, and monitoring wells previously advanced onsite.

The borings from previous investigations with their surface elevations, depths, and calculated bottom elevations, is included in the Historical Boring Details table; the logs of borings are included in Appendix E2, as pages E2.4 through E2.214.

Geotechnical investigations were conducted for each of the three existing permits associated with the facility. These investigations are summarized briefly below.

4.2.1 BME 2000 Site Investigation

Field drilling and sampling of the thirty-nine borings and nineteen piezometers were completed in March 2000. The borings were performed using thin-walled tube and mud-rotary drilling techniques in accordance with TCEQ approved boring plan and established field exploration methods.

4.2.2 BME 1998 Preliminary Site Investigation

As a part of the site selection process undertaken by the Texoma Area Solid Waste Authority (TASWA), a preliminary site investigation was conducted on the properties that eventually were combined to form the TASWA DRF property. Six borings were drilled and sampled on the property, but only one of these borings (EB-6) was drilled within the proposed permit boundary. The six borings were drilled to depths ranging from 127 to 150 feet. Thin-walled tube and mud rotary drilling techniques were used to drill EB-6. The boing was continuously sampled by pushing 3-inch-diameter, thin-walled sample tubes from the surface to the dept of refusal. Mud-rotary drilling was accomplished using 10-foot, double tube core barrels. The location of EB-6 is included in the Boring Plan and applicable maps within this application.

4.3 Site Stratigraphy

The site is on the outcrop of the Eagle Ford Shale. The Eagle Ford is typically gray to dark gray and brown shale with sandy shale and sand interbeds. Near the surface, the Eagle Ford weathers to gray to brown clay, shaly clay, and sandy clay. The Templeton Shale member of the Woodbine crops out west of the site and underlies the Eagle Ford Shale. The shallowest Woodbine sandstone is found beneath the site ranging in depth from about 70 on the western parts of the site to about 100 feet on the eastern portion of the site. The sandstone ranges from a few feet thick to as much as two feet and averaging about 14 feet across the site. The sandstone is locally interbedded with thin shale or clayey shale. The Woodbine sandstone is typically gray to dark gray, hard, carbonaceous, and glauconitic with calcareous cement.

Six geologic units have been identified in the subsurface beneath the site. They are tabulated in the Site Stratigraphy table and described in the following sections. Nine geologic cross-sections of the site illustrate generalized subsurface conditions and interpreted correlations of the geologic and hydrogeologic unit at the site (Drawings E3.2 through E3.10). The cross-sections are based on lithologic and stratigraphic data from the logs of borings provided in Appendix E2. Drawing E3.1 shows the locations of the cross-sections on a site map. Historical cross-sections are included in Appendix E8.

Generalized Site Stratigraphy

Geologic Unit	Lithology	Average Depth to top of Unit (ft)	Average Thickness of Unit (ft)	Hydrogeologic Unit
Layer I	Clay and Shaly Clay	Surface	23	Vadose Zone
Layer II	Shaly Sandstone and Shale	24	5	Perched Water Zone
Layer III	Shale with Sand	27	35	Lower Confining Layer to the Perched Water Zone
Layer IV	Shale	63	36	Upper Confining Layer to the Uppermost Aquifer
Layer V	Sandstone, Shaly Sand	99	10	Uppermost Aquifer
Layer VI	Shale and Shale with Sand	110	14*	Lower Confining Layer (Aquiclude) to Uppermost Aquifer
*Layer VI was not fully penetrated throughout the site. Depths penetrated into layer VI across the site ranged from 1.5 to 43 feet and averaged 14 feet.				

4.3.1 Layer I - Clay and Shaly Clay

Layer I is a weathered surficial unit generally consisting of clay overlying shaly clay. This layer also has some sandy shale interbeds. Layer I soils were encountered from the surface to a maximum depth of 47 feet. Average thickness of this layer is approximately 23 feet. This layer is the near-surface weathered portion of the Layer II shale layer.

4.3.2 Layer II - Shaly Sandstone and Shale

Layer II is hard and consists of thin, flaggy beds of calcareous, shaly sandstone and shale. There is a minor, thin flaggy limestone within this layer. Layer II is correlatable across the site except for a few locations where it was not identified in borings (borings EB-6, P-10, OO25, YY-25, BME-3, 4, 5, 6, 7, 9, 10, 11, 14, 15, 17, 18, 19, 20). Layer II was encountered from approximately 3 to 82 feet bgs except for one location (boring F-40 on the northwest corner of the site), where the overlaying clay is absent, and Layer II is found at the surface. This layer, where present, ranges from 1 to 24 feet thick and averages approximately 5 feet thick. A structural contour map of the top of Layer II is shown on Drawing E3.11.

4.3.3 Layer III - Shale with Sand

Layer III consists of gray to dark gray shale with sand. The shale is glauconitic, carbonaceous, and in places is calcareously cemented and fractured with near-vertical to diagonal fractures. The shale is typically gradational with slightly more sand near the top grading downward to 100 percent shale near the contact with the underlying Layer IV shale. A few thin mudstone and sand seams occur in Layer III. The unit is correlatable across the site. The layer III unit thickness ranges from 5.5 to 53 feet thick and is an average of 35 feet thick. The top of Layer III averages 27 feet below ground surface.

4.3.4 Layer IV - Shale

Layer IV is dark gray, massive shale, carbonaceous with some mudstone seams. The top of the unit was encountered at an average depth of approximately 63 feet and ranged from 3 to 79 feet thick, averaging 36 feet. The unit contained mudstone seams and traces of glauconitic sand. Near vertical and diagonal fractures occur scattered throughout the unit. The unit is correlatable across the site. A structural contour map of the top of Layer IV is shown on Drawing E3.12.

4.3.5 Layer V - Sandstone and Shaly Sand

Layer V is a tan to dark gray glauconitic, carbonaceous, variably cemented sandstone interbedded with shaly sandstones. It contains minor shale and mudstone interbeds as well as fossil shell fragments. The layer V unit thickness ranges from 1 foot to 33.5 feet thick and averages 10 feet thick across the site. The unit is correlatable across the site. A structural contour map of the of Layer V is shown on Drawing E3.13.

4.3.6 Layer VI - Shale and Shale with Sand

Layer VI is dark gray, glauconitic, carbonaceous shale with sandy seams. The unit typically grades from more sand near the base of Layer V sandstones to all shale deeper into the layer. A maximum of 43 feet of this shale unit and an average of about 14 feet was penetrated by drilling during exploration. The maximum thickness is not known because it was not fully penetrated in all borings. There is a deeper sand below Layer VI that was observed in borings BME-1, BME-8, and BME-13. The Layer VI was present in each of these borings ranging in thickness from 2 to 43 feet. The Layer VI is correlatable across the site. A structural contour map of the top of Layer VI is shown on Drawing E3.14.

5 GEOTECHNICAL DATA

30 TAC §330.63(e)(5)(A)-(F)

The geotechnical properties of the subsurface materials at this site are based on the subsurface investigations that are described in Section 4. The geotechnical design of the facility is provided in Attachment D5.

5.1 Laboratory Reports

Geotechnical tests were performed on samples recovered from each soil layer or stratum that will form the bottom and sides of the proposed excavation with test samples recovered up to 78 feet below the deepest excavation. The laboratory tests were performed by independent third-party laboratories using the industry standards that were applicable at the time that the tests were performed. The results of the laboratory tests are compiled in Appendix E5 of this attachment. Descriptions of the tests, the number performed, and the test standards are summarized in the table below.

Laboratory Test Summary

Test Description	Test Method	Number Of Tests
Minus 200 Sieve Analysis	ASTM D 1140	109
Grain Size Distribution	ASTM 6913	12
Atterberg Limits	ASTM D 4318	127
Moisture Content	ASTM D 2216	157
Unit Dry Weight	ASTM D 2937	36
Unconfined Compression	ASTM 2166	10
Triaxial Compression	ASTM 4767	3
Consolidation	ASTM 2435	2
Hydraulic Conductivity	ASTM D 5084/COE EM 1110-2-1906 APP VII	23

Atterberg limits and Minus 200 Sieve Analysis were used to classify the soils according to the Unified Soil Classification System. In addition, the Atterberg limits and Minus 200 Sieve Analysis were used to estimate parameters for the settlement/heave and slope stability calculations and to evaluate the suitability of the materials for use as compacted soil liner and final cover infiltration layer. The moisture content, unit dry weight, unconfined compressive and triaxial strength, and consolidation tests were used to estimate the parameters used for the settlement/heave and the slope stability calculations.

The permeability tests were used to estimate the parameters used for the temporary dewatering system design and to evaluate the suitability of the materials for use as compacted soil liner and final cover infiltration layer.

A total of eighteen vertical (eleven from Stratum I and seven from Stratum II) and four horizontal (three from Stratum I and one from Stratum III) hydraulic conductivity tests have been performed on undisturbed samples from the current and previous explorations on the units that will form the bottom and sides of the proposed excavations. Attempts to trim horizontally oriented undisturbed samples from Stratum II that will form the sides of the excavations for laboratory hydraulic conductivity tests were unsuccessful. All of the Stratum II samples experienced some disturbance when attempts were made to trim them

in a horizontal orientation. Therefore, field tests from the previous explorations were used to determine the horizontal permeability of the excavation sidewall soils. The laboratory and field test results were used to evaluate the hydrogeologic parameters of the site and the hydraulic conductivity of engineered fill constructed from on-site materials.

5.2 Material Characteristics

The results of the laboratory tests were reviewed along with the boring logs to develop the general soil properties of the subsurface materials that will be encountered in the excavations and provide the foundation for the landfill. As shown on the cross-sections in Appendix E3 of this attachment, the excavation will encounter clayey material. Average properties of soil included in each stratum are summarized in the table below.

Average Properties of On-Site Materials

Stratum	Material Classification	Liquid Limit %	Plasticity Index %	Passing #200 %	Moisture Content %	Unit Dry Weight (lb/ft)	Lab Permeability (cm/sec[2])
I	CH	58	36	75	22.4	100.4	3.84×10^{-8}
II	SC/SM	NP	NP	20	16.2	112.5	---
III	CL	49	27	86	23.2	103.0	9.00×10^{-8}

[1]Refer to laboratory test summary in Appendix E5 for source data.

[2]Average lab permeability calculated based on arithmetic mean.

The geotechnical design calculations that are presented in Part III, Attachment D5, show that the in-situ soils will provide adequate support for the proposed landfill. Total settlement beneath the liner system should be less than 6 inches and differential settlement should not exceed 4 inches, which is well within the strain tolerance of the proposed liner system. The factors of safety against slope failure exceeded the recommended factors of safety for all conditions that were analyzed.

5.3 Material Requirements

Onsite soils will be required for construction of the soil liner and protective cover components of the liner system, and the infiltration layer and erosion layer components of the final cover system. Onsite soils will also be required for operational cover (daily and intermediate) and general earthfill. Typical material requirements for the various landfill components are summarized in the table at the end of this section.

The soil liner and final cover infiltration layer must be constructed from soils that can be compacted to form a low hydraulic conductivity barrier. The classification and hydraulic conductivity test results indicate that the clayey soils excavated from Stratum I and III at the site should be satisfactory for use as compacted soil liner and infiltration layer material. Protective cover and the erosion layer soils should not contain large rocks or boulders.

Operational cover soils shall not have been previously mixed with waste materials, and erosion layer material shall be capable of sustaining vegetation. The test results and boring logs indicate that any of the soil material excavated from the site should be suitable

for use as operational and protective cover, and that the surface soils should be suitable for use as the upper layer of the final cover system erosion layer.

General earthfill will be used to construct the site roads and embankments. The classification test results indicate that the onsite soils are suitable for use as structural fill material.

Typical Soil Requirements for Landfill Construction

Landfill Component	Classification	LL	PI	% - 200	Hydraulic Conductivity cm/sec	Material Source
Soil Liner	SC, CL, CH, MH	30 min	15 min	30 min	1×10^{-7} max	On-site
Infiltration Layer	SC, CL, CH, MH	30 min	15 min	30 min	1×10^{-7} max	
Protective Cover	SP, SW, SM, SC, CL, CH, ML, MH	No large rocks				
Erosion Layer	SC, CL, CH, SM, ML, CL-ML	30 min	15 min	30 min	NA	
Operational Cover (Daily Cover, Intermediate Cover)	SP, SC, CL, CH, CL-ML, MH, ML	Not mixed with waste				
General Fill	SC, CL, CH, ML, CL-ML, MH	NA	5 min	15 min	NA	

5.4 Groundwater Occurrence

5.4.1 Groundwater Observation Points – Piezometers/Monitoring Wells

Data from a total of 21 piezometers and 39 monitoring wells were used to characterize site hydrogeology. Details of monitoring wells and piezometers are provided in the Monitoring Well and Piezometer Details table. Groundwater elevation levels for the site's monitoring wells are summarized in Appendix E6. Groundwater elevation levels from the historical and existing piezometers are also included in Appendix E6.

Piezometer locations are shown on Drawing E2.2. Proposed monitoring well details are provided in Attachment F.

Monitoring Well and Piezometer Details

Well No.	Date Installed	Total Depth (ft)	Surface Elevation (ft/msl)	Top of Casing Elevation (ft/msl)	Filter Pack Elevation (ft/msl)	Screen Elevation (ft/msl)	Layer Screened
Monitoring Wells							
MW-1	8/12/04	32.0	765.00	767.85	746.50 - 733.50	743.50 - 733.50	Layer II & III
MW-2	8/31/04	22.5	760.21	760.87	746.21 - 738.21	743.21 - 738.21	Layer II & III
MW-3	8/26/04	26.5	749.36	749.97	731.36 - 723.36	728.36 - 723.36	Layer II & III
MW-4	8/12/04	18.5	739.61	742.34	729.61 - 721.61	726.61 - 721.61	Layer II & III
MW-5	8/17/04	12.5	728.60	731.01	723.54 - 717.54	722.54 - 717.54	Layer II & III
MW-6	8/17/04	32.5	744.65	747.44	725.65 - 712.64	722.65 - 712.65	Layer II & III
MW-7	8/17/04	32.9	746.84	749.14	723.00 - 715.00	720.00 - 715.00	Layer II & III
MW-12	8/25/04	20.5	758.36	760.32	752.71 - 739.71	749.71 - 739.71	Layer II & III
MW-13	8/26/04	89.5	729.54	732.02	653.54 - 640.54	650.54 - 640.54	Layer V
MW-14	8/24/04	107.5	744.65	747.30	650.65 - 637.65	647.65 - 637.65	Layer V
MW-15	8/29/04	114.5	747.37	749.63	646.37 - 633.37	643.37 - 633.37	Layer V
MW-16	8/14/04	106.0	742.12	744.96	649.62 - 636.62	646.62 - 636.62	Layer V
MW-17	8/12/04	32.0	749.76	752.16	629.76 - 616.76	626.76 - 616.76	Layer V
MW-18	8/13/04	130.5	747.85	750.38	630.85 - 617.85	627.85 - 617.85	Layer V
MW-19	8/12/22	32.0	749.30	752.18	642.30 - 629.30	639.30 - 629.30	Layer V
MW-26	8/26/22	90.5	759.76	762.20	682.76 - 669.76	679.76 - 669.76	Layer V
Piezometers							
L35(S)	4/4/00	25.0	765.6	768.62	748.8 - 740.6	746.7 - 741.7	Layer II
L35(D)	4/13/00	96.0	765.3	768.24	678.6 - 669.3	675.3 - 670.3	Layer V
P10	4/19/00	109.0	766.3	765.70	666.5 - 657.3	663.3 - 658.3	Layer V
P20(S)	4/4/00	46.0	761.9	764.73	729.9 - 715.9	726.9 - 716.9	Layer III
P20(D)	4/11/00	99.0	761.8	764.78	680.2 - 662.8	675.8 - 665.8	Layer V
U30	4/4/00	45.0	757.9	760.94	726.9 - 712.9	723.1 - 713.1	Layer III
Z20	4/12/00	113.5	763.7	766.47	658.7 - 650.2	655.7 - 650.7	Layer V
EE15	4/17/00	122.0	762.8	765.73	665.3 - 640.8	656.6 - 641.6	Layer V
EE25	4/14/00	117.0	453.0	756.01	655.3 - 636.0	648.0 - 637.0	Layer V
EE35(S)	4/5/00	21.0	737.3	740.19	725.3 - 713.3	722.3 - 713.7	Layer II & III
EE35(D)	4/10/00	101.0	737.2	740.10	650.2 - 636.2	647.2 - 637.2	Layer V
JJ10(S)	4/3/00	41.5	764.4	767.18	737.7 - 723.9	734.4 - 724.4	Layer II
JJ10(D)	4/18/00	119.0	764.6	767.60	659.7 - 645.9	656.6 - 645.6	Layer V
OO15	4/20/00	112.0	748.6	751.40	651.3 - 636.6	647.6 - 637.6	Layer V

Monitoring Well and Piezometer Details (continued)

Well No.	Date Installed	Total Depth (ft)	Surface Elevation (ft/msl)	Top of Casing Elevation (ft/msl)	Filter Pack Elevation (ft/msl)	Screen Elevation (ft/msl)	Layer Screened
Piezometers (continued)							
TT10	4/20/00	105.0	745.2	748.14	654.2 - 640.2	651.2 - 641.2	Layer V
TT20	4/5/00	51.0	742.9	745.85	706.1 - 691.9	702.9 - 692.9	Layer III
TT30	4/5/00	47.0	747.2	750.23	715.1 - 700.2	712.2 - 702.2	Layer II & III
YY25	4/7/00	137.0	749.1	751.97	627.1 - 612.1	624.1 - 614.4	Layer V
YY35	4/6/00	120.0	746.8	749.56	634.8 - 626.8	631.8 - 626.8	Layer V
P-1S	3/28/22	38.0	774.3	777.20	748.8 - 736.3	746.8 - 736.8	Layer II
P-1D	3/25/22	146.0	774.3	777.31	646.8 - 628.8	644.3 - 629.3	Layer V
P-4D	3/28/22	125.0	775.2	777.85	664.2 - 650.7	661.2 - 651.2	Layer V
P-6S	3/28/22	30.5	755.9	758.40	738.9 - 725.4	735.9 - 725.9	Layer III
P-6D	3/28/22	112.0	755.6	758.15	658.6 - 644.1	654.6 - 644.6	Layer V
P-7D	3/28/22	114.0	754.8	757.46	648.3 - 640.3	646.3 - 641.3	Layer V
P-8S	3/28/22	37.5	738.9	741.54	708.9 - 701.4	706.9 - 701.9	Layer II & III
P-8D	3/28/22	124.0	738.6	741.23	633.6 - 619.1	629.6 - 619.6	Layer V
P-10S	3/28/22	46.0	732.1	734.85	701.6 - 686.6	697.1 - 687.1	Layer III
P-10D	3/28/22	115.0	732.8	735.75	631.8 - 617.8	628.8 - 618.3	Layer V
P-12S	3/28/22	34.5	734.1	736.80	708.1 - 700.6	706.1 - 701.1	Layer II & III
P-12D	3/28/22	121.0	734.1	736.47	628.1 - 614.6	625.1 - 615.1	Layer V
P-13S	3/28/22	38.0	730.5	733.24	705.5 - 693.0	703.5 - 693.5	Layer II & III
P-13D	3/28/22	119.5	730.4	732.86	620.9 - 611.9	612.4 - 617.4	Layer V
P-16S	11/21/23	41	746.33	749.06	711.3 - 705.3	713.3 - 705.3	Layer II & III
P-16D	11/21/23	103	746.33	749.06	657.33 - 643.33	654.33 - 644.33	Layer V
P-17S	11/21/23	50.5	746.15	748.46	720.15 - 695.65	716.16 - 696.15	Layer II & III
P-18D	11/21/23	81	724.6	727.4	662.6 - 643.6	659.6 - 644.6	Layer V
P-20S	11/21/23	44	754.27	756.98	723.27 - 710.27	721.27 - 711.27	Layer II & III
P-20D	11/21/23	111	754.45	756.99	661.99 - 643.99	658.95 - 643.45	Layer V

5.4.2 Water Level Measurements

Water levels at the site have been measured from 1997 to present in site monitoring wells and piezometers. This data is included in Appendix E6. Measurements of water levels were made to 0.01 foot using an electronic water level indicator. Water level elevations were calculated using measured water levels and surveyed well elevations (top of casing).

Borehole water level data are noted on the logs when present. However, because the borings were drilled with water, it was not generally possible to distinguish between drilling water and formation water. Borehole fluid level data were not used in engineering calculations because the piezometers were properly constructed and screened to provide

water level data on individual strata; these data are much more reliable than borehole data.

5.4.3 Piezometer Installations and Water Level Data

Nineteen piezometers were installed in adjacent borings during the 2000 Biggs and Mathews Environmental investigation. These piezometers are tabulated in the Historical Borings table. Piezometer construction details are tabulated in the Monitoring Well and Piezometer Details table. The logs for these piezometers are included in Appendix E2. Water level data from these piezometers are included in Appendix E6. These historic piezometers no longer remain at the facility. All were previously plugged and abandoned in accordance with appropriate regulations in effect at that time.

As a part of the subsurface investigation for this permit amendment, fourteen piezometers were installed in 2022 and an additional six piezometers were installed in 2023. These piezometers are tabulated in the Historical Borings table. Piezometer construction details are tabulated in the Monitoring Well and Piezometer Details table. The logs for theses piezometers are included in Appendix E2. Water level data obtained from these piezometers are included in Appendix E6.

5.4.4 Monitoring Well Installation and Water Level Data

Sixteen monitoring wells were installed as the groundwater monitoring network in accordance with the approved Permit No. 2290 in 2004. These monitoring wells are tabulated in the Historic Borings table. Monitoring well construction details are tabulated in the Monitoring Well and Piezometer Details table. Logs for the monitoring wells are included in Appendix E2. Water level elevation data for the monitoring wells is included in Appendix E6.

5.5 Groundwater Monitoring Historical Analytical Data

A tabulation of historic groundwater chemistry results is provided in Appendix E7. The history of the groundwater monitoring program at the site is discussed in Attachment F.

5.6 Hydrogeologic Units

5.6.1 Layer II / Layer III Shaly Sandstone and Shale with Sand

Groundwater is contained in the Layer II shaly sandstone and the Layer III shale with sand. Groundwater enters Layer II at its outcrop on the western part of the TASWA DRF property and flows to the northeast. Potentiometric surface maps of Layer II/III are included in Appendix E6. In addition to the recharge to Layer II and III from infiltration on their surface outcrops, infiltration from the surface may penetrate Layer I in localized areas where Layer I does not contain lower permeability material. Layer III contains shale with sand. Layer III generally contains more sand near the top of the layer. The amount of sand grades generally downward toward its base as it transitions into the Layer IV shale. Groundwater found in the upper parts of Layer III is apparently in direct communication with groundwater in Layer II and acts as one hydrogeologic unit. Groundwater would move preferentially in a lateral direction in the Layer II material since it is significantly more permeable than Layer III. Groundwater flow velocity in Layer II is estimated to be approximately 24 feet per year.

5.6.2 Layer IV Shale

Layer IV consists of dark gray, dense shale, and ranges from 26 to 79 feet thick across the site. The lithologic and hydrogeologic characteristics of this unit indicate that it serves as the lower confining unit to the groundwater in Layers II/III and the upper confining unit to the underlying sandstone aquifer in Layer V. Groundwater levels in the shallow Layers II/III generally range from elevation 763 ft/msl to approximately 717 ft/msl. Groundwater levels in the deeper Layer V sandstone range from 691 ft/msl to about 655 ft/msl across the site indicating that Layer II/III is a separate hydrogeologic unit from Layer V.

5.6.3 Layer V Sandstone

Groundwater enters the Layer V sandstone at its outcrop west of the site. The groundwater moves downdip, generally to the east. Potentiometric surface maps of Layer V are included in Appendix E6. Groundwater is confined in Layer V by the overlying Layer IV shale and the underlying Layer VI shale. Slug tests as discussed in Section 5.7 of this attachment were conducted in the piezometers, which were screened in Layer V. The geometric mean of hydraulic conductivity values (K) calculated from the Layer V slug tests is 1.22×10^{-4} cm/sec. The estimated groundwater flow velocity in Layer V is approximately 13 feet per year.

5.6.4 Layer VI Shale and Shale with Sand

Layer VI consists of a dark gray, dense shale similar to Layer IV. The shale in Layer VI contains thins seams of sand near the top and grades to a dense shale with depth. An average of approximately 14 feet and a maximum of 43 feet of this shale was penetrated by site borings. This shale serves as the aquiclude unit to the Layer V aquifer sand.

5.7 Field Permeability (Slug) Tests & Hydraulic Conductivity

Slug tests were performed May 4 through 12, 2000, and August 19, 2022. The test results are summarized in the Hydraulic Conductivity Values table. Graphs of slug test data are presented in Appendix E6. All slug test locations are shown on Drawing E6.3.

Slug tests were conducted by measuring the rising head or falling head of water levels with time following removal of a water column using a bailer or addition of a slug displacing a water volume. At each piezometer, a depth to static water level was measured to the nearest 0.01-foot prior to testing. A pressure transducer probe was placed near the base of the well to record initial water column heights and changes in water column heights as water levels fell or rose to static water levels. Data were recorded using a Hermit 3000 Datalogger.

Hydraulic conductivity values were calculated using the Bouwer-Rice method. Calculated values for the four test results for Layer II (uppermost groundwater zone) range from 9.44×10^{-4} to 6.28×10^{-5} centimeters per second (cm/sec) and have a geometric mean of 3.16×10^{-4} cm/sec. The calculated value for the Layer III zone (one test result) is 2.17×10^{-7} cm/sec. Calculated values for the eight tests results for Layer V (lowermost groundwater zone) range from 5.75×10^{-4} cm/sec to 5.08×10^{-6} cm/sec, with a geometric mean of 1.22×10^{-4} cm/sec.

Hydraulic Conductivity Values

Piezometer No.	Layer Screened	Lithology Screened	Hydraulic Conductivity
L35(S)	II	Shaly Sand	2.79×10^{-4} cm/sec
EE35(S)	II	Sandstone and Shale w/ Sand	6.01×10^{-4} cm/sec
JJ10(S)	II	Shaly Sand and Shale	9.44×10^{-4} cm/sec
TT30	II	Sandstone and Shale w/ Sand	6.28×10^{-5} cm/sec
P(20)S	III	Shale w/ Sand	2.17×10^{-7} cm/sec
L35(D)	V	Shaly Sand and Shale w/ Sand	1.77×10^{-4} cm/sec
EE35(D)	V	Shaly Sand and Shale w/ Sand	1.62×10^{-4} cm/sec
JJ10(D)	V	Shaly Sand	6.69×10^{-5} cm/sec
YY35	V	Sandstone and Shale w/ Sand	5.75×10^{-4} cm/sec
P20(D)	V	Sandstone and Shale w/ Sand	1.11×10^{-4} cm/sec
P-6(D)	V	Shale and Sandstone	5.08×10^{-6} cm/sec*
P-8(D)	V	Siltstone, Sandstone, Shale w/ Sand	1.92×10^{-4} cm/sec*
P-10(D)	V	Sandstone, Siltstone, and Shale	4.22×10^{-4} cm/sec*
Calculated Hydraulic Conductivity Values			
Geometric Mean	II	Uppermost Groundwater Zone	3.16×10^{-4} cm/sec
Geometric Mean	V	Lowermost Groundwater Zone	1.22×10^{-4} cm/sec

*Values were calculated using the equation: $K = (K_{RH}K_{FH})^{1/2}$, where RH is the rising head value and FH is the falling head value. This equation provides the "best" hydraulic conductivity estimate based on the two values which can vary by up to a factor of 100 (Nielsen, 1991). Individual RH and FH values for P-6(D), P8(D), and P-10(D) can be found in Appendix E6, pages E6-4k through E6-4p.

5.8 Groundwater Flow Direction and Rate

Groundwater flow velocities for the Layer II/III groundwater zone and the Layer V uppermost aquifer were estimated using hydraulic conductivity values calculated from slug tests, hydraulic gradients estimated from potentiometric surface maps for Layer II/III and Layer V, and an estimated net porosity for the lithologic materials represented in the geologic units. Groundwater in the Layer II/III groundwater zone is estimated to flow to the east-northeast at approximately 24 feet per year. Groundwater in the Layer V uppermost aquifer is estimated to flow to the east-northeast at approximately 13 feet per year. The groundwater velocity parameters and calculations are shown on Drawing E6.5.

6 ARID EXEMPTION

30 TAC §330.63(e)(6)

This applicant is not seeking an arid exemption for the landfill unit; therefore, 30 TAC §330.63(e)(6) is not applicable to this application.

7 REFERENCES

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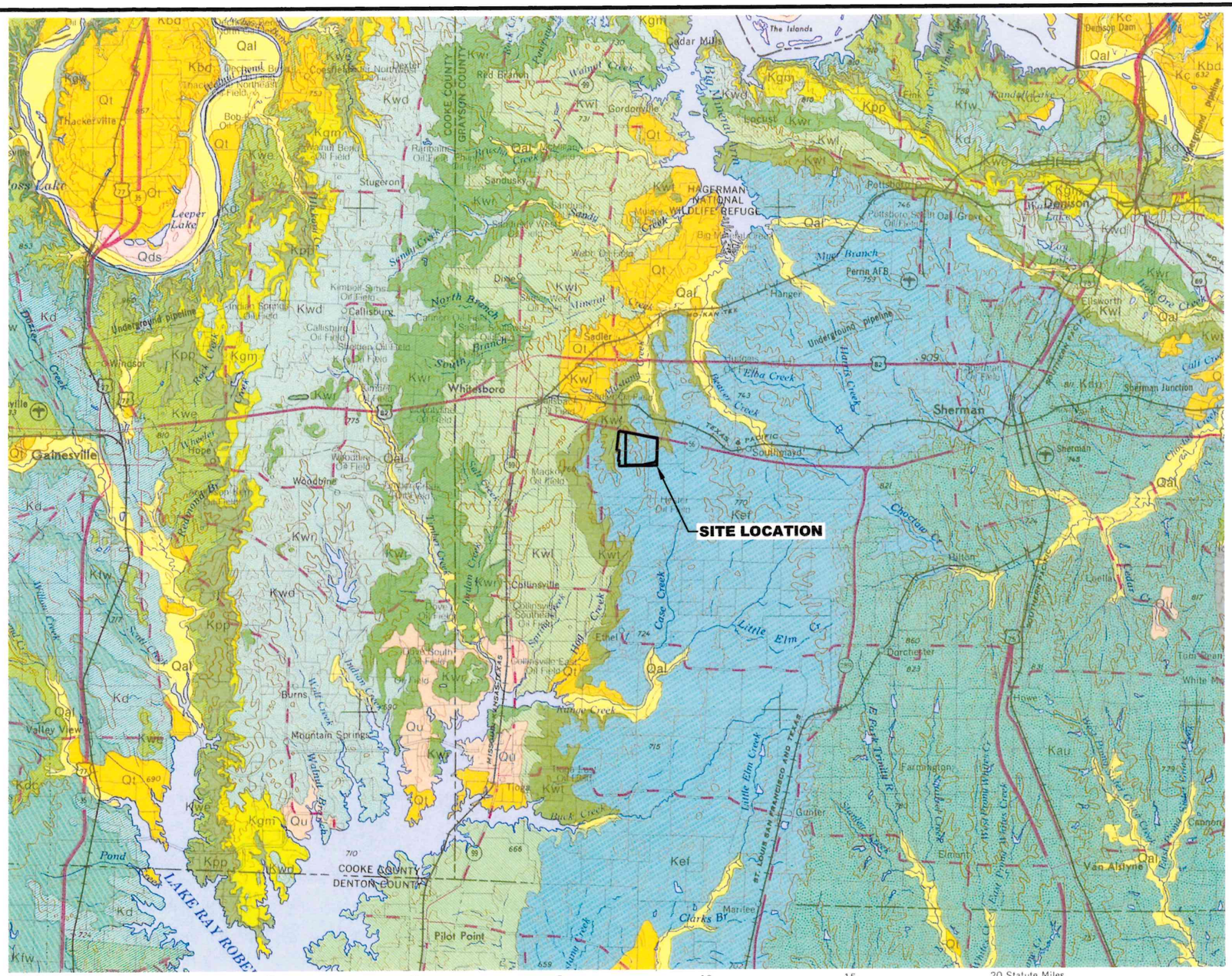
APPENDIX E1

REGIONAL GEOLOGIC/HYDROGEOLOGIC DATA

Regional Geologic Map	E1.1
Regional Cross Section	E1.2
Potentiometric Surface Woodbine Aquifer	E1.3
Potentiometric Surface Antlers & Twin Mountain Aquifers	E1.4
Water Well Location Map	E1.5



GEOLOGIC ATLAS OF TEXAS, SHERMAN SHEET

WALTER SCOTT ADKINS MEMORIAL EDITION

REVISED 1991

QUATERNARY

Pleistocene Holocene

Qal | Qds | Os | Qu | Qt

Alluvium, Qal, windblown deposits, Qds and Qs, fluviatile terrace deposits, Qt, and surficial deposits undivided, Qu

CRETACEOUS

Upper Cretaceous

Kau | Kgc | Kr | Kbr | Kbl | Kbn | Ker

Austin Group, Kau, Roxton Limestone, Kr, Gober Chalk, Kg, Brownstown Marl, Kbr, Blossom Sand, Kbl, Bonham Marl, Kbn, and Ector Chalk, Ker

Kef

Eagle Ford Formation

Kwb | Kwt | Kwl | Kwr | Kwd

Woodbine Formation, Kwb, and Templeton, Kwt, Lewisville, Kwl, Red Branch, Kwr, and Dexter, Kwd, Members of the Woodbine Formation

Kgm | Kgb | Kb

Grayson Marl and Main Street Limestone, Kgm, Grayson Marl and Bennington Limestone, Kgb, and Bennington Limestone, Kb

Lower Cretaceous

Kbp | Kpp | Kwe | Kpd | Kbd | Kd

Pawpaw Formation, Kpp, Weno Limestone, Kwe, and Denton Clay, Kd, each composing members of the Bokchito Formation in Oklahoma, and undivided in Texas, Kpd

Kfd | Kfw | Kdc | Kc

Fort Worth Limestone, Kfw, and Duck Creek Formation, Kdc, composing Caddo Formation, Kc, in Oklahoma

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

REGIONAL GEOLOGIC MAP

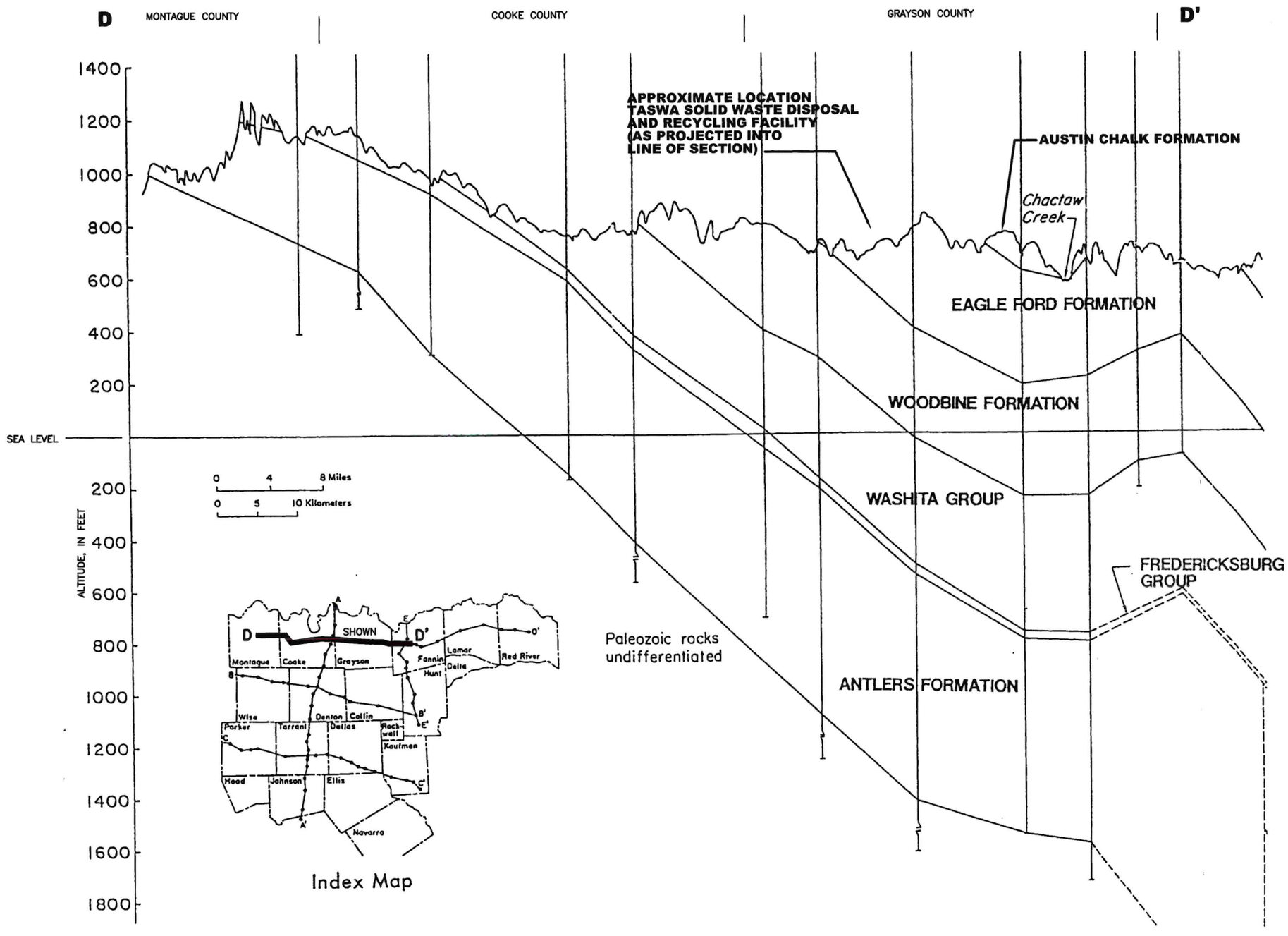
TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E1.1

O:\TASWA\P\Drawings\ATT E\E1-1_RegGeoMap.dwg Layout: E1-1 User: awhite



MODIFIED FROM NORDSTROM, 1982

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REGIONAL CROSS SECTION

TEXOMA AREA SOLID WASTE AUTHORITY
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817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E1.2

ISSUED FOR PERMITTING PURPOSES ONLY

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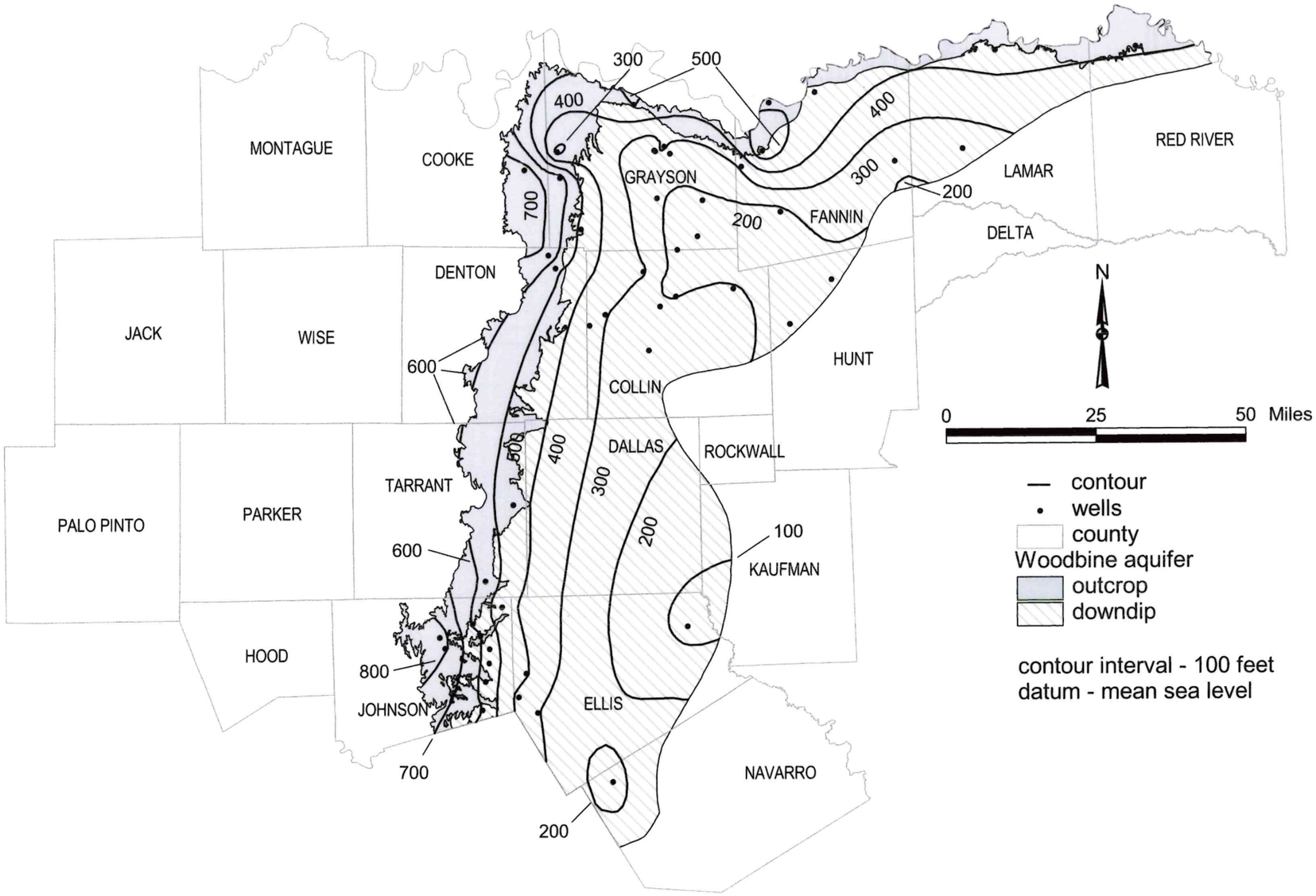

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POTENTIOMETRIC SURFACE WOODBINE AQUIFER

TEXOMA AREA SOLID WASTE AUTHORITY TASWA DRF PERMIT AMENDMENT

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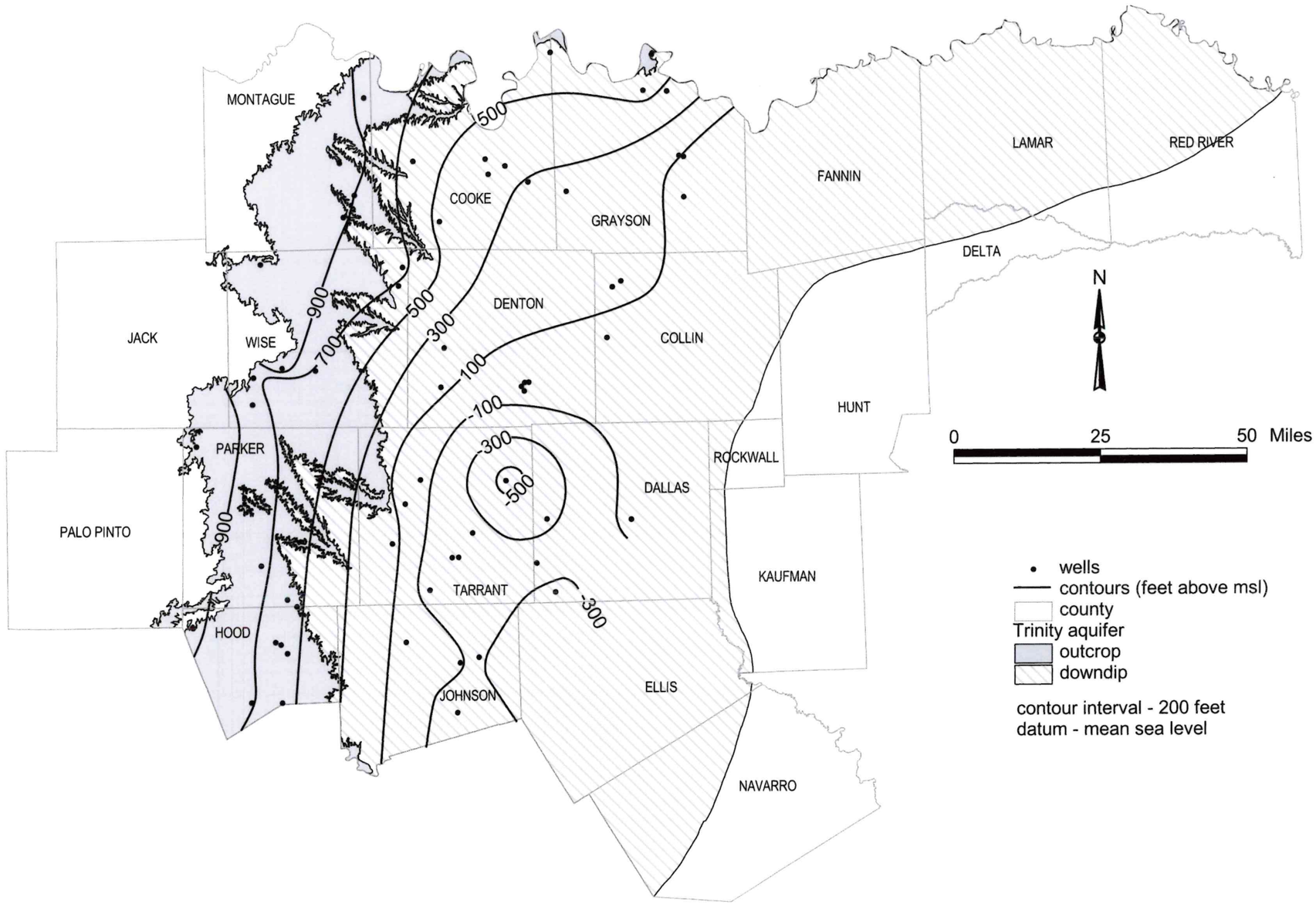
MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING E1.3

ISSUED FOR PERMITTING PURPOSES ONLY

O:\TASWA\P\Drawings\ATT E\E1-3_Woodbine.dwg Layout: Layout1 User: awhite



- wells
- contours (feet above msl)
- county

Trinity aquifer
- outcrop
- downdip

contour interval - 200 feet
datum - mean sea level

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MODIFIED FROM LANGLEY, 1999.

POTENTIOMETRIC SURFACE ANTLERS & TWIN MOUNTAIN AQUIFERS

TEXOMA AREA SOLID WASTE AUTHORITY TASWA DRF PERMIT AMENDMENT

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817-563-1144
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TBPG FIRM NO. 50222

DRAWING
E1.4

ISSUED FOR PERMITTING PURPOSES ONLY

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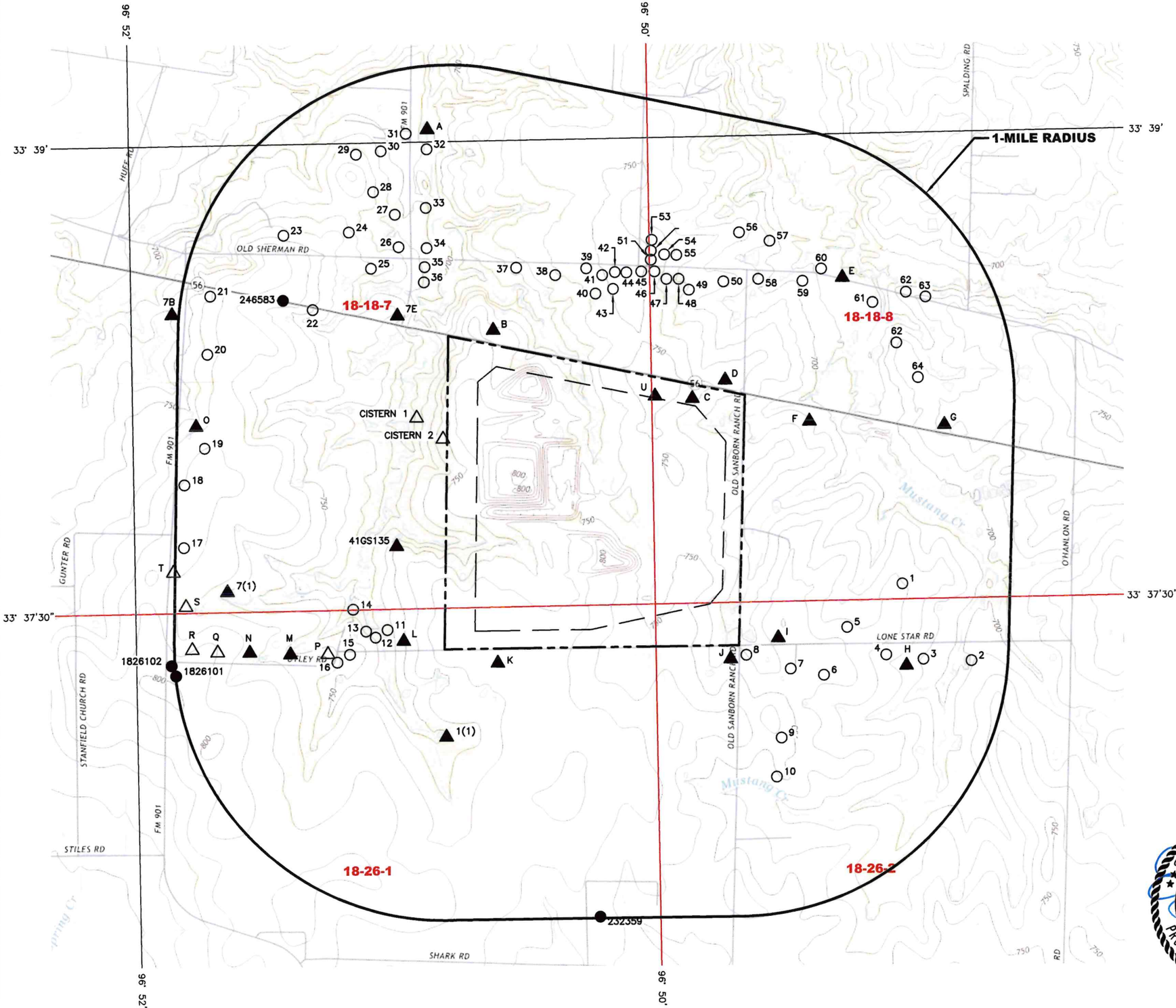

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- 700 EXISTING 10' GROUND CONTOUR
- SURFACE WATER BODY OR OTHER WATER
- WATER WELL ID GRID
- 18-18-7 WATER WELL GRID NUMBER
- ▲ HISTORICAL WATER WELL
- △ HISTORICAL POSSIBLE WATER WELL
- ● 2024 WATER WELL
- ○ 2024 POSSIBLE WATER WELL

SADLER, TEX 2022

ETHEL, TEX 2022

ROAD CLASSIFICATION

- Expressway
- Secondary Hwy
- Ramp
- Local Connector
- Local Road
- 4WD
- Interstate Route
- US Route
- State Route

NOTES:

1. 7.5 MINUTE TOPOGRAPHIC BASE MAPS SADLER, TEX AND ETHEL, TEX DOWNLOADED FROM USGS WEBSITE ON MARCH 25, 2024.
2. WATER WELLS IDENTIFIED FROM ONLINE STATE RECORDS.

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2/26/2025

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WATER WELL LOCATION MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

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TBPG FIRM NO. 50222

DRAWING
E1.5

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APPENDIX E2

SITE EXPLORATION DATA

Boring Plan Approval Letter 2022	E2.1 through E2.1a
Boring Plan Approval Letter 2023	E2.2 through E2.2a
Boring, Piezometer, and Monitoring Well Location Map	E2.3
General Notes Supplementing Boring Logs	E2.4
Logs of Borings, Piezometers, and Monitoring Wells	E2.5 through E2.244
Monitoring Well Data Sheets	E2.245 through E2.260
State Well Reports	E2.261 through E2.336

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 18, 2022

Mr. John O'Steen
Executive Director
Texoma Area Solid Waste Authority
25090 Highway 56
Whitesboro, Texas 76273

Subject: TASWA Solid Waste Disposal and Recycling Facility - Grayson County
Municipal Solid Waste - Permit No. 2290
Proposed Site Investigation - Revised Soil Boring Plan
Tracking Nos. 27022332/27059051/27182103/27298913;
RN100629922/CN600339428

Dear Mr. O'Steen:

On February 16, 2022, we received revisions to the soil boring plan (SBP), for a proposed expansion of the referenced MSW Type 1 landfill facility, in response to our letter dated February 11, 2022. The original SBP and revisions were submitted on your behalf by Ms. Beth Floyd, P.G. of Biggs & Mathews of Mansfield, Texas. Our review of the revised plan indicates that it complies with the MSW regulations. This letter constitutes approval of your plan.

The SBP proposes 26 borings in an approximately 216-acre project area of which approximately 155 acres is being considered for waste footprint. All of the borings will be drilled to an elevation of 655 feet above sea level or deeper, corresponding to depths at least 5 feet below the elevation of the deepest excavation (EDE, proposed at 660 feet above sea level). Twenty borings will be drilled to an elevation of 630 feet above sea level or deeper, corresponding to depths at least 30 feet below the EDE.

Please be advised that under Title 30 Texas Administrative Code, Chapter 330, Section 330.63(e)(4)(B), the uppermost aquifer and any hydraulically interconnected aquifers below the site must be identified, as well as the underlying confining unit. It is anticipated that this SBP, when implemented, will accurately characterize the in-situ geologic, hydrologic, and engineering properties of the surface and subsurface strata at this site. Although this plan appears to comply with the MSW regulations concerning site investigations, additional soil borings and piezometers could be required should the data generated by this SBP prove to be inconclusive.

If you find it necessary to modify this approved plan, another plan detailing any proposed modifications must be submitted for approval before implementation of the modifications.

If you have questions regarding this letter, please contact me by telephone at (512) 239-1270 or by email at [redacted] or in writing at the address on our letterhead (please include mail code MC 124 on the first line of our address).

Sincerely,

Eric Clegg, P.G., Project Manager
Municipal Solid Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality

EJC/nck

cc: Ms. Beth Floyd, P.G., Biggs & Mathews, Mansfield

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Kelly Keel, *Interim Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 25, 2023

Mr. John O'Steen
Executive Director
Texoma Area Solid Waste Authority
25090 State Highway 56
Whitesboro, Texas 76273

Via email

Subject: TASWA Disposal and Recycling Facility - Grayson County
Municipal Solid Waste - Permit No. 2290
Proposed Site Investigation - Revised Soil Boring Plan
Tracking No. 29149938; RN100629922/CN600339428

Dear Mr. O'Steen:

We received a revised soil boring plan (SBP) dated September 27, 2023, for a proposed expansion of the above-referenced MSW Type I landfill facility. The revised SBP updates the previously approved 26 borings mentioned in the TCEQ letter of February 18, 2022. In preparation for further expansion towards northern area of the permit, a total of 32 soil borings are now proposed.

In response to the TCEQ letter dated October 11, 2023, revisions were received on October 18, 2023. The SBP and the revision was submitted on your behalf by Elizabeth Floyd, P.G., from Biggs and Mathews Environmental, Mansfield, Texas. Our review of the revised plan indicates that it complies with the MSW regulations. This letter constitutes approval of your plan.

The SBP proposes 32 borings in an approximately 338.1-acre project area of which approximately 272.7 acres are being considered for waste footprint. According to the SBP, all borings will be drilled to an elevation of 655 feet above sea level, corresponding to depths at least 5 feet below the elevation of the deepest excavation (EDE), which is proposed at 660 feet above sea level. Twenty-Seven borings will be drilled to elevation of 630 feet above mean sea level, or deeper, corresponding to depths greater than 30 feet below the elevation of the deepest excavation (EDE, estimated at 660 feet above sea level).

Please be advised that under Title 30 Texas Administrative Code, Chapter 330, Section 330.63(e)(4)(B), the uppermost aquifer and any hydraulically interconnected aquifers below the site must be identified, as well as the underlying confining unit. It is anticipated that this SBP, when implemented, will accurately characterize the in-situ geologic, hydrologic, and engineering properties of the surface and subsurface strata at this site. Although this plan appears to comply with the MSW regulations concerning site investigations, additional soil borings and piezometers could be required if the data generated by this SBP are inconclusive.

If you find it necessary to modify this approved plan, another plan detailing any proposed modifications must be submitted for approval before implementation of the modifications.

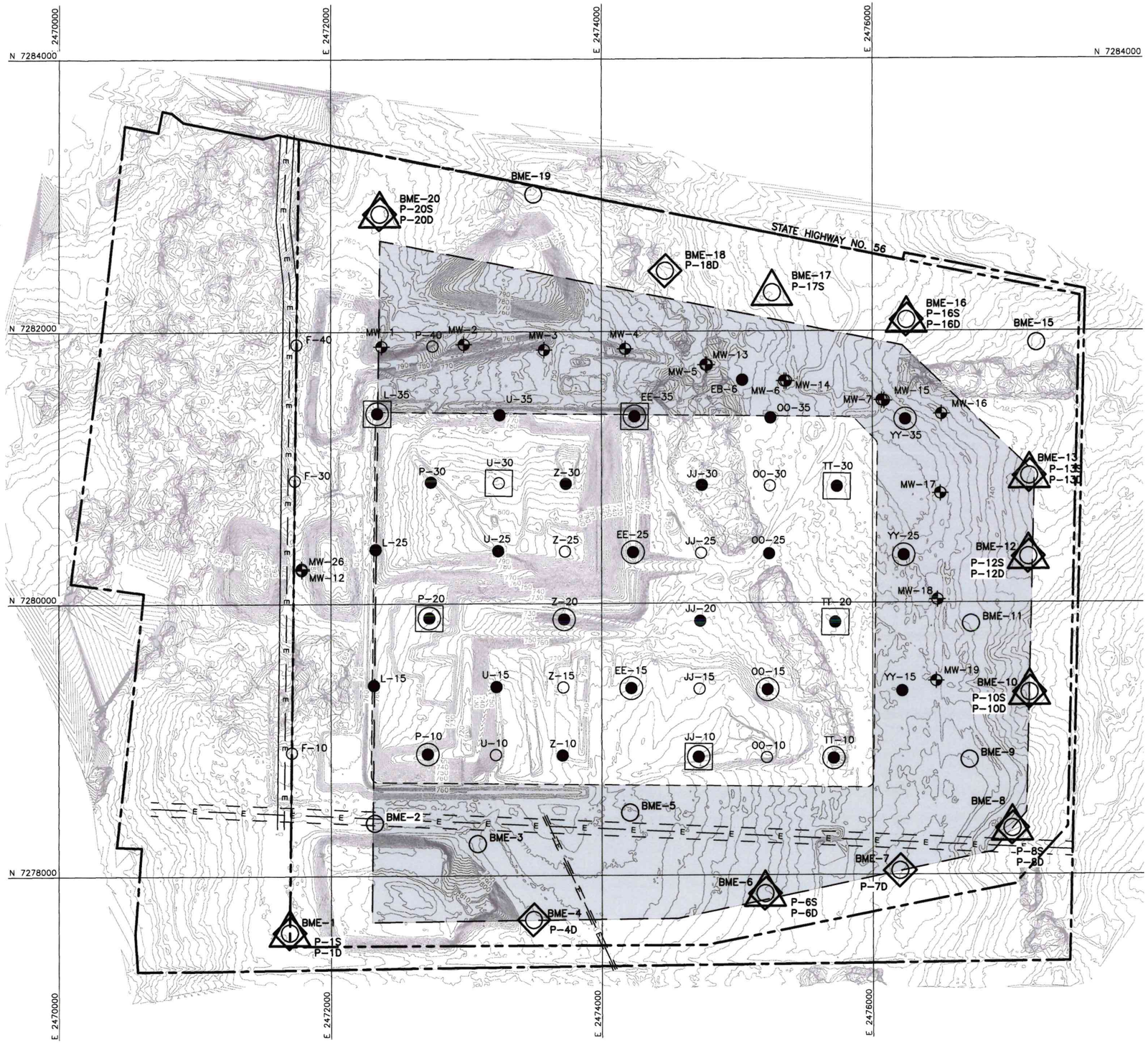
If you have questions regarding this letter, please contact me by telephone at (512) 239-0554, or [redacted] When addressing written correspondence, please use mail code MC 124.

Sincerely,

Henok Tewelde, P.G.
Municipal Solid Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality

HT/tw

cc: Ms. Elizabeth Floyd, Biggs & Mathews Environmental, Inc, Mansfield



0 400 800
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- 750 EXISTING CONTOUR
- E E ELECTRIC LINE AND EASEMENT
- N 7279000 STATE PLANE COORDINATES
- JJ-30 HISTORICAL BORINGS > 30' BELOW EDE
- Z-25 HISTORICAL BORINGS > 5' BELOW EDE
- WOODBINE PIEZOMETERS
- SHALE PIEZOMETERS
- MW-1 EXISTING MONITORING WELL
- BME-3 NEW BORING > 30' BELOW EDE
- P-10D NEW LAYER V PIEZOMETER
- P-10S NEW LAYER II/III PIEZOMETER
- EXPANSION AREA

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST
2/25/2026

ISSUED FOR PERMITTING PURPOSES ONLY

BORING, PIEZOMETER, & MONITORING WELL LOCATION MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

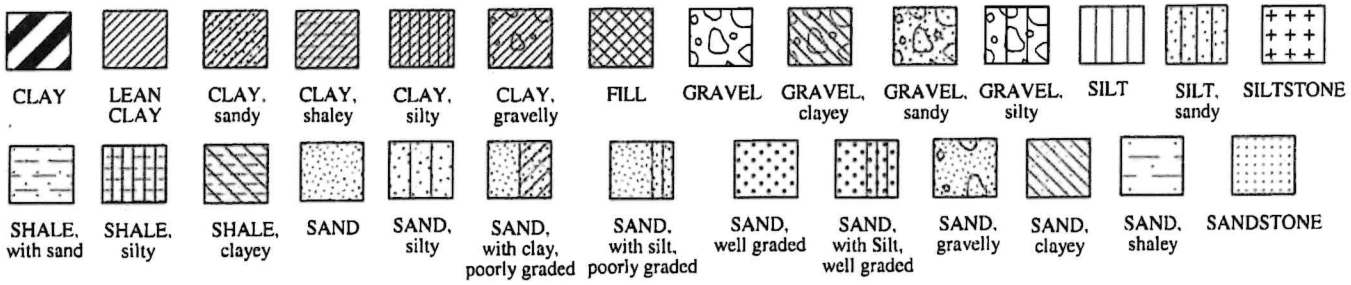
BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E2.3

O:\TASWA\P\Drawings\ATT E\E2-3_MWLocMap.dwg Layout: Layout1 User: awhite

KEY TO SOIL CLASSIFICATION TERMS AND SYMBOLS

SOIL OR ROCK TYPES (shown in symbols column)



DRILLING AND SAMPLING SYMBOLS:

A	Auger Sample
C	Double Tube Core Barrel
D	Denison Sample
NR	No Recovery
S	Split Barrel Sampler - 2" O.D., unless otherwise noted Example: 25 = 25 blows/12" after 6" seating interval; 50/7 = 50 blows per 7" after 6" seating interval; REF = 50 blows <6"
T	THD Cone Penetrometer Example: T60 = 60 blows per 12" T4.5" = 100 blows per 4.5"
U	Thin-walled Tube - 3" O.D., unless otherwise noted
W	Wash Sample
PB	Pitcher Barrel

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Penetration Resistance Blows/foot	Relative Density
0 - 4	Very loose
4 - 10	Loose
10 - 30	Medium dense
30 - 50	Dense
Over 50	Very dense

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, tsf	Consistency
Less than 0.25	Very soft
0.25 to 0.50	Soft
0.50 to 1.00	Firm
1.00 to 2.00	Stiff
2.00 to 4.00	Very stiff
4.00 and higher	Hard

TERMS CHARACTERIZING SOIL STRUCTURE:

Slickensided:	Having inclined planes of weakness that are slick and glossy in appearance.
Fissured:	Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated:	Composed of thin layers of varying color and texture.
Interbedded:	Composed of alternate layers of different soil types.
Calcareous:	Containing appreciable quantities of calcium carbonate.
Well graded:	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Poorly graded:	Predominantly of one grain size, or having a range of sizes with some intermediate size missing.

DEGREE OF WEATHERING:

Unweathered:	Rock in its natural state before being exposed to atmospheric agents.
Slightly weathered:	Noted predominantly by color change with no disintegrated zones.
Weathered:	Complete color change with zones of slightly decomposed rock.
Severely weathered:	Complete color change with consistency, texture, and general appearance approaching soil.

SUBSURFACE CONDITIONS:

Soil and rock descriptions on the boring logs are a compilation of field data as well as from laboratory testing of samples on those strata for which laboratory classification test results are presented on the boring logs. These classifications are based only on the actual samples tested, and the classification is then assigned to the remainder of the stratum interval based on visual classification. If laboratory classification test results are not presented on the boring log for a particular stratum, then that stratum was classified by visual-manual procedures only. The stratification lines represent the approximate boundary between materials and the transition can be gradual.

Classification of soils based upon visual-manual procedures was performed in general accordance with ASTM Standard D 2488. Classification of soils based upon laboratory test results was performed in general accordance with ASTM Standard D 2487.

Water-level observations have been made in the borings at the times indicated. It must be noted that fluctuations in the groundwater level may occur due to variations in rainfall, hydraulic conductivity of soil strata, construction activity, and other factors.

ELEVATIONS:

Elevation of contact or bottom of borings/piezometers is shown on the right side of the material description column.

LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471694.021 N 7277584.316**

Surface El.: **774.40 ft. msl**
Completion Depth: 246.0 ft.
Date Boring Started: 1/10/2022
Date Boring Completed: 1/10/2022



Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, dark brown, with ferrous stains, calcareous nodules, rootlets	1.75	
	U2			1.5	
5	U3		- yellow-orange and light gray, iron stains, calcareous nodules, iron nodules	2.0	
	U4			3.5	
	U5			4	
10	U6		- with sand seams, with silty sand and clay partings	1.0	
			762.40		
	U7		Clay, sandy light gray and tan, w/ ferrous stains	4.5+	
15	U8				
	U9		756.40		
	U10		Clay, shaley, tan and light gray, ferrous stains, calcareous partings, jointed	4.5+	
20	U11			4.5+	
	U12			4.5+	
25	U13			4.5+	
	U14			4.5+	
			746.40		
	U15		Sand, shaley, gray, with silt	4.5+	
30	U16			4.5+	
	U17		- with shale, dark gray seams	4.5+	
			- with abundant ferrous stains	4.5+	
35	U18			4.5+	
	U19			4.5+	
			736.40		
	U20		Shale, with sand, gray, soft rock, carbonaceous, ferrous stains, glauconitic, gypsum, massive	4.5+	
40				4.5+	
45	C21				
50			724.40		

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-40' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-1

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2471694.021 N 7277584.316**

Surface El.: **774.40 ft. msl**
Completion Depth: 246.0 ft.
Date Boring Started: 1/10/2022
Date Boring Completed: 1/10/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
			Shale, dark gray, massive, carbonaceous, fossils		
55	C22				
60	C23		- dark gray, soft rock, carbonaceous, massive fossils, pyrite		
65			- dark gray,carbonaceous, massive fossils		
70	C24				
75					
80	C25		- with sand seams		
85			- with sand stone partings, with sand seams		
90	C26				
95			- with sand partings, with mudstone partings		
100	C27				

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-40' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471694.021 N 7277584.316**

Surface El.: **774.40 ft. msl**
Completion Depth: 246.0 ft.
Date Boring Started: 1/10/2022
Date Boring Completed: 1/10/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C27		Shale, dark gray, massive, carbonaceous, fossils *(continued)*		
110	C28				
115			- dark gray, fossils, cabonaceous, massive with pyrite		
120	C29		- with diagonal fractures - with sandstone partings		
125					
			645.40		
130	C30		Sand, with shale partings, gray to dark gray		
			641.40		
135			Shale, with sand, slightly cemented, dark gray, hard		
			634.40		
140	C31		Sand, trace cementation and unconsolidated sand		
			629.40		
145			Shale, sandy, dark gray, hard		
	C32				
150			624.40		

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-40' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. *In situ*, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471694.021 N 7277584.316**

Surface El.: **774.40 ft. msl**
Completion Depth: 246.0 ft.
Date Boring Started: 1/10/2022
Date Boring Completed: 1/10/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C32		Sand, trace cementation		
155			- with shale partings, cemented, dark gray to gray		
160	C33				
165			- (fell from barrel)		
	C34				
170					
175					
180					
185					
190					
195					
200					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-40' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-1

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471694.021 N 7277584.316**

Surface El.: **774.40 ft. msl**
Completion Depth: 246.0 ft.
Date Boring Started: 1/10/2022
Date Boring Completed: 1/10/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
205			Sand, trace cementation *(continued)*		
210					
215					
220					
225					
230					
235			538.40		
240			Shale, gray, hard to moderately hard		
245			528.40		
250					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-40' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-2

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2472286.017 N 7277899.448**

Surface El.: **770.80 ft. msl**
Completion Depth: 170.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	U1		Clay, dark brown to black, ferrous stains, with calcareous nodules, rootlets, firm	1.5	
	U2			4.0	
5	U3			2.0	
	U4		- brown to olive with gray, iron nodules	4.5	
	U5			4.5	
			760.80		
10	U6		Clay, shaley, yellow-orange and gray, iron stains, calcareous nodules, blocky	4.5+	
	U7			4.5+	
	U8			4.5+	
15	U9		- with cemented sandstone partings	4.5+	
	U10		- with sand seams	4.5+	
20	U11		- light gray and brown	4.5+	
	U12			4.5+	
	U13			4.5+	
25	U14		- with abundant ferrous staining, partings	4.5+	
	U15			4.5+	
30	U16			4.5+	
			739.80		
	U17		Shale, with sand, dark gray, with gypsum	4.5+	
	A18				
35					
	C19				
40					
45	C20				
			720.80		
50					

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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-2

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472286.017 N 7277899.448**

Surface El.: **770.80 ft. msl**
Completion Depth: 170.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C21		Shale, dark gray, soft rock, carbonaceous, massive, fossils, with gypsum - with sand seams		
60					
65	C22				
70					
75	C23				
80					
			688.80 Sandstone, light gray, moderately hard 687.30		
85	C24		Shale, dark gray, soft rock, carbonaceous, massive, fossils		
90			- with sand partings, clay stone seams (tan), sandstone partings		
95	C25				
100					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the introduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-2

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472286.017 N 7277899.448**

Surface El.: **770.80 ft. msl**
Completion Depth: 170.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C26		Shale, dark gray, soft rock, carbonaceous, massive, fossils *(continued)*		
			- with sand seams		
110					
115	C27		- sandstone seams		
120			- with sand, with fossils		
125	C28				
130					
			637.80		
135	C29		Shale, with sand, dark gray, with cemented sand, sandstone, and shale partings		
			630.80		
140			Sand, cemented sand, and sandstone		
145	C30				
			620.80		
150					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-2

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472286.017 N 7277899.448**

Surface El.: **770.80 ft. msl**
Completion Depth: 170.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
155	C31		Shale, with sand, dark gray, with cemented sand, sandstone, and shale partings		
160					
165	C32				
			600.80		
170					
175					
180					
185					
190					
195					
200					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-3

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2473078.199 N 7278234.081

Surface El.: 773.20 ft. msl
Completion Depth: 145.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/6/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	U1		Clay, dark gray and brown, with rootlets, calcareous nodules, ferrous nodules, firm	1.5	
	U2			1.5	
5	U3		- brown to olive, with ferrous stains, ferrous nodules, firm	2.5	
	U4		766.20	3.0	
	U5		Clay, shaley, yellowish-orange, light gray, ferrous stains, blocky, fossils, calcareous nodules	4.5	
10	U6			4.5	
	U7			4.5	
			- with slickened sides, sand seam	4.5	
15	U8			4.5	
	U9			4.5	
	U10			4.5+	
20	U11			4.5+	
	U12			4.5+	
25	U13		- with shale partings		
			747.20		
	U14		Shale, with sand, dark gray to olive, ferrous stains, carbonaceous, with pyrite, gypsum		
	A25				
30					
35	C26				
40					
45	C27				
50					

STATE OF TEXAS
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Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-3

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2473078.199 N 7278234.081**

Surface El.: **773.20 ft. msl**
Completion Depth: 145.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/6/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C28		Shale, with sand, dark gray to olive, ferrous stains, carbonaceous, with pyrite, gypsum *(continued)* - with mudstone partings		
60			713.20 Shale, dark gray, soft rock, carbonaceous, massive, fossils, pyrite		
65	C29				
70					
75	C30				
80					
85	C31				
90					
95	C32				
100					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-3

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473078.199 N 7278234.081**

Surface El.: **773.20 ft. msl**
Completion Depth: 145.0 ft.
Date Boring Started: 12/6/2021
Date Boring Completed: 12/6/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C33		Shale, dark gray, soft rock, carbonaceous, massive, fossils, pyrite *(continued)*		
110	C34		- with sandstone layers and sand layers		
			659.20		
115			Shale, dark gray, glauconitic, calcareous, massive, with sandstone layers, slightly cemented sand partings		
120	C35				
125					
130	C36				
135					
140	C37				
			628.20		
145					
150					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473493.028 N 7277674.653**

Surface El.: **774.50 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 12/2/2021
Date Boring Completed: 12/2/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, dark brown to olive brown, firm, calcareous nodules, ferrous nodules, ferrous stains, rootlets	1.75	
	U2			1.5	
5	U3			1.75	
			768.50		
	U4		Clay, shaley, yellow, orange, and gray, ferrous stains, blocky slickened sides, trace gypsum	4.0	
	U5			4.0	
10	U6			4.0	
	U7			4.0	
15	U8			4.0	
	U9			4.0	
	U10			4.0	
20	U11			3.75	
	U12			3.5	
	U13			4.0	
25			- tan to brown with ferrous stains, slickened sides, gypsum	4.0	
	U14			4.5+	
	U15			4.5+	
30	U16			4.5+	
	U17			4.5+	
	U18		739.50		
35			Shale, with sand, with clay seams, dark gray, ferrous stains, calcareous with sandy seams, trace pyrite		
40	C19				
45	C20				
50					

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Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473493.028 N 7277674.653**

Surface El.: **774.50 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 12/2/2021
Date Boring Completed: 12/2/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C20		Shale, with sand, with clay seams, dark gray, ferrous stains, calcareous with sandy seams, trace pyrite *(continued)*		
55			- dark gray, with sand, with mudstone		
60	C21				
			709.50		
65			Shale, dark gray, soft rock, carbonaceous, massive, with fossils, trace pyrite		
70	C22				
75					
	C23				
80					
85	C24				
90					
95	C25				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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LOG OF BORING NO. BME-4

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473493.028 N 7277674.653**

Surface El.: **774.50 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 12/2/2021
Date Boring Completed: 12/2/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C26		Shale, dark gray, soft rock, carbonaceous, massive, with fossils, trace pyrite *(continued)* - with calcarous cementation, carbonaceous, pyrite, fossils, glaucuritic		
110			- with tan clay seams and mudstone seams - with cemented sand seams		
115	C27		- with sand seams		
120			654.50 Sandstone, siltstone, buff with dark gray, hard 651.50		
125	C28		Shale, dark gray, soft rock, carbonaceous, massive, with fossils, trace pyrite		
130			- with diagonal fractures, slightly cemented sand seams		
135	C29				
140	C30		- with calcareous cementation, with fossils, trace pyrite		
145			628.50		
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-5

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2474205.321 N 7278470.079

Surface El.: 769.20 ft. msl
Completion Depth: 140.0 ft.
Date Boring Started: 12/7/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, dark brown, with calcareous nodules, ferrous stains, ferrous nodules	1.7	
	U2			1.5	
	U3		- brown and olive	4.0	
5	U4			4.5+	
	U5		- tan and gray, with ferrous stains, slickened sides, trace sand partings	4.5+	
	U6			4.5+	
10	U7			3.5	
	U8			4.5+	
	U9		- with gypsum	4.5+	
15	U10			4.5+	
	U11			4.5+	
20	U12		747.20 Clay, shaley, tan and gray, with gypsum, abundant ferrous stains	4.5+	
	U13			4.5+	
	U14			4.5+	
25	U15			4.5+	
	U16		739.20 Shale, with sand, dark gray, with clay seams, mudstone seams, cemented sand	4.5+	
30	U17				
	U18				
35	C19				
40					
45	C20				
50					

STATE OF TEXAS
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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

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LOG OF BORING NO. BME-5

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2474205.321 N 7278470.079**

Surface El.: **769.20 ft. msl**
Completion Depth: 140.0 ft.
Date Boring Started: 12/7/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C20		Shale, with sand, dark gray, with clay seams, mudstone seams, cemented sand *(continued)*		
55			- dark gray, soft rock, massive, calcareous, trace pyrite		
60	C21				
65			- dark gray, soft rock, massive, calcareous, trace pyrite		
70	C22				
75					
	C23		689.20		
80			Shale, dark gray, soft rock, massive, calcareous		
85					
90	C24				
95					
	C25				
100					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-5

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2474205.321 N 7278470.079**

Surface El.: **769.20 ft. msl**
Completion Depth: 140.0 ft.
Date Boring Started: 12/7/2021
Date Boring Completed: 12/7/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C25		Shale, dark gray, soft rock, massive, calcareous *(continued)*		
110	C26				
115	C27				
120			649.20		
			Sandstone		
			647.20		
125	C28		Shale, dark gray, soft rock, massive, calcareous		
130			- with sandstone seams and sand partings		
135	C29				
140			629.20		
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-6

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2475197.789 N 7277862.949

Surface El.: 756.50 ft. msl
Completion Depth: 128.0 ft.
Date Boring Started: 12/8/2021
Date Boring Completed: 12/8/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	U1		Clay, brown to dark brown, with calcareous nodules, ferrous stains, firm	1.75	
	U2			2.5	
5	U3		- brown to olive, with calcaeous nodules, ferrous stains, with fossils	4.5	
	U4			4.5+	
	U5			4.5+	
10	U6			4.5+	
			744.50		
	U7		Clay, shaley, yellowish orange and gray, with gypsum seams, sand partings, ferrous stains	4.5+	
15	U8			4.5+	
	U9			4.5+	
	U10				
20	U11				
	U12				
25	U13				
	U14		729.50		
	U15		Shale, with sand, dark gray, soft rock, with gypsum, glauconitic, calcareous		
30	U				
	U16				
	U17				
35					
40	C18				
45	C19				
50					



Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-6

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475197.789 N 7277862.949**

Surface El.: **756.50 ft. msl**
Completion Depth: 128.0 ft.
Date Boring Started: 12/8/2021
Date Boring Completed: 12/8/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C19		Shale, with sand, dark gray, soft rock, with gypsum, glauconitic, calcareous *(continued)*		
55			701.50		
			Shale, dark gray, hard		
60	C20				
65					
70	C21				
75					
	C22				
80					
85	C23				
90			- with diagonal fractures		
95	C24				
			- with sandstone and slightly cemented sand (97'-99.5')		
100					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the introduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-6

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475197.789 N 7277862.949**

Surface El.: **756.50 ft. msl**
Completion Depth: 128.0 ft.
Date Boring Started: 12/8/2021
Date Boring Completed: 12/8/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C25		Shale, dark gray, *hard (continued)*		
			648.50		
			Sandstone, gray and dark gray, hard		
			646.50		
110	C26		Shale, with sand, dark gray, soft rock, carbonaceous, with some pyrite		
			641.50		
115			Shale, dark gray, soft rock, massive, carbonaceous, with some pyrite		
120	C27				
125	C28				
			628.50		
130					
135					
140					
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-7

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2476199.949 N 7278029.058**

Surface El.: **754.90 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/9/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, dark brown to brown, with rootlets, firm	1.5	
	U2			1.5	
5	U3		- brown and olive, with ferrous stains, calcareous nodules, ferrous nodules, gypsum	4.0	
			748.90		
	U4		Clay, shaley, yellow-orange and gray, calcareous, with fossils, hard	4.5+	
	U5			4.5+	
10	U6			4.5+	
	U7			4.5+	
15	U8			4.5+	
	U9			4.5+	
	U10			4.5+	
20	U11			4.5+	
	U12			4.5+	
25	U13			4.5+	
	U14		- with sand seams, vertical dessilation cracks	4.5+	
	U15			4.5+	
30	U16			4.5+	
	U17		- with shale seams	4.5+	
	A18		719.90		
35	C19		Shale, with sand, dark gray, soft rock, with sandstone seams, sand partings		
40			- carbonaceous		
45	C20				
50					

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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-7

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476199.949 N 7278029.058**

Surface El.: **754.90 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/9/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C21		Shale, with sand, dark gray, soft rock, with sandstone seams, sand partings *(continued)*		
			694.90		
60			Shale, dark gray, soft rock, massive, carbonaceous, with shell fragments, pyrite		
65	C22				
70	C23		- with mudstone		
75			- less sand		
80	C24				
85					
90	C25				
95	C26				
100					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-7

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476199.949 N 7278029.058**

Surface El.: **754.90 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/9/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C26		Shale, dark gray, soft rock, massive, carbonaceous, with shell fragments, pyrite *(continued)*		
			- sand seam		
110	C27		643.90		
			Sandstone		
			641.90		
115	C28		Shale, dark gray, soft rock, massive, carbonaceous, with shell fragments, pyrite		
			- sand seam		
120					
125	C29		628.90		
130					
135					
140					
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477024.516 N 7278340.09**

Surface El.: **739.70 ft. msl**
Completion Depth: 240.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/11/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, brown, with ferrous stains, calcareous nodules, stiff	2.0	
	U2			4.0	
5	U3			4.0	
			733.70		
	U4		Clay, shaley, tan and light gray, with fossil shells, gypsum, yellow-orange iron stains, hard	4.0	
	U5			4.0	
10	U6			4.0	
	U7			4.0	
15	U8		- with shale seams, dark gray	4.0	
	U9			4.0	
	U10			4.0	
20	U11			4.0	
			718.70		
	U12		Shale, with sand, dark gray, soft rock, glauconitic, calcareous	4.0	
	A13				
25					
	C14		- with partings, trace mudstone lenses		
30					
			704.70		
35			Sandstone, light gray, hard		
			703.20		
	C15		Shale, with sand, dark gray, soft rock, glauconitic, calcareous, with trace mudstone lenses, hard		
40					
45	C16				
50					

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-25' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477024.516 N 7278340.09**

Surface El.: **739.70 ft. msl**
Completion Depth: 240.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/11/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C16		Shale, with sand, dark gray, soft rock, glauconitic, calcareous, with trace mudstone lenses, hard *(continued)* - vuggy		
			- very sandy		
60	C17				
65			- with shale seams		
			669.70		
70	C18		Shale, dark gray, soft rock, massive, with fossils, carbonaceous		
75					
80	C19				
85					
90	C20		- with diagonal fracture		
95					
	C21				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-25' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477024.516 N 7278340.09**

Surface El.: **739.70 ft. msl**
Completion Depth: 240.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/11/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C21		Shale, dark gray, soft rock, massive, with fossils, carbonaceous *(continued)*		
110	C22				
			624.70		
115		+ + + + + + + + + + + +	Siltstone		
			621.70		
			Shale, dark gray, soft rock, massive, with fossils, carbonaceous		
120			619.70		
			Sand, shaley, gray, very fine-grained, firm to soft with shale partings, with trace cemented sand		
125					
130					
135					
140					
145					
150			589.70		

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-25' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477024.516 N 7278340.09**

Surface El.: **739.70 ft. msl**
Completion Depth: 240.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/11/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION		Hand Penetrometer, tsf	Penetration Blows/Foot
155			Shale, gray	584.70		
			Shale, with sand, gray	579.70		
160			Sand, light green to gray, very fine-grained, with some shale, some cementation			
165						
170						
175						
180						
185						
190						
195				544.70		
			Sandstone seams, light gray, hard	543.70		
			Sand, light green to gray, very fine-grained, with some shale, some cementation			
200						

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-25' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-8

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477024.516 N 7278340.09**

Surface El.: **739.70 ft. msl**
Completion Depth: 240.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/11/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
205			Sand, light green to gray, very fine-grained, with some shale, some cementation *(continued)*		
210					
215					
220					
225					
230					
235			504.70		
			Shale, gray, stiff		
240			499.70		
245					
250					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-25' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-9

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476710.205 N 7278844.07**

Surface El.: **752.30 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/10/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, dark brown, small calcareous nodules, iron nodules, iron stains, rootlets	1.5	
	U2			4.0	
5	U3			4.5	
	U4			4.5+	
	U5		- yellowish-orange and gray, hard, ferrous staining, ferrous nodules, calcareous nodules	4.5+	
			742.30		
10	U6		Clay, shaley, yellow-orange and light gray, iron stains, calcareous, fossils	4.5+	
	U7			4.5+	
	U8		- with slickened sides	4.5+	
15	U9		- with fossils		
	U10				
20	U11				
	U12				
25	U13		- with gypsum		
	U14				
	U15				
30	U16				
	U17				
	A18				
35			Shale, with sand, dark gray, carbonaceous, with iron stains, glauconitic, trace gypsum		
	C19				
40					
45	C20				
50					

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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-9

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476710.205 N 7278844.07**

Surface El.: **752.30 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/10/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C20		Shale, with sand, dark gray, carbonaceous, with iron stains, glauconitic, trace gypsum *(continued)*		
60	C21				
65					
70	C22				
75			677.30 Shale, dark gray, soft rock, massive, carbonaceous, with ferrous stains, glauconitic		
80	C23				
85					
90	C24				
95					
100	C25				

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-9

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476710.205 N 7278844.07**

Surface El.: **752.30 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 12/9/2021
Date Boring Completed: 12/10/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C25		Shale, dark gray, soft rock, massive, carbonaceous, with ferrous stains, glauconitic *(continued)*		
110	C26		- sand seam		
115			634.30		
120	C27		Sandstone		
			631.30		
125			Shale, dark gray, soft rock, massive, carbonaceous, with ferrous stains, glauconitic		
			627.30		
130					
135					
140					
145					
150					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-35' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-10

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477153.169 N 7279338.556

Surface El.: 733.10 ft. msl
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, brown to olive, with calcareous nodules, firm	1.5	
	U2			2.0	
	U3			3.0	
5	U4			3.5	
			725.10		
	U5		Clay, shaley, tan and light gray, with fossil shells, gypsum, yellow-orange iron stains	4.0	
10	U6			4.0	
	U7				
15	U8				
	U9				
	U10				
			713.10		
20	U11		Shale, with sand, dark gray, soft rock, glauconitic, pyrite, calcareous		
	C12		- with shaley clay seams		
30			- calcareous with fossil shells		
35	C13		- with sandy seams, tan mudstone seams		
40					
45	C14				
50					

STATE OF TEXAS
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2045
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-10

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477153.169 N 7279338.556**

Surface El.: **733.10 ft. msl**
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C15		Shale, with sand, dark gray, soft rock, glauconitic, pyrite, calcareous *(continued)*		
60	C16				
			668.10		
65			Shale, dark gray, carbonaceous, hard, some tan mudstone seams		
70	C17				
75					
80	C18				
85					
90	C19				
95					
100	C20				
			633.10		

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-10

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477153.169 N 7279338.556**

Surface El.: **733.10 ft. msl**
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C20		Shale, dark gray, soft rock, glaluconitic, pyrite, calcareous, hard		
			626.60		
110	C21		Sand, dark gray and gray, with clay, fine-grained, unconsolidated, dense		
			621.10		
		+ + + + + +	Siltstone, light gray and gray, hard		
			619.10		
115	C22		Shale, dark gray, soft rock, carbonaceous, glauconitic, massive, with shell fossils, hard		
			613.10		
120					
125					
130					
135					
140					
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-11

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476722.739 N 7279843.991**

Surface El.: **743.80 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 11/30/2021
Date Boring Completed: 11/30/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, brown to dark brown, with trace gravel, calcareous nodules, ferrous nodules, rootlets	1.5	
	U2			1.75	
	U3			2.0	
5	U4		- yellowish-brown, with calcareous nodules, ferrous stains, stiff to hard	4.5	
	U5			4.0	
10	U6		731.80	4.0	
	U7		Clay, shaley, light yellowish-brown and gray, ferrous stains, slickened sides, with gypsum	2.5	
15	U8			4.0	
	U9			4.0	
	U10		- with vertical gypsum seams, abundant ferrous staining	4.0	
20	U11			4.0	
	U12			3.75	
25	U13			4.0	
	U14			4.0	
	U15		- with sand shale seams 713.80	4.0	
30			Shale, with sand, dark gray, soft rock, glauconitic, pyrite, shell fragments		
35	C16				
40			- with calcareous cementation, laminations		
45	C17				
50					

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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-11

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476722.739 N 7279843.991**

Surface El.: **743.80 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 11/30/2021
Date Boring Completed: 11/30/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C18		Shale, with sand, dark gray, soft rock, glauconitic, pyrite, shell fragments *(continued)*		
60			- with diagonal fractures		
65	C19		- with occasional shale parting, mudstone seams		
70			673.80 Shale, dark gray, soft rock, massive, glauconitic, carbonaceous, with fossil shells		
75	C20				
80			- trace sand partings, mudstone layers		
85	C21		- laminations		
90			- diagonal fractures		
95	C22				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-11

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476722.739 N 7279843.991**

Surface El.: **743.80 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 11/30/2021
Date Boring Completed: 11/30/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C23		Shale, dark gray, soft rock, massive, glauconitic, carbonaceous, with fossil shells *(continued)*		
110	C24				
115			628.80		
120					
125					
130					
135					
140					
145					
150					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-30' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-12

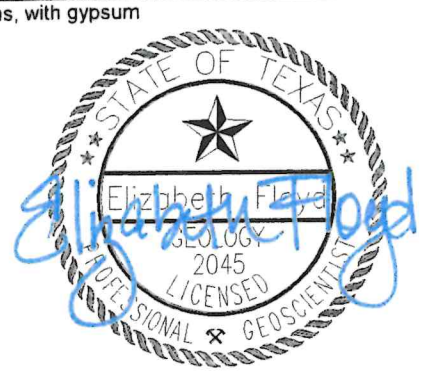
Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477177.828 N 7280338.326

Surface El.: 734.00 ft. msl
Completion Depth: 125.0 ft.
Date Boring Started: 3/1/2022
Date Boring Completed: 3/1/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	U1		Clay, slightly silty, brown, with calcarous nodules, ferrous nodules, rootlets, firm	1.0	
	U2			1.75	
5	U3			3.5	
	U4		- yellow-brown, calcareous nodules, ferrous stains, very stiff	3.0	
	U5			3.5	
			724.00		
10	U6		Clay, shaley, tan and light yellow, trace gray, with ferrous stains, gypsum, slickened sides, hard	3.0	
	U7			3.0	
	U8			4.0	
15	U9				
			716.00		
	U10		Shale, with sand, dark gray, calcareous, laminations	4.5+	
20					
	C11				
25					
30			703.00		
			Sand, shaley, light gray, carbonaceous, hard		
			702.00		
			Shale, with sand, dark gray, with some sand laminations, with gypsum		
35	C12				
40					
45	C13				
50					



Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-20' and wet rotary coring techniques to total depth. No groundwater was observed prior to the introduction of water into the borehole.

BME

Continued Next Page

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-12

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477177.828 N 7280338.326**

Surface El.: **734.00 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 3/1/2022
Date Boring Completed: 3/1/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C14		Shale, with sand, dark gray, with some sand laminations, with gypsum *(continued)*		
55					
60	C15				
65					
	C16		- with shale seams, occasional shell fragments		
70					
			659.00		
75			Shale, dark gray, calcareous, trace sand seams, shell fragments, occasional pyrite, massive, hard		
80	C17				
85					
90	C18		- diagonal fractures		
95			- blocky, pyrite		
	C19				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-20' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-12

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477177.828 N 7280338.326**

Surface El.: **734.00 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 3/1/2022
Date Boring Completed: 3/1/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	C19		*Shale, dark gray, calcareous, trace sand seams, shell fragments, occasional pyrite, massive, hard (continued)*		
110	C20		623.00		
115			*Sand, silty, trace clay, light gray and gray, very fine-grained to fine-grained, dense*		
			617.00		
			Siltstone, light gray and gray, hard		
120	C21		615.00		
			Shale, dark gray, calcareous, with shell fragments, with sand, hard		
			611.00		
125			Shale, dark gray, calcareous, wtih shell fossils, massive, hard		
			609.00		
130					
135					
140					
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-20' and wet rotary coring techniques to total depth. No groundwater was observed prior to the introduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-13

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2476534.102 N 7280846.434

Surface El.: 730.60 ft. msl
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	U1		Clay, silty, brown to olive, trace gravel, ferrous nodules, rootlets, firm	1.75	
	U2			1.75	
	U3			3.5	
5	U4				
	U5		720.60		
10	U6		Clay, shaley, tan to yellowish-brown and trace gray, ferrous stains, slickened sides, gypsum, fine-grained		
	U7				
15	U8				
	U9				
	U10		709.60		
20	U11		Shale, with trace sand, dark gray		
	C12		- carbonaceous		
25			703.60		
	C13		Sandstone, light gray, carbonaceous		
			701.10		
30			Shale, with sand, dark gray, carbonaceous, with trace pyrite		
	C14				
35					
40					
			- with calcareous cementation (43' - 45')		
45	C15				
50					

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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-13

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2476534.102 N 7280846.434**

Surface El.: **730.60 ft. msl**
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C16		Shale, with sand, dark gray, carbonaceous, with trace pyrite *(continued)*		
55			675.60		
			Shale, dark gray, massive carbonaceous, fossils		
60	C17				
65			- with trace sand, diagonal fracture		
70	C18				
75					
80	C19				
85					
	C20				
90					
	C21				
95					
	C22				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-13

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476534.102 N 7280846.434**

Surface El.: **730.60 ft. msl**
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	C22		Shale, dark gray, massive carbonaceous, fossils *(continued)*		
			615.60		
115		+ + + + + +	Siltstone, very hard		
			613.60		
			Shale, with sand, gray		
120					
125					
130					
135					
140					
145					
150					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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LOG OF BORING NO. BME-13

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476534.102 N 7280846.434**

Surface El.: **730.60 ft. msl**
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
155			Shale, with sand, gray *(continued)* - dark gray, very fine-grained		
160			570.60 Sand, with shale seams, dark gray		
165					
170					
175					
180					
185					
190					
195					
200					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the introduction of water into the borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-13

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476534.102 N 7280846.434**

Surface El.: **730.60 ft. msl**
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
205			Sand, with shale seams, dark gray *(continued)*		
210					
			515.60		
215			Sandstone		
			513.10		
			Sand, with shale seams, dark gray		
220					
225					
230					
235					
240			- alternating sand and shale seams		
245					
250					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

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BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-13

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476534.102 N 7280846.434**

Surface El.: **730.60 ft. msl**
Completion Depth: 257.0 ft.
Date Boring Started: 1/11/2021
Date Boring Completed: 1/12/2021

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
			Sand, with shale seams, dark gray *(continued)* 478.60		
255			Shale 473.60		

260 265 270 275 280 285 290 295 300

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Borehole advanced using Shelby tubes from 0-22' and wet rotary coring techniques to total depth. No groundwater was observed prior to the inroduction of water into the borehole.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the *transition may* be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-14

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477032 N 7277570

Surface El.: 735.40 ft. msl
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	C1		Clay, dark brown and olive, with calcareous nodules, firm to stiff	1.0	
	C1			2.0	
	C1			3.5	
5	C1			4.0	
	C1		728.40		
	C1		Clay, shaley, tan and gray, with shell fossils, with gypsum, with ferrous stains, hard	4.0	
	C1			4.5+	
10	C2			4.5+	
	C2		721.40		
15	C2		Shale, with sand, dark gray, soft rock, glauconitic, calcareous		
20					
			- with shell fragments		
25	C3				
30					
35	C4				
40					
45	C5				
50					

STATE OF TEXAS
Elizabeth Fleyd
GEOLOGY
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Wet rotary drilling techniques were used to drill the *entire* borehole.

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-14

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477032 N 7277570**

Surface El.: **735.40 ft. msl**
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	C6		Shale, with sand, dark gray, soft rock, glauconitic, calcareous *(continued)*		
60			674.40		
			Shale, dark gray, soft rock, with trace sand, glauconitic, calcareous, with shell fragments		
65	C7				
70					
			- with abundant shell fragments		
75	C8				
80					
85	C9		- with gypsum partings		
90					
95	C10				
100					

Contractor: **H/ET**
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Wet rotary drilling techniques were used to drill the entire borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-14

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477032 N 7277570**

Surface El.: **735.40 ft. msl**
Completion Depth: 120.0 ft.
Date Boring Started: 2/28/2022
Date Boring Completed: 2/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
			Shale, dark gray, soft rock, with trace sand, glauconitic, calcareous, with shell fragments *(continued)*		
			631.40		
105			Shale, dark gray, with sand seams, hard		
			628.40		
			Sand, gray and light greenish gray, with trace shale partings		
110			622.40		
			Shale, dark gray, with shell gragments, calcareous, glauconitic, hard		
115			615.40		
120					
125					
130					
135					
140					
145					
150					

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks: Wet rotary drilling techniques were used to drill the entire borehole.

BME

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-15

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2477206 N 728193.2**

Surface El.: **721.90 ft. msl**
Completion Depth: 93.0 ft.
Date Boring Started: 11/10/2023
Date Boring Completed: 11/10/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	CS1		Clay, silty, brown to olive, trace gravel, rootlets	2.0	
5	CS2			1.5	
10	CS3		709.90		
15	CS4		Clay, shaley, with sand, dark gray	4.5	
20	CS5			4.5	
25	CS6		- carbonaceous		
30	CS7		691.90		
35	CS8		Clay, shaley, with sand, dark green	4.5	
40	CS9			4.5	
45	CS10		681.90		
50			Shale, dark gray, hard	4.5	

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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/26/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-15

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477206 N 728193.2**

Surface El.: **721.90 ft. msl**
Completion Depth: 93.0 ft.
Date Boring Started: 11/10/2023
Date Boring Completed: 11/10/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
55	CS11		Shale, dark gray, hard *(continued)* - with trace sand, with pyrite, with fossils		
60	CS12				
65	CS13				
70	CS14				
75	CS15				
80	CS16				
85	CS17				
90	CS18		Shale, with sand and clay shale seams, dark gray to greenish gray		
95	CS19		Shale, dark gray, hard		
100					

636.90
631.90
628.90

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/26/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-16

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2176251 N 7282080.8

Surface El.: 746.30 ft. msl
Completion Depth: 118.0 ft.
Date Boring Started: 11/11/2023
Date Boring Completed: 11/11/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	CS1		Clay, dark brown and gray, with calcareous nodules, with ferrous stains, rootlets, stiff	2.5	
5	CS2			2.5	
10	CS3		- tan to yellowish brown with gray, with gypsum	1.75	
15	CS4			2.0	
20	CS5			2.0	
25	CS6		721.30 Clay, shaley, with sand, yellowish brown and olive, with ferrous stains	2.5	
30	CS7			4.5	
35	CS8		713.30 Shale, dark gray, with trace gypsum, hard - with sand, dark gray, hard	4.5	
40	CS9			4.5	
45	CS10				
50			696.30		

STATE OF TEXAS
Elizabeth Floyd
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2045
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PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

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TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-16

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2176251 N 7282080.8**

Surface El.: **746.30 ft. msl**
Completion Depth: 118.0 ft.
Date Boring Started: 11/11/2023
Date Boring Completed: 11/11/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	CS11		Shale, dark gray, with trace gypsum, hard	4.5	
55	CS12		- with fossil fragments, hard	4.5	
60	CS13			4.5	
65	CS14			4.5	
70	CS15			4.5	
75	CS16			4.5	
80	CS17			4.5	
85	CS18			4.5	
90	CS19				
95	CS20				
			648.30		
100			Shale, with sand, greenish gray, fine-grained, wtih clay partings		

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-16

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2176251 N 7282080.8**

Surface El.: **746.30 ft. msl**
Completion Depth: 118.0 ft.
Date Boring Started: 11/11/2023
Date Boring Completed: 11/11/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
			Shale, with sand, greenish gray, fine-grained, wtih clay partings *(continued)*		
			644.30		
	CS21		Shale, sandy, dark gray		
105					
	CS22				
110			- with clayey shale seams		
	CS23				
115			- hard		
	CS24		628.30		
120					
125					
130					
135					
140					
145					
150					

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed *prior to* introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-17

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475253 N 7282282**

Surface El.: **746.00 ft. msl**
Completion Depth: 117.0 ft.
Date Boring Started: 11/12/2023
Date Boring Completed: 11/12/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	CS1		Clay, dark brown and brown, with calcareous nodules, with rootlets, hard	4.5	
5	CS2		- tan and light brown, with gypsum	3.0	
10	CS3			3.0	
15	CS4			3.5	
20	CS5			4.5	
25			719.50	4.5	
30	CS6		Clay, with sand, light gray to gray and olive, with gypsum, with ferrous stains	4.5	
35	CS7		714.00		
40	CS8		Shale, dark gray, with gypsum, with ferrous stains	4.5	
45	CS9		- with ferrous stains, hard	4.5	
50	CS10		- with sand, with trace fossil fragments, hard	4.5	

STATE OF TEXAS
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Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

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TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-17

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2475253 N 7282282**

Surface El.: **746.00 ft. msl**
Completion Depth: 117.0 ft.
Date Boring Started: 11/12/2023
Date Boring Completed: 11/12/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	CS11		Shale, dark gray, with gypsum, with ferrous stains *(continued)*	4.5	
55	CS12		- with siltstone strings	4.5	
60	CS13			4.5	
65	CS14		- with fossils, hard	4.5	
70	CS15			4.5	
75	CS16			4.5	
80	CS17			4.5	
85	CS18		- with fossil fragments, with ferrous nodules, hard	4.5	
90	CS19				
			651.00		
95	CS20		Sand, greenish gray and gray, very fine-grained to fine-grained, with clay partings		
100			646.00		

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-17

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475253 N 7282282**

Surface El.: **746.00 ft. msl**
Completion Depth: 117.0 ft.
Date Boring Started: 11/12/2023
Date Boring Completed: 11/12/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	CS21		Siltstone, with shale interbeds, very hard	4.5	
105			641.00		
	CS22		Shale, with sand, dark gray	4.5	
110			- with sand, dark gray and greenish gray, hard	4.5	
	CS23				
115	CS24		- with fossils	4.5	
			629.00		
120					
125					
130					
135					
140					
145					
150					

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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LOG OF BORING NO. BME-18

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2474467 N 7282443.8**

Surface El.: **724.00 ft. msl**
Completion Depth: 95.0 ft.
Date Boring Started: 7/14/2023
Date Boring Completed: 7/16/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0	CS1		Clay, dark brown and brown, with gypsum, with rootlets, trace ferrous stains	4.0	
5	CS2		- shaley, with ferrous stains	2.0	
10			713.00	4.5	
10	CS3		Shale, with sand, dark gray, with ferrous stains		
15	CS4		- with fossil fragments, with fine sand	4.5	
20	CS5			4.5	
25	CS6		- with fossils, trace gypsum	4.5	
30	CS7			4.5	
35	CS8		- with fossils	4.5	
40			684.00		
40	CS9		Shale, dark gray, hard	4.5	
45	CS10			4.5	
50					

STATE OF TEXAS
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-18

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2474467 N 7282443.8**

Surface El.: **724.00 ft. msl**
Completion Depth: 95.0 ft.
Date Boring Started: 7/14/2023
Date Boring Completed: 7/16/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	CS11		Shale, dark gray, hard *(continued)*	4.5	
55			- with fossil, hard	4.5	
	CS12		- dark gray and greenish gray, very fine-grained to fine-grained sand seams		
60			- with sand	4.5	
	CS13		659.00		
65			Shale, dark gray and greenish gray, with very-fine sand to fine sand	4.5	
	CS14				
70			- with siltstone	4.5	
	CS15				
75			- dark gray and dark greenish gray, with sand seams greenish gray	4.5	
	CS16		644.00		
80			Shale, dark gray, hard, with fossils	4.5	
	CS17				
85			- hard	4.5	
	CS18				
90			- hard	4.5	
	CS19				
95			629.00		
100					

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-19

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473498 N 7283008**

Surface El.: **732.00 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/19/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
0			Clay, dark brown, with calcareous nodules, with rootlets, stiff	2.5	
			730.00		
	CS1		Clay, tan to light brown, with ferrous stains		
5			- dark brown and tan, with abundant ferrous stains	4.5	
	CS2				
10			- with abundant ferrous stains, with trace gypsum	4.5	
	CS3		720.00		
			Shale, with sand, hard		
15	CS4			4.5	
20				4.5	
	CS5				
25				4.5	
	CS6		702.00		
30			Shale, with sand seams		
	CS7				
35					
	CS8				
40			- with abundant fossil fragments		
	CS9				
45					
	CS10				
50					

STATE OF TEXAS
Elizabeth Floyd
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PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

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TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-19

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473498 N 7283008**

Surface El.: **732.00 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/19/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
50	CS11		Shale, with sand seams *(continued)*	4.5	
55	CS12			4.5	
60	CS13			4.5	
65	CS14			4.5	
70	CS15		662.00 Shale, with siltstone	4.5	
75	CS16		- with greenish gray partings, sand seams	4.5	
80	CS17		652.00 Shale, dark gray, hard, with trace sand seams	4.5	
85	CS18			4.5	
90	CS19		- with fossils	4.5	
95	CS20			4.5	
100					

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-19

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473498 N 7283008**

Surface El.: **732.00 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/19/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
			Shale, dark gray, hard, with trace sand seams *(continued)*		
			629.00		

105
110
115
120
125
130
135
140
145
150

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF BORING NO. BME-20

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472360 N 7282865.3**

Surface El.: **754.30 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 11/14/2023
Date Boring Completed: 11/15/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
	CS1		Clay, dark brown, with calcareous nodules with rootlets, stiff to very stiff	3.0	
			751.30		
5	CS2		Clay, silty, with sand seams, with ferrous stains	4.0	
10	CS3		- clay, sandy, brown with ferrous stains	4.5	
15	CS4		- tan and gray	4.5	
20	CS5		- dark gray, with brown, abundant ferrous stains	4.5	
25	CS6		- with gypsum	4.5	
30	CS7			4.5	
			721.30		
35	CS8		Shale, dark gray, hard, with sand - with fossils	4.5	
40	CS9			4.5	
45	CS10			4.5	
50					



Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF BORING NO. BME-20

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472360 N 7282865.3**

Surface El.: **754.30 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 11/14/2023
Date Boring Completed: 11/15/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
50	CS11		Shale, dark gray, hard, with sand *(continued)*	4.5	
55	CS12			4.5	
60	CS13			4.5	
65	CS14			4.5	
70	CS15			4.5	
75	CS16		679.30 Shale, dark gray, hard	4.5	
80	CS17				
85	CS18		669.30 Shale, with siltstone layers		
90	CS19				
95	CS20		659.30 Shale, dark gray, with sand seams and alternating sand and clay layers		
100					

Contractor: H/ET

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF BORING NO. BME-20

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472360 N 7282865.3**

Surface El.: **754.30 ft. msl**
Completion Depth: 126.0 ft.
Date Boring Started: 11/14/2023
Date Boring Completed: 11/15/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer, tsf	Penetration Blows/Foot
105	NR		Shale, dark gray, with sand seams and alternating sand and clay layers *(continued)*	4.5	
110	CS21			4.5	
	CS22		643.30 Shale, dark gray, with fossils, hard	4.5	
115	CS23			4.5	
120	CS24				
125			628.30		
130					
135					
140					
145					
150					

Contractor: **H/ET**

Groundwater Observations	
Date	Depth

Remarks: Sonic drilling methods utilizing water were used to drill the boring. No groundwater was observed prior to introduction of water into the borehole. The borehole was grouted upon completion.

BME

TASWA 2024 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-1S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471706.69 N 7277572.34**

Top of Casing El.: **777.20 ft. msl**
Surface El.: **774.33 ft. msl**
Completion Depth: 38.0 ft.
Date Boring Started: 3/25/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, with ferrous stains, with calcareous nodules, with rootleets	
5			- yellowish orange and light gray	
10			- with silty sand and clay partings	
			761.33	
15			Clay, silty, light gray and tan, with ferrous stains, hard	
			756.33	
20			Clay, shaley, tan and light gray, ferrous stains, with calcareous partings, slickensides, hard	
25			746.33	
30			Sand, shaley, reddish orange and gray, with silty sand partings, hard	
35			737.33	
			Shale, with sand, gray, soft rock, carbonaceous, ferrous stains, glauconitic, with gypsum	
			736.33	
40				
45				
50				

STATE OF TEXAS
Elizabeth Floyd
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-1D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471696.3 N 7277561.5**

Top of Casing El.: **777.31 ft. msl**
Surface El.: **774.30 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 3/25/2022
Date Boring Completed: 3/25/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, with ferrous stains, with calcareous nodules, with rootlets	
5			- yellowish orange and light gray	
10			- with silty sand and clay partings	
			761.30	
15			Clay, silty, light gray and tan, with ferrous stains, hard	
			756.30	
20			Clay, shaley, tan and light gray, ferrous stains, with calcareous partings, slickensides, hard	
25				
			746.30	
30			Sand, shaley, reddish orange and gray, with silty sand partings	
35				
			737.30	
40			Shale, with sand, gray, soft rock, carbonaceous, ferrous stains, glauconitic, with gypsum	
45				
50				

STATE OF TEXAS
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

Continued Next Page

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-1D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471696.3 N 7277561.5**

Top of Casing El.: **777.31 ft. msl**
Surface El.: **774.30 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 3/25/2022
Date Boring Completed: 3/25/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, gray, soft rock, carbonaceous, ferrous stains, glauconitic, with gypsum *(continued)* - massive, hard	
60				
65				
			704.30	
70			Shale, gray, soft rock, carbonaceous, ferrous stains, glauconitic, gypsum, massive, hard	
75				
80				
85				
90				
95				
100				

Contractor: **H/ET**

Remarks:

Continued Next Page

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-1D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2471696.3 N 7277561.5**

Top of Casing El.: **777.31 ft. msl**
Surface El.: **774.30 ft. msl**
Completion Depth: 146.0 ft.
Date Boring Started: 3/25/2022
Date Boring Completed: 3/25/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, gray, soft rock, carbonaceous, ferrous stains, glauconitic, gypsum, massive, hard *(continued)*	
110				
115				
120				
125				
			645.30	
130			Sand, with shale partings, gray to dark gray, unconsolidated, very fined-grained, dense	
			641.30	
135			Shale, with sand, slightly cemented, dark gray, hard	
			634.30	
140			Sand, unconsolidaated, dark gray, very fine-grained, dense	
			629.30	
145			Shale, sandy, dark gray, hard	
			628.30	
150				

Contractor: ***H/ET***

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-4D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473465.33 N 7277657.96**

Top of Casing El.: **777.85 ft. msl**
Surface El.: **775.22 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 3/10/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details	Hand Penetrometer, tsf
0			Clay, dark brown to olive brown, with calcareous nodules, with ferrous nodules, with ferrous stains, with rootlets, firm		
			769.22		
5			Clay, shaley, yellowish orange and gray, ferrous stains, blocky, with slickenedsides, with trace gypsum, hard		
10					
15					
20					
25			- tan to brown		
30					
			740.22		
35			Shale, with sand clay seams, dark gray, with ferrous stains, with calcareous seams, with trace pyrite, hard		
40					
45					
50					

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2/26/2025

Contractor: H/ET
Project No.:

Groundwater Observations	
Date	Depth

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

BME 2022 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/11/25

LOG OF PIEZOMETER NO. P-4D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473465.33 N 7277657.96**

Top of Casing El.: **777.85 ft. msl**
Surface El.: **775.22 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 3/10/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand clay seams, dark gray, with ferrous stains, with calcareous seams, with trace pyrite, hard *(continued)*	
60				
65			710.22 Shale, dark gray, soft rock, carbonaceous, massive, with fossils, with trace pyrite	
70				
75				
80				
85				
90			- hard	
95				
100				

Contractor: **H/ET**

Remarks:

Continued Next Page

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LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-4D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2473465.33 N 7277657.96**

Top of Casing El.: **777.85 ft. msl**
Surface El.: **775.22 ft. msl**
Completion Depth: 125.0 ft.
Date Boring Started: 3/10/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, dark gray, soft rock, carbonaceous, massive, with fossils, with trace pyrite *(continued)*	
110				
115			- with sand seams	
120			655.22 Siltstone, buff to dark gray, hard	
125			652.22 Shale, dark gray, soft rock, carbonaceous, massive, with fossils, with pyrite, hard 650.22	
130				
135				
140				
145				
150				

Contractor: H/ET

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

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LOG OF PIEZOMETER NO. P-6S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475194.04 N 7277881.65**

Top of Casing El.: **758.40 ft. msl**
Surface El.: **755.92 ft. msl**
Completion Depth: 30.5 ft.
Date Boring Started: 3/7/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown to dark brown, with calcareous nodules, with ferrous stains, firm	
10			743.92	
10			Clay, shaley, yellow orange and gray, with gypsum seams, with sand partings, with ferrous stains, hard	
30			725.42	
50				

STATE OF TEXAS
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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-6D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2475204.48 N 7277891.29

Top of Casing El.: 758.15 ft. msl
Surface El.: 755.57 ft. msl
Completion Depth: 112.0 ft.
Date Boring Started: 3/9/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown to dark brown, with calcareous nodules, with ferrous stains, firm	
12			743.57 Clay, shaley, yellowish orange and gray, with sand partings, with gypsum seams, with ferrous stains, hard	
27			728.57 Shale, with sand, dark gray, soft rock, with gypsum, glauconitic, calcareous, hard	
50				

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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-6D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475204.48 N 7277891.29**

Top of Casing El.: **758.15 ft. msl**
Surface El.: **755.57 ft. msl**
Completion Depth: 112.0 ft.
Date Boring Started: 3/9/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, soft rock, with gypsum, glauconitic, calcareous, hard *(continued)*	
60				
65				
			685.57	
70			Shale, dark gray, soft rock, with gypsum, massive, glauconitic, calcareous, hard	
75				
80				
85				
90				
95				
100			- with sandstone seams	

Contractor: **H/ET**

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

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LOG OF PIEZOMETER NO. P-6D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2475204.48 N 7277891.29**

Top of Casing El.: **758.15 ft. msl**
Surface El.: **755.57 ft. msl**
Completion Depth: 112.0 ft.
Date Boring Started: 3/9/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, dark gray, soft rock, with gypsum, massive, glauconitic, calcareous, hard *(continued)*	
			647.57	
			Sandstone, gray and dark gray, hard	
			645.57	
110			Shale, dark gray, soft rock, massive, carbonaceous, with pyrite, hard	
			643.57	
115				
120				
125				
130				
135				
140				
145				
150				

Contractor: ***H/ET***

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-7D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2476192.95 N 7278056.29

Top of Casing El.: 757.46 ft. msl
Surface El.: 754.81 ft. msl
Completion Depth: 114.0 ft.
Date Boring Started: 3/6/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown and brown, with rootlets, firm	
5			- brown and olive, with ferrous stains, with calcareous nodules, with ferrous nodules, with gypsum, hard	
			748.81	
			Clay, shaley, yellowish orange and gray, calcareous, with fossils, hard	
10				
15				
20				
25				
30				
			719.81	
35			Shale, with sand, dark gray, soft rock, with some sandstone seams, and sand partings	
40				
45				
50				

STATE OF TEXAS
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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-7D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476192.95 N 7278056.29**

Top of Casing El.: **757.46 ft. msl**
Surface El.: **754.81 ft. msl**
Completion Depth: 114.0 ft.
Date Boring Started: 3/6/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, soft rock, with some sandstone seams, and sand partings *(continued)* - massive, carbonaceous, hard	
60			694.81 Shale, dark gray, soft rock, carbonaceous, with shell fragments, with pyrite, hard	
65				
70				
75				
80				
85				
90				
95				
100				

Contractor: **H/ET**

Remarks:

Continued Next Page

The stratification lines represent approximate *strata* boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF PIEZOMETER NO. P-7D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476192.95 N 7278056.29**

Top of Casing El.: **757.46 ft. msl**
Surface El.: **754.81 ft. msl**
Completion Depth: 114.0 ft.
Date Boring Started: 3/6/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION		Piezometer Construction Details
105			Shale, dark gray, soft rock, carbonaceous, with shell fragments, with pyrite, hard *(continued)*		
110				643.81	
			Sandstone, liglht gray, hard	641.81	
			Shale, dark gray, soft rock, carbonaceous, massive, with shell fragments, with pyrite, hard	640.81	
115					
120					
125					
130					
135					
140					
145					
150					

Contractor: ***H/ET***

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-8S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477020.04 N 7278310.74

Top of Casing El.: 741.54 ft. msl
Surface El.: 738.94 ft. msl
Completion Depth: 37.5 ft.
Date Boring Started: 3/4/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown and gray, with ferrous stains, with calcareous nodules, stiff	
732.94				
			Clay, shaley, tan and light gray, with fossil shells, with gypsum, with ferrous stains, hard	
717.94				
			Shale, with sand, dark gray, soft rock, glauconitic, calcareous, hard	
703.94				
			Sandstone, light gray, hard	
701.44				
50				

STATE OF TEXAS
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GEOLOGIST
2045
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-8D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477023.59 N 7278295.66**

Top of Casing El.: **741.23 ft. msl**
Surface El.: **738.61 ft. msl**
Completion Depth: 124.0 ft.
Date Boring Started: 3/5/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown, with ferrous stains, calcareous nodules, stiff	
			732.61	
			Clay, shaley, tan and light gray, with fossil shells, with gypsum, with ferrous stains, hard	
			717.61	
			Shale, with sand, dark gray, soft rock, glauconitic, calcareous, hard	
			703.61	
			Sandstone, light gray, hard	
			701.11	
			Shale, with sand, dark gray, soft rock, glauconitic, calcareous, with trace mudstone lenses	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF PIEZOMETER NO. P-8D

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2477023.59 N 7278295.66**

Top of Casing El.: **741.23 ft. msl**
Surface El.: **738.61 ft. msl**
Completion Depth: 124.0 ft.
Date Boring Started: 3/5/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, soft rock, glauconitic, calcareous, with trace mudstone lenses *(continued)*	
60				
65				
70				
75				
80				
85			653.61 Shale, dark gray, soft rock, with shell fossils, carbonaceous, massive, hard	
90				
95				
100				

Contractor: **H/ET**

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-8D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477023.59 N 7278295.66**

Top of Casing El.: **741.23 ft. msl**
Surface El.: **738.61 ft. msl**
Completion Depth: 124.0 ft.
Date Boring Started: 3/5/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, dark gray, soft rock, with shell fossils, carbonaceous, massive, hard *(continued)*	
110				
			624.61	
115			Sand, silty, gray and greenish gray, unconsolidated, fine-grained, dense	
			620.61	
		+ + +	Siltstone, with cemented sand, light gray	
			619.61	
120			Shale, dark gray, soft rock, with shale fossils, massive, carbonaceous	
			614.61	
125				
130				
135				
140				
145				
150				

Contractor: **H/ET**

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
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LOG OF PIEZOMETER NO. P-10S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477169.59 N 7279365.85

Top of Casing El.: 734.85 ft. msl
Surface El.: 732.07 ft. msl
Completion Depth: 46.0 ft.
Date Boring Started: 3/11/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown to olive, with calcareous nodules, firm	
			724.07	
10			Clay, shaley, tan and light gray, with fossil shells, with gypsum, yellow orange ferrous stains, hard	
			712.07	
20			Shale, with sand, dark gray, soft rock, glauconitic, with pyrite, calcareous, hard	
30			- with sandy seams	
			686.07	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-10D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477154.78 N 7279360.74**

Top of Casing El.: **735.75 ft. msl**
Surface El.: **732.79 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 3/11/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, brown to olive, with calcareous nodules, firm	
			724.79	
			Clay, shaley, tan and light gray, with fossil shells, with gypsum, yellow ferrous stains, hard	
			712.79	
			Shale, with sand, dark gray, soft rock, glauconitic, with pyrite, calcareous, hard, massive	
			- with sandy seams, with some mudstone seams	

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GEOLOGY
2045
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PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-10D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477154.78 N 7279360.74**

Top of Casing El.: **735.75 ft. msl**
Surface El.: **732.79 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 3/11/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, soft rock, glauconitic, with pyrite, calcareous, hard, massive *(continued)*	
60				
65				
70				
75				
80				
85				
90				
95				
100				632.79

Contractor: **H/ET**

Remarks:

Continued Next Page

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-10D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477154.78 N 7279360.74**

Top of Casing El.: **735.75 ft. msl**
Surface El.: **732.79 ft. msl**
Completion Depth: 115.0 ft.
Date Boring Started: 3/11/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION		Piezometer Construction Details
105			Shale, dark gray, soft rock, glauconitic, pyrite, calcareous, hard	626.29	
110			Sand, dark gray and gray, with clay, fine-grained, unconsolidated, dense	620.79	
		+ + + + + + + + +	Siltstone, light gray and gray, hard	618.79	
115			Shale, dark gray, hard	617.79	
120					
125					
130					
135					
140					
145					
150					

Contractor: **H/ET**

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-12S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-6892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477163.78 N 7280332.28**

Top of Casing El.: **736.80 ft. msl**
Surface El.: **734.05 ft. msl**
Completion Depth: 34.5 ft.
Date Boring Started: 3/2/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, slightly silty, brown, with calcareous nodules, with ferrous nodules, with rootlets, with ferrous stains	
5			- very stiff	
			724.05	
10			Clay, shaley, tan and light yellow with gray streaks, with ferrous stains, with slickenedsides, and gypsum hard	
15			717.05	
20			Shale, trace sand, dark gray, with laminations, calcareous, hard	
25				
30			703.05	
			Sand, shaley, light gray, carbonaceous, hard 702.05	
			Shale, with sand, dark gray, with gypsum, hard	
35			699.55	
40				
45				
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

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TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-12D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477149.98 N 7280327.8

Top of Casing El.: 736.47 ft. msl
Surface El.: 734.05 ft. msl
Completion Depth: 121.0 ft.
Date Boring Started: 3/2/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, slightly silty, brown, with calcareous nodules, with ferrous nodules, with rootlets, with ferrous stains	
5			- very stiff	
			724.05	
10			Clay, shaley, tan and light yellow with gray streaks, with ferrous stians, with slickenedsides, with gypsum, hard	
15			717.05	
			Shale, trace sand, dark gray, with laminations, calcareous, hard	
20				
25				
30			703.05	
			Sand, shaley, light gray, carbonaceous, hard 702.05	
			Shale, with sand, dark gray, with gypsum, hard	
35				
40				
45				
50				

STATE OF TEXAS
Elizbheth Floyd
GEOLOGY
2045
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PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

LOG OF PIEZOMETER NO. P-12D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477149.98 N 7280327.8**

Top of Casing El.: **736.47 ft. msl**
Surface El.: **734.05 ft. msl**
Completion Depth: 121.0 ft.
Date Boring Started: 3/2/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, with gypsum, hard *(continued)*	
60				
65				
70				
			659.05	
75			Shale, dark gray, calcareous, trace sand seams, with shell fragments, occasional pyrite, massive hard	
80				
85				
90				
95				
100				

Contractor: **H/ET**

Remarks:

Continued Next Page

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-12D

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2477149.98 N 7280327.8**

Top of Casing El.: **736.47 ft. msl**
Surface El.: **734.05 ft. msl**
Completion Depth: 121.0 ft.
Date Boring Started: 3/2/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, dark gray, calcareous, trace sand seams, with shell fragments, occasional pyrite, massive hard *(continued)*	
110			623.05	
115			Sand, silty, trace clay, light gray and gray, very fine-grained to fine-grained, dense	
			617.05	
			Siltstone, light gray and gray, hard	
120			615.05	
			Shale, dark gray, hard	
			613.05	
125				
130				
135				
140				
145				
150				

Contractor: **H/ET**

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-13S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2477211.06 N 7280859.86

Top of Casing El.: 733.24 ft. msl
Surface El.: 730.52 ft. msl
Completion Depth: 38.0 ft.
Date Boring Started: 3/3/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, silty, brown to olive, with trace gravel, *ferrous* nodules, with rootlets, firm	
			720.52	
10			Clay, shaley, tan to yellowish brown, and trace gray, with ferrous stains, with slickenedsides, gypsum, hard	
			709.52	
20			Shale, with trace sand, dark gray,carbonaceous, with trace pyrite, hard	
			703.52	
25			Sandstone, light gray, carbonaceous, hard	
			701.02	
30			Shale, with sand, dark gray, carbonaceous, with trace pyrite, hard	
			692.52	
40				
45				
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In *situ*, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-13D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477208.55 N 7280876.82**

Top of Casing El.: **732.86 ft. msl**
Surface El.: **730.40 ft. msl**
Completion Depth: 119.5 ft.
Date Boring Started: 3/3/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, silty, brown to olive, with trace gravel, ferrous nodules, with rootlets, firm	
5				
			720.40	
10			Clay, shaley, tan to yellowish brown, and gray, with ferrous stains, with slickenedsides, gypsum, hard	
15				
20			709.40	
			Shale, with trace sand, dark gray, carbonaceous, with trace pyrite, hard	
25				
			703.40	
			Sandstone, light gray, carbonaceous, hard	
			00.90	
30			Shale, with sand, dark gray, carbonaceous, with trace pyrite, hard	
35				
			690.40	
40			Shale, dark gray, soft rock, glauconitic, pyrite, carbonaceous, with cemented sand seams, with shell fossils, hard	
45				
			680.40	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
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Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-13D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477208.55 N 7280876.82**

Top of Casing El.: **732.86 ft. msl**
Surface El.: **730.40 ft. msl**
Completion Depth: 119.5 ft.
Date Boring Started: 3/3/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, glauconitic, pyrite, carbonaceous, with shell fossils	
60				
65			- with fractures	
			660.40	
70			Shale, dark gray, soft rock, glauconitic, with pyrite, carbonaceous, with shell fragments	
75				
80				
85				
90				
95				
100				

Contractor: H/ET

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-13D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2477208.55 N 7280876.82**

Top of Casing El.: **732.86 ft. msl**
Surface El.: **730.40 ft. msl**
Completion Depth: 119.5 ft.
Date Boring Started: 3/3/2022
Date Boring Completed: 3/28/2022

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, dark gray, soft rock, glauconitic, with pyrite, carbonaceous, with shell fragments *(continued)*	
110				
115			615.40	
		+ + + + + + + + +	Siltstone, and sandstone, light gray, hard	
			613.40	
			Shale, dark gray, soft rock, glauconitic, with pyrite	
120			610.90	
125				
130				
135				
140				
145				
150				

Contractor: **H/ET**

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata *boundaries*. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-16S

Project Description: Texoma Area Solid Waste Authority
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: E 2476269.75 N 7282092.55

Surface El.: 746.30 ft. msl
Completion Depth: 41.0 ft.
Date Boring Started: 11/17/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, tan, yellowish brown, with sand	
25			721.30 Clay, shaley, with sand	
30			713.30 Shale, dark gray, with gypsum and sand, hard	
40			705.30	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
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PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-16D

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2476251.91 N 7282080.68**

Surface El.: **746.33 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/18/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, tan, yellowish brown	
5				
10				
15				
20				
25				
30				
			713.33	
			Shale, dark gray, with siltstone	
35				
40				
45				
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-16D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476251.91 N 7282080.68**

Surface El.: **746.33 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/18/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, dark gray, with siltstone *(continued)*	
60				
65				
70				
75				
80				
85				
90				
95			651.33 Sand, greenish gray, fine grained, with siltstone	
100				

Contractor: **H/ET**

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-16D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2476251.91 N 7282080.68**

Surface El.: **746.33 ft. msl**
Completion Depth: 103.0 ft.
Date Boring Started: 11/18/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
			Sand, greenish gray, fine grained, with siltstone *(continued)*	
			643.33	

105
110
115
120
125
130
135
140
145
150

Contractor: H/ET

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-17S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: Texoma Area Solid Waste Authority
Grayson County

Location: E 2475259.21 N 7282269.4

Surface El.: 746.15 ft. msl
Completion Depth: 50.5 ft.
Date Boring Started: 11/17/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, tan, and light brown, hard	
25			719.65	
			Clay, with sand	
30			714.15	
			Shale, dark gray, hard	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-17S

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2475259.21 N 7282269.4**

Surface El.: **746.15 ft. msl**
Completion Depth: 50.5 ft.
Date Boring Started: 11/17/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
			695.65	
55				
60				
65				
70				
75				
80				
85				
90				
95				
100				

Contractor: **H/ET**

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-18D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2474475.83 N 7282445.52**

Surface El.: **724.60 ft. msl**
Completion Depth: 81.0 ft.
Date Boring Started: 11/17/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown and brown, hard	
10			713.60	
			Shale, with sand, dark gray	
40			684.60	
			Shale, dark gray, hard	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-18D

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2474475.83 N 7282445.52**

Surface El.: **724.60 ft. msl**
Completion Depth: 81.0 ft.
Date Boring Started: 11/17/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, dark gray, hard *(continued)*	
60				
65			659.60 Shale, with sand, greenish gray, wilth siltstone layers	
70				
75				
80			643.60	
85				
90				
95				
100				

Contractor: **H/ET**

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-20S

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472385.98 N 7282855.8**

Surface El.: **754.27 ft. msl**
Completion Depth: 44.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, stiff	
			751.27	
			Clay, silty, with sand seams, ferrous stains	
5				
10				
15				
20				
25				
30				
			721.27	
			Shale, with sand, dark gray, hard	
35				
40				
			710.27	
45				
50				

STATE OF TEXAS
Elizabeth Fleva
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-20D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472366.13 N 7282866.8**

Surface El.: **754.45 ft. msl**
Completion Depth: 111.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
0			Clay, dark brown, stiff	
			751.45	
			Clay, silty, with sand seams, ferrous stains	
30			721.45	
			Shale, with sand, dark gray, hard	
50				

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

Elizabeth Floyd

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222
2/26/2025

Contractor: H/ET

Remarks:

BME

Continued Next Page

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-20D

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Location: **E 2472366.13 N 7282866.8**

Surface El.: **754.45 ft. msl**
Completion Depth: 111.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
55			Shale, with sand, dark gray, hard *(continued)*	
60				
65				
70				
75			679.45 Shale, dark gray, hard	
80				
85			669.45 Shale, with siltstone layers	
90				
95			659.45 Shale, with sand layers, gray and greenish gray	
100				

Contractor: **H/ET**

Remarks:

BME

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

LOG OF PIEZOMETER NO. P-20D

Biggs and Mathews Environmental
1700 Robert Road, Ste 100
Mansfield, Texas 76063-5892
Phone: 817-563-1144

Project Description: **Texoma Area Solid Waste Authority**
Grayson County

Location: **E 2472366.13 N 7282866.8**

Surface El.: **754.45 ft. msl**
Completion Depth: 111.0 ft.
Date Boring Started: 11/19/2023
Date Boring Completed: 11/21/2023

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Piezometer Construction Details
105			Shale, with sand layers, gray and greenish gray *(continued)*	
110			643.45	
115				
120				
125				
130				
135				
140				
145				
150				

Contractor: **H/ET**

Remarks:

TASWA PIEZOMETERS 2025 TASWA2022.GPJ B&M DATA TEMPLATE.GDT 2/7/25

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.
LOGS ARE NOT INTENDED TO BE USED SEPARATELY FROM THE ORIGINAL REPORT.

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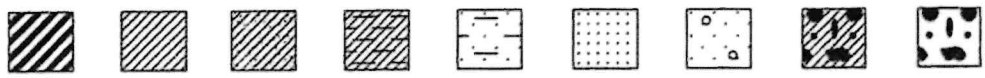
KEY TO SOIL CLASSIFICATION TERMS AND SYMBOLS

SOIL OR ROCK TYPES (shown in symbols column)



Clay | Lean Clay | Clay w/Sand or Sandy Clay | Shaly Clay | Shaly Sand/ Sandstone | Sand/ Sandstone | Gravelly Sand | Clayey Gravel | Gravel



Sandy Gravel | Conglom-erate | Weathered Shale | Shale | Shale w/Sand | Limestone | Solid Waste | Igneous | Volcanic

DRILLING AND SAMPLING SYMBOLS:

A Auger Sample
C Double Tube Core Barrel
D Denison Sample
S Split Barrel Sampler - 2" O.D., unless otherwise noted
Example: 25 = 25 blows/12" after 6" seating interval;
50/7 = 50 blows per 7" after 6" seating interval;
REF = 50 blows <6"

T THD Cone Penetrometer
Example: T60 = 60 blows per 12"
T4.5" = 100 blows per 4.5"
U Thin-walled Tube - 3" O.D., unless otherwise noted
W Wash Sample

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Penetration Resistance Blows/foot	Relative Density
0 - 4	Very loose
4 - 10	Loose
10 - 30	Medium dense
30 - 50	Dense
Over 50	Very dense

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, tsf	Consistency
Less than 0.25	Very soft
0.25 to 0.50	Soft
0.50 to 1.00	Firm
1.00 to 2.00	Stiff
2.00 to 4.00	Very stiff
4.00 and higher	Hard

TERMS CHARACTERIZING SOIL STRUCTURE:

Slickensided:	Having inclined planes of weakness that are slick and glossy in appearance.
Fissured:	Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated:	Composed of thin layers of varying color and texture.
Interbedded:	Composed of alternate layers of different soil types.
Calcareous:	Containing appreciable quantities of calcium carbonate.
Well graded:	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Poorly graded:	Predominantly of one grain size, or having a range of sizes with some intermediate size missing.

DEGREE OF WEATHERING:

Unweathered:	Rock in its natural state before being exposed to atmospheric agents.
Slightly weathered:	Noted predominantly by color change with no disintegrated zones.
Weathered:	Complete color change with zones of slightly decomposed rock.
Severely weathered:	Complete color change with consistency, texture, and general appearance approaching soil.

SUBSURFACE CONDITIONS:

Soil and rock descriptions on the boring logs are a compilation of field data as well as from laboratory testing of samples on those strata for which laboratory classification test results are presented on the boring logs. These classifications are based only on the actual samples tested, and the classification is then assigned to the remainder of the stratum interval based on visual classification. If laboratory classification test results are not presented on the boring log for a particular stratum, then that stratum was classified by visual-manual procedures only. The stratification lines represent the approximate boundary between materials and the transition can be gradual.

Classification of soils based upon visual-manual procedures was performed in general accordance with ASTM Standard D 2488. Classification of soils based upon laboratory test results was performed in general accordance with ASTM Standard D 2487.

Water-level observations have been made in the borings at the times indicated. It must be noted that fluctuations in the groundwater level may occur due to variations in rainfall, hydraulic conductivity of soil strata, construction activity, and other factors.

LOG OF BORING NO. EB-6

Project Description: Proposed Solid Waste Facility

Location:

Surface El.: 739.02 MSL

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			CLAY, brown, moist, yellow-orange, tan & light gray, iron stains, calcareous, fossiliferous											
			735.0											
5			CLAY, yellow-orange, tan & light gray, iron stains, calcareous, fossiliferous											
10														
	C-1					14								
15														
20			717.5											
	C-2		SHALE w/sand, gray to dark gray, soft rock, iron stains, fossiliferous, some calcareously-cemented sandy shale lenses											
25														
30	C-3													
			- increased sand, iron stains 32' - 39'											
35														
			700.0											
40	C-4		SHALE, dark gray, soft rock, massive, occasional sand partings, fossiliferous, carbonaceous											
45														
50														

Completion Depth: 150.0 ft.
Date Boring Started: 12/1/98
Date Boring Completed: 12/2/98
Engineer/Geologist: M. Brown
Project No.: 61710-004.001

Remarks: Borehole grouted upon completion

Continued Next Page

Proj Id: 61710SWT.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. EB-6

Project Description: **Proposed Solid Waste Facility**

Location:
Surface El.: 739.02 MSL

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
50	C-5		SHALE (cont.)			100				73	34	39	92	
55														
60	C-6					84								
65														
70	C-7					95								
75														
80	C-8					96								
85														
			650.0											
90	C-9		SHALY SAND, dark gray, carbonaceous, glauconitic - cemented sandstone layer 90.0' to 90.9'			27								
95														
100														

Completion Depth: 150.0 ft.
Date Boring Started: 12/1/98
Date Boring Completed: 12/2/98
Engineer/Geologist: M. Brown
Project No.: 61710-004.001

Remarks: Borehole grouted upon completion

Continued Next Page

Proj.Id: 61710SWF.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. EB-6

Project Description: Proposed Solid Waste Facility

Location:

Surface El.: 739.02 MSL

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-10		- calcareous shaly sandstone layer 100.0' to 100.5'			80								
			636.0											
			SANDY SHALE, dark gray, w/sand seams, glauconitic, carbonaceous											
105														
110	C-11					66								
115														
120	C-12					96								
			618.0											
			SHALE, dark gray, soft rock, massive, fossiliferous, w/some sandy laminations											
125														
130	C-13					38								
135														
			601.0											
			SAND, light gray, medium to coarse, w/shale seams, shale layer from 148' to 148.5', carbonaceous											
140	C-14					28								
145														
			590.5											
			SANDSTONE, cemented, calcareous											
			589.5											
150			589.0											

Completion Depth: 150.0 ft.
Date Boring Started: 12/1/98
Date Boring Completed: 12/2/98
Engineer/Geologist: M. Brown
Project No.: 61710-004.001

Remarks: Borehole grouted upon completion

Continued Next Page

Proj.Id: 61710SWF.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. F10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 1000.000**
Surface El.: **766.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	W		CLAY, dark brown to olive brown to yellow-orange											
			- olive-brown											
			- yellow-orange											
			762.1											
5			SHALY SAND, yellow-orange, w/cemented sandstone layer 4.5' to 5.0', white calcareous pockets and nodules, purple iron stains											
			757.6											
10	C1		SHALE w/SAND, yellow-orange & olive-gray, soft rock, iron stains, red iron nodules, iron-coated joints, vuggy, diagonal fractures, carbonaceous, glauconitic				59/120							
15			- diagonal fracture w/iron coating					25.2	96.5	52	22	30	94.4	
20	C2						23/120							
25			- shaly sand seam											
30	C3						104/120							
			- mudstone seam											
35			- mudstone seam											
40														

Completion Depth: **95.0 ft.**
Date Boring Started: **3/30/00**
Date Boring Completed: **3/30/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. F10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 1000.000**
Surface El.: **766.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C4		SHALE w/SAND (continued)				52/60							
45	C5						57/60	18.8	106.6	63	25	38	98.1	
50	C6		714.1				109/120							
			SHALE, dark gray, soft rock, **massive, carbonaceous,** fossils											
55			- diagonal fracture											
60	C7						31/60							
65	C8		- diagonal fracture				56/60							
70	C9						89/120							
75			689.6											
			SHALY SAND, gray, soft rock, glauconitic, carbonaceous, w/cemented sandstone seams, sand seams, shale seams											
80														

Completion Depth: **95.0 ft.**
Date Boring Started: **3/30/00**
Date Boring Completed: **3/30/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. F10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 1000.000**
Surface El.: **766.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C10		SHALY SAND (continued)				20/120							
			- cemented sandstone seam 683.8											
			SANDSTONE, tan, soft rock, carbonaceous, glauconitic, laminations, some fossil fragments											
85	C11						44/120							
			678.9											
			SHALE w/SAND, dark gray, w/scattered sand seams, glauconitic, vuggy					17.7		42	19	23		
90														
			671.6											
95														
100														
105														
110														
115														
120														

Completion Depth: **95.0 ft.**
Date Boring Started: **3/30/00**
Date Boring Completed: **3/30/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. F30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 3000.000**
Surface El.: **746.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	W		CLAY, dark brown to olive brown to yellow-orange											
			743.3											
5			SHALY SAND, yellow-orange & olive gray, iron stains; cemented sandstone layer at top											
			- olive-gray											
			737.8											
10	C1		SHALE w/SAND, yellow, yellow-orange & light gray, soft rock, iron stains, iron-cemented seams, carbonaceous, glauconitic, fossils					24.2	90.6	41	20	21	66.1	
15														
20	C2						107/120							
			- calcareous cementation 21.6' to 22.5'					16.1	114.5	38	20	18	59.2	
25														
30	C3						85/120							
35			- diagonal fractures											
40														

Completion Depth: **72.0 ft.**
Date Boring Started: **3/21/00**
Date Boring Completed: **3/21/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted. Elevation estimated when boring moved from original staked location.

Continued Next Page

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. F30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 3000.000**
Surface El.: **746.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C4		SHALE w/SAND (continued)				101/120							
45			700.3											
			SHALE, dark gray, soft rock, **massive**, fossils											
50	C5						55/60							
55	C6		- diagonal fracture				59/60							
60	C7						105/120							
			- diagonal fractures											
65														
			- diagonal fractures											
70	C8						23/24							
			674.3											
75														
80														

Completion Depth: **72.0 ft.**
Date Boring Started: **3/21/00**
Date Boring Completed: **3/21/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted. Elevation estimated when boring moved from original staked location.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. F40

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 4000.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		SHALY SAND w/SANDY SHALE, yellow-orange, iron stains											
			746.1											
			SHALE w/SAND, yellow-orange & light gray, soft rock, iron stains, iron cemented seams, carbonaceous and glauconitic below 18'											
5														
10	C1							20.8	100.6	44	18	26	64.7	
15														
20	C2		- softer shale 20.5' to 23.5'				72/120							
25			- diagonal fracture					39.6	90.9	42	21	21		
			- diagonal fracture											
30	C3						93/120							
			713.6											
35			SHALE, dark gray, soft rock, massive, carbonaceous, fossils											
40														

Completion Depth: **74.0 ft.**
Date Boring Started: **3/23/00**
Date Boring Completed: **3/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted. Elevation estimated when boring moved from original staked location.

Continued Next Page

Proj.ids: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. F40

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 500.000 N 4000.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C4		SHALE (continued)				98/120							
50	C5						68/120							
55														
60	C6						62/120							
65														
			681.4											
70	C7		SHALY SAND w/SANDY SHALE, dark gray, soft rock, glauconitic, carbonaceous, mudstone seams, sand seams, shale seams				11/48							
			- diagonal fractures											
			675.6											
75			SHALE w/SAND, yellow-orange & light gray to gray, soft rock, some yellow & red iron stains, iron coatings along fracture planes, scattered iron cemented sandy seams, vuggy											
			674.6											
80														

Completion Depth: **74.0 ft.**
Date Boring Started: **3/23/00**
Date Boring Completed: **3/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 10' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted. Elevation estimated when boring moved from original staked location.

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 1500.000**
Surface El.: **748.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		SANDY CLAY, dark brown to yellow-brown, very stiff, moist, iron nodules and stains, scattered gravel	4.0										
			746.5											
	U2		SANDY CLAY, yellow-orange to yellow, orange & light gray, hard, slightly moist to dry, iron stains, abundant iron nodules, small calcareous nodules & pockets, blocky, iron-stained joints	4.5+										
	U3			4.5+										
5	U4			4.5+										
	U5			4.5+										
			740.0	4.5+										
	U6		SHALE w/SAND, yellow-orange & light gray to gray, hard, slightly moist, glauconitic, carbonaceous	4.5+										
	U7			4.5+										
10	U8			4.5+										
	U9		- gray below 11.5', massive											
	U10							17.6	110.4	52	21	31	72.7	
15	C1						47/60							
20	C2						65/120							
25			- mudstone seam, fractured											
30	C3						15/60							
			- mudstone seam, fractured											
			713.0											
35	C4		SHALE, dark gray, soft rock, massive, w/incompetent seams, carbonaceous, fossils, pyrite - diagonal fractures 37' to 39'				38/60							
40														

Completion Depth: **100.0 ft.**
Date Boring Started: **3/29/00**
Date Boring Completed: **3/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced w/Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered except as noted. Elevation est. when boring moved from original staked location.

Continued Next Page

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 1500.000**
Surface El.: **748.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C5		SHALE (continued)											
45			- mudstone seam											
50	C6						04/120							
			- diagonal fracture											
			- light gray waxy seam											
55			- diagonal fracture											
60	C7													
65			- mudstone seam, fractured											
			- pyritized wood fragment - diagonal fracture											
			679.9											
			SHALY SAND, fine, gray, soft rock, carbonaceous, glauconitic, w/cemented sandstone seams & layers										32.8	
70	C8						0/24							
	C9		- hard sandstone layer 71.5 - 72.2'				0/36							
			674.0											
75	C10		SHALE w/SAND, dark gray, soft rock, massive, carbonaceous, glauconite, fossils - cemented sandstone seam, 2" thick				23/60							
80														

Completion Depth: **100.0 ft.**
Date Boring Started: **3/29/00**
Date Boring Completed: **3/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced w/Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered except as noted. Elevation est. when boring moved from original staked location.

Continued Next Page

Prob.lit: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 1500.000**
Surface El.: **748.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C11		SHALE w/SAND, (continued)				45/120							
85														
90	C12						70/120							
			- calcareously cemented seam 652.9											
95			SHALE, dark gray, soft rock, massive, carbonaceous, glauconitic, fossils - diagonal fractures below 96.5'					21.9		83	32	51		
			648.0											
100														
105														
110														
115														
120														

Completion Depth: **100.0 ft.**
Date Boring Started: **3/29/00**
Date Boring Completed: **3/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced w/Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered except as noted. Elevation est. when boring moved from original staked location.

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 2500.000**
Surface El.: **762.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, dark gray-brown to yellow-brown, soft to very stiff, moist to slightly moist, iron stains, small calcareous nodules, small round iron nodules, rootlets	0.75										
	U2			1.25										
	U3			2.25										
5	U4			3.5										
	U5			3.5										
	U6			3.5										
			754.4	4.0										
	U7		SHALY CLAY, yellow-tan & light gray, very stiff to hard, slighly moist, iron stains, manganese dioxide, jointed	4.5										
10	U8			4.5										
	U9		- waxy seam	4.5				30.0	91.5	61	27	34	89.9	
	U10			4.5										
15	W													
			744.6											
			SHALY SAND, yellow-orange to yellow & olive-gray, soft rock, iron stains											
20			- yellow-orange calcareous sandstone layer at top											
			- red iron stains				0/60							
25	C1													
			734.2											
			SHALE w/SAND, yellow-orange & gray, soft rock, iron stains, somewhat vuggy, gypsum, carbonaceous, glauconitic				81/120							
30	C2													
								18.5	109.3	52	22	30	87.4	
35			- some calcareous cementation 35.6' to 37.3'											
			- mudstone seam											
40														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/15/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Prolib: TASWA-LGP1

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 2500.000**
Surface El.: **762.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (continued)				93/120							
45								17.7	111.4	58	24	34	99.0	
50	C4						53/60							
			- fractured mudstone seam											
55	C5		706.9				59/60							
			SHALE, dark gray, soft rock, massive, carbonaceous, fossils											
60	C6		- mudstone seam				90/120							
								17.9		72	26	46	99.9	
65														
70	C7						104/120							
			- diagonal fracture											
75			- diagonal fracture											
80														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/15/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 2500.000**
Surface El.: **762.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C8		SHALE (continued)				100/120							
90	C9		671.6				35/60							
			SHALY SAND, gray, soft rock, w/moderate to hard calcareous cementation from 92.5' to 93.9', shale stringers, sand seams, thin mudstone seams, glauconitic					21.5		37	23	14	41.5	
95	C10		664.9				10/60							
100	C11		SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic, vuggy, gypsum - mudstone seam				40/120							
105														
110	C12		- calcareously cemented shaly sandstone 110.0' to 110.8' - calcareous cementation 112.4' to 113.0'				21/120							
115			643.1											
120														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/15/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Prob.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 2500.000**
Surface El.: **762.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C13		SHALE, dark gray, soft rock, massive, carbonaceous, glauconitic				57/60	21		86	32	54	91.2	
125			- diagonal fracture 637.9											
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/15/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 3500.000**
Surface El.: **765.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	U1		CLAY, dark gray-brown to yellowish-brown, firm to very stiff, moist to slightly moist, small calcareous nodules, small iron nodules, rootlets	1.25										
	U2			1.25										
	U3			4.5										
5	U4		759.3	4.0										
	U5		SHALY CLAY, yellow-tan & light gray, very stiff to hard, iron stains, calcareous partings, fossil shell material, manganese dioxide, jointed	4.0										
	U6			2.75										
10	U7			3.25										
	U8			4.25										
	U9			4.5+										
	U10			4.5+				28.9	91.7	69	29	40	80.3	
15	W		746.5											
			SHALY SAND, yellow-orange to yellow & olive gray, soft rock, cemented, calcareous sandstone layer at top, iron stains											
20														
25			738.8											
			SHALE w/SAND, yellow-orange & gray, soft rock, iron stains, w/some thin iron-cemented seams below 30', gypsum, glauconitic below 32', carbonaceous											
30	C1						93/120							
								17.4	107.0	52	21	31	76.5	
35			- diagonal fracture - slight calcareous cementation 36.8' to 38.2'											
40														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj#: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. L35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 3500.000**
Surface El.: **765.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C2		SHALE w/SAND (continued)				10/120							
45														
50	C3						61/120							
			- diagonal fracture											
			- mudstone seam 712.3											
			SHALE, dark gray, soft rock, carbonaceous, massive, fossils											
55			- mudstone seam											
60	C4						88/120							
			- diagonal fracture											
65														
			- diagonal fracture											
			- diagonal fractures 69' to 74'											
70	C5						48/60							
75	C6						58/60							
80														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-LGPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. L35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 3500.000**
Surface El.: **765.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C7		SHALE (continued)				103/120							
85			- diagonal fracture - mudstone seam, 2" thick											
			675.3											
90	C8		SHALY SAND, dark gray, soft rock, shale seams & layers, sand seams, shale stringers, glauconitic, carbonaceous, pyrite - cemented sandy shale 90.0' to 90.7', w/shale stringers, shaly mudstone seams and cemented sandstone seams, diagonal fracture				16/60							
			670.3											
95	C9		SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, massive, shale stringers - mudstone seam				37/60							
100	C10						27/120							
			662.2											
			SHALY SAND, dark gray, very soft rock, glauconitic, carbonaceous											
105			660.1											
			SHALE w/SAND, dark gray, soft rock, w/some sand seams, shale stringers, glauconitic, carbonaceous											
			656.7											
			SHALY SANDSTONE, light gray, hard to moderate rock, glauconitic, shale stringers, calcareous cement											
110	C11		655.4				59/120							
			SHALE w/SAND, dark gray, soft rock, shale stringers, glauconitic, carbonaceous, w/thin sand seams											
115			- diagonal fractures					20.3		66	30	36		
120			- laminated sandy layer 118.9' to 119.5'											

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. L35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1100.000 N 3500.000**
Surface El.: **765.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C12		SHALE w/SAND (continued) 643.3				49/60							
			SHALE, dark gray, soft rock, carbonaceous, massive, fossils 640.3					19.5		67	29	38		
125														
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. P10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 1000.000**
Surface El.: **765.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, **dark gray-brown** to olive-brown, firm to hand, moist to slightly moist, calcareous nodules, small round iron nodules, iron stains, rootlets	1.25										
	U2			2.75										
	U3			4.5										
5	U4			4.5										
	U5			4.5				20.6	102.6	61	21	40	73.6	
	U6			2.5										
			756.4											
	U7		SHALY CLAY, yellow-orange & light gray to olive gray, slightly moist, iron stains, somewhat blocky, fossils, manganese dioxide	4.5										
10	U8			4.5				21.6	98.4	51	22	29	73.0	
	U9			4.5										
	W		- orange-tan cemented sandstone seam											
			749.9											
15			SHALE **w/SAND, olive-gray** & yellow-orange to yellow, gray **& orange, clay** seams, iron stains to 31', glauconitic **below 31', carbonaceous**, scattered mudstone **nodules, pyrite** below 40', fossils											
20														
25														
30	C1						41/120							
35								18.1	101.6	49	23	26	61.8	
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/1/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: **Borehole advanced with Shelby tubes** until refusal at 13.5'. Boring then advanced using **rotary wash** to 30' and **mud-rotary** coring techniques to total depth. Borehole **grouted upon completion. No groundwater** encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-LGP1

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 1000.000**
Surface El.: **765.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C2		SHALE w/SAND (continued)				98/120							
45			- diagonal fractures below 49'											
50	C3		- mudstone seam, 1 1/2" thick				64/120	15.8	111.7	63	23	40	70.2	
55			708.4											
			SHALE, dark gray, soft rock, carbonaceous, massive, fossils, pyrite											
60	C4						72/96							
65														
	C5						24/24							
70	C6						09/120	15.8		75	29	46	83.5	
75														
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/1/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 13.5'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. P10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 1000.000**
Surface El.: **765.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C7		SHALE (continued) - diagonal fractures				59/120							
			679.9											
			SHALY SAND, dark gray, soft rock, glauconitic, shale stringers, sandstone seam, 3" thick											
			678.7											
			SHALE w/SAND, dark gray, soft rock, w/thin sandstone seams, some calcareous cementation, glauconitic, carbonaceous, sand seams, pyrite, fossils										84.8	
90	C8						18/120							
95														
100	C9						32/120							
			662.4											
			SHALY SANDSTONE, light gray & dark gray, hard rock, w/shale stringers, glauconitic, laminations											
			660.9											
105			SHALY SAND, dark gray, soft rock, shale stringers, calcareously-cemented seams, glauconitic, carbonaceous, tan sand seams											
110	C10						8/48							
			654.4											
			SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, w/shale seams, sand seams - diagonal fractures				52/72							
115	C11							11.9		66	26	40	87.2	
			645.4											
120														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/1/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 13.5'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-LGPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. P20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 2000.000**
Surface El.: **761.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, dark gray-brown to olive brown & yellow-orange, stiff to very stiff, moist to slightly moist, iron stains, small rounded iron nodules, calcareous nodules & calcareous pockets, rootlets	2.25										
	U2			3.5										
	U3			4.0										
5	U4			4.5										
			755.1	4.5										
	U5		SHALY CLAY, yellow-orange, tan & light gray, very stiff to hard, iron stains, calcareous pockets, manganese dioxide, laminated, jointed, fossil shell material, somewhat blocky	4.5+										
	U6			4.5+										
	U7		- waxy seam	4.5+										
10	U8			4.5+										
	U9			4.5+										
	U10			4.5+				22.3	92.1	76	32	44	84.2	
15	W		745.6											
			SHALY SAND, yellow-orange to yellow & olive gray, soft rock, iron stains - yellow-orange calcareous sandstone layer 16.0' to 16.5'											
20	C1						0/60							
			736.0				37/60							
25	C2		SHALE w/SAND, gray, soft rock, iron stains at top to 29.5', glauconitic, thin gypsum seams, fossils											
30	C3		- massive below 30'				107/120							
			- mudstone nodule											
35			- calcareous cementation 34.1' to 35.1'					14.7	108.9	51	21	30	71.8	
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/14/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. P20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 2000.000**
Surface El.: **761.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C4		SHALE w/SAND (continued)				95/120	15.0	119.4	49	21	28	84.1	
50	C5		- mudstone seams below 54' - diagonal fracture				106/120							
55			701.6											
60	C6		SHALE, dark gray, soft rock, massive, fossils, carbonaceous, pyrite				94/120							
65														
70	C7		- diagonal fracture				58/60							
75	C8													
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/14/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 2000.000**
Surface El.: **761.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C9		SHALE (continued) - mudstone seam, fractured				91/120							
			673.4											
			SANDY SHALE, dark gray, soft rock, glauconitic 672.9											
			SANDSTONE, light green-gray, hard rock, calcareously-cemented, glauconitic, w/some shale stringers 671.8											
90	C10		SHALY SAND, dark gray, soft rock, shale seams & layers, sand seams, sandstone seams, glauconitic				40/120	18.9		52	24	28		
95			655.2											
			SHALE w/SAND, dark gray, soft rock, glauconitic, massive, fossils, vuggy 107' to 115'											
100	C11						49/120							
105														
110	C12		- calcareous cementation											
115			644.3											
			SHALE, dark gray, soft rock, glauconitic, massive, fossils											
120			641.6											

Completion Depth: **120.0 ft.**
Date Boring Started: **3/14/00**
Date Boring Completed: **3/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 3000.000**
Surface El.: **763.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		CLAY, dark gray-brown to yellow-brown, firm to very stiff, moist to slightly moist, small iron nodules, iron stains, rootlets											
5			757.3											
			SHALY CLAY, yellow-orange & light gray, very stiff, slightly moist, iron stains, manganese dioxide, slickensides, fossils, some gypsum											
10														
15														
			744.3											
20			SHALY SAND w/SANDY SHALE, yellow-orange to yellow & olive gray, iron stains - calcareous sandstone layer at top - yellow & olive gray											
			738.8											
25	C1		SHALE w/SAND, yellow, orange, & olive gray, soft rock, iron stains, scattered iron-cemented seams, gypsum, glauconitic below 30', carbonaceous				47/60							
30	C2						81/120	18.2	109.6	51	22	29	89.9	
35			- calcareous cementation 36' to 37'											
40														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/17/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 3000.000**
Surface El.: **763.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (continued)				12/120							
45								15.3	112.4	58	25	33	93.5	
			713.8											
50	C4		SHALE, dark gray, soft rock, carbonaceous, massive, w/incompetent layers, fossils				7/60							
			- mudstone seam, fractured											
55	C5		- mudstone seam				37/60							
60	C6		- more competent below 62'				38/60							
65	C7		- diagonal fracture				58/60							
			- diagonal fracture											
70	C8						85/120							
75														
80														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/17/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 3000.000**
Surface El.: **763.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C9		SHALE (continued)				56/60							
85	C10						55/60							
			674.6											
90	C11		SHALY SAND, dark gray, soft rock, glauconitic, carbonaceous, w/shale seams, sand seams, mudstone seams, fine-grained				29/120						33.2	
			- calcareous sandstone layer, 7" thick											
95			667.6											
			SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, w/shale seams, sand seams, mudstone seams, shale stringers											
100	C12						26/120							
105														
110	C13		- calcareous cementation 110.0' to 110.5'				55/120							
115			- gray mudstone seam & diagonal fracture - diagonal fracture											
120			- diagonal fracture											

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/17/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 3000.000**
Surface El.: **763.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C14		SHALE w/SAND (continued)				56/60							
			- diagonal fractures							54	20	34	80.9	
125			638.8											
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/16/00**
Date Boring Completed: **3/17/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj#: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P40

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 4000.000**
Surface El.: **762.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		CLAY, dark gray-brown to yellowish-brown, firm to very stiff, moist to slightly moist, small calcareous nodules, small iron nodules, rootlets											
5			756.0											
			SHALY CLAY, yellow-tan & light gray, very stiff to hard, iron stains, calcareous partings, fossil shell material, manganese dioxide, jointed											
10			750.5											
			SHALY SAND w/SANDY SHALE, yellow-orange, soft rock, iron stains - calcareous sandstone layer at top - olive gray											
15			747.0											
	C-1		SHALE w/ SAND. olive gray, yellow-orange, & yellow, iron stains, carbonaceous, glauconitic below 35'				10/60							
20	C-2		59/120 - diagonal fractures w/iron-cemented coatings 20.5' to 27.0'					30.9	95.2	48	21	27	63.8	
			- vertical fracture, iron-cemented											
25														
			- diagonal fractures 30.0' to 34.5'											
30	C-3		99/120 - vertical fracture w/iron coating											
35														
								18.8		56	23	33	89.2	
40														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/22/00**
Date Boring Completed: **3/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 15' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Projid: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P40

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 4000.000**
Surface El.: **762.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C-4		SHALE w/SAND, (continued) - high-angle fracture - mudstone seams 44.5' to 46.0' - high-angle fracture				15/120	16		49	24	25	61.6	
50	C-5		- diagonal fracture				85/120							
			708.5 SHALE, dark gray, soft rock, **massive**, carbonaceous, fossils											
55														
60	C-6		- diagonal fracture				58/60							
65	C-7		- mudstone seam				47/60							
70	C-8		- diagonal fracture				10/120							
75			- mudstone seam - diagonal fracture											
80														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/22/00**
Date Boring Completed: **3/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 15' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.fil: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. P40

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 1500.000 N 4000.000**
Surface El.: **762.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-9		SHALE, (continued) - diagonal fracture 680.0				42/96							
85			SHALE w/SAND, dark gray & light gray, soft to hard rock, glauconitic, carbonaceous, w/some sandy mudstone seams, sand seams; cemented shaly sand seam at 83'; calcareous sandstone layer 84.4' to 85.0', shale layers & seams 674.0											
90														
95														
100														
105														
110														
115														
120														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/22/00**
Date Boring Completed: **3/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 15' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1000.000**
Surface El.: **762.2 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, gray-brown to yellow-brown & gray, firm to very stiff, moist to slightly moist, iron nodules, calcareous nodules, iron stains, rootlets	1.0										
	U2			3.5										
	U3			4.5										
5	U4		- yellow-orange & gray	4.5										
	U5			4.5										
	U6			2.5										
			753.2											
10	U7		SHALY CLAY, tan, yellow-orange & light gray, iron stains, fossils, jointed, manganese dioxide	4.5				31.4	90.8	82	32	50	90.0	
	U8			3.25										
	U9			4.5										
	U10		- orange & light gray waxy seam	4.5										
15	W													
			742.7											
20			SHALY SAND, tan & yellow-orange & olive-gray, soft rock, iron stains, cemented sandstone seam at top, vuggy, w/lightly cemented sandstone seams											
	C1						47/84							
			737.2											
25			SHALE w/SAND, light gray to gray, yellow & orange to gray & red-orange, soft rock, iron stains, fossils, gypsum, glauconitic, carbonaceous											
30	C2						104/120							
35														
								16.8	114.2	40	18	22	72.2	
40														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/3/00**
Date Boring Completed: **3/3/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1000.000**
Surface El.: **762.2 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (continued)				90/120							
45			- fractured mudstone seam - mudstone seam											
50	C4						90/120							
55														
			- diagonal fracture											
60	C5						92/120							
65			696.0											
			SHALE, dark gray, soft rock, massive, fossils - vertical fracture approximately 9" long - diagonal fracture											
70	C6						47/60							
			- diagonal fractures 73' to 80'											
75	C7						30/60							
			- mudstone seam											
80														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/3/00**
Date Boring Completed: **3/3/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.Id: TASWA-LGPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1000.000**
Surface El.: **762.2 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C8		SHALE (continued)				70/96							
			674.2											
90														
95														
100														
105														
110														
115														
120														

Completion Depth: **88.0 ft.**
Date Boring Started: **3/3/00**
Date Boring Completed: **3/3/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.Id: TASWA-LGP1

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1500.000**
Surface El.: **747.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	U1		CLAY, dark brown to grayish brown, stiff to firm, moist, scattered small calcareous nodules, rootlets	2.25										
	U2			1.25										
	U3			1.5				27.7	88.9	62	23	39		
			742.5											
5	U4		CLAY, tan, light gray & orange, firm to hard, moist to dry, iron stains, fine-grained calcareous deposits, fossils	1.75										
			741.5	4.5										
	U5		SHALY CLAY, tan, light gray & orange, hard, dry, iron stains, fossils, manganese dioxide, calcareous partings, blocky, jointed, gypsum, mottled	4.5										
	U6			4.5										
	U7			4.5										
10	U8			4.5										
			734.7	2.75										
	U9		SHALY SAND, tan, yellow-orange & olive-gray, moist, soft rock, cemented sandstone seam at top, iron stains, vuggy, w/sand, sandstone, & clay seams				0/24							
	C1													
15	C2						0/60							
20	C3						73/120							
			726.1											
			SHALE w/SAND, gray to dark gray, slightly vuggy, soft rock, glauconitic, some gypsum, mudstone nodules, fossils											
25														
30	C4						78/120							
								13.4	79.0	51	15	36	83.5	
			- calcareous cementation 31.9' to 33.0'											
35														
			- diagonal fractures 36.0 ' to 40.0'											
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/2/00**
Date Boring Completed: **3/2/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 13'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1500.000**
Surface El.: **747.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C5		SHALE w/SAND (continued)				108/120							
			697.0											
50	C6		SHALE, dark gray, soft rock, massive, **fossils**, mudstone seams				94/120							
			- mudstone seam, 1 1/2" thick											
			- mudstone seam, 1 1/2" thick											
55			- mudstone seam, 1" thick											
			- mudstone seam											
60	C7						79/120							
			- diagonal fracture											
65			- diagonal fracture											
70	C8						26/60							
75	C9						27/60							
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/2/00**
Date Boring Completed: **3/2/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 13'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 1500.000**
Surface El.: **747.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C10		SHALE (continued)				35/60							
85	C11		660.6				23/60							
			SHALY SAND, dark gray, soft rock, glauconitic, w/sand seams, shale stringers, cemented sandstone seam at top											
90	C12		653.7				41/120							
			SHALE w/SAND, dark gray, soft rock, glauconitic, w/sand seams, shale stringers, cemented sandstone seam at top, scattered mudstone nodules, fossils											
95														
100	C13						67/120							
105			- cemented shaly sandstone 104.4' to 105.0'											
			- cemented shaly sandstone 107.4' to 108.2'											
110	C14						38/120							
115			629.5											
			SHALE, dark gray, soft rock, massive, fossils, mudstone seams							75	25	50	92.7	
120			627.0											

Completion Depth: **120.0 ft.**
Date Boring Started: **3/2/00**
Date Boring Completed: **3/2/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 13'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Project: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 2500.000**
Surface El.: **765.5 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	U1		CLAY, dark gray-brown to yellow-orange, brown & light gray, firm to very stiff, moist to slightly moist, iron stains	1.5										
	U2			1.75										
	U3			4.25										
5	U4		- yellow-orange, w/calcareous nodules below 4.3'	4.5										
			760.0											
	U5		- waxy seam SHALY CLAY, yellow-orange & light gray, very stiff, blocky, jointed, manganese dioxide stains, gypsum	4.0										
	U6			4.5										
	U7			3.0										
10	U8			4.25										
	U9			4.0										
	U10			3.75										
15	W													
20														
25														
			737.5											
			SHALY SAND, yellow-orange to yellow & gray, soft rock, iron stains, lightly cemented, sand seams											
30	C1		- w/yellow-tan sandstone seams 28.0' to 28.5'				48/120							
			- yellow & gray below 33.5'											
35			729.8											
			SHALE w/SAND, gray, soft rock, carbonaceous, fossils, pyrite, glauconitic below 55'					17.2	110.6	47	21	26	73.1	
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/9/00**
Date Boring Completed: **3/13/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 2500.000**
Surface El.: **765.5 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C2		SHALE w/SAND (continued)				58/60							
45	C3		- light gray mudstone seam - calcareous cementation 46.4' to 47.3'				48/60							
50	C4						109/120							
			- mudstone seam					16.1		56	24	32	92.0	
55														
60	C5		- mudstone seam				99/120							
			- diagonal fracture											
65														
			- laminated glauconitic sandstone seam, w/pyrite											
70	C6						53/120							
			693.5 SHALE, dark gray, soft rock, massive, fossils											
75														
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **3/9/00**
Date Boring Completed: **3/13/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 2500.000**
Surface El.: **765.5 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C7		SHALE (continued)				99/120							
90	C8						103/120							
95														
100	C9		SHALY SAND, dark gray, soft rock, w/sand seams & layers, shale seams & layers, mudstone seams, cemented sandstone seams, glauconitic				15/120	20.3		50	27	23	54.2	
105			665.2											
110	C10		SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic, fossils, some shaly sand seams				69/120	18.5		65	27	38		
115			657.2											
120			645.5											

Completion Depth: **120.0 ft.**
Date Boring Started: **3/9/00**
Date Boring Completed: **3/13/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 30' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3000.000**
Surface El.: **758.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		CLAY, dark gray-brown to yellowish-brown, firm to very stiff, moist to slightly moist, small calcareous nodules, small iron nodules, rootlets											
5			752.1											
			SHALY CLAY, yellow-orange & light gray, very stiff to hard, iron stains, calcareous partings, fossil shell material, manganese dioxide, jointed											
10														
15														
20			736.6											
			SHALY SAND w/SANDY SHALE, yellow-orange & tan to yellow & olive gray, iron stains, calcareously cemented sandstone layer at top											
25	C-1		- olive gray				26/60							
			730.6											
			SHALE w/SAND, yellow, yellow-orange, & light gray, soft rock, vuggy, iron stains, some iron-cemented seams, gypsum, glauconitic											
30	C-2						60/120							
			- red iron stains											
35			- no iron stains below 35.5'					17.1	109.8	45	20	25	84.0	
40														

Completion Depth: **85.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/21/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

ProLib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3000.000**
Surface El.: **758.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-3		SHALE w/SAND (continued)				103/120							
45								14.4		48	20	28	91.5	
50	C-4						93/120							
			- mudstone seam											
			704.6											
			SHALE, dark gray, soft rock, massive, carbonaceous, fossils											
55			- mudstone seam											
			- mudstone seam											
60	C-5		- mudstone seam				102/120							
65														
70	C-6		- diagonal fracture				12/120							
			- mudstone seam											
			- diagonal fracture											
75			- mudstone seam											
80														

Completion Depth: **85.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/21/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.fil: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3000.000**
Surface El.: **758.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-7		SHALE (continued)				59/60							
			673.1											
85														
90														
95														
100														
105														
110														
115														
120														

Completion Depth: **85.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/21/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 25' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.tdt: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3500.000**
Surface El.: **755.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, dark gray-brown to dark yellow-brown, stiff to very stiff, moist to slightly moist, iron stains, calcareous nodules, some small iron nodules, rootlets	2.25										
	U-2			2.75										
	U-3			3.75										
5	U-4		749.5	4.25										
	U-5		SHALY CLAY, yellow-tan & light gray, very stiff to hard, slightly moist, iron stains, fine-grained, calcareous partings & pockets, manganese dioxide, jointed, fossils	4.5+										
	U-6			4.5+										
	U-7			4.5+										
10	U-8		- waxy seam, blocky, orange	4.5+										
	U-9			4.5										
	U-10		740.3	3.0										
15	W		SHALY SAND w/SANDY SHALE, yellow-orange to yellow & olive gray, iron stains - calcareous sandstone layer at top, fractured											
			736.5											
20	C-1		SHALE w/SAND, yellow, orange, & light olive gray, soft rock, iron stains, thin iron-cemented seams, gypsum, glauconitic below 34'				71/120							
25								20.3	104.2	48	21	27	74.1	
			- diagonal gypsum-filled fractures											
30	C-2						78/120							
35			- sand seam											
40														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3500.000**
Surface El.: **755.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-3		SHALE w/SAND (continued)				01/120							
			- diagonal fracture											
			- mudstone seam 710.0											
45			SHALE, dark gray, soft rock, massive, pyrite, carbonaceous, mudstone seams											
50	C-4						100/120							
			- diagonal fracture											
55														
			- diagonal fracture											
60	C-5						31/60							
			- diagonal fractures											
65	C-6						37/60							
70	C-7						81/120							
			- diagonal fracture											
75														
80														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Project: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3500.000**
Surface El.: **755.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-8		SHALE (continued)				34/60							
85	C-9		669.3				21/60							
			SHALY SAND w/SANDY SHALE, dark gray, soft rock, glauconitic, shale stringers, carbonaceous, sand seams, shale seams, sandy mudstone seams - cemented shaly sandstone layer 86.2' to 86.9'											
90	C-10		- mudstone seam - sandstone seam				27/120							
			662.3 SHALE w/SAND, dark gray, soft rock, massive, glauconitic, pyrite, fossils, mudstone nodules, vuggy											
95														
100	C-11						41/120							
105			- calcareous cementation 105.4' to 106.2'											
			645.0											
110	C-12		SHALE, dark gray, soft rock, massive, pyrite, carbonaceous				21/120							
115														
120														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. U35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2000.000 N 3500.000**
Surface El.: **755.0 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-13		SHALE (continued)				57/60							
			- diagonal fracture					17.6		77	28	49		
125			630.0											
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **125.0 ft.**
Date Boring Started: **3/20/00**
Date Boring Completed: **3/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-LGP1

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. Z10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 2500.000 N 1000.000**
Surface El.: **764.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, dark brown to gray-brown, firm to very stiff, moist to slightly moist, small iron nodules, iron stains, rootlets	1.0										
	U2			4.25				25.3	98.1	62	20	42	77.2	
	U3		760.2	4.25										
5	U4		CLAY, yellow brown & light gray, very stiff, slightly moist, iron stains, small iron nodules	4.0										
	U5			3.25										
	U6			3.25										
	U7		- waxy layer	3.25										
10	U8		753.7	3.5										
	U9		SHALY CLAY, yellow-tan & light gray, very stiff, slightly moist, iron stains, gypsum, fine-grained gypsum partings, slickensides, fossils, manganese dioxide	3.5										
	U10			3.75										
15	U11			2.75										
	U12			3.5										
	U13			3.75										
20	W						11/120							
	C1													
25			736.2											
30	C2		SHALE, dark brownish-gray, soft rock, carbonaceous, laminated, fossils, light brown silty clay seam at 29'				60/120							
			730.5											
35			SHALY SANDSTONE, gray, hard to medium rock, carbonaceous											
			729.1											
			SHALY SAND, gray, soft rock, glauconitic, pyrite											
40			724.7											

Completion Depth: **133.0 ft.**
Date Boring Started: **2/2/00**
Date Boring Completed: **2/3/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 19.5'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Proj.id: TASWA-LGP1
EMCON
E2.164

LOG OF BORING NO. JJ15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 1500.000**
Surface El.: **756.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, gray-brown to olive-brown & gray, stiff, moist to slightly moist, calcareous nodules, small round iron nodules, iron stains, rootlets	2.25										
	U2			1.0										
	U3			2.75										
5	U4		750.3	4.5										
	U5		SHALY CLAY, yellow-brown & gray, hard, slightly moist to dry, iron stains, manganese dioxide, jointed, blocky, fossils, gypsum	4.5										
	U6			4.25										
	U7			4.25										
10	U8			3.5										
	U9			3.25										
	U10			3.75				32.1	91.1	74	30	44	94.5	
15	W													
20														
25			- dark brown seams											
			- gypsum seam											
30			725.8											
	C1		SHALY SAND, olive-brown to yellow & gray, soft rock, iron stains, thin gypsum seams				0/36							
35	C2						36/60							
			719.7											
40			SHALE w/SAND, gray, soft rock, somewhat vuggy, w/thin gypsum seams, glauconitic, carbonaceous, pyrite											

Completion Depth: **82.0 ft.**
Date Boring Started: **2/29/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with **Shelby tubes to** 15'. Boring then advanced using rotary wash to 32' and mud-rotary **coring techniques to** total depth. Borehole grouted upon completion. No groundwater **encountered during** drilling except as noted.

Continued Next Page

Proj.id: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 1500.000**
Surface El.: **756.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (continued)				108/120							
								16.2	117.6	45	20	25	84.8	
45			- sandy shale layer at 45'											
			- calcareous-cementation 45.7' to 46.2'											
50	C4						105/120							
			- calcareous cementation 50.7' to 52.2'											
			- vertical joint 52.2' to 53.5', faint iron stains											
55			- iron stains											
			- clayey seam											
60	C5		- diagonal fracture				75/120							
			- shaly sand layer 60.0' to 60.7'											
			- diagonal fracture											
			- fractured carbonaceous seam											
65			- mudstone seam, 1" thick											
			- mudstone seam, 2 1/2" thick											
70	C6						95/120							
			682.3											
75			SHALE, dark gray, soft rock, massive, fossils, pyrite											
80														

Completion Depth: **82.0 ft.**
Date Boring Started: **2/29/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 32' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 1500.000**
Surface El.: **756.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C7		SHALE (continued)				0/24							
			674.3											
85														
90														
95														
100														
105														
110														
115														
120														

Completion Depth: **82.0 ft.**
Date Boring Started: **2/29/00**
Date Boring Completed: **3/1/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 32' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 2000.000**
Surface El.: **749.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, olive brown, soft to firm, moist, calcareous nodules, rootlets	0.75										
	U2		747.1	1.0										
	U3		SHALY CLAY, tan, orange & gray, very stiff to hard, slightly moist, fine-grained calcareous partings, slickensides, iron stains, jointed, fossils, blocky, manganese dioxide, some laminations	4.5										
5	U4			4.5+										
	U5			4.5+										
	U6			3.5										
	U7			4.5+										
10	U8			4.5										
	U9			4.5+				30.8	89.0	71	28	43	92.8	
	U10			4.5+										
15	C1						0/120							
20														
	C2						14/120							
			725.6											
25			SANDY CLAY, tan to olive & gray, hard, cemented sandstone seams at top, yellow iron stains, vuggy, thin gypsum seams											
30	C3		716.6				102/120							
			SHALE w/SAND, dark gray, soft rock, iron stains at top, thin gypsum seams											
35														
40														

Completion Depth: **132.0 ft.**
Date Boring Started: **1/24/00**
Date Boring Completed: **1/25/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Proj.lib: TASWA-1.GPJ

EMCON

LOG OF BORING NO. JJ20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 2000.000**
Surface El.: **749.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C4		SHALE w/SAND (continued) - calcareous cementation 44' to 45'				92/120	15.9		43	21	22	83.7	
50	C5						105/120							
55			690.6											
60	C6		SHALE, dark gray, soft rock, fossils, carbonaceous, some pyrite, trace amounts of glauconitic sand, massive				98/120	17.5		65	26	39	92.3	
65			- diagonal fracture											
70	C7						111/120							
75														
80			- diagonal fracture											

Completion Depth: **132.0 ft.**
Date Boring Started: **1/24/00**
Date Boring Completed: **1/25/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries.
In situ, the transition may be gradual.

LOG OF BORING NO. JJ20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: E 3500.000 N 2000.000
Surface El.: 749.6 MSL

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALE (continued)											
	C8		- diagonal fracture				84/120							
85														
			- diagonal fracture											
90														
	C9						83/120							
95			- diagonal fracture											
			650.3											
100			SHALY SAND, dark gray, soft rock, carbonaceous, glauconitic, w/sand seams, sandstone seams											
	C10						22/120							
			645.6											
105			SHALE w/SAND, dark gray, soft rock, glauconitic, calcareously cemented sandstone near top										82.9	
110			- mudstone seam											
	C11						34/120							
115														
120														

Completion Depth: 132.0 ft.
Date Boring Started: 1/24/00
Date Boring Completed: 1/25/00
Engineer/Geologist: M. Brown
Project No.: 805645

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Proj.lib: TASWA-1.GPJ

EMCON

LOG OF BORING NO. JJ20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 2000.000**
Surface El.: **749.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
125	C12		SHALE w/SAND, (continued) -cemented seam				36/120							
			621.0											
130			SHALE, dark gray, soft rock, fossil shell material - diagonal fractures											
			617.6											
135														
140														
145														
150														
155														
160														

Completion Depth: **132.0 ft.**
Date Boring Started: **1/24/00**
Date Boring Completed: **1/25/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 2500.000**
Surface El.: **739.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		CLAY, dark gray-brown to yellow-orange & olive gray, firm to hard, moist to slightly moist, iron stains, small iron nodules & calcareous webbing											
5			732.8											
			SHALY CLAY, yellow-orange & light gray, hard, slightly moist to dry, iron stains, calcareous partings, manganese dioxide, gypsum											
10														
15			719.8											
20	C1		SHALE, dark gray-brown, soft rock, carbonaceous, horizontal laminations, fossil shell material				42/60							
			- light gray waxy seam, thin											
			715.3											
			SANDSTONE, light gray, hard rock, calcareously cemented, carbonaceous, w/shale stringers											
25	C2		714.2				15/60							
			SHALE w/SAND, gray, soft rock, carbonaceous, w/shaly sand seams, glauconitic, carbonaceous, pyrite pockets					17.4	111.0	36	20	16	54.9	
30	C3						11/120							
35														
40														

Completion Depth: **65.0 ft.**
Date Boring Started: **3/27/00**
Date Boring Completed: **3/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Prot.dit: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 2500.000**
Surface El.: **739.3 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C4		SHALE w/SAND (continued)				02/120	16.0	108.4	37	19	18	56.7	
			- some calcareous cementation 43.7' to 46.0'											
50	C5		- light gray mudstone seam				76/120	15.6		48	21	27	87.3	
55			- mudstone seam											
60	C6						56/60							
65			674.3											
70														
75														
80														

Completion Depth: **65.0 ft.**
Date Boring Started: **3/27/00**
Date Boring Completed: **3/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Prof id: TASWA-LGPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 3000.000**
Surface El.: **732.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	W		CLAY, dark gray-brown to olive-brown, firm to hard, moist to slightly moist, iron stains, small iron nodules, small calcareous nodules & calcareous webbing											
			726.3											
5			SHALY CLAY, yellow-orange & light gray, hard, slightly moist to dry, iron stains, calcareous partings, manganese dioxide, gypsum											
10			721.8											
			SHALE, dark gray-brown, soft rock, carbonaceous											
			720.3											
15	C1		SHALY SAND, yellow orange & gray, hard to soft rock, w/yellow-orange sandstone layers at top, iron stains, pyrite, glauconitic, vuggy - gray cemented sandstone seam, carbonaceous - shale layer 14.1' to 14.8' - moderately cemented sandstone layer 14.8' to 15.3'				11/72							
20	C2		711.3				59/120							
			SHALE w/SAND, dark gray, soft rock, carbonaceous, glauconitic, pyrite, fossils											
25			- sandy shale layer 28' to 29'					15.4		48	20	28	83.5	
30	C3						91/120							
			- some calcareous cementation 32.3' to 34.1'											
35														
40														

Completion Depth: **115.0 ft.**
Date Boring Started: **3/28/00**
Date Boring Completed: **3/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 14' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Proj.lib: TASWA-1.GPJ

EMCON

LOG OF BORING NO. JJ30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 3000.000**
Surface El.: **732.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C4		SHALE w/SAND (continued)				97/120							
			- gray mudstone seam											
45			- mudstone seam, fractured											
			- mudstone seam											
50	C5						80/120							
			- shell hash seam w/gastropods											
			- mudstone seam 1-1/2" thick											
55														
			674.8											
			SHALE, dark gray, soft rock, massive, carbonaceous. fossils											
60	C6						76/120							
65														
70	C7						32/60							
75	C8						28/60							
80														

Completion Depth: **115.0 ft.**
Date Boring Started: **3/28/00**
Date Boring Completed: **3/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 14' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. JJ30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 3500.000 N 3000.000**
Surface El.: **732.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C9		SHALE (continued)				46/120							
			645.7											
90	C10		SHALY SAND, gray, very soft rock, shale seams, sand seams & layers, carbonaceous, glauconitic				4/96							
95			635.3											
	C11		SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, w/sand seams, mudstone seam				8/24							
100	C12		633.6 SHALY SAND, gray, very soft rock, shale seams, sand seams & layers, carbonaceous, glauconitic, mudstone seams				6/120							
105			626.8											
110	C13		SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, w/sand seams				0/60			37	18	19		
			- calcareously cemented sandstone layer 112.5' to 113.2'											
115			617.8											
120														

Completion Depth: **115.0 ft.**
Date Boring Started: **3/28/00**
Date Boring Completed: **3/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with rotary wash to 14' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

Proj.id: TASWA-1.GPJ

EMCON

LOG OF BORING NO. OO10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 1000.000**
Surface El.: **754.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, dark grayish-brown to brown, very stiff, slightly moist, some small calcareous nodules at bottom	4.0										
	U-2			4.25										
			751.5											
	U-3		CLAY, orange-tan & light gray, very stiff to hard, slightly moist, yellow-orange iron stains, fossil shell material, fine-grained gypsum, somewhat blocky, some slickensides, manganese dioxide	4.5+										
5	U-4			3.0										
	U-5			4.5										
			747.6											
	U-6		SHALY CLAY, orange-tan & light gray, very stiff to hard, slightly moist, fossiliferous, fine-grained gypsum partings, yellow-orange iron stains, jointed, manganese dioxide, gypsum	4.5										
	U-7		- increased clay content 9' to 11'	4.5+										
10	U-8			4.25										
	U-9			4.25										
	U-10			4.5+										
15	U-11			4.5				28.4	90.4	64	26	38	93.5	
	W		- w/some brown carbonaceous clay seams below 17'											
20														
25														
			726.1											
	C-1		SHALY SAND, brownish-gray & yellow to gray & yellow, soft rock, orange & yellow iron stains, cemented sandstone seams				4/120							
30														
			721.6											
			SHALE w/SAND, gray, soft rock, glauconitic, sandy shale seams, fossils											
35														
	C-2						61/120							
40														

Completion Depth: **80.0 ft.**
Date Boring Started: **2/11/00**
Date Boring Completed: **2/11/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 16.5'. Boring then advanced using rotary wash to 29' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 1000.000**
Surface El.: **754.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALE w/SAND (continued)											
			- calcareously cemented layer 42.2' to 43.2'											
45			- calcareously cemented layer 45.6' to 46.5' - cemented mudstone seam					14.6		46	19	27	82.4	
	C-3						102/120							
50														
			- some yellow-orange iron stains											
55														
	C-4						72/126							
60			- mudstone seam, fractured											
65														
	C-5		- diagonal fracture				115/126							
70														
			681.1											
			SHALE, dark gray, soft rock, massive, fossils											
75														
			674.6											
80														

Completion Depth: **80.0 ft.**
Date Boring Started: **2/11/00**
Date Boring Completed: **2/11/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 16.5'. Boring then advanced using rotary wash to 29' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual

LOG OF BORING NO. 0015

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 1500.000**
Surface El.: **745.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, grayish-brown, firm to stiff, moist, small calcareous nodules, rootlets	1.0										
	U-2			2.75										
			742.8											
	U-3		CLAY, orange-tan & light gray, hard, slightly moist, iron stains, jointed, blocky, slickensides, fossils,	4.5+										
5	U-4		gypsum	4.5+				27.4	92.4	78	29	49	83.8	
			739.3	4.5										
	U-5		SHALY CLAY, orange-tan & light gray, very stiff to hard, slightly moist to very slightly moist, iron stains, fossils, gypsum, somewhat blocky, manganese dioxide, gypsum partings	3.25										
	U-6			4.0										
	U-7													
10	U-8			4.5										
	U-9			4.5+										
	U-10			4.5+										
15	W													
			- gypsum seam											
20			723.8											
			SHALY SAND, light gray, orange, & yellow, soft rock, orange & yellow iron stains, vuggy				0/84							
	C-1													
25			717.8											
			SHALE w/SAND, gray to dark gray, soft rock, glauconitic, w/shaly sand seams, gypsum, pyrite											
30	C-2						44/120							
								16.2	112.8	51	20	31	77.2	
35														
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **2/23/00**
Date Boring Completed: **2/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj#: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 1500.000**
Surface El.: **745.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-3		SHALE w/SAND (continued)				75/120							
45			- vertical fractures											
50	C-4		- vertical fracture 6" long - mudstone seam				15/120							
55														
60	C-5						46/60							
65	C-6			680.1			53/60							
			SHALE, dark gray, soft rock, carbonaceous, some pyrite, massive, fossils											
70	C-7						56/60							
75	C-8		- diagonal fracture - light gray clayey seam				56/60							
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **2/23/00**
Date Boring Completed: **2/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 1500.000**
Surface El.: **745.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C-9		**SHALE** (continued)				12/120							
90	C-10		- pyrite-healed diagonal fracture				56/120							
			650.6											
95			**SHALY SAND**, light gray, soft rock, lightly cemented, laminated, carbonaceous, glauconitic, shaly sand layer at top, shale seams & stringers										8.1	
100	C-11						7/60							
			641.4											
105	C-12		SANDSTONE, light gray, hard rock, cemented, laminated, glauconitic				13/60							
			640.1											
			SHALY SAND, light gray, soft rock, lightly cemented, laminated, carbonaceous, glauconitic, shaly sand layer at top, shale seams & stringers - increased shale below 107.7'											
			636.5											
110	C-13		SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, fossils				23/60							
115	C-14						16/60	17.9		40	21	19	70.2	
			625.8											
120														

Completion Depth: **120.0 ft.**
Date Boring Started: **2/23/00**
Date Boring Completed: **2/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with **Shelby tubes to** 15'. Boring then advanced using rotary wash to 23' and mud-rotary **coring techniques to** total depth. Borehole grouted upon completion. No groundwater **encountered during** drilling except as noted.

Proj.id: TASWA-LGP1

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 2500.000**
Surface El.: **737.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, dark brown to dark grayish brown, firm, moist, rootlets	1.0										
	U2			1.25										
	U3		733.4	1.50										
5	U4		CLAY, tan & light olive-gray, slightly moist very stiff, manganese dioxide, fossil shell material, white fine-grained calcareous partings, blocky, jointed	3.75										
	U5			3.25										
	U6		- thin fractured sandstone seam	3.0										
	U7			3.75										
10	U8			3.75				31.8		79	28	51	80.5	
	U9			4.0										
	U10		- diagonal fracture w/fine-grained calcareous coating	4.5+										
15	U11			4.25										
	U12			4.25										
	U13			4.25										
20	W		717.2				7/120							
	C1		SHALY CLAY, dark gray, soft rock, calcareous, fossiliferous, carbonaceous, breaks easily along horizontal cleavage planes, incompetent											
25			- calcareously cemented sandstone layer, 5" thick											
			- somewhat vuggy 38' to 40'											
			707.9											
30	C2		SHALE w/SAND, dark gray, hard, soft rock, fossil shell material, pyritic, glauconitic, sandy clay nodules				106/120							
35														
40														

Completion Depth: **130.0 ft.**
Date Boring Started: **1/21/00**
Date Boring Completed: **1/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 19.5'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

EMCON

Prof.id: TASWA-1.GPJ

LOG OF BORING NO. OO25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 2500.000**
Surface El.: **737.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (continued)				105/120							
45			- calcareous cementation 43.2' to 45.3'											
50	C4		- vuggy 49' to 50'				76/120							
			- mudstone seam					14.9		54	24	30	80.9	
55														
			- mudstone layer, 4" thick											
60	C5						97/120							
			- mudstone seam											
65			- mudstone seam											
			- diagonal fracture											
70	C6		656.1				103/120							
			SHALE, dark gray, soft rock, massive, fossils, pyrite											
75														
80														

Completion Depth: **130.0 ft.**
Date Boring Started: **1/21/00**
Date Boring Completed: **1/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 19.5'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.tdf: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 2500.000**
Surface El.: **737.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C7		SHALE (continued) - diagonal fractures 84' to 92'				10/120	17.2		70	29	41	73.0	
90	C8		- mudstone seam, fractured				91/120							
100	C9						22/120							
105			632.1											
			SHALY SAND, dark gray, soft rock, w/shale seams & stringers, carbonaceous, glauconitic											
110	C10		- calcareously cemented sandstone layer				47/120							
			- hard, laminated sandstone seam 624.3											
115			SHALE w/SAND, dark gray, soft rock, w/sand partings, glauconitic 622.7											
			SHALY SAND, dark gray, soft rock, w/shale seams & stringers, carbonaceous, glauconitic, pyrite											
120														

Completion Depth: **130.0 ft.**
Date Boring Started: **1/21/00**
Date Boring Completed: **1/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 19.5'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.id: TASWA-LGPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 2500.000**
Surface El.: **737.9 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C11		SHALY SAND (continued)											
			614.6											
125			SHALE w/SAND, dark gray, soft rock, w/sand partings and seams, glauconitic											
			607.9											
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **130.0 ft.**
Date Boring Started: **1/21/00**
Date Boring Completed: **1/24/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 19.5'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

ProLib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 3000.000**
Surface El.: **740.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, brown, firm to very stiff, moist to **slightly** moist, slightly silty, small rounded iron nodules, rootlets, scattered fine gravel	1.0										
	U2			4.25										
			737.8											
	U3		CLAY, tan & gray, very stiff to hard, **slightly moist,** calcareous nodules, iron nodules, iron stains, fossils, some gypsum, some slickensides	4.5										
5	U4			4.25										
	U5			3.0										
	U6			3.5										
			731.3	3.25	–	–								
	U7		SHALY CLAY, tan & light gray, very stiff to hard, **slightly moist, jointed, slickensides,** fossils, **calcareous partings, laminations,** manganese dioxide	4.25										
10	U8			3.5										
	U9			4.5+										
	U10			4.25										
15	U11			4.5+										
	U12			4.5+				30.6		66	25	41	88.0	
	U13		- diagonal fracture	4.5+										
	U14			4.5+										
20	C1						13/120							
			717.8											
			SHALE, **dark** gray-black, soft rock, **carbonaceous,** horizontally laminated, fossils											
25			715.3											
			SANDSTONE, gray, hard rock, cemented, carbonaceous											
			714.1											
			SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic, sandy mudstone nodules											
30	C2						99/120							
35														
40														

Completion Depth: **66.0 ft.**
Date Boring Started: **1/26/00**
Date Boring Completed: **1/26/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: **Borehole advanced with Shelby tubes to 21'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.**

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 3000.000**
Surface El.: **740.8 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C3		SHALE w/SAND (continued) - calcareous cementation from 41.0' to 42.1'				89/120							
50	C4						99/120							
55								15.5		54	22	32	92.9	
			- thin mudstone seam - mudstone seam											
60	C5		680.8 SHALE, dark gray, soft rock, fossils				21/120							
65			- mudstone seams below 63' 674.8											
70														
75														
80														

Completion Depth: **66.0 ft.**
Date Boring Started: **1/26/00**
Date Boring Completed: **1/26/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 21'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 3500.000**
Surface El.: **740.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, dark grayish-brown, firm, moist, rootlets	1.0										
	U-2			1.75										
			737.1	4.5+										
	U-3		CLAY, brown & tan to orange-tan & light gray, hard to very stiff, slightly moist, iron stains, iron nodules, gypsum, blocky, manganese dioxide, fossils, jointed											
5	U-4			3.5										
	U-5			3.5										
	U-6			4.5+										
			731.6											
	U-7		SHALY CLAY, orange-tan & light gray, very stiff to hard, slightly moist, iron stains, manganese dioxide, fossils, fine-grained gypsum partings	4.5										
10	U-8			4.5+										
	U-9		- orange waxy seam, manganese dioxide stains	4.5+										
	U-10			4.5+										
15	U-11			4.5+										
	U-12			4.5+										
	U-13		- iron-stained horizontal partings - crystalline gypsum partings below 18'	4.5				28.3	89.6	64	21	43	87.1	
	U-14		720.6	4.5+										
20	W		SHALY SAND, tan & light brown to tan, light yellow & gray, soft rock, w/tan calcareously cemented sandstone seam at top, lightly cemented sandstone at bottom, reddish & light yellow iron stains				0/0							
	C-1													
25	C-2						13/60							
			714.1											
			SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic below 37'											
30	C-3						05/120							
35			- calcareous cementation 39.4' to 41.0'					14.0		43	17	26	63.8	
40														

Completion Depth: **120.0 ft.**
Date Boring Started: **2/15/00**
Date Boring Completed: **2/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 20'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 3500.000**
Surface El.: **740.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-4		SHALE w/SAND (continued)				96/120							
45														
50	C-5						98/120							
55			- diagonal fracture					15.5		61	25	36	87.9	
			- mudstone seams below 58'											
60	C-6						50/120							
65														
			672.3											
			SHALE, dark gray, soft rock, massive, fossils											
70	C-7						48/120							
75														
80														

Completion Depth: **120.0 ft.**
Date Boring Started: **2/15/00**
Date Boring Completed: **2/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 20'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj Id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. OO35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4000.000 N 3500.000**
Surface El.: **740.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C-8		SHALE (continued)				94/120							
90	C-9		- diagonal fracture - diagonal fracture				42/120							
			646.3											
95			SHALY SAND, gray, soft rock, glauconitic, w/shale stringers, sand seams & layers, some calcareously cemented seams, some sandy mudstone seams											
100	C-10						0/54							
105	C-11		- calcareously cemented sandstone w/shale stringers from 104.5' to 106.5', glauconitic, carbonaceous, laminated				41/66							
			631.1											
110	C-12		SHALE w/SAND, dark gray, soft rock, glauconitic, w/shale stringers, sand lenses, laminations, fossils				76/120	19.8		38	19	19		
115														
120			620.6											

Completion Depth: **120.0 ft.**
Date Boring Started: **2/15/00**
Date Boring Completed: **2/16/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes until refusal at 20'. Boring then advanced using rotary wash to 23' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 1000.000**
Surface El.: **744.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, brown, firm, slightly moist, small calcareous nodules, rounded iron nodules, iron stains, rootlets	1.5										
	U-2			1.0										
	U-3		- light brown sandy partings	1.25										
5	U-4			1.75										
	U-5			1.75				26.9	90.9	64	22	42	86.2	
			737.7											
	U-6		CLAY, yellow-orange & light gray, firm to hard, slightly moist, iron stains, calcareous nodules, iron nodules	4.50+										
			735.7											
	U-7		SHALY CLAY, yellow-orange & light gray, hard, very slightly moist, iron stains, calcareous partings, fossils, jointed, manganese dioxide	4.50+										
10	U-8			4.50+										
	U-9		- waxy clay seam, blocky, iron-stained, manganese dioxide, red-orange & tan	4.50+										
	U-10			4.50+										
15	W													
			- dark brown layers to 19.0'											
			725.7											
20	C-1		SHALY SAND, red-orange, yellow, & gray, soft rock, iron stains, vuggy, hard sandstone seam at top				4/20							
			- gray											
			720.4											
25			SHALE w/SAND, gray, soft rock, carbonaceous, iron stains, glauconitic, gypsum					21.3	103.1	46	21	25	85.7	
30	C-2						08/120							
			- calcareous cementation 31.7' to 32.3'											
			- light gray clay seam, 2 1/2" thick, hard at bottom											
35														
			- calcareous cementation 36.8' to 38.2'					14.8	116.0	43	19	24	75.1	
40														

Completion Depth: **130.0 ft.**
Date Boring Started: **2/24/00**
Date Boring Completed: **2/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

ProjId: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 1000.000**
Surface El.: **744.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-3		SHALE w/SAND (continued)				37/60							
45	C-4						47/60	15.2	112.9	58	25	33	88.9	
50	C-5		- tan mudstone seam, fractured				48/60							
55	C-6		- mudstone seam - thin, light gray mudstone seam - tan mudstone seam				40/60							
60	C-7		683.2 SHALE, dark gray, soft rock, massive, fossils, pyrite, carbonaceous - thin, tan mudstone seam				49/60							
65	C-8						53/60							
70	C-9						4/36							
	C-10						60/84							
75														
80														

Completion Depth: **130.0 ft.**
Date Boring Started: **2/24/00**
Date Boring Completed: **2/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj#: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 1000.000**
Surface El.: **744.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C-11		SHALE (continued) - diagonal fracture - diagonal fracture				68/120							
90	C-12		- diagonal fracture				33/120							
			653.0 SHALY SAND, dark gray, glauconitic, carbonaceous, w/shale stringers and sandy shale seams											
95			646.0											
100	C-13		SANDSTONE, light gray, hard rock, w/shale stringers, carbonaceous, glauconitic, calcareously-cemented 644.3 SHALY SAND, dark gray & gray, soft rock, w/shale stringers, sandstone layer 101.0' to 101.9', glauconitic, carbonaceous 642.2 SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, w/shale layer at top				26/120						20.6	
105			634.7											
110	C-14		SHALY SAND, dark gray and gray, soft rock, w/shale stringers, glauconitic, carbonaceous, w/sand layers, pyrite, sandy shale seams				34/120							
115			627.2 SHALE w/SAND, dark gray, soft rock, glauconitic, carbonaceous, fossils, pyrite											
120														

Completion Depth: **130.0 ft.**
Date Boring Started: **2/24/00**
Date Boring Completed: **2/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT10

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 1000.000**
Surface El.: **744.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-15		SHALE w/SAND (continued)				96/120							
			620.5											
125			SHALE, dark gray, soft rock, massive, fossils, pyrite, carbonaceous - diagonal fractures - calcareous cementation 127.7' to 129.0'					17.1		83	27	56	80.8	
			614.7											
130														
135														
140														
145														
150														
155														
160														

Completion Depth: **130.0 ft.**
Date Boring Started: **2/24/00**
Date Boring Completed: **2/28/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 2000.000**
Surface El.: **742.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, gray-brown, soft to firm, moist, calcareous nodules, small round iron nodules	0.75										
	U-2		739.4	2.0										
	U-3		CLAY, orange-tan & light gray, very stiff to stiff, slightly moist, iron stains, calcareous nodules, manganese dioxide, gypsum, small iron nodules, blocky	3.25										
5	U-4			2.5										
	U-5		735.4	3.0										
	U-6		SHALY CLAY, orange-tan & light gray, very stiff, slightly moist, blocky, gypsum, gypsum partings, iron stains, manganese dioxide, jointed, fossils	3.5										
	U-7			4.25										
10	U-8			4.25										
	U-9			3.75										
	U-10			4.5				31.5	86.0	69	29	40	78.2	
15	W		722.4											
20	C-1		SHALE, dark grayish-brown, soft rock, carbonaceous, fossils, laminations, light gray clay seams				4/42							
			- light gray, iron-stained clay seam											
25	C-2						40/60							
			712.6											
30	C-3		SHALY SAND, gray, soft rock, carbonaceous				56/120							
			- laminated, calcareously-cemented shaly sandstone to 35.1'											
35			707.3											
			SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic											
40														

Completion Depth: **140.0 ft.**
Date Boring Started: **2/17/00**
Date Boring Completed: **2/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 21.5' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 2000.000**
Surface El.: **742.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-4		SHALE w/SAND (continued)				88/120							
								15.6	111.9	49	22	27	83.5	
45			w/calcareous cementation 45.6' to 46.3'											
50	C-5						62/120							
55														
60	C-6						16/48							
	C-7						62/72							
65			- mudstone seam											
70	C-8						85/120							
			- mudstone seam											
			- mudstone seam											
75			- pyrite					18.7		66	27	39	88.3	
			665.4											
			SHALE, dark gray, soft rock, massive - diagonal fracture											
80														

Completion Depth: **140.0 ft.**
Date Boring Started: **2/17/00**
Date Boring Completed: **2/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 21.5' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 2000.000**
Surface El.: **742.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-9		SHALE (continued)				31/60							
			- fine sandy parting - diagonal fracture											
85	C-10						35/60							
			- diagonal fracture											
			- diagonal fracture											
90	C-11		- mudstone seam				30/120							
95														
100	C-12						35/60							
			- diagonal fracture											
105	C-13		- diagonal fracture 636.1				8/60							
			SHALY SAND, gray & dark gray, soft rock, w/shale stringers, glauconitic, carbonaceous, pyrite, w/calcareously-cemented seams & lenses, sand layers - shale seam 3-1/2" thick - calcareous sandstone seam 2" thick											
110	C-14		- calcareous sandstone seam 4" thick				12/60						28.0	
115	C-15		- shale seams - sandstone layer, 9"-thick, laminated - sandstone seam 1-1/2"-thick 624.1				4/60							
			SHALE w/SAND, dark gray, soft rock, glauconitic,											
120														

Completion Depth: **140.0 ft.**
Date Boring Started: **2/17/00**
Date Boring Completed: **2/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 21.5' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.lib: TASWA-LGPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT20

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 2000.000**
Surface El.: **742.4 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-16		SHALE w/SAND (continued) carbonaceous, fossils. w/shale seams, sand stringers, shaly sand seams				41/60							
125	C-17		- w/sand partings 125' to 130'				0/60							
130	C-18						31/60							
135	C-19						19/60							
			605.4											
			SHALE, dark gray, soft rock - thin sandy laminations below 139' - diagonal fracture					22.3		107	34	73		
			602.4											
140														
145														
150														
155														
160														

Completion Depth: **140.0 ft.**
Date Boring Started: **2/17/00**
Date Boring Completed: **2/23/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 21.5' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-LGP1

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 3000.000**
Surface El.: **746.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0	U1		CLAY, dark grayish-brown to brown, stiff to very stiff, slightly moist, rounded iron nodules, iron stains, calcareous nodules, rootlets	2.25										
	U2			4.5										
	U3			3.0										
5			740.7											
	U4		SHALY CLAY, orange-tan & light gray, very stiff to stiff, slightly moist, jointed, iron stains, manganese dioxide, blocky, fossil shell material, fine and coarse-grained gypsum	4.5										
	U5			3.5										
10	U6			3.0										
	U7			3.0				34.2	84.1	87	31	56	96.1	
	U8			2.75										
15	C-1						0/60							
20	C-2						0/0							
25	C-3		- diagonal fracture				8/60							
30	C-4						5/60							
			713.9											
			SHALE, dark grayish-brown, soft rock, carbonaceous, horizontally laminated											
35	C-5						6/24							
			709.9											
	C-6		SANDSTONE, light gray, hard rock, calcareously-cemented											
			708.7											
40			SHALE w/SAND, dark gray, soft rock, glauconitic											

Completion Depth: **135.0 ft.**
Date Boring Started: **2/14/00**
Date Boring Completed: **2/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj#: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 3000.000**
Surface El.: **746.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C-7		SHALE w/SAND (continued) below 50', carbonaceous, pyrite				17/120							
50	C-8		- calcareously cemented layer				05/120							
60	C-9						10/120	15.6		51	23	28	96.9	
70	C-10						15/120							
75														
80														

Completion Depth: **135.0 ft.**
Date Boring Started: **2/14/00**
Date Boring Completed: **2/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: **Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.**

Continued Next Page

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: E 4500.000 N 3000.000
Surface El.: 746.7 MSL

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C-11		SHALE w/SAND (continued) 666.1				96/120							
			SHALE, dark gray, soft rock, massive, fossiliferous											
			- diagonal fractures 83' to 90'											
85														
90	C-12						115/120							
95			- diagonal fractures 96' to 98'											
100	C-13						98/120							
			- diagonal fracture											
105														
			- diagonal fracture											
110	C-14		634.1				53/108							
			SHALY SAND, dark gray, soft rock, glauconitic, carbonaceous, w/shale stringers & seams, sand seams & layers											
115			- cemented sandstone seam											
			629.4											
			SANDSTONE, greenish-gray, soft to hard rock below 119.0', laminated, glauconitic, w/shale stringers below 119.7'											
120	C-15						35/72							

Completion Depth: 135.0 ft.
Date Boring Started: 2/14/00
Date Boring Completed: 2/15/00
Engineer/Geologist: M. Brown
Project No.: 805645

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

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Proj.id: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. TT30

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 4500.000 N 3000.000**
Surface El.: **746.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SANDSTONE (continued)											
			624.2											
			SHALE w/SAND, dark gray, soft rock, **glauconitic**, w/shale stringers, sand lenses, fossils											
			621.7											
125	C-16		SANDSTONE, cemented, laminated, glauconitic				51/120							
			621.2											
			SHALE w/SAND, dark gray, soft rock, glauconitic, w/shale stringers, sand lenses, fossils					18.3		45	19	26		
130														
			611.7											
135														
140														
145														
150														
155														
160														

Completion Depth: **135.0 ft.**
Date Boring Started: **2/14/00**
Date Boring Completed: **2/15/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 1500.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, brown, firm to hand, moist to slightly moist, calcareous nodules, iron stains, rounded iron nodules, rootlets	1.75										
	U2			4.5										
	U3			4.5										
			744.1											
5	U4		CLAY, yellow-orange & light gray, very stiff to stiff, slightly moist, iron stains, gypsum, blocky, iron nodules	4.5										
	U5			3.0										
	U6			2.75										
				4.5										
			739.6											
	U7		- waxy layer, light gray, tan & orange, manganese dioxide, blocky	2.75										
10	U8		SHALY CLAY, yellow-orange & light gray, firm to very stiff, somewhat blocky, iron stains, gypsum, manganese dioxide	3.5										
	U9			3.5										
	U10			2.0				32.0	86.3	88	32	56	91.5	
15	W													
20														
25														
			721.1											
	C1		SHALE, dark gray-brown, soft rock, carbonaceous, laminations, some light gray clay seams, fossils				17/24							
30	C2						81/120							
			716.1											
			SHALY SAND, gray, moderate rock, calcareous sandstone seam at top, shale stringers											
			714.9											
35			SHALE w/SAND, gray, soft rock, carbonaceous, glauconitic below 40'											
40														

Completion Depth: **138.0 ft.**
Date Boring Started: **2/28/00**
Date Boring Completed: **2/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 28' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 1500.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C3		SHALE w/SAND (Continued)				117/120	14.5		52	18	34	84.9	
45			- calcareous cementation 45.8' to 46.5'											
50	C4		- calcareous cementation 50.4' to 51.5'				98/120							
55														
60	C5						52/60							
65	C6		- mudstone seams to 68'				58/60							
70	C7		- diagonal fracture - mudstone seam				93/120							
75			- diagonal fracture											
80			668.6											

Completion Depth: **138.0 ft.**
Date Boring Started: **2/28/00**
Date Boring Completed: **2/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 28' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 1500.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C8		SHALE, dark gray, soft rock, fossils, massive, trace pyrite				56/60							
			- diagonal fractures											
85	C9						45/60							
			- diagonal fracture											
90	C10						58/120							
95														
			- fractured mudstone seam w/pyrite											
100	C11						72/120							
105			642.6											
			SHALY SAND, gray & dark gray, soft to moderate rock, carbonaceous, glauconitic											
			- calcareous cementation 106.7' to 107.3'; sandy shale seams											
110	C12		- lightly cemented sandstone 110.0' to 111.0' 637.6				0/12							
	C13		SHALY SANDSTONE, light & dark gray, hard rock, w/shale stringers, calcareous, glauconitic, carbonaceous, laminations 635.9				18/84						8.0	
			SHALY SAND, gray & dark gray, soft to moderate rock, carbonaceous, glauconitic 633.2											
115			SHALE w/SAND, dark gray, soft rock, carbonaceous, glauconitic, w/shaly sand seams & layers											
	C14						15/24							
120														

Completion Depth: **138.0 ft.**
Date Boring Started: **2/28/00**
Date Boring Completed: **2/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 28' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-LGPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY15

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 1500.000**
Surface El.: **748.6 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C15		SHALE w/SAND (continued)				54/120							
125			- sand & shaly sand seams from 122.0' to 124.9'											
			622.9											
			SHALY SANDSTONE, light & dark gray, hard rock, calcareous, shale stringers											
			621.1											
			SHALE w/SAND, dark gray, soft rock, glauconitic, fossils											
130	C16							17.9		41	20	21		
135			- diagonal fracture											
			610.6											
140														
145														
150														
155														
160														

Completion Depth: **138.0 ft.**
Date Boring Started: **2/28/00**
Date Boring Completed: **2/29/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 28' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 2500.000**
Surface El.: **748.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U1		CLAY, dark brown, moist, firm. iron stains, rootlets, calcareous nodules at base	1.75										
	U2			1.75										
	U3			1.75										
			744.2											
5	U4		SHALY CLAY, tan, light brown, light gray, and olive, slightly moist, stiff to very stiff, somewhat blocky, some clayey sand laminations, calcareous, slickensides, some fossil shell material, yellow iron stains, manganese dioxide stains, gypsum	1.75										
	U5			3.0										
	U6			2.75										
				4.25										
				3.75										
	U7			2.0										
10	U8			4.25										
	U9			3.75										
				3.0				28.4	93.0	80	32	48	97.6	
	U10			2.75										
15	U11			3.25										
	U12			3.50										
	U13		- gypsum infilled cracks below 18', iron-stained joint surfaces	2.25										
	U14			3.75				30.4	94.2	75	28	47	95.1	
20	U15			3.0										
	U16		- tan waxy seam, manganese dioxide along jointed surfaces											
	C1		- diagonal gypsum-filled fractures											
25	W													
	C2													
	W						60/120							
30	C3													
			716.2											
			SHALE, dark gray, dry, soft rock, calcareous, fossils, some carbonaceous laminations											
35														
40														

Completion Depth: **150.0 ft.**
Date Boring Started: **1/19/00**
Date Boring Completed: **1/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 24'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

emcon

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 2500.000**
Surface El.: **748.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
45	C4		SHALE (continued) - light gray clay seam; laminations below 43'				65/120							
			702.0											
			SHALY SANDSTONE, gray, hard, very vuggy, slightly calcareous, calcareous sandstone seam at top, 4" thick											
			700.8											
50	C5		SHALY SAND, dark gray, soft rock, vuggy, fossil shell material, slightly calcareous				81/120							
			694.5											
55			SHALE w/SAND, dark gray, soft rock, slightly vuggy, pyrite, glauconitic below 58'											
60	C6						10/120							
			- light gray sandy lenses 63' to 64'					13.0		35	19	16	79.3	
65			- light gray sandy lenses 67.7' to 69.6'											
70	C7						107/120							
75														
80														

Completion Depth: **150.0 ft.**
Date Boring Started: **1/19/00**
Date Boring Completed: **1/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 24'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-LGP1

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 2500.000**
Surface El.: **748.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
85	C8		SHALE w/SAND (continued) - light gray calcareous mudstone seam, fractured w/pyrite infillings				92/120							
			- sandy seam											
90	C9						53/120							
95			651.7					16.6		56	22	34	85.3	
			SHALE, dark gray, soft rock, fossils, massive, trace pyrite											
100	C10						62/120							
105								17.0		72	27	45	83.5	
			- hard mudstone seam, thin waxy seam											
110	C11		- less competent shale 110' to 115'				5/120							
115			- tan & gray mudstone seams											
120														

Completion Depth: **150.0 ft.**
Date Boring Started: **1/19/00**
Date Boring Completed: **1/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 24'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.id: TASWA-1.GPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY25

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 2500.000**
Surface El.: **748.7 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	C12		SHALE (continued)				80/120							
			623.9											
125			SHALY SAND, dark gray, soft rock, w/sand seams & laminations, glauconitic, calcareous sandstone layer 125.3' to 125.9', carbonaceous, sand partings											
			619.1											
130	C13		SAND, gray & green, laminated, glauconitic, w/thin hard clay stringers, some shale laminations				46/120						10.5	
			613.2											
135			SHALE w/SAND, gray, soft rock, pyrite, glauconitic sand partings, fossils											
							76/120							
140	C14							19.2		42	22	20		
145														
			598.7											
150														
155														
160														

Completion Depth: **150.0 ft.**
Date Boring Started: **1/19/00**
Date Boring Completed: **1/20/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: **Borehole advanced with Shelby tubes to 24'. Boring then advanced using mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.**

Projid: TASWA-LGPJ

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 3500.000**
Surface El.: **748.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
	U-1		CLAY, slightly silty, brown to olive brown, firm, moist, w/some fine gravel, small calcareous nodules, rounded iron nodules, rootlets	1.5										
	U-2		746.1	2.25										
	U-3		CLAY, yellow-brown, stiff, slightly moist, calcareous nodules, yellow-orange iron stains	3.0										
5	U-4		743.1	3.5										
	U-5		SHALY CLAY, tan, light yellow-brown, & light gray, slightly moist, yellow-orange iron stains, gypsum, slickensides, manganese dioxide, fossils, some fine-grained gypsum	3.0										
	U-6		- waxy seam	4.0										
	U-7			4.0										
10	U-8			2.75				33.7	93.3	88	33	55	98.9	
	U-9			4.0										
	U-10			4.5+										
15	W													
20	C-1						0/0							
	C-2						10/120							
25														
30			- dark brown carbonaceous seams below 30'											
	C-3		715.1 SHALY SAND, light gray to dark gray, calcareous sandstone layer at top, laminations, carbonaceous				82/108							
35			713.5 SHALE w/SAND, dark gray, soft rock, glauconitic, pyrite, carbonaceous, vuggy											
40														

Completion Depth: **132.0 ft.**
Date Boring Started: **2/10/00**
Date Boring Completed: **2/10/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with **Shelby tubes to 15'.** Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 3500.000**
Surface El.: **748.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALE w/SAND (continued)											
	C-4						89/120							
45														
			- calcareous cementation from 47.8' to 49.8'											
50														
	C-5						105/120							
55								10.9		37	17	20	93.0	
			- diagonal fracture											
60			- cemented seam											
	C-6		- cemented seam				99/120							
65														
			679.6											
			SHALE, dark gray, soft rock, massive, glauconitic, carbonaceous, fossil shell material, pyrite											
70														
	C-7						89/120							
75														
80														

Completion Depth: **132.0 ft.**
Date Boring Started: **2/10/00**
Date Boring Completed: **2/10/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Prn/dt: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 3500.000**
Surface El.: **748.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALE (continued)											
	C-8						95/120							
85														
			- light gray waxy seam											
90														
	C-9						101/120							
95														
			- diagonal fracture											
100														
	C-10		- diagonal fractures 103' to 105'				46/120							
105			642.8											
			SHALE w/SAND , dark gray, soft rock, glauconitic, carbonaceous, w/ shaly sand seams, sand seams, shale stringers											
110														
	C-11						67/120							
115			632.7											
			SANDSTONE, light gray, soft rock, laminations, glauconitic, carbonaceous, shaly at bottom										10.2	
			630.2											
120			SHALE w/SAND, dark gray, soft rock, massive, glauconitic, carbonaceous, fossils, pyrite					12.4		66	24	42	93.4	

Completion Depth: **132.0 ft.**
Date Boring Started: **2/10/00**
Date Boring Completed: **2/10/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Continued Next Page

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF BORING NO. YY35

Project Description: **TASWA Disposal and Recycling Facility, Grayson County, Texas**
Site Investigation

Location: **E 5000.000 N 3500.000**
Surface El.: **748.1 MSL**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Hand Penetrometer (tsf)	Penetration Blows/Foot	Recovery %	RQD	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
125	C-12		SHALE w/SAND (continued)				52/120							
130			616.1											
135														
140														
145														
150														
155														
160														

Completion Depth: **132.0 ft.**
Date Boring Started: **2/10/00**
Date Boring Completed: **2/10/00**
Engineer/Geologist: **M. Brown**
Project No.: **805645**

Remarks: Borehole advanced with Shelby tubes to 15'. Boring then advanced using rotary wash to 20' and mud-rotary coring techniques to total depth. Borehole grouted upon completion. No groundwater encountered during drilling except as noted.

Proj.lib: TASWA-1.GPJ

EMCON

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF MONITORING WELL NO. MW- 1

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 1125.680 N 3993.460**

Top of Casing El.: **767.85 ft. msl**
Surface El.: **765.00 ft. msl**
Completion Depth: **32.0 ft.**
Date Boring Started: **8/12/04**
Date Boring Completed: **8/12/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, brown, yellow-orange, tan, light gray, iron stains, calcareous										
			761.00										
5			SHALEY CLAY, yellow tan and light gray, very stiff to hard, iron stains, calcareous partings, manganese dioxide, jointed										
10													
15													
20													
			744.00										
25			SHALEY SAND, yellow-orange to yellow and olive gray, soft rock, calcareous cemented sandstone layers at top, iron stains										
30													
			733.00										
35													
40													
45													
50													

Drilling Contractor: **HVET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations

Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

LOG OF MONITORING WELL NO. MW- 2

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 1730.000 N 4015.620**

Top of Casing El.: **762.64 ft. msl**
Surface El.: **760.21 ft. msl**
Completion Depth: **22.5 ft.**
Date Boring Started: **8/31/04**
Date Boring Completed: **8/31/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark gray-brown to dark yellow-brown, stiff to very stiff, iron stains, calcareous nodules										
			755.21										
5			SHALEY CLAY, yellow-tan and light gray, very stiff to hard, iron stains										
10													
			745.21										
15			SHALEY SAND with sandy shale, yellow-orange to yellow and olive, gray, iron stains, fine to very fine calcareous sandstone at top, sand										
20			738.21										
25													
30													
35													
40													
45													
50													

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations	
Date	Depth

Remarks: Installed monitoring well upon completion of borehole.

LOG OF MONITORING WELL NO. MW- 2
PAGE 1 OF 1

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

...3PJ BME.GDT 9/20/04
BME LI

LOG OF MONITORING WELL NO. MW- 3

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 2328.710 N 3980.730**

Top of Casing El.: **751.77 ft. msl**
Surface El.: **749.36 ft. msl**
Completion Depth: **26.5 ft.**
Date Boring Started: **8/26/04**
Date Boring Completed: **8/26/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, gray-brown to yellow-brown, firm to very stiff, small calcareous and iron nodules										
			742.86										
5			SHALEY CLAY, yellow-tan and light gray, very stiff to hard, iron stains, below 16 feet silt stringers										
10													
15													
20													
			728.36										
			SHALEY SAND with sandy shale, yellow-orange, soft rock, sand fine, calcareous sandstone layer at top										
25			722.86										
30													
35													
40													
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Installed monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

...\PJ BME.GDT 9/20/04
BME LI

LOG OF MONITORING WELL NO. MW- 4

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 2925.950 N 3995.320**

Top of Casing El.: **742.34 ft. msl**
Surface El.: **739.61 ft. msl**
Completion Depth: **18.5 ft.**
Date Boring Started: **8/12/04**
Date Boring Completed: **8/12/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark gray-brown, stiff to very stiff, iron stains, calcareous nodules, iron nodules										
			734.61										
5			SHALEY CLAY, yellow tan and light gray, very stiff to hard, fine gravel, calcareous partings										
			728.61										
10			SHALEY SAND, yellow orange to yellow and olive brown, iron stains, calcareous sandstone layer at top, with sandy shale										
			721.11										
15													
20													
25													
30													
35													
40													
45													
50													

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations	
Date	Depth

Remarks:



LOG OF MONITORING WELL NO. MW- 4
PAGE 1 OF 1

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

BME LO
PJ BME.GDT 9/20/04

LOG OF MONITORING WELL NO. MW- 5

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 3527.180 N 3882.830**

Top of Casing El.: **732.35 ft. msl**
Surface El.: **729.54 ft. msl**
Completion Depth: **12.5 ft.**
Date Boring Started: **8/17/04**
Date Boring Completed: **8/17/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark grayish brown, firm										
			725.54										
5			CLAY, brown and tan to orange, light gray, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese dioxide, calcareous cemented sandstone layer, sand, brown, fine grained to silt										
10			717.54										
			SHALE, gray, soft rock, with sand 717.04										
15													
20													
25													
30													
35													
40													
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

JPJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW- 6

Project Description: Texoma Area Solid Waste Authority
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: E 4111.680 N 3769.910

Top of Casing El.: 747.44 ft. msl
Surface El.: 744.65 ft. msl
Completion Depth: 32.5 ft.
Date Boring Started: 8/17/04
Date Boring Completed: 8/17/04

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark grayish brown grading to brown, tan, light gray, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese dioxide										
5													
			735.65										
10			SHALEY CLAY, orange-tan and light gray, very stiff to hard, iron stains, manganese dioxide, fine grained gypsum partings										
15													
20													
			720.65										
25			SHALEY SAND, tan and light brown to tan, light yellow and gray, soft rock with tan calcareously cemented sandstone seam at top										
30													
			712.15										
35													
40													
45													
50													

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations

Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

..GPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW- 7

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4824.810 N 3638.220**

Top of Casing El.: **749.97 ft. msl**
Surface El.: **747.37 ft. msl**
Completion Depth: **32.9 ft.**
Date Boring Started: **8/17/04**
Date Boring Completed: **8/17/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, brown to olive brown, yellow-brown, some fine gravel, calcareous nodules, iron nodules, yellow-orange iron stain, slightly silty										
			742.37										
5			SHALEY CLAY, tan, light yellow-brown, light gray, yellow orange iron stains, gypsum, manganese dioxide										
10													
15													
20													
25													
30													
			714.50										
35													
40													
45													
50													

Drilling Contractor: **HVET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

LOG OF MONITORING WELL NO. MW- 7
PAGE 1 OF 1

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

BME LOG.GPJ BME.GDT 9/20/04

LOG OF MONITORING WELL NO. MW-12

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 558.020 N 2341.430**

Top of Casing El.: **762.21 ft. msl**
Surface El.: **759.71 ft. msl**
Completion Depth: **20.5 ft.**
Date Boring Started: **8/25/04**
Date Boring Completed: **8/25/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark gray-brown, firm to very stiff										
5			753.71										
			SHALEY CLAY, yellow-tan and light gray, very stiff to hard, iron stains										
10			749.71										
			SHALEY SAND, yellow-orange to brown, fine to very fine, soft rock, iron stains										
15													
20			739.21										
25													
30													
35													
40													
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Hole total depth at 20 feet.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

GPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-13

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 3516.900 N 3884.410**

Top of Casing El.: **732.02 ft. msl**
Surface El.: **729.54 ft. msl**
Completion Depth: **89.5 ft.**
Date Boring Started: **8/26/04**
Date Boring Completed: **8/26/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark-grayish brown, firm										
			725.54										
5			CLAY, brown and tan and orange, light gray, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese, dioxide, calcareous cemented sandstone layer, sand, brown lime to silt										
10			717.54										
15			SHALE with sand, gray, soft rock										
20													
25													
30													
35													
40													
45													
50													

Drilling Contractor: **HET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Installed monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

..\PJ BME.GDT 9/20/04
BME.LO

LOG OF MONITORING WELL NO. MW-13

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 3516.900 N 3884.410**

Top of Casing El.: **732.02 ft. msl**
Surface El.: **729.54 ft. msl**
Completion Depth: **89.5 ft.**
Date Boring Started: **8/26/04**
Date Boring Completed: **8/26/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALE with sand, gray, soft rock *(continued)*										
			674.54										
			SHALE, dark gray soft rock, calcareous										
60													
65													
			658.54										
70			SHALE, dark gray, soft rock, sand seams and layers, gray fine to silt, calcareous										
75													
			649.54										
80			SHALEY SAND, gray, medium to fine soft rock, calcareously cemented sandstone 85 to 87 feet, with shale stringers										
85													
			641.54										
			SHALE with sand, dark gray, soft rock										
			640.04										
90													
95													
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Installed monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

.GPJ BME.GDT 9/20/04
BME-L

LOG OF MONITORING WELL NO. MW-14

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
8031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4097.210 N 3771.060**

Top of Casing El.: **747.30 ft. msl**
Surface El.: **744.65 ft. msl**
Completion Depth: **107.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/24/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark grayish brown, firm										
			741.65										
5			CLAY, brown, tan to orange-tan and light gray, hard to very stiff, iron stains, manganese dioxide										
			735.65										
10			SHALEY CLAY, orange-tan and light gray, very stiff to hard, iron stains, manganese dioxide, fine grained, gypsum partings										
15													
20													
			720.65										
25			SHALEY SAND, tan, light brown to tan, light yellow and gray, soft rock, with tan calcareously cemented sandstone at top										
30			713.65										
			SHALE with sand, gray, soft rock, carbonaceous										
35													
40													
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Monitoring well installed upon completion of bore hole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

#PJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-14

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4097.210 N 3771.060**

Top of Casing El.: **747.30 ft. msl**
Surface El.: **744.65 ft. msl**
Completion Depth: **107.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/24/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALE with sand, gray, soft rock, carbonaceous *(continued)*										
60													
65													
70													
			672.65										
75			SHALE, dark gray, soft rock, massive, sand lenses										
			664.65										
80			SHALE with sand, gray, calcareous nodules, sand lenses, fine to very fine										
85													
90													
95													
			646.65										
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Monitoring well installed upon completion of bore hole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

...\PJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW-14

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4097.210 N 3771.060**

Top of Casing El.: **747.30 ft. msl**
Surface El.: **744.65 ft. msl**
Completion Depth: **107.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/24/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALEY SAND, dark gray, soft rock, glauconitic, shale stringers, sand lenses, laminations, fine to very fine, sand *(continued)*										
			637.15										
110													
115													
120													
125													
130													
135													
140													
145													
150													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Monitoring well installed upon completion of bore hole.

LOG OF MONITORING WELL NO. MW-14
PAGE 3 OF 3

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

JPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-15

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
8031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4842.170 N 3633.750**

Top of Casing El.: **749.63 ft. msl**
Surface El.: **747.37 ft. msl**
Completion Depth: **114.5 ft.**
Date Boring Started: **8/29/04**
Date Boring Completed: **8/29/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, brown to olive brown and yellow-brown, some fine gravel, calcareous nodules, iron nodules, yellow-orange, iron stains, slightly silty										
			742.37										
5			SHALEY CLAY, tan, light yellow-brown, and light gray, yellow orange, iron stains, gypsum manganese dioxide										
10													
15													
20													
25													
30													
			714.37										
			SHALEY SAND, light gray to dark gray, calcareous sandstone at top, carbonaceous laminations, calcareous cementation zone 33 to 33.5 feet										
35			712.37										
			SHALE with sand, dark gray, soft rock, glauconitic, pyrite, carbonaceous										
40													
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Set monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

GPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-15

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4842.170 N 3633.750**

Top of Casing El.: **749.63 ft. msl**
Surface El.: **747.37 ft. msl**
Completion Depth: **114.5 ft.**
Date Boring Started: **8/29/04**
Date Boring Completed: **8/29/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALE with sand, dark gray, soft rock, glauconitic, pyrite, carbonaceous *(continued)*										
60													
			684.37										
65			SHALE, dark gray, soft rock, massive glauconitic, pyrite										
70													
75													
80													
85													
90													
95													
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Set monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

JPJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW-15

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 4842.170 N 3633.750**

Top of Casing El.: **749.63 ft. msl**
Surface El.: **747.37 ft. msl**
Completion Depth: **114.5 ft.**
Date Boring Started: **8/29/04**
Date Boring Completed: **8/29/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALE, dark gray, soft rock, massive glauconitic, pyrite *(continued)*										
			641.37										
110			SHALE with sand, dark gray, soft rock, glauconitic, carbonaceous with shaley sand, seams and layers, fine to very fine										
			632.87										
115													
120													
125													
130													
135													
140													
145													
150													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks: Set monitoring well upon completion of borehole.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

3PJ BME.GDT 9/20/04
BME L

LOG OF MONITORING WELL NO. MW-16

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
8031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5264.700 N 3542.020**

Top of Casing El.: **744.96 ft. msl**
Surface El.: **742.12 ft. msl**
Completion Depth: **106.0 ft.**
Date Boring Started: **8/14/04**
Date Boring Completed: **8/14/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, slightly silty, brown to olive brown, firm with some fine gravel, calcareous nodules, iron nodules, below 3 feet yellow-brown, yellow-orange, iron stains										
			737.12										
5			SHALEY CLAY, tan, light yellow brown and light gray, yellow-orange iron stains, yellow-orange iron stains, gypsum, manganese dioxide, fine grained gypsum, dark brown carbonaceous seams below 22 feet										
10													
15													
20													
25													
			714.12										
			SHALEY SAND, light gray to dark gray, calcareous sandstone layer at top										
30			712.12										
			SHALE with sand, dark gray, soft rock, glauconitic, pyrite, carbonaceous calcareous cementation										
35													
40													
45													
50													

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

PJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-16

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5264.700 N 3542.020**

Top of Casing El.: **744.96 ft. msl**
Surface El.: **742.12 ft. msl**
Completion Depth: **106.0 ft.**
Date Boring Started: **8/14/04**
Date Boring Completed: **8/14/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lbs/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALE with sand, dark gray, soft rock, glauconitic, pyrite, carbonaceous calcareous cementation *(continued)*										
80													
			680.12										
			SHALE, dark gray, soft rock, massive, glauconitic										
65													
70													
75													
80													
85													
90													
95													
			643.12										
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

JPJ BME.GDT 9/20/04
BME LI

LOG OF MONITORING WELL NO. MW-16

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
8031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5264.700 N 3542.020**

Top of Casing El.: **744.96 ft. msl**
Surface El.: **742.12 ft. msl**
Completion Depth: **106.0 ft.**
Date Boring Started: **8/14/04**
Date Boring Completed: **8/14/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALE, with sand, dark gray, glauconitic, carbaceous, with shaley sand seams, sand seams, shale stringers *(continued)*										
			637.12										
			SANDSTONE, light gray, soft rock, glauconitic, carbonaceous										
			636.12										

110 115 120 125 130 135 140 145 150

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

JPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-17

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5263.720 N 2957.330**

Top of Casing El.: **752.16 ft. msl**
Surface El.: **749.76 ft. msl**
Completion Depth: **133.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/25/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark brown, firm, iron stains, calcareous nodules at base										
			746.28										
5			SHALEY CLAY, tan, light yellow brown, yellow-orange, iron stains, gypsum										
10													
15													
20													
25													
30													
			718.76										
			SHALEY SAND, light gray to dark gray, carbonaceous, calcareous, sandstone layers at top										
			714.76										
35			SHALE with sand, glauconitic, pyrite, carbonaceous, calcareous cementation										
40													
			708.76										
			SHALEY SANDSTONE, gray, hard, calcareous										
			706.76										
			SHALEY SAND, dark gray, soft rock, slightly calcareous										
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

..GPJ BME.GDT 9/20/04
BME LL

LOG OF MONITORING WELL NO. MW-17

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5263.720 N 2957.330**

Top of Casing El.: **752.16 ft. msl**
Surface El.: **749.76 ft. msl**
Completion Depth: **133.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/25/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALEY SAND, dark gray, soft rock, slightly calcareous *(continued)*										
			694.76										
			SHALE with sand, dark gray, soft rock, pyrite, glauconitic below 56 feet										
60													
65													
70													
75													
80													
85													
90													
95													
			651.76										
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

GPJ BME.GDT 9/20/04
BME LG

LOG OF MONITORING WELL NO. MW-17

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
8031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5263.720 N 2957.330**

Top of Casing El.: **752.16 ft. msl**
Surface El.: **749.76 ft. msl**
Completion Depth: **133.5 ft.**
Date Boring Started: **8/24/04**
Date Boring Completed: **8/25/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALE with sand, dark gray, soft rock, glauconitic, carbonaceous, with shaley sand seams, sand seams, shale stringers *(continued)*										
110													
115													
120													
125													
130				616.26									
135													
140													
145													
150													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

..GPJ BME.GDT 9/20/04
BME LI

LOG OF MONITORING WELL NO. MW-18

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5251.740 N 2174.510**

Top of Casing El.: **750.38 ft. msl**
Surface El.: **747.85 ft. msl**
Completion Depth: **130.5 ft.**
Date Boring Started: **8/13/04**
Date Boring Completed: **8/13/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark brown, firm iron stains, calcareous nodules at base										
			742.85										
5			SHALEY CLAY, tan, light brown, light gray and olive, stiff to very stiff, somewhat blocky, some clayey sand laminations, calcareous, yellow iron stains, gypsum										
10													
15													
20													
25													
30			717.85										
			SHALE, dark gray, soft rock, calcareous, some carbonaceous laminations										
35													
40													
			704.85										
45			SHALEY SANDSTONE, gray, hard, slightly calcareous										
50			697.85										

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

...GPJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW-18

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
8031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5251.740 N 2174.510**

Top of Casing El.: **750.38 ft. msl**
Surface El.: **747.85 ft. msl**
Completion Depth: **130.5 ft.**
Date Boring Started: **8/13/04**
Date Boring Completed: **8/13/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALEY SAND, dark gray, soft rock, slightly calcareous										
			694.85										
55			SHALE, with sand, soft rock, pyrite										
60													
65													
70													
75													
80													
85													
90													
95			652.85										
			SHALE, dark gray, soft rock, trace pyrite										
100													

...GPJ BME.GDT 9/20/04

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

BME LOG

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

LOG OF MONITORING WELL NO. MW-18

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

Biggs & Mathews Environmental, Inc.
6031 Interstate 20 West, Ste 242
Arlington, Texas 76017
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5251.740 N 2174.510**

Top of Casing El.: **750.38 ft. msl**
Surface El.: **747.85 ft. msl**
Completion Depth: **130.5 ft.**
Date Boring Started: **8/13/04**
Date Boring Completed: **8/13/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALE, dark gray, soft rock, trace pyrite *(continued)*										
110													
115													
120													
			624.85										
125			SHALEY SAND, dark gray, soft rock with sand seams, and laminations, glauconitic, calcareous, sandstone, carbonaceous sand partings										
130			617.35										
135													
140													
145													
150													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

-3PJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW-19

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5249.530 N 1577.000**

Top of Casing El.: **752.18 ft. msl**
Surface El.: **749.30 ft. msl**
Completion Depth: **122.0 ft.**
Date Boring Started: **8/12/04**
Date Boring Completed: **8/12/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, brown, firm to hard calcareous nodules, iron stains, iron nodules										
			745.30										
5			CLAY, yellow-orange and light gray, very stiff to stiff, iron stains, blocky, iron nodules										
			740.30										
10			SHALEY CLAY, yellow-orange light gray, firm to stiff iron stains										
15													
20													
25													
			720.30										
30			SHALE, dark brown soft rock, some light gray seams										
35													
			713.30										
			SHALEY SAND, gray, moderate rock, calcareous sandstone seam at top shale stringers										
			711.30										
40			SHALE, with sand, gray, soft rock, carbonaceous, glauconitic below 40 feet										
45													
50													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

.GPJ BME.GDT 9/20/04
BME LOG

LOG OF MONITORING WELL NO. MW-19

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5249.530 N 1577.000**

Top of Casing El.: **752.18 ft. msl**
Surface El.: **749.30 ft. msl**
Completion Depth: **122.0 ft.**
Date Boring Started: **8/12/04**
Date Boring Completed: **8/12/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
55			SHALE, with sand, gray, soft rock, carbonaceous, glauconitic below 40 feet *(continued)* - calcareous cementation										
60													
65			- mudstone seams										
70													
75			- mudstone seams										
80			667.30 SHALE, dark gray, soft rock, massive, trace pyrite										
85													
90													
95													
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

.GPJ BME.GDT 9/20/04
BME LO

LOG OF MONITORING WELL NO. MW-19

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
5031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 5249.530 N 1577.000**

Top of Casing El.: **752.18 ft. msl**
Surface El.: **749.30 ft. msl**
Completion Depth: **122.0 ft.**
Date Boring Started: **8/12/04**
Date Boring Completed: **8/12/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
105			SHALE, dark gray, soft rock, massive, trace pyrite *(continued)*										
			643.30										
110			SHALEY SAND, gray and dark gray, soft to moderate rock, carbonaceous, glauconitic, light cemented sandstone										
			636.30										
			SHALEY SANDSTONE, light and dark gray, soft to moderate rock, carbonaceous, glauconitic										
			634.30										
115			SHALEY SAND, gray and dark gray, soft to moderate rock, carbonaceous										
			632.30										
			SHALE, with sand, dark gray, soft rock, carbonaceous, glauconitic with shaley sand seam layers										
			629.30										
120			SHALE, dark gray, soft rock										
			627.30										
125													
130													
135													
140													
145													
150													

Drilling Contractor: **HWET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

...GPJ BME.GDT 9/20/04
BME LIC

LOG OF MONITORING WELL NO. MW-26

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 557.740 N 2351.770**

Top of Casing El.: **762.20 ft. msl**
Surface El.: **759.76 ft. msl**
Completion Depth: **90.5 ft.**
Date Boring Started: **8/26/04**
Date Boring Completed: **8/26/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
0			CLAY, dark gray-brown, firm to very stiff										
			753.76										
5			SHALEY CLAY, yellow-tan and light gray, very stiff to hard, iron stains										
			749.76										
10			SHALEY SAND, yellow-orange to brown, fine to very fine, soft rock, iron stains										
15													
			739.76										
20			SHALE with sand, olive gray, yellow, iron stains, carbonaceous										
25													
30													
35													
40													
45													
50													

Drilling Contractor: H/ET
Drilling Method: Wet Rotary
Sampling Method:
Geologist/Engineer: Boyce
Project No.: 202.01.200

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

Continued Next Page

.GPJ BME.GDT 9/20/04
BME LC

LOG OF MONITORING WELL NO. MW-26

Project Description: **Texoma Area Solid Waste Authority**
Grayson County, Texas

BIGGS & MATHEWS ENVIRONMENTAL
6031 Interstate 20 West, Suite 242
Arlington, Texas 76017-1045
Phone: 817-563-1144
Fax: 817-563-1224

Location: **E 557.740 N 2351.770**

Top of Casing El.: **762.20 ft. msl**
Surface El.: **759.76 ft. msl**
Completion Depth: **90.5 ft.**
Date Boring Started: **8/26/04**
Date Boring Completed: **8/26/04**

Depth, feet	Samples	Symbol / USCS	MATERIAL DESCRIPTION	Monitoring Well Construction Details	Hand Penetrometer, tsf	Penetration Blows/Foot	Moisture Content, %	Unit Dry Weight, lb/cu ft.	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 200 Sieve	Unc. Compressive Strength, tsf
			SHALE with sand, olive gray, yellow, iron stains, carbonaceous *(continued)*										
55			704.76 SHALE, dark gray, soft rock										
60													
65													
70													
75													
80			678.76 SHALEY SAND, gray, medium to fine grained, glauconitic, shaley lenses										
85													
90			669.26										
95													
100													

Drilling Contractor: **H/ET**
Drilling Method: **Wet Rotary**
Sampling Method:
Geologist/Engineer: **Boyce**
Project No.: **202.01.200**

Groundwater Observations	
Date	Depth

Remarks:

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradual.

_GPJ BME.GDT 9/20/04
BME LI

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/12/04
Monitor Well Latitude: 33°38'7.2" Longitude: 96°50'40"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

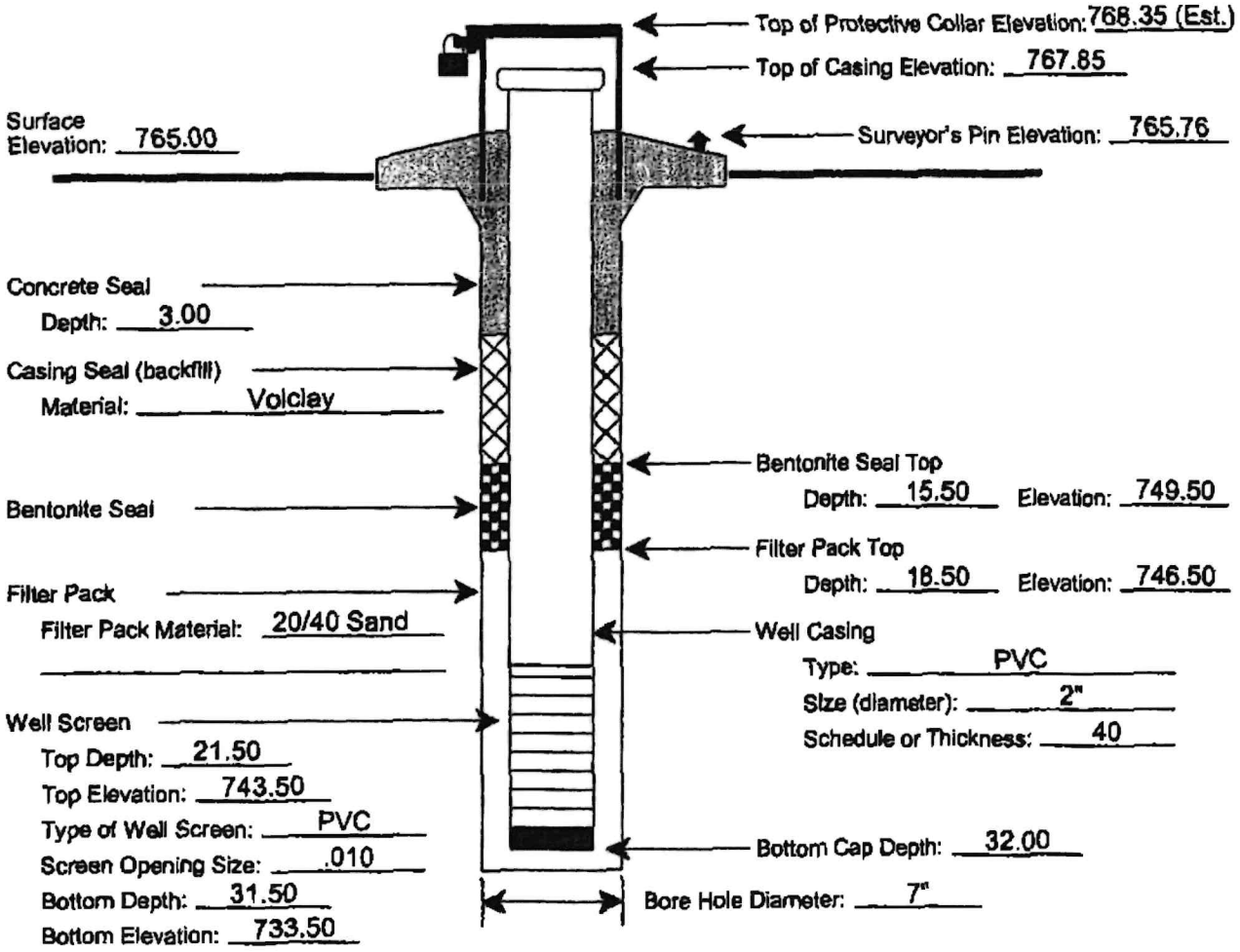
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-1
Date of Monitor Well
Development: 9/2/04
Monitor Well Driller
Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 743.44
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/31/04
Monitor Well Latitude: 33°38'7.3" Longitude: 96°50'33"
Monitor Well Groundwater Gradient Position:
Upgradient ____ Downgradient X

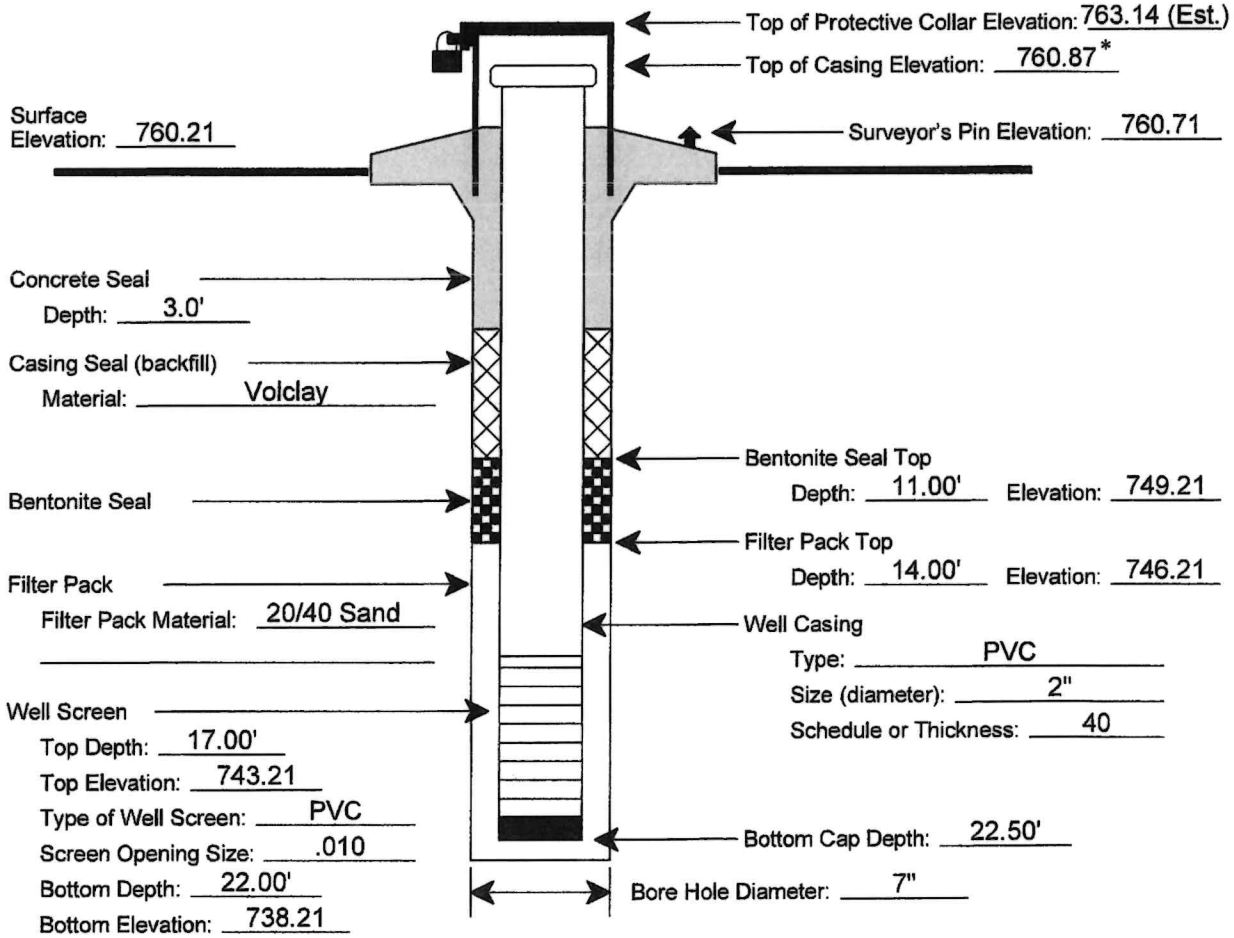
MSW Permit No.: 2290
Monitor Well I.D. No.: MW- 2
Date of Monitor Well Development: 9/2/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 737.83
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

*Due to shrink/swell of near surface clays, this elevation has been adjusted (December 2023)

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/26/04
Monitor Well Latitude: 33°38'0.7" Longitude: 96°50'25.8"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

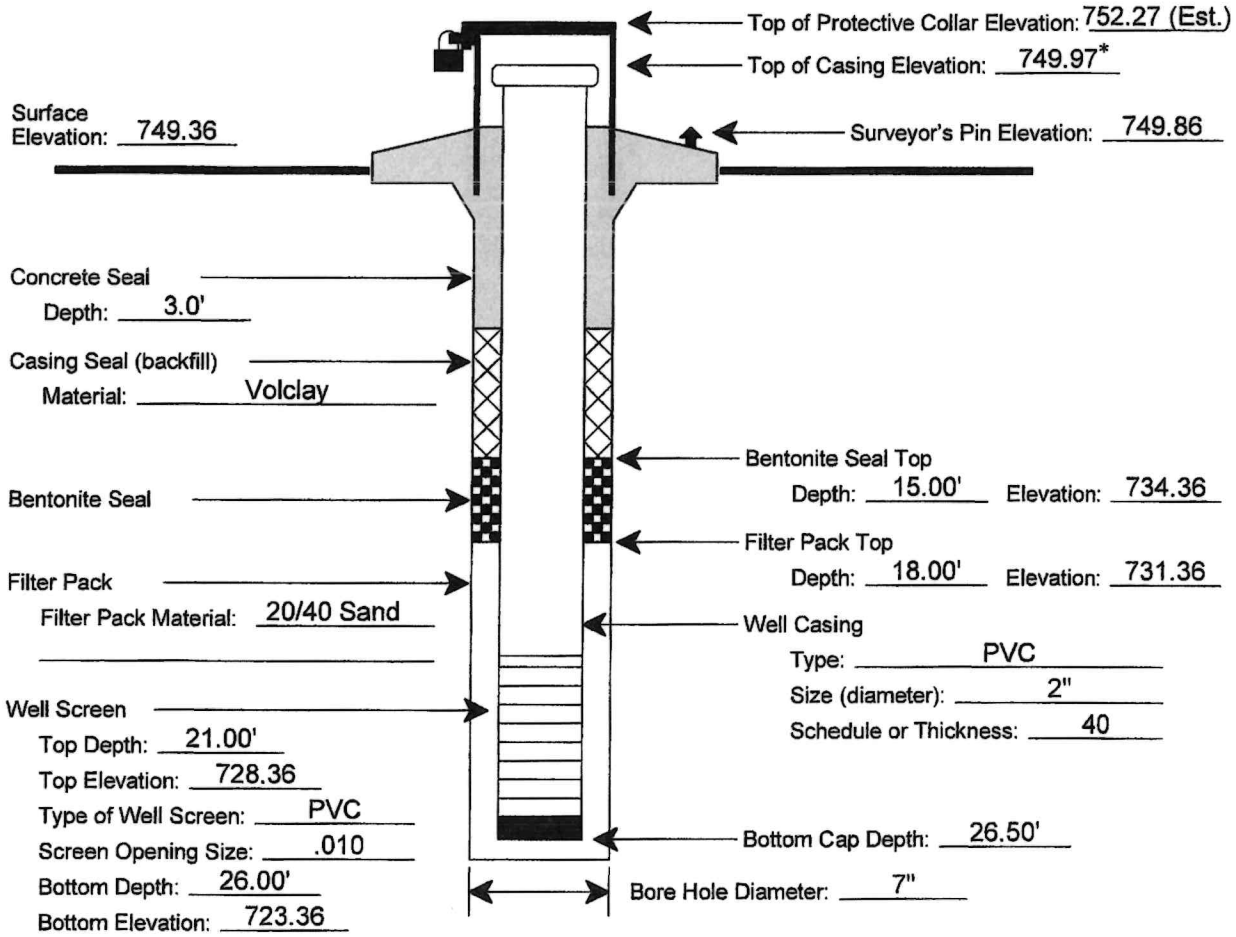
MSW Permit No.: 2290
Monitor Well I.D. No.: MW- 3
Date of Monitor Well Development: 9/1/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 729.64
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

*Due to shrink/swell of near surface clays, this elevation has been adjusted (December 2023)

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/12/04
Monitor Well Latitude: 33°38'7" Longitude: 96°50'18.8"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

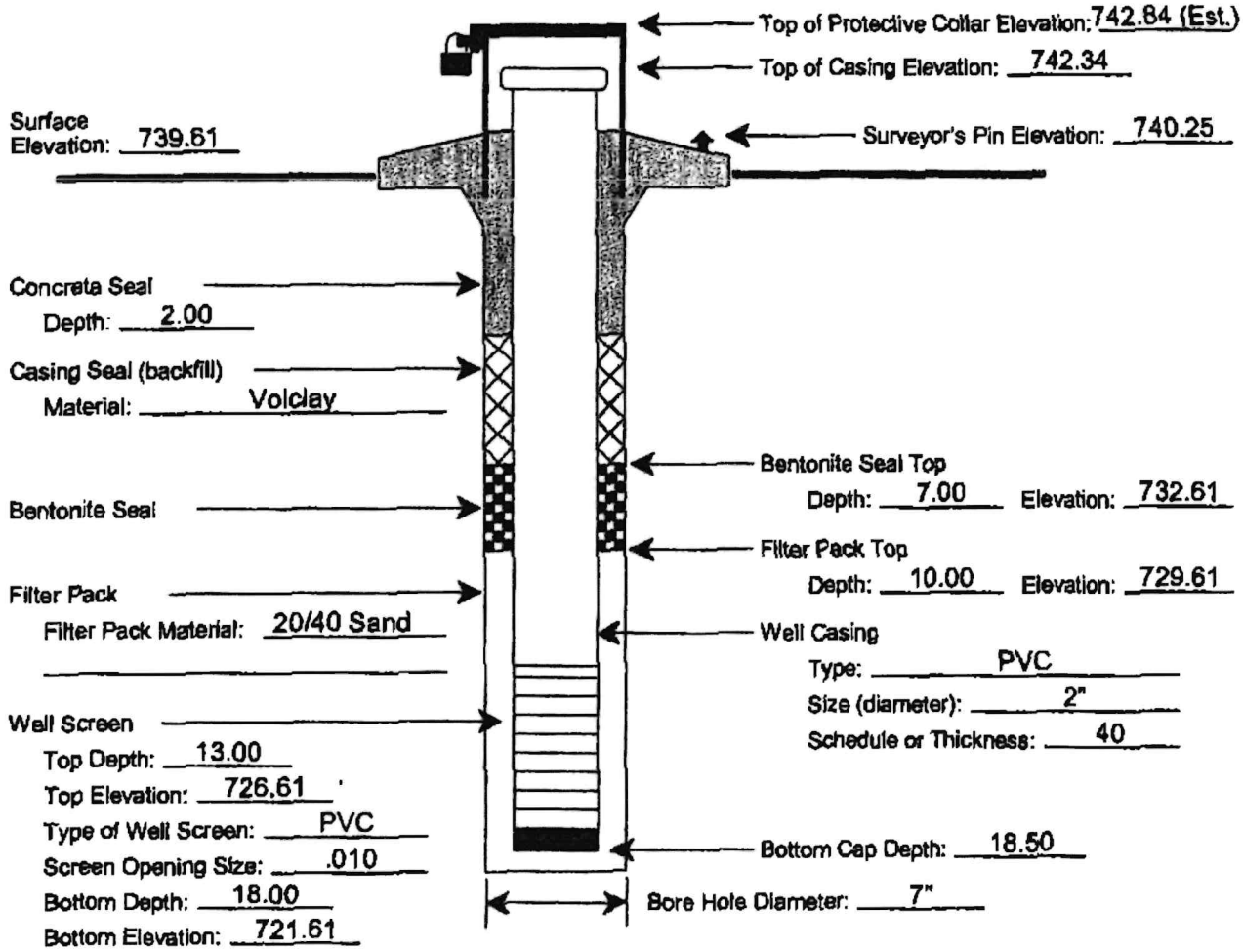
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-4
Date of Monitor Well
Development: 8/31/04
Monitor Well Driller
Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 721.37
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation: 8/17/04
Monitor Well Latitude: 33°38'5.6" Longitude: 96°50'11.6"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

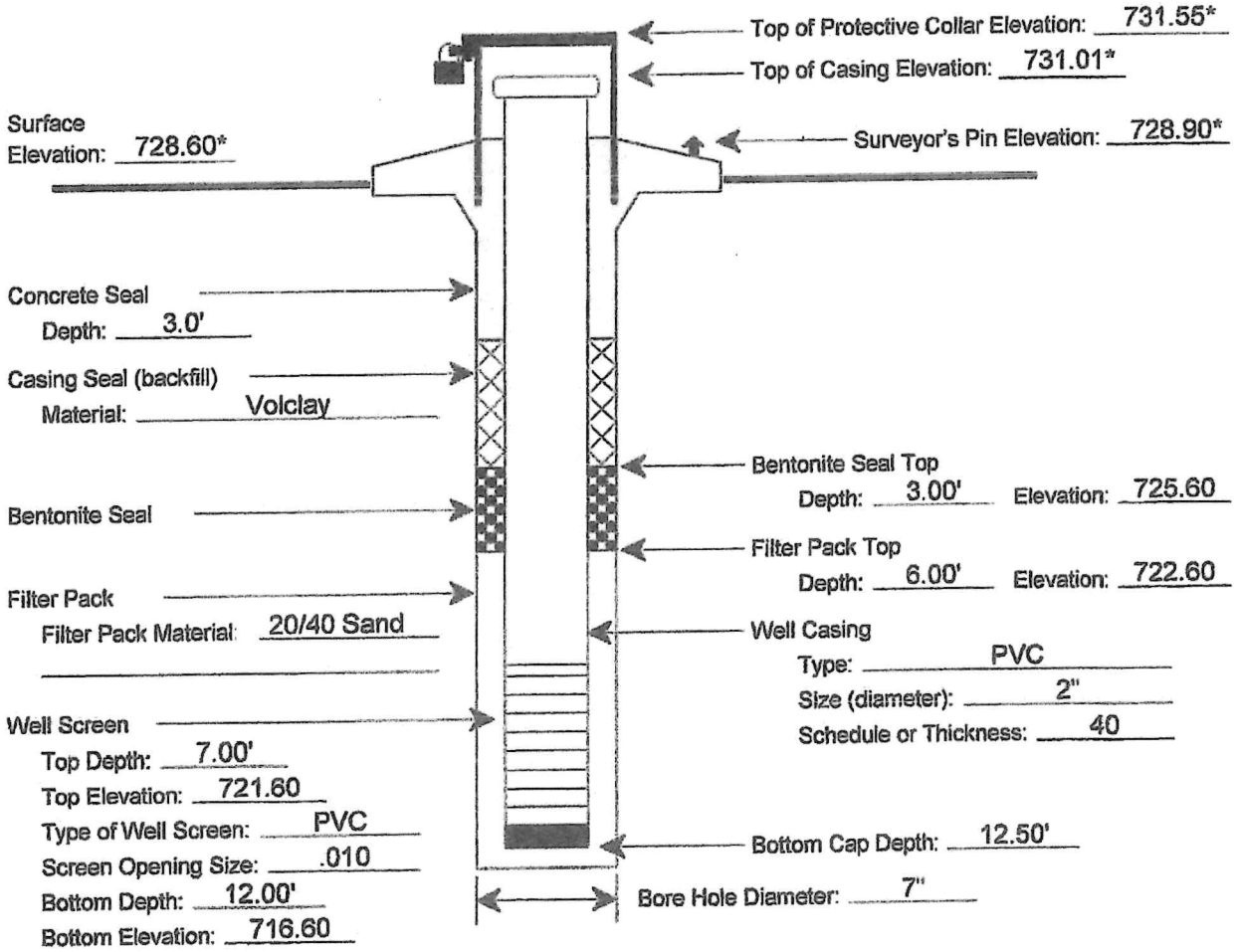
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-5
Date of Monitor Well Development: Insufficient water
Monitor Well Driller
Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: Insufficient water
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x4"



TCEQ-10308

* Due to shrink/swell of near surface clay, this elevation has been adjusted (June 2022)

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation: 8/17/04
Monitor Well Latitude: 33°38'4.4" Longitude: 96°50'4.6"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

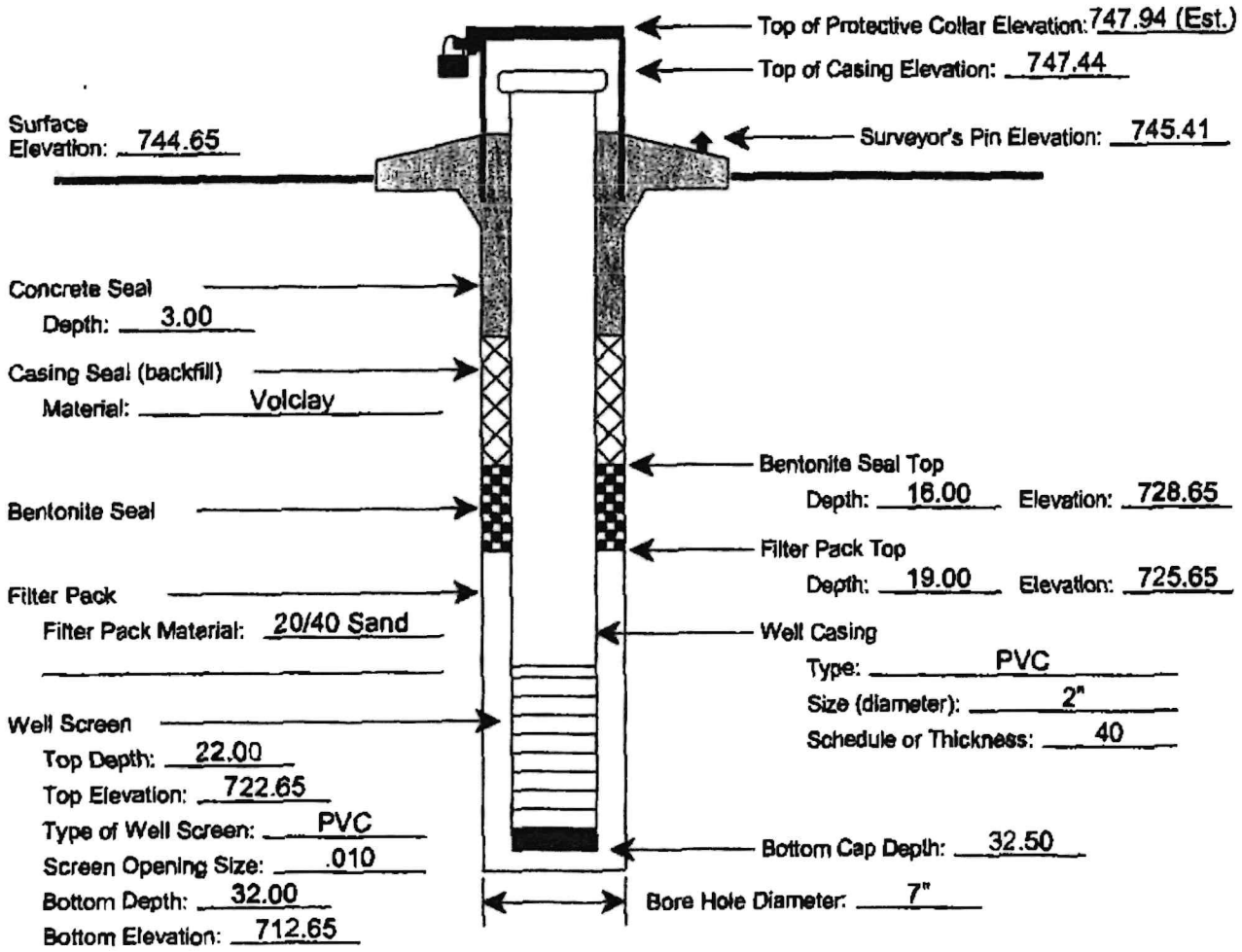
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-6
Date of Monitor Well Development: 8/31/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 720.55
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation: 8/17/04
Monitor Well Latitude: 33°38'3" Longitude: 96°49'56.4"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

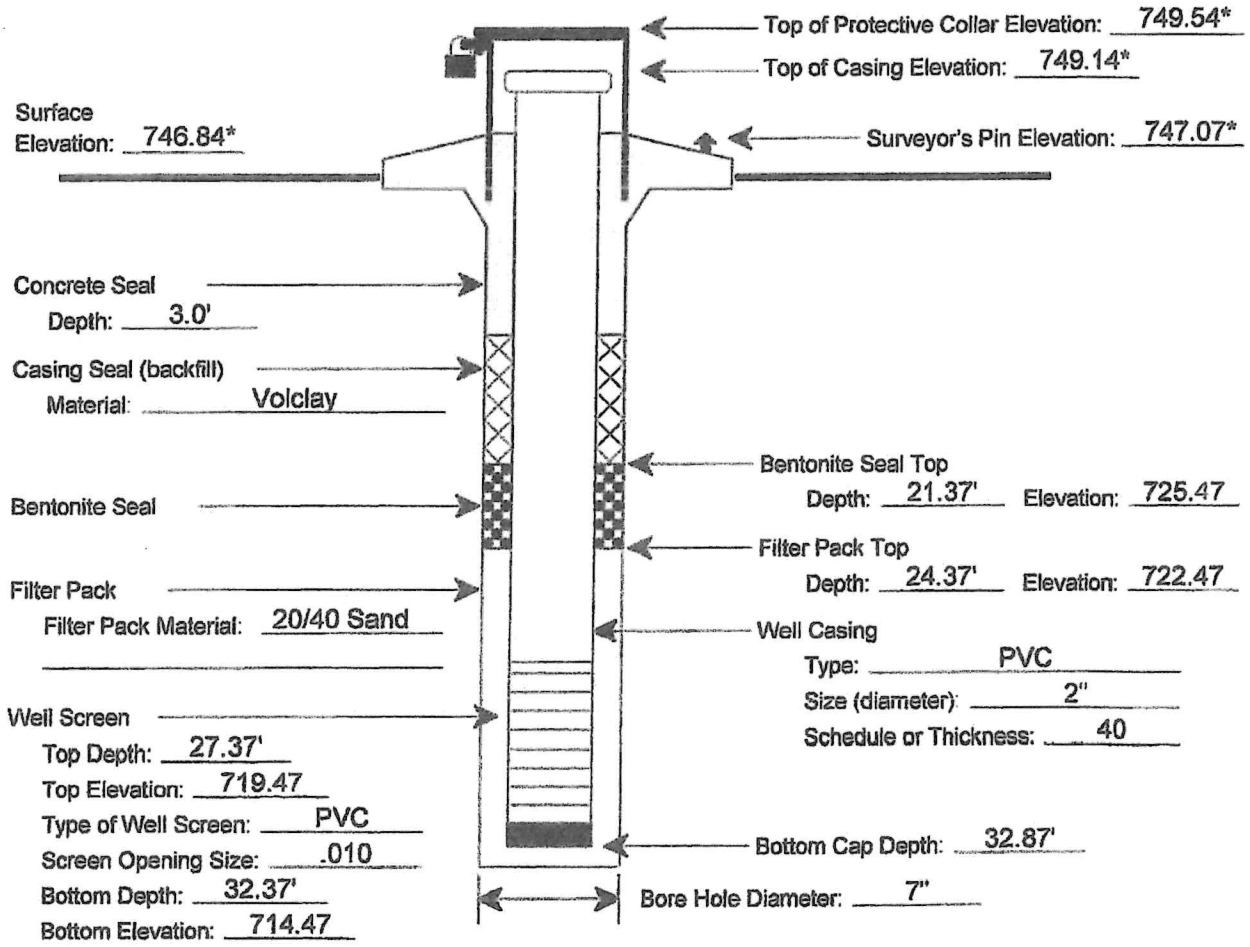
MSW Permit No.: 2290
Monitor Well I.D. No.: MW- 7
Date of Monitor Well Development: 8/31/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend)
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 723.24
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x4"



TCEQ-10308

* Due to shrink/swell of near surface clay, this elevation has been adjusted (June 2022)

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation: 8/25/04
Monitor Well Latitude: 33°37'51.8" Longitude: 96°50'47.1"
Monitor Well Groundwater Gradient Position:
Upgradient X Downgradient

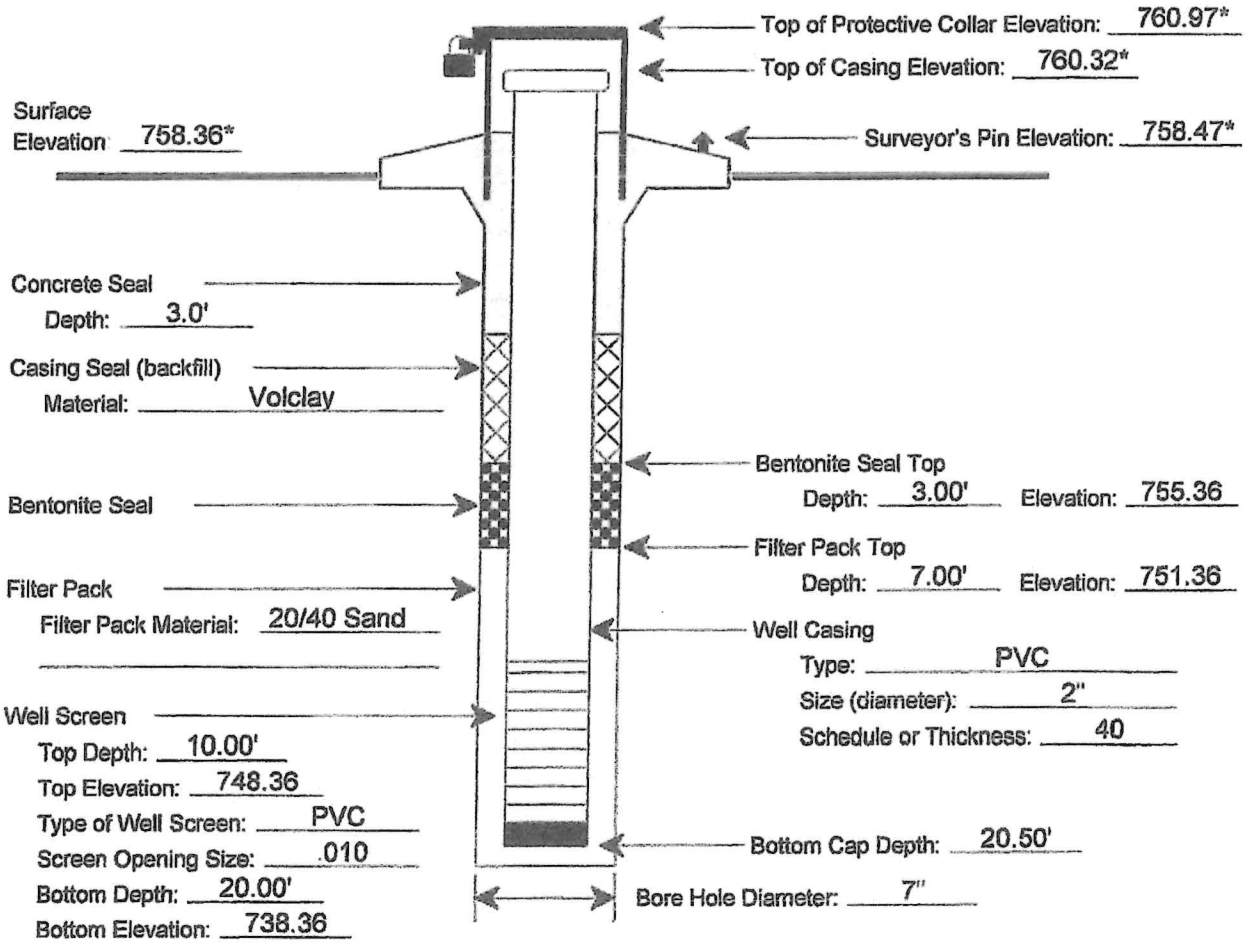
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-12
Date of Monitor Well Development: 8/27/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend)
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 739.40
Name of Geologic Formation(s) in which Well is completed: Eagle Ford

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x4"



TCEQ-10308

* Due to shrink/swell of near surface clay, this elevation has been adjusted (June 2022)

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/26/04
Monitor Well Latitude: 33°38'5.6" Longitude: 96°50'11.6"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

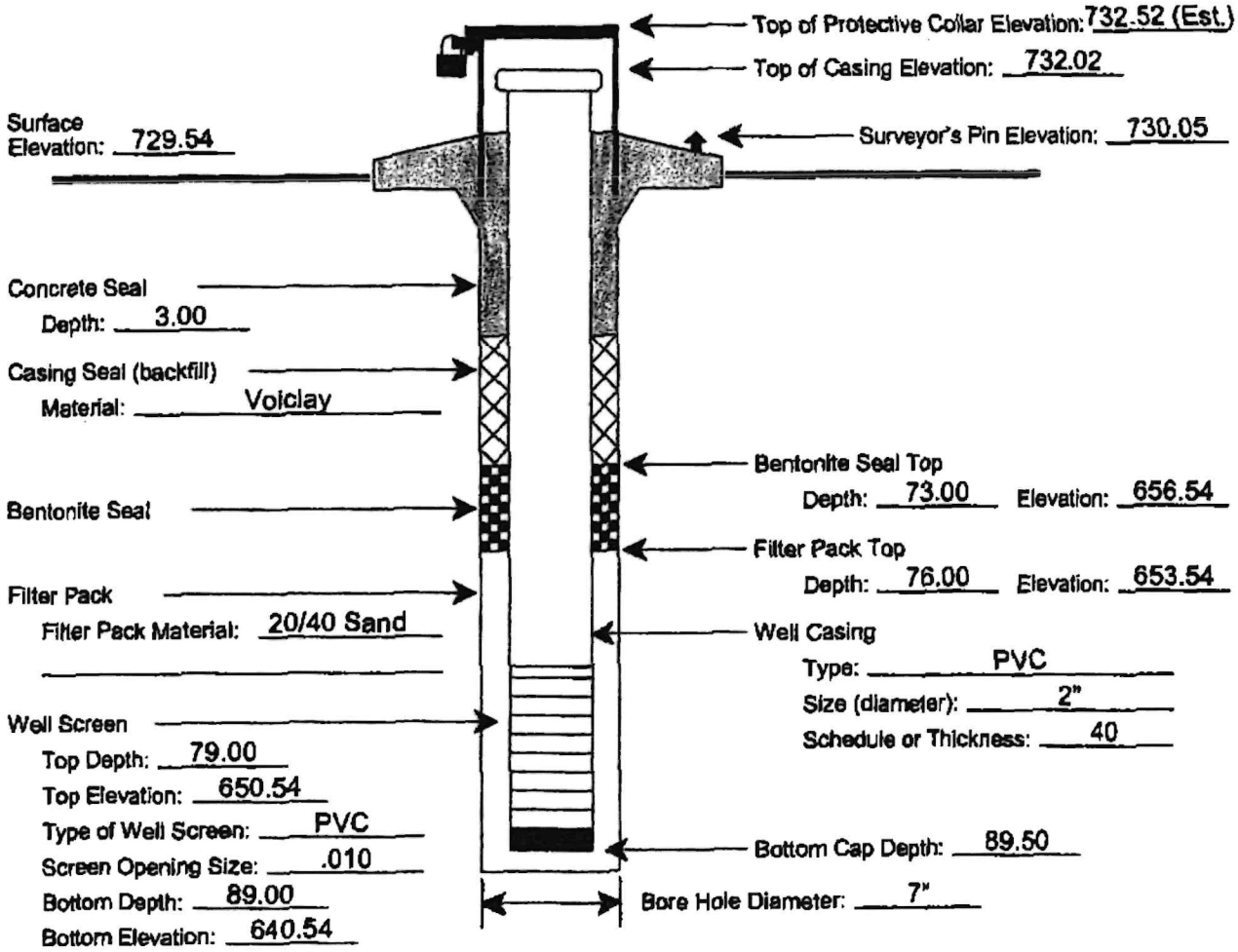
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-13
Date of Monitor Well Development: 8/30/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 645.90
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/24/04
Monitor Well Latitude: 33°38'4.4" Longitude: 96°50'4.6"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

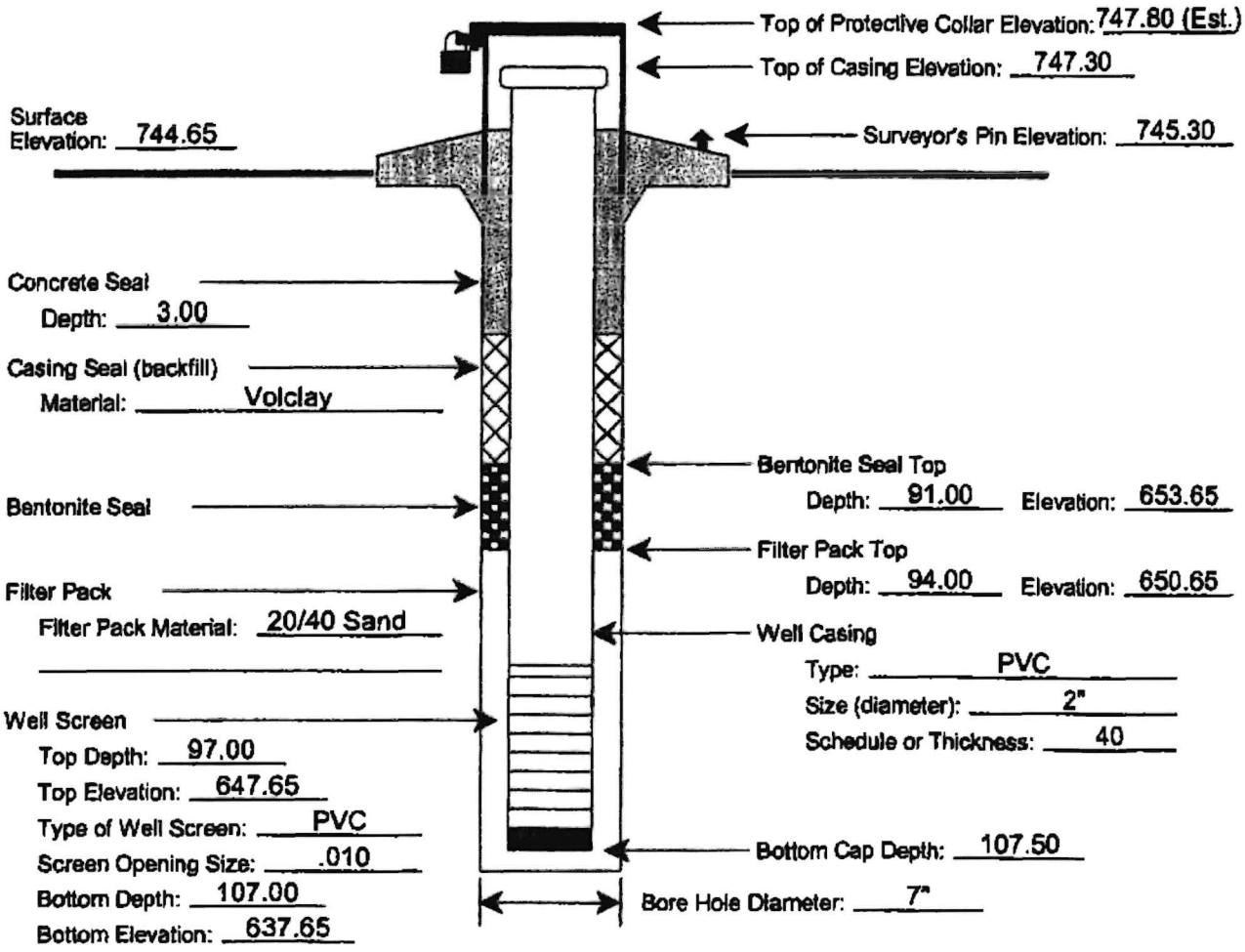
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-14
Date of Monitor Well Development: 8/25/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 649.31
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/29/04
Monitor Well Latitude: 33°38'3.01" Longitude: 96°49'56.4"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

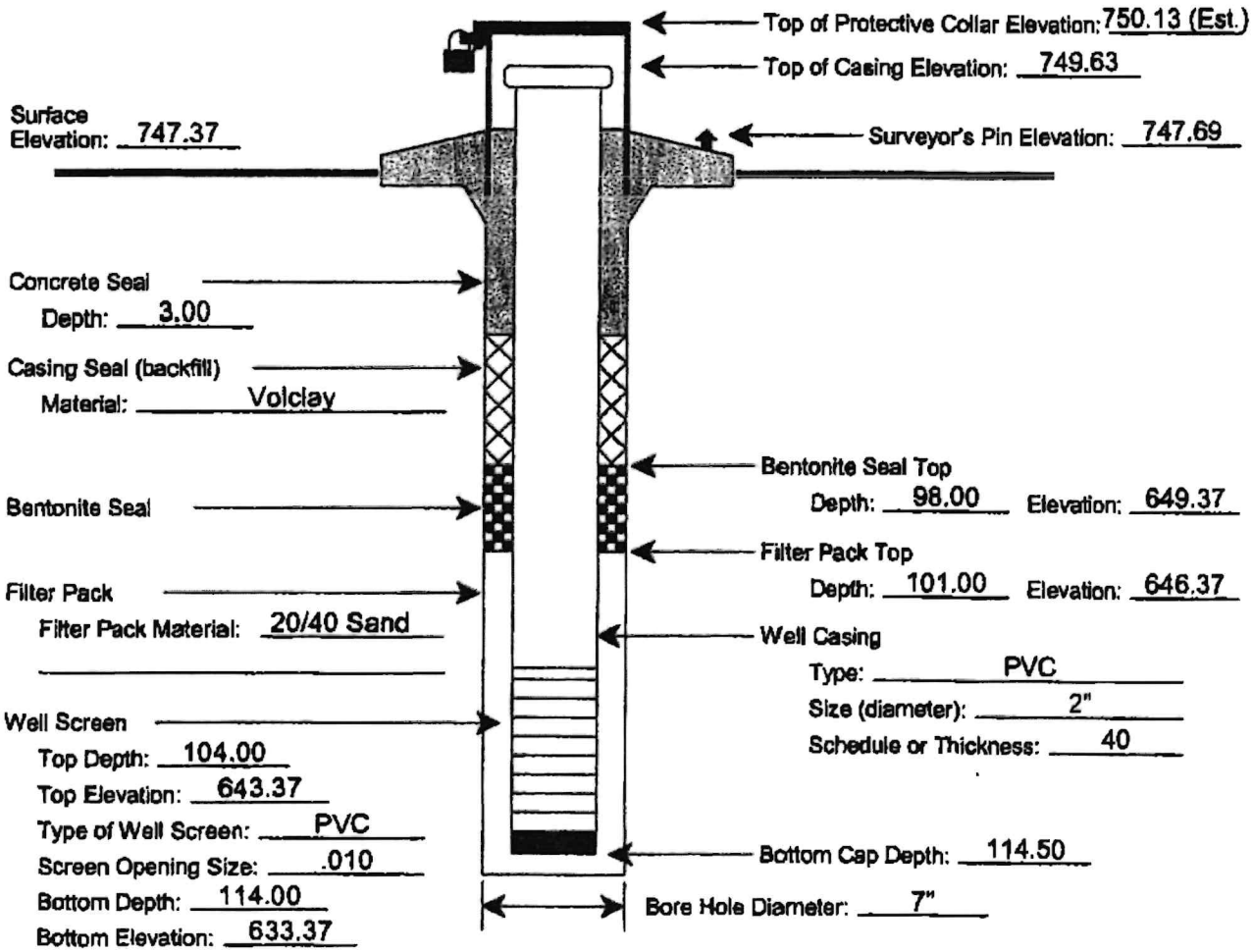
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-15
Date of Monitor Well Development: 8/30/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 642.11
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/14/04
Monitor Well Latitude: 33°38'1.7" Longitude: 96°49'51.3"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

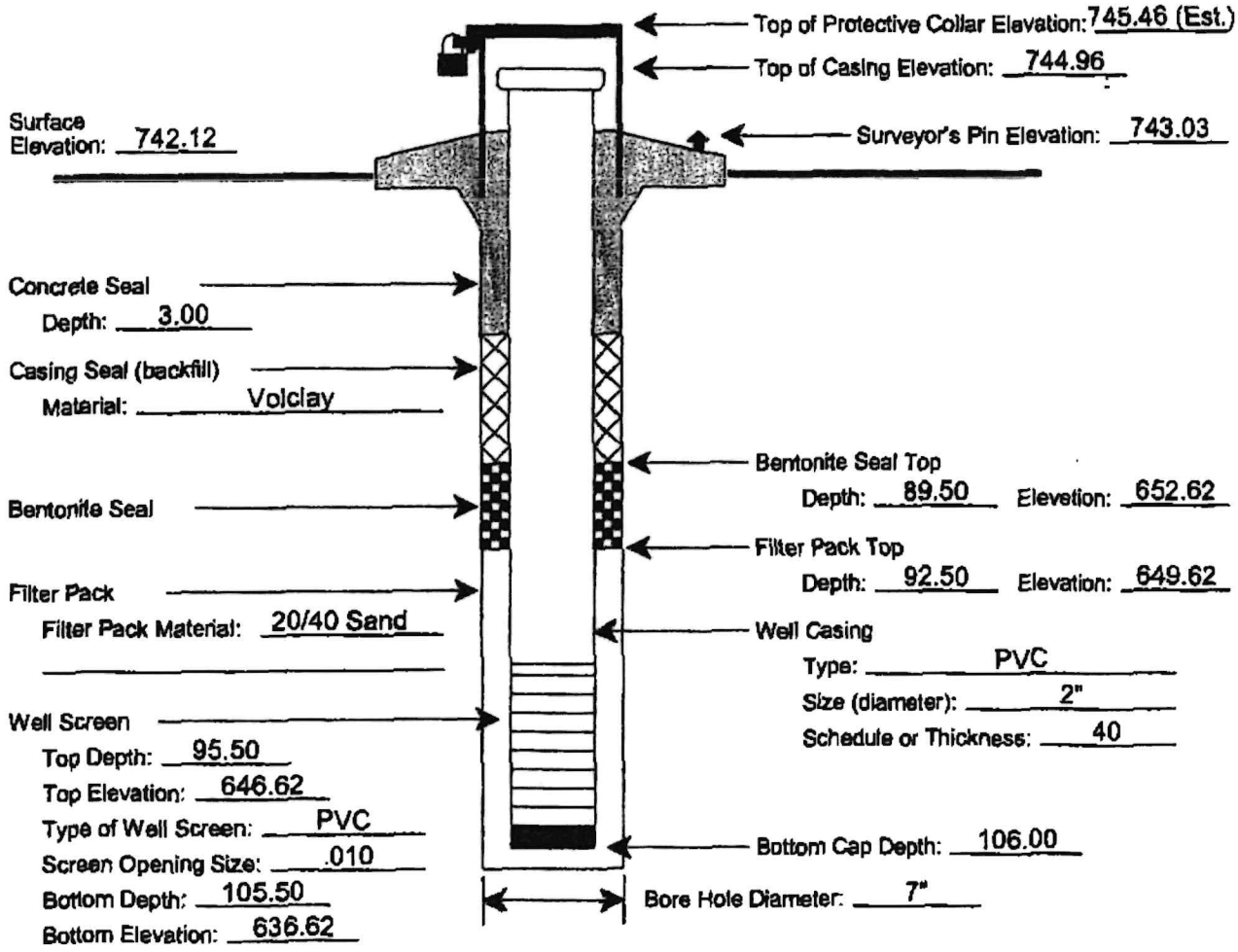
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-16
Date of Monitor Well
Development: 8/25/04
Monitor Well Driller
Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 638.75
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/25/04
Monitor Well Latitude: 33°37'55.6" Longitude: 96°49'51.5"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

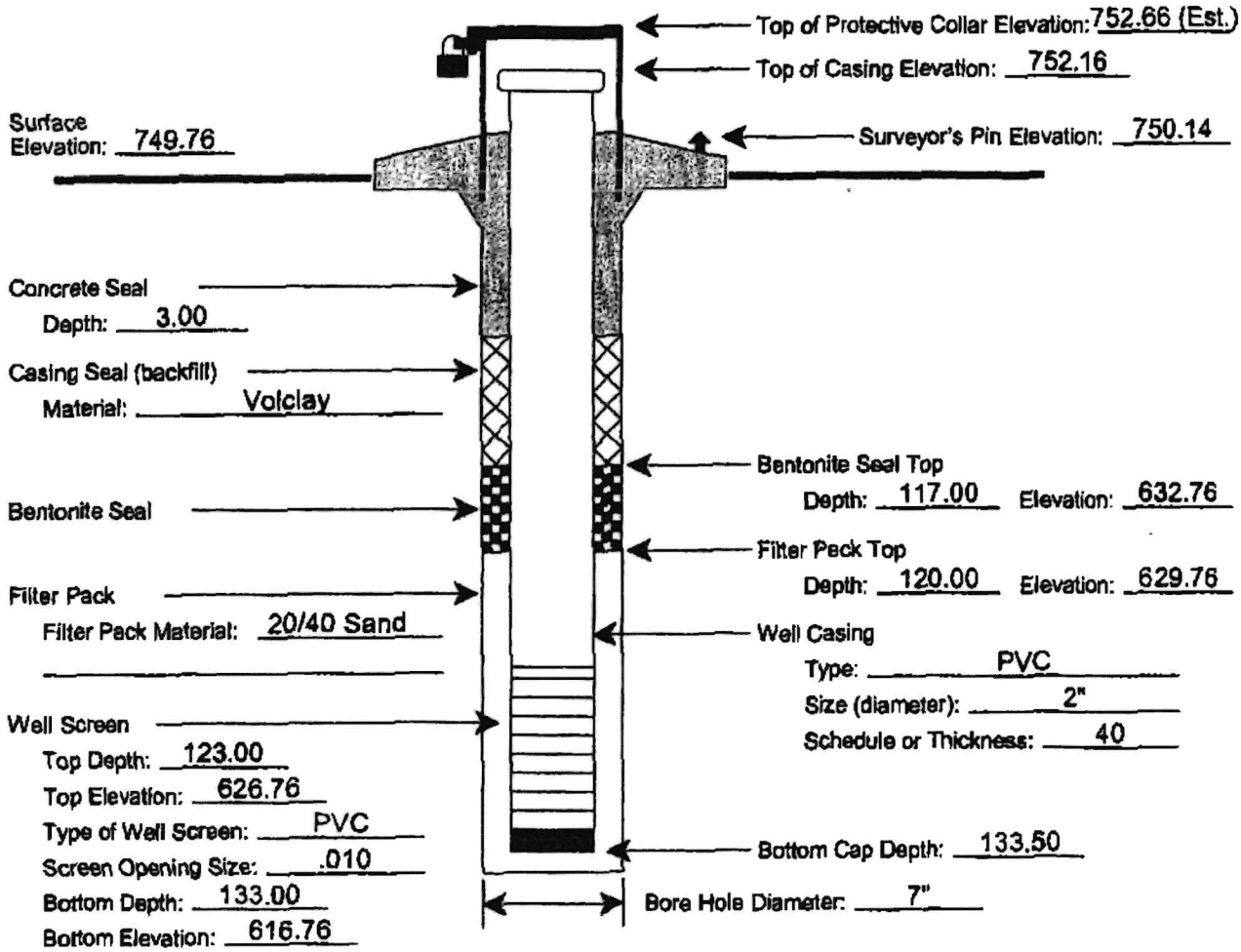
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-17
Date of Monitor Well Development: 8/26/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 634.77
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation: 8/13/04
Monitor Well Latitude: 33°37'48.1" Longitude: 96°49'51.9"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

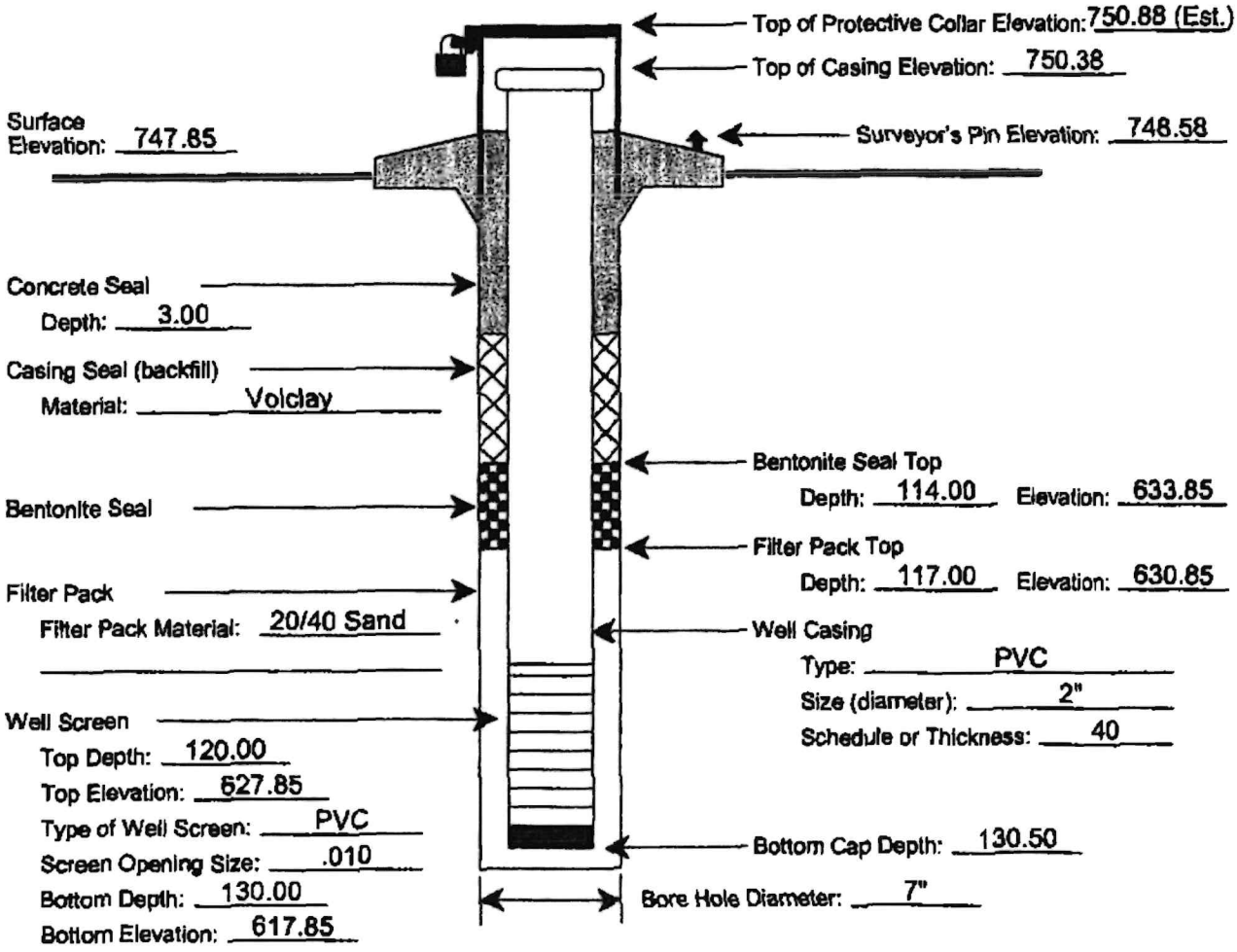
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-18
Date of Monitor Well Development: 8/24/04
Monitor Well Driller
Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 633.68
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/12/04
Monitor Well Latitude: 33°37'42.5" Longitude: 96°49'51.7"
Monitor Well Groundwater Gradient Position:
Upgradient _____ Downgradient X

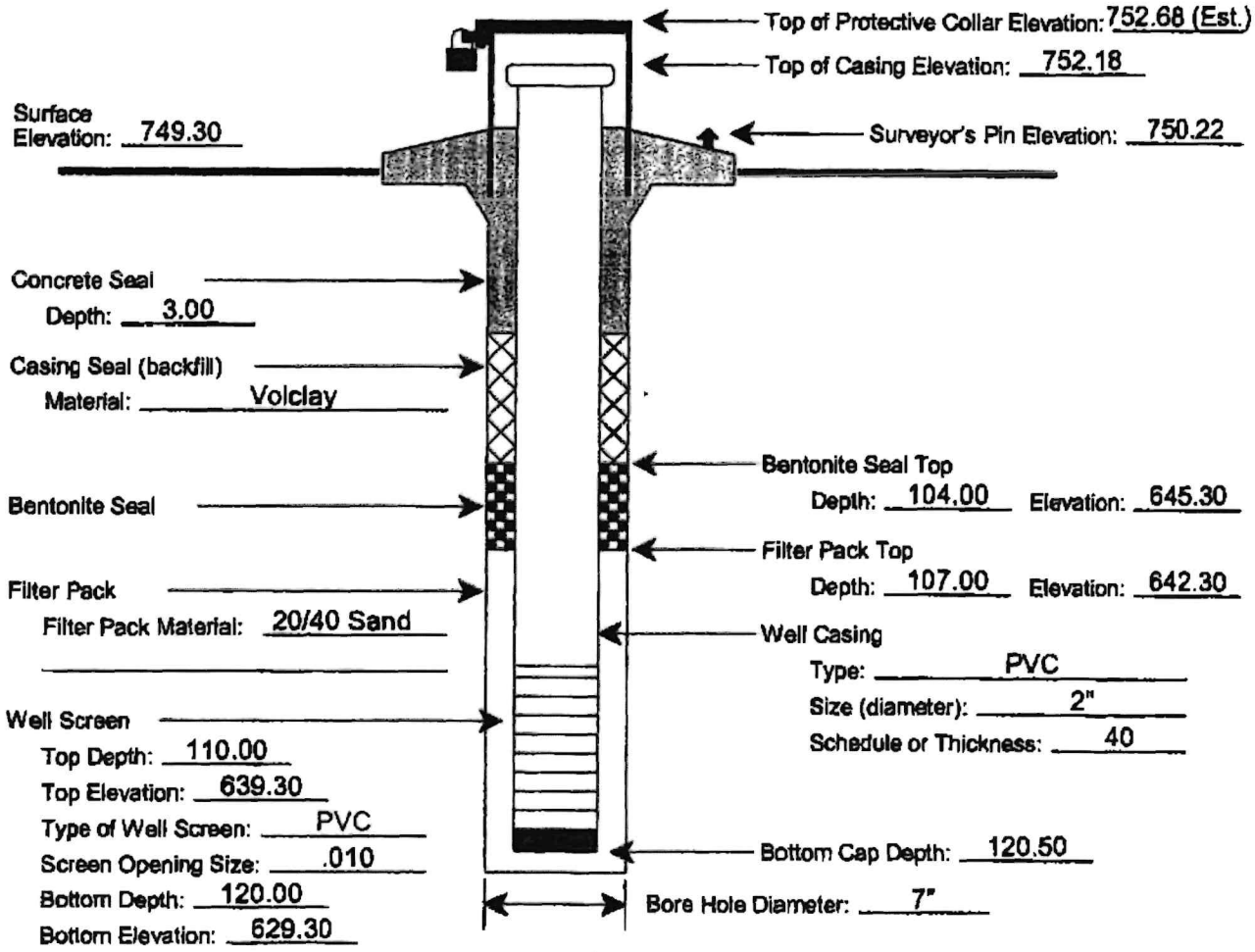
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-19
Date of Monitor Well Development: 8/26/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 638.62
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

Monitor Well Data Sheet

Permittee or Site Name: Texoma Area Solid Waste Authority
County: Grayson
Date of Monitor Well Installation 8/26/04
Monitor Well Latitude: 33°37'51.8" Longitude: 96°50'47.1"
Monitor Well Groundwater Gradient Position:
Upgradient X Downgradient

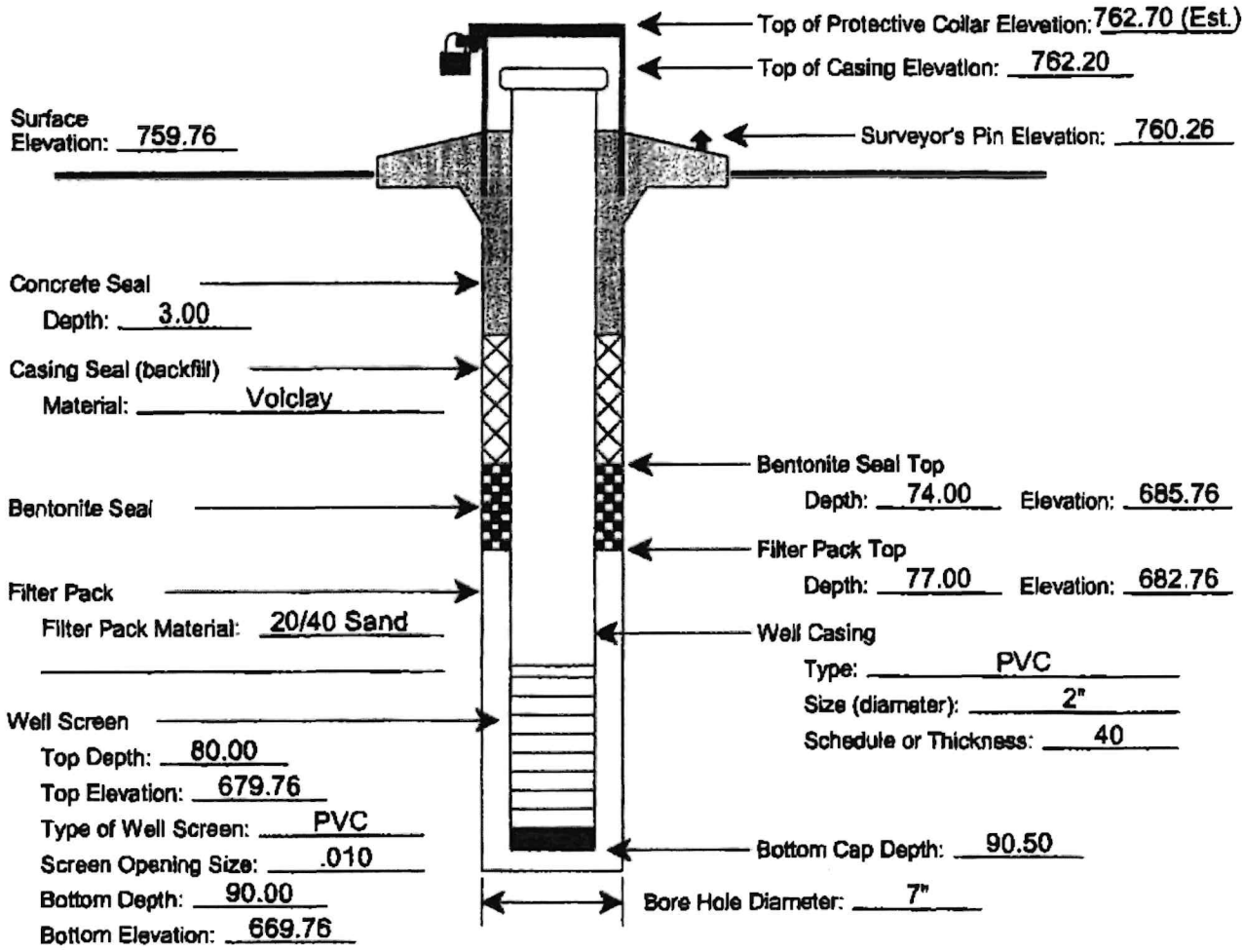
MSW Permit No.: 2290
Monitor Well I.D. No.: MW-26
Date of Monitor Well Development: 8/27/04
Monitor Well Driller Name: Stamoulis
License No.: 54882

NOTES:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of well casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).
- Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist, or Engineer Supervising Well Installation: Boyce
Static Water Level Elevation (with respect to MSL) after Well Development: 676.73
Name of Geologic Formation(s) in which Well is completed: Woodbine

Type of Locking Device: Padlock Type of Casing Protection: Aluminum
Concrete Surface Pad (with steel reinforcement) Dimensions: 4'x4'x6"



TCEQ-10308

STATE OF TEXAS WELL REPORT for Tracking #44862

Owner:	**TASWA**	Owner Well #:	**MW-1**
Address:	**25090 SH 56 Whitesboro , TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 SH 56 Whitesboro , TX 76273**	Latitude:	**33° 38' 07" N**
Well County:	**Grayson**	Longitude:	**096° 50' 40" W**
Elevation:	**765 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/12/2004**
Completed: **8/12/2004**

Diameter of Hole: Diameter: **7 in From Surface To 32 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **18.5 ft to 32 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 15.5 ft with 2 Volclay (#sacks and material)**
3rd Interval: **From 15.5 ft to 18.5 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner of the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking **#44862**) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-4 Clay, brown, yellow orange, tan, light grey, iron stains, calcareous.
4-21 Shaly clay, yellow, tan to light grey, very stiff to hard, iron stains, calcareous partings, manganese dioxide jointed.
21-32 Shaly sand, yellow orange to yellow and olive grey, soft rock, calcareous sandstone at top, iron stains.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-21.5 Sch 40
2 New PVC Screen 21.5-31.5 0.010

STATE OF TEXAS WELL REPORT for Tracking #44865

Owner:	**TASWA**	Owner Well #:	**MW-2**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 07" N**
Well County:	**Grayson**	Longitude:	**096° 50' 33" W**
Elevation:	**760 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/31/2004**
Completed: **8/31/2004**

Diameter of Hole: Diameter: **7** in **From Surface To 22.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **14 ft to 22.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 11 ft with 1 Volclay (#sacks and material)**
3rd Interval: **From 11 ft to 14 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner of the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #44865) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, dark grey brown to dark yellow brown, stiff to very stiff, iron stains, calcareous nodules.
5-15 Shaly clay, yellow tan to light grey, very stiff to hard, iron stains.
15-22.5 Shaly sand with sand shale, yellow orange to yellow olive grey, iron stains, sand fine to very fine, calcareous sandstone at the top.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-17 Sch 40**
2	**New**	**PVC Screen**	**17-22 0.010**

STATE OF TEXAS WELL REPORT for Tracking #44868

Owner:	TASWA	Owner Well #:	MW-3
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	16-16-7
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 38' 07" N
Well County:	Grayson	Longitude:	096° 50' 26" W
Elevation:	749 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **8/26/2004**
Completed: **8/26/2004**

Diameter of Hole: Diameter: **7 in From Surface To 26.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **18 ft to 26.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 15 ft with 1 Volclay (#sacks and material)**
3rd Interval: **From 15 ft to 18 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking number (Tracking **#44868**) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-6.5 Clay, grey brown to yellow brown, firm to very stiff, small calcareous and iron nodules.
6.5-21 Shaly clay, yellow tan to light grey, very stiff to hard, iron stains, below 16' silt stringer.
21-26.5 Shaly sand with sandy shale, yellow orange, soft rock, fine sand, calcareous sandstone layer at top.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser Sch 40**	**0-21**
2	**New**	**PVC Screen 0.010**	**21-26**

STATE OF TEXAS WELL REPORT for Tracking #44919

Owner:	TASWA	Owner Well #:	MW-4
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	16-16-7
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 38' 07" N
Well County:	Grayson	Longitude:	096° 50' 19" W
Elevation:	739 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **8/12/2004**
Completed: **8/12/2004**

Diameter of Hole: Diameter: **7 in From Surface To 18.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **10 ft to 18.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 2 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 2 ft to 7.0 ft with 1 Volclay (#sacks and material)**
3rd Interval: **From 7.0 ft to 10.0 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, dark grey -brown, stiff to very stiff, iron stains, calcareous nodules, iron nodules.
5-11 Shaly clay, yellow-tan, light grey, very stiff to hard, fine gravel, calcareous partings.
11-16.5 Shaly sand with sand shale, yellow-orange to yellow, olive brown, iron stains, calcareous sandstone layers at top.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-13 Sch 40**
2	**New**	**PVC Screen**	**13-18 0.010**

STATE OF TEXAS WELL REPORT for Tracking #44875

Owner:	**TASWA**	Owner Well #:	**MW-5**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 06" N**
Well County:	**Grayson**	Longitude:	**096° 50' 12" W**
Elevation:	**729 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/17/2004**
Completed: **8/17/2004**

Diameter of Hole: Diameter: **7 in From Surface To 12.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **6 ft to 12.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: From **0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: From **3 ft to 6 ft with Bent (#sacks and material)**
3rd Interval: **No Data**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-4 Clay dark greyish brown, firm.
4-12 Clay, brown and tan to orange, light grey, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese dioxide, calcareously cemented sandstone layer, sand fine to silt.
12-12.5 Shale with sand, grey, soft rock.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser Sch 40**	**0-7**
2	**New**	**PVC Screen 0.010**	**7-12**

STATE OF TEXAS WELL REPORT for Tracking #44878

Owner:	**TASWA**	Owner Well #:	**MW-6**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 04" N**
Well County:	**Grayson**	Longitude:	**096° 50' 05" W**
Elevation:	**744 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/17/2004**
Completed: **8/17/2004**

Diameter of Hole: Diameter: **7 in From Surface To 32.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **19 ft to 32.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 16 ft with Volclay (#sacks and material)**
3rd Interval: **From 16 ft to 19 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: **54882**

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-9 Clay dark greyish brown grading to brown and tan, light grey, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese dioxide.
9-24 Shaly clay, orange - tan to light grey, very stiff to hard, iron stains, manganese dioxide, fine grained gypsum partings.
24-32.5 Shaly sand, tan to light brown tan, light yellow and grey, soft rock, with tan calcareously cemented sandstone seams at the top.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-22 Sch 40**
2	**New**	**PVC Screen**	**22-32 0.010**

STATE OF TEXAS WELL REPORT for Tracking #44880

Owner:	TASWA	Owner Well #:	MW-7
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	18-18-8
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 38' 03" N
Well County:	Grayson	Longitude:	096° 49' 56" W
Elevation:	747 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: 8/17/2004
Completed: 8/17/2004

Diameter of Hole: Diameter: 7 in From Surface To 32.90 ft

Drilling Method: Mud Rotary

Borehole Completion: Gravel Packed From: 24.37 ft to 32.90 ft
Gravel Pack Size: 20/40 Sand

Annular Seal Data: 1st Interval: From 0 ft to 3 ft with 1 Cemt (#sacks and material)
2nd Interval: From 3 ft to 21.37 ft with 2 Volclay (#sacks and material)
3rd Interval: From 21.37 ft to 24.37 ft with 1 Bent (#sacks and material)
Method Used: Tremie
Cemented By: Driller
Distance to Septic Field or other Concentrated Contamination: No Data
Distance to Property Line: No Data
Method of Verification: No Data
Approved by Variance: No Data

Surface Completion: Surface Slab Installed

Water Level: Static level: No Data
Artesian flow: No Data

Packers: No Data

Plugging Info: Casing or Cement/Bentonite left in well: No Data

Type Of Pump: No Data

Well Tests: No Data

Water Quality: Type of Water: No Data
Depth of Strata: No Data
Chemical Analysis Made: No
Did the driller knowingly penetrate any strata which contained undesirable constituents: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: Prospector Drilling and Tool Co., Inc.
17226 E. Hwy 6
Alvin , TX 77511

Driller License Number: 54862

Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, slightly silty, brown to olive brown, yellow-brown, some fine gravel, calcareous nodules, iron nodules, yellow orange, iron stains.
5-32.90 Shaly clay, tan, light yellow brown, light grey, yellow orange, iron stains, gypsum, manganese dioxide.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-27.37 Sch 40
2 New PVC Screen 27.37-32.37 0.010

STATE OF TEXAS WELL REPORT for Tracking #44882

Owner:	TASWA	Owner Well #:	MW-12
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	18-18-7
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 37' 52" N
Well County:	Grayson	Longitude:	096° 50' 47" W
Elevation:	759 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **8/25/2004**
Completed: **8/25/2004**

Diameter of Hole: Diameter: **7 in From Surface To 20.50 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **7 ft to 20.50 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 7 ft with 2 Bent (#sacks and material)**
3rd Interval: **No Data**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-6 Clay, dark grey-brown, firm to very stiff.
6-10 Shaly clay, yellow tan, light grey, very stiff to hard, iron stains.
10-20.50 Shaly sand, yellow-orange to brown, fine to very fine, soft rock, iron stains.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-10 Sch 40**
2	**New**	**PVC Screen**	**10-20 0.010**

STATE OF TEXAS WELL REPORT for Tracking #44883

Owner:	TASWA	Owner Well #:	MW-13
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	16-18-7
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 38' 06" N
Well County:	Grayson	Longitude:	096° 50' 12" W
Elevation:	729 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: 8/26/2004
Completed: 8/26/2004

Diameter of Hole: Diameter: 7 in From Surface To 89.5 ft

Drilling Method: Mud Rotary

Borehole Completion: Gravel Packed From: 76 ft to 89.5 ft
Gravel Pack Size: 20/40 Sand

Annular Seal Data: 1st Interval: From 0 ft to 3 ft with 1 Cemt (#sacks and material)
2nd Interval: From 3 ft to 73 ft with 4 Volclay (#sacks and material)
3rd Interval: From 73 ft to 76 ft with 1 Bent (#sacks and material)
Method Used: Tremie
Cemented By: Driller
Distance to Septic Field or other Concentrated Contamination: No Data
Distance to Property Line: No Data
Method of Verification: No Data
Approved by Variance: No Data

Surface Completion: Surface Slab Installed

Water Level: Static level: No Data
Artesian flow: No Data

Packers: No Data

Plugging Info: Casing or Cement/Bentonite left in well: No Data

Type Of Pump: No Data

Well Tests: No Data

Water Quality: Type of Water: No Data
Depth of Strata: No Data
Chemical Analysis Made: No
Did the driller knowingly penetrate any strata which contained undesirable constituents: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: Prospector Drilling and Tool Co., Inc.
17226 E. Hwy 6

Alvin , TX 77511

Driller License Number:	54882
Licensed Well Driller Signature:	Stefan Stamoulis
Registered Driller Apprentice Signature:	No Data
Apprentice Registration Number:	No Data
Comments:	No Data

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-4 Clay, dark greyish brown, firm.
4-12 Clay, brown-tan to orange, light grey, hard to very stiff, iron stains, iron nodules, gypsum, blocky, manganese dioxide, calcareous cemented sandstone layer, sand, brown fine to silt.
12-55 Shale with sand, grey, soft rock.
55-70 Shale, dark grey, soft rock, calcareous.
70-80 Shaly, dark grey, soft rock, sand.
80-88 Shaly sand, grey, medium to fine, soft rock with shale stringers, calcareously cemented sandstone 85'-87'.
88-89.5 Shale with sand, dark grey, soft rock.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-79 Sch 40**
2	**New**	**PVC Screen**	**79-89 0.010**

STATE OF TEXAS WELL REPORT for Tracking #44885

Owner:	**TASWA**	Owner Well #:	**MW-14**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 04" N**
Well County:	**Grayson**	Longitude:	**096° 50' 05" W**
Elevation:	**744 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date:	Started: **6/24/2004** Completed: **8/24/2004**
Diameter of Hole:	Diameter: **7 in From Surface To 107.5 ft**
Drilling Method:	**Mud Rotary**
Borehole Completion:	Gravel Packed From: **94 ft to 107.5 ft** Gravel Pack Size: **20/40 Sand**
Annular Seal Data:	1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)** 2nd Interval: **From 3 ft to 91 ft with 4 Volclay (#sacks and material)** 3rd Interval: **From 91 ft to 94 ft with 1 Bent (#sacks and material)** Method Used: **Tremie** Cemented By: **Driller** Distance to Septic Field or other Concentrated Contamination: **No Data** Distance to Property Line: **No Data** Method of Verification: **No Data** Approved by Variance: **No Data**
Surface Completion:	**Surface Slab Installed**

Water Level:	Static level: **No Data** Artesian flow: **No Data**
Packers:	**No Data**
Plugging Info:	Casing or Cement/Bentonite left in well: **No Data**
Type Of Pump:	**No Data**
Well Tests:	**No Data**

Water Quality:	Type of Water: **No Data** Depth of Strata: **No Data** Chemical Analysis Made: **No** Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**
Certification Data:	The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.
Company Information:	**Prospector Drilling and Tool Co., Inc.** **17226 E. Hwy 6**

E2.279

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking number (Tracking **#44885**) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-3 Clay, dark greyish brown, firm.
3-9 Clay, brown-tan to orange tan, light grey, hard to very stiff, iron stains, manganese dioxide.
9-24 Shaly clay, orange-tan to light grey, very stiff to hard, iron stains, manganese dioxide, fine grained gypsum partings.
24-31 Shaly sand, tan to light brown-tan, light yellow-grey, soft rock, with tan calcareouisy cemented sandstone at top.
31-72 Shale with sand, grey, soft rock, carbonaceous.
72-80 Shale, dark grey, soft rock, massive silt lense, grey.
80-98 Shale with sand, grey, calcareous nodules.
98-107.5 Shaly sand, dark grey, soft rock, glauconitic, with shale stringers, sand lenses, lamations, sand, grey, fine to very fine.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-97 Sch 40
2 New PVC Screen 97-107 0.010

STATE OF TEXAS WELL REPORT for Tracking #44902

Owner:	**TASWA**	Owner Well #:	**MW-15**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 03" N**
Well County:	**Grayson**	Longitude:	**096° 49' 56" W**
Elevation:	**747 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/29/2004**
Completed: **8/29/2004**

Diameter of Hole: Diameter: **7 in From Surface To 114.50 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **101 ft to 114.50 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 98 ft with 4 Volclay (#sacks and material)**
3rd Interval: **From 98 ft to 101 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking number (Tracking **#44902**) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, slightly silty, brown to olive brown, yellow brown, some fine gravel, calcareous nodules, iron nodules, yellow-orange iron stains.
5-33 Shaly clay, tan, light yellow-brown, light grey, yellow orange iron stains, gypsum, manganese dioxide.
33-35 Calcareous cemented zone 33-33.5', shaly sand, light grey to dark grey, calcareous sandstone at top, carbonaceous laminations.
35-63 Shale with sand, dark grey, soft rock, Glauconitic, pyrite, carbonaceous.
63-106 Shale, dark grey, soft rock, massive Glauconitic, pyrite.
106-114.50 Shale with sand, dark grey, soft rock, glauconite, carbonaceous, with shaly sand seamsand and layers, grey, fine to very fine.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-104 Sch 40
2 New PVC Screen 104-114 0.010

STATE OF TEXAS WELL REPORT for Tracking #44907

Owner:	**TASWA**	Owner Well #:	**MW-16**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 38' 02" N**
Well County:	**Grayson**	Longitude:	**096° 49' 51" W**
Elevation:	**742 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/14/2004**
Completed: **8/14/2004**

Diameter of Hole: Diameter: **7 in From Surface To 106 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **92.50 ft to 106.0 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 89.50 ft with 4 Volclay (#sacks and material)**
3rd Interval: **From 89.50 ft to 92.50 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesireble constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, slightly silty, brown to olive brown, firm w/ some fine gravel, calcareous nodules, iron nodules below 3', yellow brown, yellow orange iron stains.
5-28 Shaly clay, tan, light yellow, brown , light grey, yellow orange, iron stains, gypsum.
28-30 Shaly sand, light grey to dark grey, calcareous sandstone layer at 27'.
30-62 Shale with sand, dark grey, soft rock, Glauconitic, pyrite, carbonaceous calcareous cementation 41.8'-43.8'.
62-99 Shale, dark grey, soft rock, massive Glauconitic, carbonaceous, pyrite.
99-105 Shale with sand, dark grey, Glauconitic, carbonaceous, with shaly sand seams, sand seams, shale stringers.
105-106 Sandstone, light grey, soft rock, laminations, Glauconitic, carbonaceous.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-95.5 Sch 40
2 New PVC Screen 95.5-105.5 0.010

STATE OF TEXAS WELL REPORT for Tracking #44910

Owner:	**TASWA**	Owner Well #:	**MW-17**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 37' 56" N**
Well County:	**Grayson**	Longitude:	**096° 49' 52" W**
Elevation:	**749 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/24/2004**
Completed: **8/25/2004**

Diameter of Hole: Diameter: **7 in From Surface To 133.50 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **120.0 ft to 133.50 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 117 ft with 1 Volclay (#sacks and material)**
3rd Interval: **From 117 ft to 120 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking number (Tracking **#44910**) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-3.5 Clay, dark brown, firm, iron stains, calcareous nodules at base.
3.5-31 Shaly sand, light grey to dark grey, carbonaceous, calcareous sandstone layer at top.
31-41 Shale with sand, Glauconitic, pyrite, carbonaceous, calcareous cementation.
41-43 Shaly sandstone, grey hard, calcareous.
43-55 Shaly with sand, dark grey, soft rock, slightly calcareous.
55-98 Shale with sand, dark grey, soft rock, pyrite, Glauconitic below 56'.
98-133.5 Shale with sand, dark grey, soft grey, Glauconitic, carbonaceous, with shaly sand seams, sand seams and shale stringers.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-123 Sch 40
2 New PVC Screen 123-133 0.010

STATE OF TEXAS WELL REPORT for Tracking #44912

Owner:	**TASWA**	Owner Well #:	**MW-18**
Address:	**25090 SH 56** **Whitesboro , TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 SH 56** **Whitesboro , TX 76273**	Latitude:	**33° 37' 48" N**
Well County:	**Grayson**	Longitude:	**096° 49' 52" W**
Elevation:	**747 ft.**	GPS Brand Used:	**Garmin 3 Plus**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Date: Started: **8/13/2004**
Completed: **8/13/2004**

Diameter of Hole: Diameter: **7 in From Surface To 130.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **117 ft to 130.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 114 ft with 6 Volclay (#sacks and material)**
3rd Interval: **From 114 ft to 117 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking number (Trecking #44912) on your written request.

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P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-5 Clay, dark brown, firm, iron stains, calcareous nodules at base.
5-30 Shaly clay, tan light brown, light grey to olive, stiff to very stiff, somewhat blocky, some clay, sand laminations, calcareous, yellow iron stains, gypsum.
30-43 Shale, dark grey, calcareous, some carbonaceous laminations.
43-53 Shaly sandstone, grey hard, slightly calcareous.
53-95 Shale with sand, soft rock, pyrite.
95-123 Shale, dark grey, soft rock, trace pyrite.
123-130.5 Shaly sand, dark grey, soft rock with sand seams and lamionation, Glauconitic, calcareous sandstone, carbonaceous sand partings.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-120 Sch 40
2 New PVC Screen 120-130 0.010

STATE OF TEXAS WELL REPORT for Tracking #44914

Owner:	TASWA	Owner Well #:	MW-19
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	18-18-8
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 37' 42" N
Well County:	Grayson	Longitude:	096° 49' 52" W
Elevation:	749 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **8/12/2004**
Completed: **8/12/2004**

Diameter of Hole: Diameter: **7 in From Surface To 122.0 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **107 ft to 122.0 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 104 ft with 4 Volclay (#sacks and material)**
3rd Interval: **From 104 ft to 107 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

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P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-4 Clay, brown, firm to hard.
4-9 Clay yellow-orange, light grey, stiff to very stiff, iron stains, blocky iron nodules.
9-29 Shaly clay, yellow-orange, light grey, firm to stiff, iron stains.
29-36 Shale, dark brown, soft rock, some light grey seams.
36-38 Shaly sand, grey, moderate rock, calcareous sandstone at the top, shale stringers.
38-82 Shale and sand, grey, moderate rock, calcareous.
82-106 Shale, dark grey, soft rock, massive trace pyrite.
106-113 Shaly sand, grey-dark grey, soft to moderate rock, carbonaceous, Glauconitic.
113-115 Shaly sandstone, light to dark grey, soft to moderate rock, carbonaceous.
115-117 Shaly sand, grey to dark grey, soft to moderate rock.
117-120 Shale with sand, dark grey, soft rock, carbonaceous with shaly sand seams and layers.
120-122.0 Shale, dark grey, soft.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia. New/Used Type Setting From/To
2 New PVC Riser 0-110 Sch 40
2 New PVC Screen 110-120 0.010

STATE OF TEXAS WELL REPORT for Tracking #44915

Owner:	TASWA	Owner Well #:	MW-26
Address:	25090 SH 56 Whitesboro , TX 76273	Grid #:	18-18-7
Well Location:	25090 SH 56 Whitesboro , TX 76273	Latitude:	33° 37' 52" N
Well County:	Grayson	Longitude:	096° 50' 47" W
Elevation:	759 ft.	GPS Brand Used:	Garmin 3 Plus
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **8/26/2004**
Completed: **8/26/2004**

Diameter of Hole: Diameter: **7 in From Surface To 90.5 ft**

Drilling Method: **Mud Rotary**

Borehole Completion: Gravel Packed From: **77 ft to 90.5 ft**
Gravel Pack Size: **20/40 Sand**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Cemt (#sacks and material)**
2nd Interval: **From 3 ft to 74 ft with 4 Volclay (#sacks and material)**
3rd Interval: **From 74 ft to 77 ft with 1 Bent (#sacks and material)**
Method Used: **Tremie**
Cemented By: **Driller**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **Prospector Drilling and Tool Co., Inc.**
17226 E. Hwy 6

	Alvin , TX 77511
Driller License Number:	**54882**
Licensed Well Driller Signature:	**Stefan Stamoulis**
Registered Driller Apprentice Signature:	**No Data**
Apprentice Registration Number:	**No Data**
Comments:	**No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft) To (ft) Description
0-6 Clay, dark grey brown, firm to very stiff.
6-10 Shaly clay, yellow-tan to light grey, very stiff to hard, iron stains.
10-20 Shaly sand, yellow-orange to brown, fine , soft rock, iron stains.
20-55 Shale with sand, olive grey, yellow, iron stains, carbonaceous.
55-81 Shale, dark grey, soft rock.
81-90.5 Shale sand, grey, medium to fine grained, shale lense, grey glauconitic.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2	**New**	**PVC Riser**	**0-80 Sch 40**
2	**New**	**PVC Screen**	**80-90 0.010**

STATE OF TEXAS WELL REPORT for Tracking #602439

Owner:	**TASWA**	Owner Well #:	**P-1s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-1**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 37' 25" N**
		Longitude:	**096° 50' 49" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/25/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**38**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**25.5**	**38**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Concrete 1 Bags/Sacks**
	3	**22.5**	**Bentonite 2.5 Bags/Sacks**
	22.5	**25.5**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	13	CLAY, DK BRN, W/SILTY SAND
13	18	CLAY, SILTY, LT GREY AND TAN, HARD
18	28	CLAY, SHALEY, TAN AND LIGHT GREY, HARD
28	37	SAND, SHALEY, REDDISH-ORANGE AND GREY, DENSE
37	38	SHALE, W/SAND, DARK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	27.5
2	Screen	New Plastic (PVC)	0.010	27.5	37.5

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602442

Owner:	**TASWA**	Owner Well #:	**P-1d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-1**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 37' 25" N**
		Longitude:	**096° 50' 49" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/25/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**146**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**127.5**	**146**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**123**	**Bentonite 6 Bags/Sacks**
	123	**127.5**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	13	CLAY, DK BRN, W/SILTY SAND
13	18	CLAY, SILTY LT GREY AND TAN, HARD
18	28	CLAY, SHALEY, TAN AND LIGHT GREY, HARD
28	37	SAND, SHALEY, REDDISH-ORANGE AND GREY
37	70	SHALE, W/SAND, DK GREY, HARD
70	129	SHALE, DK GREY, HARD
129	133	SAND, W/SHALE, GREY AND DK GREY, DENSE
133	140	SHALE, W/SAND, HARD
140	145	SAND, UNC. DARD GREY, VPG. DENSE
145	146	SHALE, SANDY, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	130
2	Screen	New Plastic (PVC)	0.010	130	145

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602444

Owner:	**TASWA**	Owner Well #:	**P-4d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-1**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 37' 25" N**
		Longitude:	**096° 50' 28" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/10/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**125**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**111**	**125**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**107**	**Bentonite 6 Bags/Sacks**
	107	**111**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Report Amended on 6/4/2024 by Request #42519

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	6	CLAY, DK BN AND OLIVE BRN, FIRM
6	35	CLAY, SHALEY, YELLOWISH ORANGE AND GREY, HARD
35	65	SHALE, W/SAND, DK GREY, HARD
65	120	SHALE, DK GREY, HARD
120	123	SILTSTONE, BUFF TO DARK GREY, HARD
123	125	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	114
2	Screen	New Plastic (PVC)	0.1	114	124

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602456

Owner:	**TASWA**	Owner Well #:	**P-6s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-1**
		Latitude:	**33° 37' 27" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 50' 07" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/7/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**30.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**17**	**30.5**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**13**	**Bentonite 2 Bags/Sacks**
	13	**17**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**
17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	12	CLAY, BRN TO DK BRN, FIRM
12	30.5	CLAY, SHALEY YELLOW ORANGE AND GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	20
2	Screen	New Plastic (PVC)	0.010	20	30

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602455

Owner:	**TASWA**	Owner Well #:	**P-6d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-1**
		Latitude:	**33° 37' 27" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 50' 07" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/9/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**112**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**97**	**112**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**94**	**Bentonite 7 Bags/Sacks**
	94	**97**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	12	CLAY, BROWN AND DK BROWN, FIRM
12	27	CLAY, SHALEY, YELLOWISH ORANGE AND GREY, HARD
27	70	SHALE, W/SAND, DK GREY, HARD
70	108	SHALE, DK GREY, HARD
108	110	SANDSTONE, GREY AND DARK GREY, HARD
110	112	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	101
2	Screen	New Plastic (PVC)	0.010	101	111

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602454

Owner:	**TASWA**	Owner Well #:	**P-7d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-26-2**
		Latitude:	**33° 37' 29" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 56" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/6/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**114**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**106.5**	**114**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**102**	**Bentonite 9 Bags/Sacks**
	102	**106.5**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	6	CLAY, DK BRN, BRN, FIRM
6	35	CLAY, SHALEY, YELLOWISH ORANGE AND GREY, HARD
35	60	SHALE, W/SAND, DK GREY, HARD
60	111	SHALE, DK GREY, HARD
111	113	SANDSTONE, LIGHT GREY, HARD
113	114	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	108.5
2	Screen	New Plastic (PVC)	0.010	108.5	113.5

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STATE OF TEXAS WELL REPORT for Tracking #602453

Owner:	**TASWA**	Owner Well #:	**P-8s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 31" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 46" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/4/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**37.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**30**	**37.5**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**27**	**Bentonite 2 Bags/Sacks**
	27	**30**	**BENTONITE CHIPS 1 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	6	CLAY, BRN AND GREY, STIFF
6	21	CLAY, SHALEY TAN AND LIGHT GREY, HARD
21	35	SHALE, DK GREY W/SAND, HARD
35	37.5	SANDSTONE, LIGHT GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	32
2	Screen	New Plastic (PVC)	0.010	32	37

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602452

Owner:	**TASWA**	Owner Well #:	**P-8d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 31" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 46" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/5/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**124**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**105**	**124**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**100**	**Bentonite 8 Bags/Sacks**
	100	**105**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	6	CLAY, BRN, STIFF
6	21	CLAY, SHALEY, TAN AND LIGHT GREY, HARD
21	35	SHALE W/SAND, DK GREY, HARD
35	37.5	SANDSTONE, LIGHT GREY, HARD
37.5	85	SHALE W/SAND, DK GREY, HARD
85	114	SHALE, DARK GREY, HARD
114	118	SAND, SILTY, GREY AND GREENISH GREY, DENSE
118	119	SILTSTONE W/CEMENTED SAND, L GREY, HARD
119	124	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	109
2	Screen	New Plastic (PVC)	0.010	109	119

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602450

Owner:	**TASWA**	Owner Well #:	**P-10s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 42" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 44" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/1/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**46**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**30.5**	**46**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**26**	**Bentonite 2.5 Bags/Sacks**
	26	**30.5**	**BENTONITE CHIPS 1 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	8	CLAY, BROWN AND OLIVE, FIRM
8	20	CLAY, SHALEY, HARD
20	46	SHALE, W/SAND, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	35
2	Screen	New Plastic (PVC)	0.010	35	45

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602449

Owner:	**TASWA**	Owner Well #:	**P-10d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 42" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 44" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/1/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**115**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**101**	**115**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**98**	**Bentonite 7 Bags/Sacks**
	98	**101**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	8	CLAY, BRN AND OLIVE, FIRM
8	20	CLAY, SHALEY, TAN AND LIGHT GREY, HARD
20	80	SHALE, W/SAND DK GREY, HARD
80	106.5	SHALE, DK GREY, HARD
106.5	112	SAND, DK GREY AND GREY, DENSE
112	114	SILTSTONE, LIGHT GREY AND GREY, HARD
114	115	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	104
2	Screen	New Plastic (PVC)	0.010	104	114

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Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602448

Owner:	**TASWA**	Owner Well #:	**P-12s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 51" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 44" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/2/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**34.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**26**	**34.5**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**22**	**Bentonite 3 Bags/Sacks**
	22	**26**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	CLAY, BROWN, VERY STIFF
10	17	CLAY, SHALEY, TAN AND YELLOW AND GRAY, HARD
17	31	SHALE, W/SAND, DK GRAY, HARD
31	32	SAND, SHALEY, LIGHT GREY, HARD
32	34.5	SHALE, W/SAND, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	28
2	Screen	New Plastic (PVC)	0.010	28	33

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Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602447

Owner:	**TASWA**	Owner Well #:	**P-12d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 37' 51" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 44" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/2/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**121**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**106**	**121**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**102**	**Bentonite 8 Bags/Sacks**
	102	**106**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	CLAY, BRN, VERY STIFF
10	17	CLAY, SHALEY, TAN AND LIGHT YELLOW, HARD
17	31	SHALE, TRACE SAND DK GREY, HARD
31	32	SAND, SHALEY, LT GREY, HARD
32	75	SHALE, W/SAND, DK GREY, HARD
75	111	SHALE, DK GREY, HARD
111	117	SILTY SAND, L GREY AND GREY, DENSE
117	119	SILSTONE, LT GREY AND GREY, HARD
119	121	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	109
2	Screen	New Plastic (PVC)	0.010	109	119

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602446

Owner:	**TASWA**	Owner Well #:	**P-13s**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 37' 57" N**
		Longitude:	**096° 49' 43" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/3/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**38**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**25**	**38**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**21**	**Bentonite 2.5 Bags/Sacks**
	21	**27**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Report Amended on 6/4/2024 by Request #42521

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	CLAY. SILTY, BRN AND OLIVE, FIRM
10	21	CLAY, SHALEY, TAN AND YELLOWISH BRN, HARD
21	27	SHALE, DK GREY, HARD
27	29.5	SANDSTONE, LIGHT GRAY, HARD
29.5	38	SHALE, W/SAND, DK GRAY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	27
2	Screen	New Plastic (PVC)	0.010	27	38

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #602445

Owner:	**TASWA**	Owner Well #:	**P-13d**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 37' 57" N**
		Longitude:	**096° 49' 43" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **3/3/2022** Drilling End Date: **3/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**119.5**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**109.5**	**119.5**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**106**	**Bentonite 7.5 Bags/Sacks**
	106	**109.5**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Report Amended on 6/4/2024 by Request #42520

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	10	CLAY, SILTY, BRN TO OLIVE, FIRM
10	21	CLAY, SHALEY, TAN TO YELLOWISH BRN, HARD
21	27	SHALE, W/SAND, DK GREY, HARD
27	29.5	SANDSTONE, LIGHT GREY, HARD
29.5	40	SHALE, W/SAND, DK GREY, HARD
40	70	SHALE, W/SAND, DK GREY, HARD
70	115	SHALE, DK GREY, HARD
115	117	SILTSTONE AND SANDSTONE, LIGHT GREY, HARD
117	119.5	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	113
2	Screen	New Plastic (PVC)	0.010	113	118

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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655309

Owner:	**TASWA**	Owner Well #:	**P-16S**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 38' 09" N**
		Longitude:	**096° 49' 54" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/17/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**41**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**33**	**41**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**30**	**BENTONITE GROUT 4 Bags/Sacks**
	30	**33**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: No

Did the driller knowingly penetrate any strata which contained injurious constituents?: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	33	CLAY, DK BRN, TAN, YELLOWISH BRN, W/SAND
33	41	SHALE, DK GREY, W/GYPSUM, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	35
2	Screen	New Plastic (PVC)	0.010	35	40

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Texas Department of Licensing and Regulation
P.O. Box 12157
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(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655308

Owner:	**TASWA**	Owner Well #:	**P-16D**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-8**
		Latitude:	**33° 38' 09" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 49' 54" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/18/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**103**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**89**	**103**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**86**	**BENTONITE GROUT 5 Bags/Sacks**
	86	**89**	**BENTONITE CHIPS 3 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: No

Did the driller knowingly penetrate any strata which contained injurious constituents?: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: H/ET
17226 E HWY 6
ALVIN, TX 77511

Driller Name: STEFAN STAMOULIS License Number: 54882

Comments: No Data

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	33	CLAY, DK BRN, TAN AND YELLOWISH BROWN
33	95	SHALE, DK GREY, W/SILTSTONE
95	103	W/SAND GREENISH GREY, FINE GRAINED W/SILTSTONE

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	92
2	Screen	New Plastic (PVC)	0.010	92	102

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655307

Owner:	**TASWA**	Owner Well #:	**P-17S**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-7**
		Latitude:	**33° 38' 11" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 50' 06" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/17/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**50.5**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**26**	**50.5**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1.5 Bags/Sacks**
	3	**22.5**	**BENTONITE GROUT 3.5 Bags/Sacks**
	22.5	**26**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	26.5	CLAY, DK BRN, TAN AND LIGHT BRN, HARD
26.5	32	SHALE, LIGHT GREY AND OLIVE, HARD
32	50.5	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	30
2	Screen	New Plastic (PVC)	0.010	30	50

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655306

Owner:	**TASWA**	Owner Well #:	**P-18D**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-7**
		Latitude:	**33° 38' 13" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 50' 15" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/17/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**81**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**62**	**81**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1.5 Bags/Sacks**
	3	**58**	**BENTONITE GROUT 5 Bags/Sacks**
	58	**62**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	11	CLAY, DK BRN AND BROWN, HARD
11	65	SHALE, DK GREY, GARD
65	81	SHALE, W/SAND - GREENISH GREY, W/SILTSTONE LAYERS

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	65
2	Screen	New Plastic (PVC)	0.010	65	80

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655304

Owner:	**TASWA**	Owner Well #:	**P-20S**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-7**
		Latitude:	**33° 38' 17" N**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Longitude:	**096° 50' 40" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/19/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**44**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**31**	**44**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**27**	**BENTONITE GROUT 3.5 Bags/Sacks**
	27	**31**	**BENTONITE CHIPS 1.5 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	No Data	No Data

Chemical Analysis Made: No

Did the driller knowingly penetrate any strata which contained injurious constituents?: No

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: H/ET
17226 E HWY 6
ALVIN, TX 77511

Driller Name: STEFAN STAMOULIS License Number: 54882

Comments: No Data

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	3	CLAY, DK BRN, STIFF
3	33	CLAY, TAN AND L GREY AND BRN, HARD
33	44	SHALE, DK GREY, HARD

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	33
2	Screen	New Plastic (PVC)	0.010	33	43

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #655305

Owner:	**TASWA**	Owner Well #:	**P-20D**
Address:	**25090 TX-56 WHITESBORO, TX 76273**	Grid #:	**18-18-7**
Well Location:	**25090 TX-56 WHITESBORO, TX 76273**	Latitude:	**33° 38' 17" N**
		Longitude:	**096° 50' 40" W**
Well County:	**Grayson**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/19/2023** Drilling End Date: **11/21/2023**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**6.5**	**0**	**111**

Drilling Method: **SONIC**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**93**	**111**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**3**	**Cement 1 Bags/Sacks**
	3	**93.5**	**BENTONITE GROUT 4.5 Bags/Sacks**
	93.5	**95.5**	**BENTONITE CHIPS 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

	Strata Depth (ft.)	Water Type
Water Quality:	**No Data**	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **H/ET**

17226 E HWY 6
ALVIN, TX 77511

Driller Name: **STEFAN STAMOULIS** License Number: **54882**

Comments: **No Data**

Report Amended on 6/4/2024 by Request #42518

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	3	CLAY, DK BRN, STIFF
3	33	CLAY, SILTY W/SAND
33	75	SHALE, W/SAND, DK GRAY, HARD
75	95	SHALE, DK GRAY, HARD
95	111	SHALE, DK GRAY W/SAND

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	Riser	New Plastic (PVC)	SCH 40	0	95.5
2	Screen	New Plastic (PVC)	0.010	95.5	110.5

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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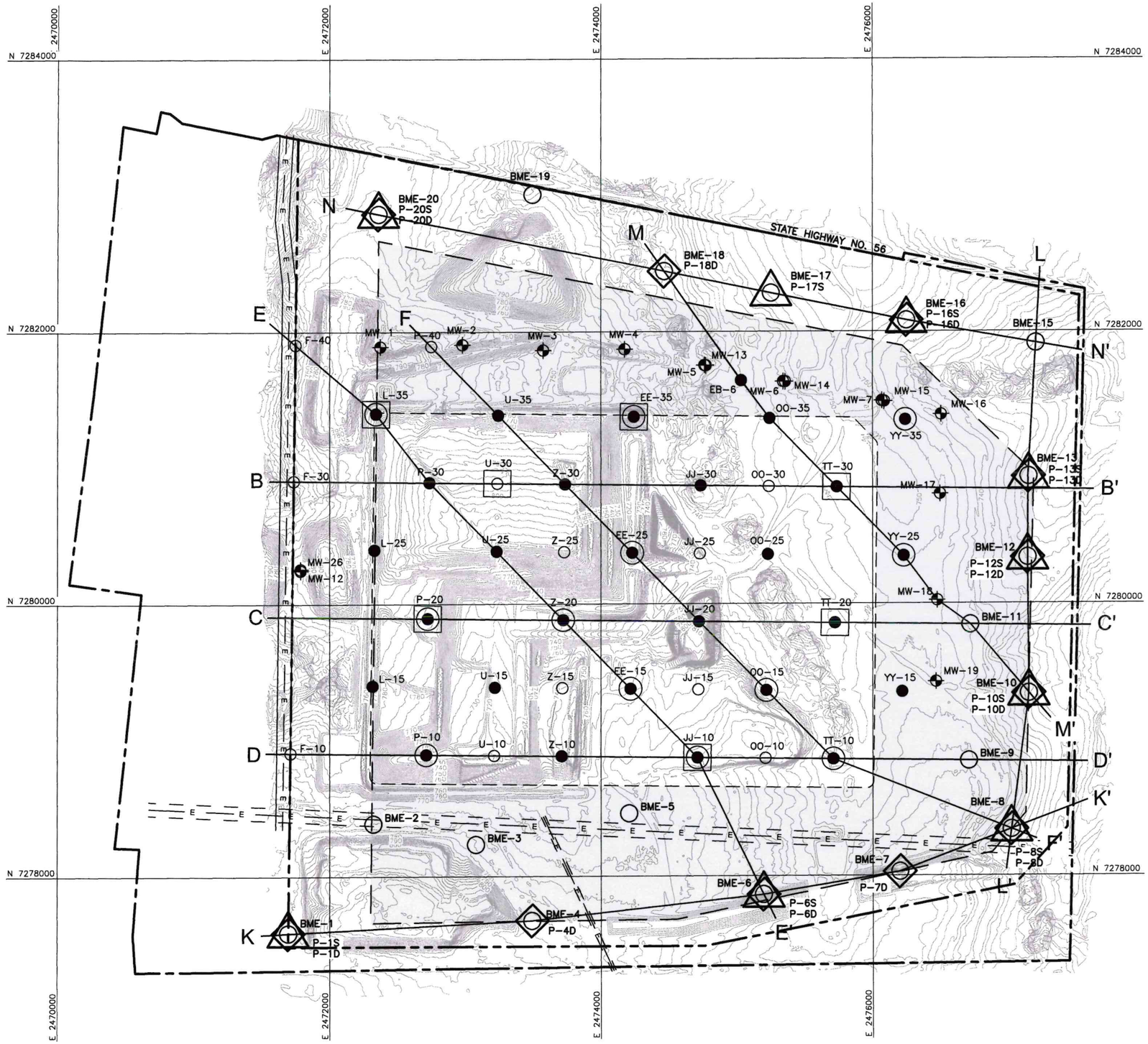
Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

APPENDIX E3

SITE GEOLOGIC DATA

Cross Section Location Map	E3.1
Cross Section B-B'	E3.2
Cross Section C-C'	E3.3
Cross Section D-D'	E3.4
Cross Section E-E'	E3.5
Cross Section F-F'	E3.6
Cross Section K-K'	E3.7
Cross Section L-L'	E3.8
Cross Section M-M'	E3.9
Cross Section N-N'	E3.10
Top of Layer II Structure Contour Map	E3.11
Top of Layer IV Structure Contour Map	E3.12
Top of Layer V Structure Contour Map	E3.13
Top of Layer VI Structure Contour Map	E3.14



0 400 800
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- 750 EXISTING CONTOUR
- E E ELECTRIC LINE AND EASEMENT
- N 7279000 STATE PLANE COORDINATES
- JJ-30 HISTORICAL BORINGS > 30' BELOW EDE
- Z-25 HISTORICAL BORINGS > 5' BELOW EDE
- WOODBINE PIEZOMETERS
- SHALE PIEZOMETERS
- MW-1 EXISTING MONITORING WELL
- BME-3 NEW BORING > 30' BELOW EDE
- P-10D NEW LAYER V PIEZOMETER
- P-10S NEW LAYER II/III PIEZOMETER
- EXPANSION AREA

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON AUGUST 8, 2023.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

CROSS SECTION LOCATION MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E3.1

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B WEST

B' EAST

E–E'

F–F'

J–J'

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000

PERMIT BOUNDARY

PERMIT BOUNDARY 2290

PERMIT BOUNDARY 2290A

F–30 P–30 U–30 Z–30 JJ–30 OO–30 TT–30 MW–17 BME–13

743.47 731.06 724.27

655.16 653.64

EXISTING GRADE

LIMIT OF EXCAVATION

LAYER I

II

LAYER III

LAYER IV

V

LAYER VI

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600 580 560 540 520 500 480

0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL

B F–30 P–30 U–30 Z–30 JJ–30 OO–30 TT–30 BME–13 B'

KEY MAP

LEGEND

- MONITORING WELL SCREENED INTERVAL
- PIEZOMETER SCREENED INTERVAL
- GROUNDWATER LEVEL ON JUNE 29, 2000
- GROUNDWATER LEVEL ON MARCH 19, 2024
- CLAY
- SHALY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS–SECTION LOCATION MAP IS FIGURE E3–1.
3. ALL BOREHOLES WERE DRILLED USING METHODS THAT USED WATER IN THE DRILLING PROCESS. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

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CROSS SECTION B – B'

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E3.2

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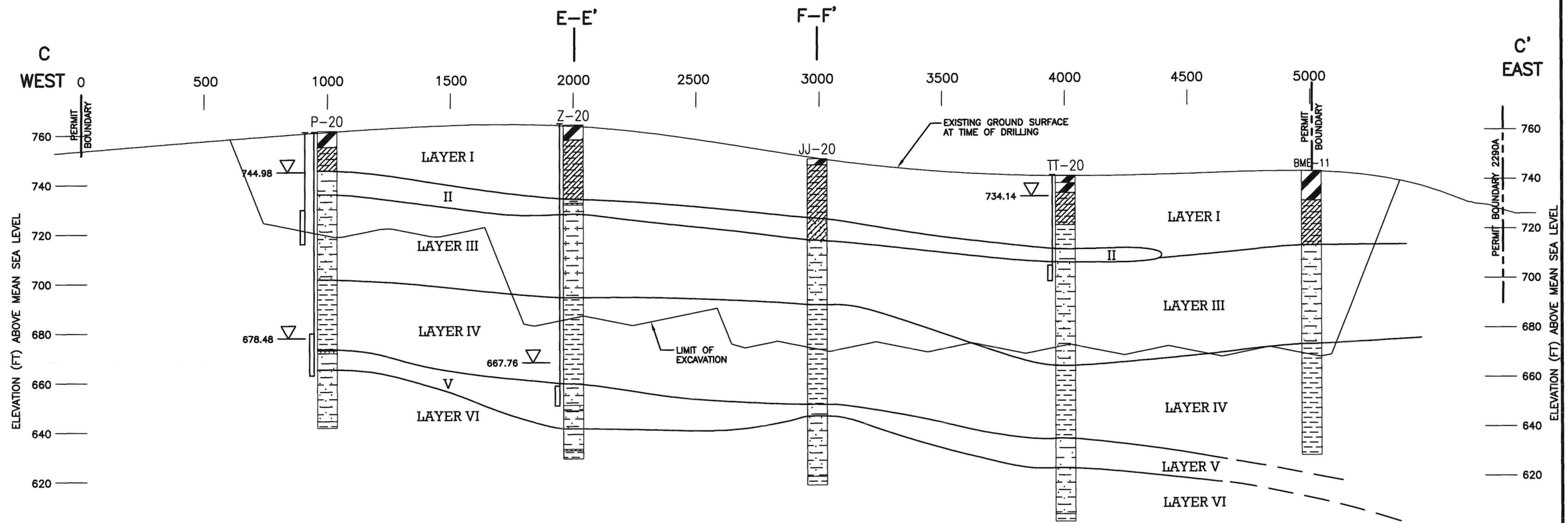

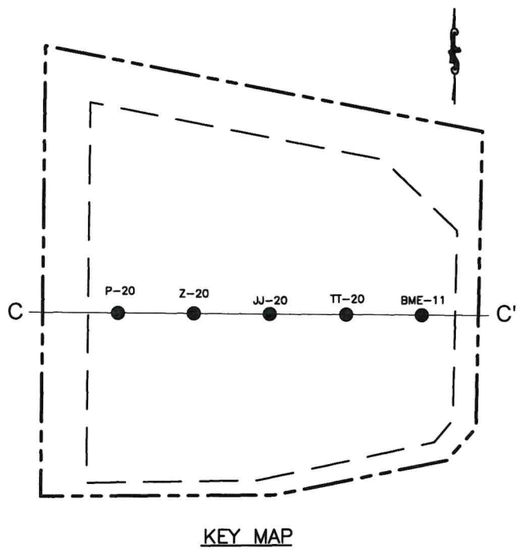

KEY MAP

0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL

PIEZOMETER SCREENED INTERVAL

GROUNDWATER LEVEL ON JUNE 29, 2000

GROUNDWATER LEVEL ON MARCH 19, 2024

LEGEND

- CLAY
- SHALY CLAY
- SANDY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS–SECTION LOCATION MAP IS FIGURE E3–1.
3. ALL BOREHOLES WERE DRILLED USING METHODS THAT USED WATER IN THE DRILLING PROCESS. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
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2/26/2025

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CROSS SECTION C – C'

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E3.3

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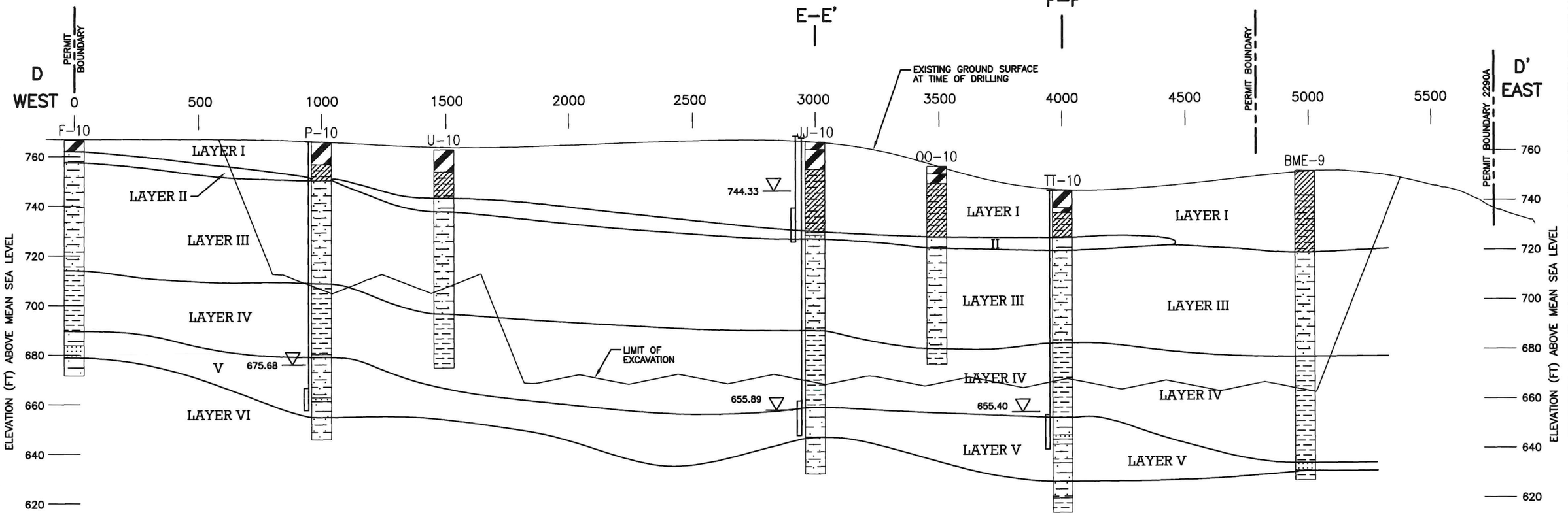

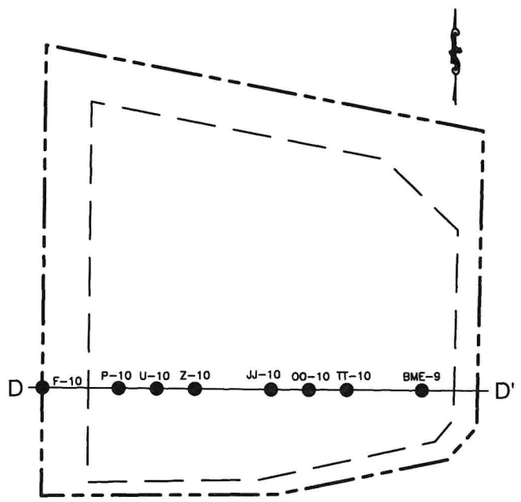

KEY MAP

0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL

PIEZOMETER SCREENED INTERVAL

GROUNDWATER LEVEL ON JUNE 29, 2000

GROUNDWATER LEVEL ON MARCH 19, 2024

LEGEND

- CLAY
- SHALY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE
- SANDSTONE W/ SHALE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS–SECTION LOCATION MAP IS FIGURE E3–1.
3. ALL BOREHOLES WERE DRILLED USING METHODS THAT USED WATER IN THE DRILLING PROCESS. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST
2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

CROSS SECTION D – D'

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
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817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E3.4

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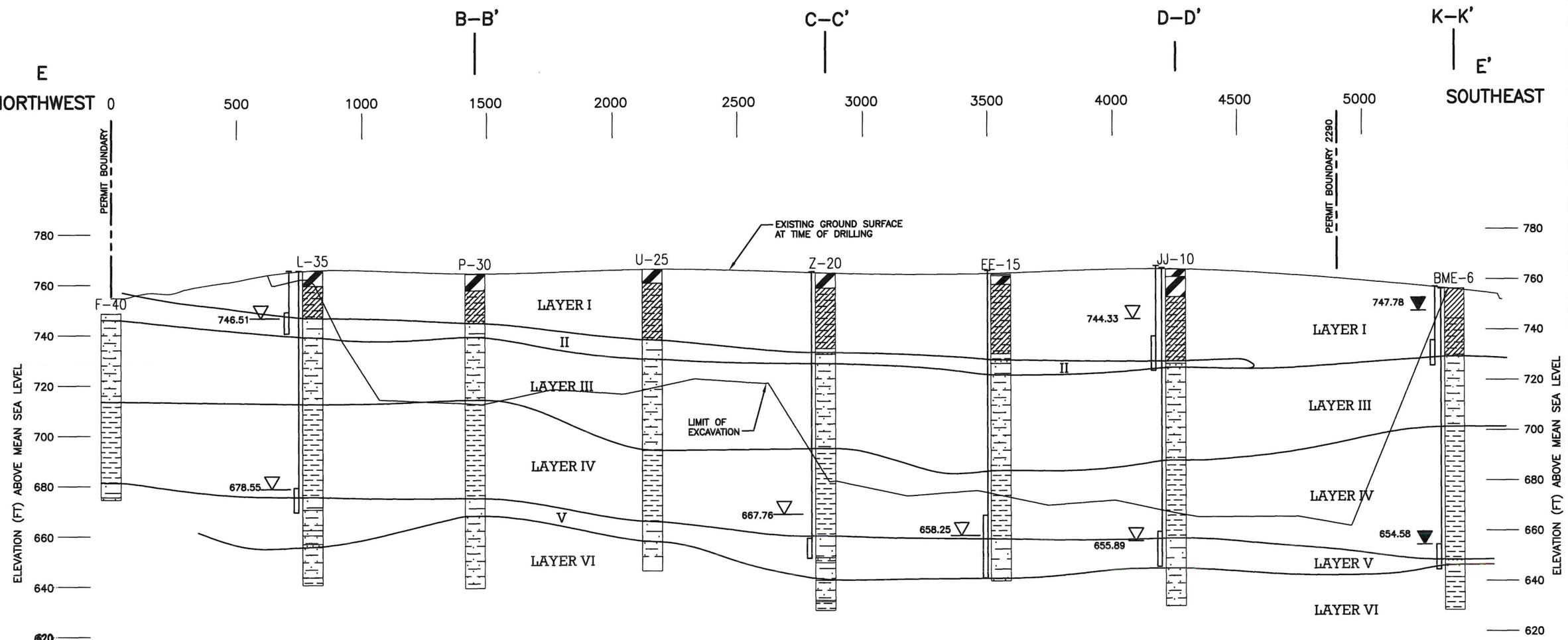

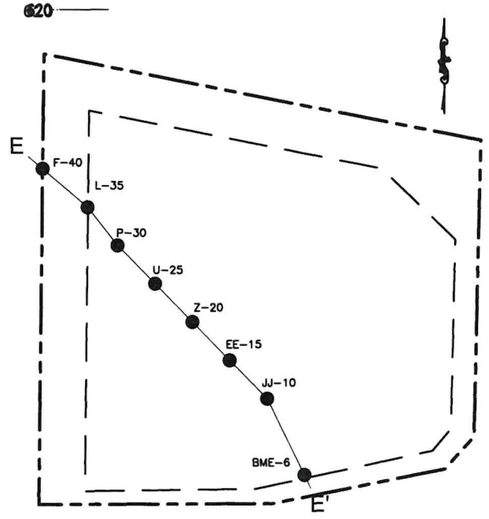

KEY MAP

0 200 400 SCALE IN FEET HORIZONTAL

0 20 40 SCALE IN FEET VERTICAL

LEGEND

- PIEZOMETER SCREENED INTERVAL
- GROUNDWATER LEVEL ON JUNE 29, 2000
- GROUNDWATER LEVEL ON MARCH 19, 2024
- CLAY
- SHALY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE
- SANDSTONE W/ SHALE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE E3-1.
3. ALL BOREHOLES WERE DRILLED USING METHODS THAT USED WATER IN THE DRILLING PROCESS. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

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CROSS SECTION E – E'

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING E3.5

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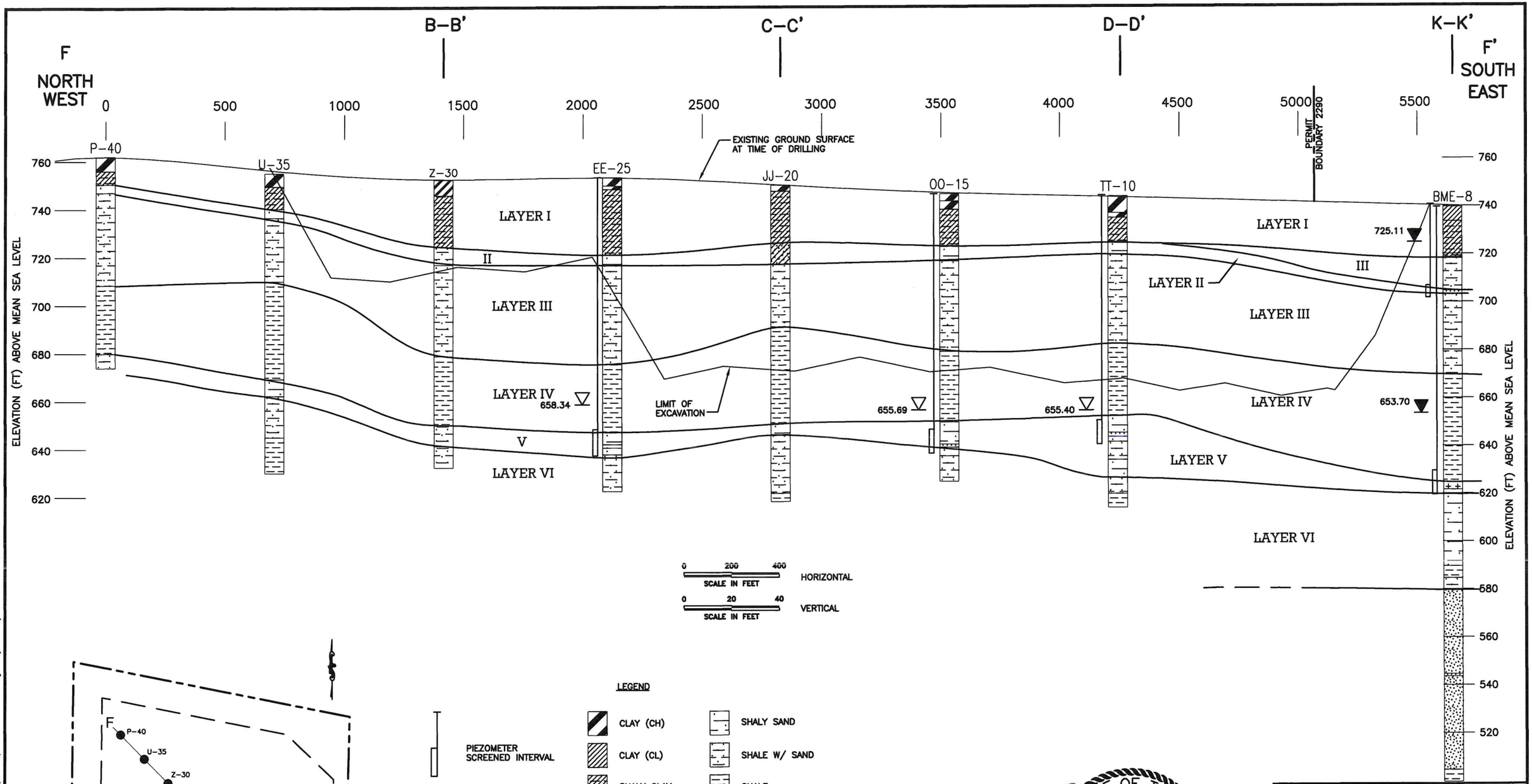

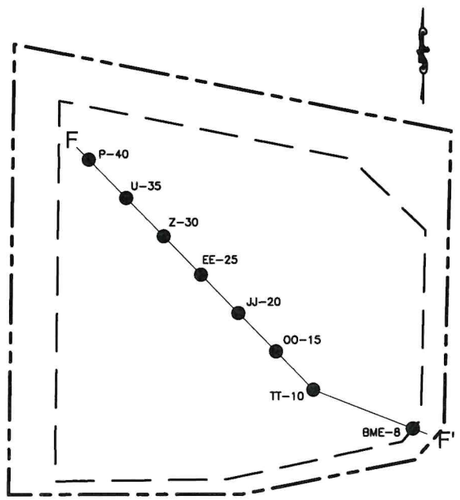

KEY MAP

LEGEND

- PIEZOMETER SCREENED INTERVAL
- GROUNDWATER LEVEL ON JUNE 29, 2000
- GROUNDWATER LEVEL ON MARCH 19, 2024
- CLAY (CH)
- CLAY (CL)
- SHALY CLAY
- SANDY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
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3. ALL BOREHOLES WERE DRILLED USING METHODS THAT USED WATER IN THE DRILLING PROCESS. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

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CROSS SECTION F – F'

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TASWA DRF
PERMIT AMENDMENT

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817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E3.6

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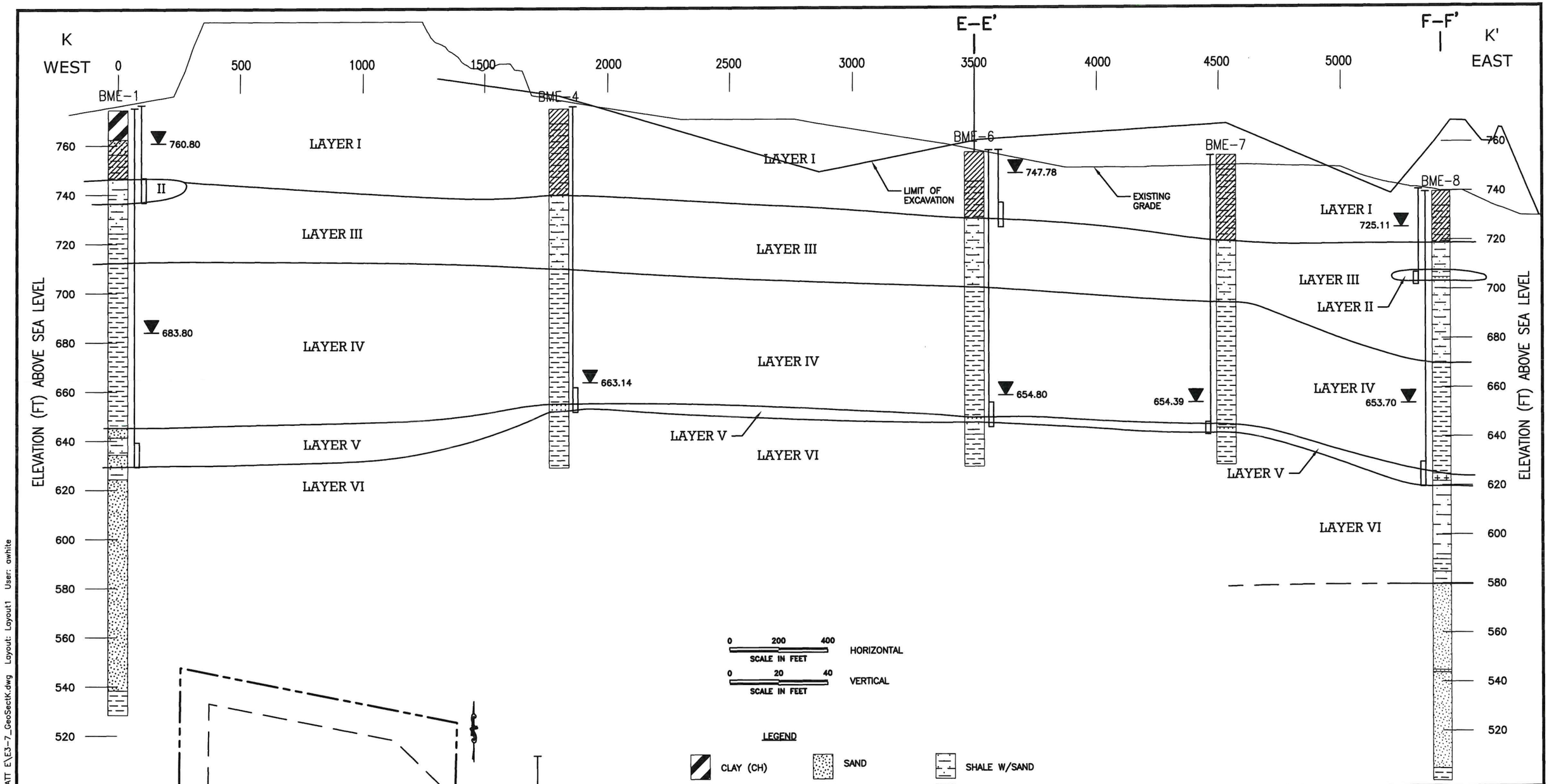

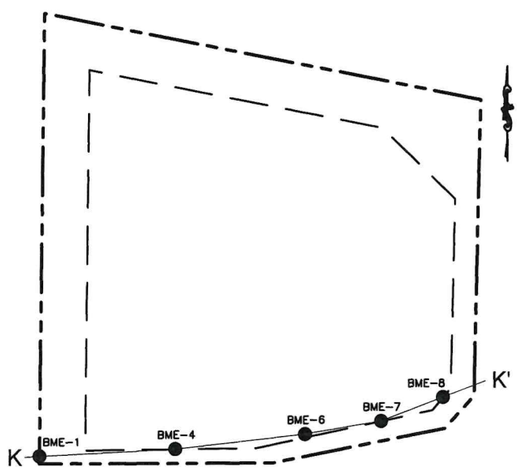

KEY MAP

0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL

LEGEND

PIEZOMETER SCREENED INTERVAL

GROUNDWATER LEVEL ON MARCH 19, 2024

CLAY (CH)
CLAY (CL)
SHALY CLAY
SANDY CLAY
SAND
SANDY SHALE
SHALY SAND
SHALE
SHALE W/SAND
SANDSTONE
SILTSTONE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
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CROSS SECTION K – K'

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TASWA DRF
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817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E3.7

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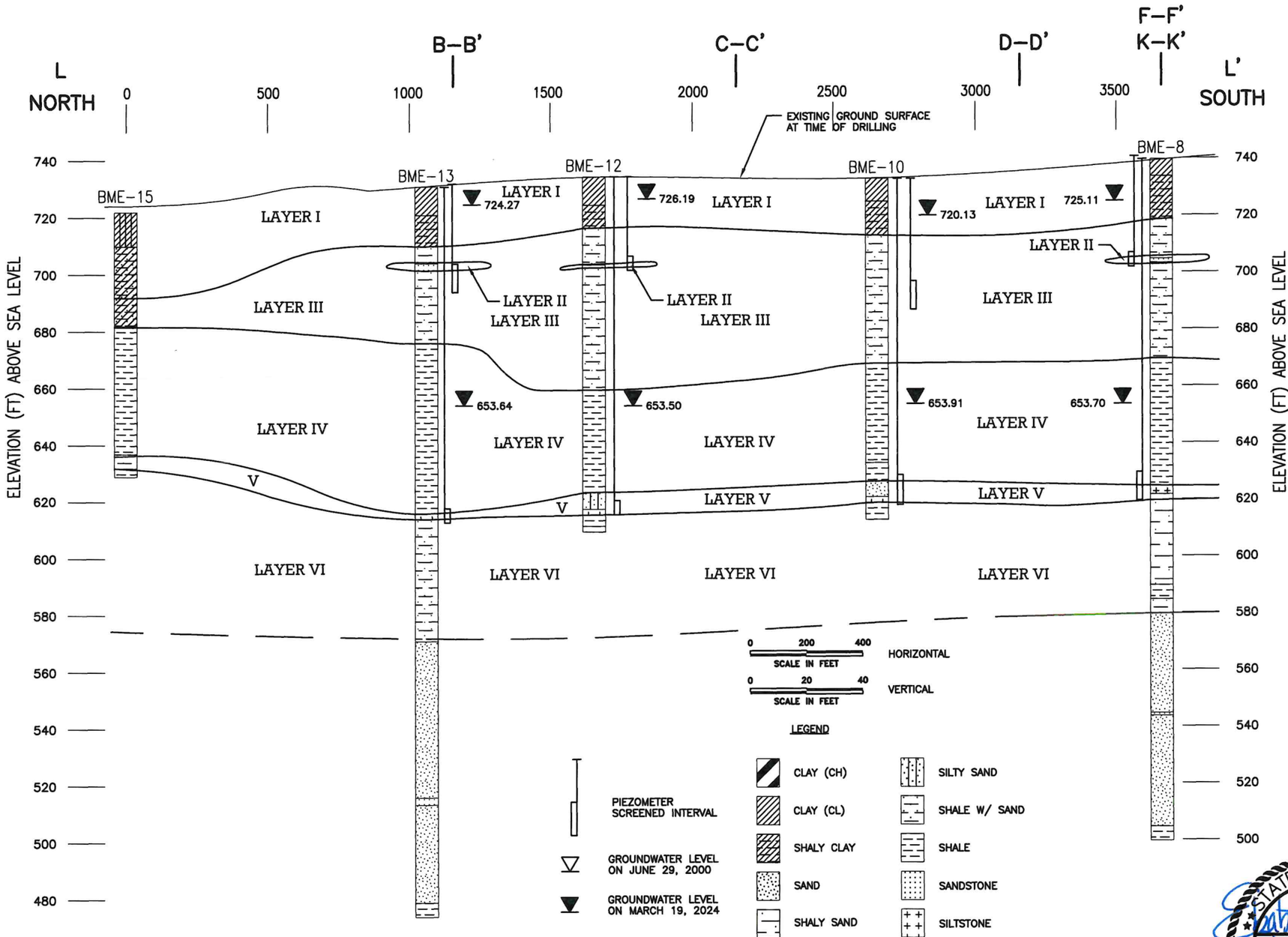

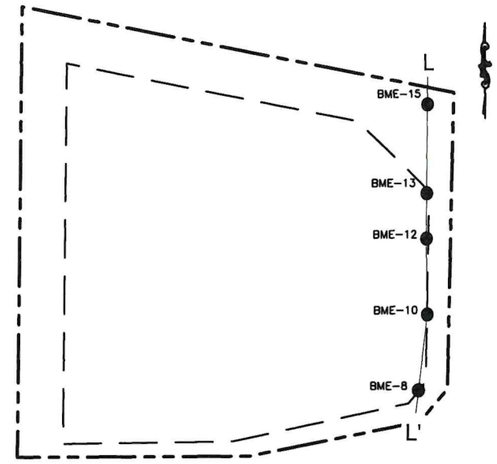

KEY MAP

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE E3-1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER OR ESTABLISHED MONITORING WELL.

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CROSS SECTION L – L'

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TASWA DRF
PERMIT AMENDMENT

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MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E3.8

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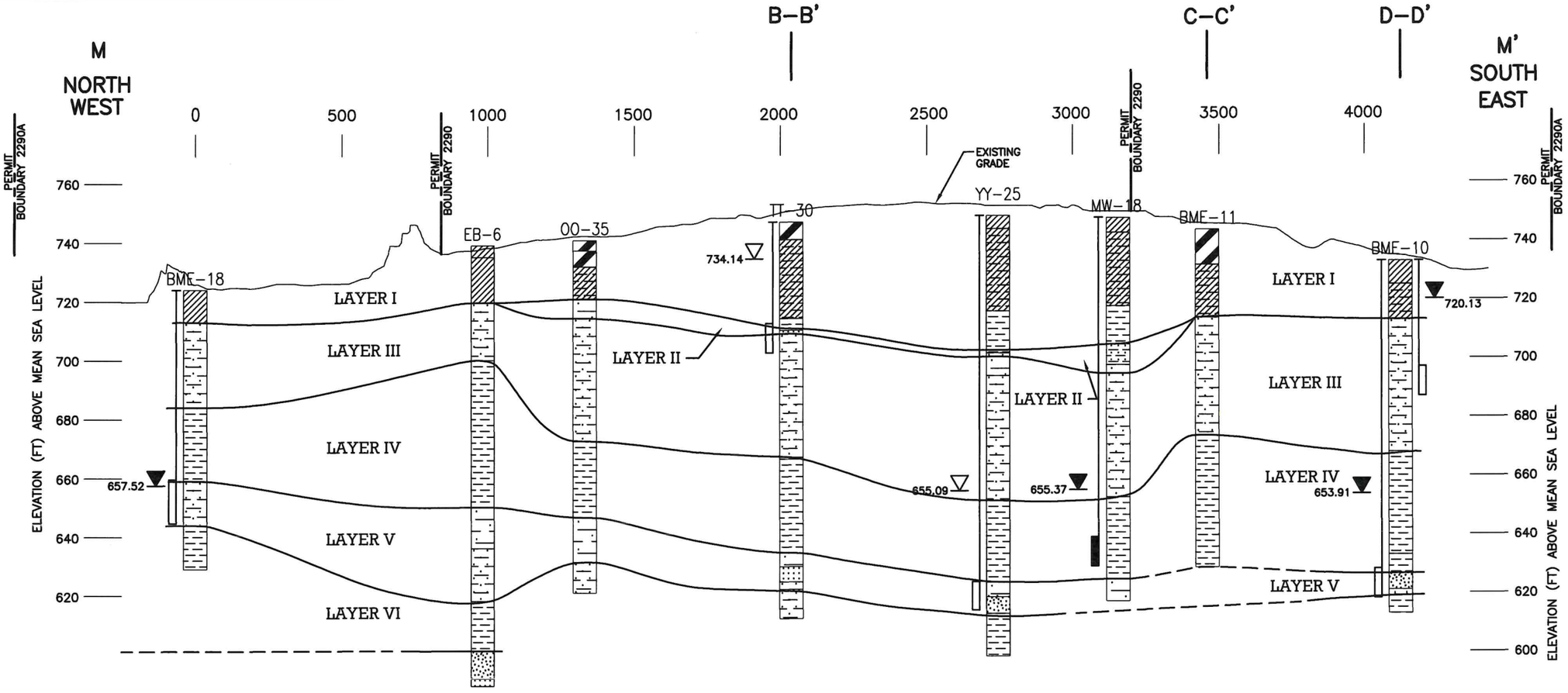
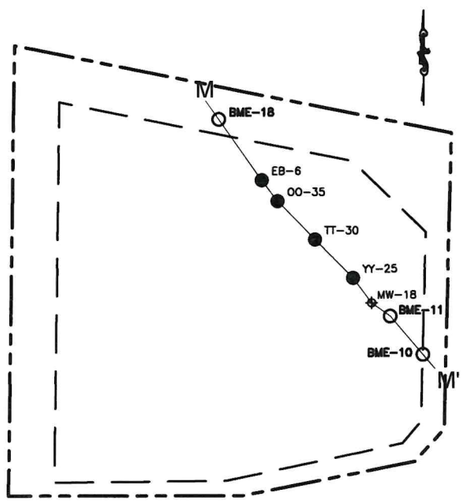


0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL



KEY MAP

LEGEND

- PIEZOMETER SCREENED INTERVAL
- MONITORING WELL SCREENED INTERVAL
- GROUNDWATER LEVEL ON JUNE 29, 2000
- GROUNDWATER LEVEL ON MARCH 19, 2024
- CLAY (CH)
- CLAY (CL)
- SHALY CLAY
- SANDY CLAY
- SHALY SAND
- SHALE W/ SAND
- SHALE
- SANDSTONE
- SANDSTONE W/ SHALE
- SAND
- SILTSTONE

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
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CROSS SECTION M – M'

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TASWA DRF
PERMIT AMENDMENT

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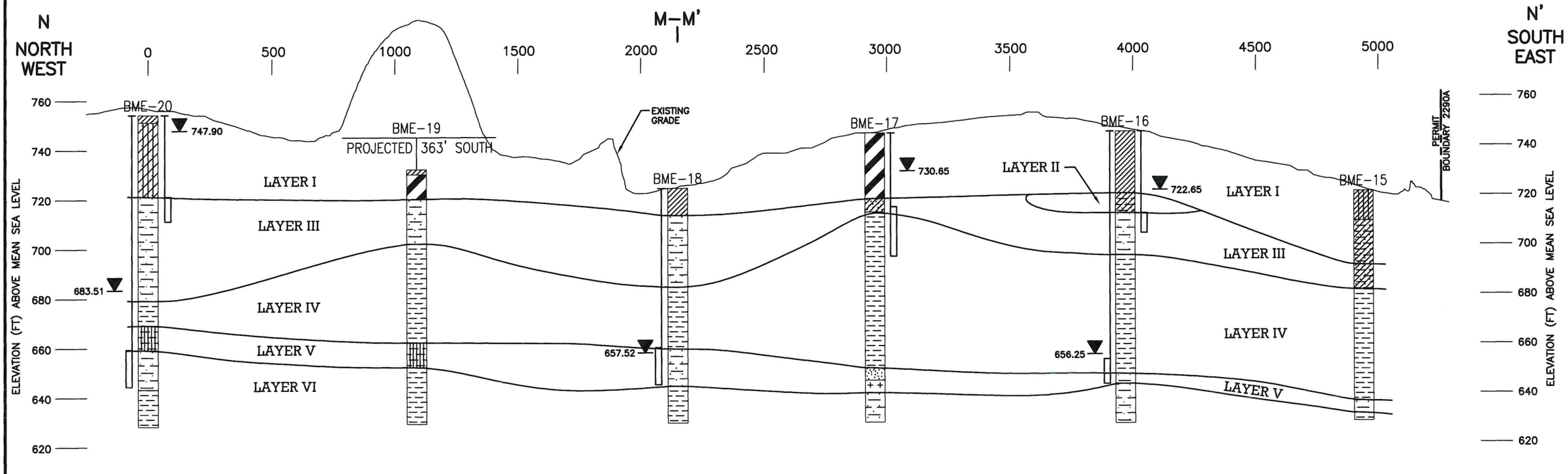
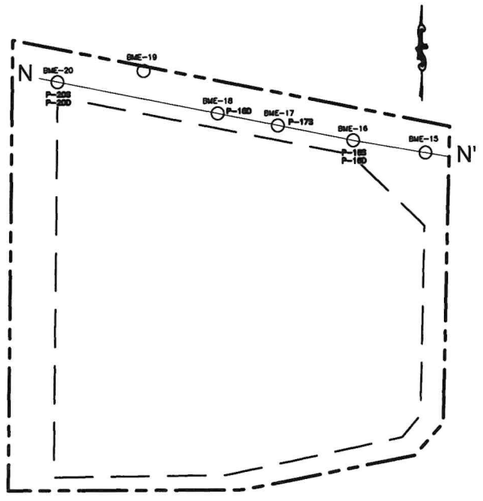
817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E3.9

O:\TASWA\P\Drawings\ATT E\E3–9_GeoSectM.dwg Layout: Layout1 User: bboles





KEY MAP

0 200 400
SCALE IN FEET
HORIZONTAL

0 20 40
SCALE IN FEET
VERTICAL

PIEZOMETER SCREENED INTERVAL

GROUNDWATER LEVEL ON JUNE 29, 2000

GROUNDWATER LEVEL ON MARCH 19, 2024

LEGEND

- CLAY (CH)
- CLAY (CL)
- SHALY CLAY
- CLAY W/SILT & SAND
- CLAY W/SAND
- CLAY W/SAND & SHALE
- CLAY W/ SILT
- SHALY SAND
- SHALE
- SHALE W/ SAND
- SHALE W/ SILT
- SAND
- SANDSTONE
- SILTSTONE

NOTES:

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CROSS SECTION N – N'

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TASWA DRF
PERMIT AMENDMENT

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817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E3.10

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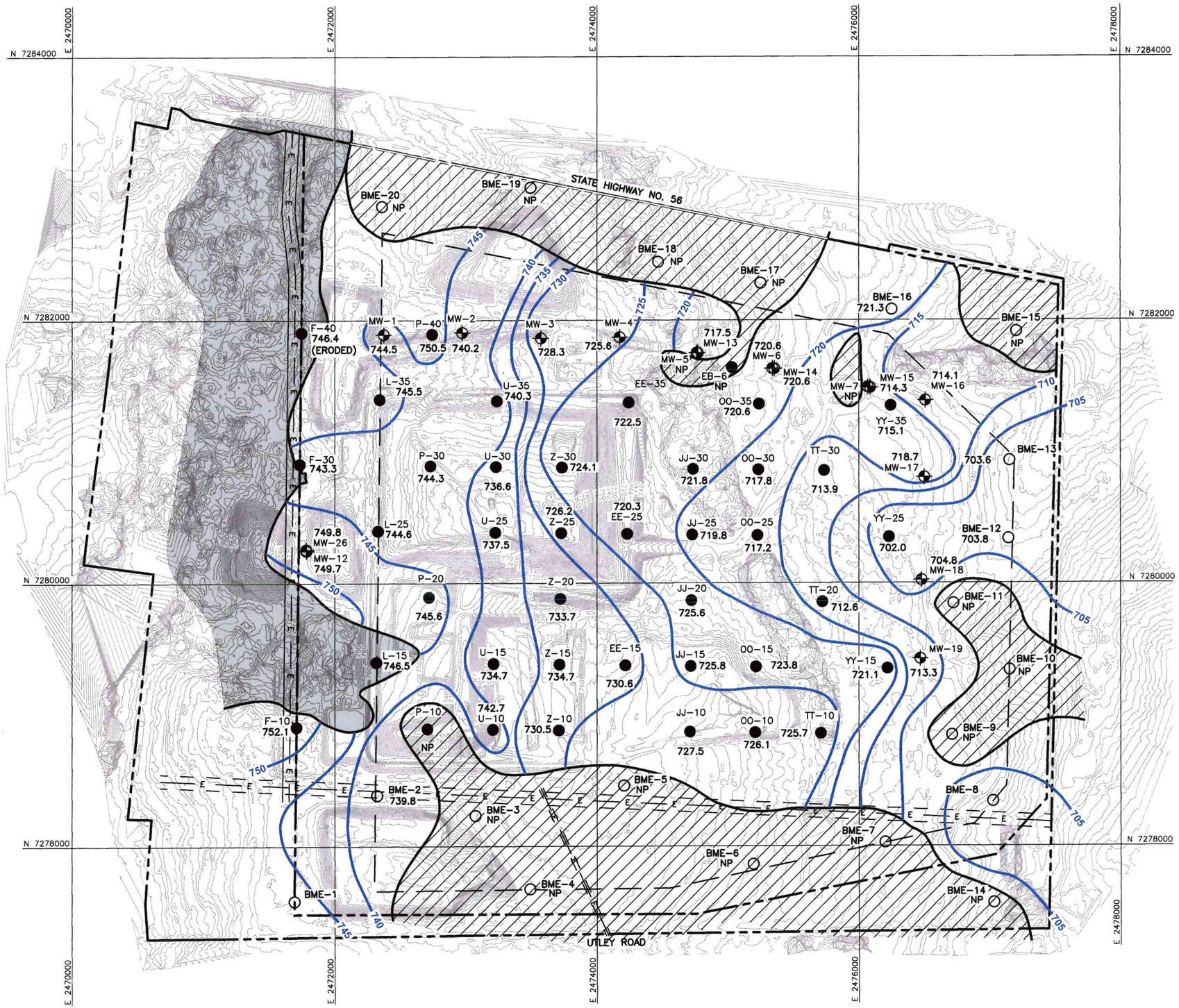
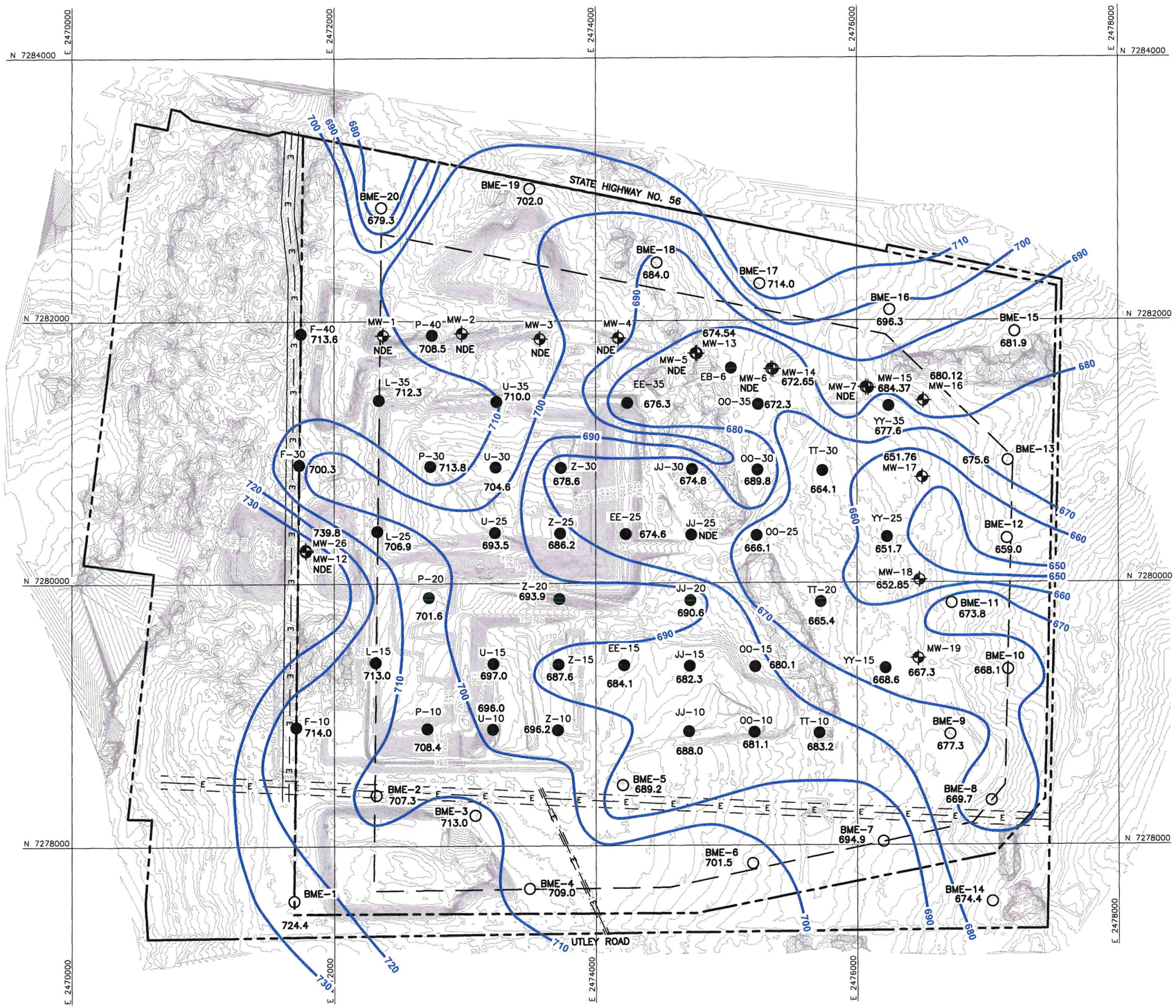

N 7284000
E 2470000
E 2472000
E 2474000
E 2476000
E 2478000
N 7282000
N 7280000
N 7278000
STATE HIGHWAY NO. 56
UTLEY ROAD
BME-20 NP
BME-19 NP
BME-18 NP
BME-17 NP
BME-16 721.3
BME-15 NP
BME-14 NP
BME-13 703.6
BME-12 703.8
BME-11 NP
BME-10 NP
BME-9 NP
BME-8
BME-7 NP
BME-6 NP
BME-5 NP
BME-4 NP
BME-3 NP
BME-2 739.8
BME-1
F-40 746.4 (ERODED)
F-30 743.3
F-10 752.1
MW-1 744.5
P-40 750.5
MW-2 740.2
MW-3 728.3
MW-4 725.6
MW-5 NP
MW-6 720.6
MW-7 NP
MW-13 717.5
MW-14 720.6
MW-15 714.3
MW-16 714.1
MW-17 718.7
MW-18 704.8
MW-19 713.3
MW-26 749.8
MW-12 749.7
L-35 745.5
L-25 744.6
L-15 746.5
P-30 744.3
P-20 745.6
P-10 NP
U-35 740.3
U-30 736.6
U-25 737.5
U-15 734.7
U-10 742.7
Z-30 724.1
Z-25 726.2
Z-20 733.7
Z-15 734.7
Z-10 730.5
EE-35 722.5
EE-25 720.3
EE-15 730.6
JJ-30 721.8
JJ-25 719.8
JJ-20 725.6
JJ-15 725.8
JJ-10 727.5
OO-35 720.6
OO-30 717.8
OO-25 717.2
OO-15 723.8
OO-10 726.1
TT-30 713.9
TT-20 712.6
TT-10 725.7
YY-35 715.1
YY-25 702.0
YY-15 721.1
745
740
735
730
725
720
715
710
705
750
E
E E E



0 400 800
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LIMIT OF WASTE
- 700 EXISTING 10' GROUND CONTOUR
- N 7282000 STATE PLANE COORDINATES
- E ELECTRIC LINE EASEMENT
- 720 TOP OF LAYER IV CONTACT ELEVATION
- JJ-30 HISTORICAL BORINGS
- BME-15 EXPANSION BORINGS
- MW-1 EXISTING MONITORING WELL
- 759.1 ELEVATION OF LAYER IV
- NDE BORING COMPLETION DEPTH NOT DEEP ENOUGH TO FULLY PENETRATE THROUGH LAYER

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

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TOP OF LAYER IV STRUCTURE CONTOUR MAP

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TASWA DRF
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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E3.12

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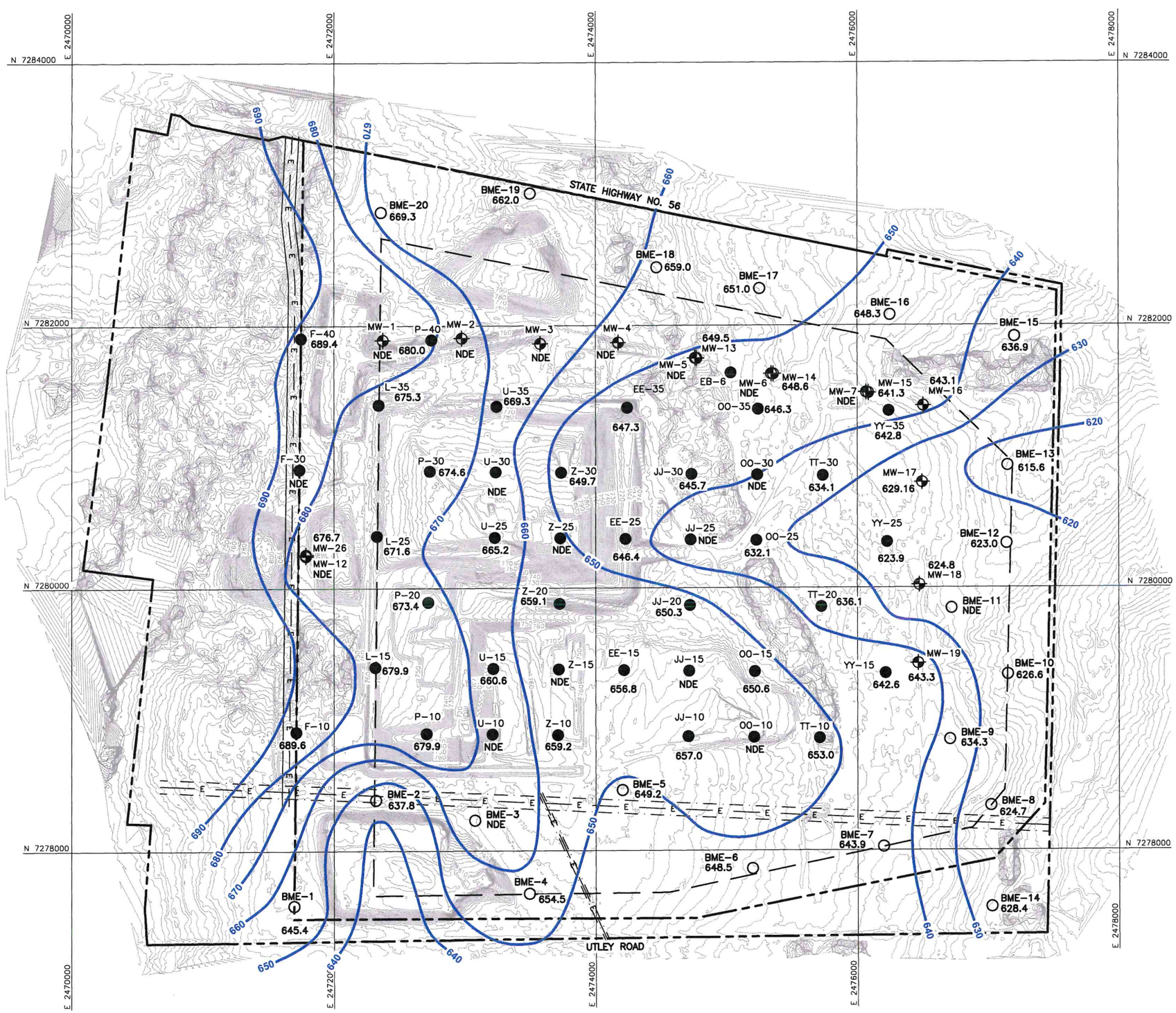

0 400 800
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LIMIT OF WASTE
- 700 EXISTING 10' GROUND CONTOUR
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- 650 TOP OF LAYER V CONTACT ELEVATION
- JJ-30 HISTORICAL BORINGS
- BME-15 EXPANSION BORINGS
- MW-1 EXISTING MONITORING WELL
- 759.1 ELEVATION OF LAYER V
- NDE BORING COMPLETION DEPTH NOT DEEP ENOUGH TO FULLY PENETRATE THROUGH LAYER

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

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TOP OF LAYER V STRUCTURE CONTOUR MAP

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DRAWING
E3.13

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0 400 800
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LIMIT OF WASTE
- 700 — EXISTING 10' GROUND CONTOUR
- N 7282000 — STATE PLANE COORDINATES
- E — ELECTRIC LINE EASEMENT
- 650 — TOP OF LAYER VI CONTACT ELEVATION
- JJ-30 — HISTORICAL BORINGS
- BME-15 — EXPANSION BORINGS
- MW-1 — EXISTING MONITORING WELL
- 759.1 — ELEVATION OF LAYER VI
- NDE — BORING COMPLETION DEPTH NOT DEEP ENOUGH TO FULLY PENETRATE THROUGH LAYER

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

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TOP OF LAYER VI STRUCTURE CONTOUR MAP

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TBPG FIRM NO. 50222

DRAWING
E3.14

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APPENDIX E4

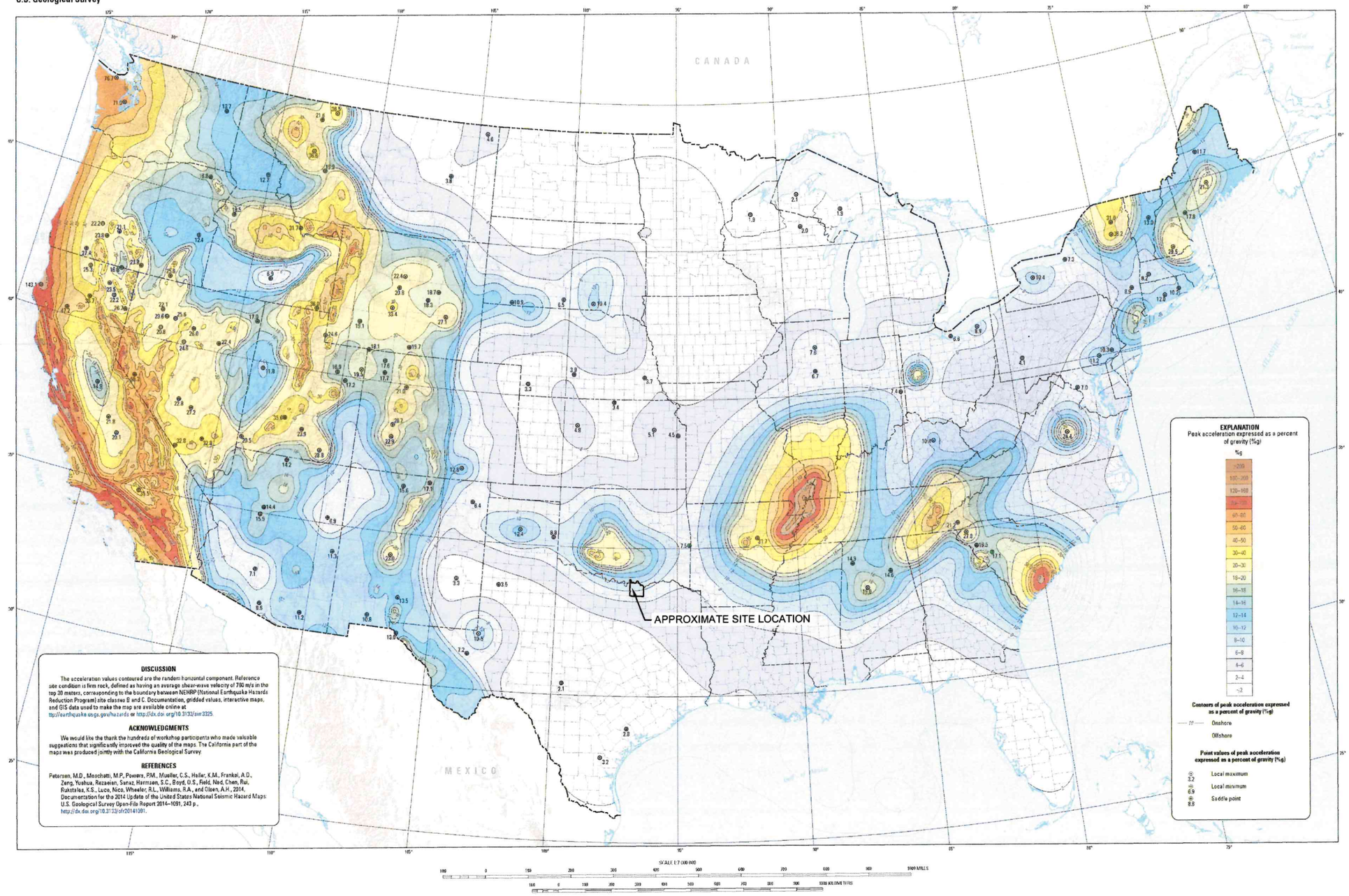
SEISMIC INFORMATION

Seismic Impact Zone Map	E4.1
Earthquake Hazards 201 - Technical Q&A	E4.2
Locations of Oil and Gas Wells	E4.3

USGS
science for a changing world

U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 3325
Sheet 2 of 6



DISCUSSION

The acceleration values contoured are the random horizontal component. Reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters, corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C. Documentation, gridded values, interactive maps, and GIS data used to make the map are available online at http://earthquake.usgs.gov/hazards or http://dx.doi.org/10.3133/sim3325.

ACKNOWLEDGMENTS

We would like the thank the hundreds of workshop participants who made valuable suggestions that significantly improved the quality of the maps. The California part of the maps was produced jointly with the California Geological Survey.

REFERENCES

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Yuehua, Rezaeian, Sanaz, Harmsen, S.C., Boyd, O.S., Field, Ned, Chen, Rui, Rukstales, K.S., Luco, Nico, Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014, Documentation for the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014–1091, 243 p., http://dx.doi.org/10.3133/ofr20141091.

Seismic-Hazard Maps for the Conterminous United States, 2014

Peak Horizontal Acceleration with 2 Percent Probability of Exceedance in 50 Years

By

Mark D. Petersen,[1] Morgan P. Moschetti,[1] Peter M. Powers,[1] Charles S. Mueller,[1] Kathleen M. Haller,[1] Arthur D. Frankel,[1] Yuehua Zeng,[1] Sanaz Rezaeian,[1] Stephen C. Harmsen,[1] Oliver S. Boyd,[1] Edward H. Field,[1] Rui Chen,[2] Nicolas Luco,[1] Russell L. Wheeler,[1] Robert A. Williams,[1] Anna H. Olsen,[1] and Kenneth S. Rukstales[1]

2015

NOTES:

1. THE FACILITY LIES IN AN AREA WHERE THE PGA, WITH A 2% PROBABILITY OF BEING EXCEEDED IN 50 YEARS, IS LESS THAN 10% OF GRAVITY (LESS THAN 0.1g). THIS IS EQUIVALENT TO A 10% PROBABILITY IN 250 YEARS. A PRINTOUT OF THE USGS FAQ RESPONSE CONFIRMING THE EQUIVALENCY IS INCLUDED IN THIS SUBMITTAL ON THE NEXT PAGE.
2. THE MAP PRESENTED HERE IS INTENDED TO ONLY DEPICT THE IMPACT ZONE IN WHICH THE FACILITY LIES. PLEASE REFER TO PETERSON, M.D., ET AL., 2015, SEISMIC HAZARD MAPS FOR THE CONTERMINOUS UNITED STATES, 2014: U.S. GEOLOGICAL SURVEY SCIENTIFIC INVESTIGATION MAP 3325, 6 SHEETS, SCALE 1:7,000,000. HTTPS://PUBS.USGS.GOV/SIM/3325/PDF/SIM3325_SHEET2.PDF FOR A FULLY LEGIBLE VERSION.

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2045
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PROFESSIONAL GEOSCIENTIST

2/26/2025

SEISMIC IMPACT ZONE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DISPOSAL AND RECYCLING FACILITY
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817–563–1144

TBPE FIRM NO. F–256
TBPG FIRM NO. 50222

DRAWING
E4.1

ISSUED FOR PERMITTING PURPOSES ONLY

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The seismic hazard map is for ground motions having a 2% probability of exceedance in 50 years. Are those values the same as those for 10% in 250?

Yes, basically. This conclusion will be illustrated by using an approximate rule-of-thumb for calculating Return Period (RP).

A typical seismic hazard map may have the title, "Ground motions having 90 percent probability of not being exceeded in 50 years." The 90 percent is a "non-exceedance probability"; the 50 years is an "exposure time." An equivalent alternative title for the same map would be, "Ground motions having 10 percent probability of being exceeded in 50 years." A typical shorthand to describe these ground motions is to say that they are 475-year return-period ground motions. This means the same as saying that these ground motions have an annual probability of occurrence of 1/475 per year. "Return period" is thus just the inverse of the annual probability of occurrence (of getting an exceedance of that ground motion).

To get an approximate value of the return period, RP, given the exposure time, T, and exceedance probability, r = 1 - non-exceedance probability, NEP, (expressed as a decimal, rather than a percent), calculate:

RP = T / r* Where r* = r(1 + 0.5r).r* is an approximation to the value -loge (NEP).
In the above case, where r = 0.10, r* = 0.105 which is
approximately = -loge (0.90) = 0.10536 Thus,
approximately, when r = 0.10, RP = T / 0.105

Consider the following table:

			Rule of Thumb		Exact
NEP	T	r	r*	Calculation	RP
0.90	50	0.10	0.105	50/0.105	476.2	474.6
0.90	100	0.10	0.105	100/0.105	952.4	949.1
0.90	250	0.10	0.105	250/0.105	2381.0	2372.8

In this table, the exceedance probability is constant for different exposure times. Compare the results of the above table with those shown below, all for the same exposure time, with differing exceedance probabilities.

				Rule of Thumb	Exact
NEP	T	r	r*	Calculation RP	RP
0.90	50	0.10	0.105	50/0.105	474.6
			476.2		
0.95	50	0.05	0.0512550/0.05125		974.8
			975.6		
0.98	50	0.02	0.0202	50/0.0202	2475.
			2475.2		9

Comparison of the last entry in each table allows us to see that ground motion values having a 2% probability of exceedance in 50 years should be approximately the same as those having 10% probability of being exceeded in 250 years: The annual exceedance probabilities differ by about 4%. Corresponding ground motions should differ by 2% or less in the EUS and 1 percent or less in the WUS, based upon typical relations between ground motion and return period.

96° 51'

96° 50'

33° 38'

33°37'30"

500-FOOT RADIUS

OLD SANBORN RANCH RD

SANBORN RANCH RD

181

18131354

18130633

18130882

18130920

18131431

56

750

800

700

0 500 1000
SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- LIMIT OF WASTE
- 500 FOOT RADIUS
- 700 EXISTING 10' GROUND CONTOUR
- OIL WELL LOCATION
- PERMITTED WELL LOCATION – PERMIT EXPIRED, WELL NEVER DRILLED
- DRY HOLE

SADLER, TEX 2022

ETHEL, TEX 2022

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route / State Route

NOTES:

1. 7.5 MINUTE TOPOGRAPHIC BASE MAPS SADLER, TEX AND ETHEL, TEX DOWNLOADED FROM USGS WEBSITE ON MARCH 25, 2024.
2. OIL AND GAS WELL LOCATIONS DOWNLOADED FROM RAILROAD COMMISSION OF TEXAS IN MARCH 2024.
3. THERE ARE NO PRODUCING WELLS WITHIN 500 FEET OF THE PERMIT BOUNDARY.
4. REFER TO PART III, ATTACHMENT E FOR OIL AND GAS WELL INFORMATION.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/25/2026

ISSUED FOR PERMITTING PURPOSES ONLY

LOCATIONS OF OIL AND GAS WELLS

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING E4.3

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APPENDIX E5

LABORATORY TESTS

Geotechnical Laboratory Test Summary

Boring No.	Depth ft.	Layer	Liquid Limit	Plastic Limit	Plasticity Index	(-) 200 Mesh Sieve	Moisture Content	Dry Weight, pcf
L-25	14	I	61	27	34	89.9	30.0	91.5
P-10	7	I	61	21	40	73.6	20.6	102.6
P-10	12	I	51	22	29	73.0	21.6	98.4
P-20	15	I	76	32	44	84.2	22.3	92.1
U-10	10	I	82	32	50	90.0	31.4	90.8
U-15	4	I	62	23	39		27.7	88.9
Z-10	3	I	62	20	42	n.2	25.3	98.1
Z-15	9	I	89	29	60	99.7	30.1	92.2
Z-20	12	I	83	27	56	94.7	33.2	88.0
Z-30	10	I	78	31	47	70.4	31.1	87.9
Z-30	15	I	60	26	34	82.1	31.4	88.6
EE15	13	I	81	30	51	98.6	32.3	84.9
EE-35	12	I	54	23	31	85.8	28.9	
JJ-10	9	I	95	33	62	93.1	35.0	76.9
JJ-10	22	I	76	30	46	87.5	30.2	
JJ-15	15	I	74	30	44	94.5	32.1	91.1
JJ-20	13	I	71	28	43	92.8	30.8	89.0
OO-10	16	I	64	26	38	93.5	28.4	90.4
OO-15	6	I	78	29	49	83.8	27.4	92.4
OO-25	12	I	79	28	51	80.5	31.8	
OO-30	18	I	66	25	41	87.8	30.6	
OO-35	20	I	64	21	43	87.1	28.3	89.6
TT-10	7	I	64	22	42	86.2	26.9	90.9
TT-20	15	I	69	29	40	78.2	31.5	86.0
TT-30	13	I	87	31	56	96.1	34.2	84.1
YY-15	15	I	88	32	56	91.5	32.0	86.3
YY-25	12	I	80	32	48	97.6	28.4	93.0
YY-25	22	I	75	28	47	95.1	30.4	94.2
YY-35	12	I	88	33	55	98.9	33.7	93.3
BME-01	10	I	40	18	22	56.0		
BME-02	6	I	64	19	45	94.0		
BME-04	22	I	70	29	41	93.0		
BME-05	4	I	69	19	50	90.0		
BME-06	12	I	50	18	32	77.0		
BME-07	28	I	82	28	54	92.0		
BME-08	6	I	64	20	44	83.0		
BME-09	20	I	80	27	53	100.0		
BME-10	16	I	67	25	42	92.0		
BME-11	8	I	86	26	60	97.0		
BME-12	16	I	74	25	49	96.0		
BME-13	18	I	82	25	57	96.0		
L-35	14	I	69	29	40	80.3	28.9	91.7
Averages			72	26	45	88	30	90

Geotechnical Laboratory Test Summary

Boring No.	Depth ft.	Layer	Liquid Limit	Plastic Limit	Plasticity Index	(-) 200 Mesh Sieve	Moisture Content	Dry Weight, pcf
Z-20	33	II	36	26	10	35.1	18.9	
L-15	15	III	52	21	31	72.7	17.6	110.4
F-10	17	III	52	22	30	94.4	25.2	96.5
F-10	47	III	63	25	38	98.1	18.8	106.6
F-30	13	III	41	20	21	66.1	24.2	90.6
F-30	23	III	38	20	18	59.2	16.1	114.5
F-40	14	III	44	18	26	64.7	20.8	100.6
F-40	23	III	42	21	21		17.2	108.3
L-25	33	III	52	22	30	87.4	18.5	109.3
L-25	46	III	58	24	34	99.0	17.7	111.4
L-35	33	III	52	21	31	76.5	17.4	107.0
P-10	35	III	49	23	26	61.8	18.1	101.6
P-10	53	III	63	23	40	70.2	15.8	111.7
P-20	39	III	51	21	30	71.8	14.7	108.9
P-20	45	III	49	21	28	84.1	15.0	119.4
P-30	32	III	51	22	29	89.9	18.2	109.6
P-30	49	III	58	25	33	93.5	15.3	112.4
P-40	21	III	48	21	27	63.8	15.6	107.8
P-40	38	III	56	23	33	89.2	18.8	
P-40	49	III	49	24	25	61.6	16.0	
U-10	39	III	40	18	22	72.2	16.8	114.2
U-15	32	III	51	15	36	83.5	13.4	
U-25	39	III	47	21	26	73.1	17.2	110.6
U-25	56	III	56	24	32	92.0	16.1	
U-30	39	III	45	20	25	84.0	17.1	109.8
U-30	46	III	48	20	28	91.5	14.4	
U-35	26	III	48	21	27	74.1	20.3	104.2
Z-10	42	III	30	18	12	71.8	16.0	116.7
Z-10	48	III	47	22	25	93.2	15.4	118.5
Z-15	44	III	50	18	32	80.4	15.5	
Z-20	46	III	52	21	31	89.7	16.1	
Z-20	65	III	60	24	36		16.4	
Z-25	44	III	48	21	27	82.6	16.6	
Z-25	57	III	48	19	29	89.8	15.4	
Z-30	38	III	50	22	28	80.1	21.3	103.0
Z-30	51	III	59	22	37		15.5	
EE15	65	III	56	21	35	98.8	13.4	
EE-25	41	III	41	20	21	79.3	16.6	111.8
EE-25	56	III	45	20	25	75.9	16.0	
JJ-10	44	III	43	20	23	85.9	17.3	
JJ-10	55	III	40	20	20	71.8	13.9	
JJ-15	42	III	45	20	25	84.8	16.2	117.6

Geotechnical Laboratory Test Summary

Boring No.	Depth ft.	Layer	Liquid Limit	Plastic Limit	Plasticity Index	(-) 200 Mesh Sieve	Moisture Content	Dry Weight, pcf
JJ-20	49	III	43	21	22	83.7	15.9	
JJ-25	29	III	36	20	16	54.9	17.4	111.0
JJ-25	43	III	37	19	18	56.7	16.0	108.4
JJ-25	52	III	48	21	27	87.3	15.6	
JJ-30	26	III	48	20	28	83.5	15.4	
OO-10	48	III	46	19	27	82.4	14.6	
00·15	33	III	51	20	31	77.2	16.2	112.8
OO-25	55	III	54	24	30	80.9	14.9	
OO-30	55	III	54	22	32	92.9	15.5	
OO-35	39	III	43	17	26	63.8	14.0	
OO-35	58	III	61	25	36	87.9	15.5	
TT-10	27	III	46	21	25	85.7	21.3	103.1
TT-10	39	III	43	19	24	75.1	14.8	116.0
TT-10	47	III	58	25	33	88.9	15.2	112.9
TT-20	44	III	49	22	27	83.5	15.6	111.9
TT-20	76	III	66	27	39	88.3	18.7	
TT-30	62	III	51	23	28	96.9	15.6	
YY-15	41	III	52	18	34	84.9	14.5	
YY-25	63	III	35	19	16	79.3	13.0	
YY-35	56	III	37	17	20	93.0	10.9	
BME-01	26	III	50	18	32	73.0		
BME-03	40	III	44	20	24	84.0		
BME-05	30	III	86	31	55	92.0		
BME-06	29	III	43	20	23	68.0		
BME-08	35	III	38	19	19	34.0		
BME-09	35	III	40	19	21	53.0		
BME-11	40	III	41	17	24	54.0		
BME-12	65	III	78	28	50	99.0		
BME-13	30	III	50	20	30	87.0		
Averages			49	21	28	80	17	109

L-25	64	IV	72	26	46	99.9	17.9	
P-10	72	IV	75	29	46	83.5	15.8	
Z-10	74	IV	45	25	20		18.7	
Z-30	89	IV	79	30	49	19.3		
EE15	88	IV	73	28	45	92.0	16.4	
JJ-10	87	IV	64	28	36	97.4	16.5	
JJ-20	69	IV	65	26	39	92.3	17.5	
OO-25	88	IV	70	29	41	73.0	17.2	
YY-25	95	IV	56	22	34	85.3	16.6	
YY-25	103	IV	72	27	45	83.5	17.0	
BME-05	65	IV	67	26	41	91.0		
BME-06	90	IV	65	25	40	95.0		
BME-07	70	IV	70	28	42	98.0		

Geotechnical Laboratory Test Summary

Boring No.	Depth ft.	Layer	Liquid Limit	Plastic Limit	Plasticity Index	(-) 200 Mesh Sieve	Moisture Content	Dry Weight, pcf
BME-08	85	IV	69	22	47	94.0		
BME-10	75	IV	82	29	53	100.0		
BME-11	80	IV	69	21	48	93.0		
BME-13	90	IV	65	18	47	92.0		
Averages			68	26	42	87	17	
F-10	88	V	42	19	23		17.7	
L-15	68	V				32.8		
L-25	92	V	37	23	14	41.5	21.5	
L-35	118	V	66	30	36		20.3	
P-10	88	V				84.8		
P-20	91	V	52	24	28		18.9	
P-30	92	V				33.2		
U-25	103	V	50	27	23	54.2	20.3	
Z-20	110	V	39	21	18	31.4	20.5	
Z-30	105	V	37	21	16	42.5	19.1	
EE15	112	V	31	28	3	25.6	21.2	
EE-25	108	V	31	29	2		22.6	
EE-25	110	V				42.0	20.8	
EE-25	124	V	39	18	21	19.8		
EE-35	93	V	36	26	10	22.1		
EE-35	106	V	32	24	8	17.5		
JJ-10	111	V				21.3		
00-15	97	V				8.1		
TT-10	101	V				20.6		
TT-20	113	V				28.0		
YY-15	111	V				8.0		
YY-25	132	V				10.5		
YY-35	116	V				10.2		
BME-01	155	V				8.0		
BME-04	110	V	44	21	23	62.0		
BME-07	112	V	34	28	6	11.0		
Averages			41	24	17	29	20	
L-15	99	VI	83	32	51		21.9	
L-25	121	VI	86	32	54	91.2	21.0	
L-35	125	VI	67	29	38		19.5	
P-10	119	VI	66	26	40	87.2	11.9	
P-30	125	VI	54	20	34	80.9		
U-15	119	VI	75	25	50	92.7		
U-25	113	VI	65	27	38		18.5	
U-35	124	VI	77	28	49		17.6	
Z-10	130	VI	58	20	38		19.9	
Z-20	138	VI	76	31	45		19.9	

Geotechnical Laboratory Test Summary

Boring No.	Depth ft.	Layer	Liquid Limit	Plastic Limit	Plasticity Index	(-) 200 Mesh Sieve	Moisture Content	Dry Weight, pcf
Z-30	112	VI	74	29	45	21.5		
EE-35	115	VI	45	21	24	70.1	19.4	
JJ-10	124	VI	45	20	25		21.8	
JJ-20	106	VI				82.9		
JJ-30	115	VI	37	18	19			
00-15	115	VI	40	21	19	70.2	17.9	
OO-35	115	VI	38	19	19		19.8	
TT-10	126	VI	83	27	56	80.8	17.1	
TT-20	139	VI	107	34	73	22.3		
TT-30	130	VI	45	19	26		18.3	
YY-15	130	VI	41	20	21	17.9		
YY-25	141	VI	42	22	20	19.2		
YY-35	119	VI	66	24	42	93.4	12.4	
BME-01	75	VI	63	27	36	96.0		
BME-02	60	VI	63	26	37	99.0		
BME-03	90	VI	67	24	43	99.0		
Averages			63	25	38	70	18	

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	
LOCATION:	JJ20 2.5'-3.0'	LAB START DATE:	4/30/01
MATERIAL:	Clay, brown	LAB REP. DATE:	5/2/01
BORING/SAMPLE:		TECHNICIAN:	ML
PROCTOR # :		DEPTH/LIFT:	
SAMPLE ORIENTATION:	H ____ V ✓ Remold ____	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume (0.7854 * a * b ^ 2):	4.909 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	112.1 pcf

INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring + Wet Weight Soil:	685.8 gms	k. Wet Weight Soil + Tare:	239.6 gms
f. Wet Weight Soil + Tare:	237.4 gms	l. Dry Weight Soil + Tare:	203.5 gms
g. Dry Weight Soil + Tare:	203.5 gms	m. Tare Weight:	92.9 gms
h. Tare Weight:	92.9 gms	n. Moisture Content [(k-l)/(l-m)]*100:	32.6 %
i. Moisture Content [(f-g)/(g-h)]*100:	30.7 %	o. Unit Dry Weight [d/(1+(n/100))]:	84.5 pcf
j. Unit Dry Weight [d/(1+(i/100))]:	85.8 pcf	p. Ring Weight:	541.3 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
30-Apr	14:50		73.5	66.0					
01-May	05:43	53580			69.7	62.2	22	0.953	7.3E-08
01-May	05:43		69.7	62.2					
01-May	09:00	11820			69.0	61.5	22	0.953	6.3E-08
01-May	09:00		69.0	61.5					
01-May	11:00	7200			68.7	61.2	22	0.953	4.5E-08
01-May	11:00		68.7	61.2					
01-May	14:20	12000			68.3	60.8	22	0.953	3.6E-08
01-May	14:20		68.3	60.8					
02-May	09:00	67200			67.1	59.6	22	0.953	2.0E-08
01-May	05:43		69.7	62.2					
02-May	09:00	98220			67.1	59.6	22	0.953	2.9E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.50 cm	1.05 cm	0.866 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	0300-127
LOCATION:		LAB START DATE:	5/22/00
MATERIAL:	Shale, Dark gray	LAB REP. DATE:	5/24/00
BORING/SAMPLE:	L-25	TECHNICIAN:	MLT
PROCTOR # :		DEPTH/LIFT:	72.3'-73.9'
SAMPLE ORIENTATION:	H ____ V ✓ Remold ____	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	1.9 in
c. Sample Volume (0.7854 * a * b ^ 2):	2.761 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	127.3 pcf

INITIAL CONDITIONS

e. Ring + Wet Weight Soil:	891.1 gms
f. Wet Weight Soil + Tare:	187.1 gms
g. Dry Weight Soil + Tare:	172.3 gms
h. Tare Weight:	94.8 gms
i. Moisture Content [(f-g)/(g-h)]*100:	19.1 %
j. Unit Dry Weight [d/(1+(i/100))]:	106.9 pcf

FINAL CONDITIONS

k. Wet Weight Soil + Tare:	190.4 gms
l. Dry Weight Soil + Tare:	172.3 gms
m. Tare Weight:	94.8 gms
n. Moisture Content [(k-l)/(l-m)]*100:	23.4 %
o. Unit Dry Weight [d/(1+(n/100))]:	103.2 pcf
p. Ring Weight:	798.8 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
22-May	06:00		76.4	68.9					
22-May	15:30	34200			75.0	67.5	22	0.953	7.1E-08
22-May	15:30		75.0	67.5					
23-May	05:45	51300			74.7	67.2	22	0.953	1.0E-08
23-May	05:45		74.7	67.2					
23-May	09:00	11700			74.6	67.1	22	0.953	1.5E-08
23-May	09:00		74.6	67.1					
23-May	12:20	12000			74.5	67.0	22	0.953	1.5E-08
23-May	12:20		74.5	67.0					
23-May	15:30	11400			74.4	66.9	22	0.953	1.5E-08
22-May	15:30		75.0	67.5					
23-May	15:30	86400			74.4	66.9	22	0.953	1.2E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.50 cm	1.05 cm	0.866 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	0300-127
LOCATION:		LAB START DATE:	5/17/00
MATERIAL:	Shaly clay, tan	LAB REP. DATE:	5/21/00
BORING/SAMPLE:	Proctor	TECHNICIAN:	MLT
PROCTOR # :	#1	DEPTH/LIFT:	
SAMPLE ORIENTATION:	H ___ V ✓ Remold ✓	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume (0.7854 * a * b ^ 2):	4.909 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	108.0 pcf

INITIAL CONDITIONS

e. Ring + Wet Weight Soil:	654.7 gms
f. Wet Weight Soil + Tare:	229.0 gms
g. Dry Weight Soil + Tare:	199.6 gms
h. Tare Weight:	89.9 gms
i. Moisture Content [(f-g)/(g-h)]*100:	26.8 %
j. Unit Dry Weight [d/(1+(i/100))]:	85.1 pcf

FINAL CONDITIONS

k. Wet Weight Soil + Tare:	234.9 gms
l. Dry Weight Soil + Tare:	199.6 gms
m. Tare Weight:	89.9 gms
n. Moisture Content [(k-l)/(l-m)]*100:	32.2 %
o. Unit Dry Weight [d/(1+(n/100))]:	81.7 pcf
p. Ring Weight:	515.6 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
17-May	13:35		79.5	72.0					
18-May	06:00	59100			75.1	67.6	22	0.953	7.1E-08
18-May	06:00		75.1	67.6					
18-May	09:00	10800			74.9	67.4	22	0.953	1.8E-08
18-May	09:00		74.9	67.4					
18-May	11:03	7380			74.5	67.0	22	0.953	5.3E-08
18-May	11:03		74.5	67.0					
19-May	05:50	67620			71.7	64.2	22	0.953	4.2E-08
19-May	05:50		71.7	64.2					
19-May	08:48	10680			71.5	64.0	22	0.953	1.9E-08
18-May	06:00		75.1	67.6					
19-May	08:48	96480			71.5	64.0	22	0.953	3.8E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.50 cm	1.05 cm	0.866 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	0300-127
LOCATION:		LAB START DATE:	5/16/00
MATERIAL:	Shale, dark gray	LAB REP. DATE:	5/21/00
BORING/SAMPLE:	Proctor	TECHNICIAN:	MLT
PROCTOR # :	#2	DEPTH/LIFT:	
SAMPLE ORIENTATION:	H ___ V ✓ Remold ✓	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume (0.7854 * a * b ^ 2):	4.909 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	118.0 pcf

INITIAL CONDITIONS

e. Ring + Wet Weight Soil:	668.5 gms
f. Wet Weight Soil + Tare:	241.9 gms
g. Dry Weight Soil + Tare:	214.9 gms
h. Tare Weight:	89.9 gms
i. Moisture Content [(f-g)/(g-h)]*100:	21.6 %
j. Unit Dry Weight [d/(1+(i/100))]:	97.0 pcf

FINAL CONDITIONS

k. Wet Weight Soil + Tare:	246.4 gms
l. Dry Weight Soil + Tare:	214.9 gms
m. Tare Weight:	89.9 gms
n. Moisture Content [(k-l)/(l-m)]*100:	25.2 %
o. Unit Dry Weight [d/(1+(n/100))]:	94.2 pcf
p. Ring Weight:	516.5 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
16-May	13:10		72.5	65.0					
17-May	06:12	61320			69.4	61.9	22	0.953	5.2E-08
17-May	06:12		69.4	61.9					
17-May	08:01	6540			69.1	61.6	22	0.953	4.8E-08
17-May	08:01		69.1	61.6					
17-May	09:58	7020			68.8	61.3	22	0.953	4.5E-08
17-May	09:58		68.8	61.3					
17-May	12:50	10320			68.5	61.0	22	0.953	3.1E-08
17-May	12:50		68.5	61.0					
18-May	06:00	61800			66.9	59.4	22	0.953	2.8E-08
17-May	06:12		69.4	61.9					
18-May	06:00	85680			66.9	59.4	22	0.953	3.1E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.48 cm	1.04 cm	0.849 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	549
LOCATION:		LAB START DATE:	12/23/2004
MATERIAL:	Clay, dark brown	LAB REP. DATE:	12/26/2004
BORING/SAMPLE:	Proctor	TECHNICIAN:	MLT
PROCTOR # :	#8	DEPTH/LIFT:	
SAMPLE ORIENTATION:	H ____ V ____ Remold ___ x	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume (0.7854 * a * b ^ 2):	4.909 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	108.0 pcf

INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring + Wet Weight Soil:	680.0 gms	k. Wet Weight Soil + Tare:	151.3 gms
f. Wet Weight Soil + Tare:	147.2 gms	l. Dry Weight Soil + Tare:	117.8 gms
g. Dry Weight Soil + Tare:	117.8 gms	m. Tare Weight:	8.1 gms
h. Tare Weight:	8.1 gms	n. Moisture Content [(k-l)/(l-m)]*100:	30.5 %
i. Moisture Content [(f-g)/(g-h)]*100:	26.8 %	o. Unit Dry Weight [d/(1+(n/100))]:	82.7 pcf
j. Unit Dry Weight [d/(1+(i/100))]:	85.1 pcf	p. Ring Weight:	540.9 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
23-Dec	18:14		51.7	44.7					
23-Dec	23:18	18240			50.9	43.9	22	0.953	6.6E-08
23-Dec	23:18		50.9	43.9					
24-Dec	02:49	12660			50.4	43.4	22	0.953	6.0E-08
24-Dec	02:49		50.4	43.4					
24-Dec	06:03	11640			50.2	43.2	22	0.953	2.6E-08
24-Dec	06:03		50.2	43.2					
24-Dec	10:14	15060			50.0	43.0	22	0.953	2.0E-08
24-Dec	10:14		50.0	43.0					
24-Dec	12:44	9000			49.9	42.9	22	0.953	1.7E-08
23-Dec	23:18		50.9	43.9					
24-Dec	12:44	48360			49.9	42.9	22	0.953	3.2E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.00 cm	1.05 cm	0.866 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

HYDRAULIC CONDUCTIVITY WORKSHEET

FALLING HEAD - FIXED WALL PERMEAMETER

PROJECT:	TASWA	JOB No.:	549
LOCATION:		LAB START DATE:	12/23/2004
MATERIAL:	Clay, tan & brown	LAB REP. DATE:	12/26/2004
BORING/SAMPLE:	Proctor	TECHNICIAN:	MLT
PROCTOR # :	#7	DEPTH/LIFT:	
SAMPLE ORIENTATION:	H ____ V ____ Remold ___ x	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume (0.7854 * a * b ^ 2):	4.909 cu in	d. Wet Unit Weight: [((f-h)*3.8095)/c)]:	113.3 pcf

INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring + Wet Weight Soil:	685.2 gms	k. Wet Weight Soil + Tare:	156.7 gms
f. Wet Weight Soil + Tare:	153.9 gms	l. Dry Weight Soil + Tare:	125.0 gms
g. Dry Weight Soil + Tare:	125.0 gms	m. Tare Weight:	7.9 gms
h. Tare Weight:	7.9 gms	n. Moisture Content [(k-l)/(l-m)]*100:	27.1 %
i. Moisture Content [(f-g)/(g-h)]*100:	24.7 %	o. Unit Dry Weight [d/(1+(n/100))]:	89.2 pcf
j. Unit Dry Weight [d/(1+(i/100))]:	90.9 pcf	p. Ring Weight:	539.2 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
23-Dec	18:00		49.9	42.4					
23-Dec	23:18	19080			48.5	41.0	22	0.953	1.2E-07
23-Dec	23:18		48.5	41.0					
24-Dec	02:49	12660			48.0	40.5	22	0.953	6.4E-08
24-Dec	02:49		48.0	40.5					
24-Dec	06:03	11640			47.7	40.2	22	0.953	4.2E-08
24-Dec	06:03		47.7	40.2					
24-Dec	10:14	15060			47.3	39.8	22	0.953	4.4E-08
24-Dec	10:14		47.3	39.8					
24-Dec	12:44	9000			47.1	39.6	22	0.953	3.7E-08
23-Dec	23:18		48.5	41.0					
24-Dec	12:44	48360			47.1	39.6	22	0.953	4.8E-08

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.50 cm	1.05 cm	0.866 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

LANDTEC

LANDTEC engineers

1700 Robert Road, Suite 101
Mansfield, Texas 76063
Metro 817.572.2818
Fax 817.453.9984

CLIENT: Biggs & Mathews Environmental
1700 Robert Road, Suite 100
Mansfield, Texas 76063
ATTN: David Clark, P.E.

REPORT DATE: 8/12/2008

PROJECT NO.: 1752

PROJECT: TASWA Sector 3

HYDRAULIC CONDUCTIVITY WORKSHEET
FALLING HEAD - FIXED WALL PERMEAMETER

LOCATION: On-Site Borrow
MATERIAL: Clay, brown
BORING/SAMPLE:
PROCTOR # : TASWA 11
SAMPLE ORIENTATION: H ____ V _X__
Remold _X__

LAB START DATE: 8/5/2008
LAB RPT. DATE: 8/8/2008
TECHNICIAN: MLT
DEPTH/LIFT: N/A
PERM FLUID USED: De-aired Tap Water

a. Length of Specimen, L: 1.0 in
b. Avg. Diameter of Specimen: 2.5 in
c. Sample Volume ($\pi b^2 / 4 * a$): 4.909 cu in
d. Wet Unit Weight [((f-h)*3.8095)/c)]: 110.1 pcf

INITIAL CONDITIONS

e. Ring + Wet Weight Soil: 622.3 gms
f. Wet Weight Soil + Tare: 150.0 gms
g. Dry Weight Soil + Tare: 118.6 gms
h. Tare Weight: 8.1 gms
i. Moisture Content [(f-g)/(g-h)]*100: 28.4 %
j. Unit Dry Weight [d/(1+(i/100))]: 85.8 pcf

FINAL CONDITIONS

k. Wet Weight Soil + Tare: 156.9 gms
l. Dry Weight Soil + Tare: 118.6 gms
m. Tare Weight: 8.1 gms
n. Moisture Content [(k-l)/(l-m)]*100: 34.7 %
o. Unit Dry Weight [d/(1+(n/100))]: 81.8 pcf
p. Ring Weight: 480.4 gms

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
05-Aug	14:02		42.3	35.3					
05-Aug	21:00	25080			40.1	33.1	22	0.953	3.1E-07
05-Aug	21:00		40.1	33.1					
06-Aug	8:30	41400			39.0	32.0	22	0.953	9.9E-08
06-Aug	8:30		39.0	32.0					
06-Aug	19:47	40620			38.2	31.2	22	0.953	7.5E-08
06-Aug	19:47		38.2	31.2					
07-Aug	2:25	23880			37.8	30.8	22	0.953	6.5E-08
07-Aug	2:25		37.8	30.8					
07-Aug	13:50	41100			37.2	30.2	22	0.953	5.8E-08
05-Aug	21:00		40.1	33.1					
07-Aug	13:50	147000			37.2	30.2	22	0.953	7.6E-08

Height of Top of Specimen From Top of Table: 7.01 cm
Standpipe Diameter: 1.42 cm
Standpipe Area: 1.584 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

LANDTEC engineers

1700 Robert Road, Suite 101
Mansfield, Texas 76063
Metro 817.572.2818
Fax 817.453.9984

CLIENT: TASWA Landfill
25090 State Highway 56
Whitesboro Texas 76273

REPORT DATE: 9/8/17

PROJECT NO.: 0517-2500

PROJECT: TASWA LF, Sector 4, Whitesboro, Texas

HYDRAULIC CONDUCTIVITY WORKSHEET
FALLING HEAD - FIXED WALL PERMEAMETER

LOCATION:	See Test Location Plan	LAB START DATE:	9/5/2017
MATERIAL:	Clay, brown	LAB RPT. DATE:	9/8/2017
BORING/SAMPLE:	F1-22	TECHNICIAN:	MT
PROCTOR # :	TASWA-11	DEPTH/LIFT:	1
SAMPLE ORIENTATION:	H ____ V _X_ Remold ____	PERM FLUID USED:	De-aired Tap Water
a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume ($\pi b^2 / 4 * a$):	4.909 cu in	d. Wet Unit Weight: [((f-e)*3.8095)/c)]:	115.7 pcf

INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring Weight:	452.7 gms		
f. Ring + Wet Weight Soil:	601.8 gms		
g. Wet Weight Soil + Tare:	156.7 gms	l. Wet Weight Soil + Tare:	160.7 gms
h. Dry Weight Soil + Tare:	118.4 gms	m. Dry Weight Soil + Tare:	118.4 gms
i. Tare Weight:	7.6 gms	n. Tare Weight:	7.6 gms
j. Moisture Content [(g-h)/(h-i)]*100:	34.5 %	o. Moisture Content [(l-m)/(m-n)]*100:	38.1 %
k. Unit Dry Weight [d/(1+(j/100))]:	86.0 pcf	p. Unit Dry Weight [d/(1+(o/100))]:	83.7 pcf

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
05-Sep	19:00		76.7	76.7			19.3		
06-Sep	07:36	45360			75.6	75.6	19.3	1.025	2.3E-08
06-Sep	07:36		75.6	75.6			19.3		
06-Sep	09:39	7380			75.5	75.5	19.3	1.025	1.5E-08
06-Sep	09:39		75.5	75.5			19.3		
06-Sep	11:34	6900			75.5	75.5	19.3	1.025	<1.00E-09
06-Sep	11:34		75.5	75.5			19.3		
06-Sep	13:42	7680			75.4	75.4	19.3	1.025	1.5E-08
06-Sep	13:42		75.4	75.4			19.3		
06-Sep	16:16	9240			75.3	75.3	19.3	1.025	1.2E-08
06-Sep	16:16		75.3	75.3			19.3		
07-Sep	08:15	57540			74.7	74.7	20.6	1.000	1.1E-08
07-Sep	08:15		74.7	74.7			20.6		
07-Sep	12:35	15600			74.5	74.5	20.6	1.000	1.4E-08
Cumulative									
05-Sep	19:00		76.7	76.7					
07-Sep	12:35	149700			74.5	74.5	19.3	1.025	1.4E-08
From Top of Table:		7.70 cm			1.05 cm			0.866 sq cm	

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

LANDTEC ENGINEERS

1700 Robert Road, Suite 101
Mansfield, Texas 76063
817.572.2818

CLIENT: Biggs & Mathews Environmental, Inc.
1700 Robert Road, Suite 100
Mansfield, Texas 76063

REPORT DATE: 6/5/2020

PROJECT NO.: 0520-2913

PROJECT: TASWA

HYDRAULIC CONDUCTIVITY WORKSHEET
FALLING HEAD - FIXED WALL PERMEAMETER

LOCATION:	See Test Location Plan	LAB START DATE:	6/1/2020
MATERIAL:	SHALY CLAY, tan & gray	LAB RPT. DATE:	6/5/2020
BORING/SAMPLE:		TECHNICIAN:	MT
PROCTOR # :	TASWA-14 (Remold)	DEPTH/LIFT:	N/A
SAMPLE ORIENTATION:	H ____ V _X_ Remold _X_	PERM FLUID USED:	De-aired Tap Water

a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume ($\pi b^2 / 4 * a$):	4.909 cu in	d. Wet Unit Weight: [((f-e)*3.8095)/c)]:	134.2 pcf

INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring Weight:	522.3 gms		
f. Ring + Wet Weight Soil:	695.3 gms		
g. Wet Weight Soil + Tare:	181.0 gms	l. Wet Weight Soil + Tare:	193.6 gms
h. Dry Weight Soil + Tare:	155.5 gms	m. Dry Weight Soil + Tare:	155.5 gms
i. Tare Weight:	8.1 gms	n. Tare Weight:	8.1 gms
j. Moisture Content [(g-h)/(h-i)]*100:	17.3 %	o. Moisture Content [(l-m)/(m-n)]*100:	25.8 %
k. Unit Dry Weight [d/(1+(j/100))]:	114.4 pcf	p. Unit Dry Weight [d/(1+(o/100))]:	106.6 pcf

Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
01-Jun	14:55		52.1	45.1			22.0		
02-Jun	8:00	61500			48.8	41.8	22.0	0.953	8.7E-08
02-Jun	8:00		48.8	41.8			22.0		
02-Jun	10:28	8880			48.5	41.5	22.0	0.953	5.7E-08
02-Jun	10:28		48.5	41.5			22.0		
02-Jun	13:00	9120			48.5	41.5	22.0	0.953	<1.00E-09
02-Jun	13:00		48.5	41.5			22.0		
02-Jun	15:30	9000			48.5	41.5	22.0	0.953	<1.00E-09
02-Jun	15:30		48.5	41.5			22.0		
02-Jun	17:00	5400			48.5	41.5	22.0	0.953	<1.00E-09
02-Jun	17:00		48.5	41.5			22.0		
03-Jun	7:00	50400			48.4	41.4	22.0	0.953	3.4E-09
03-Jun	7:00		48.4	41.4			22.0		
03-Jun	12:00	18000			48.4	41.4	22.0	0.953	<1.00E-09
03-Jun	12:00		48.4	41.4			22.0		
03-Jun	16:00	14400			48.4	41.4	22.0	0.953	<1.00E-09
03-Jun	16:00		48.4	41.4			22.0		
04-Jun	9:00	61200			48.3	41.3	22.0	0.953	2.8E-09
Cumulative									
02-Jun	8:00		48.8	41.8					
04-Jun	9:00	176400			48.3	41.3	22.0	0.953	4.8E-09

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.01 cm	1.08 cm	0.916 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht

LANDTEC ENGINEERS

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Mansfield, Texas 76063
817.572.2818

CLIENT: Biggs & Mathews Environmental, Inc.
1700 Robert Road, Suite 100
Mansfield, Texas 76063

REPORT DATE: 6/5/2020

PROJECT NO.: 0520-2913

PROJECT: TASWA

HYDRAULIC CONDUCTIVITY WORKSHEET
FALLING HEAD - FIXED WALL PERMEAMETER

LOCATION:	See Test Location Plan	LAB START DATE:	6/1/2020
MATERIAL:	SHALE, dark gray	LAB RPT. DATE:	6/5/2020
BORING/SAMPLE:		TECHNICIAN:	MT
PROCTOR # :	TASWA-15 (Remold)	DEPTH/LIFT:	N/A
SAMPLE ORIENTATION:	H ____ V _X_ Remold _X_	PERM FLUID USED:	De-aired Tap Water
a. Length of Specimen, L:	1.0 in	b. Avg. Diameter of Specimen:	2.5 in
c. Sample Volume ($\pi b^2 / 4 * a$):	4.909 cu in	d. Wet Unit Weight: [((f-e)*3.8095)/c)]:	128.2 pcf

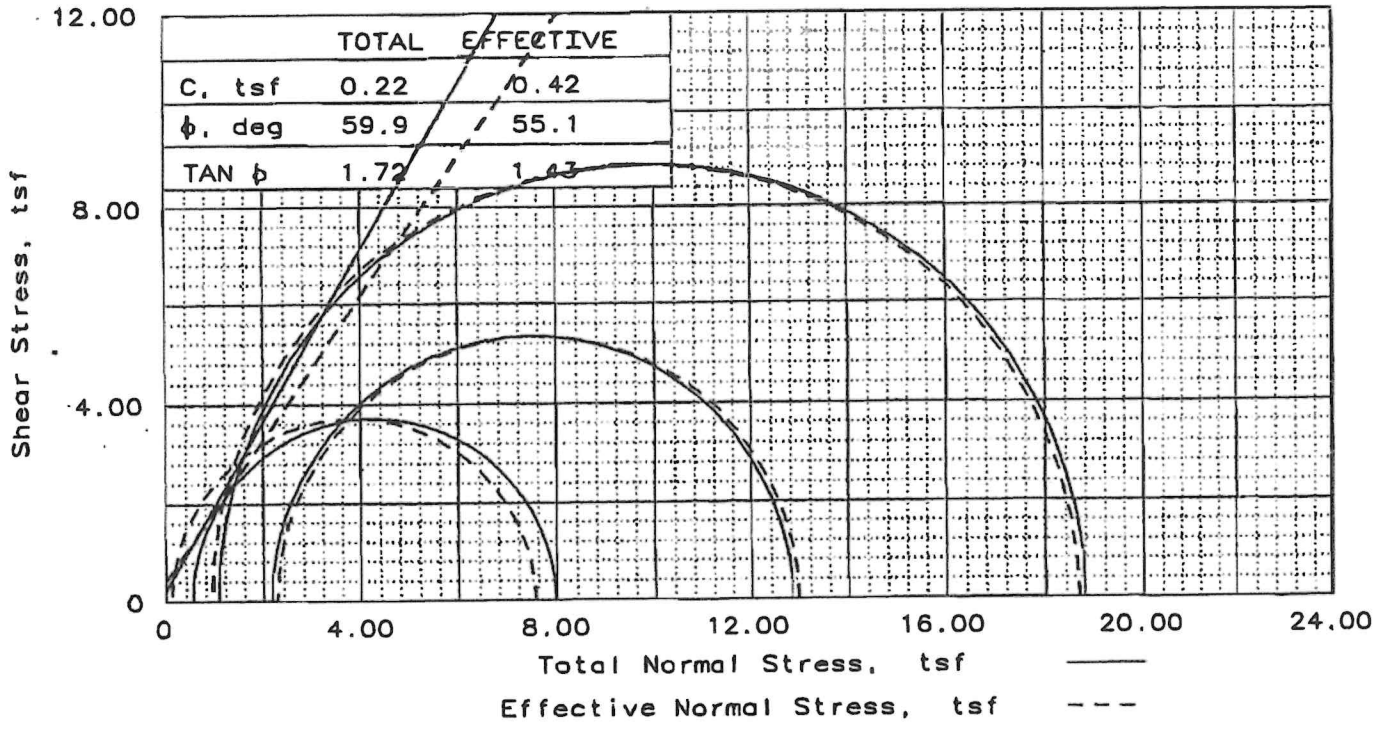
INITIAL CONDITIONS		FINAL CONDITIONS	
e. Ring Weight:	511.9 gms		
f. Ring + Wet Weight Soil:	677.1 gms		
g. Wet Weight Soil + Tare:	173.6 gms	l. Wet Weight Soil + Tare:	178.4 gms
h. Dry Weight Soil + Tare:	141.8 gms	m. Dry Weight Soil + Tare:	141.8 gms
i. Tare Weight:	8.4 gms	n. Tare Weight:	8.4 gms
j. Moisture Content [(g-h)/(h-i)]*100:	23.8 %	o. Moisture Content [(l-m)/(m-n)]*100:	27.4 %
k. Unit Dry Weight [d/(1+(j/100))]:	103.6 pcf	p. Unit Dry Weight [d/(1+(o/100))]:	100.7 pcf

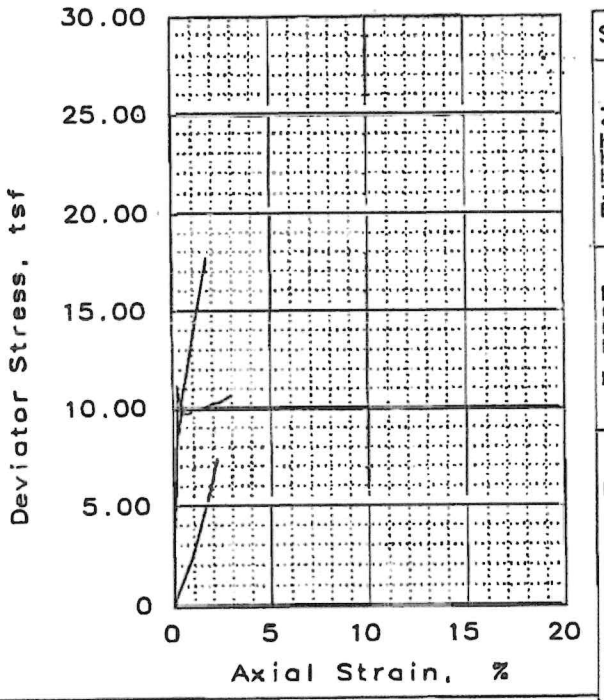
Date	Time	t sec	Initial Height, ho	Corrected ho - C	Final Height, hf	Corrected hf - C	Temp C	Rt	k @ 20C cm/sec
01-Jun	15:25		58.7	51.7			22.0		
02-Jun	8:00	59700			50.6	43.6	22.0	0.953	2.0E-07
02-Jun	8:00		50.6	43.6			22.0		
02-Jun	10:28	8880			50.3	43.3	22.0	0.953	5.4E-08
02-Jun	10:28		50.3	43.3			22.0		
02-Jun	13:00	9120			50.3	43.3	22.0	0.953	<1.00E-09
02-Jun	13:00		50.3	43.3			22.0		
02-Jun	15:30	9000			50.3	43.3	22.0	0.953	<1.00E-09
02-Jun	15:30		50.3	43.3			22.0		
02-Jun	17:00	5400			50.3	43.3	22.0	0.953	<1.00E-09
02-Jun	17:00		50.3	43.3			22.0		
03-Jun	7:00	50400			50.2	43.2	22.0	0.953	3.2E-09
03-Jun	7:00		50.2	43.2			22.0		
03-Jun	12:00	18000			50.2	43.2	22.0	0.953	<1.00E-09
03-Jun	12:00		50.2	43.2			22.0		
03-Jun	16:00	14400			50.2	43.2	22.0	0.953	<1.00E-09
03-Jun	16:00		50.2	43.2			22.0		
04-Jun	9:00	61200			50.2	43.2	22.0	0.953	<1.00E-09
Cumulative									
02-Jun	8:00		50.6	43.6					
04-Jun	9:00	176400			50.2	43.2	22.0	0.953	3.7E-09

Height of Top of Specimen From Top of Table:	Standpipe Diameter	Standpipe Area
7.01 cm	1.08 cm	0.916 sq cm

Test Method: Corps of Engineers EM 1110-2-1906, Appendix VII

Hx-C = Hx-Ht





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	17.0	17.0	17.0
	DRY DENSITY, pcf	112.5	112.5	112.5
	SATURATION, %	95.6	95.6	95.6
	VOID RATIO	0.470	0.470	0.470
	DIAMETER, in	1.80	1.80	1.80
	HEIGHT, in	4.00	4.00	4.00
AT TEST	WATER CONTENT, %	17.7	17.7	17.7
	DRY DENSITY, pcf	112.5	112.5	112.5
	SATURATION, %	99.7	99.7	99.7
	VOID RATIO	0.470	0.470	0.470
	DIAMETER, in	1.80	1.80	1.80
	HEIGHT, in	4.00	4.00	4.00
Time to failure, min				
BACK PRESSURE, tsf		3.06	3.06	3.06
CELL PRESSURE, tsf		3.60	4.14	5.22
FAILURE STRESS, tsf		7.43	17.73	10.69
PORE PRESSURE, tsf		3.48	3.20	2.94
ULTIMATE STRESS, tsf		7.43	17.73	10.69
PORE PRESSURE, tsf		3.48	3.20	2.94
$\bar{\sigma}_1$ FAILURE, tsf		7.55	18.68	12.97
$\bar{\sigma}_3$ FAILURE, tsf		0.12	0.94	2.28

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: Core Sample
DESCRIPTION: Shale, gray sandy

LL= PL= PI=
SPECIFIC GRAVITY= 2.65
REMARKS:

FIG. NO.

CLIENT:

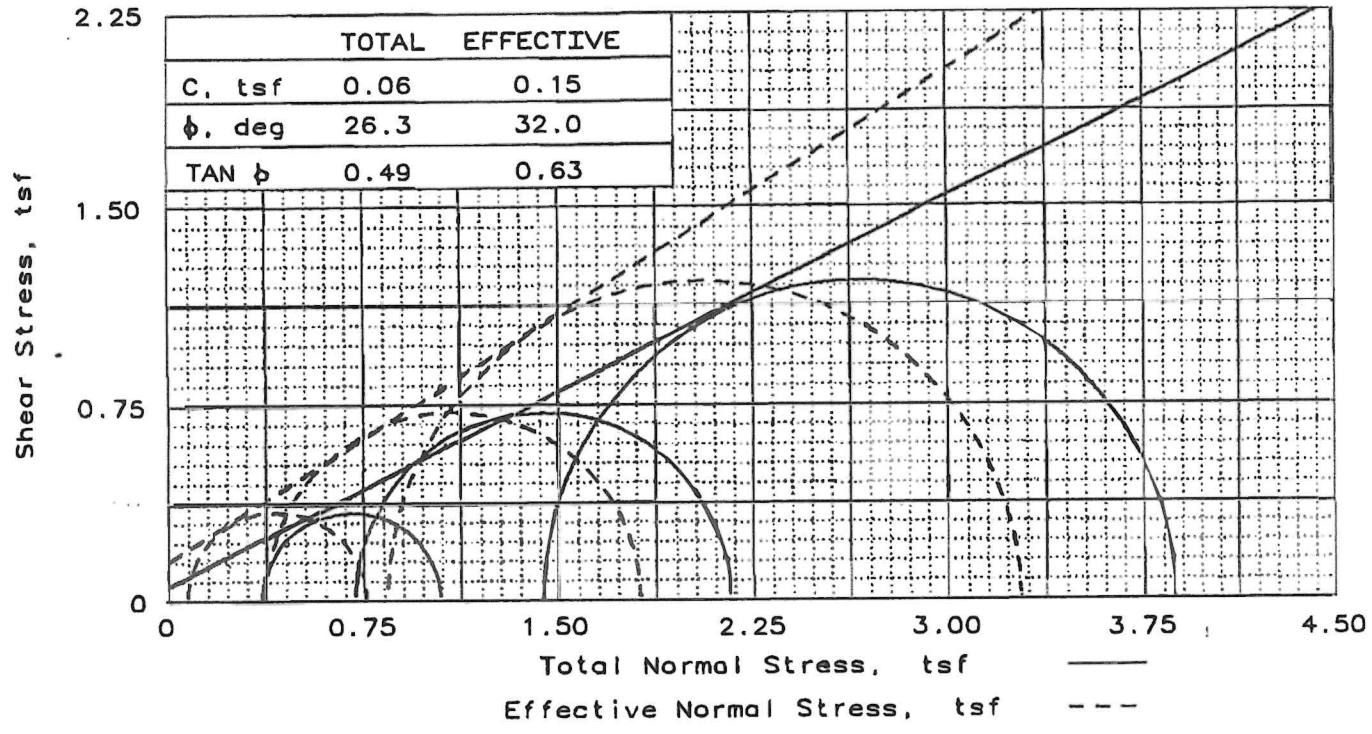
PROJECT: TASWA

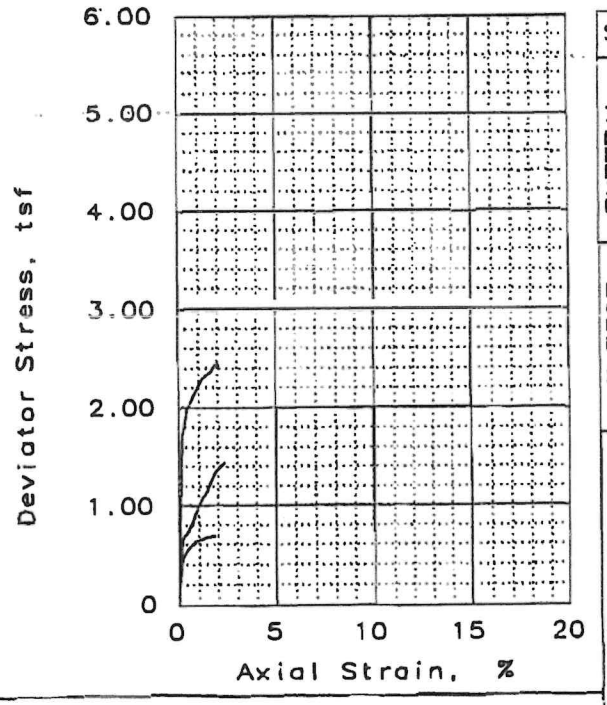
SAMPLE LOCATION: EE-35 @ 21.2'-21.8'

PROJ. NO.: 0300-127 DATE: 5/15/00

TRIAXIAL SHEAR TEST REPORT

EMCON Baker-Shiflett, Inc.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	34.3	34.3	34.3
	DRY DENSITY, pcf	82.5	82.5	82.5
	SATURATION, %	90.3	90.3	90.3
	VOID RATIO	1.006	1.006	1.006
	DIAMETER, in	2.75	2.75	2.75
	HEIGHT, in	4.25	4.25	4.25
AT TEST	WATER CONTENT, %	35.7	35.7	35.7
	DRY DENSITY, pcf	82.5	82.5	82.5
	SATURATION, %	93.9	93.9	93.9
	VOID RATIO	1.006	1.006	1.006
	DIAMETER, in	2.75	2.75	2.75
	HEIGHT, in	4.25	4.25	4.25
Time to failure, min				
BACK PRESSURE, tsf		3.96	3.96	3.96
CELL PRESSURE, tsf		4.32	4.68	5.40
FAILURE STRESS, tsf		0.69	1.44	2.43
PORE PRESSURE, tsf		4.25	4.31	4.56
ULTIMATE STRESS, tsf		0.69	1.44	2.43
PORE PRESSURE, tsf		4.26	4.31	4.58
$\bar{\sigma}_1$ FAILURE, tsf		0.76	1.82	3.28
$\bar{\sigma}_3$ FAILURE, tsf		0.07	0.37	0.84

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: Undisturbed
DESCRIPTION: Shaly clay, tan

LL= PL= PI=
SPECIFIC GRAVITY= 2.65
REMARKS:

FIG. NO.

CLIENT:

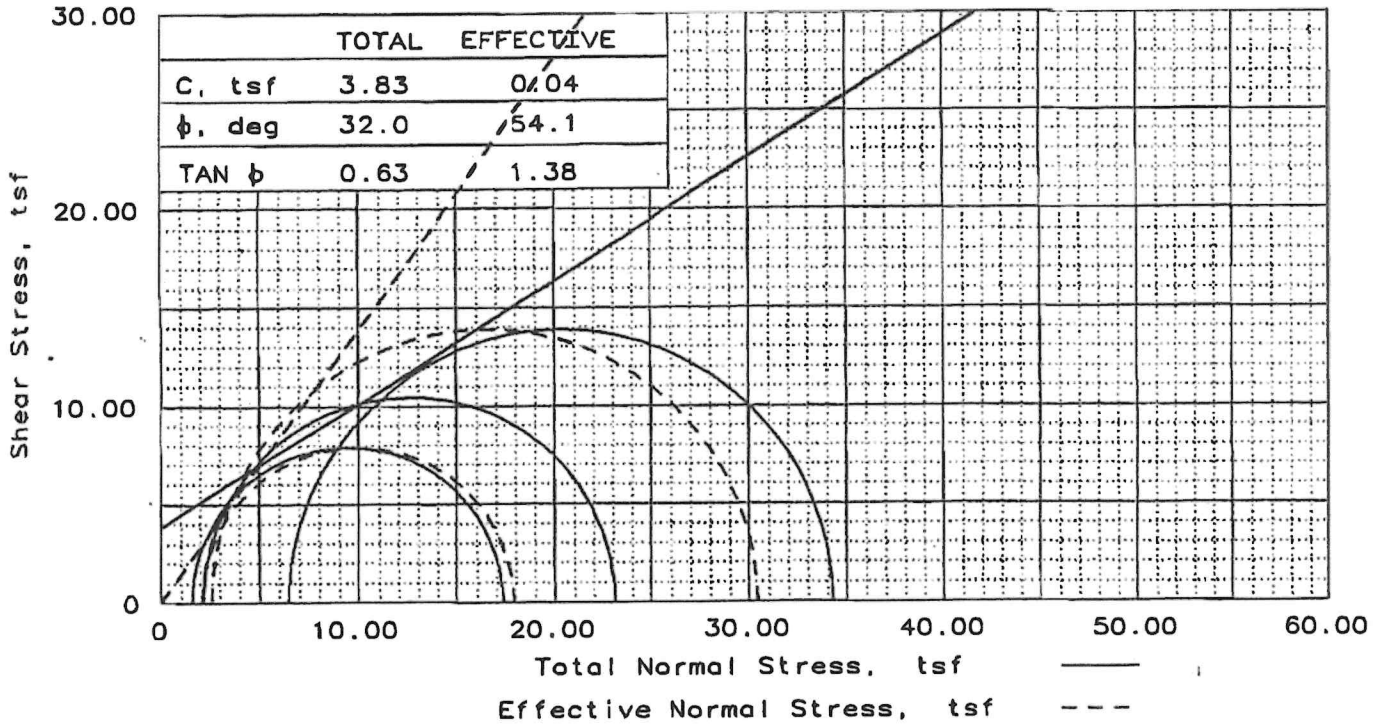
PROJECT: TASWA

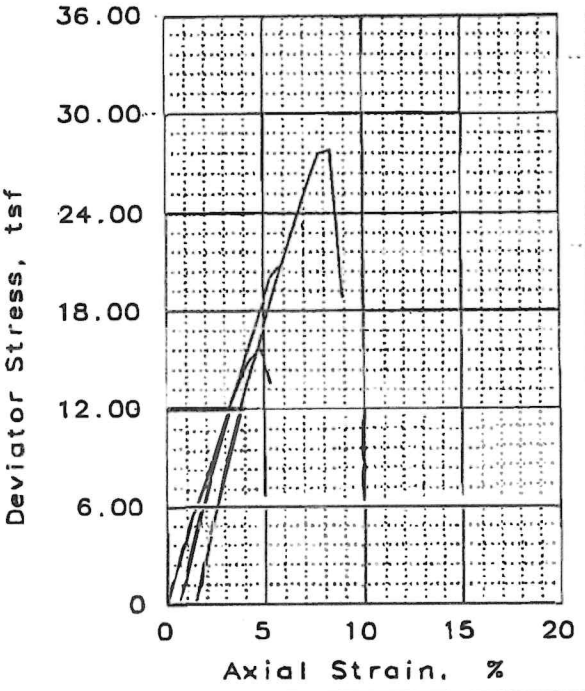
SAMPLE LOCATION: Z-10 @ U-9

PROJ. NO.: 0300-127 DATE: 5/12/00

TRIAXIAL SHEAR TEST REPORT

EMCON Baker-Shiflett, Inc.





SAMPLE NO.		1	2	3
INITIAL	WATER CONTENT, %	14.7	15.2	15.3
	DRY DENSITY, pcf	117.9	116.6	117.6
	SATURATION, %	96.8	96.1	99.7
	VOID RATIO	0.403	0.419	0.407
	DIAMETER, in	2.10	2.10	2.10
	HEIGHT, in	3.35	3.35	3.35
AT TEST	WATER CONTENT, %	16.7	15.7	15.9
	DRY DENSITY, pcf	117.9	116.6	117.6
	SATURATION, %	109.6	99.3	103.9
	VOID RATIO	0.403	0.419	0.407
	DIAMETER, in	2.10	2.10	2.10
	HEIGHT, in	3.35	3.35	3.35
Time to failure, min				
BACK PRESSURE, tsf		3.60	3.24	0.72
CELL PRESSURE, tsf		5.18	5.40	7.20
FAILURE STRESS, tsf		15.80	20.97	27.81
PORE PRESSURE, tsf		3.06	3.28	4.58
ULTIMATE STRESS, tsf		13.61	20.97	27.81
PORE PRESSURE, tsf		2.08	3.28	4.58
$\bar{\sigma}_1$ FAILURE, tsf		17.92	23.09	30.44
$\bar{\sigma}_3$ FAILURE, tsf		2.12	2.12	2.62

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: NX Core
DESCRIPTION: Shale, sandy gray

LL= PL= PI=
SPECIFIC GRAVITY= 2.65
REMARKS:

FIG. NO.

CLIENT:

PROJECT: TASWA

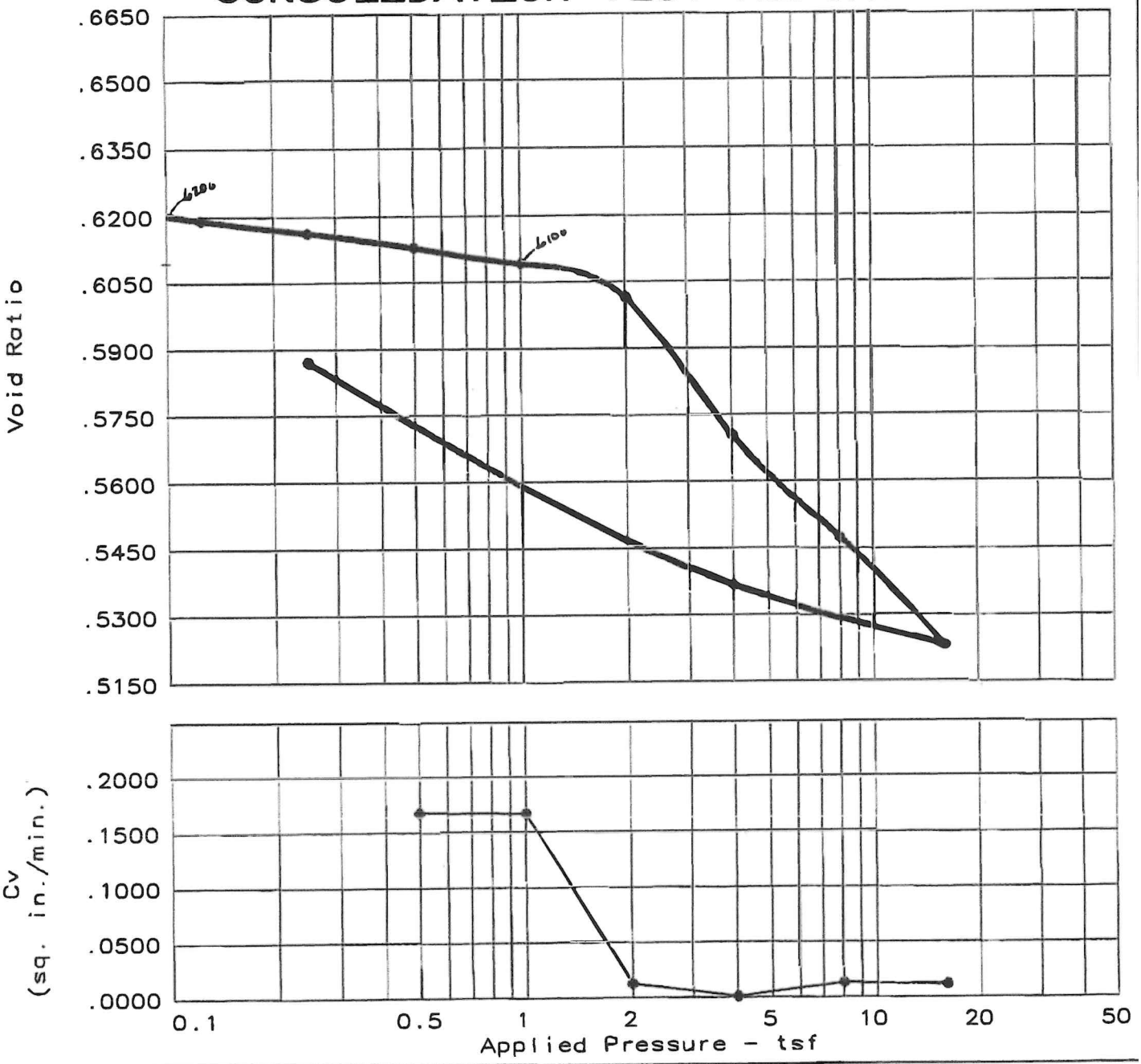
SAMPLE LOCATION: Z-10 @ 54.5'-55.0'

PROJ. NO.: 0300-127 DATE: 5/8/00

TRIAXIAL SHEAR TEST REPORT

EMCON Baker-Shiflett, Inc.

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
75.6 %	17.7	102.1			2.65	0.6203

TEST RESULTS

MATERIAL DESCRIPTION

Shale, dark gray

Project No.: 0300-127
Project: TASWA
Location: P-30 82.0' - 82.6'
Layer IV
Date: 5/12/00

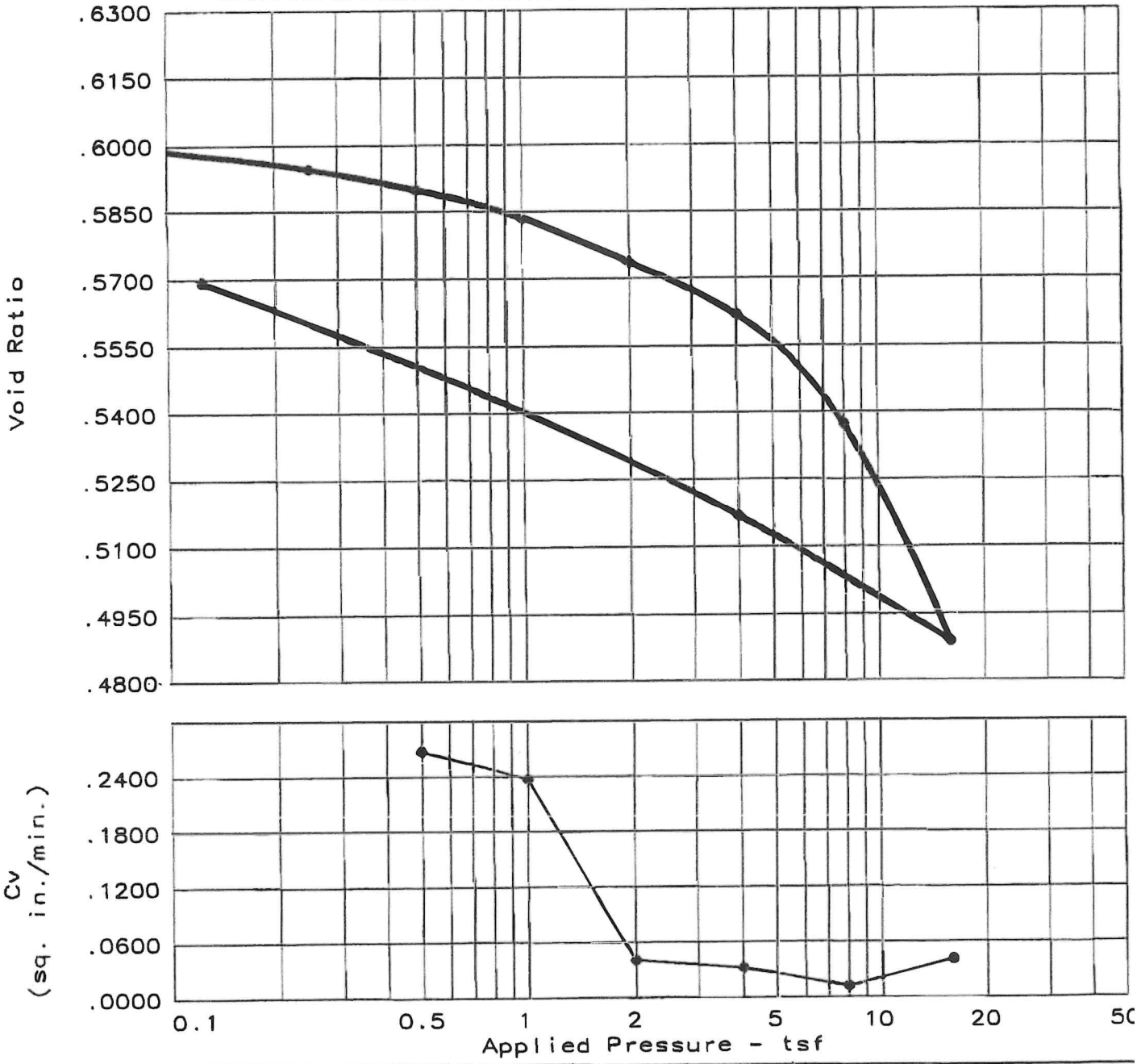
Remarks:

CONSOLIDATION TEST REPORT

EMCON Baker-Shiflett, Inc.

Fig. No. _____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
93.8 %	21.2	103.5			2.65	0.5987

TEST RESULTS

MATERIAL DESCRIPTION

Shale, gray

Project No.: 0300-127
Project: TASWA
Location: U-25 91.4' - 92.1'
LAYER IV
Date: 5/15/00

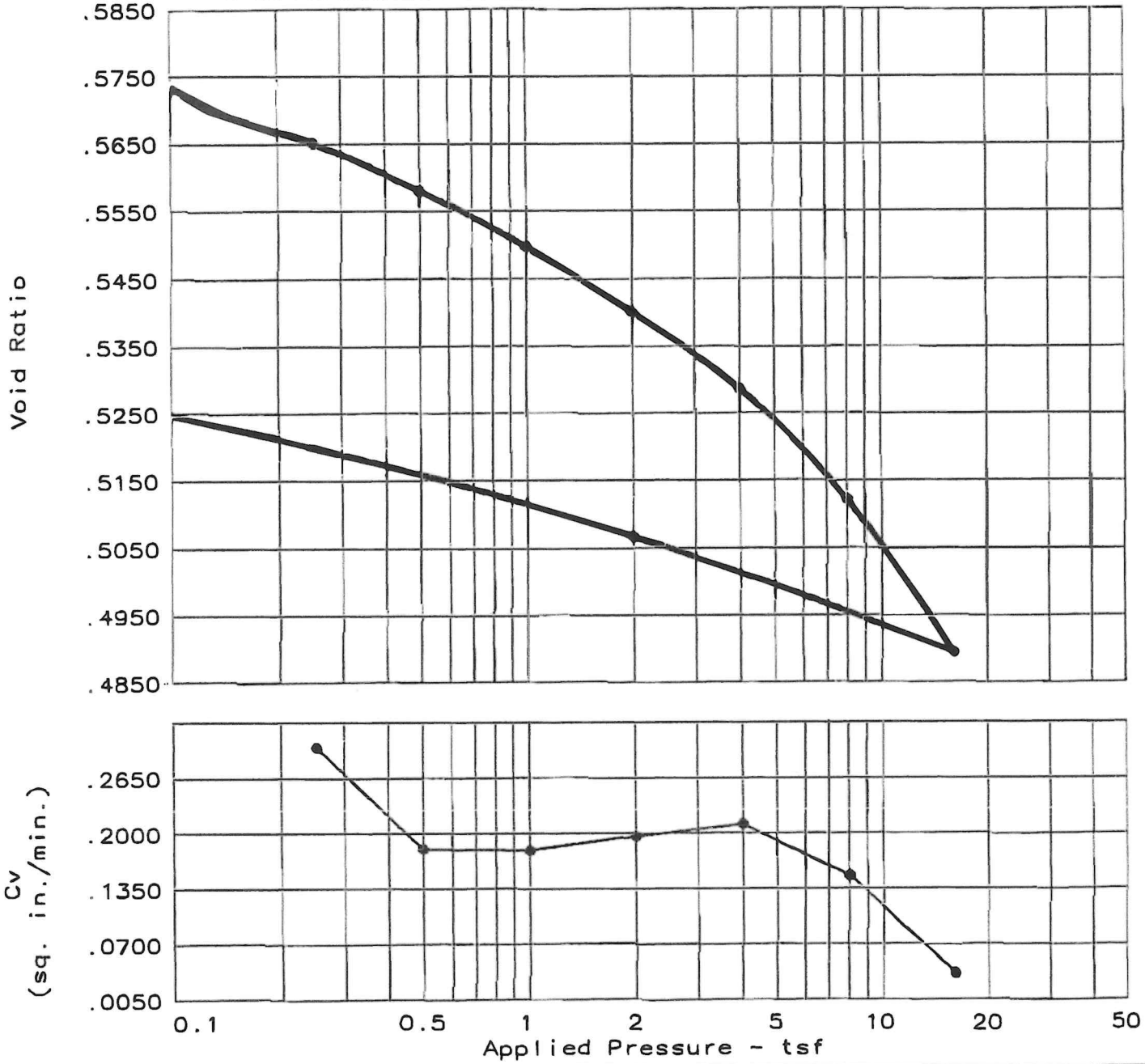
Remarks:

CONSOLIDATION TEST REPORT

EMCON Baker-Shiflett, Inc.

Fig. No. _____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
82.5 %	17.8	105.1			2.65	0.5736

TEST RESULTS

MATERIAL DESCRIPTION

Shale, sandy gray

Project No.: 0300-127
Project: TASWA
Location: P-30 103.0' - 105.0'
LAYER #1
Date: 5/16/00

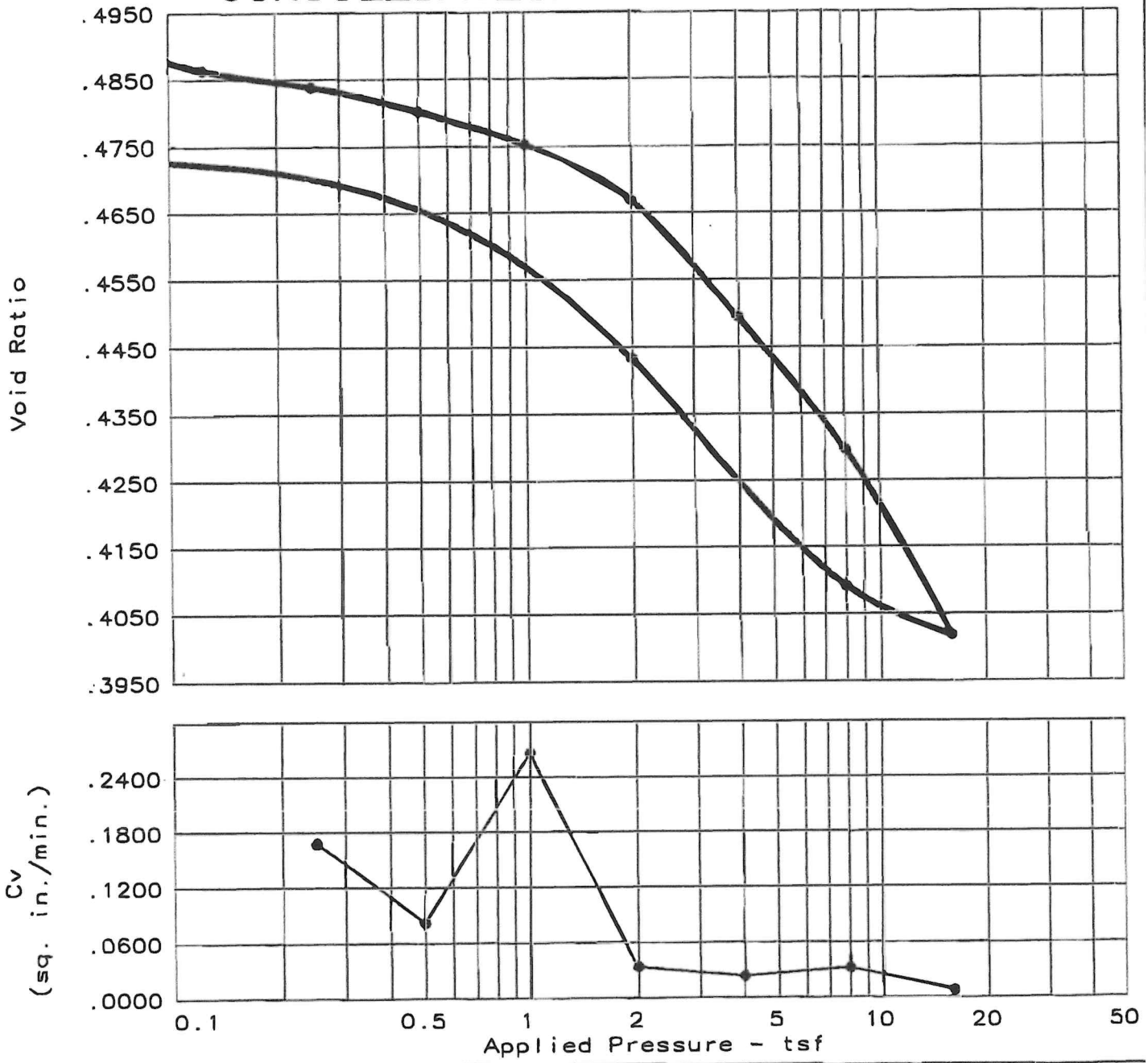
Remarks:

CONSOLIDATION TEST REPORT

EMCON Baker-Shiflett, Inc.

Fig. No. _____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
93.6 %	17.2	111.2			2.65	0.4877

TEST RESULTS

MATERIAL DESCRIPTION

Shaly clay, dark gray

Project No.: 0300-127
Project: TASWA
Location: 00-25 61.0' - 62.5'
Layer III
Date: 5/10/00

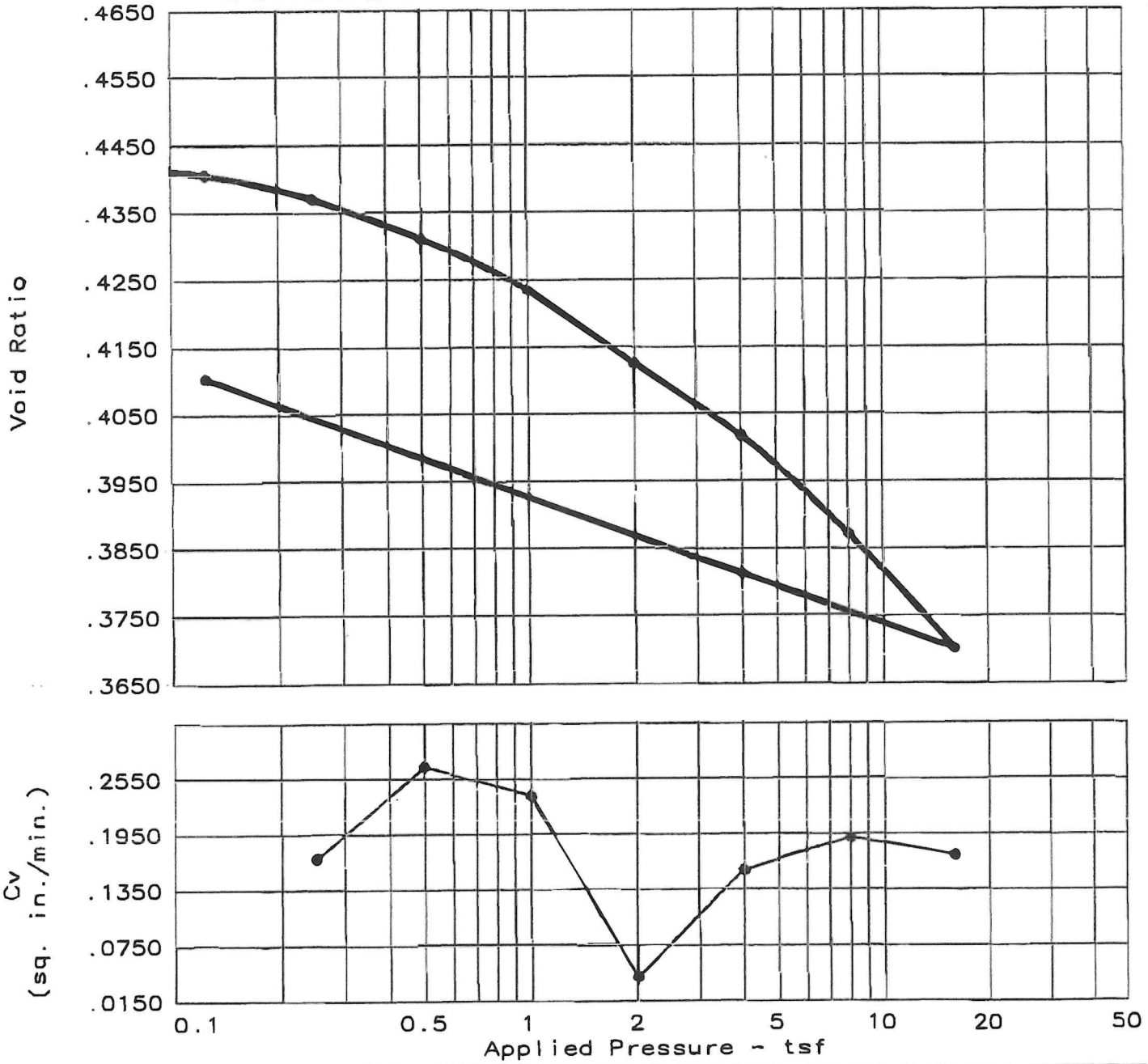
Remarks:

CONSOLIDATION TEST REPORT

EMCON Baker-Shiflett, Inc.

Fig. No. _____

CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
88.8 %	14.8	114.8			2.65	0.4412

TEST RESULTS

MATERIAL DESCRIPTION

Sandy shale, gray

Project No.: 0300-127
Project: TASWA
Location: TT-30 67.1' - 68.0'
LAYER III
Date: 5/18/00

Remarks:

CONSOLIDATION TEST REPORT

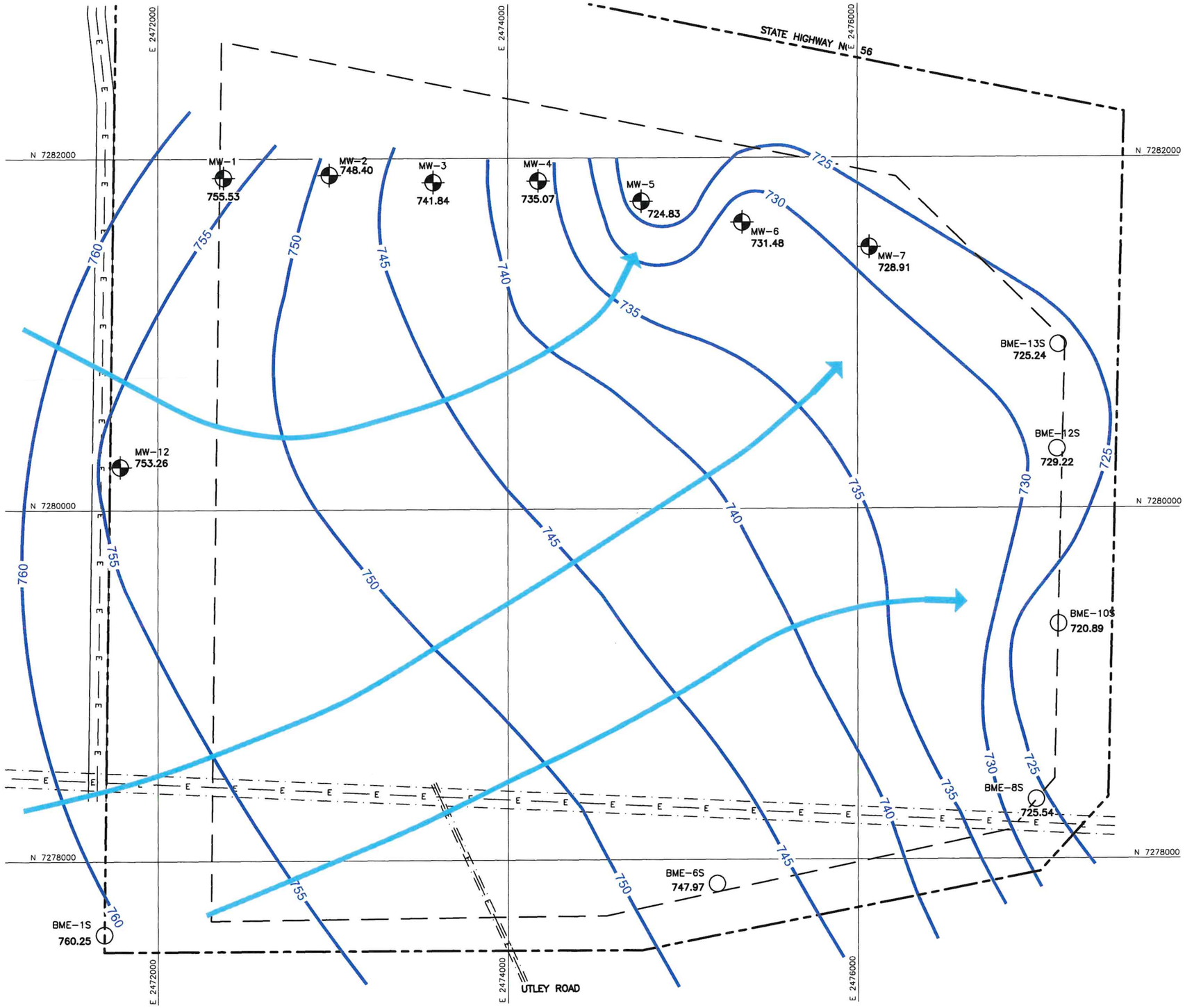
EMCON Baker-Shiflett, Inc.

Fig. No. _____

APPENDIX E6

SITE HYDROGEOLOGIC DATA

Potentiometric Surface Maps of Layer II/III Groundwater	E6.1a through E6.1aa
Potentiometric Surface Maps of Layer V Groundwater	E6.2a through E6.2aa
Slug Test Location Map	E6.3
Hydraulic Conductivity Calculations and Graphs	E6.4a through E6.4p
Groundwater Velocity Calculations	E6.5
Water Level Elevation Table Monitoring Wells	E6.6a through E6.6d
Water Level Elevation Table Historical Piezometers	E6.7
Water Level Elevation Table Existing Piezometers	E6.8



0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-15 — MONITOR WELL LOCATION AND ID NUMBER
- BME-10 — PIEZOMETER LOCATION AND ID NUMBER
- 730.59 — WATER LEVEL ELEVATION
- 670 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

MARCH 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1a

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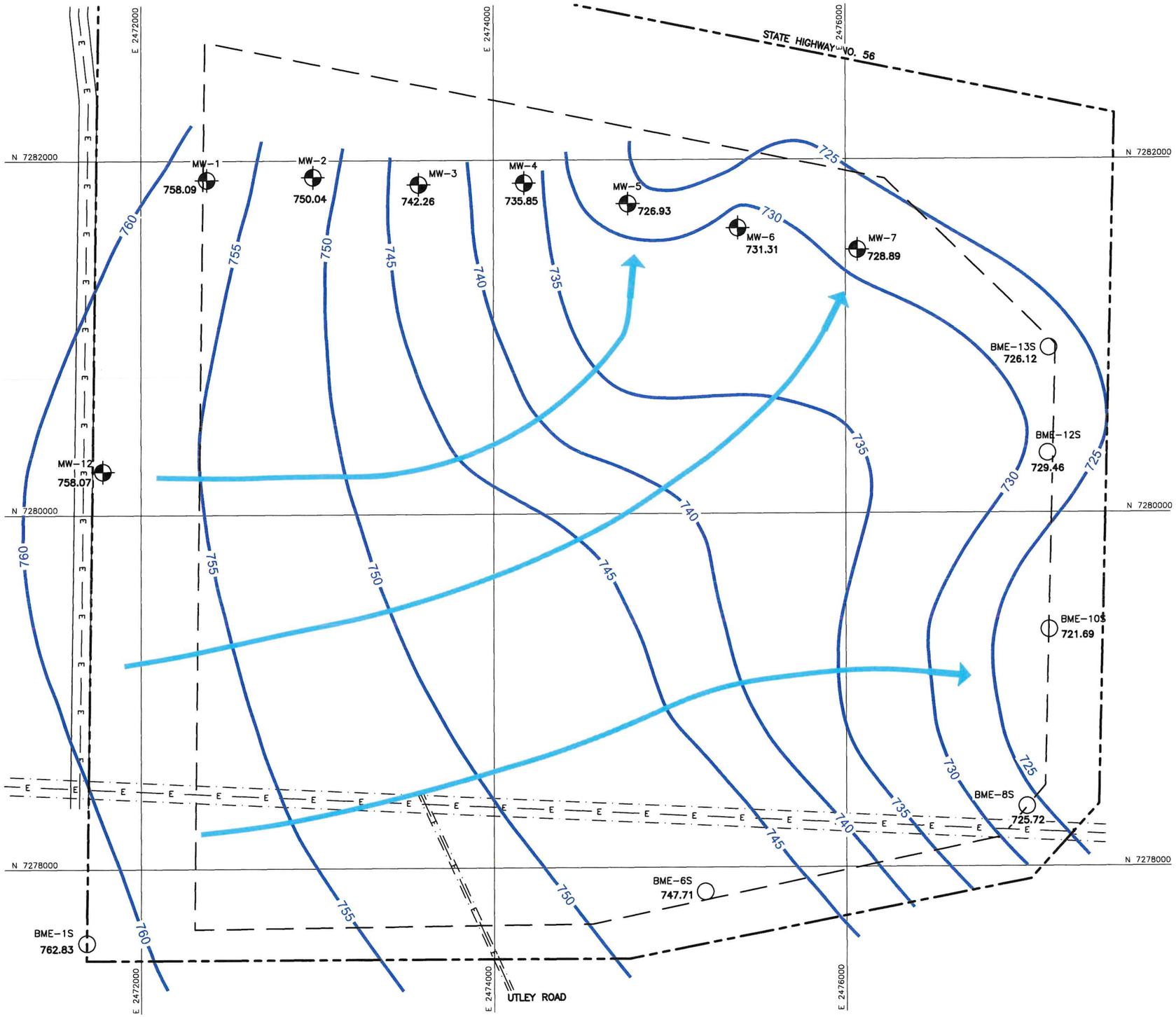

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

STATE OF TEXAS
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GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

APRIL 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1b

ISSUED FOR PERMITTING PURPOSES ONLY

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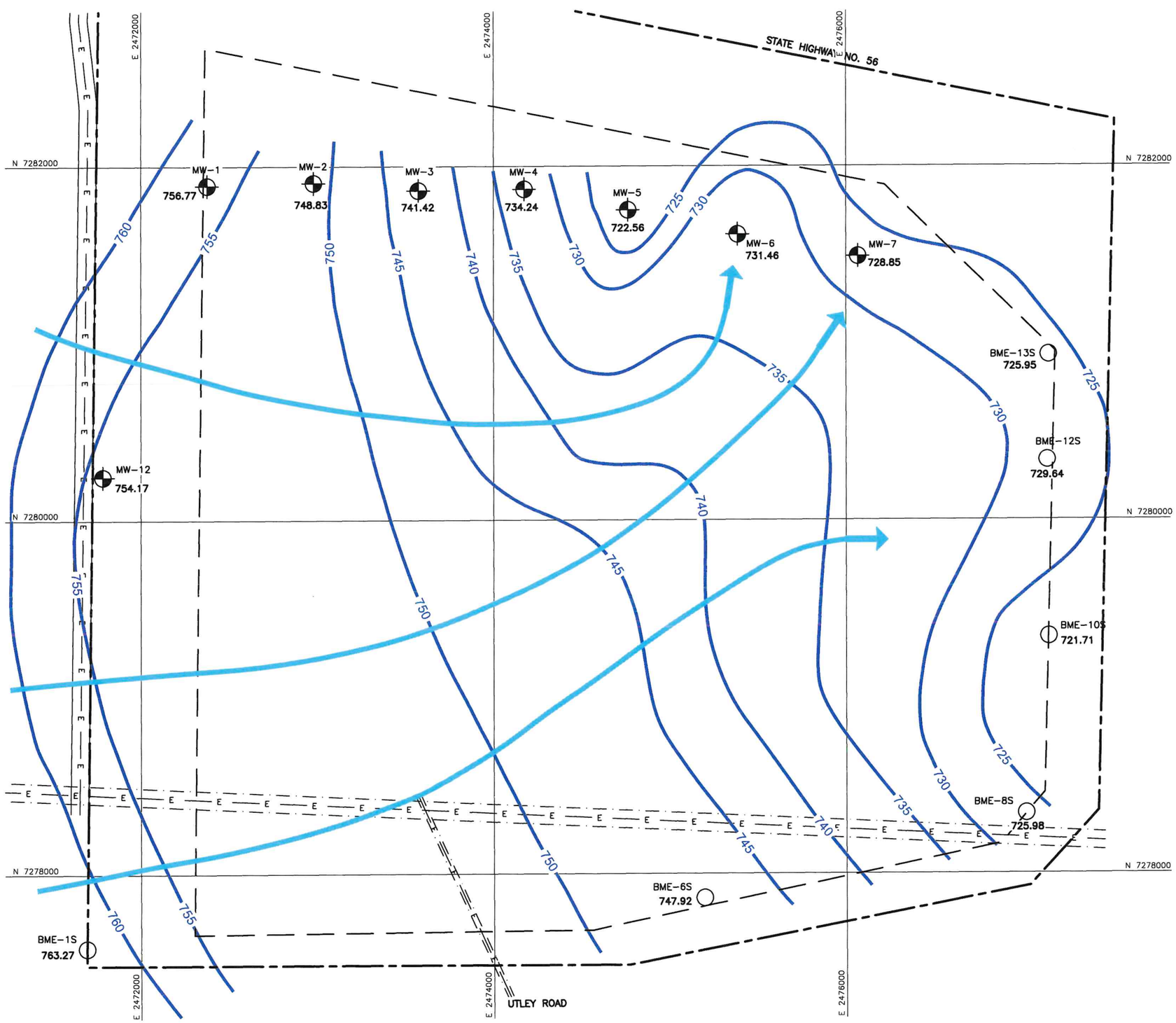

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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2/26/2025

MAY 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1c

ISSUED FOR PERMITTING PURPOSES ONLY

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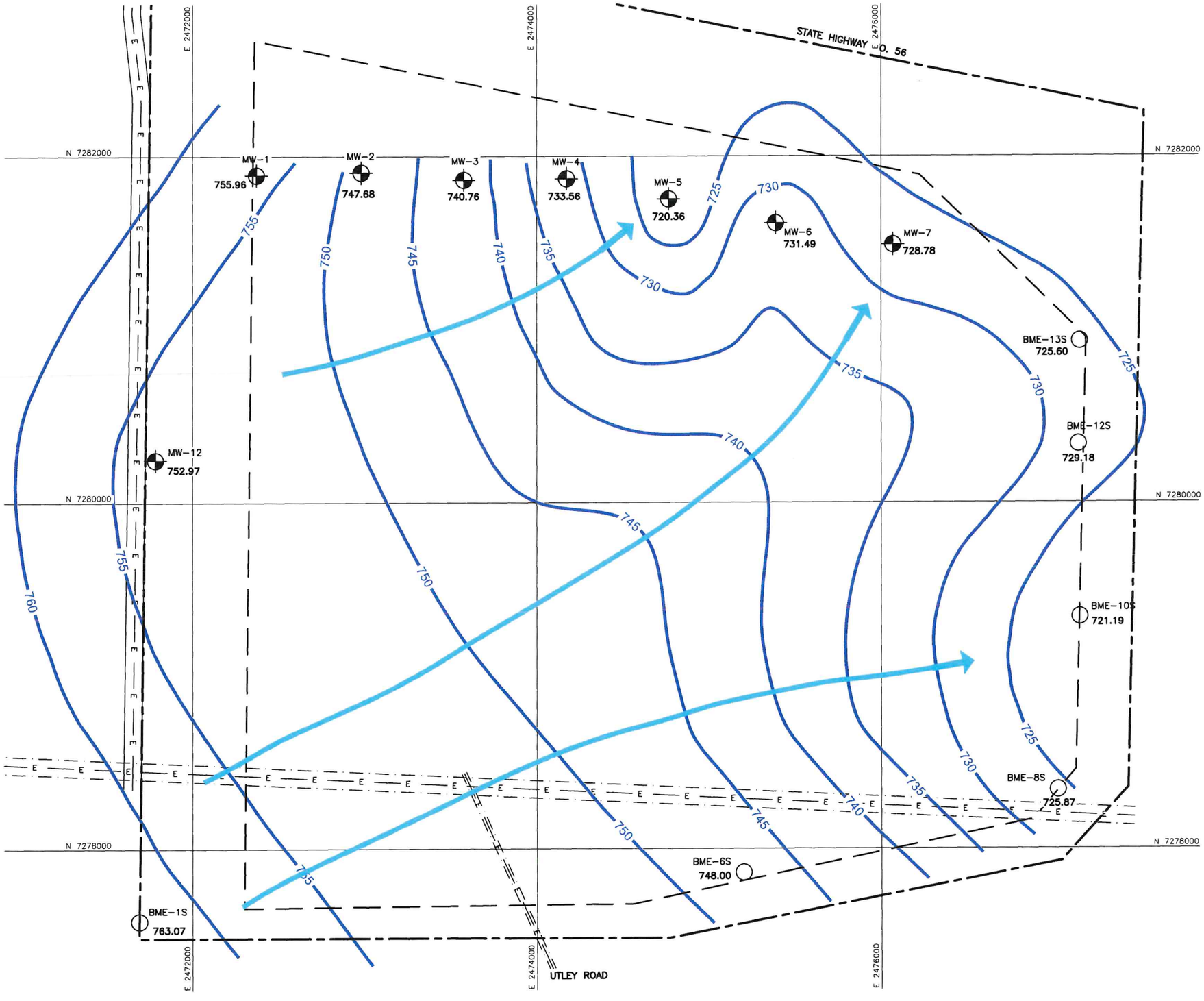

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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2/26/2025

JUNE 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1d

ISSUED FOR PERMITTING PURPOSES ONLY

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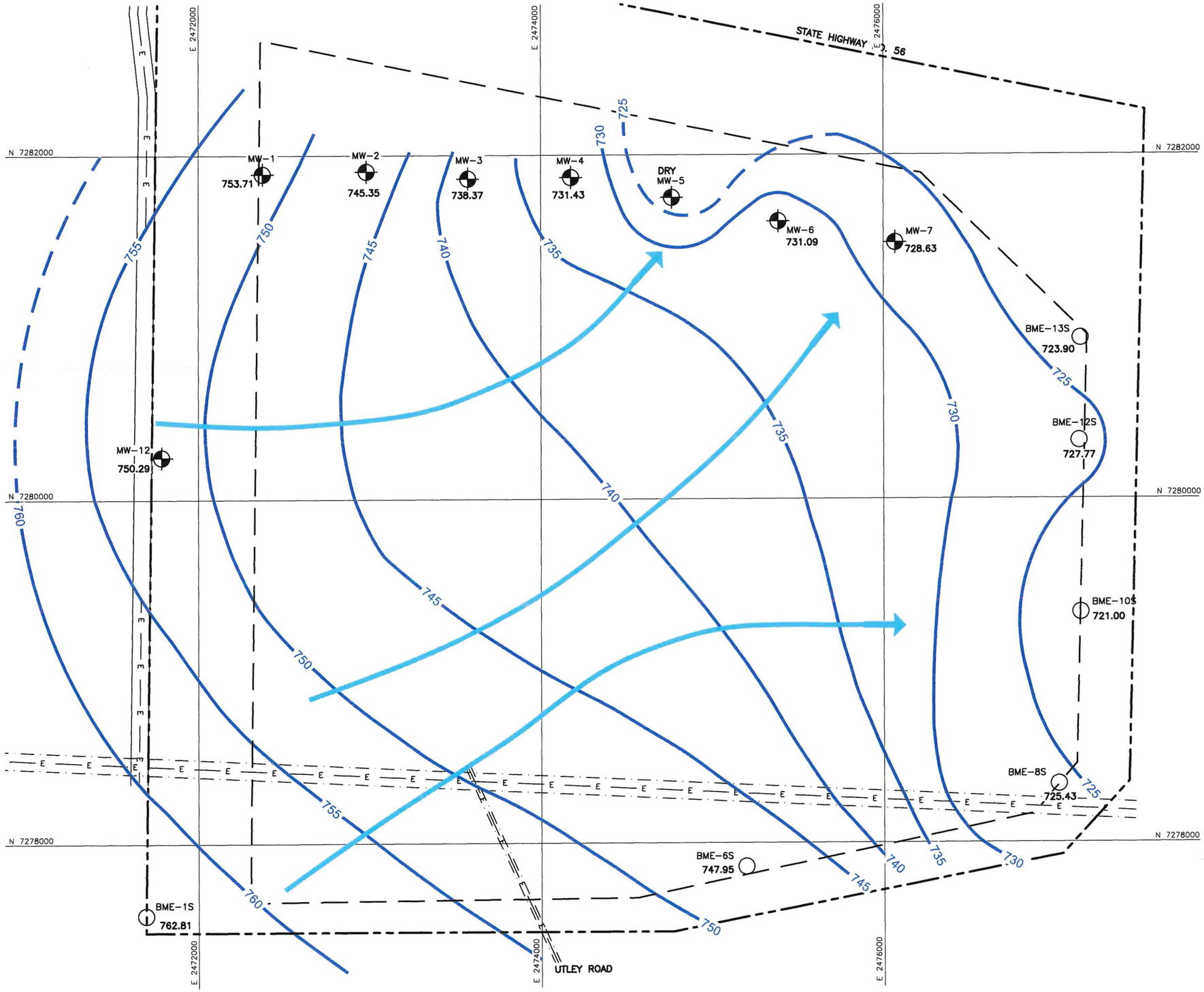

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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2/26/2025

JULY 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1e

ISSUED FOR PERMITTING PURPOSES ONLY

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STATE HIGHWAY NO. 56

E 2472000 | E 2474000 | E 2476000

N 7282000 | N 7280000 | N 7278000

MW-1 752.45
MW-2 744.05
MW-3 736.99
MW-4 730.26
MW-5 DRY
MW-6 730.76
MW-7 728.75
MW-12 748.97
BME-1S 762.22
BME-6S 748.00
BME-8S 725.10
BME-10S 720.65
BME-12S 726.54
BME-13S 722.92

760 755 750 745 740 735 730 725

UTLEY ROAD

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
- BME-15 PIEZOMETER LOCATION AND ID NUMBER
- 725.28 WATER LEVEL ELEVATION
- 735 CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

STATE OF TEXAS
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2/26/2025

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AUGUST 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING E6.1f

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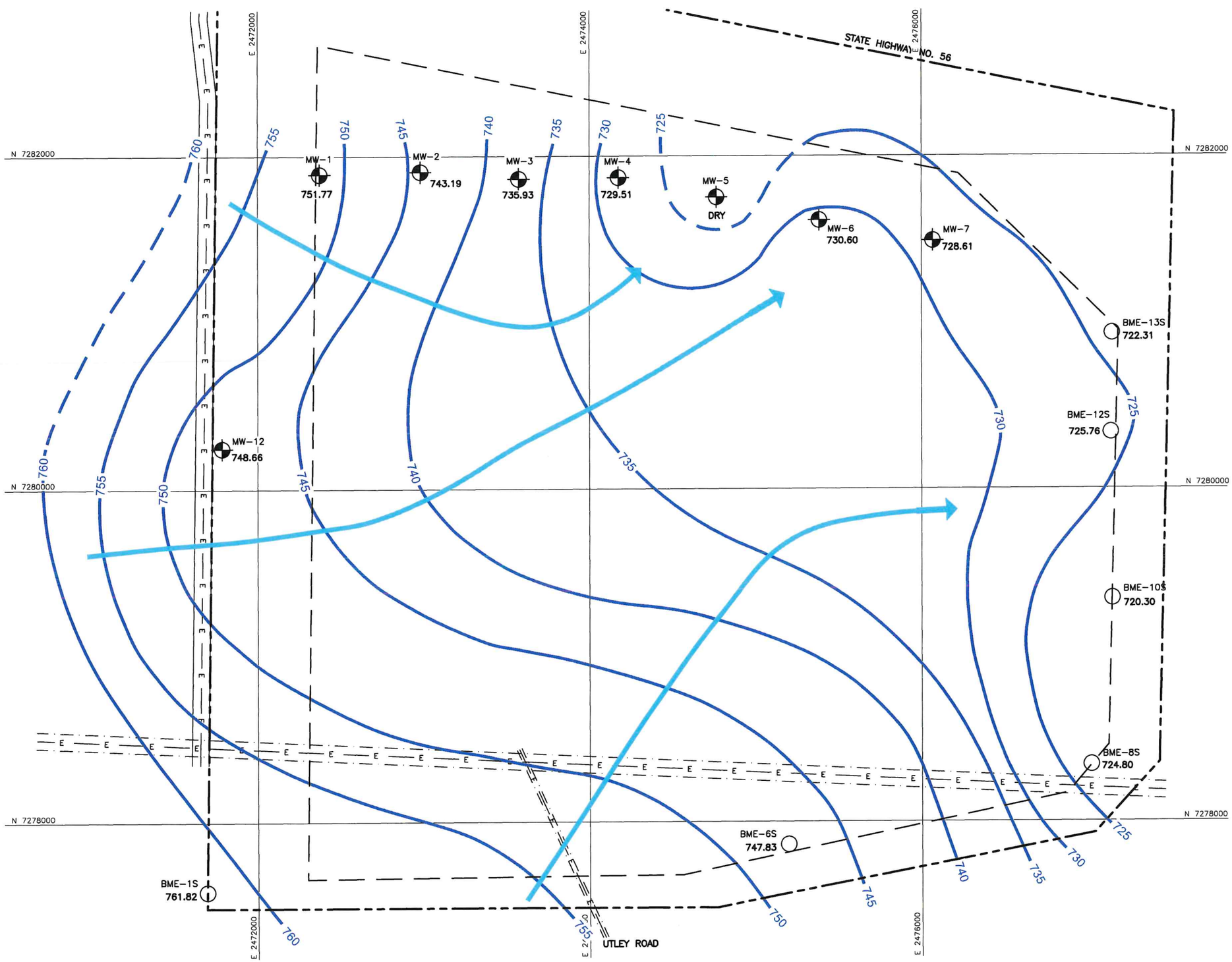

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

STATE OF TEXAS
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GEOLOGY
2045
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2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

SEPTEMBER 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
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MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1g

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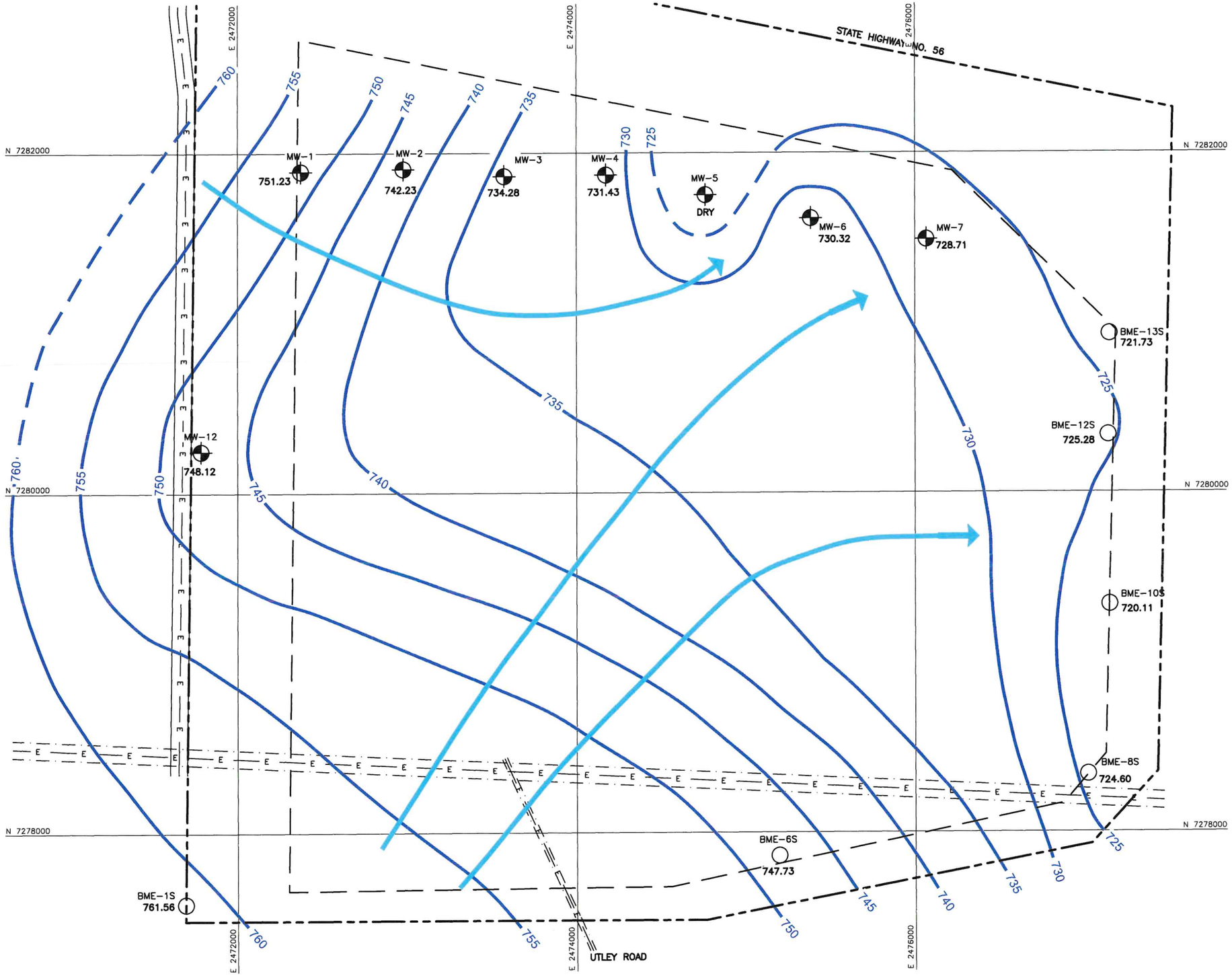

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
- BME-15 PIEZOMETER LOCATION AND ID NUMBER
- 725.28 WATER LEVEL ELEVATION
- 735 CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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OCTOBER 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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STATE HIGHWAY NO. 56

E 2472000 E 2474000 E 2476000

N 7282000 N 7280000 N 7278000

760 755 750 745 740 735 730 725

MW-1 753.24
MW-2 744.69
MW-3 739.15
MW-4 732.79
MW-5 DRY
MW-6 730.24
MW-7 728.82
MW-12 753.23
BME-1S 761.38
BME-6S 747.58
BME-8S 725.30
BME-10S 721.04
BME-12S 726.22
BME-13S 722.85

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SCALE IN FEET

LEGEND

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NOVEMBER 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

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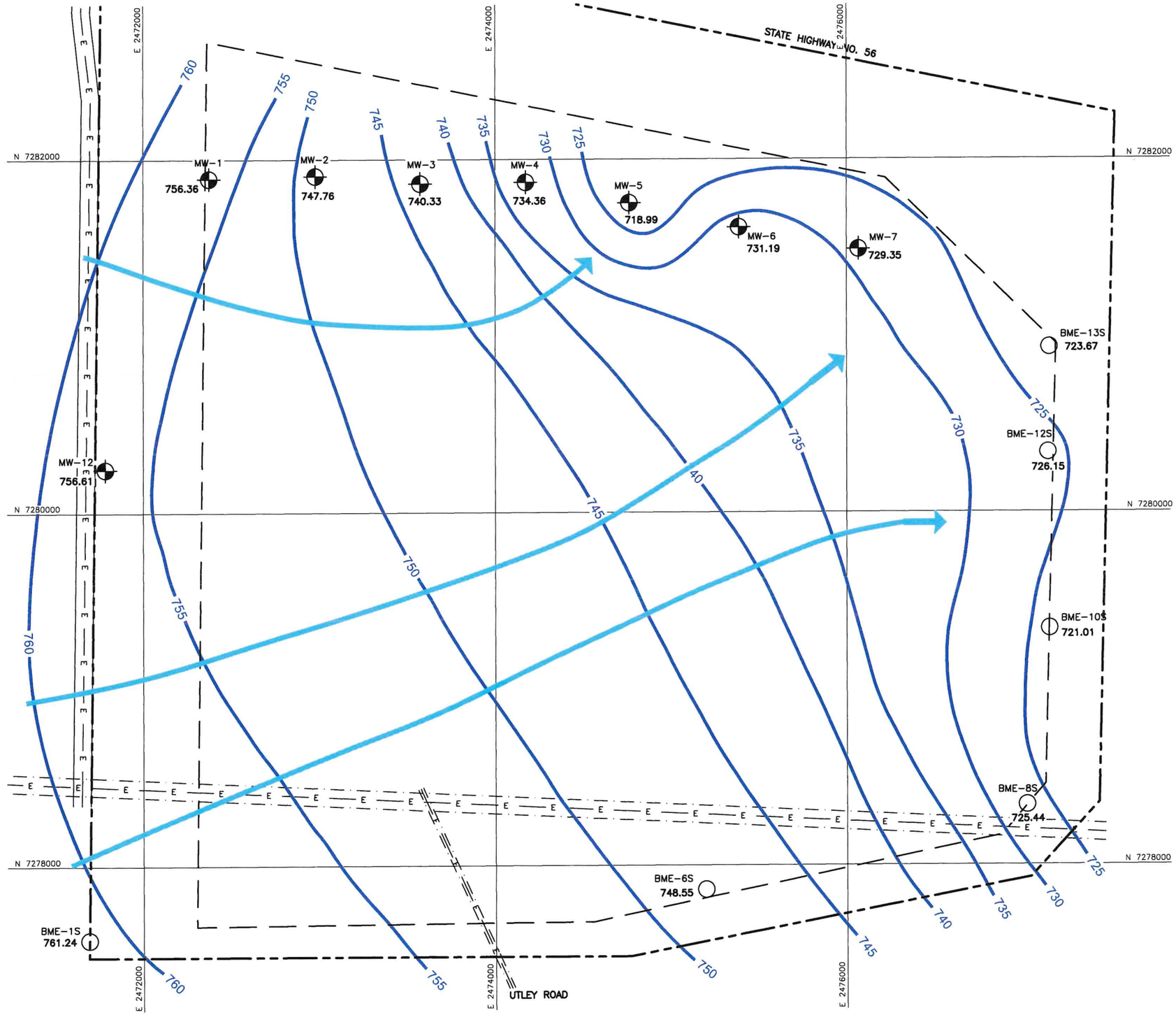

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
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- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
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- APPARENT DIRECTION OF GROUNDWATER FLOW

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DECEMBER 2022 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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DRAWING
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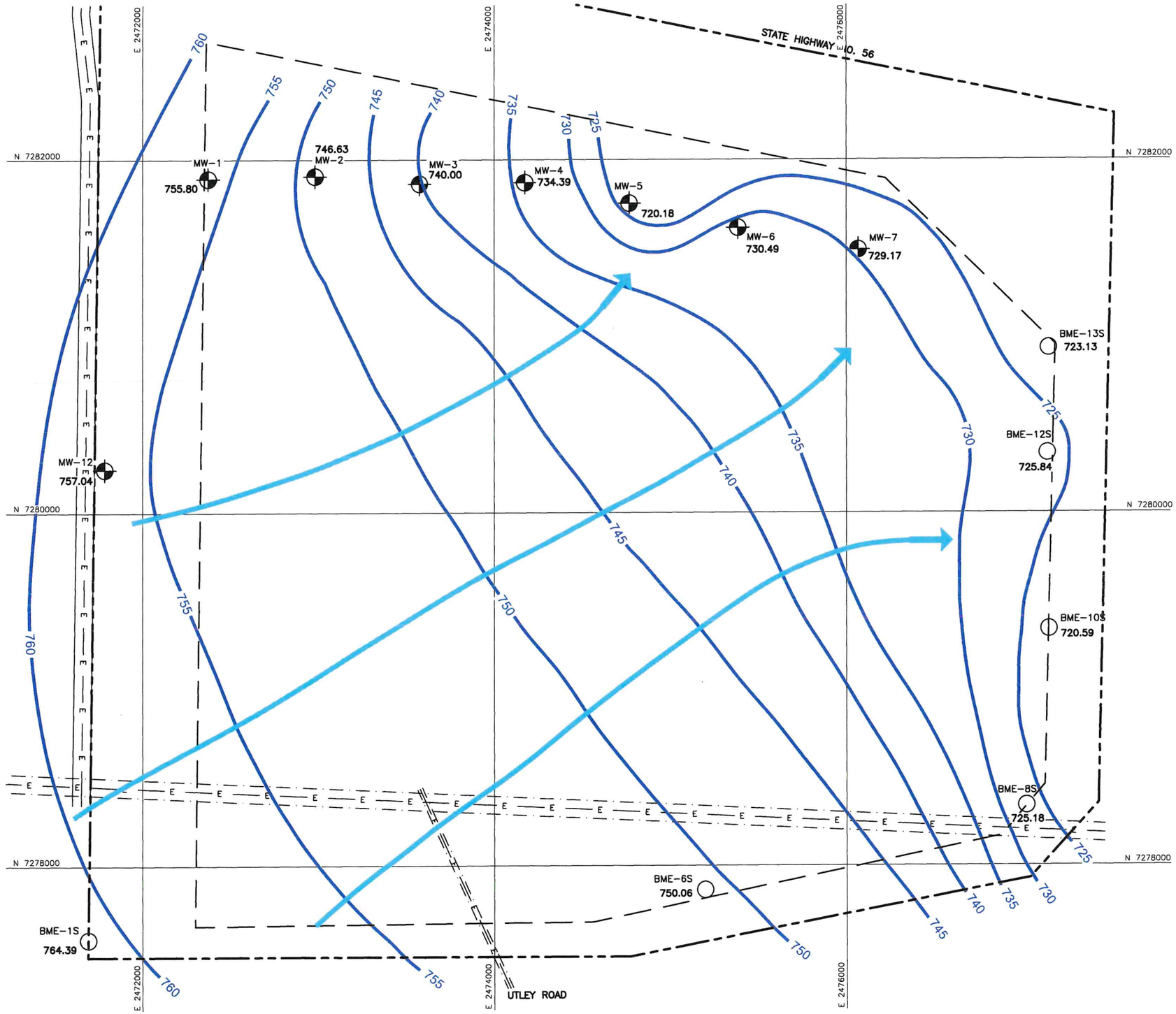

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SCALE IN FEET

LEGEND

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JANUARY 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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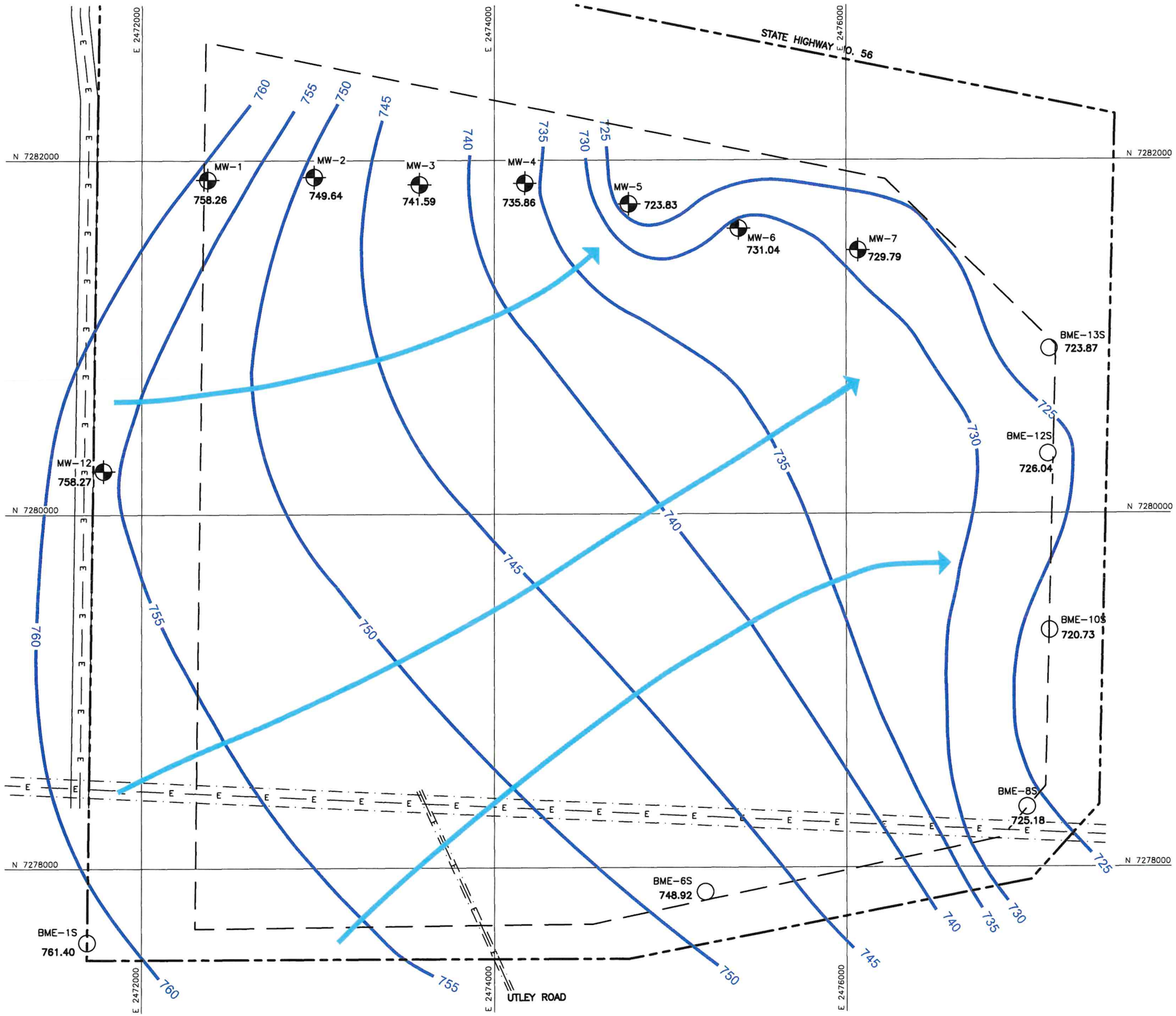

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SCALE IN FEET

LEGEND

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FEBRUARY 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

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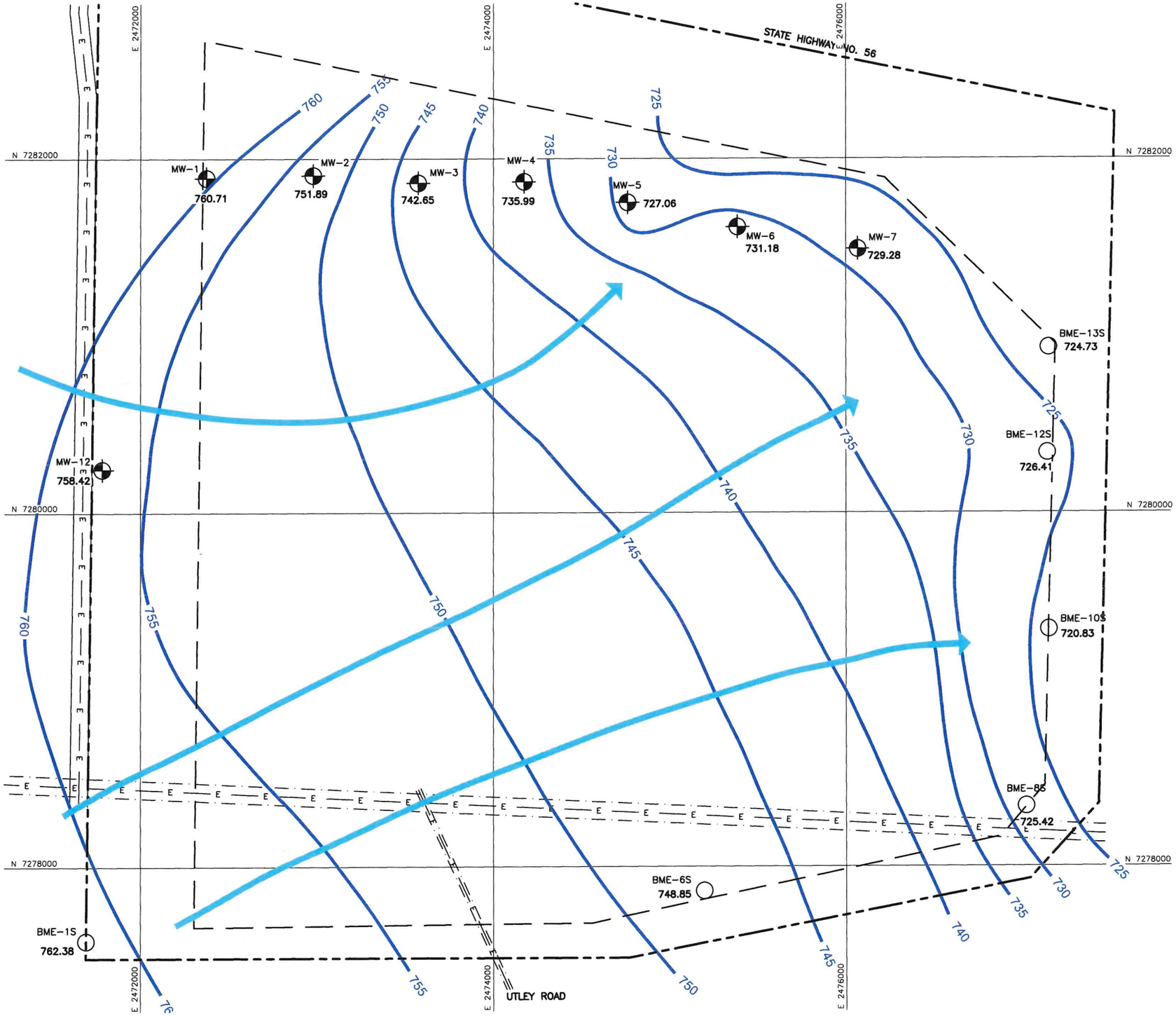

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SCALE IN FEET

LEGEND

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MARCH 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

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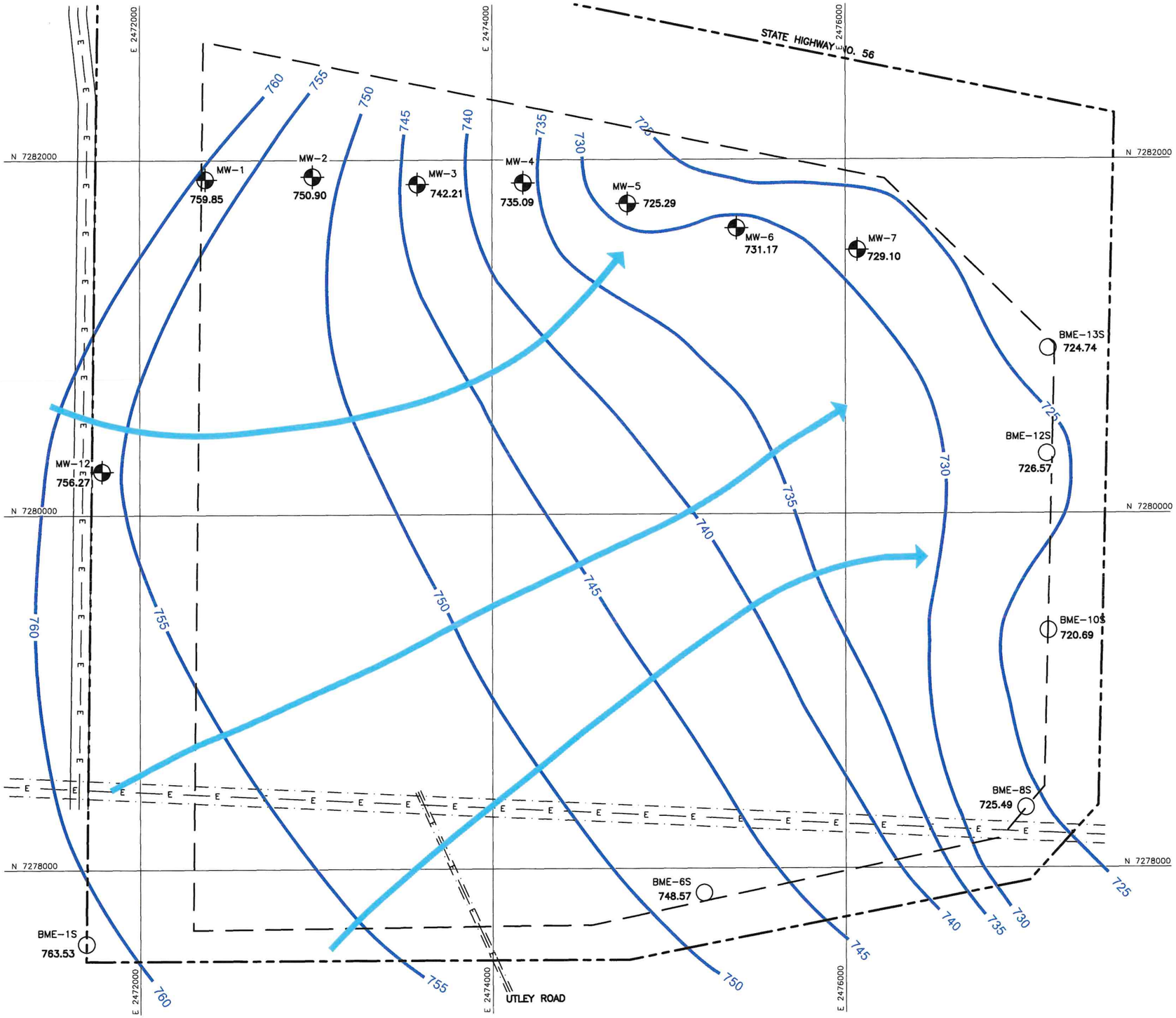

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SCALE IN FEET

LEGEND

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APRIL 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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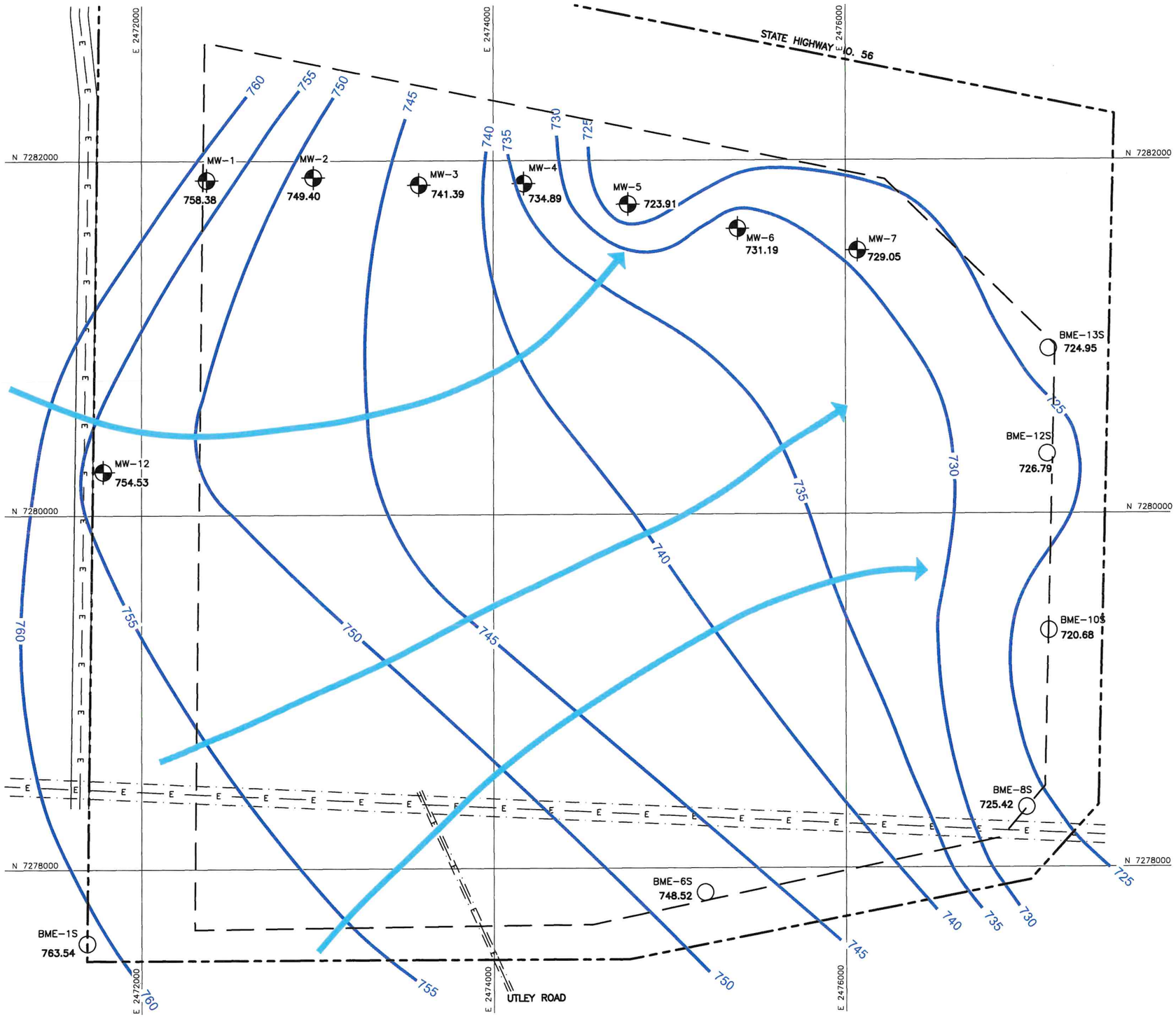

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SCALE IN FEET

LEGEND

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MAY 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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DRAWING
E6.1o

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E 2472000
E 2474000
E 2476000
N 7282000
N 7280000
N 7278000
STATE HIGHWAY NO. 56
743.76
BME-20S
728.86
BME-17S
BME-16S
722.43
MW-1
751.16
MW-2
743.03
MW-3
738.83
MW-4
732.34
MW-5
717.57
MW-6
730.62
MW-7
729.01
BME-13S
722.82
BME-12S
725.99
MW-12
747.96
BME-10S
719.94
724.94
BME-8S
BME-6S
747.96
BME-1S
761.31
760
755
750
745
740
735
730
725
720

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
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DECEMBER 2023 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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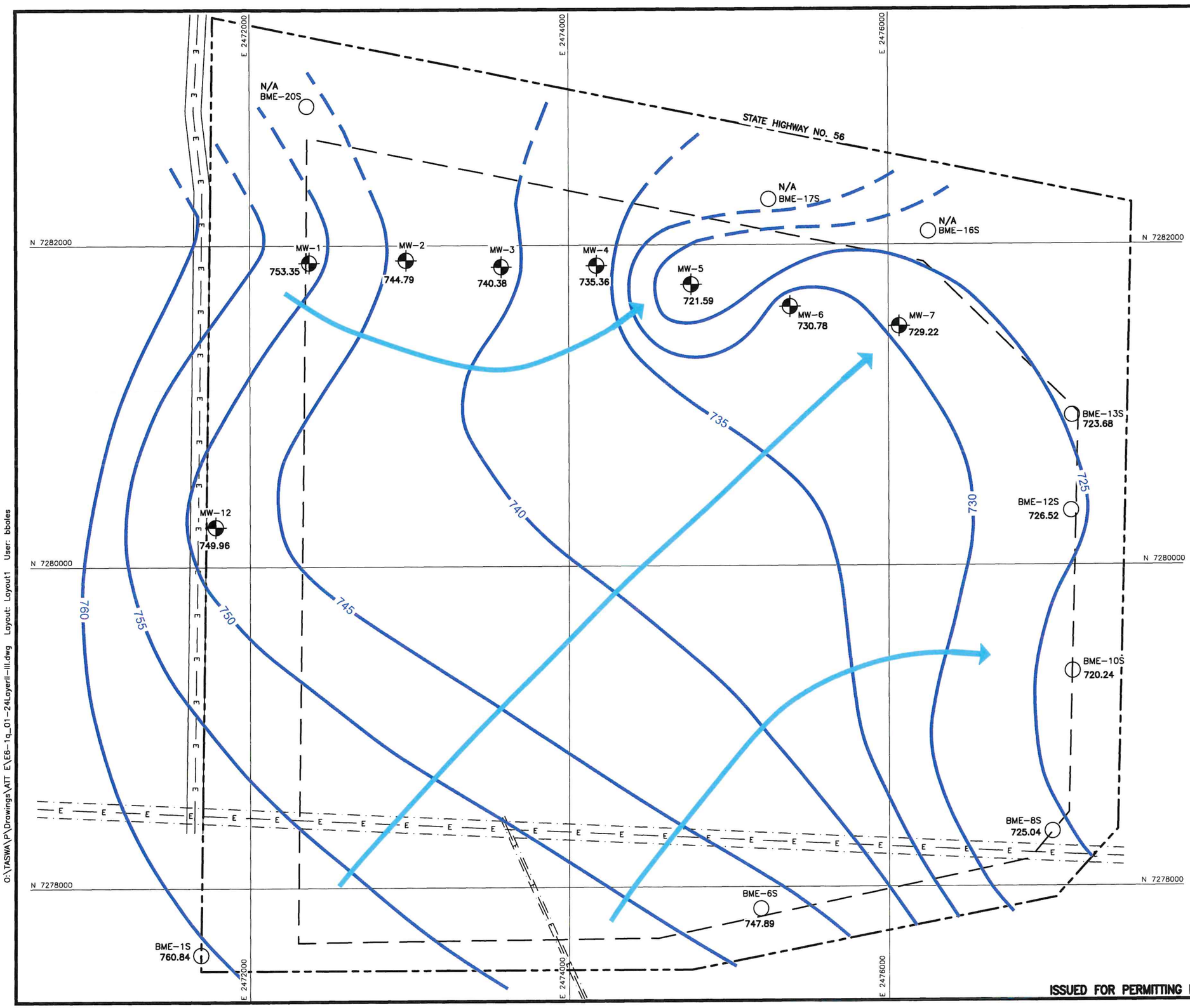

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
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- APPARENT DIRECTION OF GROUNDWATER FLOW
- N/A — WATER LEVEL NOT AVAILABLE

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JANUARY 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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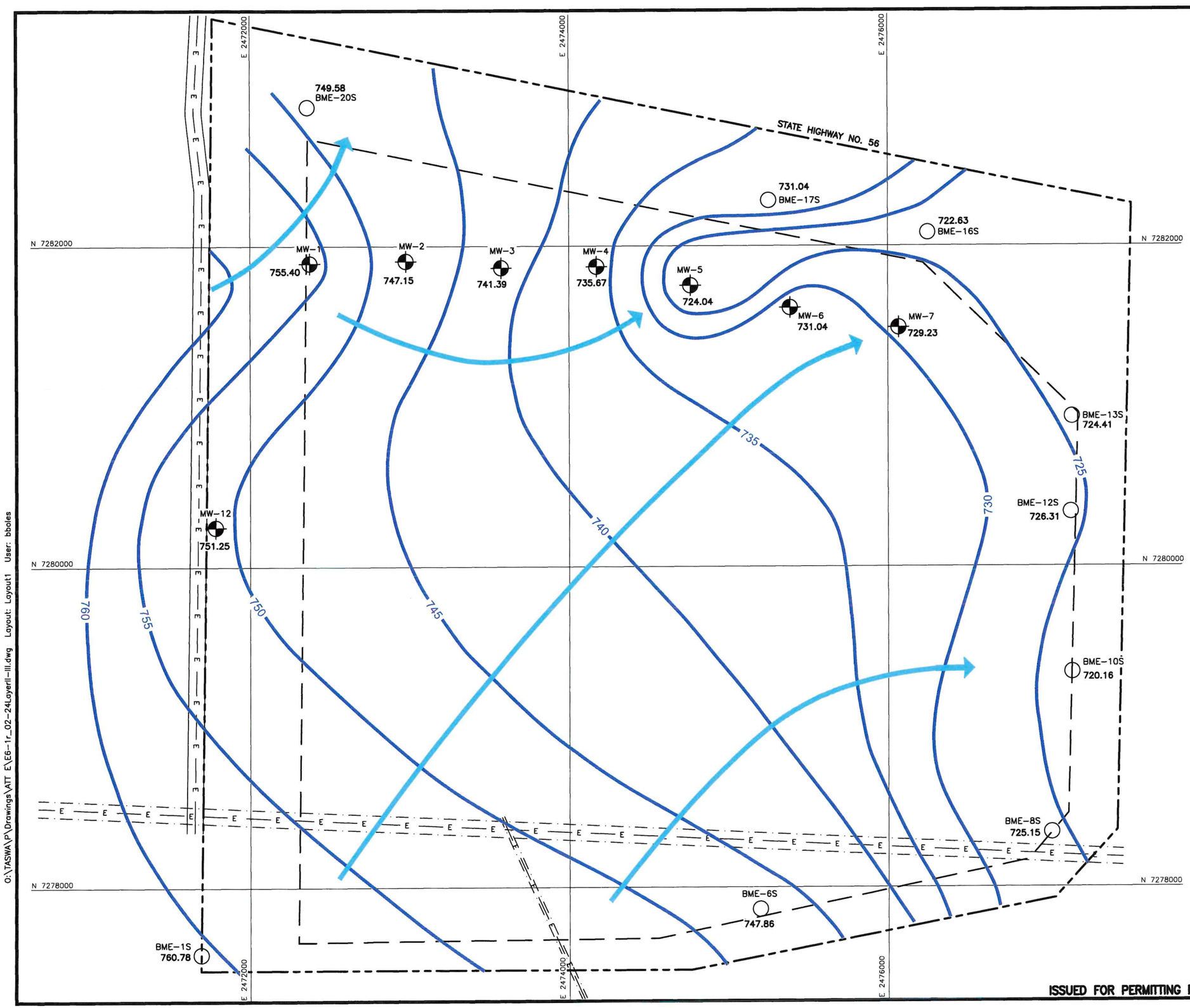

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
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- N 7282000 — STATE PLANE COORDINATES
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FEBRUARY 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

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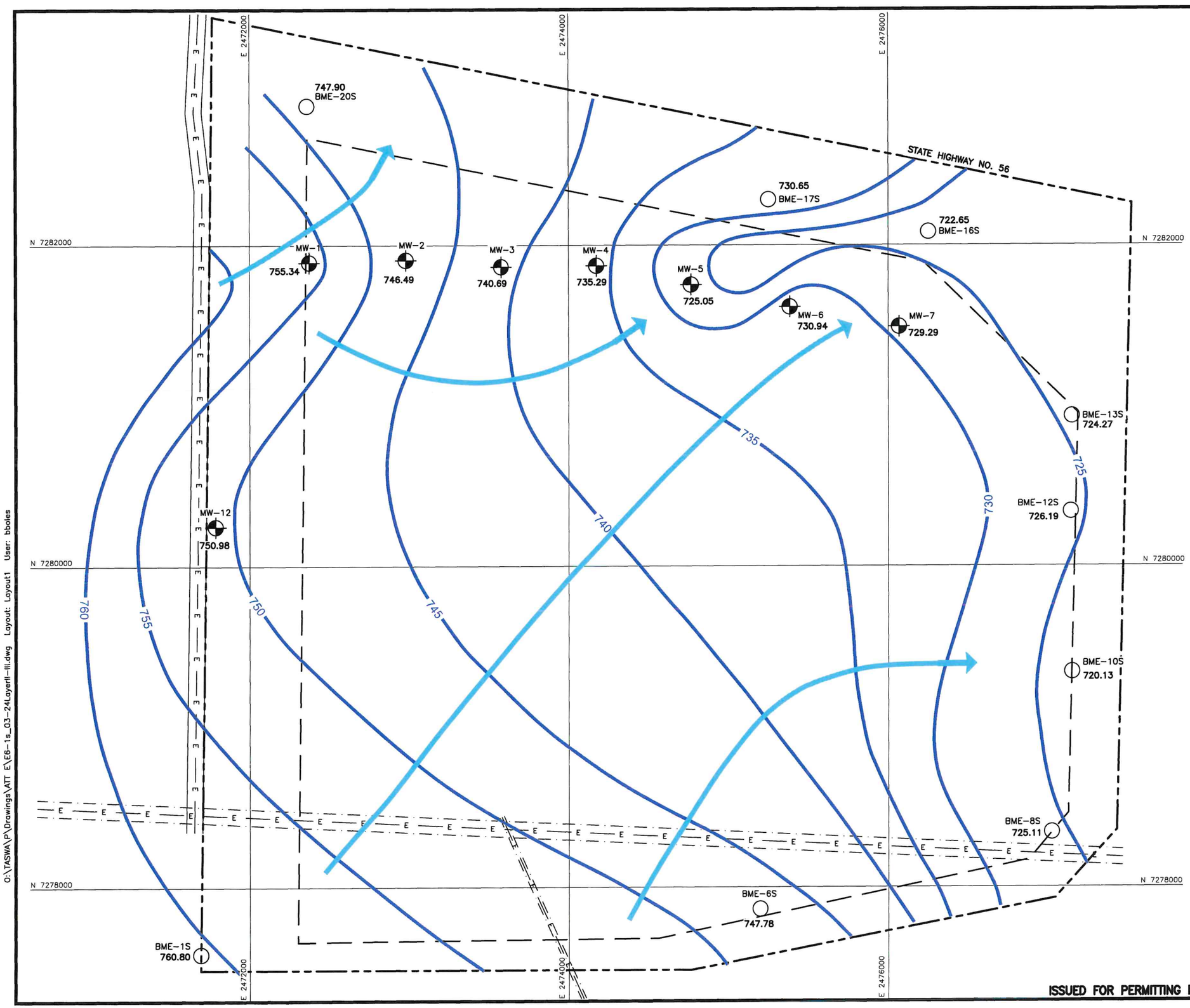

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SCALE IN FEET

LEGEND

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MARCH 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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DRAWING
E6-1s

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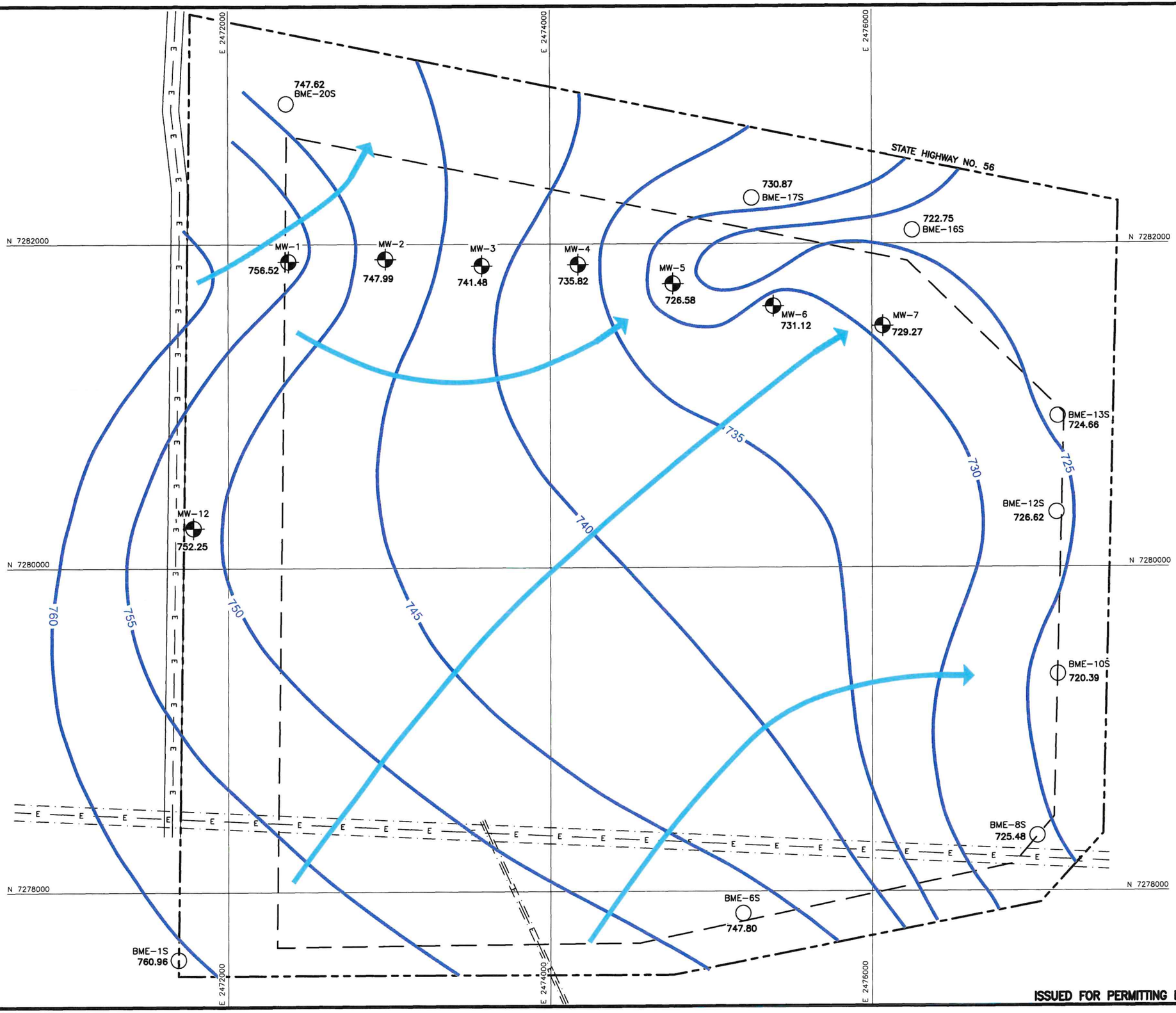

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SCALE IN FEET

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APRIL 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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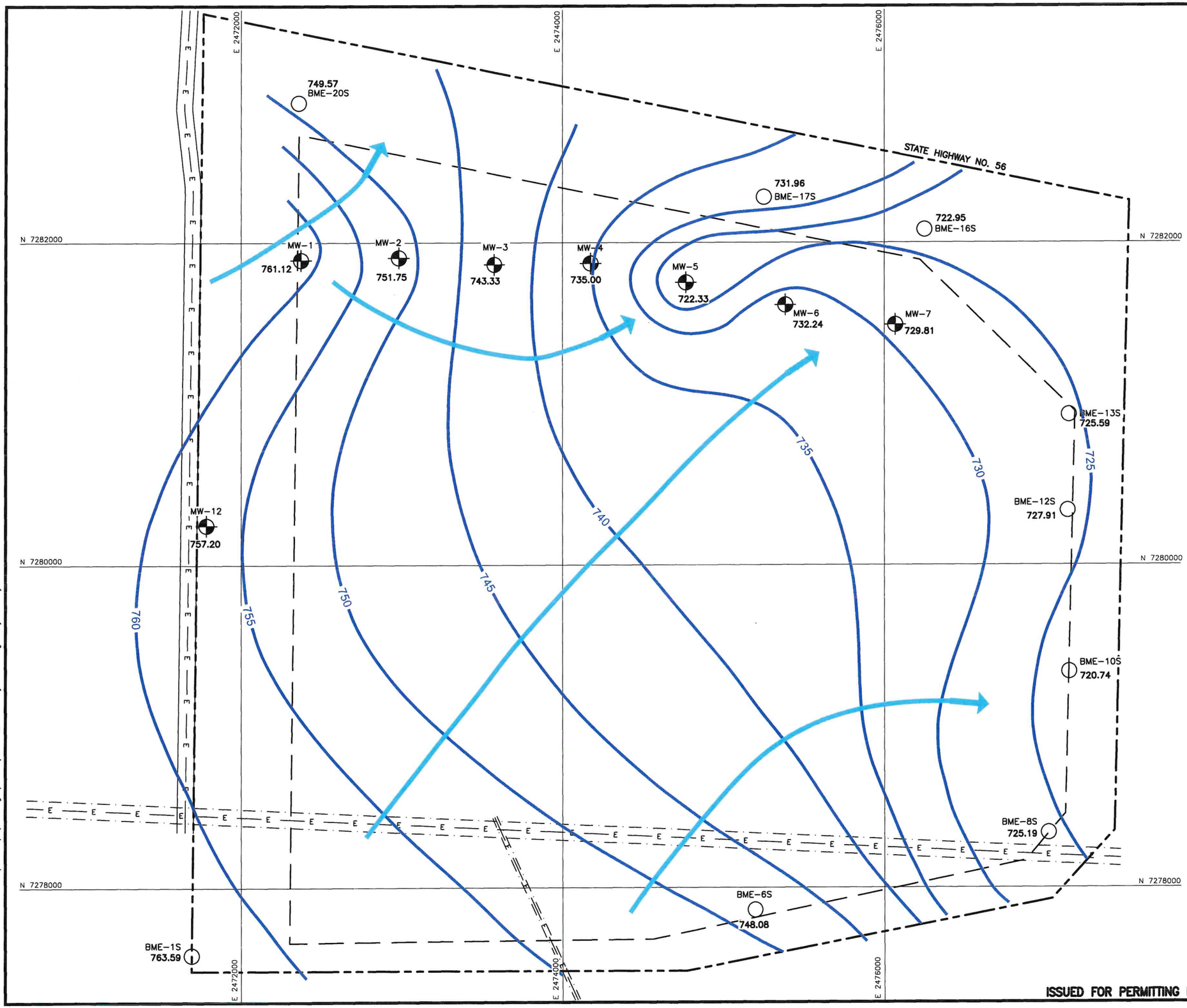

LEGEND

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JUNE 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.1u

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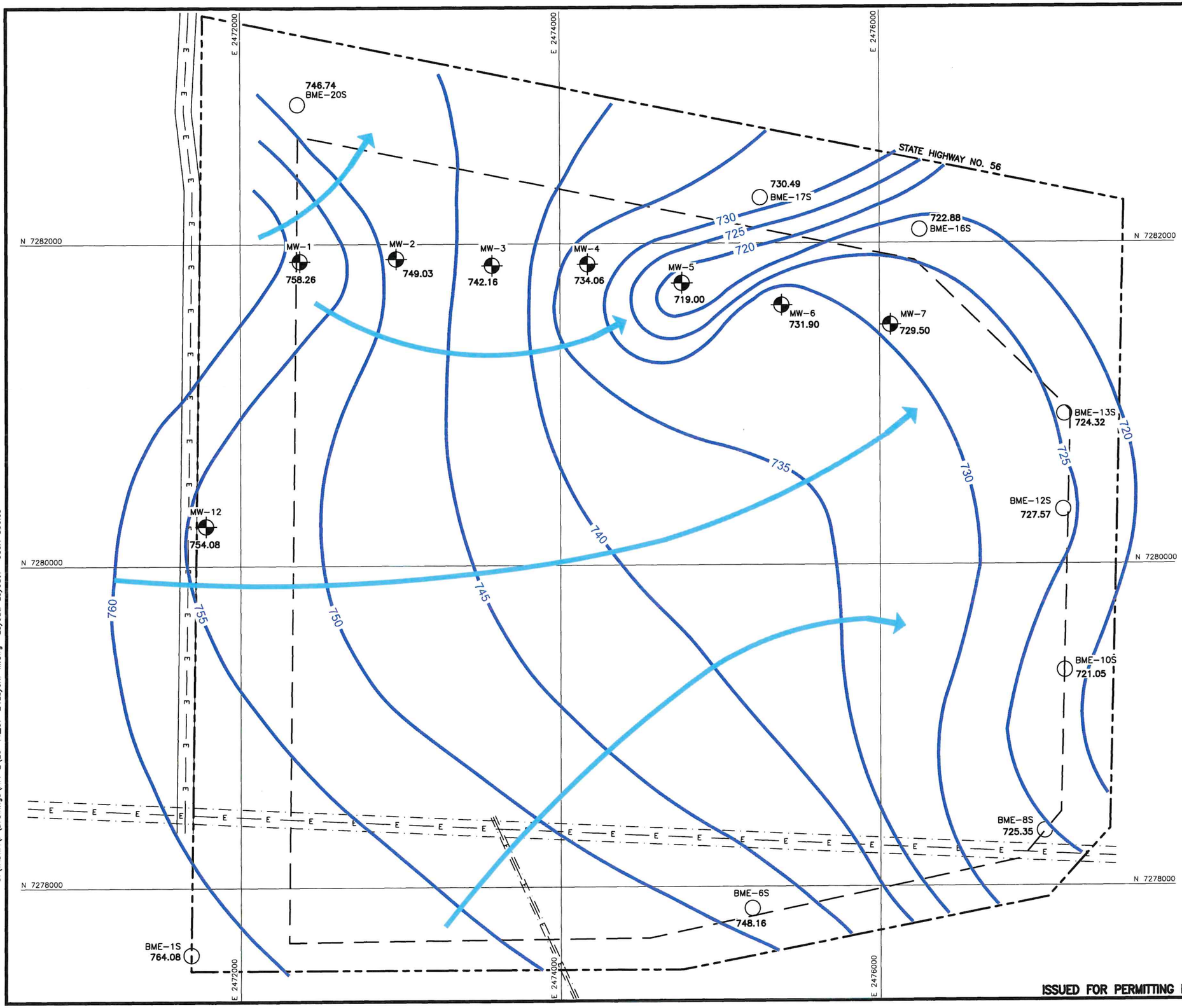



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JULY 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
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BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6-1v

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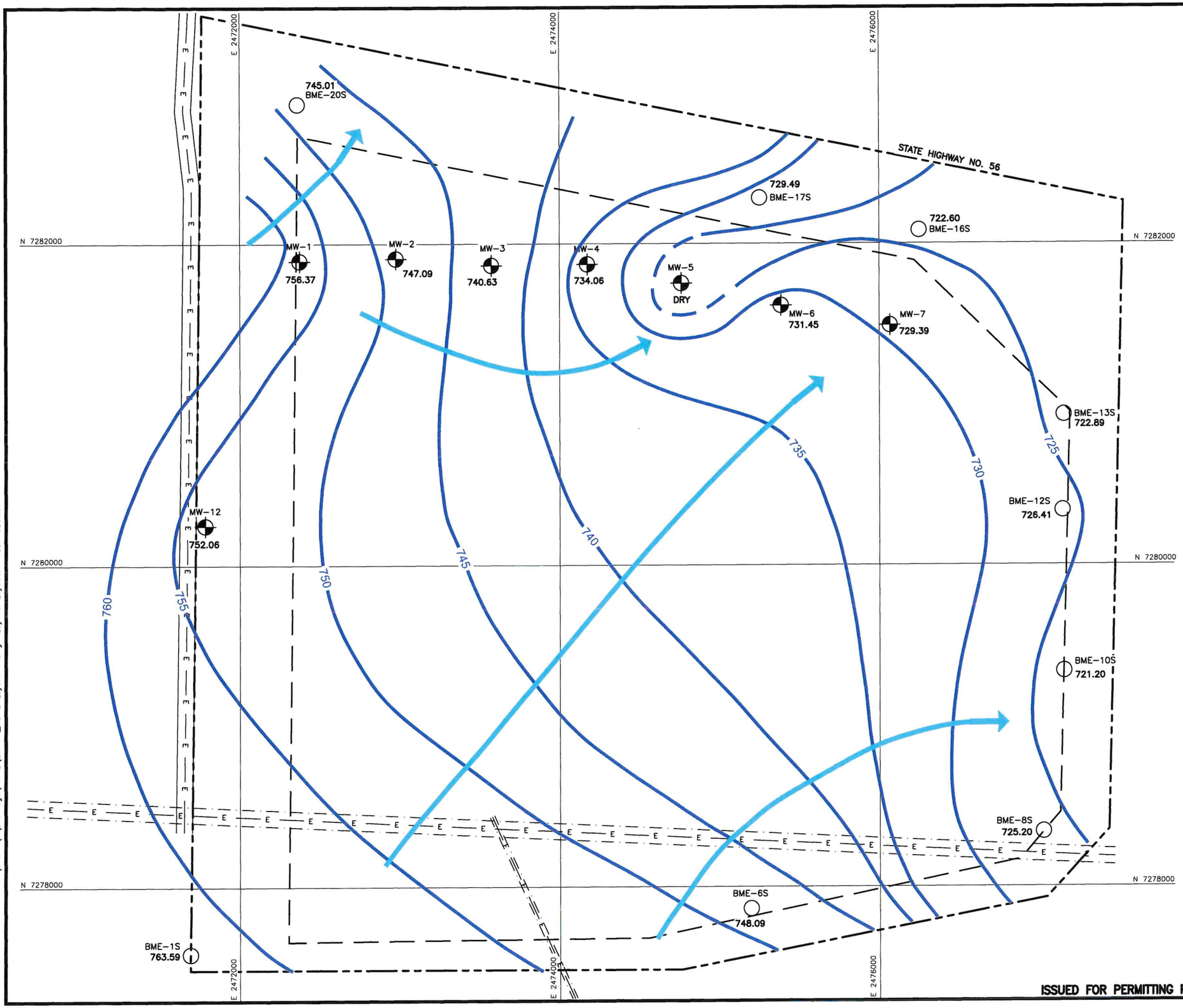

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 725.28 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER II/III POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW
- N/A — WATER LEVEL NOT AVAILABLE

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AUGUST 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
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E 2472000
E 2474000
E 2476000
N 7282000
N 7280000
N 7278000
STATE HIGHWAY NO. 56
BME-20S 743.69
MW-1 754.27
MW-2 745.40
MW-3 739.87
MW-4 731.90
MW-5 DRY
728.90 BME-17S
722.68 BME-16S
MW-6 731.37
MW-7 729.69
BME-13S 722.03
BME-12S 725.48
BME-10S 721.06
BME-8S 725.47
MW-12 750.09
BME-6S 748.14
BME-1S 763.43
735
730
725
740
745
750
755
760
0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
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SEPTEMBER 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6-1x

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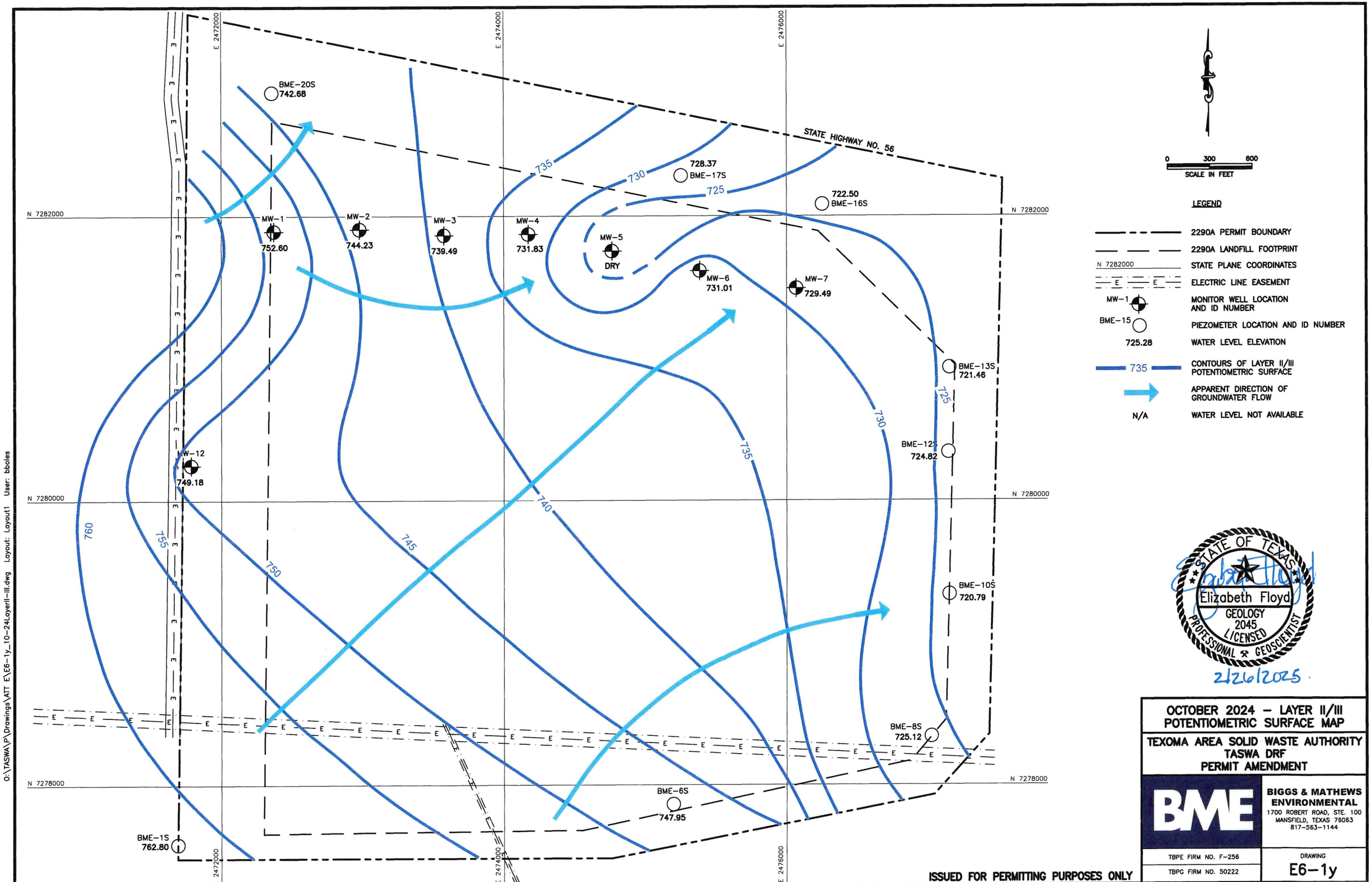

OCTOBER 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6-1y

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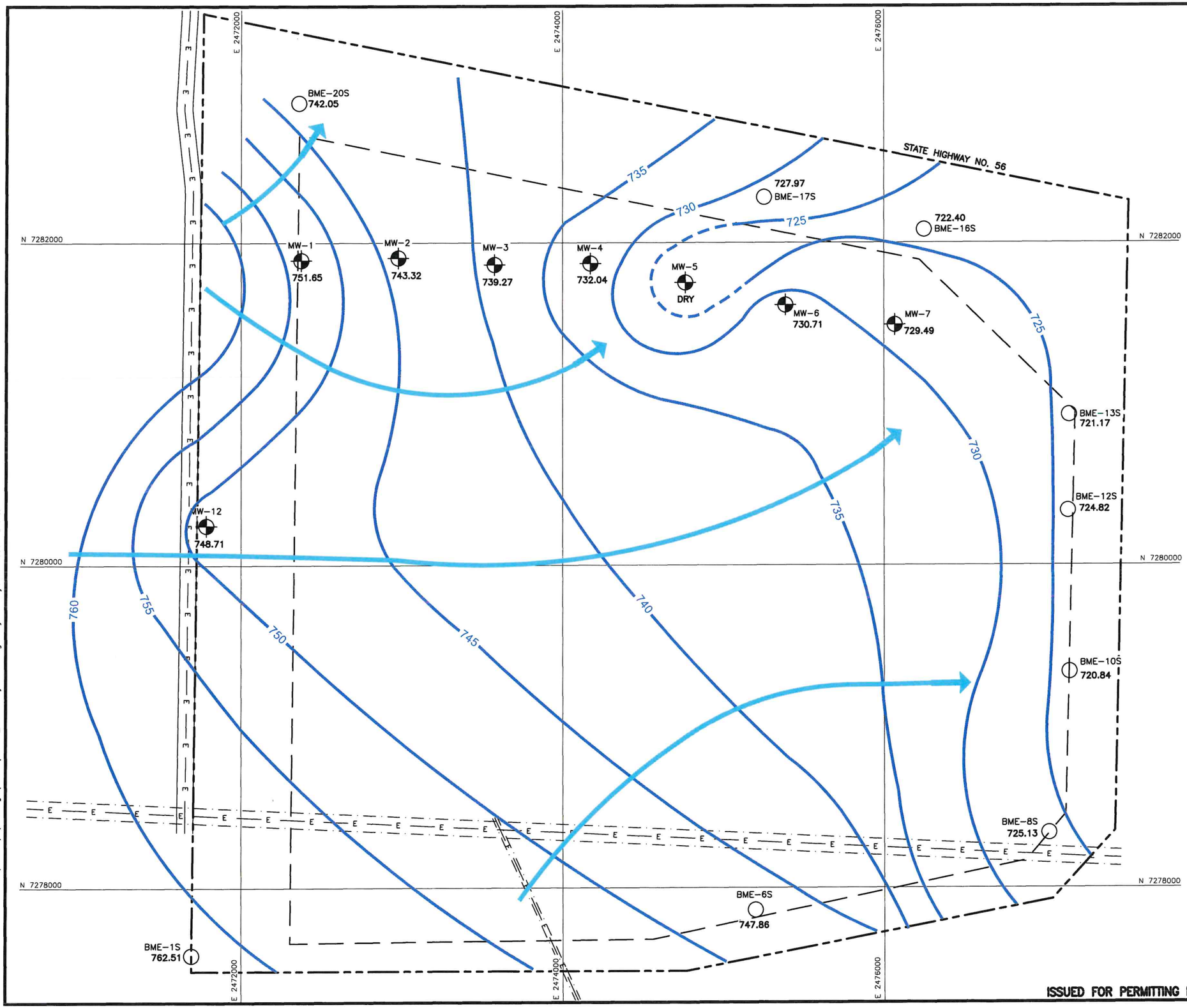

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NOVEMBER 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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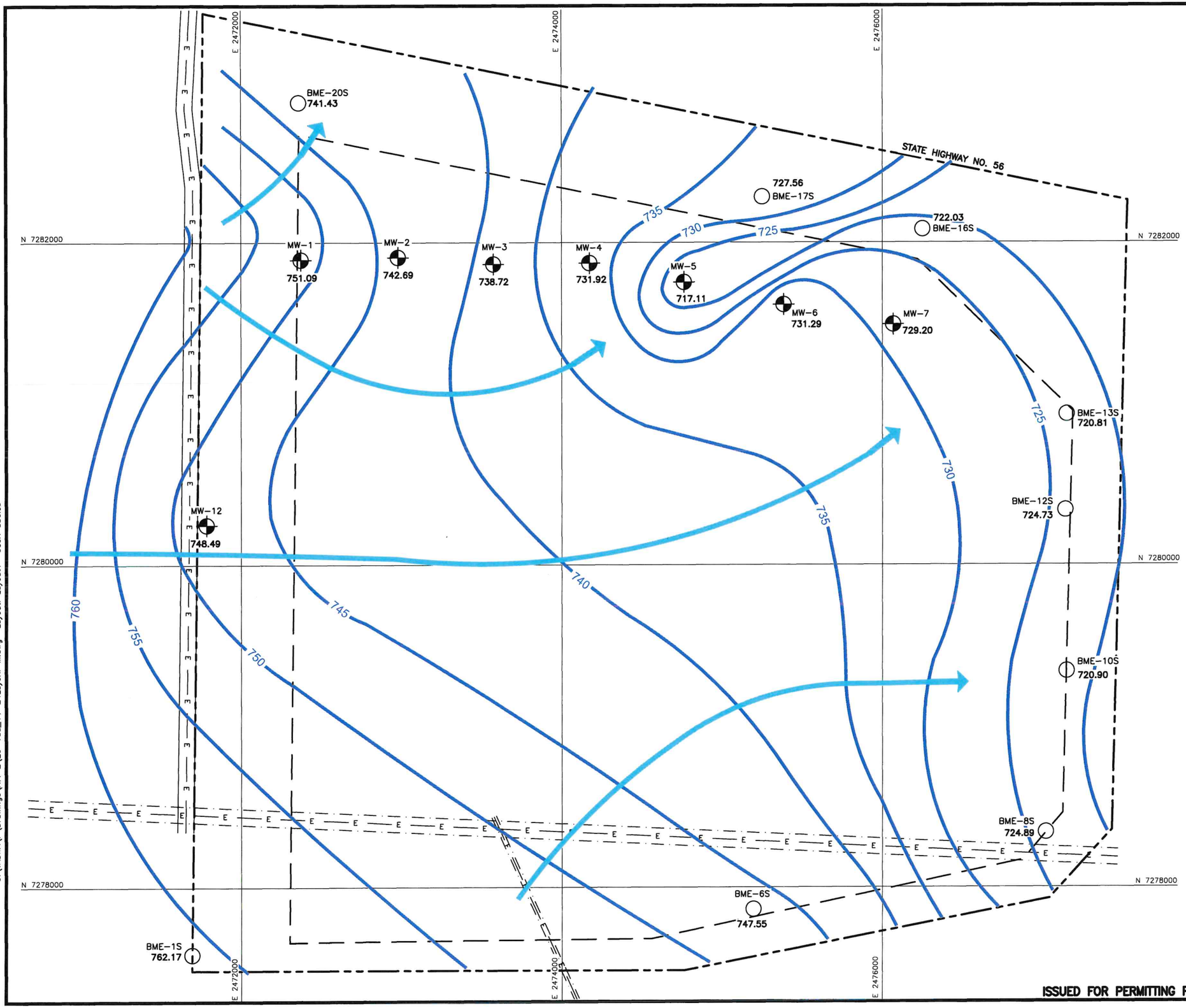
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.1z



0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
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DECEMBER 2024 – LAYER II/III POTENTIOMETRIC SURFACE MAP

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817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6-1aa

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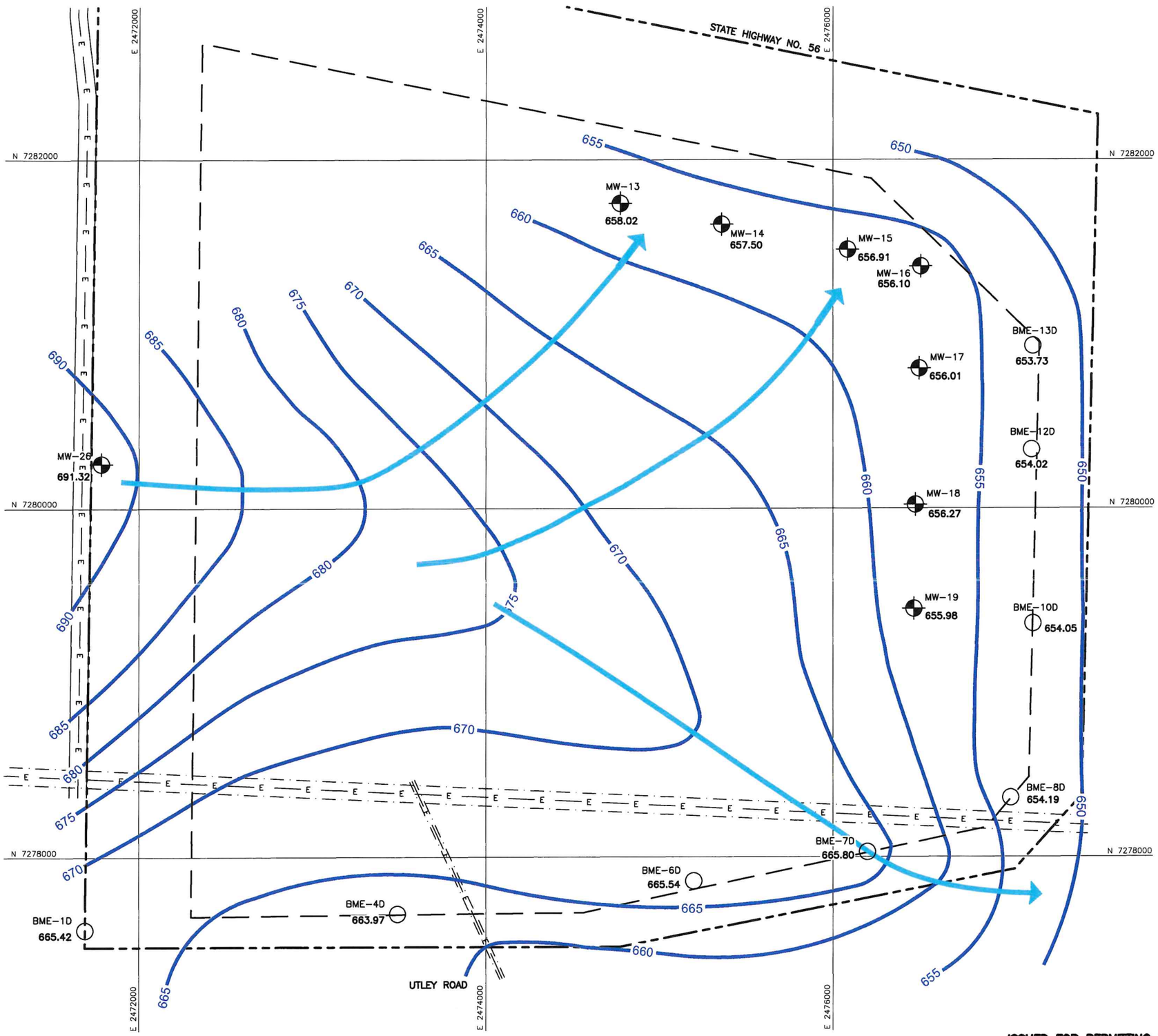

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 654.05 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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MARCH 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2a

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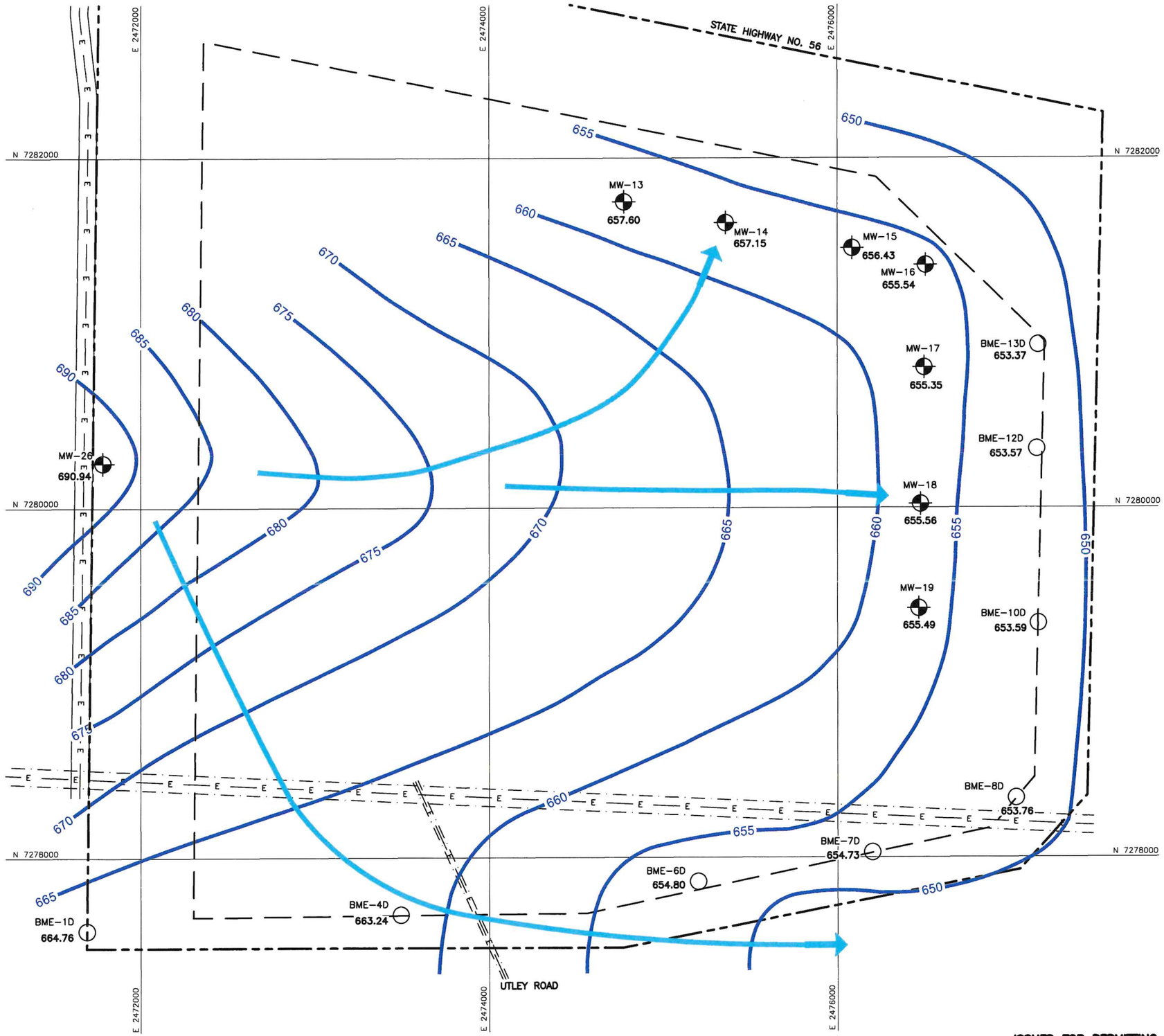

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
- BME-15 PIEZOMETER LOCATION AND ID NUMBER
- 654.05 WATER LEVEL ELEVATION
- 735 CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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APRIL 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2b

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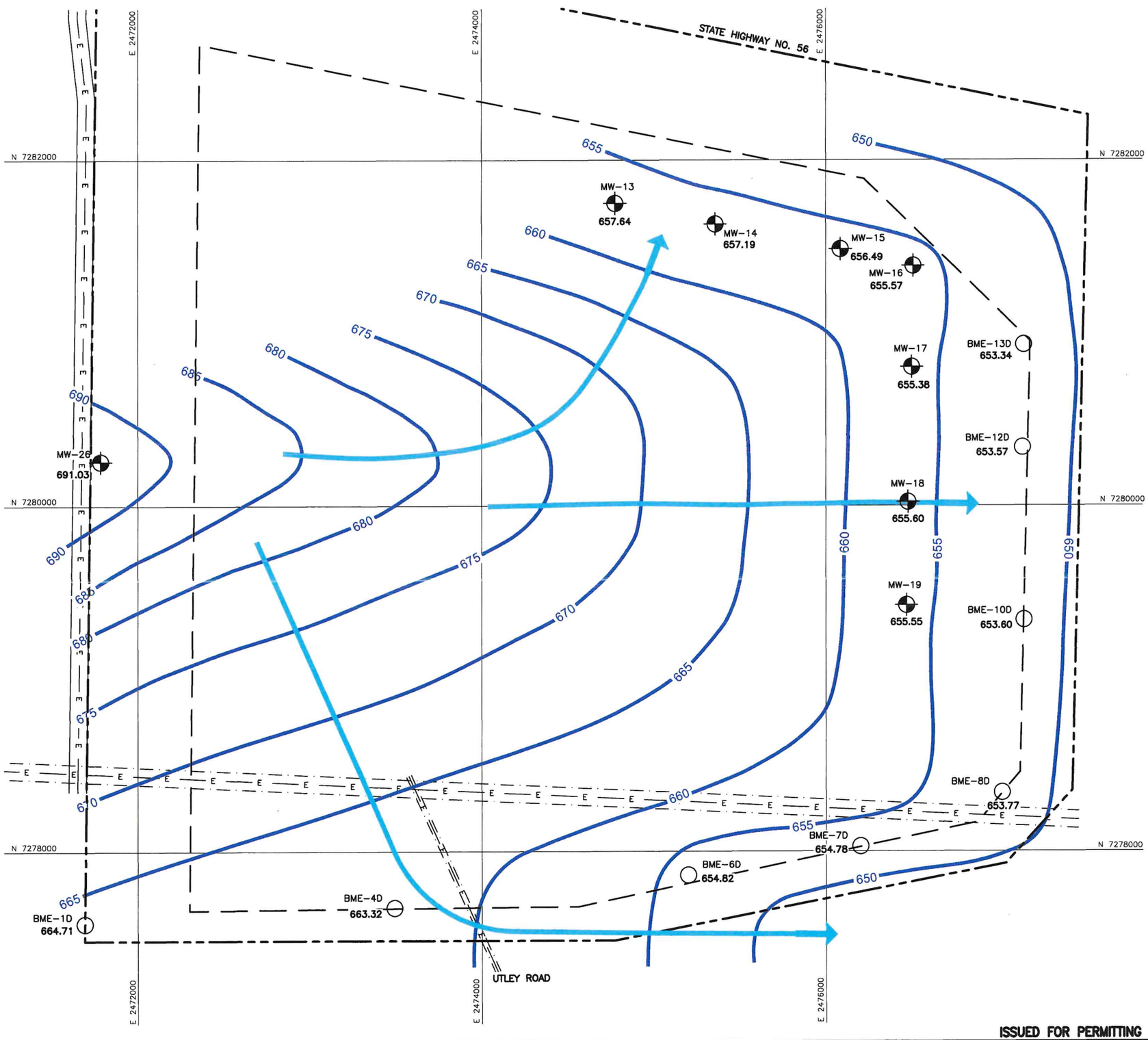

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SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 654.05 — WATER LEVEL ELEVATION
- 735 — CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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MAY 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2c

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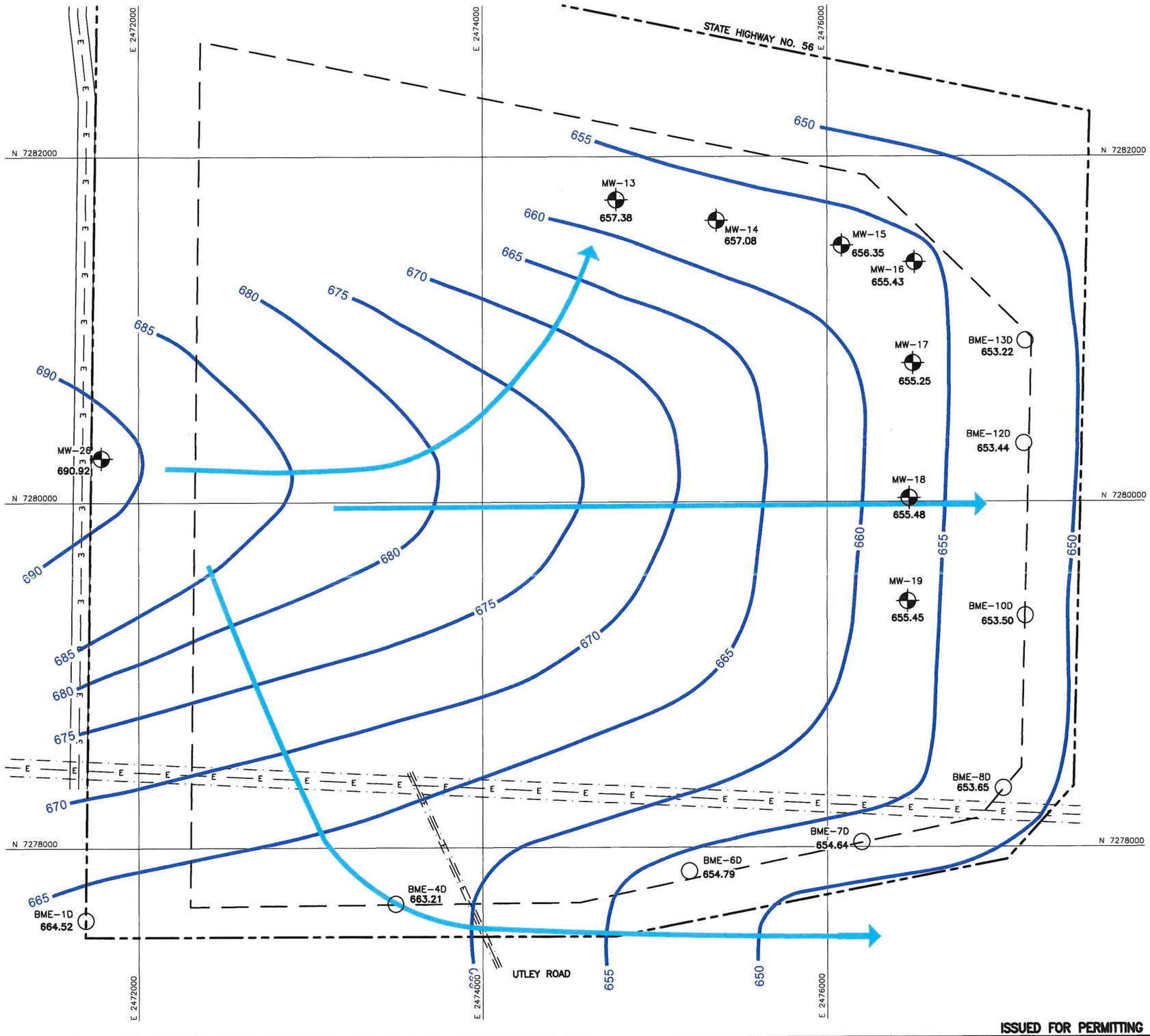

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
- BME-15 PIEZOMETER LOCATION AND ID NUMBER
- 654.05 WATER LEVEL ELEVATION
- 735 CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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JUNE 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
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MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2d

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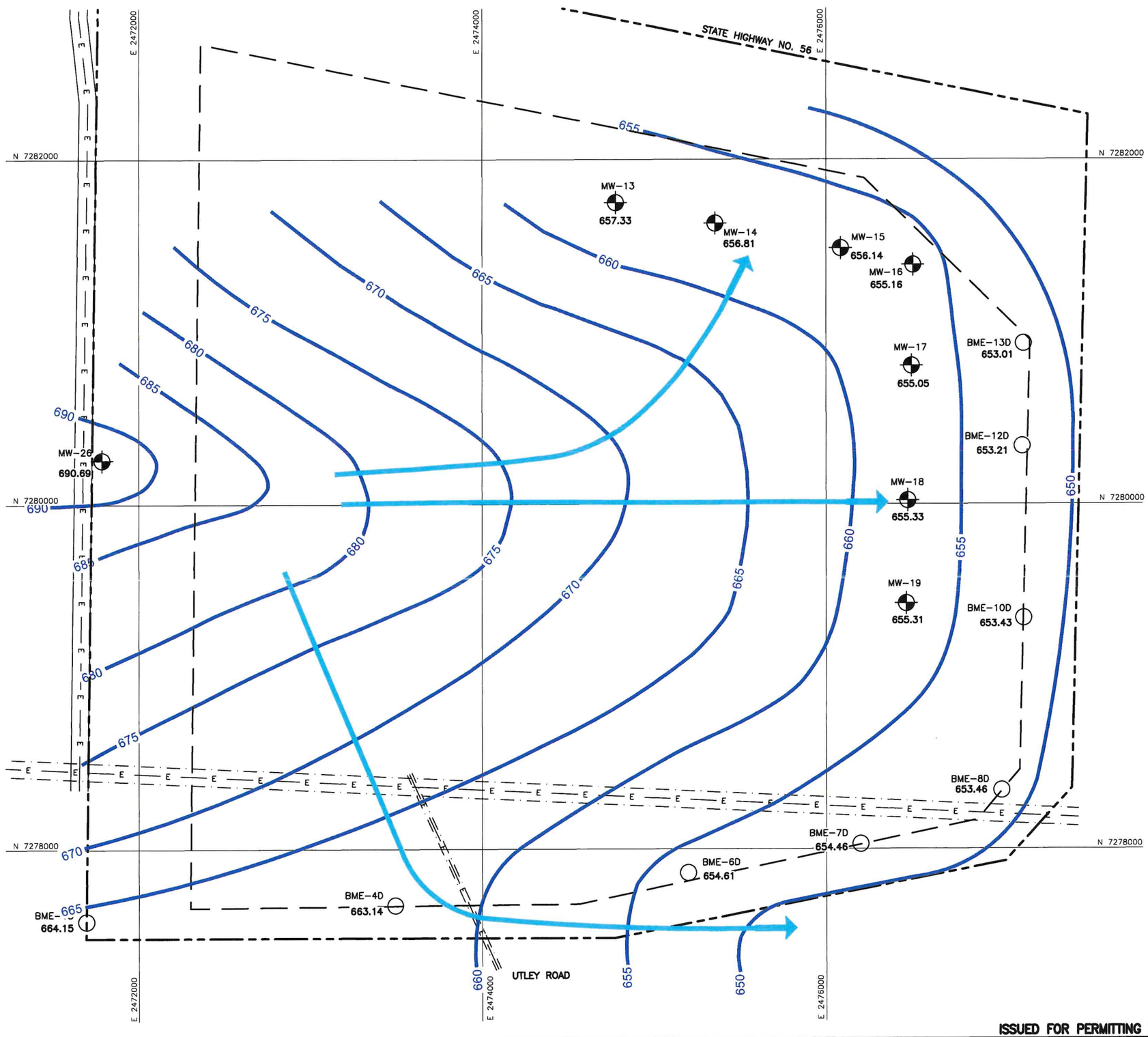

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
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- 735 — CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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JULY 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2e

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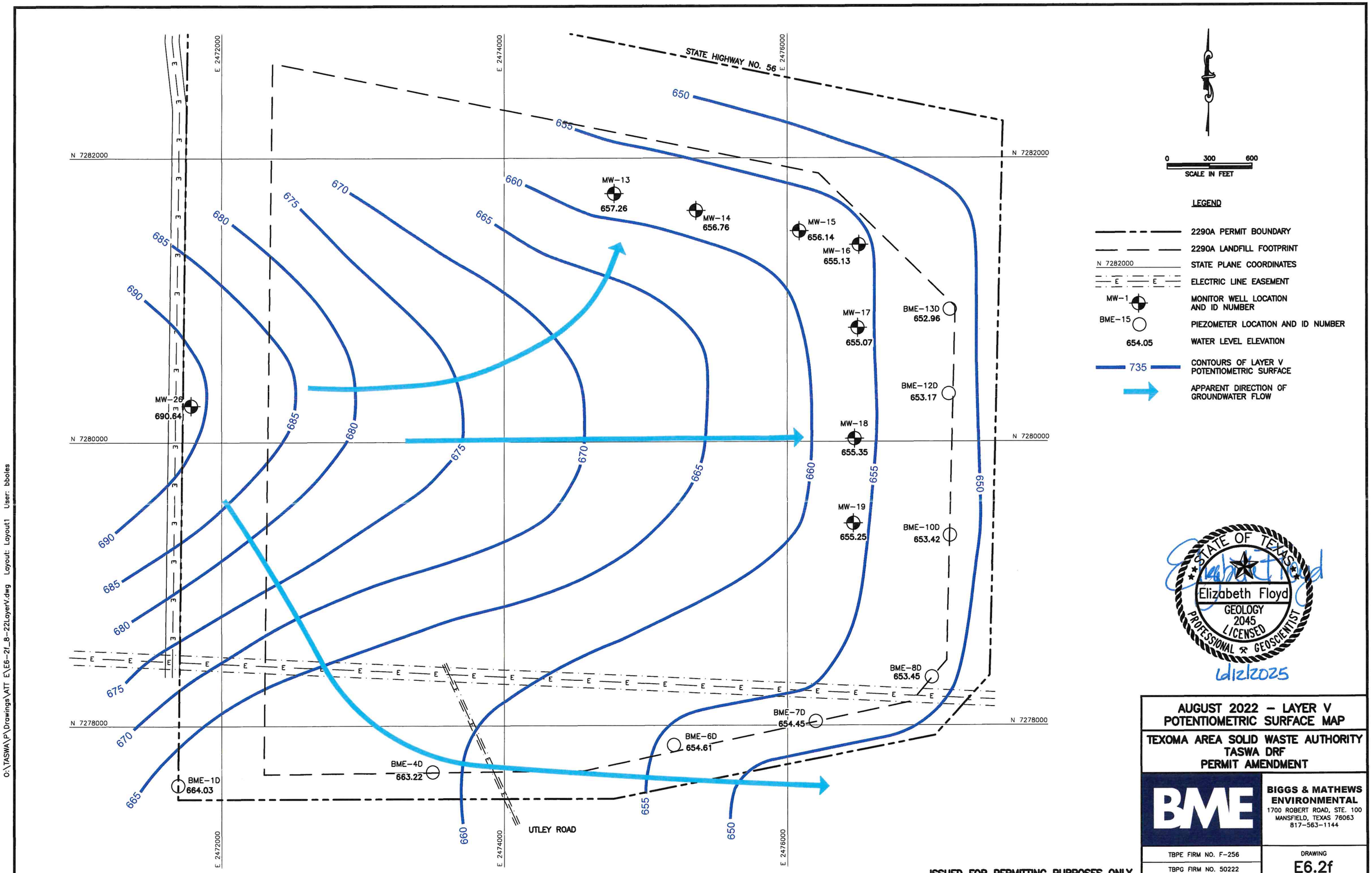

AUGUST 2022 – LAYER V
POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
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BME

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TBPG FIRM NO. 50222

DRAWING
E6.2f

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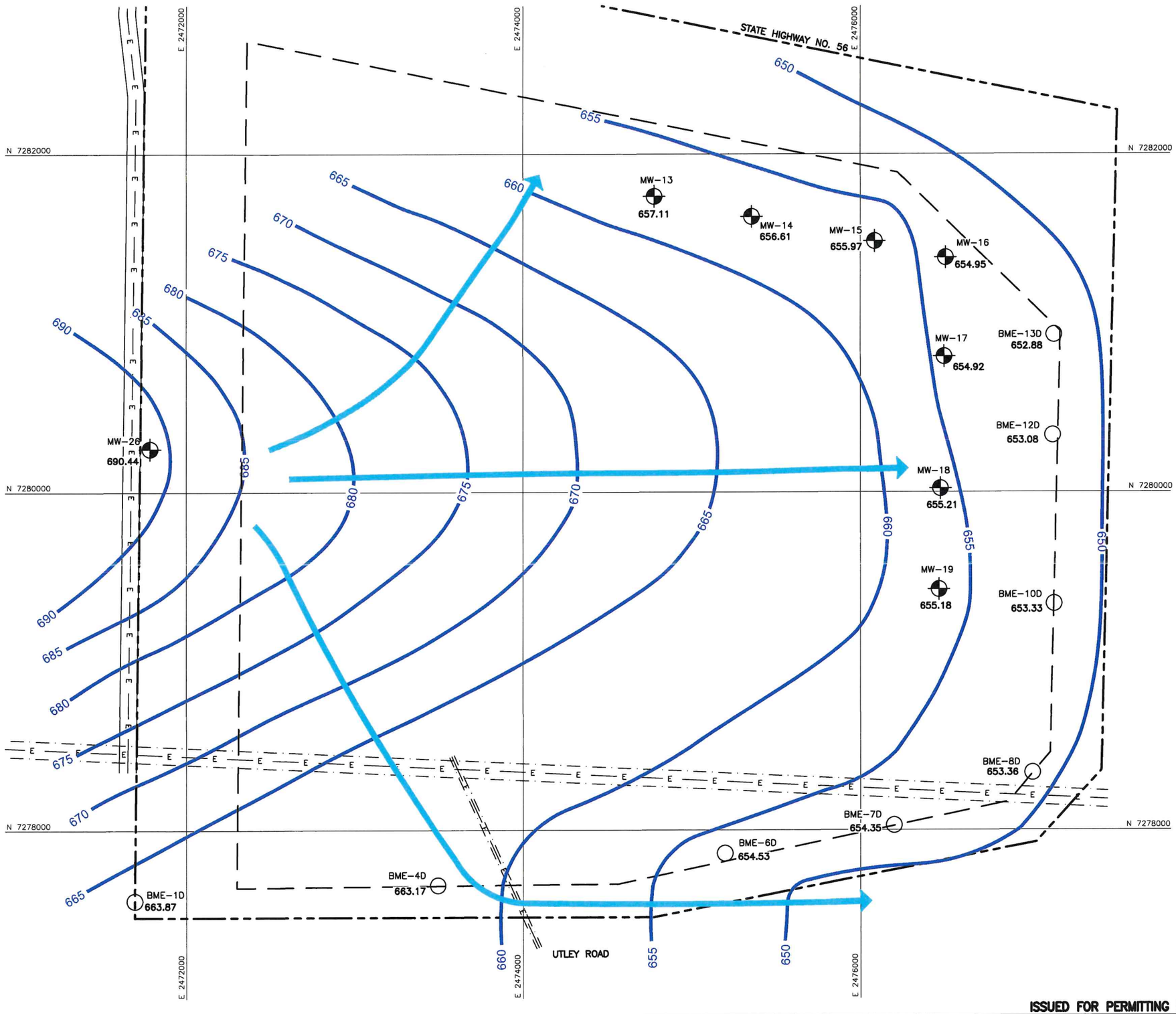

0 300 600

SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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SEPTEMBER 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
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TBPG FIRM NO. 50222

DRAWING
E6.2g

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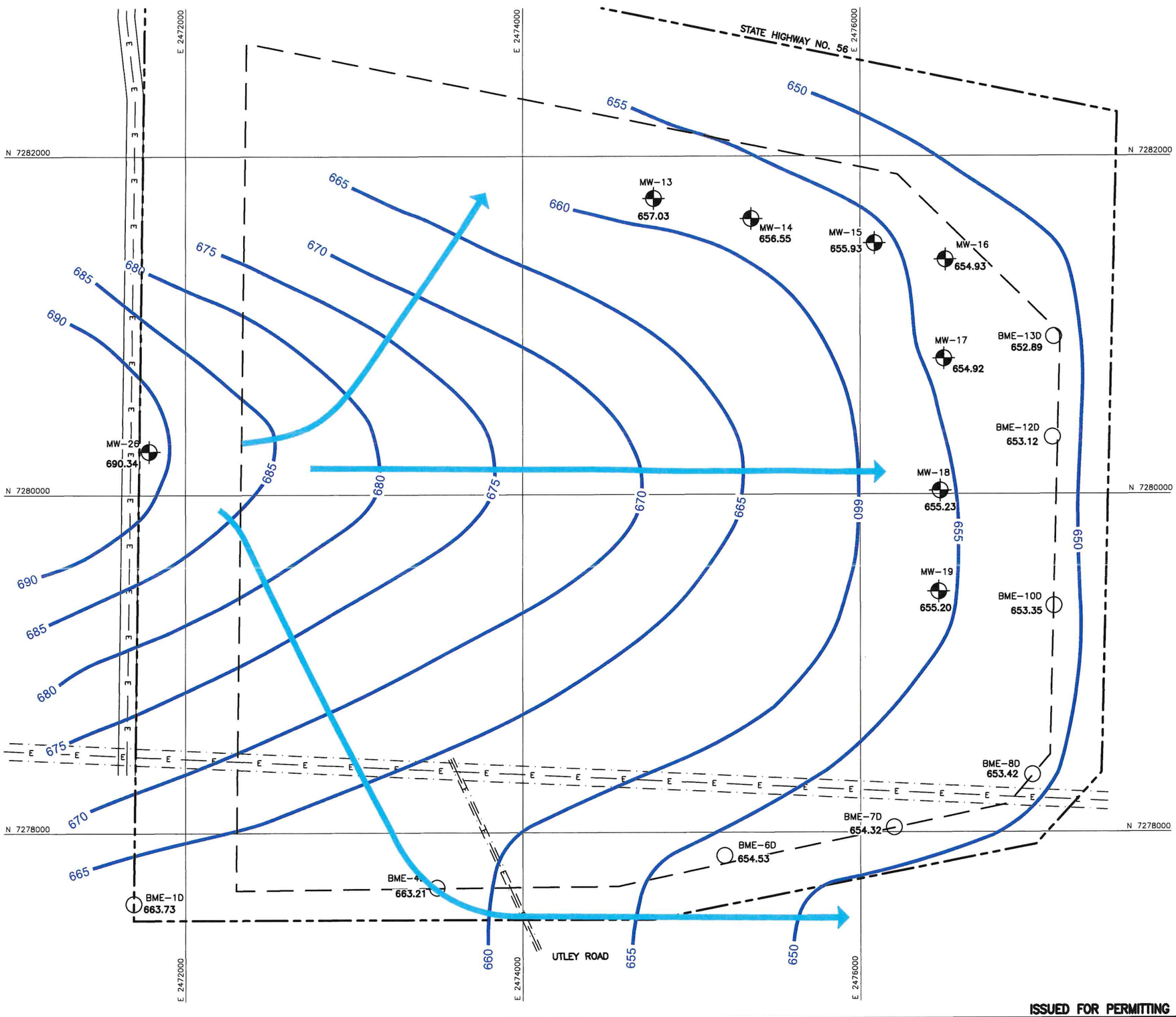
STATE HIGHWAY NO. 56
E 2472000
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N 7282000
N 7280000
N 7278000
650
655
660
665
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675
680
685
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MW-13
657.03
MW-14
656.55
MW-15
655.93
MW-16
654.93
MW-17
654.92
MW-18
655.23
MW-19
655.20
MW-26
690.34
BME-13D
652.89
BME-12D
653.12
BME-10D
653.35
BME-8D
653.42
BME-7D
654.32
BME-6D
654.53
BME-4
663.21
BME-1D
663.73
UTLEY ROAD
E E E

STATE HIGHWAY NO. 56

E 2472000 E 2474000 E 2476000

N 7282000 N 7280000 N 7278000

655 650 660 665 670 675 680 685 690

MW-13 657.03
MW-14 656.66
MW-15 656.11
MW-16 655.11
MW-17 655.04
MW-18 655.26
MW-19 655.30
MW-26 690.32

BME-13D 653.04
BME-12D 653.22
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BME-8D 653.54
BME-7D 654.43
BME-6D 654.39
BME-4D 663.04
BME-1D 663.78

UTLEY ROAD

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
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NOVEMBER 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2i

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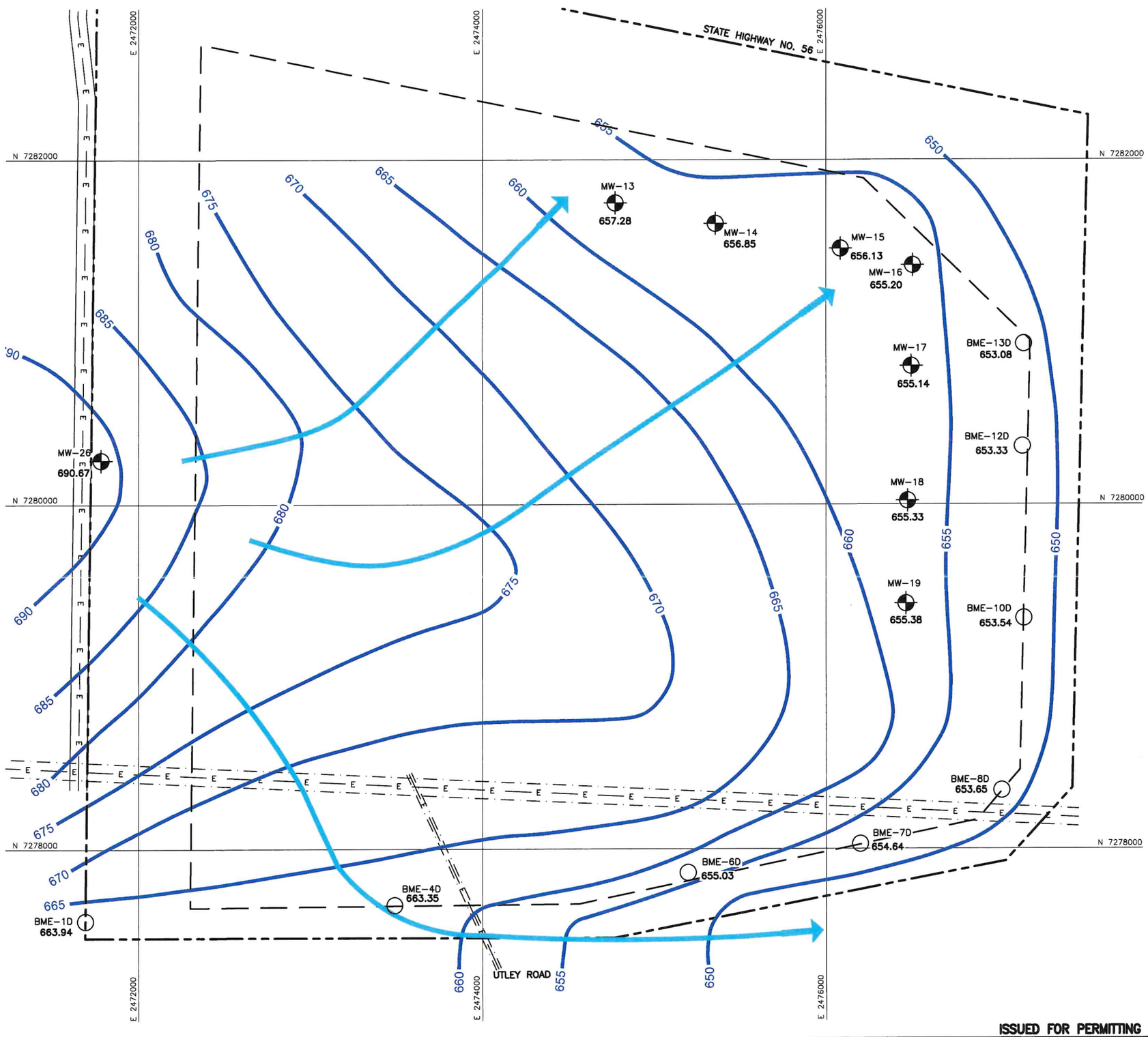

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
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DECEMBER 2022 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2j

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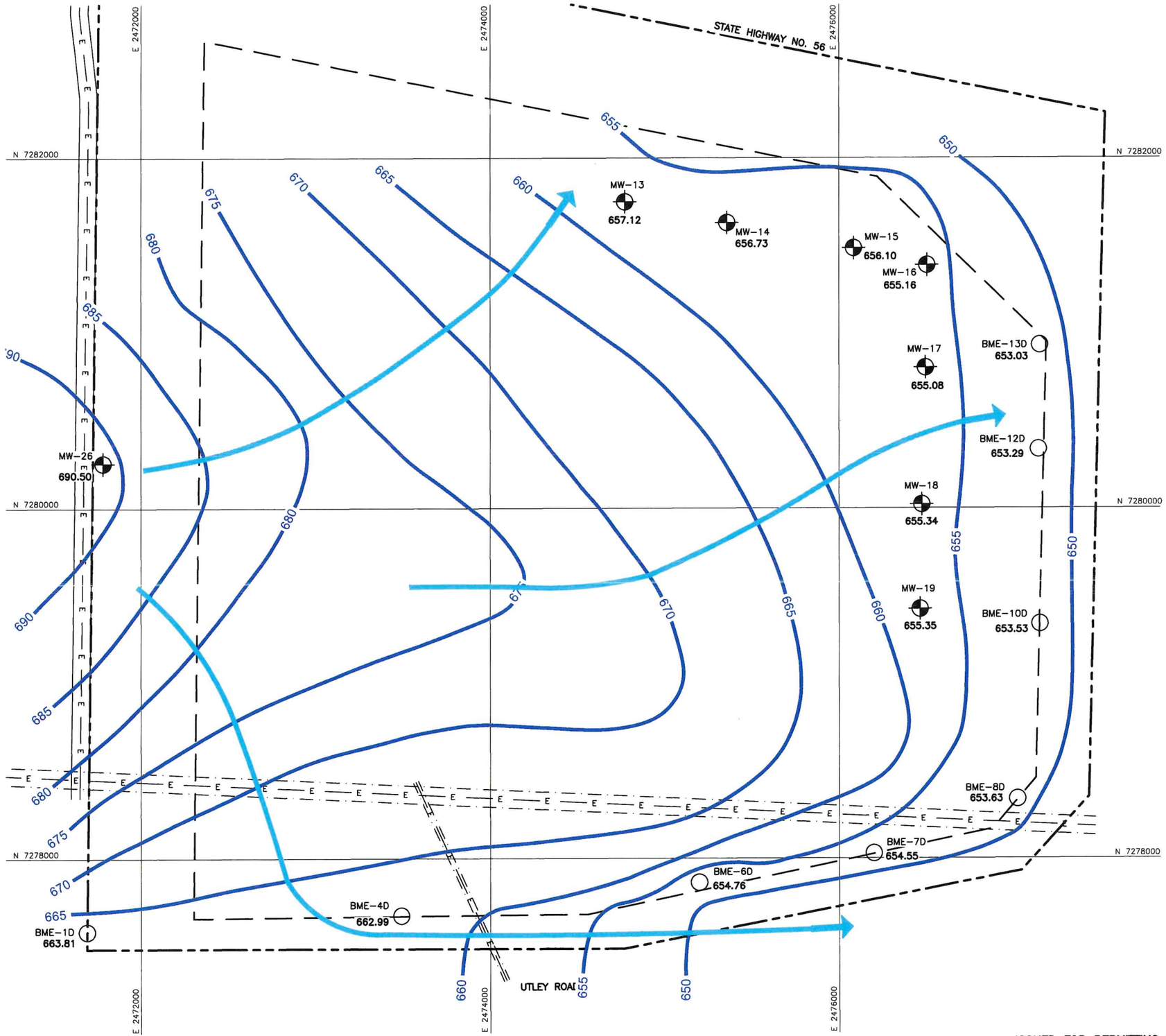

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
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JANUARY 2023 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2k

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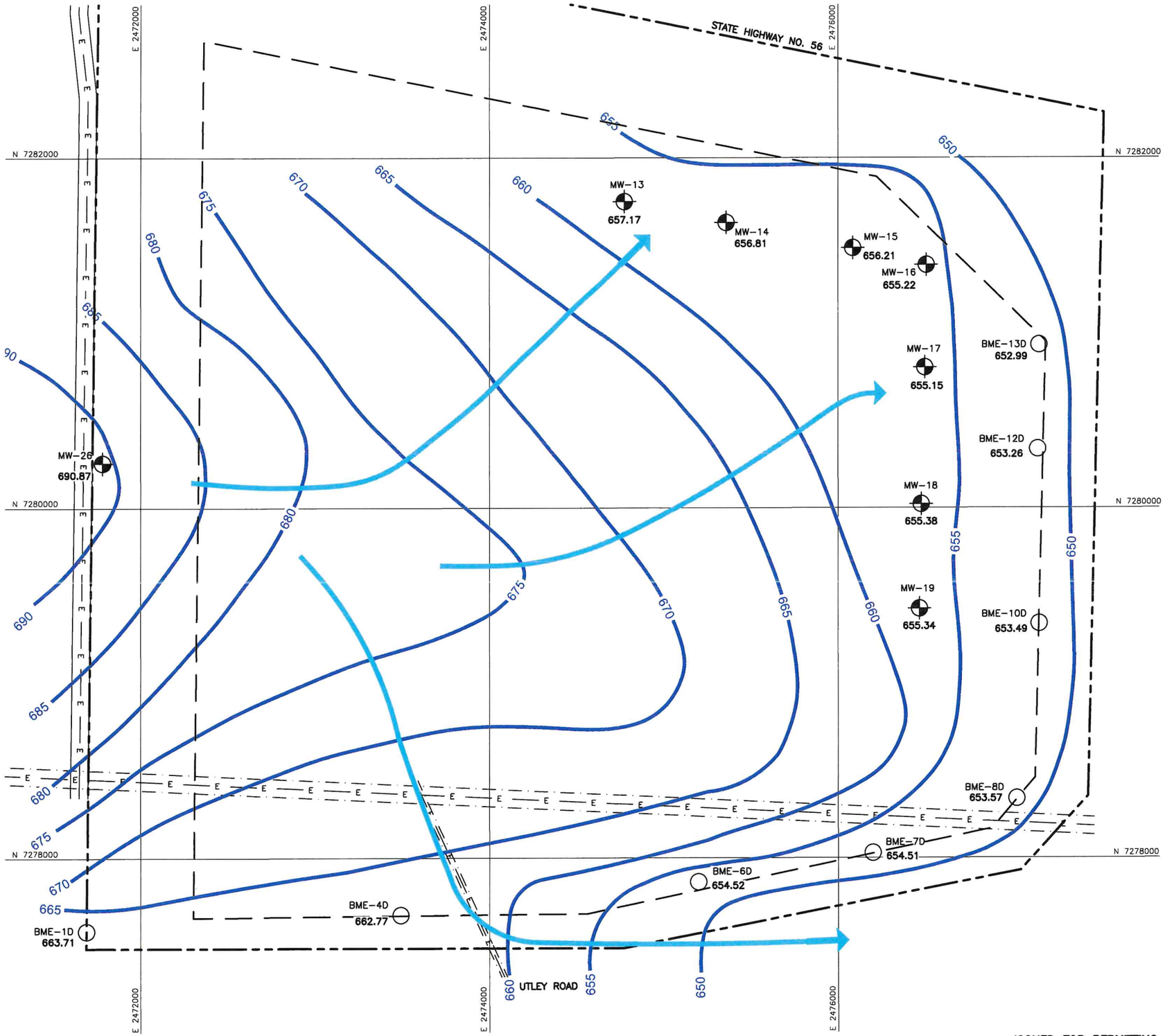

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-1 MONITOR WELL LOCATION AND ID NUMBER
- BME-15 PIEZOMETER LOCATION AND ID NUMBER
- 654.05 WATER LEVEL ELEVATION
- 735 CONTOURS OF LAYER V POTENTIOMETRIC SURFACE
- APPARENT DIRECTION OF GROUNDWATER FLOW

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FEBRUARY 2023 – LAYER V POTENTIOMETRIC SURFACE MAP

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MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.21

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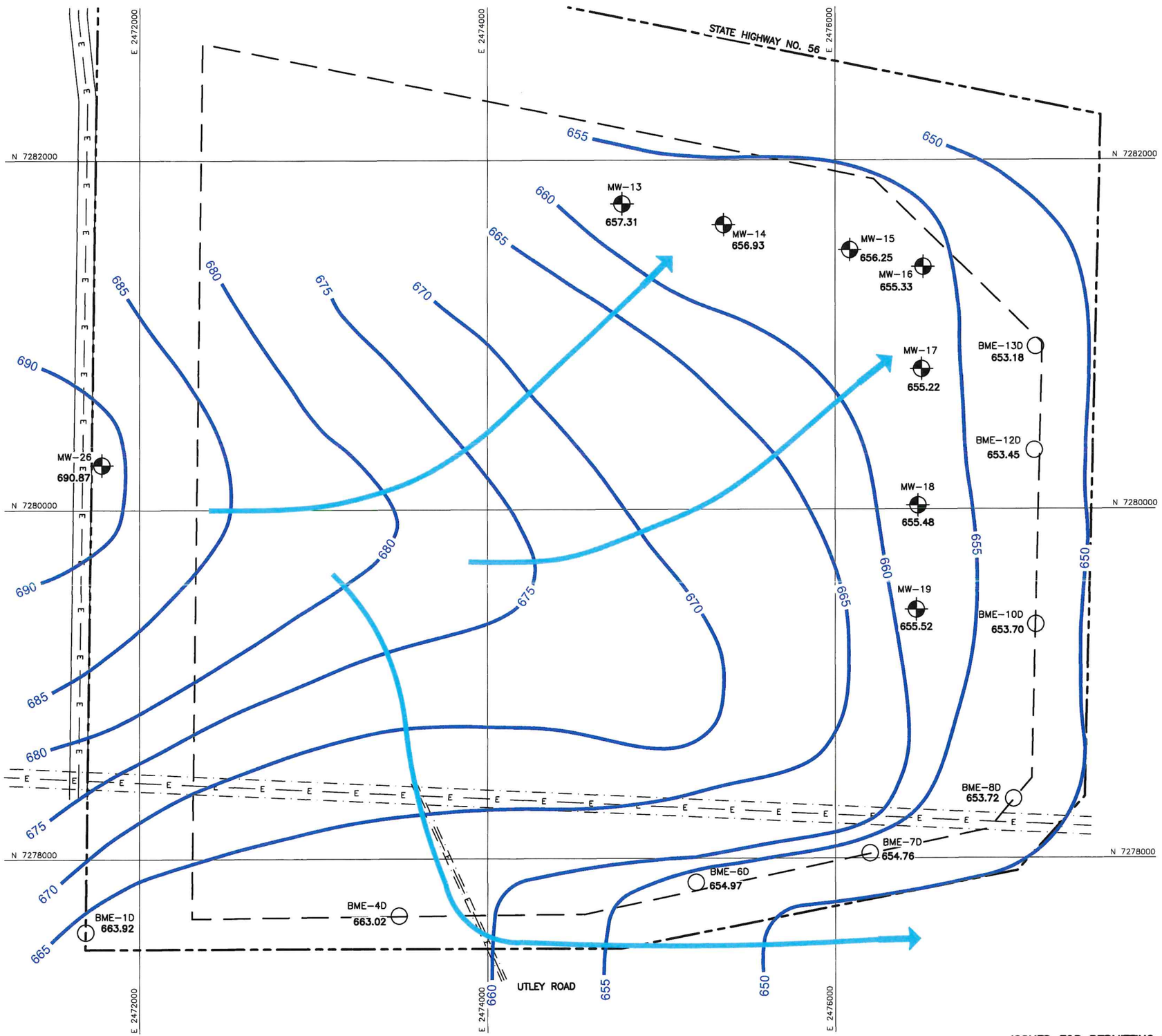

0 400 800
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
- 654.05 — WATER LEVEL ELEVATION
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MARCH 2023 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2m

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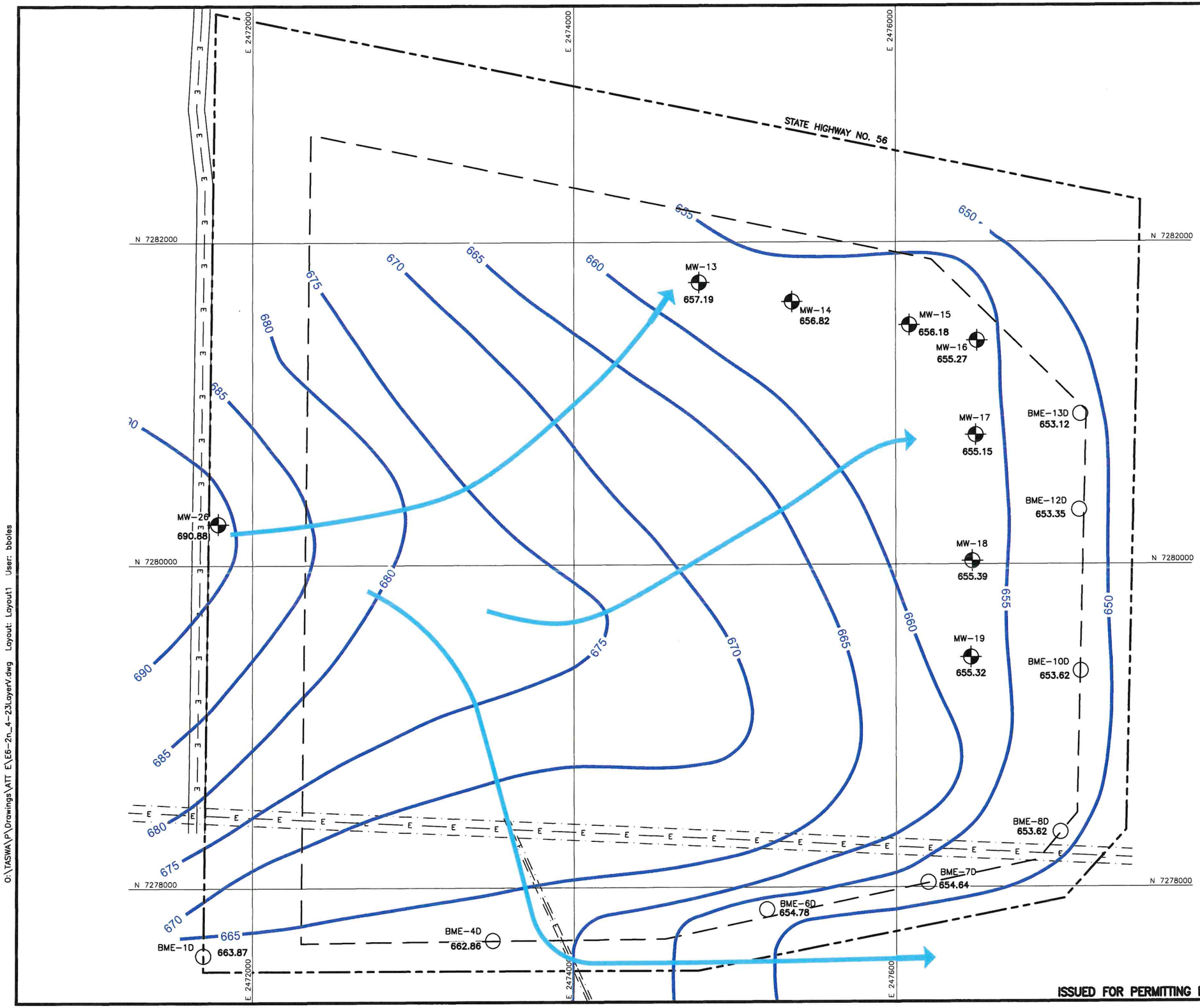

0 400 800
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
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APRIL 2023–LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2n

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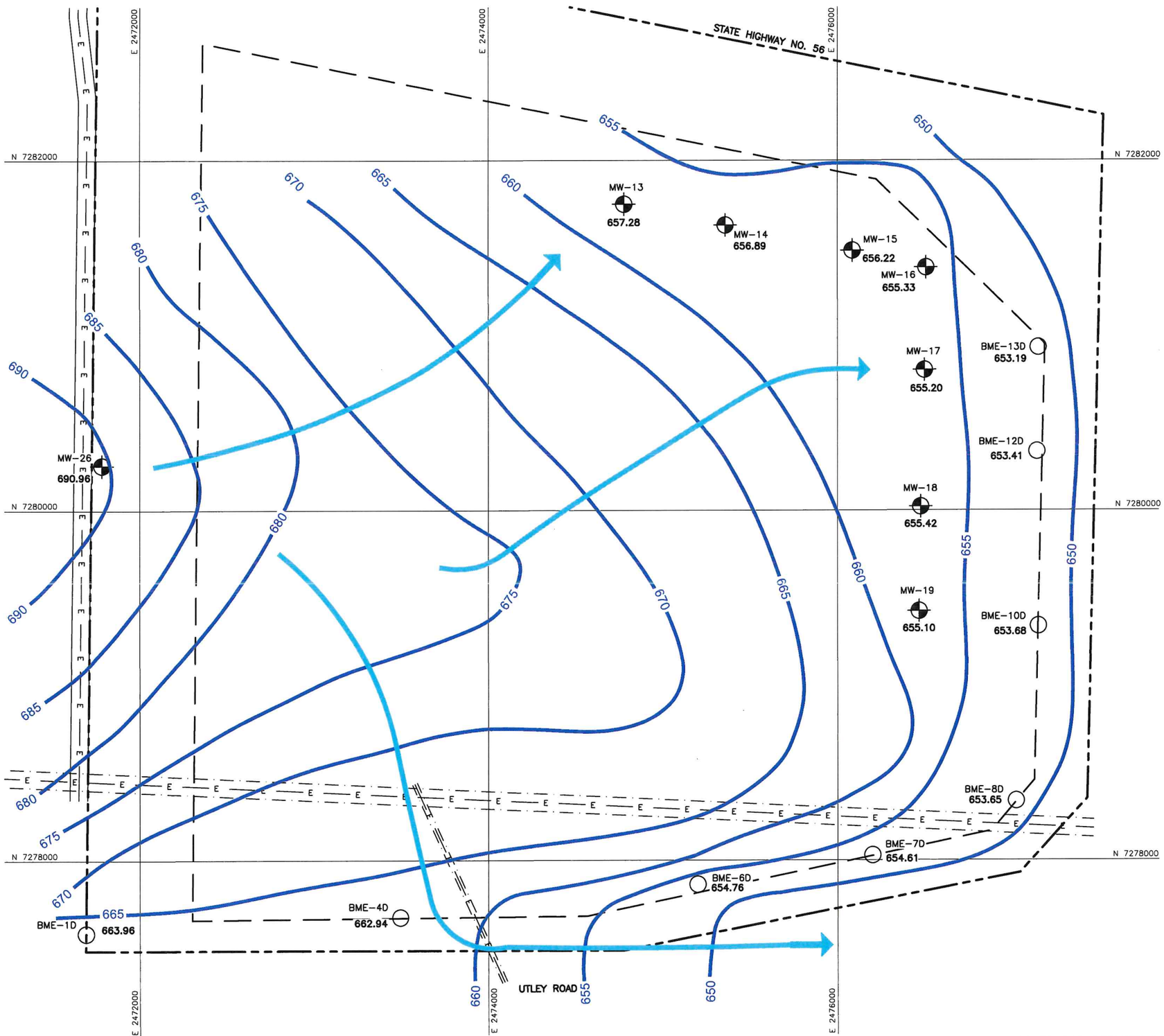

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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MAY 2023 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPG FIRM NO. 50222

DRAWING
E6.2o

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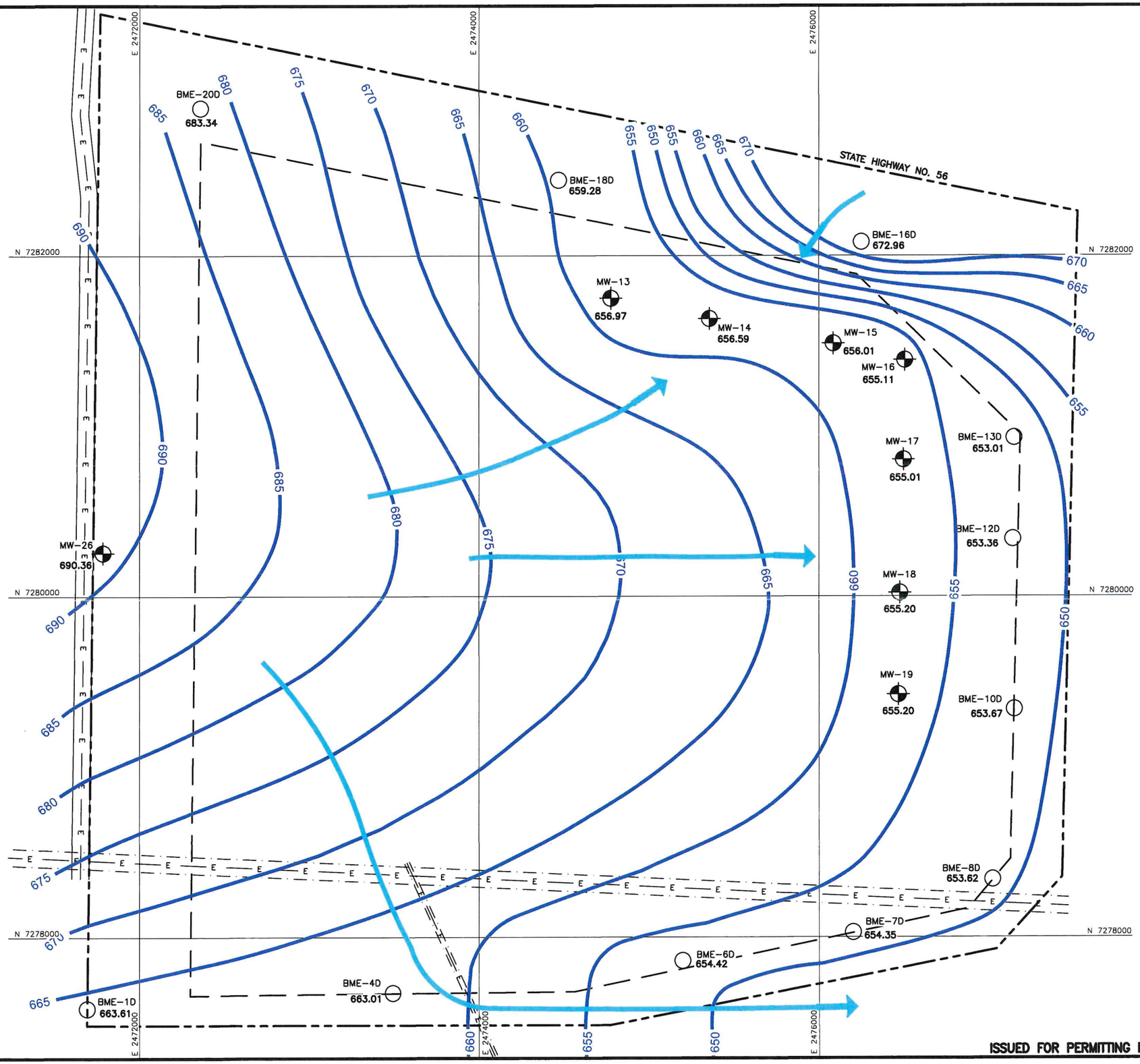

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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DECEMBER 2023 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2p

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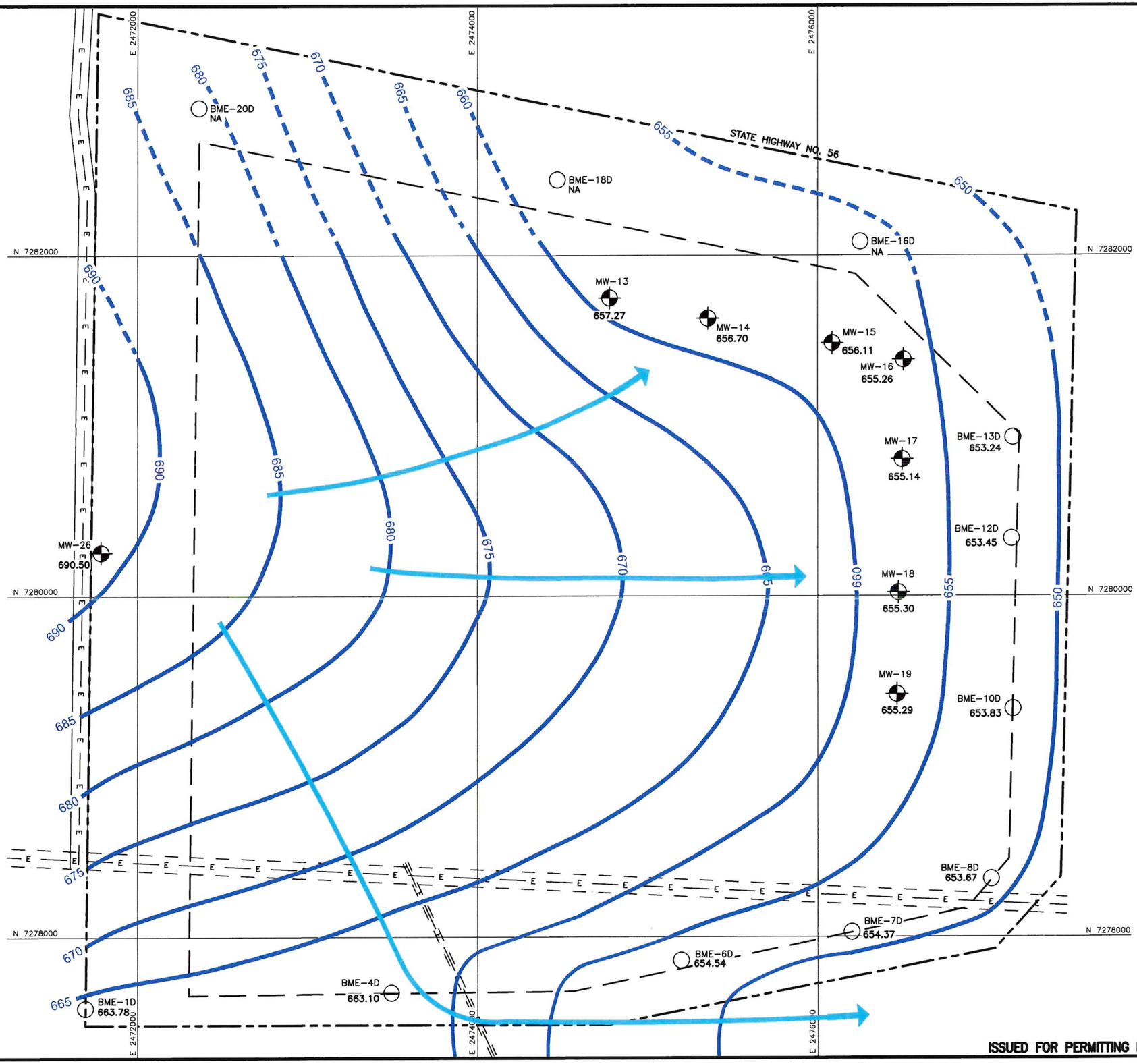

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
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JANUARY 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2q

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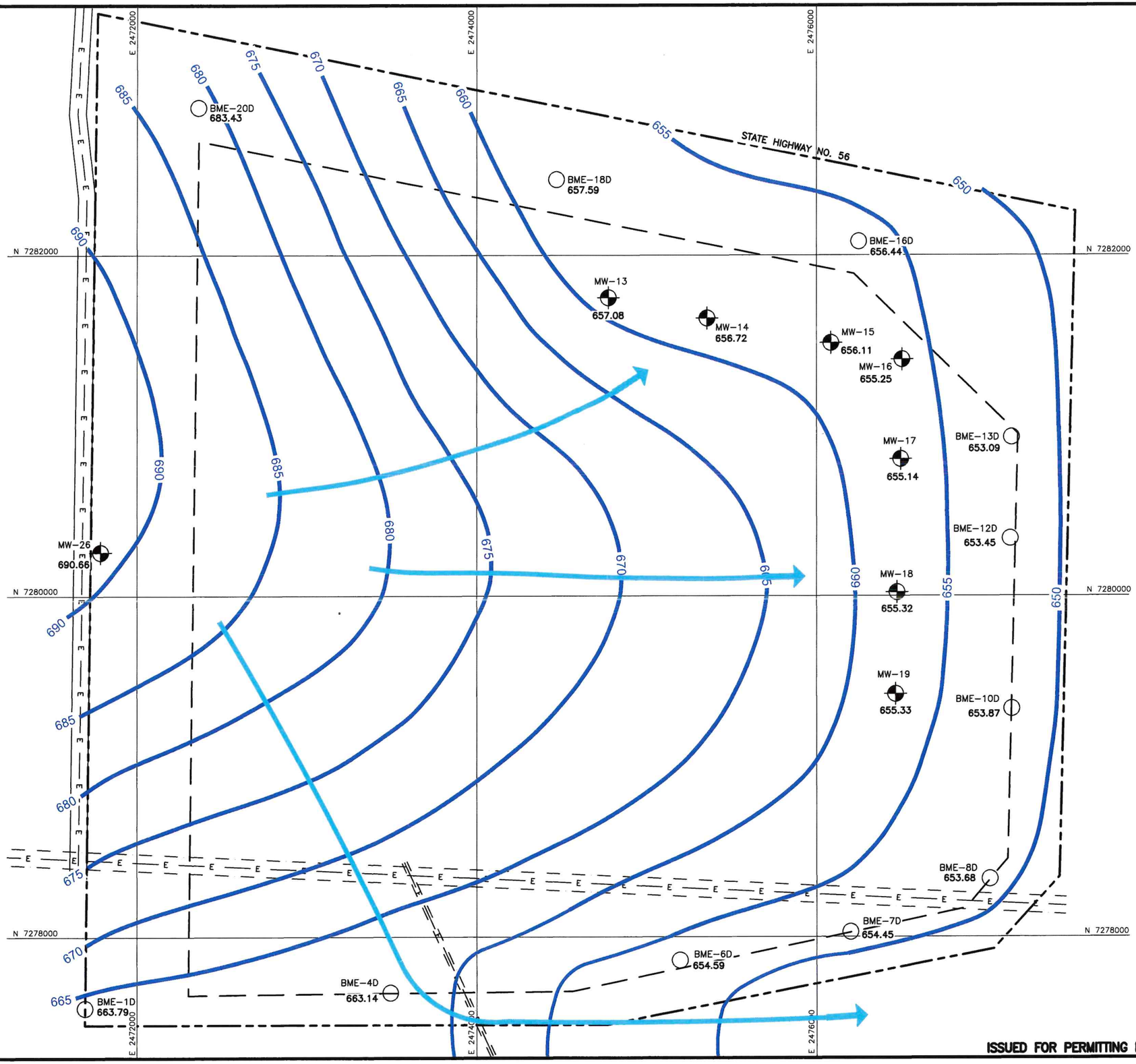

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E — E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
- BME-15 — PIEZOMETER LOCATION AND ID NUMBER
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FEBRUARY 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2r

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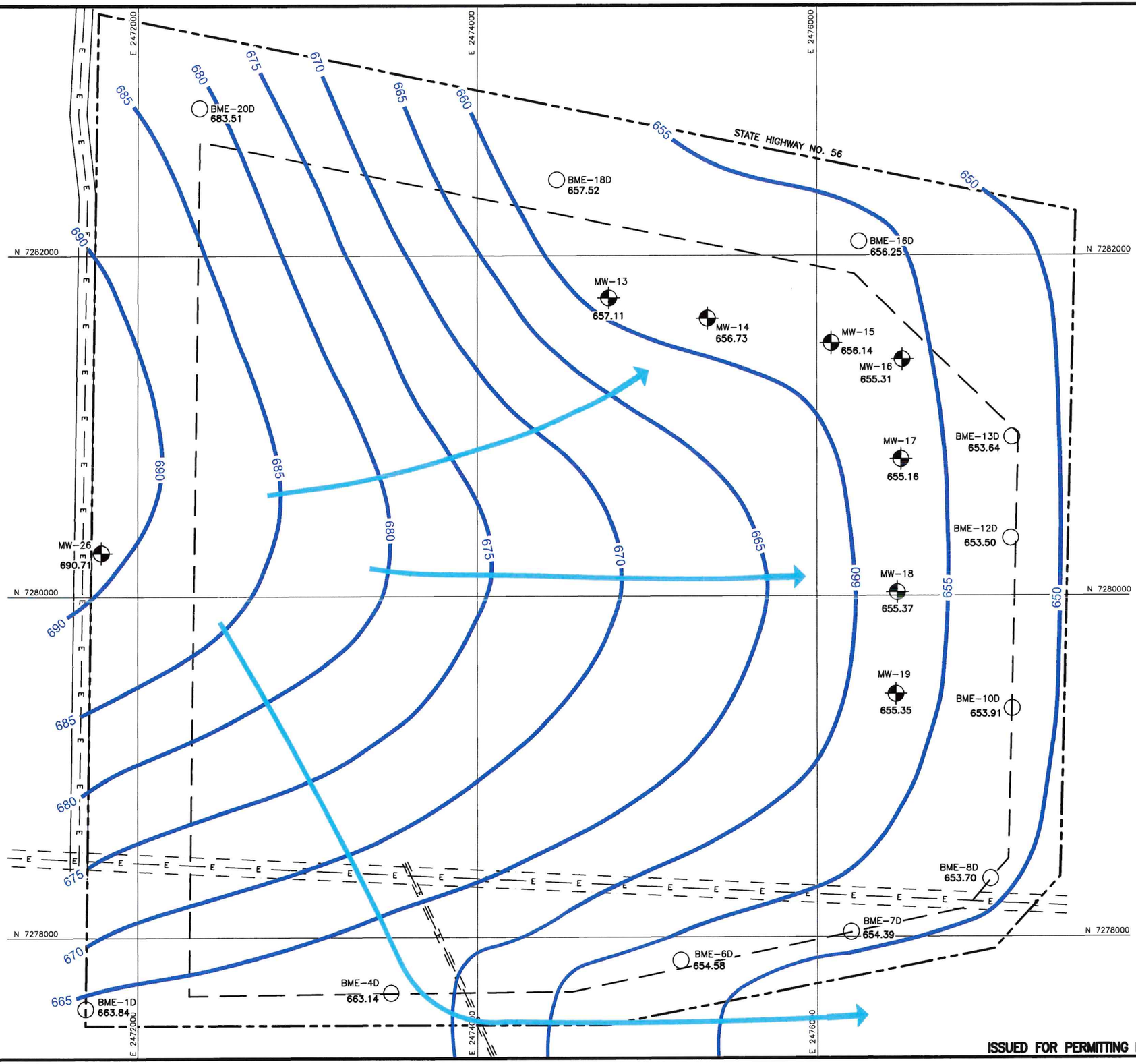

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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MARCH 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2s

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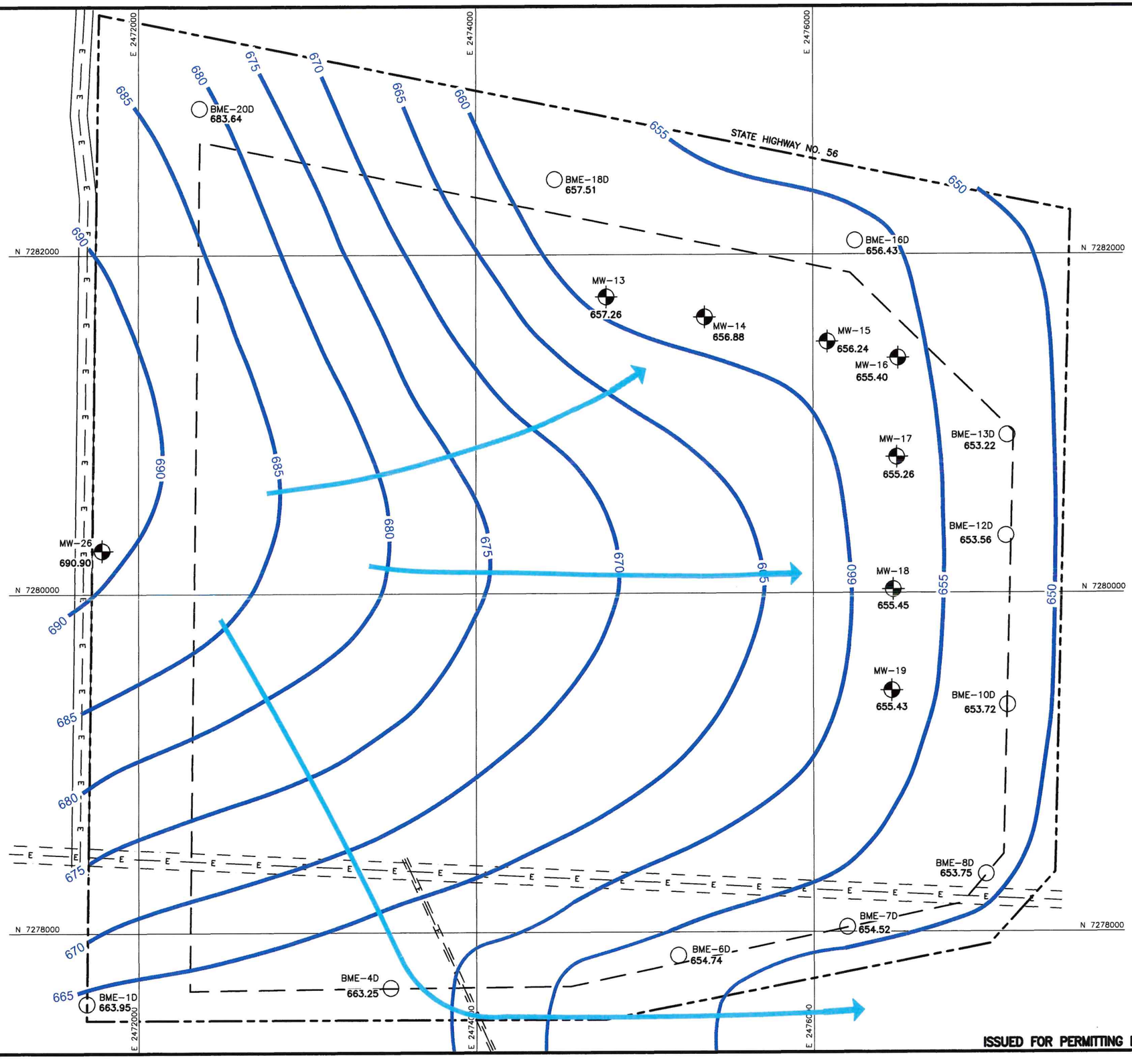
E 2472000
E 2474000
E 2476000
N 7282000
N 7280000
N 7278000
STATE HIGHWAY NO. 56
BME-20D
683.64
BME-18D
657.51
BME-16D
656.43
MW-13
657.26
MW-14
656.88
MW-15
656.24
MW-16
655.40
MW-17
655.26
BME-13D
653.22
BME-12D
653.56
MW-18
655.45
MW-19
655.43
BME-10D
653.72
BME-8D
653.75
BME-7D
654.52
BME-6D
654.74
BME-4D
663.25
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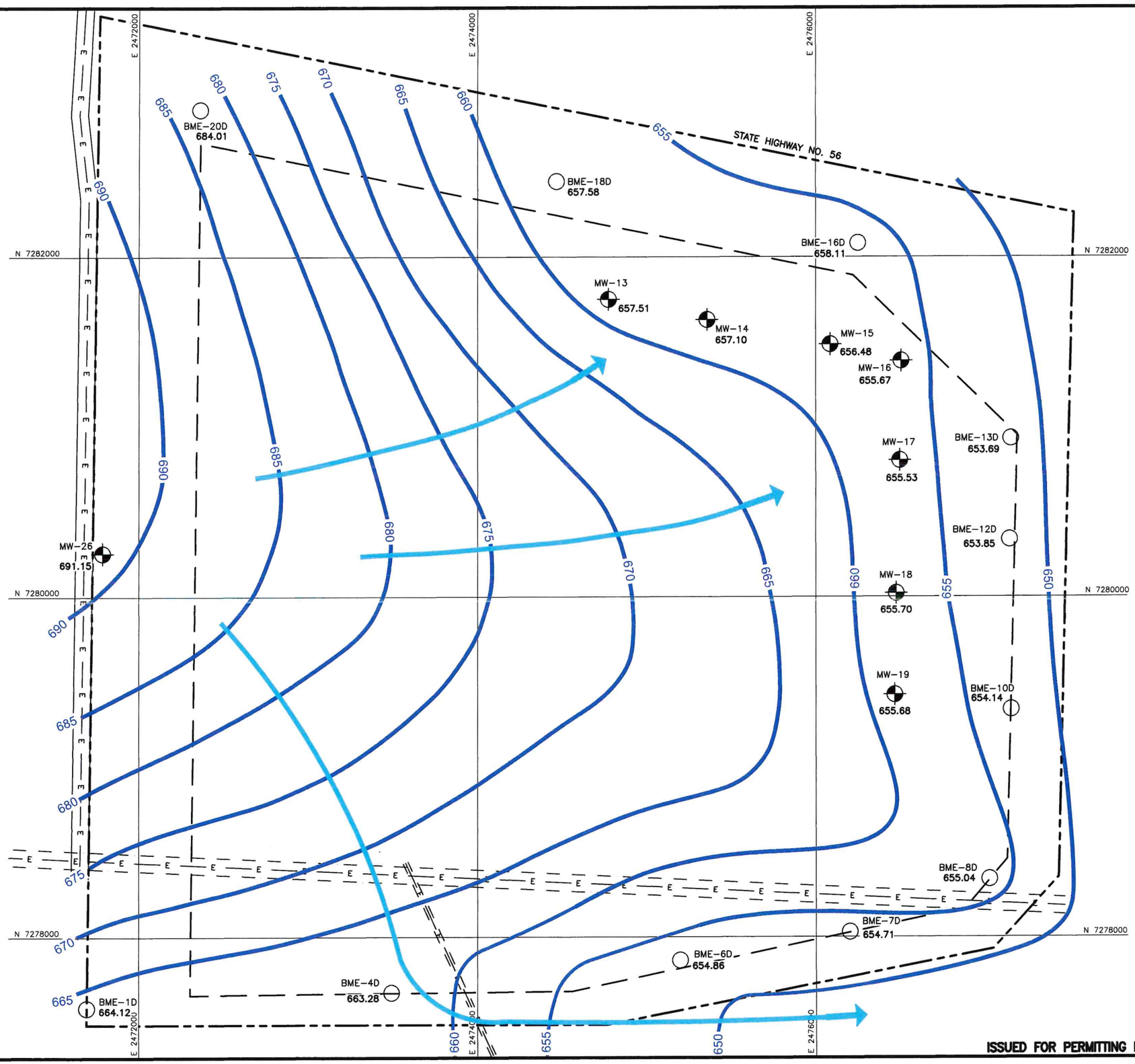
663.95
MW-26
690.90
690
685
680
675
670
665
660
655
650
E E E



0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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- APPARENT DIRECTION OF GROUNDWATER FLOW

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JUNE 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2u

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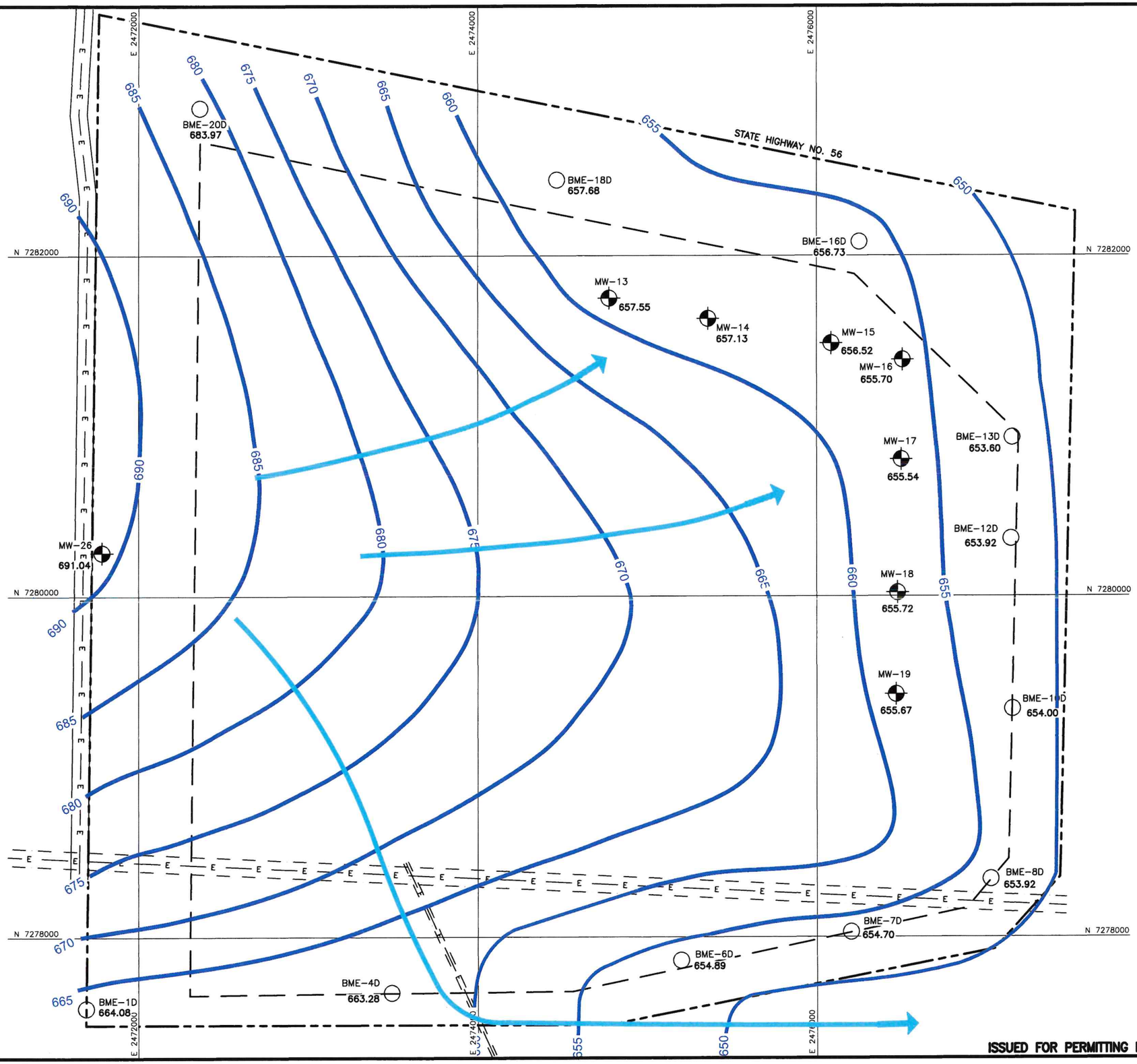

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — MONITOR WELL LOCATION AND ID NUMBER
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JULY 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2v

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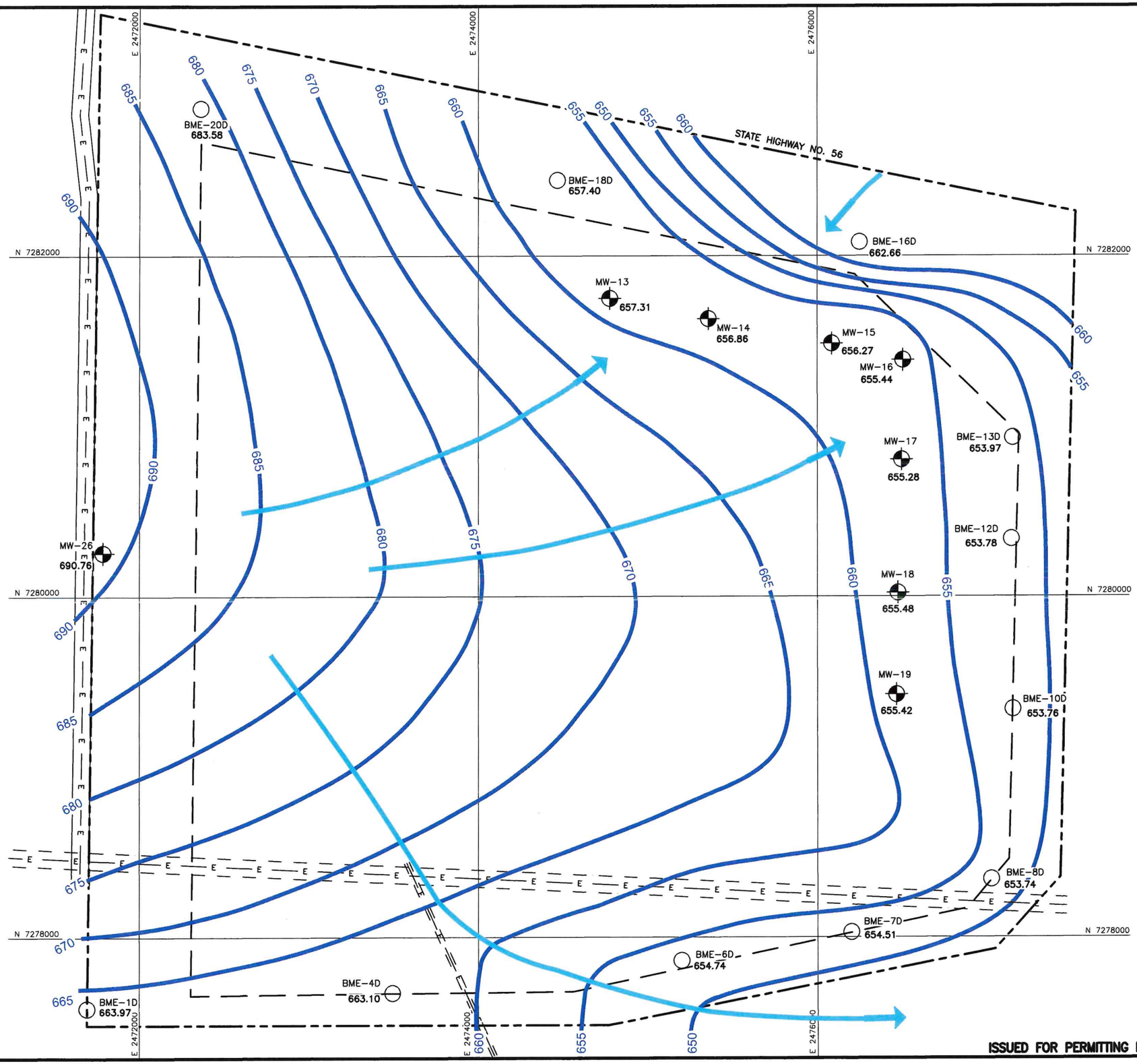

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
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AUGUST 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2w

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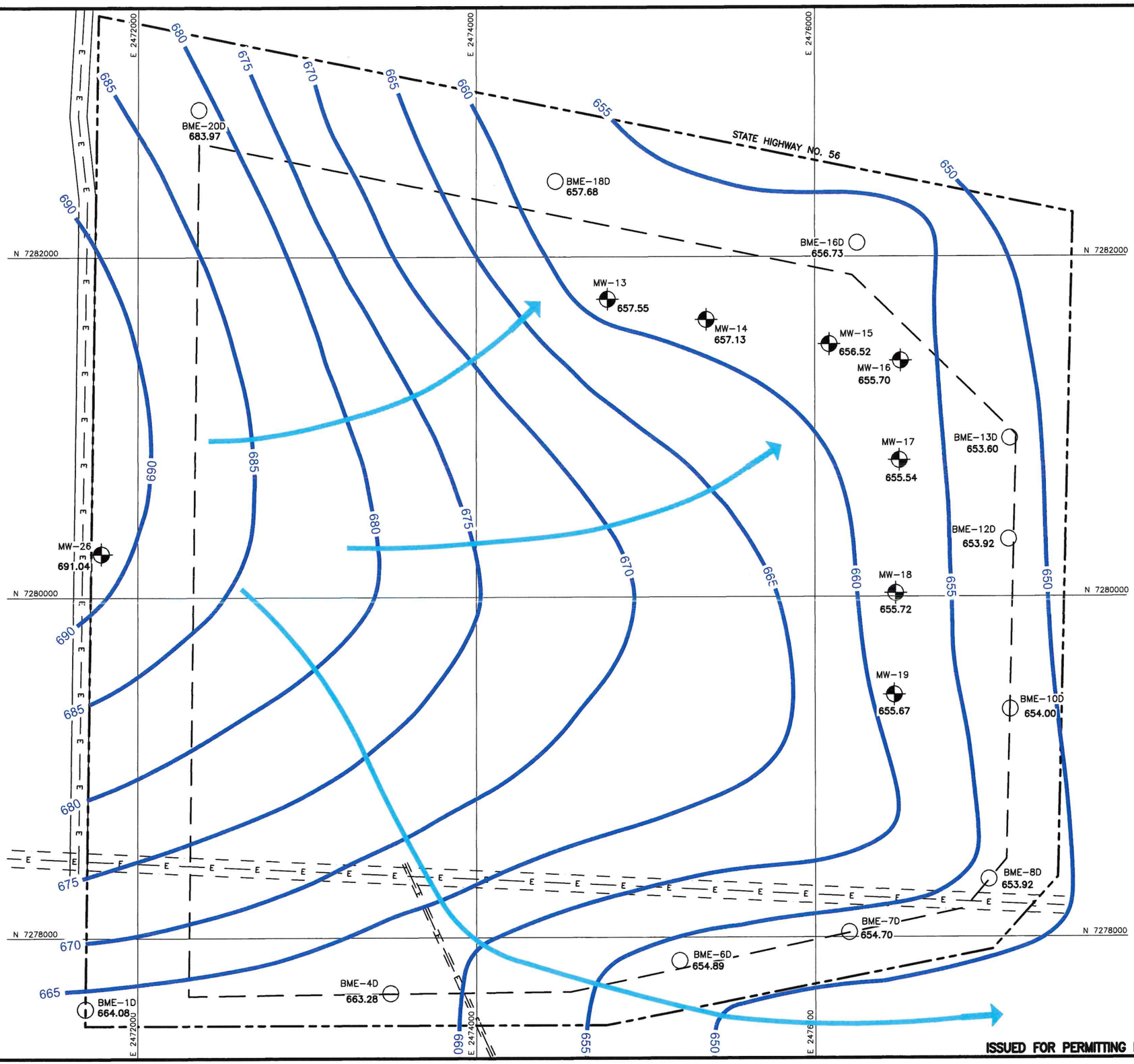

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SEPTEMBER 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2x

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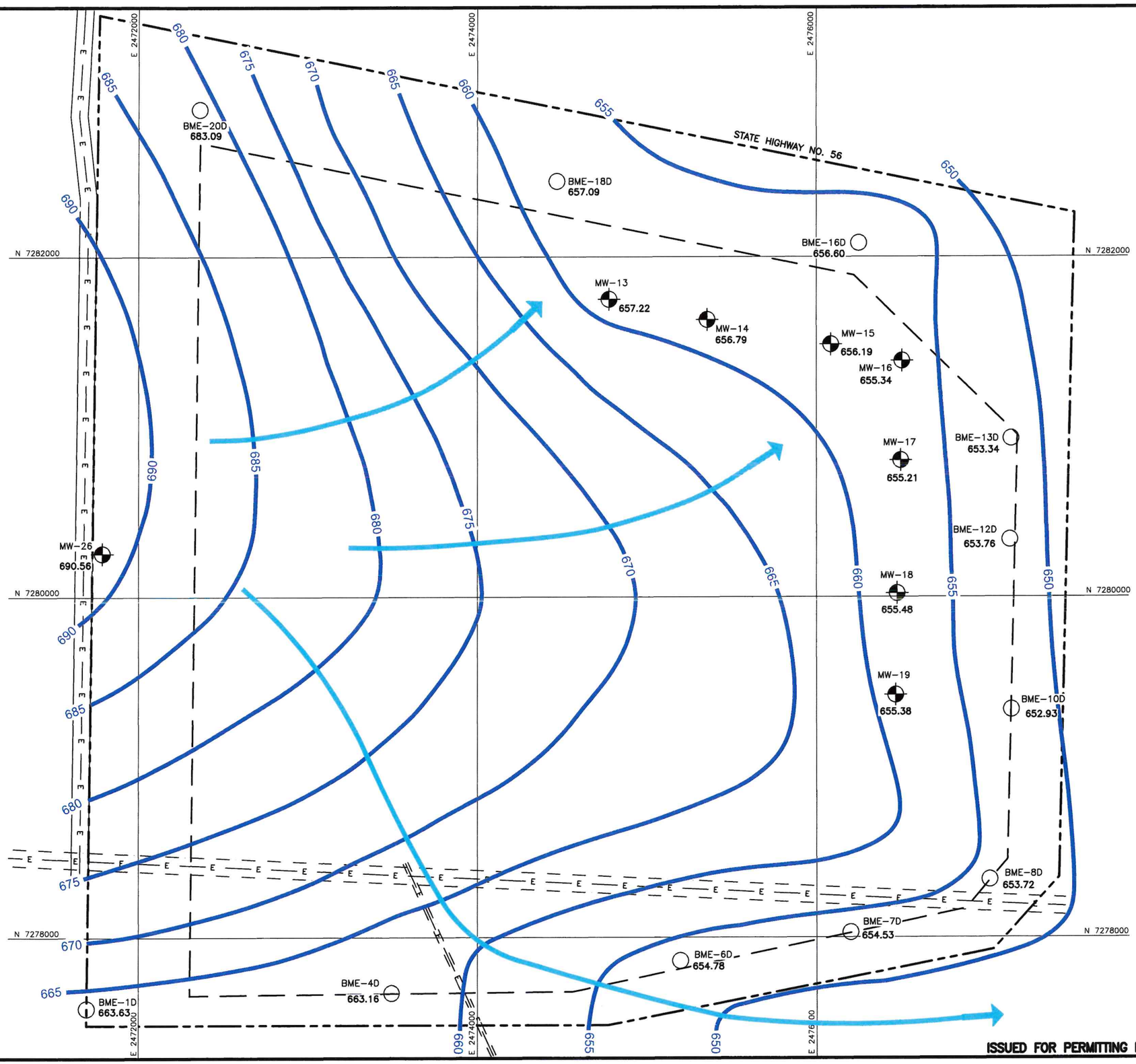

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
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OCTOBER 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2y

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E 2472000 | E 2474000 | E 2476000

N 7282000 | N 7280000 | N 7278000

STATE HIGHWAY NO. 56

BME-20D 682.99
BME-18D 657.29
BME-16D 656.45
MW-13 657.23
MW-14 656.83
MW-15 656.25
MW-16 655.39
MW-17 655.29
BME-13D 653.39
BME-12D 653.80
MW-18 655.58
MW-19 655.47
BME-10D 653.69
BME-8D 653.79
BME-7D 654.61
BME-6D 654.80
BME-4D 663.18
BME-1D 663.63
MW-26 690.52

690 685 680 675 670 665 660 655 650

0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
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NOVEMBER 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

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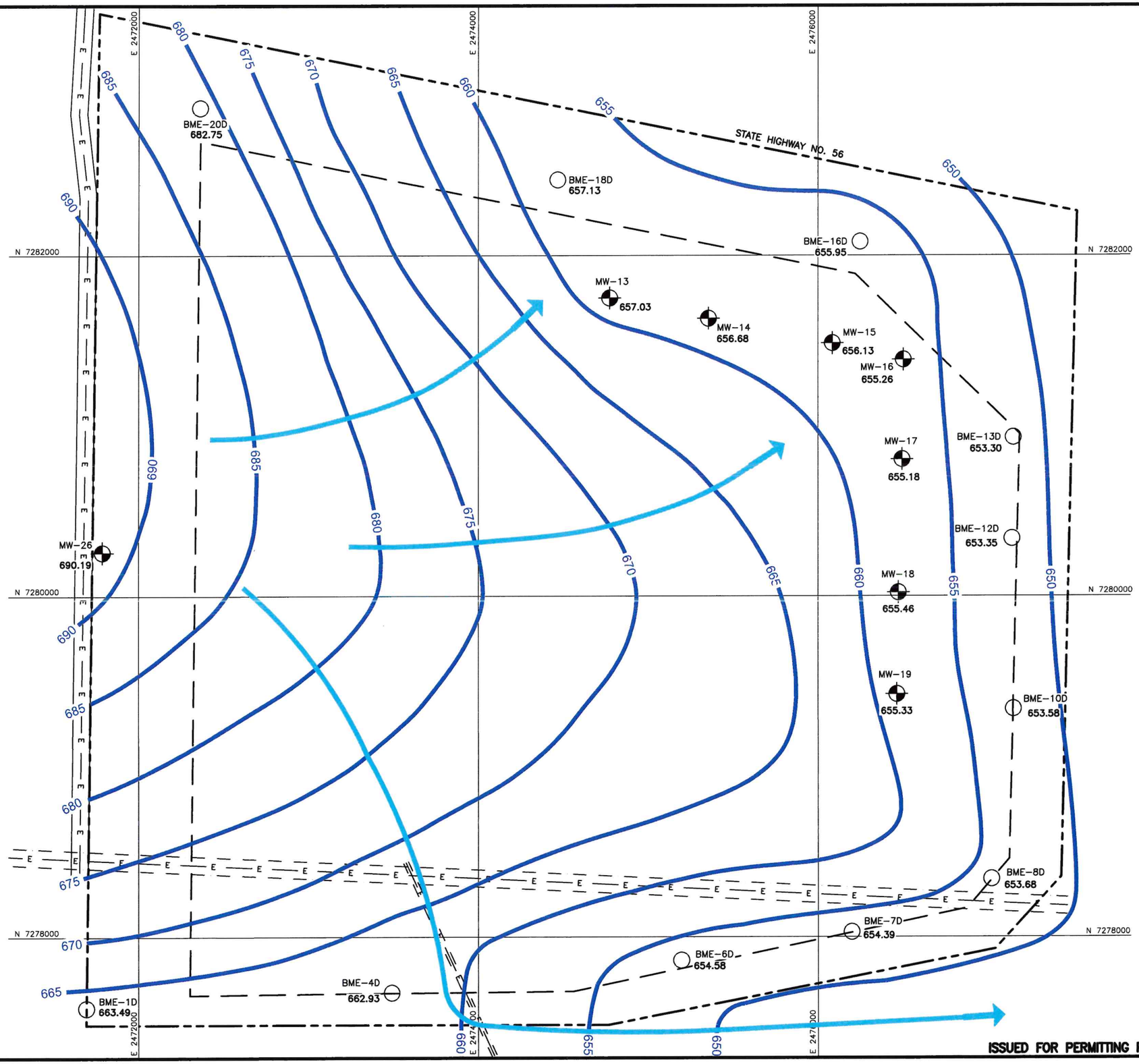
TBPG FIRM NO. 50222

DRAWING
E6.2z



0 300 600
SCALE IN FEET

LEGEND

- 2290A PERMIT BOUNDARY
- 2290A LANDFILL FOOTPRINT
- N 7282000 — STATE PLANE COORDINATES
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6/12/2025

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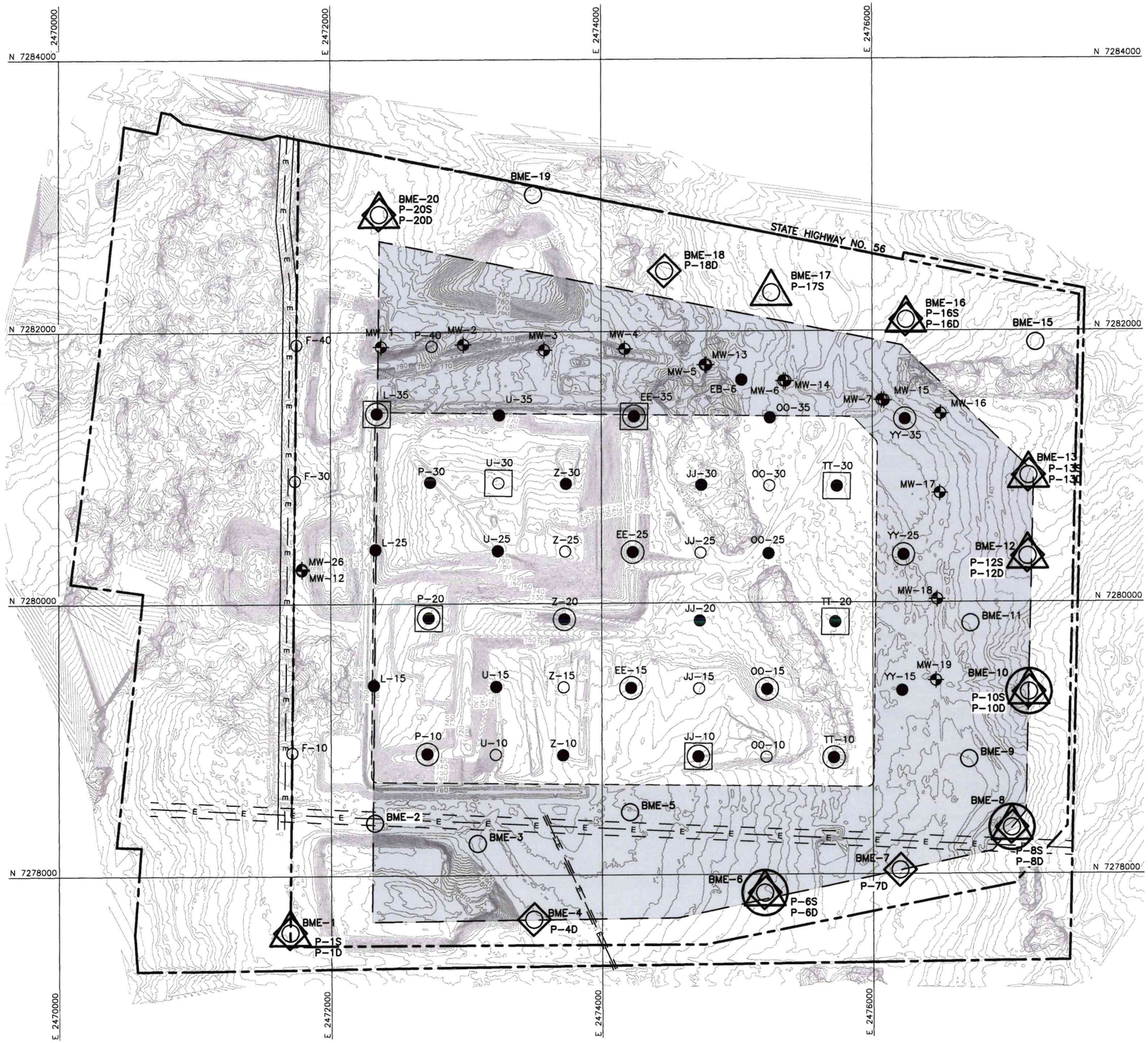
DECEMBER 2024 – LAYER V POTENTIOMETRIC SURFACE MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.2aa

O:\TASWA\P\Drawings\ATT E\E6-2aa_12-24LayerV.dwg Layout: Layout1 User: bboles



0 400 800
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LANDFILL FOOTPRINT
- 750 EXISTING CONTOUR
- E E ELECTRIC LINE AND EASEMENT
- N 7279000 STATE PLANE COORDINATES
- JJ-30 HISTORICAL BORINGS > 30' BELOW EDE
- Z-25 HISTORICAL BORINGS > 5' BELOW EDE
- WOODBINE PIEZOMETERS
- SHALE PIEZOMETERS
- MW-1 EXISTING MONITORING WELL
- BME-3 NEW BORING > 30' BELOW EDE
- P-10D NEW LAYER V PIEZOMETER
- P-10S NEW LAYER II/III PIEZOMETER
- S SLUG TEST LOCATION – SHALLOW
- D SLUG TEST LOCATION – DEEP
- EXPANSION AREA

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/25/2025

ISSUED FOR PERMITTING PURPOSES ONLY

SLUG TEST LOCATION MAP

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

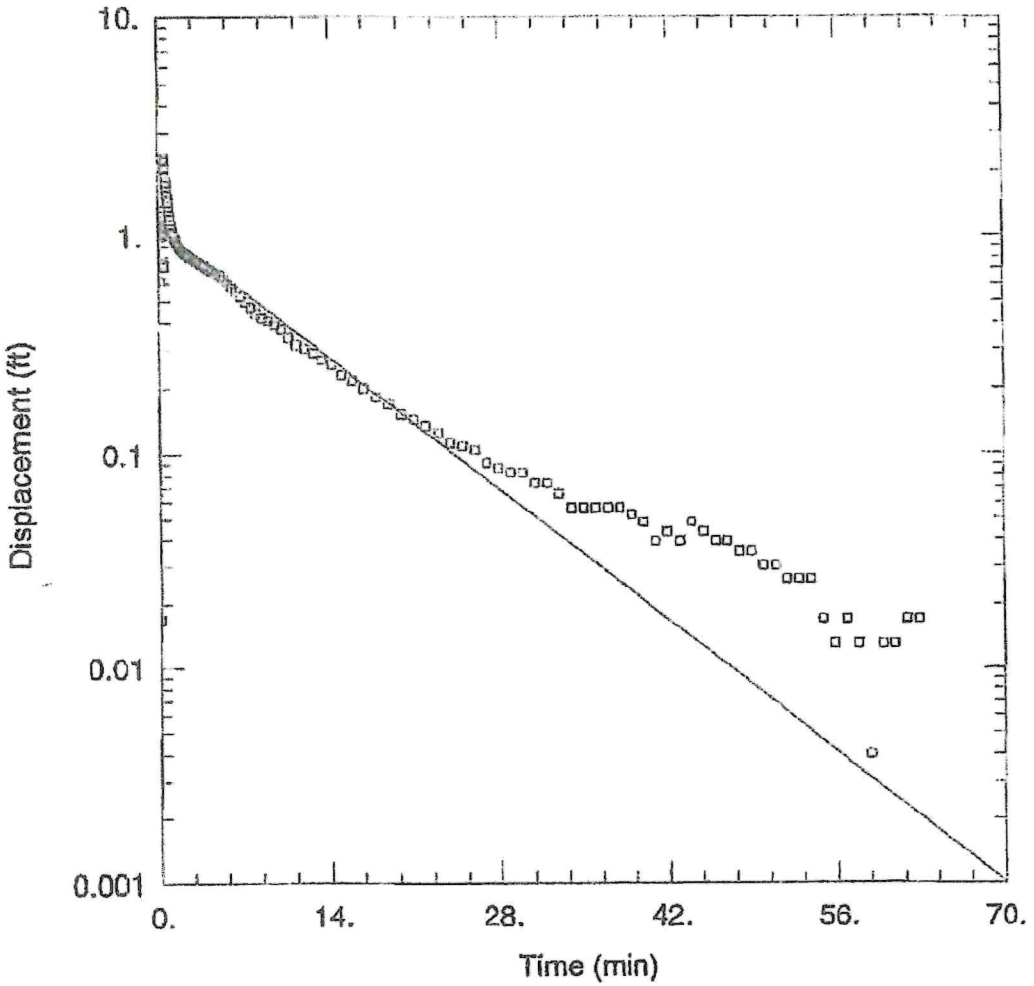
TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
E6.3

O:\TASWA\P\Drawings\ATT E\E6-3_SlugTestLocMap.dwg Layout: Layout1 User: awhite

L35S Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\l35sout.aqt
Date: 05/17/00 Time: 13:59:10

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002794 cm/sec
y0 = 1.117 ft

AQUIFER DATA

Saturated Thickness: 5.87 ft
Anisotropy Ratio (Kz/Kr): 1.

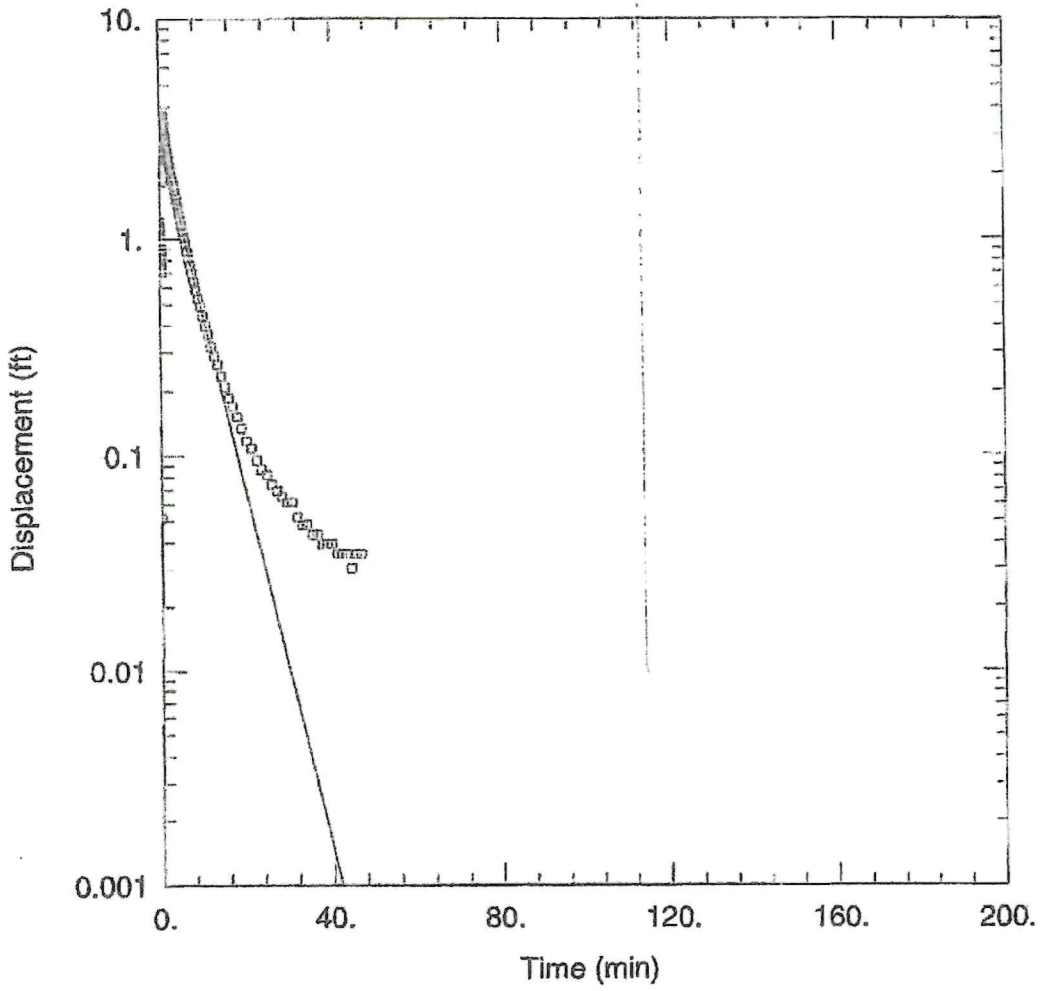
WELL DATA (L35S)

Initial Displacement: 2.302 ft
Water Column Height: 5.87 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.28 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.25

COPY

EE35S Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\ee35sout.aqt
Date: 05/17/00 Time: 13:57:54

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0006006 cm/sec
y0 = 3.098 ft

AQUIFER DATA

Saturated Thickness: 14.66 ft
Anisotropy Ratio (Kz/Kr): 1.

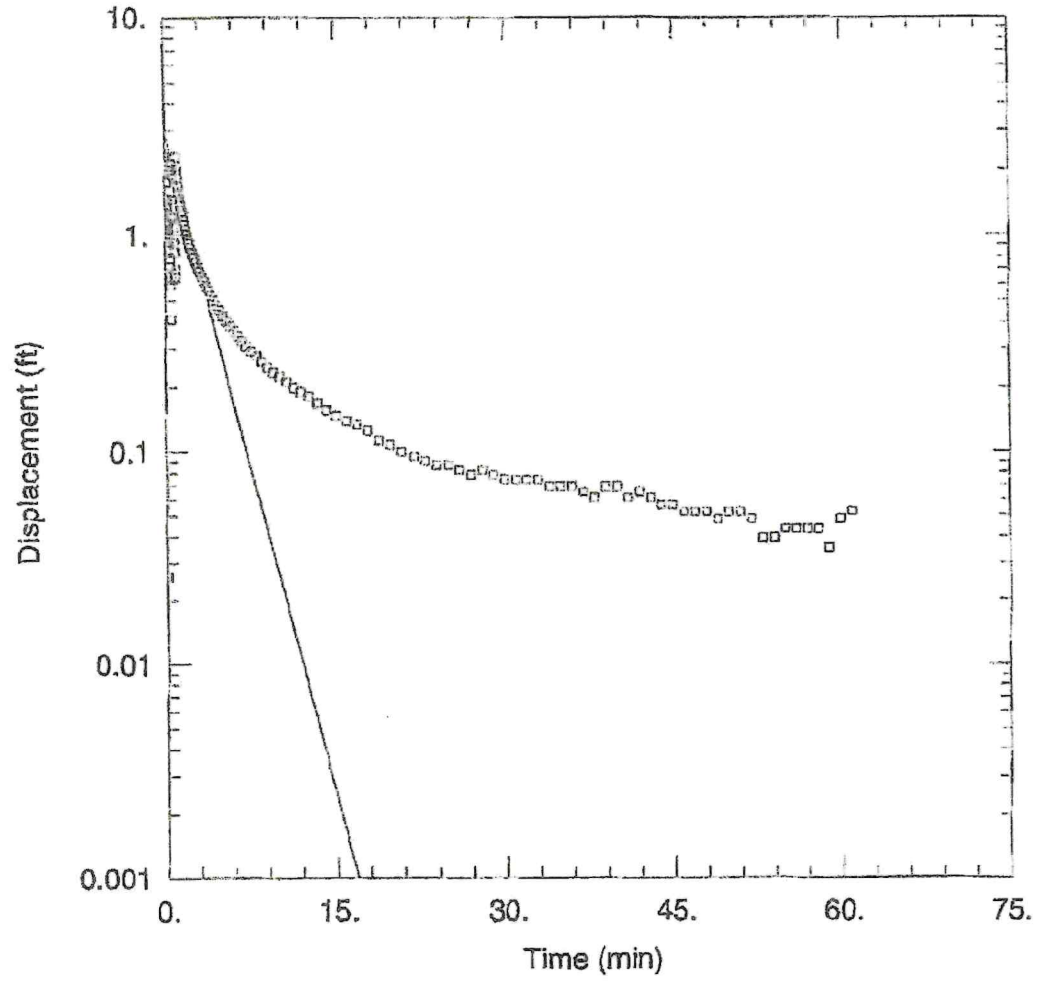
WELL DATA (EE35S)

Initial Displacement: 3.628 ft
Water Column Height: 14.66 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.25

COPY

JJ10S Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\jj10ssout.aqt
Date: 09/05/00 Time: 14:27:24

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0009442 cm/sec
y0 = 2.953 ft

AQUIFER DATA

Saturated Thickness: 20.61 ft
Anisotropy Ratio (Kz/Kr): 1.

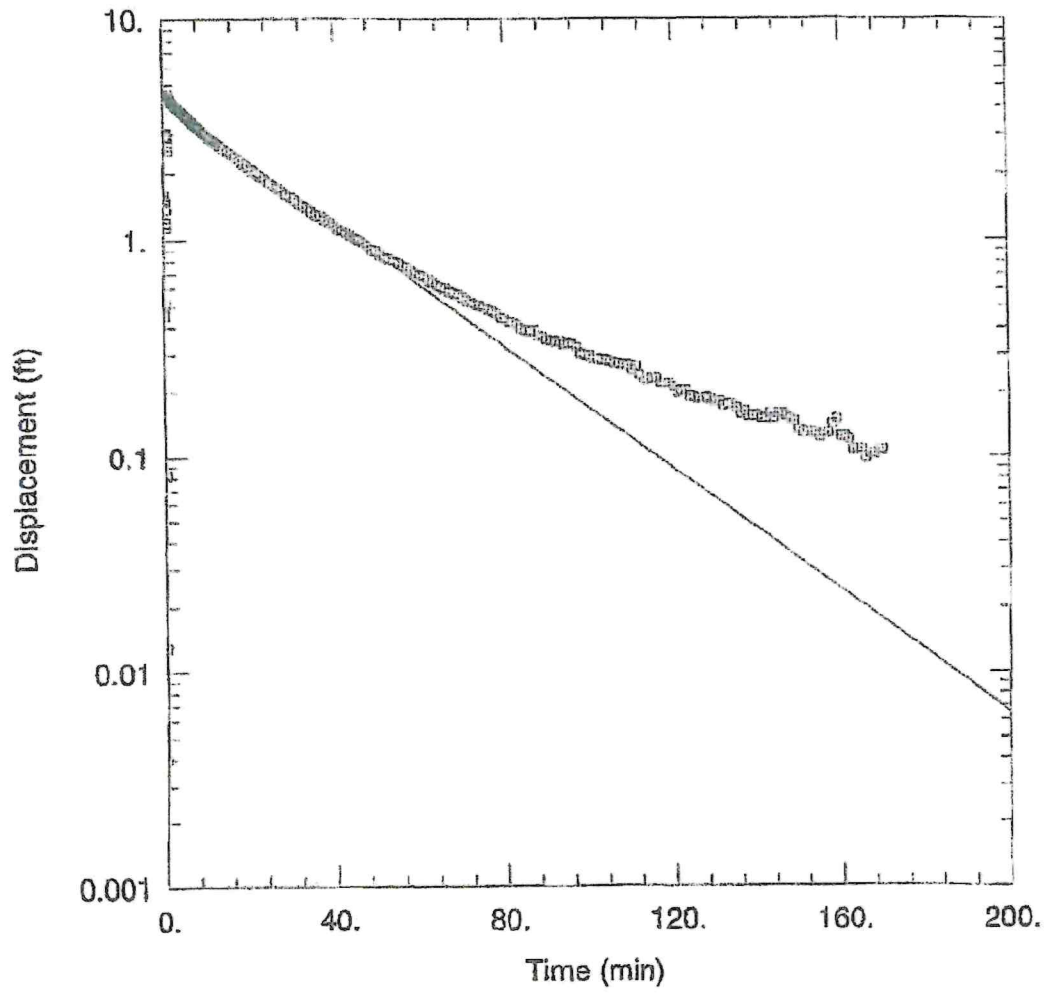
WELL DATA (JJ10S)

Initial Displacement: 2.286 ft
Water Column Height: 20.61 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.28 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY

TT30 Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\tt30out.aqt
Date: 05/17/00 Time: 14:01:38

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 6.277E-05 cm/sec
y0 = 4.347 ft

AQUIFER DATA

Saturated Thickness: 29.89 ft
Anisotropy Ratio (Kz/Kr): 1.

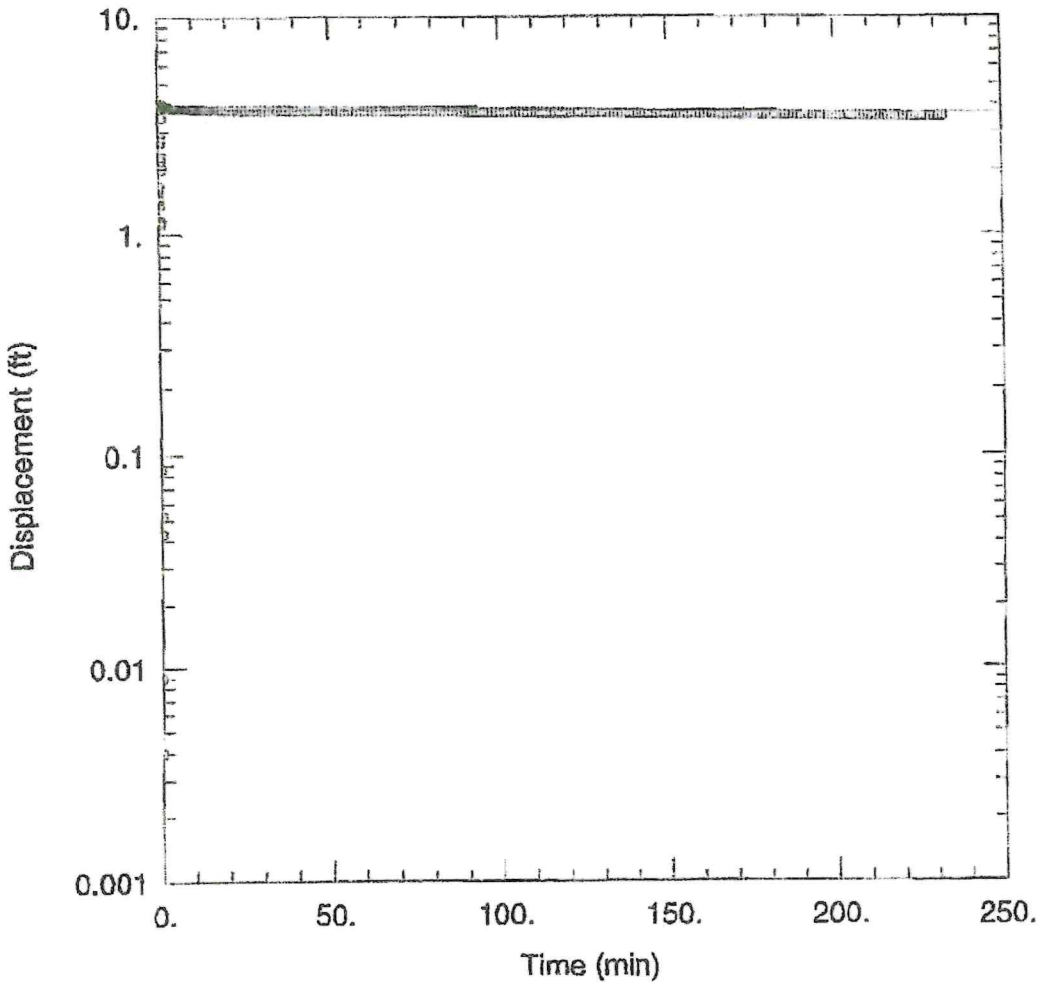
WELL DATA (TT30)

Initial Displacement: 4.505 ft
Water Column Height: 29.89 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY

P20S Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\p20sout.aqt
Date: 05/17/00 Time: 13:59:48

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.17E-07 cm/sec
y0 = 3.778 ft

AQUIFER DATA

Saturated Thickness: 24.99 ft
Anisotropy Ratio (Kz/Kr): 1.

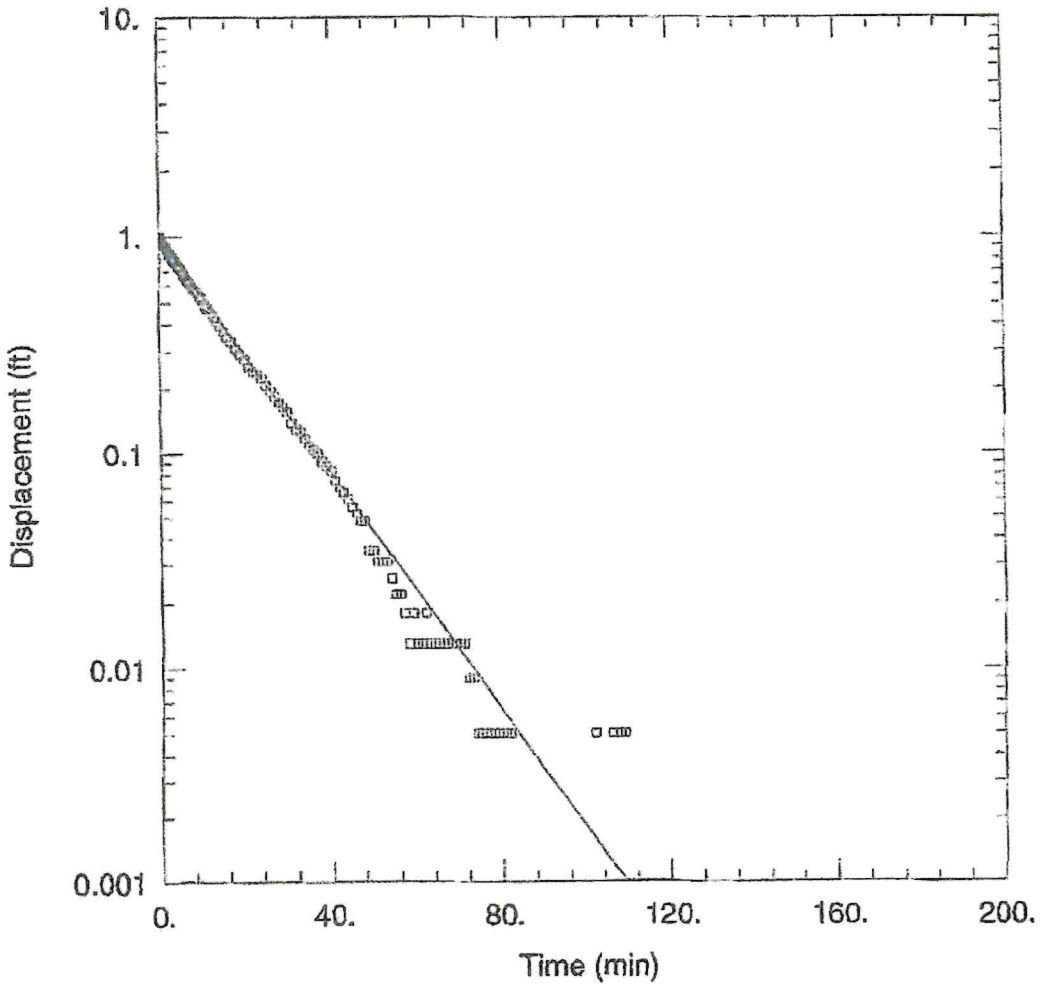
WELL DATA (P20S)

Initial Displacement: 4.03 ft
Water Column Height: 24.99 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY

L35D Falling-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\l35din.aqt
Date: 05/17/00 Time: 14:06:26

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0001767 cm/sec
y0 = 1.023 ft

AQUIFER DATA

Saturated Thickness: 8.3 ft
Anisotropy Ratio (Kz/Kr): 1.

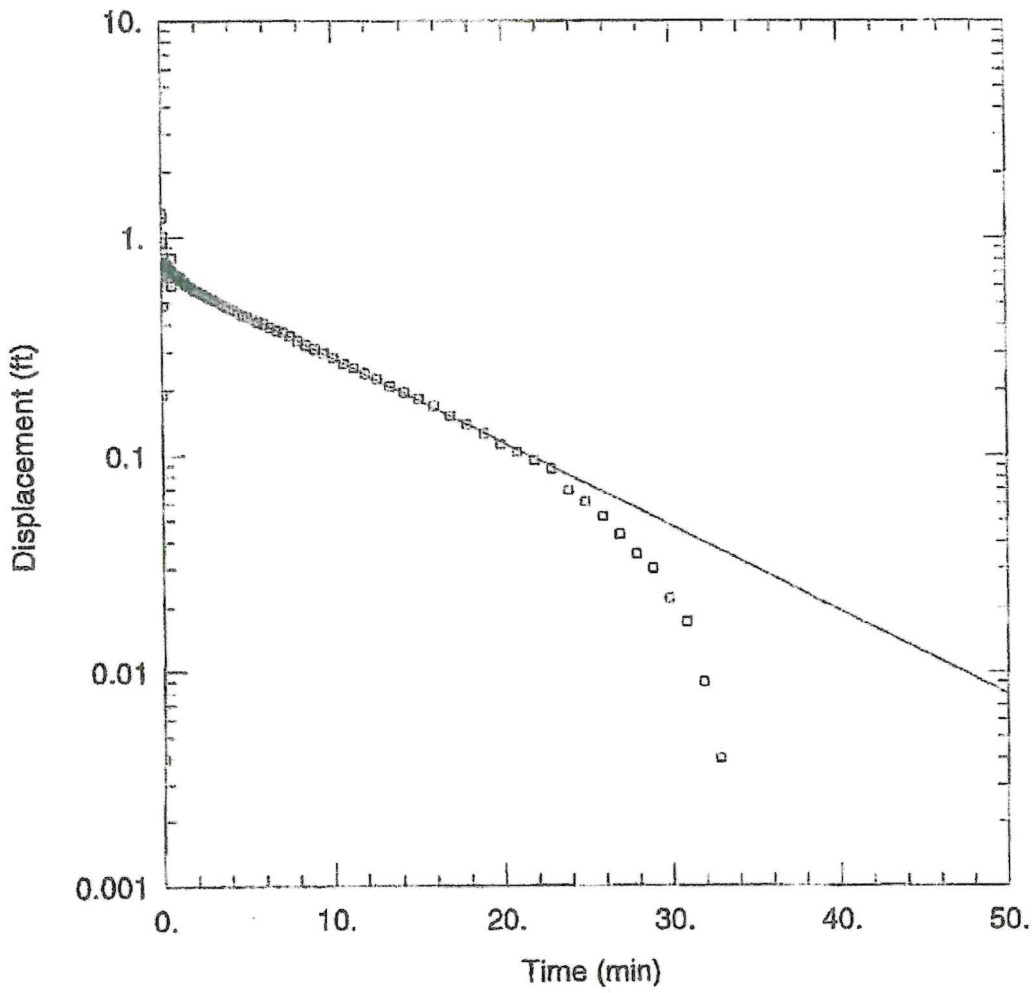
WELL DATA (L35D)

Initial Displacement: 1.008 ft
Water Column Height: 8.3 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.25

COPY

EE35D Falling-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\ee35din.aqt
Date: 05/17/00 Time: 14:03:16

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0001618 cm/sec
y0 = 0.6812 ft

AQUIFER DATA

Saturated Thickness: 21.09 ft
Anisotropy Ratio (Kz/Kr): 1.

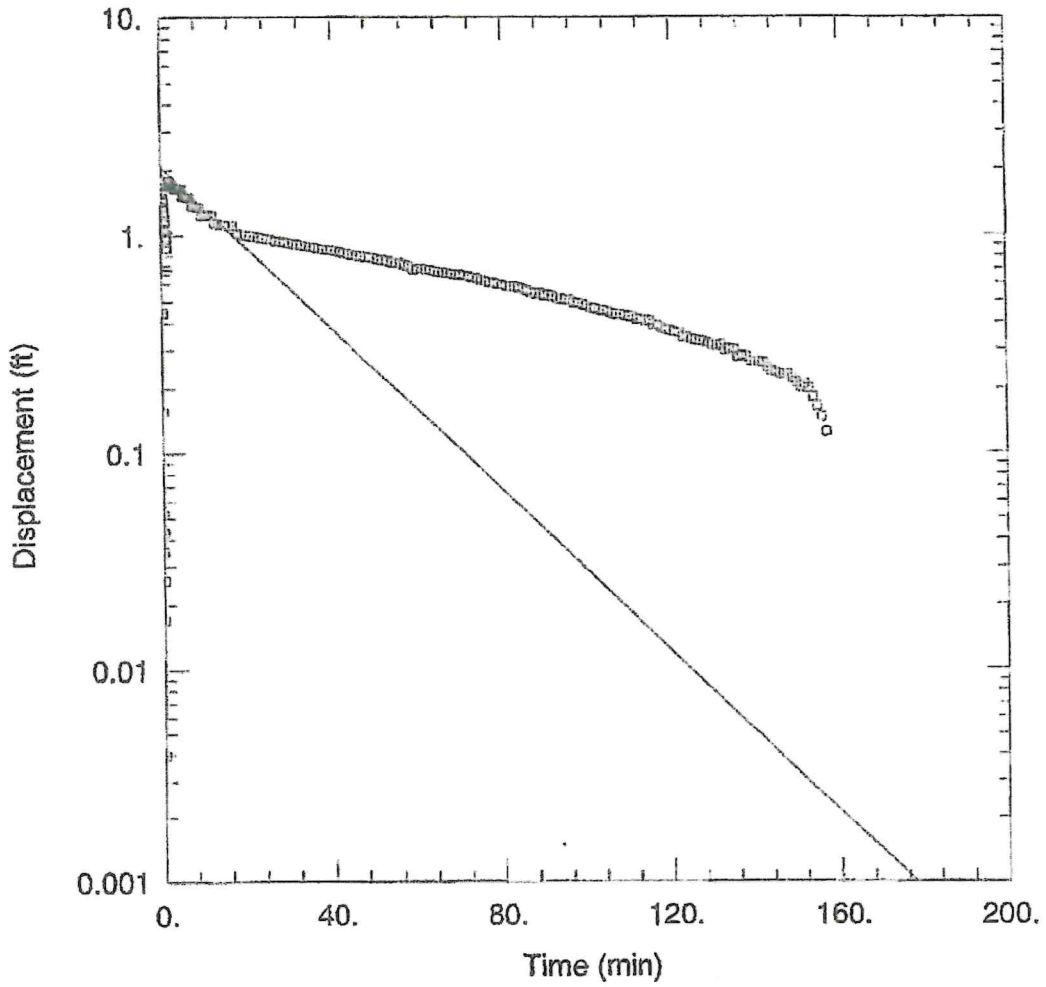
WELL DATA (EE35D)

Initial Displacement: 1.303 ft
Water Column Height: 21.09 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY

JJ10D Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\jj10dout.aqt
Date: 05/17/00 Time: 14:05:44

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 6.685E-05 cm/sec
y0 = 2.077 ft

AQUIFER DATA

Saturated Thickness: 9.92 ft
Anisotropy Ratio (Kz/Kr): 1.

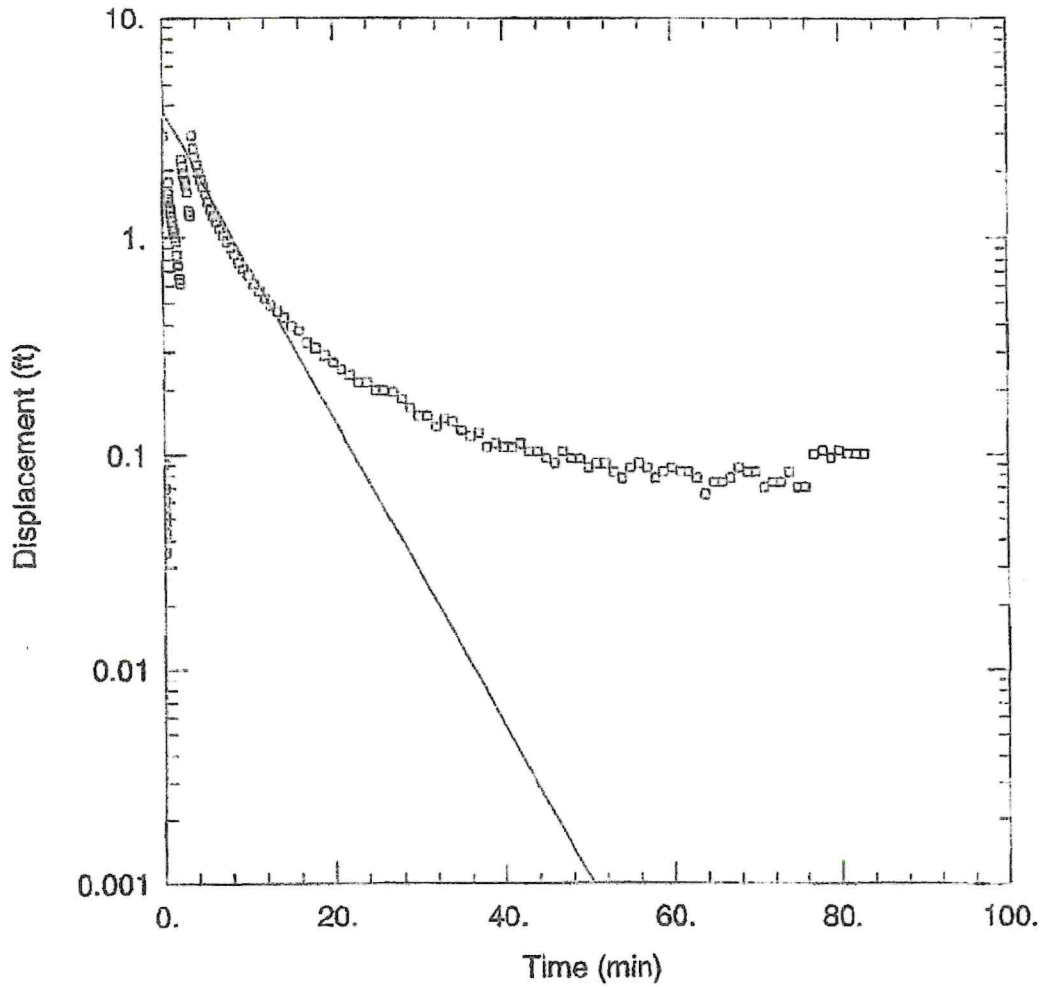
WELL DATA (JJ10D)

Initial Displacement: 1.813 ft
Water Column Height: 9.92 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY

YY35 Rising-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\yy35out.aqt
Date: 05/17/00 Time: 14:07:02

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0005753 cm/sec
y0 = 3.828 ft

AQUIFER DATA

Saturated Thickness: 28.47 ft
Anisotropy Ratio (Kz/Kr): 1.

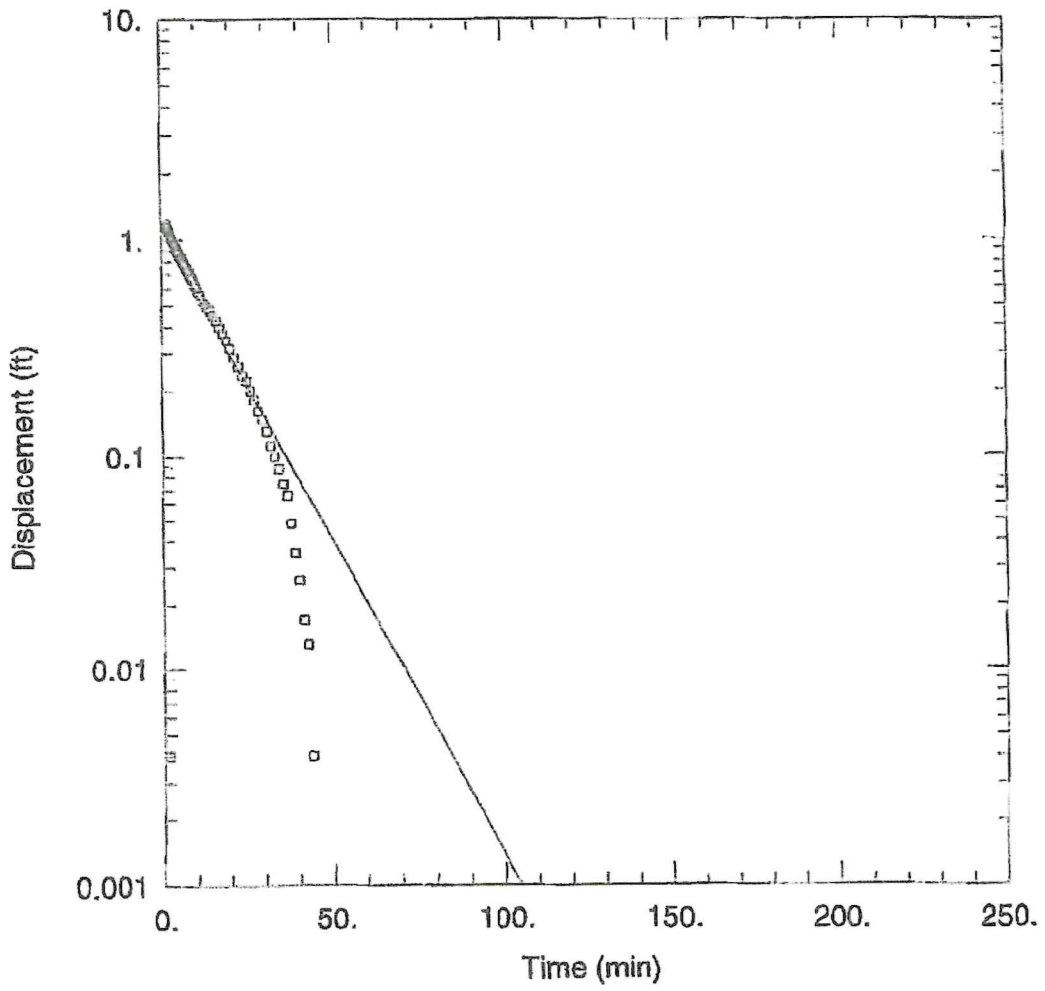
WELL DATA (YY35)

Initial Displacement: 2.906 ft
Water Column Height: 28.47 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 5. ft
Gravel Pack Porosity: 0.25

COPY

P20D Falling-Head Slug Test Analysis

Prepared By:	Prepared For:
EMCON/OWT	TASWA
Project:	**Location:**
805645	Grayson County, Texas



Data Set: C:\taswa\aqt\p20Dout.aqt
Date: 05/17/00 Time: 10:00:57

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.000111 cm/sec
y0 = 1.131 ft

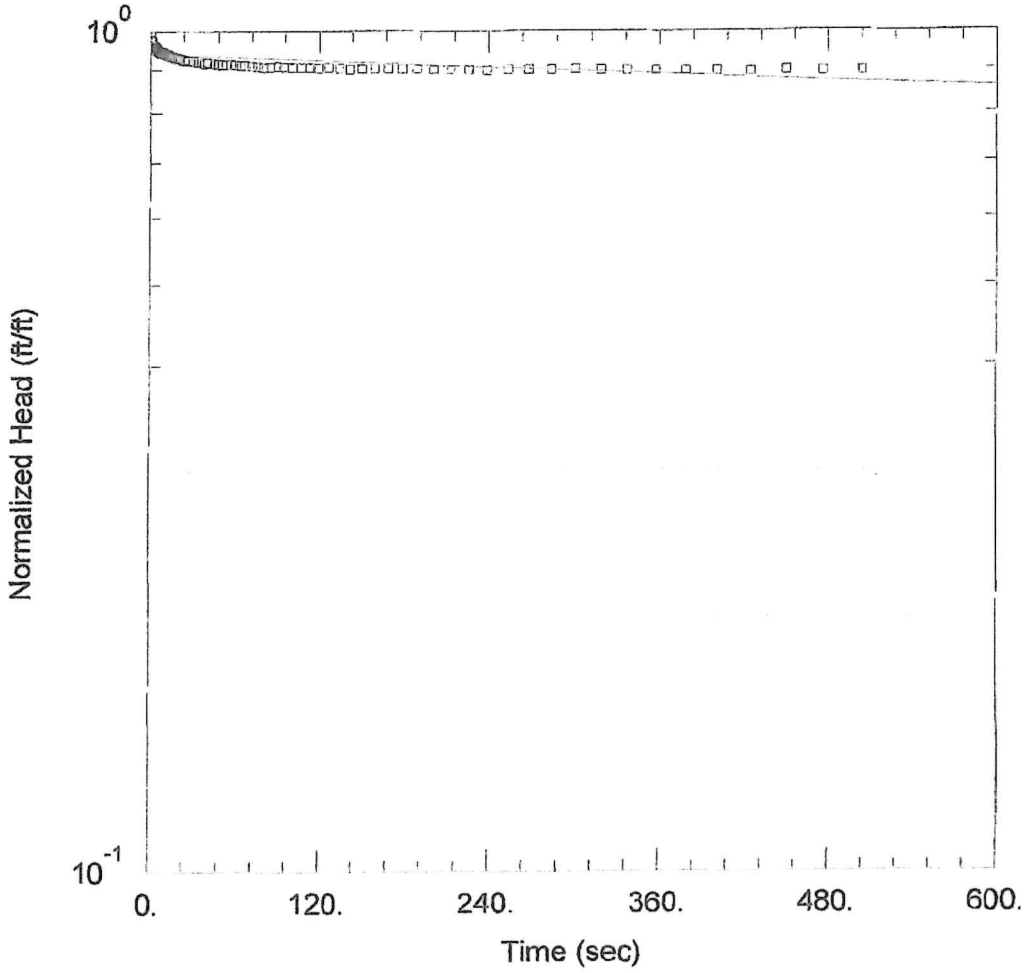
AQUIFER DATA

Saturated Thickness: 13.13 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P20D)

Initial Displacement: 1.181 ft
Water Column Height: 13.13 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.26 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.25

COPY



WELL TEST ANALYSIS

Data Set:
Date: 05/24/23 Time: 15:17:41

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 6D-RH

AQUIFER DATA

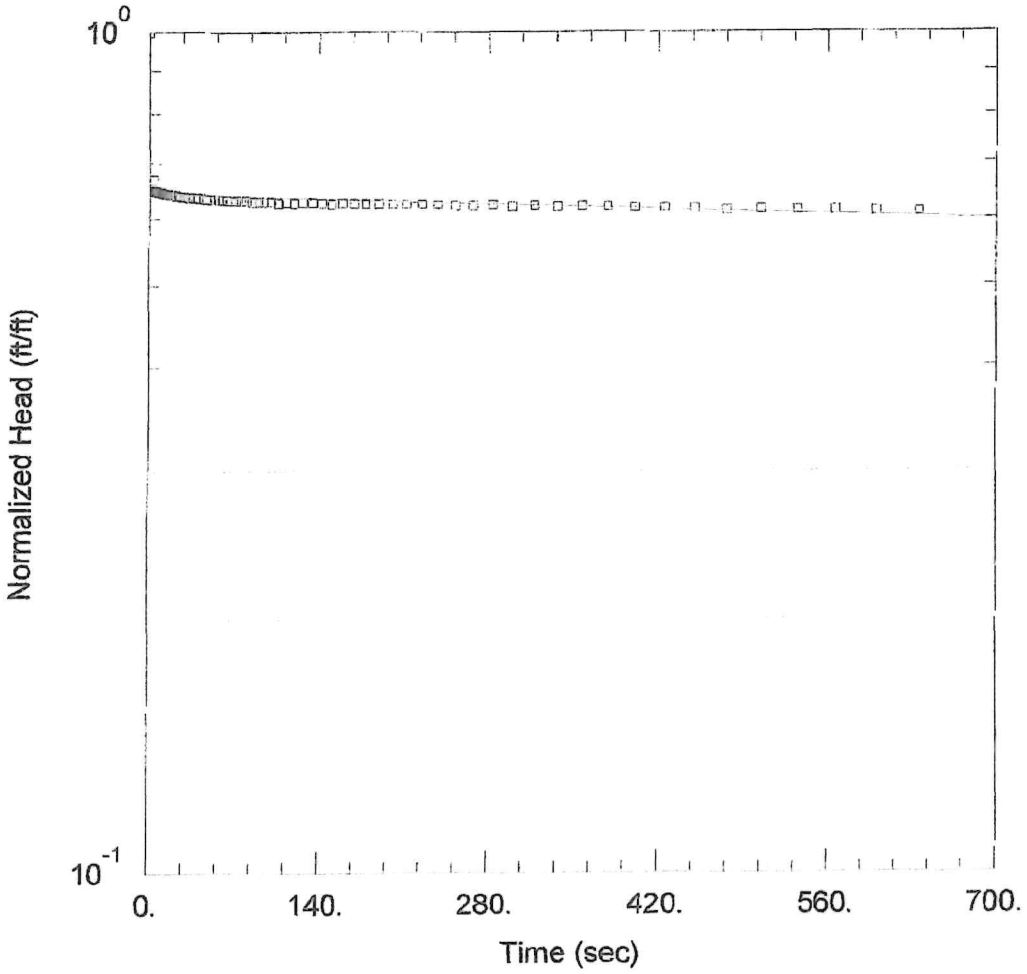
Saturated Thickness: 14.76 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (6D-RH)

Initial Displacement: 4.583 ft
Total Well Penetration Depth: 14.58 ft
Casing Radius: 0.083 ft
Static Water Column Height: 12.79 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 6.206E-6 cm/sec
y0 = 4.305 ft



WELL TEST ANALYSIS

Data Set:
Date: 05/24/23 Time: 15:55:40

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 6D-FH

AQUIFER DATA

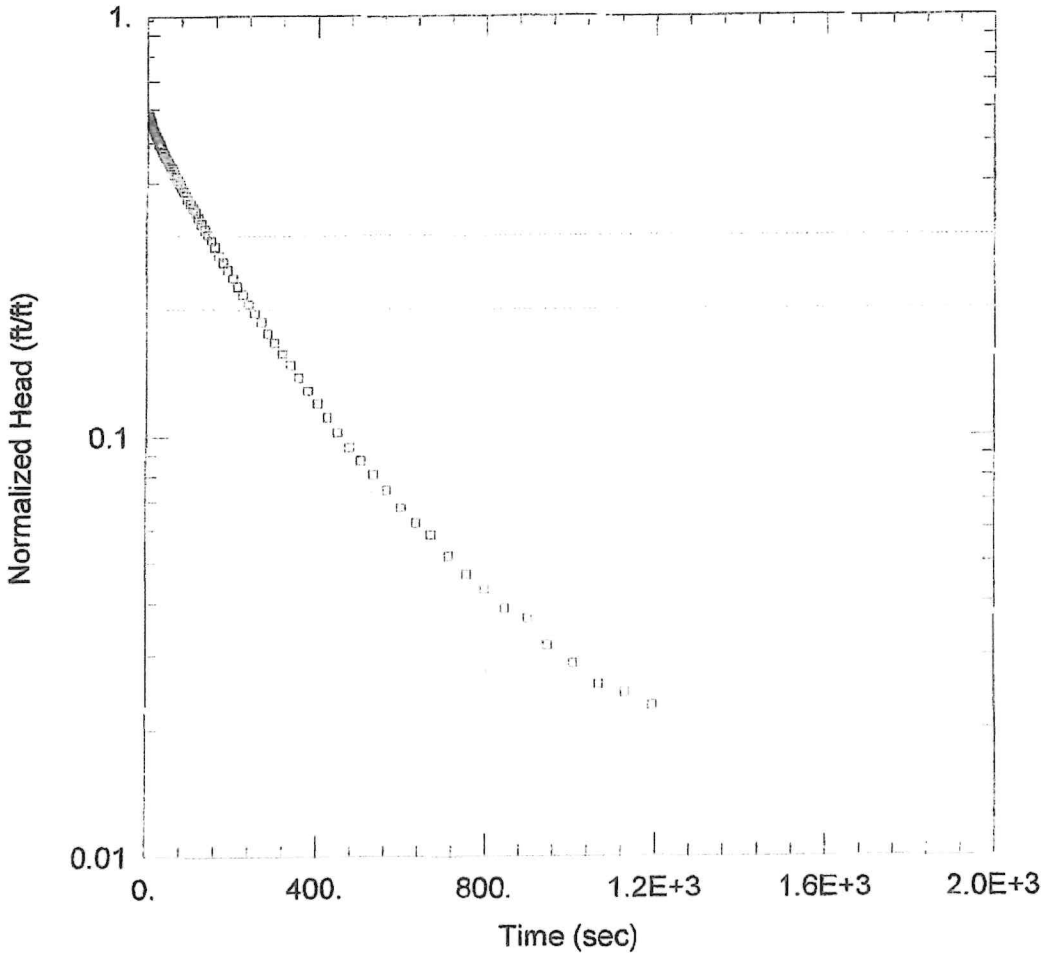
Saturated Thickness: 16.19 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (6D-FH)

Initial Displacement: 6.612 ft
Total Well Penetration Depth: 17.17 ft
Casing Radius: 0.083 ft
Static Water Column Height: 8.779 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.159E-6 cm/sec
y0 = 4.239 ft



WELL TEST ANALYSIS

Data Set: O:\TASWA\Solid Waste\Slug Test VuSitu\P8D-RH.aqt
Date: 05/25/23 Time: 15:51:55

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 8D-RH

AQUIFER DATA

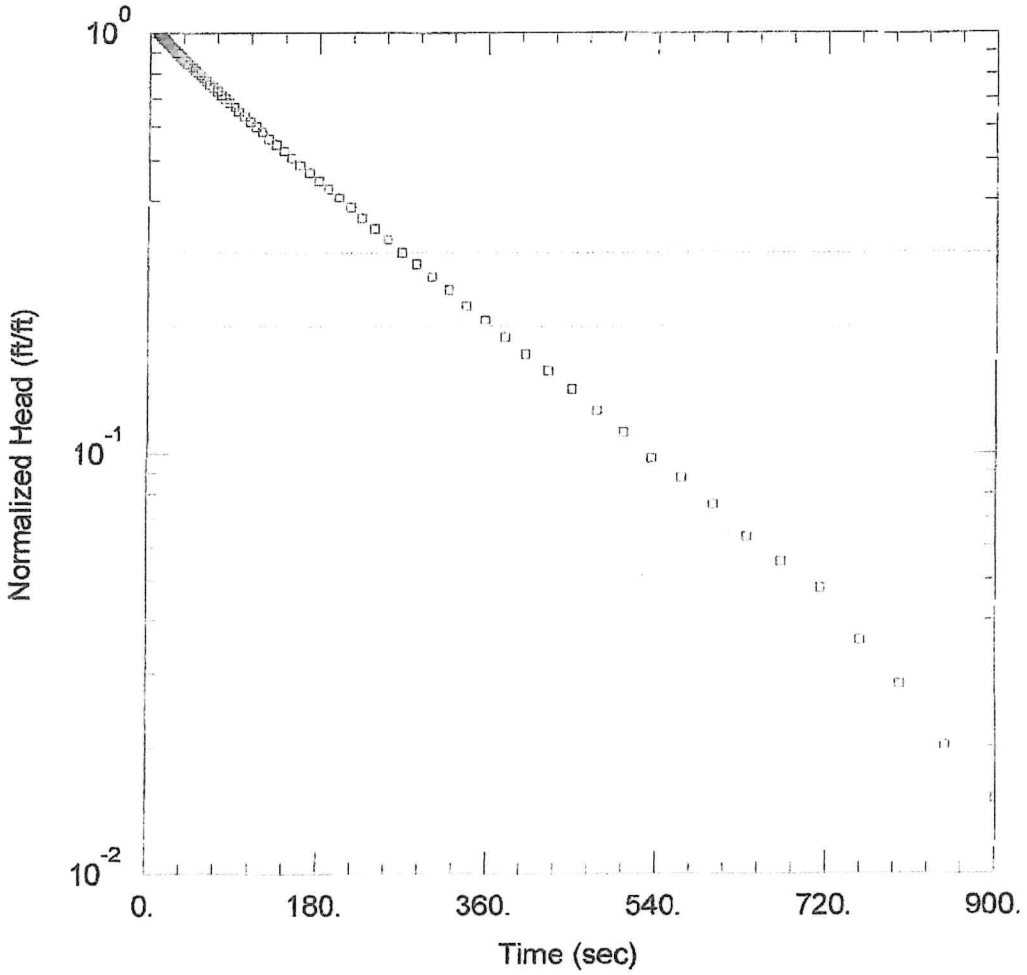
Saturated Thickness: 41.43 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (8D-RH)

Initial Displacement: 7.588 ft
Total Well Penetration Depth: 41.43 ft
Casing Radius: 0.083 ft
Static Water Column Height: 22.83 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined
K = 0.0001735 cm/sec
Solution Method: Bouwer-Rice
y0 = 3.753 ft



WELL TEST ANALYSIS

Data Set:
Date: 05/24/23 Time: 14:41:31

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 8D-FH

AQUIFER DATA

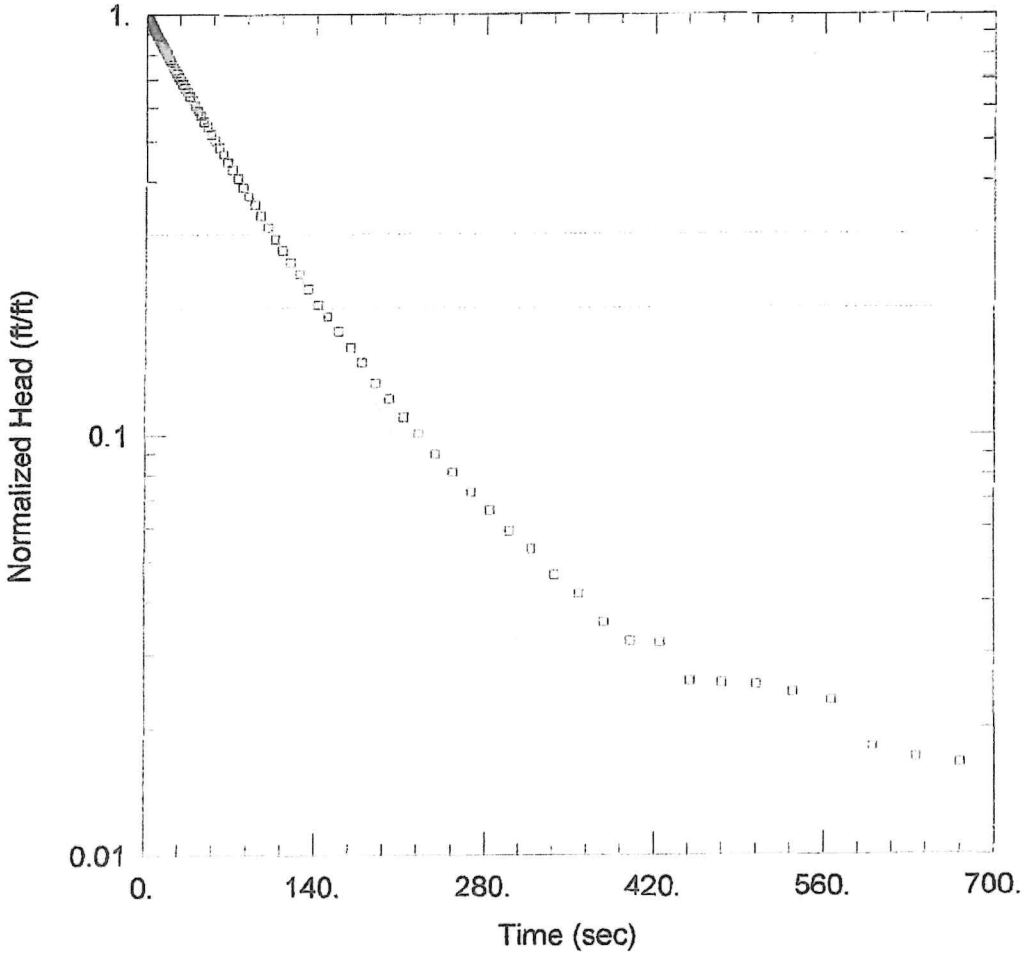
Saturated Thickness: 37.91 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (8D-FH)

Initial Displacement: 4.07 ft
Total Well Penetration Depth: 37.92 ft
Casing Radius: 0.083 ft
Static Water Column Height: 22.82 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.0002123 cm/sec y0 = 4.134 ft



WELL TEST ANALYSIS

Data Set: O:\TASWA\Solid Waste\Slug Test VuSitu\P10D-RH.aqt
Date: 05/25/23 Time: 15:55:58

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 10D-RH

AQUIFER DATA

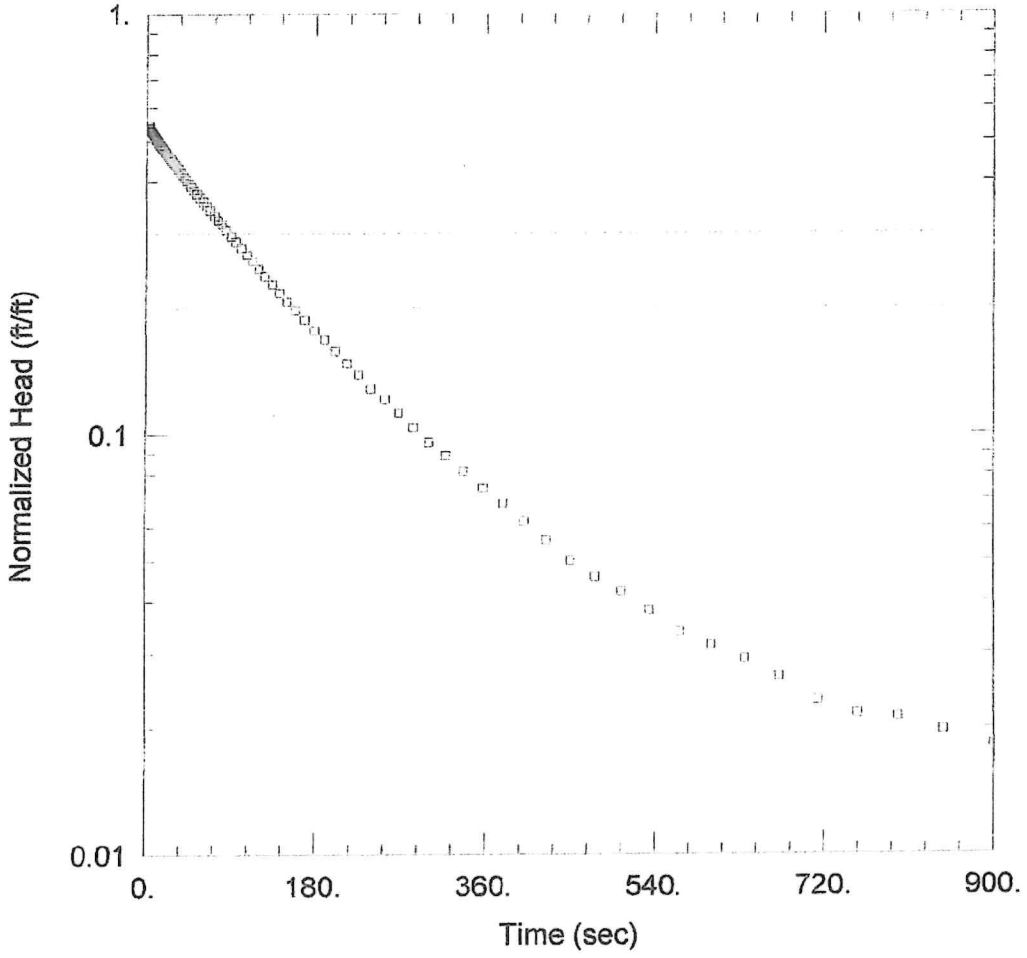
Saturated Thickness: 38.48 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (10D-RH)

Initial Displacement: 3.808 ft
Total Well Penetration Depth: 38.47 ft
Casing Radius: 0.083 ft
Static Water Column Height: 28.04 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0005654 cm/sec
y0 = 3.682 ft



WELL TEST ANALYSIS

Data Set: O:\TASWA\Solid Waste\Slug Test VuSitu\P10D-FH.aqt
Date: 05/25/23 Time: 15:57:33

PROJECT INFORMATION

Company: Biggs and Mathews
Client: TASWA
Test Well: 10D-FH

AQUIFER DATA

Saturated Thickness: 42.35 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (10D-FH)

Initial Displacement: 7.681 ft
Total Well Penetration Depth: 42.34 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.92 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.000315 cm/sec
y0 = 4.046 ft

COMPUTATION SHEET

Project Title: TASWA | Project No.: 202.01.501

Description: Groundwater Flow Velocity Calculations | Sheet 1 of 1

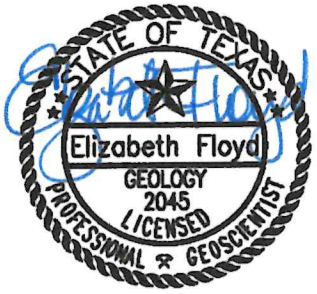
GROUNDWATER VELOCITY CALCULATIONS

Layers II/III and V

$$V = \frac{Ki}{n_e}$$

WHERE:

V = Groundwater Flow Velocity
K = Hydraulic Conductivity
i = Hydraulic Gradient
n_e = Effective Porosity



Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222

2/26/2025

Layer II/III

K	=	3.16E-04	cm/sec	(Geometric mean of Layer II/III K values)
i	=	0.0110	ft/ft	(From Drawings E6-1a through E6-1aa)
n_e	=	0.15		(From Pettijohn, 1975)

$$V = \frac{3.16E\text{-}04 \times 0.0110}{0.15} \times 2835 = 0.066 \text{ ft/day}$$

$$= 0.066 \times 365 = \mathbf{23.98 \text{ ft/year}}$$

Layer V

K	=	1.22E-04	cm/sec	(Geometric mean of Layer V K values)
i	=	0.0155	ft/ft	(From Drawings E6-2a through E6-2aa)
n_e	=	0.15		(From Pettijohn, 1975)

$$V = \frac{1.22E\text{-}04 \times 0.0155}{0.15} \times 2835 = 0.036$$

$$= 0.036 \times 365 = \mathbf{13.05 \text{ ft/year}}$$

Notes:
1) Hydraulic Conductivity (K) value from site specific field permeability tests (BME, 2000 and 2022)
2) 2835 is a multiplyer that converts cm/sec to ft/day

Water Level Elevation Table
Monitoring Wells

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-26
10/1/2004	749.48	742.50	734.35	728.57		726.24	727.14	747.69	656.30	655.97	655.23	654.56	654.56	654.73	654.97	688.13
1/25/2005	755.75	749.66	739.92	731.62	720.85	726.83	727.97	754.90	656.63	656.26	655.61					688.50
1/27/2005												654.92	654.82	654.84	654.95	
5/11/2005	751.63	745.14	739.07	732.06	723.85	727.28	727.97	754.07	657.02	656.60	655.88	655.11	654.92	654.89	654.84	688.78
9/7/2005	750.03	743.44	736.87	729.27		726.64	727.52	748.97	655.72	655.20	654.63	653.66	653.77	653.89	653.89	688.65
11/9/2005	749.60	743.44	735.12	727.69		726.37	727.60	747.37	655.02	654.55						
11/10/2005											654.00	653.08	653.24	653.39	653.44	688.40
2/15/2006	748.99	743.44	733.89	727.26		725.80	727.77	745.82	654.85	654.38	653.81	652.89	653.07	653.27	653.31	688.12
5/24/2006	748.12	743.44	734.74	728.76		725.22	727.31	745.82	654.61	654.16	653.59	652.66	652.83	653.02	653.01	687.96
8/23/2006	747.82	743.24	733.23	726.84		724.91	726.92	745.82	652.64					651.39	651.51	687.46
9/6/2006										652.23	651.73	650.76	651.06			
11/28/2006	747.54		734.29	728.47		725.11	727.07		653.02	652.57	652.03	651.03	651.29	651.64	651.75	687.35
3/20/2007	751.81	745.74	736.47	729.98		725.32	727.03	745.84	653.25	652.90	652.35	651.56	651.67	651.89	651.93	687.68
6/7/2007	752.85	745.82	737.31	731.96		725.84	726.97	749.74	653.47	653.10	652.48	651.56	651.65	651.82	651.89	688.15
8/7/2007	761.05	754.08	739.99	732.61		726.46	726.57	753.10	654.16	653.78	653.09	652.23	652.22	652.34	652.32	688.35
11/28/2007	752.79	745.21	737.59	730.24		726.24	726.27	748.82	654.09	653.61	653.06	652.14	652.17	652.44	652.44	688.30
3/11/2008	755.08	749.36	738.19	731.82		726.12	726.49	752.25	654.67	654.30	653.66	652.79	652.84	652.94	652.99	688.22
6/19/2008	755.80	748.19	739.34	732.04	720.91	726.76	726.32	749.96	655.15	654.74	654.03	653.19	653.19	653.28	653.29	688.60
11/18/2008	750.47		736.03	728.76		725.97	725.90	747.48	654.02	654.06	652.99	651.98	652.19	652.54	652.54	687.71
2/4/2009							725.71									
6/3/2009	751.35	745.64	737.27	731.34		725.11	726.00	750.12	654.17	653.84	653.19	652.29	652.34	652.64	652.69	687.85
8/18/2009						725.49								652.39		
12/1/2009	758.46	751.87	739.82	732.74		724.94	726.27	751.97	654.45	654.10	653.43	652.46	652.50	652.79	652.86	687.97
2/16/2010															653.19	
6/2/2010	758.42	751.22	741.37	733.52	722.65	727.29	725.93	753.51	655.37	654.95	654.25	653.43	653.33	653.59	653.59	689.02

Water Level Elevation Table
Monitoring Wells (Continued)

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-26
8/10/2010							725.71									
12/2/2010	752.94	745.69	738.48	731.44		728.14	726.12	750.22	654.83	654.45	653.83	653.00	652.97	653.29	653.31	688.43
2/17/2011						728.04								653.49		
5/25/2011	752.51	745.64	738.90	732.79	720.78	727.91	726.27	750.22	655.14	654.76	654.10	653.26	653.27	653.61	653.57	688.99
11/10/2011	749.85		733.65			726.44	725.55	747.91	653.25	652.85	652.33	651.34	651.47	651.94	652.07	687.90
5/17/2012	751.98	744.94	736.67	730.54		726.46	725.91	750.82	653.84	653.48	652.85	651.93	651.95	652.24	652.39	688.60
11/14/2012	750.27		737.25	729.21		725.91	725.45	747.69	652.65	652.22	651.71	650.70	650.81	651.31	651.39	687.78
3/20/2013	749.07		738.26	730.49		725.53	725.86	747.82	652.57	652.22	651.68	650.60	650.67	651.16	651.26	687.86
9/18/2013	749.62		738.12	729.53		725.64	725.34	747.41	652.00	651.52	650.95	649.89	650.04	650.63	650.73	687.40
3/6/2014	748.50		738.45	730.90		725.32	725.70	746.80	651.99	651.65	651.05	650.36	650.11	650.63	650.70	687.34
9/9/2014	747.83		738.66	730.37		724.70	725.36	746.19	651.54	651.11	650.54	649.52	649.64	650.25	650.33	686.80
3/26/2015	759.94	755.41	741.70	734.77		725.70	726.30	752.94	652.04	651.65	651.03	650.09	650.12	650.60	650.68	687.05
9/9/2015	757.57	750.05	741.29	731.58		727.43	726.58	754.01	652.52	652.07	651.43	650.44	650.39	650.90	650.93	687.60
3/16/2016	763.67	757.12	744.64	736.29	728.35	729.00	727.12	760.22	653.67	653.37	652.73	651.76	651.66	651.96	652.01	688.42
9/7/2016	758.17	749.89	742.51	733.24		729.26	726.90	754.22	654.52	654.11	653.42	652.49	652.34	652.64	652.67	688.62
9/20/2016		749.61				729.41	727.04		654.59							
11/21/2016										651.27						
3/8/2017	759.77	753.02	743.78	735.29		729.67	727.21	758.22	655.02	654.66	653.99	653.05	652.87	653.17	653.14	688.84
9/14/2017	758.79	750.72	742.09	733.79		730.04	727.47	757.23	655.40	655.00	654.23	653.25	653.14	653.38	653.38	689.18
3/21/2018	756.49	752.71	742.41	734.36		729.56	727.51	758.72	655.69	655.36	654.66	653.69	653.49	653.74	653.70	689.12
9/11/2018	752.20	745.27	740.42	731.84		729.32	727.31	751.71	655.65	655.22	654.55	653.54	653.42	653.77	653.75	688.90
11/26/2018						730.37										
3/26/2019	760.62	755.25	745.14	736.34	727.83	731.21	727.86	758.79	656.22	655.85	655.16	654.26	654.08	654.34	654.26	689.78
9/4/2019	757.20	749.68	742.45	733.17		731.19	728.29	753.75	656.45	655.99	655.30	654.39	654.19	654.48	654.46	689.95
11/26/2019						731.70	728.90									
3/25/2020	763.13	758.32	747.02	737.84	729.05	732.32	729.40	760.37	656.87	656.42	655.70	654.83	654.64	654.88	654.82	690.49
7/9/2020							729.39									

Water Level Elevation Table
Monitoring Wells (Continued)

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-26
9/15/2020	758.57	752.46	743.96	734.67		732.02	729.29	753.77	656.98	656.52	655.88	654.93	654.76	654.96	654.91	690.52
2/22/2021	755.19	748.53	742.28	734.52		731.32	729.22	753.28	656.87	656.40	655.74	654.89	654.78	655.03	654.99	690.43
8/24/2021	758.64	752.36	744.22	734.97		731.92	729.41	754.87	657.22	656.76	656.10	655.18	655.00	655.24	655.18	690.94
3/8/2022	754.51	748.40	741.84	734.38	724.83	731.29	728.91	753.26	657.42	657.00	656.31	655.39	655.20	655.42	655.37	690.76
4/28/2022	758.09	750.04	742.26	735.85	726.93	731.31	728.89	758.07	657.60	657.15	656.43	655.54	655.35	655.56	655.49	690.94
5/31/2022	756.77	748.43	741.42	734.24	722.56	731.46	728.85	754.17	657.64	657.19	656.49	655.57	655.38	655.60	655.55	691.03
6/24/2022	755.96	747.68	740.76	733.56	720.36	731.49	728.78	752.97	657.38	657.08	656.35	655.43	655.25	655.48	655.45	690.92
7/29/2022	753.71	745.35	738.37	731.43		731.09	728.63	750.29	657.33	656.81	656.14	655.16	655.05	655.33	655.31	690.69
8/29/2022	752.45	744.05	736.99	730.26		730.76	728.75	748.97	657.26	656.76	656.14	655.13	655.07	655.35	655.25	690.64
9/22/2022	751.77	743.19	735.93	729.51		730.60	728.61	748.66	657.11	656.61	655.97	654.95	654.92	655.21	655.18	690.44
10/27/2022	751.23	742.23	734.28	727.78		730.32	728.71	748.12	657.03	656.55	655.93	654.93	654.92	655.23	655.20	690.34
11/30/2022	753.24	744.69	739.15	732.79		730.24	728.82	753.23	657.03	656.66	656.11	655.11	655.04	655.26	655.30	690.32
12/28/2022	756.36	747.76	740.33	734.36	718.99	731.19	729.35	756.61	657.28	656.85	656.13	655.20	655.14	655.33	655.38	690.67
1/27/2023	755.80	746.63	740.00	734.39	720.18	730.49	729.17	757.04	657.12	656.73	656.10	655.16	655.08	655.34	655.35	690.50
2/17/2023	758.26	749.64	741.59	735.86	723.83	731.04	729.79	758.27	657.17	656.81	656.21	655.22	655.15	655.38	655.34	690.87
3/23/2023	760.71	751.89	742.65	735.99	727.06	731.18	729.28	758.42	657.31	656.93	656.25	655.33	655.22	655.48	655.52	690.87
4/21/2023	759.85	750.90	742.21	735.09	725.29	731.17	729.10	756.27	657.19	656.82	656.18	655.27	655.15	655.39	655.32	690.88
5/25/2023	758.38	749.40	741.79	734.89	723.91	731.19	729.05	754.53	657.28	656.89	656.22	655.33	655.20	655.42	655.42	690.96
8/15/2023	754.07	745.39	739.29	732.27		730.98	728.97	749.85	657.04	656.57	655.99	655.04	654.96	655.20	655.20	690.67
12/5/2023	751.16	743.03	738.83	732.34	717.57	730.62	729.01	747.96	656.97	656.59	656.01	655.11	655.01	655.20	655.20	690.36
1/29/2024	753.35	744.79	740.38	735.36	721.59	730.78	729.22	749.96	657.27	656.70	656.11	655.26	655.14	655.30	655.29	690.50
2/25/2024	755.40	747.15	741.09	735.67	724.04	731.04	729.23	751.25	657.08	656.72	656.11	655.25	655.14	655.32	655.33	690.66
3/19/2024	755.34	746.49	740.69	735.29	725.05	730.94	729.29	750.98	657.11	656.73	656.14	655.31	655.16	655.37	655.35	690.71
4/25/2024	756.52	747.99	741.48	735.82	726.58	731.12	729.27	752.25	657.26	656.88	656.24	655.40	655.26	655.45	655.43	690.90
6/25/2024	761.12	751.75	743.33	735.00	722.33	732.24	729.81	757.20	657.10	656.48	655.67	655.53	655.70	655.68	691.15	691.15
7/29/2024	758.26	749.03	742.16	734.06	719.00	731.90	729.50	754.08	657.55	657.13	656.52	655.70	655.54	655.72	655.67	691.04
8/26/2024	756.37	747.09	740.63	732.61	DRY	731.45	729.39	752.06	657.31	656.86	656.27	655.44	655.28	655.48	655.42	690. 76

Water Level Elevation Table
Monitoring Wells (Continued)

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	MW-26
9/26/2024	754.27	745.40	739.87	731.90	DRY	731.37	729.69	750.09	657.42	657.00	656.42	655.58	655.45	655.68	655.59	690.83
10/25/2024	752.60	744.23	739.49	731.83	DRY	731.01	729.49	749.18	657.22	656.79	656.19	655.34	655.21	655.48	655.38	690.56
11/25/2024	751.65	743.32	739.27	732.04	DRY	730.71	729.49	748.71	657.23	656.83	656.25	655.39	655.29	655.58	655.47	690.52
12/20/2024	751.09	742.69	731.72	731.92	717.11	731.29	729.20	748.49	657.06	656.68	656.13	655.26	655.18	655.46	655.33	690.19

Water Level Elevation Table
Historical Piezometers

Date	L35(D)	L35(S)	P10	P20(D)	P20(S)	U30	Z20	EE15	EE25	EE35(D)	EE35(S)	JJ10(D)	JJ10(S)	OO15	TT10	TT20	TT30	YY25	YY35
4/4/2000													745.41						
4/5/2000		746.80			734.20	742.73													
4/6/2000		746.88			736.45	743.10					731.29		745.26			720.07	732.68		
4/7/2000		746.89			738.37	743.16					730.97		745.23			726.85	732.73		654.65
4/10/2000		746.80			741.34	743.06					730.84		744.93			732.41	732.43	654.17	654.74
4/11/2000		746.70			742.20	742.99				657.73	730.73		744.78			733.27	732.37	654.31	654.73
4/12/2000		746.60		681.42	742.66	742.99				658.00	730.75								
4/13/2000		746.73		680.53	743.21	743.00	666.53			658.00	730.89		744.67			734.07	732.27	654.64	654.80
4/14/2000	680.55	746.79		680.46	743.65	743.08	666.90			658.03	731.03								
4/17/2000	680.46	746.67		680.38	744.63	742.98	667.30			658.07	731.02		744.60			734.66	732.30	655.10	654.83
4/18/2000	680.49	746.98		680.68	744.95	743.15	667.41		664.54	658.12	731.31		741.60			734.73	732.47	655.22	654.88
4/19/2000	680.51	747.00		680.36	745.13	743.16	667.43	664.03	664.39	658.11	731.33	665.90	744.69			734.78	732.52	655.28	654.89
4/21/2000	680.50	746.63	675.52	680.34	745.32	742.88	667.43	664.03	664.22	658.02	731.05	665.90	744.45	655.65	665.38	734.80	732.22	655.27	654.79
4/25/2000	678.54	746.64	675.85	678.65	732.06	742.81	667.41	664.03	658.30	657.88	731.15	665.90	744.50	655.66	655.38	727.48	731.90	657.16	652.63
5/4/2000	678.34	746.79		678.71	741.52	742.94	667.66		658.41	657.99	731.65								
5/5/2000								658.42				655.98	744.65	655.76	655.49	733.33	731.93	655.15	654.87
5/12/2000	678.60	746.88	675.85	666.57	742.58	742.91	667.67	658.37	658.34	657.94	731.62	655.92	744.84	655.73	655.46	733.74	731.92	655.11	654.83
5/24/2000	678.64	746.85	675.87	678.60	744.49	742.84	667.77	658.33	658.41	658.00	731.46	655.89	744.86	655.80	655.54	733.95	731.65	655.15	654.89
6/29/2000	678.55	746.51	675.68	678.48	744.98	743.47	667.76	658.25	658.34	657.97	731.84	655.89	744.33	655.69	655.40	734.14	731.06	655.09	654.87
7/20/2000	678.50	746.45	675.41	678.40	744.79	742.31	667.62	658.07	658.17	657.80	730.62	655.60	744.33	655.52	655.24	733.99	730.99	654.92	654.66
8/18/2000	678.34	746.33	675.22	678.28	744.58	742.10	667.47	657.91	657.95	657.56	729.81	655.41	744.14	655.32	655.01	733.81	730.77	654.68	654.36
9/22/2000	678.26	746.35	675.11	678.25	744.20	742.14	667.36	657.69	657.68	657.10	729.22	655.00	744.38	655.08	654.81	733.66	730.83	654.27	653.89
10/20/2000	678.21	746.18	675.50	678.33	744.38	742.03	667.54	657.86	657.79	657.27	729.92	655.33	743.93	655.19	654.93	733.84	730.25	654.27	654.03
11/22/2000	678.11	747.30	675.58	678.13	744.65	742.10	668.43	657.79	657.76	657.67	731.22	655.29	744.01	655.14	654.86	734.07	729.97	654.35	654.05
1/3/2001	678.19	750.72	675.09	678.13	744.83	742.13	667.37	657.73	657.81	657.40	732.34	655.25	743.98	655.15	654.89	734.05	729.48	654.52	654.26
1/22/2001	678.39	752.35	675.77	678.24	745.24	742.31	667.44	657.83	657.96	657.56	733.15	655.28	744.03	655.26	654.90	734.71	729.90	654.56	654.32
2/21/2001	678.40	752.33	675.81	678.23	745.22	742.32	667.49	657.85	657.99	657.58	733.18	655.31	744.04	655.24	654.93	734.74	729.96	654.59	654.37
3/23/2001	678.98	757.53	675.58	678.63	746.32	743.43	667.70	658.19	658.34	658.22	736.11	655.70	744.34	655.65	655.34	734.29	729.20	655.31	655.26
4/23/2001		757.71									735.77								

Water Level Elevation Table
Existing Piezometers

	BME-1S	BME-6S	BME-8S	BME-10S	BME-12S	BME-13S	BME-16S	BME-17S	BME-20S	BME-1D	BME-4D	BME-6D	BME-7D	BME-8D	BME-10D	BME-12D	BME-13D	BME-16D	BME-18D	BME-20D
3/8/2022	760.26	747.97	725.54	720.89	729.22	725.24	n/a	n/a	n/a	**665.42**	**663.86**	**655.54**	**655.80**	654.19	654.05	**654.02**	**653.73**	n/a	n/a	n/a
4/28/2022	762.83	747.71	725.72	721.69	729.46	**726.12**	n/a	n/a	n/a	664.76	663.24	654.80	654.73	653.76	653.59	653.57	653.37	n/a	n/a	n/a
5/31/2022	763.27	747.92	**725.98**	**721.71**	**729.64**	725.95	n/a	n/a	n/a	664.71	663.32	654.82	654.78	653.77	653.60	653.57	653.34	n/a	n/a	n/a
6/24/2022	763.07	748.00	725.87	721.19	729.18	725.60	n/a	n/a	n/a	664.52	663.21	654.79	654.64	653.65	653.50	653.44	653.22	n/a	n/a	n/a
7/29/2022	762.81	747.95	725.43	721.00	727.77	723.90	n/a	n/a	n/a	664.15	663.14	654.61	654.46	653.46	653.43	653.21	653.01	n/a	n/a	n/a
8/29/2022	762.22	748.00	725.10	720.65	726.54	722.92	n/a	n/a	n/a	664.03	663.22	654.61	654.45	653.45	653.42	653.17	652.96	n/a	n/a	n/a
9/22/2022	761.82	747.83	724.80	720.30	725.76	722.31	n/a	n/a	n/a	663.87	663.17	654.53	654.35	653.36	653.33	653.08	652.88	n/a	n/a	n/a
10/27/2022	761.56	747.73	724.60	720.11	725.28	721.73	n/a	n/a	n/a	663.73	663.21	654.53	654.32	653.42	653.35	653.12	652.89	n/a	n/a	n/a
11/30/2022	761.38	747.58	725.30	721.04	726.22	722.85	n/a	n/a	n/a	663.78	663.04	654.39	654.43	653.54	653.43	653.22	653.04	n/a	n/a	n/a
12/28/2022	761.24	748.55	725.44	721.01	726.15	723.67	n/a	n/a	n/a	663.94	663.35	655.03	654.64	653.65	653.54	653.33	653.08	n/a	n/a	n/a
1/27/2023	761.39	**750.06**	725.18	720.59	725.84	723.13	n/a	n/a	n/a	663.81	662.99	654.76	654.55	653.63	653.53	653.29	653.02	n/a	n/a	n/a
2/17/2023	761.40	748.92	725.18	720.73	726.04	723.87	n/a	n/a	n/a	663.71	662.77	654.52	654.51	653.57	653.49	653.26	652.99	n/a	n/a	n/a
3/23/2023	762.38	748.85	725.42	720.83	726.41	724.73	n/a	n/a	n/a	663.92	663.02	654.97	654.76	653.72	653.70	653.45	653.18	n/a	n/a	n/a
4/21/2023	763.53	748.57	725.46	720.69	726.57	724.74	n/a	n/a	n/a	663.87	662.86	654.78	654.64	653.62	653.62	653.35	653.12	n/a	n/a	n/a
5/25/2023	763.54	748.52	725.42	720.68	726.79	724.95	n/a	n/a	n/a	663.96	662.94	654.76	654.61	653.65	653.68	653.41	653.19	n/a	n/a	n/a
8/15/2023	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
12/5/2023	761.31	747.96	724.94	719.94	725.99	722.82	722.43	728.86	743.76	663.61	663.01	654.42	654.35	653.62	653.67	653.36	653.01	**672.96**	**659.28**	683.34
1/29/2024	760.84	747.89	725.04	720.24	726.52	723.68	n/a	n/a	n/a	663.78	663.10	654.54	654.37	653.67	653.83	653.45	653.24	n/a	n/a	n/a
2/25/2024	760.78	747.86	725.15	720.16	726.31	724.41	722.63	731.04	**749.58**	663.79	663.14	654.59	654.45	653.68	653.87	653.45	653.09	656.44	657.59	683.43
3/19/2024	760.80	747.78	725.11	720.13	726.19	724.27	722.65	730.65	747.90	663.84	663.14	654.58	654.39	653.70	653.91	653.50	653.64	656.25	657.52	683.51
4/25/2024	760.96	747.80	725.48	720.39	726.62	724.66	722.75	730.87	747.62	663.95	663.25	654.74	654.52	653.75	653.72	653.56	653.22	656.43	657.51	683.64
6/25/2024	763.59	748.08	725.19	720.74	727.91	725.59	**722.95**	**731.96**	749.57	664.12	663.28	654.86	654.71	**655.04**	**654.14**	653.85	653.69	658.11	657.58	**684.01**
7/29/2024	**764.08**	748.16	725.35	721.05	727.57	724.32	722.88	730.49	746.74	664.08	663.28	654.89	654.70	653.92	654.00	653.92	653.60	656.73	657.68	683.97
8/26/2024	763.59	748.09	725.20	721.20	726.41	722.89	722.60	729.49	745.01	663.79	663.10	654.74	654.51	653.74	653.76	653.78	**653.97**	662.66	657.40	683.58
9/26/2024	763.43	748.14	725.47	721.06	725.48	722.03	722.68	728.90	743.69	663.91	663.33	654.92	654.66	653.96	653.87	654.01	653.66	657.77	657.55	683.49
10/25/2024	762.80	747.95	725.12	720.79	724.82	721.46	722.50	728.37	742.68	663.63	663.16	654.78	654.53	653.72	652.93	653.76	653.34	656.60	657.09	683.09
11/25/2024	762.51	747.86	725.13	720.84	724.87	721.17	722.40	727.97	742.05	663.63	663.18	654.80	654.61	653.79	653.69	653.80	653.39	656.45	657.29	682.99
12/20/2024	762.17	747.55	724.89	720.90	724.73	720.81	722.03	727.56	741.43	663.49	662.93	654.58	654.39	653.68	653.58	653.35	653.30	655.95	657.13	682.75

APPENDIX E7

HISTORICAL GROUNDWATER ANALYTICAL DATA

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-1	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.60	2520	1538	0.50	296	15.7	892	315	64.1	5.48	99.3	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.49	1020	344	<0.10	258	6.3	70	91	9.6	<5	40.5	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.63	2493	2180	0.41	242	10.5	1420	442	72.6	6.47	109	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.73	2177	1604	0.17	258	9.5	1000	325	49.8	5.21	87.1	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.60	2040	2129	0.33	266	9.2	1470	353	63.8	5.72	96.2	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.66	1976	2686	0.83	337	12.2	1780	488	102.0	8.35	129	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.85	1935	1915	0.41	269	9.9	1200	383	75.5	7.81	106	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.77	1692	891	0.14	199	9.1	498	190	28.9	<5	67.2	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.71	2482	1398	0.31	258	8.9	800	308	57.9	5.89	90.3	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.53	2398	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.75	1561	643	<0.10	248	6.0	286	162	19.3	<5	47.3	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.99	1089	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.47	2461	2527	0.56	264	9.1	1630	539	92.6	8.32	118	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.74	1515	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.45	2175	2442	0.26	242	7.5	1620	525	71.5	7.17	92	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.51	2702	2198	0.34	246	8.44	1580	301	80.2	8.11	99	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	6.49	1533	899	<0.10	261	7.16	497	185	26.1	<5	55.3	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	6.87	1712	646	<0.10	248	5.90	314	137	18.1	<5	48.8	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	6.87	1712	651	<0.10	245	6.28	311	144	18.8	<5	50.1	n/a	n/a
	6/2/2010	<5	<5	17.3	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.89	2171	2169	<0.100	242	6.92	1430	467	60.2	5.49	80.3	n/a	n/a
	12/2/2010	<5	<5	15.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.71	2808	2463	0.38	230	8.01	1570	570	85.9	6.56	109	<0.259	1.91
	5/25/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.60	1829	987	<0.100	246	6.29	540	230	30.6	<5	58.8	0.271	0.0674
	11/10/2011	<5	<5	12.7	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.72	2186	1895	0.15	248	7.86	1200	400	66.4	6.50	92.3	0.409	0.984
	11/10/2011	<5	<5	12.1	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.72	2186	1936	0.15	246	8.22	1220	424	69.7	6.17	86.8	<0.100	1.00
	5/17/2012	<5	<5	12.0	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.64	1762	1976	0.25	264	8.10	1240	423	70.3	7.44	97.1	<0.100	0.991
	11/14/2012	<5	<5	11.1	<4	<2	<20	<5	<10	<15	20.6	<50	<10	<1	<10	<100	6.31	2337	2113	0.14	244	7.99	1380	453	62.8	5.96	83.2	0.580	0.847
	11/14/2012	<5	<5	10.9	<4	<2	<20	<5	<10	<15	20.0	<50	<10	<1	<10	<100	6.31	2337	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/20/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.70	1973	2460	0.30	260	8.9	1600	510	85.0	7.5	120	<0.10	1.8
	9/18/2013	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.07	1650	936	<0.10	260	6.8	590	140	19.0	3.2	49	<0.100	0.14
	3/6/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.52	1990	1006	<0.10	280	5.8	580	190	28.0	3.7	61	<0.100	0.51
	9/9/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.92	1541	625	<0.10	270	5.5	280	130	20.0	3.5	53	<0.100	0.20
	3/26/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.72	1213	382	<0.10	260	4.4	90	100	14.0	<3	46	0.120	0.20
	9/9/2015	<5	<5	20	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.89	2882	2650	0.36	240	7.9	1800	540	76.0	7.4	100	0.370	1.70
	3/16/2016	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.87	1349	455	<0.10	260	3.8	140	120	14.0	3.1	46	<0.100	0.018
	9/7/2016	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.71	2064	857	<0.10	260	5.3	440	200	25.0	3.7	55	<0.100	0.058
	3/8/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.01	1641	1022	<0.10	280	5.3	610	190	22.0	3.5	54	<0.100	0.220
	9/14/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	1862	1068	<0.10	240	6.6	690	170	26.0	3.8	54	<0.100	0.070
	3/21/2018	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.69	1934	1044	<0.10	260	5.2	560	250	32.0	5.7	63	<0.100	0.170
	9/11/2018	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.00	2846	2705	0.28	270	8.0	1800	570	76.0	7.7	110	0.120	1.30
	3/26/2019	<5	<5	19	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.81	1963	1771	<0.10	260	<10	1100	430	43.0	4.9	65	<0.100	<0.010
	9/4/2019	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.67	1718	1603	<0.10	270	5.1	1000	350	43.0	4.7	67	<0.100	0.033
	3/25/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.83	1293	524	<0.10	290	5.4	170	140	16.0	3.1	47	<0.100	0.032
	9/15/2020	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.84	1720	1494	<0.10	250	3.8	900	360	39.0	4.5	64	<0.100	0.018
	2/22/2021	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.73	2275	1774	<0.10	270	7.4	1100	400	52.0	5.3	77	<0.100	0.290
	8/24/2021	<5	<5	16	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.71	1668	1431	<0.10	280	4.5	850	340	36.0	4.1	59	0.720	0.026
	3/8/2022	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.43	2328	2022	0.15	270	6.1	1300	430	61.0	5.8	86	<0.100	0.630
	8/29/2022	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.87	2640	2562	0.23	270	8.7	1700	540	77	7.1	96	<0.100	1.0
	2/15/2023	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.69	1361	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	18	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.70	2086	n/a	<0.10	240	11.0	1800	580	71.0	6.2	83	<0.100	0.280
	2/21/2024	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.72	1581	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	20	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.82	2290	n/a	<0.10	250	13.0	1400	490	53.0	5.5	75	<0.100	0.063

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-2	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.90	545	330	<0.10	277	7.5	49.8	106	8.2	<5	21.8	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.56	611	279	<0.10	268	2.5	26.2	103	<5	<5	15.1	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.94	556	265	<0.10	256	2.5	23.6	100	<5	<5	12.7	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.30	581	301	<0.10	253	<5	48.0	104	7.3	<5	17.4	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	6.6	<5	n/a	n/a	<20	7.01	568	311	<0.10	256	3.3	47.0	107	8.6	<5	18.8	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.02	579	338	<0.10	312	3.3	46.4	108	7.9	<5	18.9	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.05	649	319	<0.10	258	3.3	47.6	112	10.1	<5	19.5	n/a	n/a
	8/25/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.00	642	324	<0.10	273	4.2	47.4	111	8.4	<5	18.6	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.96	554	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.12	605	295	<0.10	262	2.9	38.5	108	<5	<5	16.9	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.29	514	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.80	570	323	<0.10	276	4.4	50.3	115	<5	<5	17.1	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.03	589	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.84	582	330	<0.10	254	5.1	61.8	114	5.1	<5	19.3	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.84	582	334	<0.10	257	4.8	62.3	116	5.1	<5	19.5	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	5.69	<5	<1	<50	<20	6.85	499	337	<0.10	295	<5	61.4	109	<5	<5	21.7	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.10	638	362	<0.10	279	5.4	74.9	122	<5	<5	22.3	n/a	n/a
	6/2/2010	<5	<5	52.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.20	602	347	<0.100	267	4.22	62.1	124	5.6	<5	20.2	n/a	n/a
	12/2/2010	<5	<5	16.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.05	630	306	<0.100	243	3.97	53.3	111	<5	<5	18.0	<0.259	<0.0150
	5/25/2011	<5	<5	13.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	522	340	<0.100	245	3.90	72.0	117	7.6	<5	19.4	<0.100	<0.0150
	5/17/2012	<5	<5	55	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.88	598	406	<0.100	305	4.09	83.4	138	6.1	<5	24.7	<0.100	<0.0150
	3/26/2015	<5	<5	54	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.79	632	333	<0.10	280	4.1	55	110	5.1	<3	21	0.30	<0.010
	9/9/2015	<5	<5	48	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.24	605	352	<0.10	290	4.1	67	110	5.5	<3	23	<0.100	<0.010
	3/16/2016	<5	<5	66	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.13	623	337	<0.10	260	3.7	59	120	4.1	<3	22	<0.100	<0.010
	9/7/2016	<5	<5	26	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.96	625	333	<0.10	280	4.1	56	110	7.0	<3	18	<0.100	<0.010
	9/20/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.86	623	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/8/2017	<5	<5	58	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.24	636	364	<0.10	290	3.8	70	120	4.5	<3	23	<0.100	<0.010
	9/14/2017	<5	<5	47	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.09	644	335	<0.10	270	3.3	63	110	5.2	<3	21	<0.100	<0.010
	3/21/2018	<5	<5	46	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.96	608	320	<0.10	270	3.2	52	110	4.5	<3	18	<0.100	<0.010
	9/11/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.04	625	344	<0.10	280	3.6	58	120	6.5	<3	18	<0.100	<0.010
	3/26/2019	<5	<5	37	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.02	607	316	<0.10	280	<3	47	110	5.0	<3	16	<0.100	<0.010
	9/4/2019	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.85	486	335	<0.10	280	3.7	61	110	6.6	<3	16	0.310	<0.010
	3/25/2020	<5	<5	52	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	555	337	<0.10	300	<3	48	120	4.9	<3	17	<0.100	<0.010
	9/15/2020	<5	<5	46	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	608	322	<0.10	260	<3	53	120	4.9	<3	16	<0.100	<0.010
	2/22/2021	<5	<5	19	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.68	680	339	<0.10	290	<3	53	120	5.7	<3	18	<0.100	<0.010
	8/23/2021	<5	<5	24	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	593	342	<0.10	300	<3	54	120	5.3	<3	15	<0.100	<0.010
	3/8/2022	<5	<5	19	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.75	652	343	<0.10	310	<3	48	120	5.7	<3	17	<0.100	<0.010
	9/1/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.96	588	320	<0.10	240	3.4	64	110	7.6	<3	17	<0.100	<0.010
	2/15/2023	<5	<5	39	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.84	668	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.84	542	n/a	<0.10	280	3.2	67	130	6.9	<3	20	<0.100	<0.010
	2/21/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.92	642	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.01	656	n/a	<0.1	290	<3	61	120	6.0	<3	20	<0.1	<0.010

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-3	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.4	<5	n/a	n/a	<20	6.57	600	346	<0.10	323	7.1	44.2	85	12.5	<5	38.3	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	6.5	<5	n/a	n/a	<20	7.43	662	340	<0.10	248	3.9	84.2	80	14.5	<5	36.3	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	6.6	<5	n/a	n/a	<20	6.84	610	310	<0.10	260	3.7	50.2	78	13.0	<5	38.0	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.4	<5	n/a	n/a	<20	7.04	615	318	<0.10	291	4.5	39.2	84	11.1	<5	36.8	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	8.0	<5	n/a	n/a	<20	6.97	608	333	<0.10	288	3.5	44.7	87	13.3	<5	43.5	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.3	<5	n/a	n/a	<20	6.99	602	369	<0.10	349	4.5	50.5	87	12.1	<5	43.6	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	7.9	<5	n/a	n/a	<20	6.81	617	315	<0.10	282	2.9	33.4	88	14.1	<5	37.6	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	6.2	<5	<2	<50	<20	7.09	686	295	<0.10	182	4.9	50.9	91	12.5	<5	46.6	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	5.7	<5	<2	<50	<20	7.04	624	320	<0.10	284	4.0	30.1	95	13.4	<5	37.6	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.83	626	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	6.0	<5	<2	<50	<20	6.86	666	326	<0.10	270	3.3	55.5	83	14.0	<5	38.0	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.10	528	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	7.0	<5	<2	<50	<20	6.63	591	327	<0.10	282	3.9	48.6	82	13.7	<5	39.6	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.86	594	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	6.2	<5	<2	<50	<20	6.73	563	315	<0.10	257	4.2	49.4	82	14.0	<5	38.9	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	7.4	<5	<2	<50	<20	6.86	630	316	<0.10	283	3.11	41.9	82	13.0	<5	37.1	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	8.80	<5	<1	<50	<20	6.79	520	346	<0.10	306	4.25	51.5	86	12.6	<5	40.4	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	6.30	<5	<1	<50	<20	6.96	618	344	<0.10	243	4.03	101	72	12.9	<5	34.3	n/a	n/a
	6/2/2010	<5	<5	23.6	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.00	657	363	<0.100	285	3.57	73.0	91.8	14.0	<5	40.0	n/a	n/a
	12/2/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.96	668	315	<0.100	251	3.17	49.6	84.9	11.8	<5	42.1	<0.259	<0.0150
	5/25/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.74	520	326	<0.100	271	3.20	48.8	87.7	14.2	<5	39.2	0.156	<0.0150
	11/10/2011	<5	<5	54.5	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.05	634	360	<0.100	272	7.30	62.0	89.4	12.6	<5	54.5	0.177	<0.0150
	5/17/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.81	546	370	<0.100	279	3.40	75.3	90.0	16.2	5.12	43.1	<0.100	<0.0150
	11/14/2012	<5	<5	11.0	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.61	701	313	<0.100	284	3.24	44.2	78.8	12.0	<5	34.9	<0.228	<0.0150
	3/20/2013	<5	<5	10.5	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.79	905	325	<0.10	290	3.0	36	87	13.0	<5	43	<0.10	<0.015
	9/18/2013	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.00	804	325	<0.10	310	3.8	34	83	13.0	3.1	36	<0.100	<0.010
	3/6/2014	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.75	875	338	<0.10	310	4.0	36	89	13.0	3.5	40	<0.100	<0.010
	9/9/2014	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.92	781	334	<0.10	290	4.7	41	90	13.0	3.4	39	<0.100	<0.010
	3/26/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.73	729	368	<0.10	270	4.3	83	83	16.0	4.4	45	<0.100	<0.010
	9/9/2015	<5	<5	41	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.17	654	379	<0.10	290	5.6	78	90	14.0	3.8	45	<0.100	<0.010
	3/16/2016	<5	<5	17	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.01	673	365	<0.10	270	3.9	65	98	15.0	4.5	46	<0.100	<0.010
	9/7/2016	<5	<5	57	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.95	713	398	<0.10	310	8.6	65	96	13.0	3.3	60	<0.100	<0.010
	3/8/2017	<5	<5	62	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.24	716	427	<0.10	330	9.3	75	87	11.0	3.1	79	<0.100	<0.010
	9/14/2017	<5	<5	62	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	760	408	<0.10	310	8.7	75	77	11.0	<3	84	<0.100	<0.010
	3/21/2018	<5	<5	67	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.91	732	420	<0.10	320	7.2	81	78	9.5	3.6	83	<0.100	<0.010
	9/11/2018	<5	<5	46	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.00	698	375	0.14	310	4.2	60	92	12.0	3.1	51	<0.100	<0.010
	3/26/2019	<5	<5	64	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.05	753	430	<0.10	340	7.8	81	73	8.9	<3	92	<0.100	<0.010
	9/4/2019	<5	<5	72	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.91	603	435	<0.10	350	8.0	80	75	8.9	<3	91	<0.100	<0.010
	3/25/2020	<5	<5	70	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.91	689	454	<0.10	370	5.5	78	80	8.9	<3	100	<0.100	<0.010
	9/15/2020	<5	<5	62	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	752	402	<0.10	290	5.3	81	78	10.0	<3	85	<0.100	<0.010
	2/22/2021	<5	<5	68	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	845	441	<0.10	340	5.3	83	80	10.0	<3	96	<0.100	<0.010
	8/23/2021	<5	<5	61	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	724	427	<0.10	340	5.1	80	78	9.5	<3	87	0.110	<0.010
	3/8/2022	<5	<5	66	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.86	784	429	<0.10	330	5.1	82	80	10.0	<3	90	<0.100	<0.010
	8/29/2022	<5	<5	70	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.02	766	434	<0.10	340	6.2	89	74	9.0	<3	89	<0.100	<0.010
	2/15/2023	<5	<5	46	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.89	669	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	60	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.92	654	n/a	<0.10	300	6.5	89	84	11.0	<3	77	0.100	<0.010
	2/21/2024	<5	<5	29	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.88	669	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	66	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	757	n/a	<0.1	310	5.8	82	81	11.0	<3	76	<0.1	<0.010

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-4	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	49.4	<5	<5	n/a	n/a	164	6.15	2750	2537	0.52	133	35.2	1790	421	48.8	12	164	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	48.4	<5	<5	n/a	n/a	179	6.07	2660	2358	0.58	61.0	32.5	1680	380	48.6	11.2	175	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	44.1	<5	<5	n/a	n/a	165	5.58	2324	2125	0.58	39.5	31.5	1490	355	46.4	11.4	171	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	142	5.34	2447	2024	0.49	46.9	29.6	1410	338	42.5	11.2	169	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	41.7	5.7	<5	n/a	n/a	164	5.59	2063	1818	0.54	43.2	30.7	1190	346	48.4	12.1	169	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	145	5.99	1769	1842	0.49	62.3	31.1	1240	332	42.1	10.9	155	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	153	5.92	2201	1952	0.45	58.3	27.9	1330	332	45.5	11.9	176	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	136	6.04	1933	2429	0.47	29.3	27.9	1830	337	42.9	11.3	165	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	135	5.82	2081	1701	0.44	62.6	28.4	1200	209	46.7	10.8	175	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	5.76	1892	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	131	6.01	1903	1849	0.40	70.2	31.9	1250	319	40.8	9.75	163	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.14	1533	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	145	5.52	1846	1914	0.42	47.3	30.5	1300	322	44.5	11.4	182	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	5.96	1680	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	143	5.52	1754	2108	0.59	18.1	37.7	1530	315	42.9	10.8	162	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	157	5.40	2223	1886	0.52	26.5	29.3	1300	324	44.7	12.8	162	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	5.49	<5	<1	<50	129	5.64	1890	1775	0.28	75.9	131.0	1120	238	34.6	8.1	206	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	137	5.95	1801	1734	0.32	57.8	40.3	1200	252	34.2	8.82	170	n/a	n/a
	6/2/2010	<5	<5	<10	<4	<2	<20	29.5	<10	<15	35.9	<50	<10	<1	<10	130	5.97	2101	2015	0.36	28.2	103.0	1350	297	40.1	9.18	201	n/a	n/a
	12/2/2010	<5	<5	<10	<4	<2	<20	29.6	<10	<15	38.6	<50	<10	<1	<10	163	5.74	2003	1654	0.48	15.1	29.4	1080	307	42.2	10.2	177	9.72	0.289
	5/25/2011	<5	<5	<10	<4	<2	<20	28.0	<10	<15	34.7	<50	<10	<1	<10	126	5.58	1495	1812	0.43	10.0	32.0	1300	272	36.8	9.59	156	10.9	0.261
	5/17/2012	<5	<5	<10	<4	<2	<20	27.0	<10	<15	35.1	<50	<10	<1	<10	157	5.51	1495	1666	0.41	8.42	30.7	1110	292	40.4	11.4	177	10.1	0.254
	11/14/2012	<5	<5	<10	<4	<2	<20	26.7	10.4	<15	46.3	<50	<10	<1	<10	139	5.14	2123	1835	0.54	<5	31.1	1280	324	38.2	10.0	151	13.0	0.276
	3/20/2013	<5	<5	<10	<4	<2	<20	26.3	<10	<15	40.7	<50	<10	<1	<10	143	6.16	1961	1983	0.47	13	31.0	1400	310	41.0	11	190	7.4	0.270
	9/18/2013	<5	<5	<10	<4	<2	<20	24	<10	<15	34	<50	<10	<1	<10	150	6.77	1951	2033	0.49	<5	32.0	1500	290	41.0	10	160	7.9	0.290
	3/6/2014	<5	<5	<10	<4	<2	<20	26	<10	<15	38	<50	<10	<1	<10	160	6.26	1890	1862	0.47	6.8	32.0	1300	300	40.0	10	180	6.8	0.280
	9/9/2014	<5	<5	<10	<4	<2	<20	30	<10	<15	40	<50	<10	<1	<10	160	6.72	1905	1987	0.45	<5	33.0	1400	320	43.0	11	180	8.2	0.310
	3/26/2015	<5	<5	<10	<4	<2	<20	14	<10	<15	29	<50	<10	<1	<10	<100	5.63	2537	1902	0.30	39	210.0	1100	260	43.0	8.8	280	2.6	0.180
	9/9/2015	<5	<5	<10	<4	<2	<20	23	<10	<15	33	<50	<10	<1	<10	130	5.61	1979	1768	0.55	7.2	59.0	1200	270	38.0	10	190	8.6	0.250
	3/16/2016	<5	<5	<10	<4	<2	<20	26	<10	<15	36	<50	<10	<1	<10	130	5.69	1970	1746	0.48	6.9	37.0	1200	290	38.0	11	170	6.6	0.260
	9/7/2016	<5	<5	<10	<4	<2	<20	23	<10	<15	34	<50	<10	<1	<10	140	5.38	2036	1747	0.48	<5	38.0	1200	290	39.0	10	170	8.4	0.260
	3/8/2017	<5	<5	<10	<4	<2	<20	24	<10	<15	35	<50	<10	<1	<10	150	5.77	1955	1758	0.45	<5	41.0	1200	290	37.0	10	180	7.3	0.270
	9/14/2017	<5	<5	<10	<4	<2	<20	23	<10	<15	29	<50	<10	<1	<10	130	5.51	2055	1808	0.54	<5	40.0	1300	250	38.0	9.7	170	7.1	0.220
	3/21/2018	<5	<5	<10	<4	<2	<20	27	<10	<15	37	<50	<10	<1	<10	160	5.50	2014	1736	0.43	<5	39.0	1200	280	36.0	11	170	5.4	0.270
	9/11/2018	<5	<5	<10	<4	<2	<20	25	<10	<15	35	<50	<10	<1	<10	140	5.65	2106	1750	0.47	<5	43.0	1200	280	36.0	11	180	8.0	0.240
	3/26/2019	<5	<5	<10	<4	<2	<20	21	<10	<15	28	<50	<10	<1	<10	130	5.58	2069	1739	0.41	10	52.0	1200	260	37.0	10	180	1.7	0.230
	9/4/2019	<5	<5	<10	<4	<2	<20	24	<10	<15	34	<50	<10	<1	<10	140	5.16	1686	1958	0.49	<10	50.0	1400	280	38.0	10	180	6.5	0.240
	3/25/2020	<5	<5	<10	<4	<2	<20	14	<10	<15	22	<50	<10	<1	<10	<100	5.96	1900	1520	0.59	55	64.0	940	260	37.0	8.6	210	1.1	0.160
	9/15/2020	<5	<5	<10	<4	<2	<20	20	<10	<15	26	<50	<10	<1	<10	<100	5.35	2097	1865	0.31	45	69.0	1300	260	36.0	9.6	190	4.9	0.200
	2/22/2021	<5	<5	<10	<4	<2	<20	17	<10	<15	23	<50	<10	<1	<10	<100	5.98	2393	1708	0.30	59	70.0	1100	270	39.0	9.0	220	3.4	0.180
	8/23/2021	<5	<5	<10	<4	<2	<20	13	<10	<15	<20	<50	<10	<1	<10	<100	6.05	2145	1744	0.27	87	100.0	1100	260	36.0	8.0	240	3.9	0.150
	3/8/2022	<5	<5	<10	<4	<2	<20	17	<10	<15	22	<50	<10	<1	<10	<100	5.58	2302	1728	0.30	96	79.0	1100	280	40.0	9.1	220	4.9	0.190
	9/9/2022	<5	<5	<10	<4	<2	<20	24	<10	<15	28	<50	<10	<1	<10	100	6.15	2298	1903	0.46	28	53.0	1300	300	40	10	200	8.2	0.270
	2/15/2023	<5	<5	<10	<4	<2	<20	18	<10	<15	20	<50	<10	<1	<10	<100	5.64	2231	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	<10	<4	<2	<20	20	<10	<15	24	<50	<10	<1	<10	<100	5.58	2004	n/a	0.42	67	90.0	1300	300	43.0	9.9	230	7.700	0.220
	2/21/2024	<5	<5	14	<4	<2	<20	17	<10	<15	23	<50	<10	<1	<10	<100	6.00	2259	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	<10	<4	<2	<20	21.00	<10	<15	24	<50	<10	<1	<10	<100	5.81	2271	n/a	0.39	94	76.0	1200	270	39.0	8.9	220	7.600	0.210

TASWA Solid Waste Disposal Recycling Facility

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Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-5	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	6.3	<5	n/a	n/a	<20	7.33	2360	1852	<0.1	347	122	1010	388	25.4	<5	136	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.64	2056	1527	<0.1	343	98	769	366	22.9	<5	103	n/a	n/a
	6/19/2008	<6	<10	<200	<4	<2	<5	<50	279	16.8	<40	9.9	<5	<2	<50	33	6.88	2265	1837	<0.1	322	143	946	435	28.5	<5	126	n/a	n/a
	6/2/2010	<5	<5	48.6	<4	<2	<20	6.60	36.9	<15	<20	<50	<10	<1	<10	<100	7.49	2887	2052	<0.100	323	341	901	504	30.0	<5	117	n/a	n/a
	5/25/2011	<5	<5	15.9	<4	<2	<20	<5	18.8	<15	<20	<50	<10	<1	<10	<100	6.75	4584	2446	<0.100	370	257	1240	568	37.5	<5	162	0.595	0.0407
	3/16/2016	<5	<5	20	<4	<2	<20	<5	22	<15	<20	<50	<10	<1	<10	<100	7.24	2367	1055	<0.10	310	110	420	260	15.0	<3	98	<0.100	<0.010
	3/27/2019	<5	<5	20	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.96	1947	1232	<0.10	400	120	510	310	18.0	<3	77	<0.100	0.017
	3/25/2020	<5	<5	20	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.83	1721	1414	<0.10	410	62	660	360	20.0	<3	110	0.160	<0.010
	3/9/2022	<5	<5	24	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.71	1236	1669	<0.10	380	110	840	410	23.0	<3	99	<0.100	<0.010
	2/16/2023	<5	<5	24	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.85	2128	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2/22/2024	<5	<5	18	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.80	1802	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MW-6	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	26.5	6.51	4660	4049	0.44	347	347	2370	522	78.9	11	549	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	21.2	7.17	4710	3815	0.62	334	310	2210	493	78.4	10	549	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.58	4600	3786	0.94	328	257	2180	441	75.5	10.5	660	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.68	4651	3866	0.47	324	337	2290	501	71.2	10.0	497	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.7	<5	n/a	n/a	<20	6.57	4188	3867	0.20	307	411	2110	542	82.2	11.0	560	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.51	3640	3779	0.20	373	382	2040	547	76.7	10.5	539	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.37	4572	6931	0.50	315	320	5280	536	80.7	11.6	547	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.62	4756	3869	0.33	187	344	2170	567	79.5	10.9	605	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.60	4319	3919	0.19	303	378	2050	689	85.9	8.93	558	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.58	4600	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.64	4797	4078	0.84	346	289	2420	451	73.9	8.73	664	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.79	3798	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	21.7	6.55	4275	4045	0.51	357	279	2340	491	80.5	11.2	667	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.66	4288	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	23.7	6.57	4407	4078	1.20	405	211	2460	475	81.8	11.8	638	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.64	4679	3942	0.20	320	353	2220	540	82.0	12.1	577	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.64	4679	4006	0.24	316	355	2290	542	80.9	11.3	571	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	5.93	<5	1.16	<50	<20	6.52	3752	3980	0.22	323	415	2260	534	79.2	10.1	523	n/a	n/a
	8/18/2009	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<5	n/a	n/a	n/a	n/a	6.62	3789	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	12/8/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	6.80	3832	4057	0.29	317	334	2420	522	77.4	10.5	537	n/a	n/a
	6/2/2010	<5	<5	13.6	<4	<2	<20	26.8	<10	<15	<20	<50	<10	<1	<10	<100	7.62	4422	4046	0.46	325	307	2440	490	76.2	9.0	564	n/a	n/a
	12/1/2010	<5	<5	12.9	<4	<2	<20	54.8	<10	<15	<20	<50	<10	<1	<10	<100	6.70	4056	3646	<0.100	295	327	1960	558	82.0	9.63	564	2.99	0.820
	12/1/2010	<5	6.25	11.8	<4	<2	<20	58.4	<10	<15	<20	<50	<10	<1	<10	<100	6.70	4056	3427	0.20	288	368	2090	195	82.9	9.46	540	4.34	0.918
	2/17/2011	n/a	n/a	n/a	n/a	n/a	n/a	31.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.65	2753	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	5/25/2011	<5	<5	12.7	<4	<2	<20	36.5	<10	<15	<20	<50	<10	<1	<10	<100	6.69	6939	4127	0.37	308	486	2300	525	79.6	10.8	574	1.92	0.720
	11/10/2011	<5	<5	13.5	<4	<2	<20	44.7	<10	<15	20.6	<50	<10	1.20	<10	<100	6.77	4180	3545	0.10	276	433	1820	553	79.9	11.0	512	0.856	0.507
	5/17/2012	<5	5.08	14.1	<4	<2	<20	45.9	<10	<15	<20	<50	<10	<1	<10	<100	6.73	4719	3875	0.27	335	367	2120	574	88.5	13.2	547	3.61	0.679
	11/14/2012	<5	<5	12.5	<4	<2	<20	37.9	<10	<15	29.6	<50	<10	1.14	<10	<100	6.44	4122	3331	0.11	297	21.8	2090	496	66.9	7.7	502	0.818	0.462
	3/20/2013	<5	<5	10.7	<4	<2	<20	22.7	<10	<15	20.0	<50	<10	1.08	<10	<100	6.51	3730	4115	<0.10	280	550	2100	630	78.0	9.4	610	0.18	0.14
	9/18/2013	<5	<5	12	<4	<2	<20	28	<10	<15	<20	<50	<10	<1	<10	<100	6.45	4162	3885	<0.10	330	470	2100	540	74.0	8.7	530	0.54	0.33
	3/6/2014	<5	<5	14	<4	<2	<20	27	<10	<15	<20	<50	<10	1.2	<10	<100	6.02	3651	3935	0.10	300	490	2100	540	69.0	8.8	580	0.23	0.27
	9/9/2014	<5	<5	12	<4	<2	<20	18	<10	<15	<20	<50	<10	1.1	<10	<100	6.55	4189	3924	<0.10	290	550	2000	570	73.0	8.9	580	0.55	0.088
	3/26/2015	<5	<5	13	<4	<2	<20	60	<10	<15	<20	<50	<10	1.0	<10	<100	6.61	4726	3905	0.17	320	360	2200	510	88.0	9.5	580	1.5	0.900
	9/9/2015	<5	<5	12	<4	<2	<20	49	<10	<15	<20	<50	<10	<1	<10	<100	6.93	4341	3887	0.12	310	390	2200	510	74.0	10	550	1.2	0.570
	3/16/2016	<5	<5	14	<4	<2	<20	32	<10	<15	<20	<50	<10	<1	<10	<100	6.77	4678	4027	0.28	320	320	2300	560	78.0	11	600	1.3	0.680
	9/7/2016	<5	<5	14	<4	<2	<20	52	<10	<15	<20	<50	<10	1.0	<10	<100	6.73	4843	3903	<0.10	280	590	1900	600	76.0	9.1	590	2.0	0.430
	9/20/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.71	4788	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/8/2017	<5	<5	12	<4	<2	<20	52	<10	<15	<20	<50	<10	<1	<10	<100	6.96	4706	3968	<0.10	300	540	2000	620	71.0	9.2	580	0.57	0.360
	9/14/2017	<5	<5	11	<4	<2	<20	45	<10	<15	<20	<50	<10	<1	<10	<100	7.08	4921	3859	<0.10	270	560	2000	530	78.0	8.3	550	0.42	0.270
	3/21/2018	<5	<5	12	<4	<2	<20	31	<10	<15	<20	<50	<10	<1	<10	<100	6.67	4706	3849	<0.10	300	440	2100	540	72.0	9.4	540	0.40	0.560
	9/12/2018	<5	<5	13	<4	<2	<20	26	<10	<15	<20	51	<10	<1	<10	<100	7.00	4947	4187	<0.10	280	640	2100	600	70.0	9.7	630	0.64	0.110
	11/26/2018	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<50	n/a	n/a	n/a	n/a	6.85	4505	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/26/2019	<5	<5	11	<4	<2	<20	37	<10	<15	<20	<50	<10	<1	<10	<100	6.74	4721	3884	0.17	320	400	2100	550	76.0	10	590	0.92	0.520
	3/26/2019	<5	<5	12	<4	<2	<20	37	<10	<15	<20	<50	<10	<1	<10	<100	6.74	4721	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/4/2019	<5	<5	13	<4	<2	<20	9.8	<10	<15	<20	90	<10	<1	<10	<100	6.66	3998	4255	<0.10	280	680	2200	600	69.0	8.4	560	1.1	0.065
	11/26/2019	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<50	n/a	n/a	n/a	n/a	6.59	3864	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/25/2020	<5	<5	12	<4	<2	<20	52	<10	<15	<20	<50	<10	<1	<10	<100	6.72	4335	3764	0.24	310	430	1900	600	73.0	8.6	600	3.2	0.490
	9/15/2020	<5	<5	11	<4	<2	<20	11	<10	<15	<20	55	<10	<1	<10	<100	7.50	4711	3959	0.23	260	560	2000	610	73.0	8.4	580	0.590	0.120
	2/22/2021	<5	<5	11	<4	<2	<20	5.5	<10	<15	<20	56	<10	<1	<10	<100	6.70	5368	4091	<0.10	280	650	2000	620	75.0	8.4	600	<0.100	0.095

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
	8/24/2021	<5	<5	12	<4	<2	<20	6.4	<10	<15	<20	61	<10	<1	<10	<100	7.62	4696	4066	<0.10	290	640	2000	610	67.0	6.7	600	0.310	0.063
	3/8/2022	<5	<5	13	<4	<2	<20	5.5	<10	<15	<20	74	<10	<1	<10	<100	6.59	5038	4020	<0.10	280	570	2000	630	74.0	8.4	600	<0.100	0.081
	8/31/2022	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	82	<10	<1	<10	<100	7.27	4809	4182	<0.10	250	670	2100	620	71	8.2	590	<0.100	0.041
	2/15/2023	<5	<5	12	<4	<2	<20	5.50	<10	<15	<20	78	<10	<1	<10	<100	6.68	4842	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	130	<10	<1	<10	<100	6.83	3873	n/a	2.40	230	22	650	9	3.7	0.4	400	<0.100	0.020
	11/6/2023	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	n/a	n/a	n/a	n/a	6.88	4954	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2/21/2024	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	81	<10	<1	<10	<100	6.71	4850	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	91	<10	<1	<10	<100	6.83	4868	n/a	<0.10	260	690	2000	600	69.0	8.1	600	<0.100	0.035

TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-7	10/20/2004	n/a	12.3	<200	n/a	<2	<5	n/a	<25	<3	<40	28.4	<5	n/a	n/a	<20	5.99	4620	4187	0.31	295	652	2260	576	77.5	10.8	465	n/a	n/a
	1/25/2005	n/a	13.2	<200	n/a	<2	<5	n/a	<25	<3	<40	23.5	<5	n/a	n/a	<20	7.19	4760	5203	0.28	291	529	3390	553	79.8	10.3	498	n/a	n/a
	5/11/2005	n/a	13.6	<200	n/a	<2	<5	n/a	<25	<3	<40	6.6	<5	n/a	n/a	<20	6.52	4522	3664	0.31	286	493	1940	534	79.1	10.8	466	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	44.2	<5	n/a	n/a	<20	6.68	4427	3673	0.22	287	469	2010	529	69.6	10.2	444	n/a	n/a
	11/9/2005	n/a	13.7	<200	n/a	<2	<5	n/a	<25	<3	<40	32.5	<5	n/a	n/a	<20	6.63	4248	3817	0.28	292	480	2030	543	82.4	12.2	526	n/a	n/a
	2/15/2006	n/a	10.5	<200	n/a	<2	<5	n/a	<25	<3	<40	28.1	<5	n/a	n/a	<20	6.60	3671	3802	0.29	350	478	2000	573	78.4	11.0	489	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	56.4	<5	n/a	n/a	<20	6.41	4635	3710	0.23	286	467	1930	588	80.4	11.9	492	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	67.5	<5	<2	<50	<20	6.65	5655	3645	0.21	165	449	1970	601	76.3	11.0	456	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	24.2	<5	<2	<50	<20	6.63	4361	3946	0.27	296	479	1970	716	90.3	9.54	535	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.55	4602	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	20.0	<5	<2	<50	<20	6.64	4852	4006	0.25	297	525	2140	604	80.5	9.07	501	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.77	3822	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	20.1	<5	<2	<50	<20	6.55	4309	3932	0.25	303	497	2090	550	81.7	11.5	553	n/a	n/a
	3/11/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.64	4324	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	26.1	<5	<2	<50	<20	6.36	4210	3738	0.25	272	481	2020	558	80.5	11.0	454	n/a	n/a
	11/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	35.3	<5	<2	<50	20.4	6.71	5192	4559	0.25	291	473	2780	578	79.7	11.0	494	n/a	n/a
	2/4/2009	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<20	6.68	4806	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	25.6	<5	1.57	<50	<20	6.45	3732	3983	0.27	313	485	2180	567	80.2	10.8	506	n/a	n/a
	12/9/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	20.4	<5	1.56	<50	<20	6.80	3886	4380	0.28	276	551	2540	569	79.8	11.1	493	n/a	n/a
	6/2/2010	<5	20.2	17.6	<4	<2	<20	15.1	<10	<15	32.8	<50	<10	1.64	<10	<100	6.82	4453	4023	0.33	288	523	2220	584	79.2	9.41	465	n/a	n/a
	8/10/2010	n/a	11.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.86	4344	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	12/1/2010	<5	9.38	14.7	<4	<2	<20	10.2	<10	<15	26.7	<50	<10	1.92	<10	<100	6.68	4117	3506	0.30	270	454	1800	566	75.6	9.36	468	7.48	0.570
	5/25/2011	<5	25.0	17.6	<4	<2	<20	13.6	<10	<15	31.1	<50	<10	1.84	<10	<100	6.69	6993	3936	0.36	296	483	2140	572	83.5	11.3	500	14.5	0.709
	11/10/2011	<5	26.2	18.6	<4	<2	<20	18.2	<10	<15	32.9	<50	<10	1.84	<10	<100	6.75	4093	3699	0.28	284	450	1970	566	82.0	12.0	479	10.9	0.659
	5/17/2012	<5	12.4	17.8	<4	<2	<20	10.5	<10	<15	27.7	<50	<10	1.52	<10	<100	6.74	4673	3866	0.49	319	479	2020	595	90.4	13.9	510	9.47	0.666
	11/14/2012	<5	6.61	15.6	<4	<2	<20	9.90	<10	<15	40.5	<50	<10	1.51	<10	<100	6.43	3986	3637	0.22	289	434	2030	475	69.2	8.42	478	3.96	0.597
	3/20/2013	<5	<5	13.4	<4	<2	<20	8.72	<10	<15	25.1	<50	<10	1.38	<10	<100	6.72	3092	3978	0.26	300	470	2100	590	80.0	10	580	4.1	0.590
	9/18/2013	<5	<5	15	<4	<2	<20	6.6	<10	<15	<20	<50	<10	1.0	<10	<100	7.03	3485	3830	0.17	310	470	2100	550	69.0	8.8	480	3.2	0.470
	3/6/2014	<5	<5	19	<4	<2	<20	11	<10	<15	28	<50	<10	1.2	<10	<100	7.17	4076	3932	0.30	320	490	2100	550	75.0	9.7	550	7.7	0.650
	9/9/2014	<5	9.2	17	<4	<2	<20	10	<10	<15	26	<50	<10	1.5	<10	<100	6.44	4324	3832	0.28	300	480	2000	570	75.0	9.7	550	6.5	0.640
	3/26/2015	<5	19	17	<4	<2	<20	10	<10	<15	33	<50	<10	1.7	<10	<100	6.59	4784	3921	0.39	320	500	2000	610	93.0	10	550	16	0.750
	9/9/2015	<5	10	16	<4	<2	<20	9.7	<10	<15	26	<50	<10	1.5	<10	<100	7.00	4346	3887	0.38	300	490	2100	550	78.0	11	510	7.7	0.650
	3/16/2016	<5	7.0	18	<4	<2	<20	13	<10	<15	32	<50	<10	1.6	<10	<100	6.72	4713	3966	0.34	300	500	2000	640	86.0	12	580	8.2	0.720
	9/7/2016	<5	20	18	<4	<2	<20	9.9	<10	<15	30	<50	<10	1.5	<10	<100	6.72	4696	3870	0.32	330	510	1900	630	86.0	11	570	11.0	0.710
	9/20/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.66	4720	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/8/2017	<5	7.8	15	<4	<2	<20	9.7	<10	<15	25	<50	<10	1.5	<10	<100	7.00	4612	3964	0.30	330	520	2000	630	81.0	10	560	8.6	0.730
	3/8/2017	<5	9.1	16	<4	<2	<20	9.8	<10	<15	28	<50	<10	1.4	<10	<100	7.00	4612	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/14/2017	<5	<5	15	<4	<2	<20	8.1	<10	<15	20	<50	<10	1.4	<10	<100	7.11	4724	3966	0.31	330	500	2000	610	93.0	10	590	3.9	0.580
	3/21/2018	<5	<5	16	<4	<2	<20	9.8	<10	<15	25	<50	<10	1.4	<10	<100	6.65	4590	3895	0.26	310	490	2000	620	81.0	11	540	4.5	0.680
	9/12/2018	<5	6.6	17	<4	<2	<20	9.9	<10	<15	28	<50	<10	1.3	<10	<100	7.09	4767	3927	0.26	320	490	2000	620	78.0	11	570	6.0	0.600
	3/26/2019	<5	9.8	15	<4	<2	<20	9.7	<10	<15	25	<50	<10	1.2	<10	<100	6.67	4729	3992	0.34	330	540	2100	570	79.0	10	530	8.3	0.640
	9/4/2019	<5	<5	16	<4	<2	<20	<5	<10	<15	<20	94	<10	<1	<10	<100	6.64	3714	3875	<0.10	290	510	2100	570	63.0	9.0	480	0.780	0.320
	9/10/2019	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.66	3726	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/26/2019	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<50	n/a	n/a	n/a	n/a	6.42	3667	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/25/2020	<5	<5	14	<4	<2	<20	5.0	<10	<15	<20	80	<10	<1	<10	<100	6.67	4105	3648	0.29	300	370	1900	630	71.0	9.3	520	2.2	0.430
	7/9/2020	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<50	n/a	n/a	n/a	n/a	7.04	3414	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/15/2020	<5	6.5	14	<4	<2	<20	6.9	<10	<15	<20	<50	<10	<1	<10	<100	7.32	4266	3719	0.40	270	420	2000	600	76.0	9.6	480	5.0	0.530
	2/22/2021	<5	6.7	14	<4	<2	<20	7.5	<10	<15	<20	<50	<10	<1	<10	<100	6.70	5020	3916	0.24	320	520	2000	620	79.0	9.6	530	5.9	0.520
	8/24/2021	<5	7.2	14	<4	<2	<20	7.6	<10	<15	<20	<50	<10	1.0	<10	<100	7.44	4181	3772	0.27	310	440	2000	600	71.0	8.1	500	5.3	0.540
	3/9/2022	<5	6.1	15	<4	<2	<20	6.7	<10	<15	<20	<50	<10	<1	<10	<100	6.56	4685	3840	0.23	310	450	2000	620	78.0	9.4	530	4.2	0.510
	8/29/2022	<5	6.4	15	<4	<2	<20	6.8	<10	<15	<20	<50	<10	<1	<10	<100	7.45	4485	3927	0.22	310	500	2000	630	83	11	550	4.1	0.520
	2/15/2023	<5	6.5	15	<4	<2	<20	7.40	<10	<15	<20	<50	<10	1	<10	<100	6.61	4506	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	14	<4	<2	<20	5.20	<10	<15	<20	69	<10	<1	<10	<100	6.79	3598	n/a	1.90	260	44	730	7.6	3.3	3.2	490	<0.100	0.021
	2/22/2024	<5	7.5	16	<4	<2	<20	9.00	<10	<15	23	<50	<10	1	<10	<100	6.63	4602	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	15	<4	<2	<20	5.80	<10	<15	<20	51	<10	<1	<10	<100	6.82	4465	n/a	0.21	290	530	2100	590	71.0	8.9	520	2.800	0.390

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Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-12	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.85	620	392	<0.10	299	10.9	81.2	110	10.2	<5	32.7	n/a	n/a
	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.85	620	396	<0.10	314	10.7	78.8	109	10.1	<5	33.1	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.53	811	411	<0.10	337	7.4	76.4	128	10.9	<5	22.1	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.53	811	412	<0.10	334	7.6	78.0	129	11.0	<5	22.2	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.82	702	390	<0.10	327	7.1	66.3	126	10.7	<5	18.8	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.82	702	385	<0.10	323	7.0	65.4	124	10.5	<5	18.9	n/a	n/a
	9/7/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	37.4	6.91	742	394	<0.10	311	7.3	73.1	123	11.4	<5	25.9	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.87	715	402	0.11	305	6.5	81.3	123	12.8	<5	28.5	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.36	645	395	<0.10	344	6.2	71.0	112	10.4	<5	26.6	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.08	696	358	<0.10	276	5.8	64.4	112	12.2	<5	27.7	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.99	781	376	<0.10	300	6.0	69.6	114	10.6	<5	27.9	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.01	742	398	<0.10	285	6.4	86.4	124	12.9	<5	28.6	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	6.76	696	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/7/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.93	666	364	<0.10	264	6.8	86.9	110	9.8	<5	20.8	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.14	534	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.75	638	368	<0.10	295	6.3	69.1	114	10.5	<5	23.5	n/a	n/a
	3/10/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.00	626	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/6/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.82	601	367	<0.10	272	7.0	80.5	115	10.8	<5	19.8	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	6.89	705	395	<0.10	286	6.68	93.7	119	12.1	<5	23.2	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.41	486	400	<0.10	311	6.35	89.9	119	11.2	<5	20.8	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.11	717	459	<0.10	317	5.54	123	133	11.6	<5	29.5	n/a	n/a
	6/2/2010	<5	<5	56.8	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.03	673	434	<0.100	298	9.08	104	135	12.6	<5	26.4	n/a	n/a
	12/1/2010	<5	<5	46.8	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.89	707	423	<0.100	289	7.23	96.5	131	14.4	<5	31.9	0.321	<0.0150
	5/25/2011	<5	<5	59.5	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.77	617	430	<0.100	303	7.03	96.1	143	12.9	<5	22.1	0.189	<0.0150
	11/10/2011	<5	<5	42.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.02	727	429	<0.100	298	7.20	102	132	13.5	<5	27.7	0.197	<0.0150
	5/17/2012	<5	<5	49.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.06	560	386	<0.100	286	5.27	92.3	114	11.5	<5	22.1	<0.100	<0.0150
	11/14/2012	<5	<5	38.1	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.68	813	411	<0.100	290	6.73	106	118	12.2	<5	25.6	0.309	<0.0150
	3/20/2013	<5	<5	36.4	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.82	633	439	<0.10	300	6.8	110	130	13.0	<5	32	<0.10	<0.015
	9/18/2013	<5	<5	31	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.06	791	426	<0.10	300	7.2	110	120	13.0	<3	28	<0.100	<0.010
	3/6/2014	<5	<5	39	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.88	605	450	<0.10	320	7.0	120	120	13.0	<3	33	0.110	0.016
	9/9/2014	<5	<5	35	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	5.87	754	402	<0.10	200	7.3	120	130	13.0	<3	33	<0.100	<0.010
	3/26/2015	<5	<5	58	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.97	616	369	<0.10	270	4.7	90	110	11.0	<3	21	0.250	0.030
	9/9/2015	<5	<5	50	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.18	737	421	<0.10	260	8.3	130	120	12.0	<3	23	<0.100	<0.010
	3/16/2016	<5	<5	85	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.11	1004	611	<0.10	270	18	240	180	15.0	<3	25	<0.100	<0.010
	9/7/2016	<5	<5	65	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	985	673	<0.10	300	22	260	200	18.0	<3	25	<0.100	<0.010
	3/8/2017	<5	<5	80	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.23	1076	748	<0.10	270	26	340	210	17.0	<3	22	0.110	0.012
	9/14/2017	<5	<5	71	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.02	1009	628	<0.10	260	20	270	170	17.0	<3	23	<0.100	0.016
	3/21/2018	<5	<5	77	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.91	999	660	<0.10	250	21	290	190	16.0	<3	20	<0.100	<0.010
	9/11/2018	<5	<5	56	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.08	941	615	<0.10	300	16	230	180	15.0	<3	26	<0.100	<0.010
	3/26/2019	<5	<5	77	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.73	1317	934	<0.10	310	28	450	260	22.0	<3	22	<0.100	0.010
	9/4/2019	<5	<5	62	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.73	873	746	<0.10	310	22	330	200	18.0	<3	24	<0.100	<0.010
	3/25/2020	<5	<5	71	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.98	1354	965	<0.10	320	18	460	280	24.0	<3	26	<0.100	<0.010
	3/25/2020	<5	<5	70	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.98	1354	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/15/2020	<5	<5	65	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.75	1108	767	<0.10	280	15	340	230	20.0	<3	24	0.130	<0.010
	2/22/2021	<5	<5	61	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.27	1319	863	<0.10	330	15	400	240	21.0	<3	25	<0.100	<0.010
	2/22/2021	<5	<5	61	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.27	1319	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/23/2021	<5	<5	53	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	836	547	<0.10	300	9.2	200	160	13.0	<3	17	<0.100	<0.010
	8/23/2021	<5	<5	52	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.93	836	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/9/2022	<5	<5	61	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.69	1141	776	<0.10	330	13	330	230	20.0	<3	21	<0.100	<0.010
	8/29/2022	<5	<5	45	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.76	943	644	<0.10	310	13	260	180	16	<3	23	0.210	0.051
	2/15/2023	<5	<5	50	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.80	842	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	42	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.70	821	n/a	<0.10	270	14	230	170	16.0	<3	21	0.110	0.021
	2/21/2024	<5	<5	51	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.85	979	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/26/2024	<5	<5	47	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.80	1001	n/a	<0.1	270	13	270	170	15.0	<3	23	<0.10	<0.01

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Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-13	10/22/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.17	1770	1134	2.20	254	23.8	623	8.28	<5	<5	352	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.49	1670	1032	2.20	229	19.9	551	7.44	<5	<5	339	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.27	1575	1006	2.20	222	23.7	528	7.29	<5	<5	336	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.36	1449	1021	2.20	233	20.0	545	7.55	<5	<5	332	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.34	1542	1081	2.40	228	19.1	571	7.17	<5	<5	369	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.32	1484	1023	2.30	280	19.2	529	7.40	<5	<5	327	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	5.85	1639	1156	2.40	231	18.6	662	7.91	<5	<5	352	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.38	2393	939	2.10	128	17.8	517	7.63	<5	<5	332	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.38	1534	1057	2.10	232	18.7	539	8.16	<5	<5	375	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.31	1575	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.32	1628	1077	2.30	230	18.8	586	8.37	<5	<5	348	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.44	1628	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.18	1526	1024	2.40	233	22.2	558	8.04	<5	<5	319	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.18	1526	1037	2.70	230	23.0	563	8.19	<5	<5	327	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.38	1473	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/5/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.12	1596	1031	2.30	219	20.6	564	7.91	<5	<5	329	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.40	1861	1053	2.50	227	18.6	554	7.41	<5	<5	359	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.21	1299	1073	2.68	243	19.7	572	7.63	<5	<5	352	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.21	1299	1082	2.28	241	21.2	599	7.18	<5	<5	334	n/a	n/a
	12/8/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.39	1388	1095	2.25	225	20.4	604	7.65	<5	<5	350	n/a	n/a
	6/2/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.88	1652	1102	1.99	227	20.7	610	10.1	<5	<5	348	n/a	n/a
	12/1/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.51	1710	949	1.95	202	17.4	522	6.42	<5	<5	302	<0.259	<0.0150
	5/24/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.41	2550	1073	1.78	225	22.0	579	11.6	<5	<5	348	<0.100	0.0170
	11/9/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.36	1506	1046	1.99	222	18.3	552	8.02	<5	<5	357	<0.100	0.0151
	5/16/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.29	1697	1073	2.50	240	18.0	559	8.20	<5	<5	367	<0.100	0.0175
	11/13/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.50	1701	1070	2.59	240	19.0	566	8.22	<5	<5	356	<0.228	0.0246
	3/19/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.55	1693	1133	2.30	230	19	580	8.2	<5	<5	410	<0.10	0.020
	3/19/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.55	1693	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/17/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.50	1558	1080	3.70	230	19	560	7.9	3.3	3.4	370	<0.100	0.019
	3/5/2014	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.32	1693	1127	2.30	250	18	580	7.7	3.0	3.3	390	<0.100	0.019
	9/8/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.11	1705	1122	2.30	260	18	570	7.7	3.0	3.4	390	<0.100	0.019
	9/8/2014	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.11	1705	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/25/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.21	1670	1068	2.50	230	18	550	7.7	3.3	3.1	370	<0.100	0.021
	9/8/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.15	1585	1083	2.70	220	18	580	7.1	2.9	3.7	360	<0.100	0.019
	3/16/2016	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.55	1727	1150	1.90	230	19	590	9.2	3.4	3.8	410	<0.100	0.028
	9/7/2016	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.28	1751	1126	2.30	240	20	570	8.9	3.5	3.5	400	<0.100	0.024
	9/20/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.27	1712	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/8/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.38	1737	1171	2.40	250	20	620	9.1	3.3	3.3	390	<0.100	0.023
	9/13/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.98	1854	1170	1.80	230	19	610	9.1	4.0	3.5	410	<0.100	0.029
	9/13/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.98	1854	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/21/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.07	1766	1169	1.90	230	18	630	8.9	3.4	3.8	390	<0.100	0.031
	9/11/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.25	1831	1181	2.30	250	19	600	8.8	3.3	4.3	420	<0.100	0.024
	3/26/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	1907	1233	2.20	250	21	660	9.3	3.9	3.6	410	<0.100	0.025
	9/4/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	1441	1213	2.40	250	22	650	8.4	3.5	3.7	400	<0.100	0.020
	3/25/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.39	1661	1221	4.90	250	16	620	9.6	3.9	4.0	440	<0.100	0.035
	9/14/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.71	1735	1195	2.40	220	19	660	8.6	3.6	3.5	390	<0.100	0.023
	2/23/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.20	1985	1220	2.20	250	18	650	9.2	3.8	3.5	410	<0.100	0.021
	8/24/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.25	1718	1183	2.20	260	21	610	8.6	3.4	<3	410	0.120	0.021
	3/8/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.23	1838	1209	2.10	250	18	640	9.0	3.8	3.5	410	<0.100	0.023
	8/31/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.24	1687	1171	2.40	250	21	630	7.6	3.2	3.4	380	<0.100	0.022
	2/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.29	1797	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.19	1738	n/a	<0.1	240	690	2000	670	74.0	8.4	610	<0.100	0.012
	2/22/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.36	1698	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.46	1696	n/a	2.20	230	21	580	7.4	3.0	3.3	370	<0.100	0.014

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-14	10/22/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.30	1970	1324	1.70	291	35.6	720	6.2	<5	<5	417	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.69	1930	1219	1.80	252	32.4	659	5.4	<5	<5	397	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.37	1811	1113	1.90	245	30.0	591	<5	<5	<5	370	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.54	1663	1138	1.70	252	28.1	600	5.1	<5	<5	379	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.54	1663	1120	1.70	257	30.9	597	<5	<5	<5	364	n/a	n/a
	11/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.52	1743	1197	1.80	255	31.8	616	<5	<5	<5	422	n/a	n/a
	2/16/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.50	1677	1203	1.90	291	29.7	597	5.4	<5	<5	426	n/a	n/a
	2/16/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.50	1677	1183	1.90	285	29.4	585	5.0	<5	<5	422	n/a	n/a
	5/25/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.47	1874	1160	2.00	251	30.0	583	5.1	<5	<5	416	n/a	n/a
	9/6/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.50	1672	1156	1.90	271	28.9	592	<5	<5	<5	400	n/a	n/a
	9/6/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.50	1672	1148	1.90	275	28.8	593	<5	<5	<5	389	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.52	1687	1186	1.60	251	29.8	587	5.3	<5	<5	439	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.52	1687	1203	1.80	246	29.3	622	5.1	<5	<5	424	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.51	1782	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.50	1884	1187	1.80	249	31.0	632	<5	<5	<5	400	n/a	n/a
	8/8/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.59	1666	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.34	1694	1220	1.90	263	29.8	600	<5	<5	<5	459	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.53	1687	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.53	1687	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/5/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.31	1880	1162	1.80	247	30.6	642	<5	<5	<5	366	n/a	n/a
	11/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.49	2031	1195	1.82	253	29.7	610	<5	<5	<5	429	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.57	1475	1204	1.79	269	31.7	636	<5	<5	<5	402	n/a	n/a
	12/8/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.65	1536	1203	1.82	254	32.5	664	<5	<5	<5	380	n/a	n/a
	6/2/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	9.30	1776	1141	1.77	244	31.3	613	<5	<5	<5	375	n/a	n/a
	12/1/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.64	1888	1081	1.74	236	30.8	527	<5	<5	<5	405	<0.259	0.0150
	5/24/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.62	2751	1158	1.63	241	29.8	613	<5	<5	<5	395	<0.100	0.0150
	11/9/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.57	1611	1135	1.69	235	28.3	595	<5	<5	<5	394	<0.100	<0.0150
	5/16/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.55	1881	1170	1.88	270	28.5	601	5.18	<5	<5	401	<0.100	<0.0150
	5/16/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.55	1881	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/13/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.71	1817	1121	1.95	249	27.8	584	<5	<5	<5	385	<0.228	<0.0150
	3/19/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.75	1847	1234	2.00	250	29	620	<5	<5	<5	460	<0.10	<0.015
	9/17/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.69	1692	1190	1.90	270	29	600	4.7	1.9	<3	420	<0.100	0.013
	9/17/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.69	1692	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/5/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.76	1846	1494	2.10	280	28	880	4.6	1.8	<3	440	<0.100	0.013
	3/5/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.76	1846	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/8/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.32	1867	1264	2.20	300	28	630	4.6	1.8	<3	450	<0.100	0.013
	3/23/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.49	1890	1216	2.30	260	29	610	5.0	2.2	<3	440	<0.100	0.015
	3/23/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.49	1890	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/8/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.51	1770	1183	2.50	250	29	630	4.2	1.7	3.1	390	<0.100	0.016
	9/8/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.51	1770	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/16/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.76	1843	1264	2.00	250	29	630	5.2	2.0	3.1	470	<0.100	0.014
	9/7/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.48	1874	1221	2.10	270	29	620	5.7	1.9	<3	430	<0.100	0.014
	11/21/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.37	1717	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/8/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.60	1798	1190	2.00	270	29	620	4.7	1.9	<3	400	<0.100	0.014
	9/13/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.38	1882	1190	2.00	250	28	620	4.6	2.1	<3	410	<0.100	0.013
	3/21/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.30	1809	1157	2.00	250	26	590	4.6	1.8	<3	410	<0.100	0.014
	9/11/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.51	1919	1233	2.00	270	28	610	4.9	1.8	3.3	450	<0.100	0.014
	3/26/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.39	2264	1453	2.00	290	59	740	11	4.8	3.5	490	<0.100	0.019
	9/4/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.26	1728	1489	1.90	290	54	780	12	4.9	3.7	490	<0.100	0.014
	3/25/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.46	1935	1369	4.00	290	42	650	12	4.9	3.7	510	<0.100	0.022
	9/14/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.82	1987	1272	2.30	250	37	640	12	4.4	3.0	450	<0.100	0.017
	2/23/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.13	2105	1287	1.90	270	32	670	7.1	2.9	<3	440	<0.100	0.018
	8/24/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.58	1890	1293	2.00	290	39	650	6.9	2.8	<3	450	0.340	0.016
	3/9/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.37	1946	1269	2.00	280	31	660	6.2	2.6	<3	430	<0.100	0.019
	8/31/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.62	1881	1259	2.00	270	36	660	6.1	2.5	<3	420	<0.100	0.062
	2/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.46	1965	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.40	2018	n/a	0.15	270	510.0	2100	650	7.8	9.8	530	1.700	0.400
	2/22/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.41	2161	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/27/2024	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.47	2247	n/a	1.90	270	56	790	8.5	3.7	3.4	510	<0.100	0.022
	10/25/2024	n/a	n/a	<10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.63	2006	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-15	10/21/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.27	2180	1410	1.40	355	51.8	728	8.27	<5	<5	446	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	9.09	2110	1386	1.40	336	50.4	714	7.84	<5	<5	447	n/a	n/a
	5/12/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.37	2118	1297	1.50	315	44.9	641	6.25	<5	<5	448	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.37	2380	1407	1.50	322	47.5	738	7.33	<5	<5	454	n/a	n/a
	11/10/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.33	2196	1445	1.60	323	49.4	747	6.97	<5	<5	481	n/a	n/a
	2/16/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.31	2275	1555	1.60	383	52.0	758	7.15	<5	<5	548	n/a	n/a
	5/25/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.19	2540	1640	1.80	316	51.6	834	7.71	<5	<5	590	n/a	n/a
	9/6/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.27	2160	1526	1.60	346	54.9	754	6.87	<5	<5	539	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.25	2436	1750	1.50	318	57.3	894	8.45	<5	<5	632	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.24	2633	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.15	3090	1981	1.70	323	66.0	1140	8.69	<5	<5	606	n/a	n/a
	8/8/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.17	2846	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.96	2764	1805	1.80	332	66.8	1040	9.39	<5	<5	524	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.13	2629	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.95	3723	1989	1.70	358	74.7	1150	8.27	<5	<5	578	n/a	n/a
	11/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.17	3831	2061	1.87	315	69.3	1080	9.65	<5	<5	745	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.03	2611	2234	1.98	334	73.7	1300	9.63	<5	<5	684	n/a	n/a
	12/8/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.14	2440	2155	1.62	306	80.6	1240	9.76	<5	<5	673	n/a	n/a
	6/2/2010	<5	<5	15.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.10	3325	1907	1.85	305	75.1	1030	10.2	<5	<5	640	n/a	n/a
	12/2/2010	<5	<5	13.6	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.20	3110	2094	1.79	297	72.9	1240	10.3	<5	<5	623	<0.259	<0.0150
	5/24/2011	<5	<5	13.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.29	4597	2352	1.60	294	77.1	1450	10.0	<5	<5	669	<0.100	0.0170
	11/10/2011	<5	<5	13.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.18	2856	1956	1.76	311	70.1	1090	10.4	<5	<5	631	0.122	0.0230
	5/17/2012	<5	<5	14.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.18	3092	2071	2.05	342	76.0	1150	11.0	<5	<5	664	<0.100	<0.0150
	11/13/2012	<5	<5	12.7	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.32	3017	2023	2.09	323	71.6	1130	9.49	<5	<5	651	<0.228	<0.0150
	3/19/2013	<5	<5	12.8	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.41	3068	2229	2.10	310	74	1200	10	<5	<5	790	<0.10	0.015
	9/17/2013	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.36	2827	2007	2.10	310	77	1100	8.8	3.3	3.3	660	<0.100	0.016
	3/5/2014	<5	<5	16	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.28	3090	2203	2.30	330	72	1200	9.5	3.4	3.4	750	<0.100	0.016
	9/8/2014	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.95	3226	2145	2.30	350	74	1100	9.7	3.6	3.6	780	<0.100	0.017
	3/23/2015	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.20	3191	2183	2.50	300	76	1200	10	4.0	3.3	740	<0.100	0.018
	9/9/2015	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.13	3145	2086	2.60	290	75	1200	8.4	3.2	4.2	650	<0.100	0.015
	3/16/2016	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.38	3088	2213	2.20	300	76	1200	10	3.5	3.8	770	<0.100	0.018
	9/7/2016	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.16	3152	2114	2.10	320	77	1100	10	3.7	3.6	760	<0.100	0.021
	3/9/2017	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.28	2990	2197	2.20	330	76	1200	10	3.5	3.5	740	<0.100	0.022
	9/13/2017	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.96	3166	2161	2.10	300	75	1200	9.0	3.7	3.2	720	<0.100	0.017
	3/21/2018	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.95	3041	2145	2.10	300	69	1200	9.4	3.4	3.5	710	<0.100	0.021
	9/11/2018	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.92	3177	2109	2.80	320	72	1100	9.7	3.5	4.1	760	<0.100	0.020
	3/27/2019	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	3118	2091	2.30	320	74	1100	9.5	3.6	3.8	740	<0.100	0.022
	9/4/2019	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.36	2534	2324	2.20	330	82	1300	9.8	3.7	3.9	760	<0.100	0.023
	3/25/2020	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.46	2817	2123	4.40	330	69	1100	9.9	3.7	3.9	770	<0.100	0.023
	9/14/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.82	2990	2028	2.40	290	67	1100	9.3	3.6	3.4	700	<0.100	0.021
	2/23/2021	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.18	3373	2200	2.10	320	74	1200	9.8	3.8	3.4	750	<0.100	0.024
	8/24/2021	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.71	2968	2105	2.20	330	78	1100	9.5	3.5	<3	750	0.210	0.024
	3/9/2022	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.17	3161	2192	2.20	320	76	1200	9.6	3.7	3.6	740	<0.100	0.024
	8/31/2022	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.70	3015	2170	2.00	310	79	1200	9.1	3.6	3.5	720	<0.100	0.023
	2/16/2023	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.25	3118	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.26	2967	n/a	2.10	300	80	1200	10	4.0	3.7	760	<0.100	0.025
	2/22/2024	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.24	3120	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/28/2024	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.33	3162	n/a	2.20	310	79	1200	9.9	3.9	4.3	770	<0.100	0.023

TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-16	10/21/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.06	1970	1254	1.00	362	39.6	625	10.3	<5	<5	400	n/a	n/a
	1/27/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.85	1890	1225	1.10	341	37.8	595	8.20	<5	<5	415	n/a	n/a
	5/12/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.21	1900	1202	1.20	333	35.7	568	8.44	<5	<5	425	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.19	1880	1232	1.10	362	36.7	605	8.17	<5	<5	403	n/a	n/a
	11/10/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.26	1925	1264	1.20	345	36.7	603	7.84	<5	<5	446	n/a	n/a
	2/16/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.30	1931	1328	1.10	416	35.8	598	7.26	<5	<5	481	n/a	n/a
	5/25/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.23	2114	1324	1.10	344	35.3	591	7.09	<5	<5	520	n/a	n/a
	9/6/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.37	1761	1270	1.10	371	34.7	595	5.66	<5	<5	451	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.34	1927	1298	0.96	350	33.9	583	6.55	<5	<5	501	n/a	n/a
	3/21/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.35	2030	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/21/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.35	2030	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.31	2123	1351	1.10	346	35.7	681	6.04	<5	<5	457	n/a	n/a
	8/8/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.38	1950	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.30	2169	1275	1.10	356	34.1	653	6.67	<5	<5	405	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.27	1982	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.32	1887	1284	1.20	398	36.6	628	6.07	<5	<5	416	n/a	n/a
	11/20/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.36	2284	1318	0.99	338	35.6	622	6.36	<5	<5	487	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.17	1671	1345	1.06	363	40.3	675	5.61	<5	<5	445	n/a	n/a
	12/10/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.23	1944	1313	1.00	343	37.6	682	5.47	<5	<5	418	n/a	n/a
	6/3/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	1865	1332	0.98	338	38.8	697	5.64	<5	<5	423	n/a	n/a
	12/2/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.40	2068	1170	0.98	309	36.6	525	5.64	<5	<5	450	<0.259	<0.0150
	5/24/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.42	3079	1347	0.85	342	36.2	680	5.55	<5	<5	456	<0.100	<0.0150
	11/11/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.44	2071	1231	0.96	334	33.4	591	5.06	<5	<5	436	<0.100	<0.0150
	5/17/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.39	2035	1279	1.14	338	34.1	631	5.37	<5	<5	441	<0.100	<0.0150
	11/14/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.53	2007	1213	1.13	351	33.5	584	<5	<5	<5	422	<0.228	<0.0150
	3/20/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.52	2111	1423	1.00	340	38	650	7.2	<5	<5	560	<0.10	<0.015
	9/17/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	1963	1288	1.10	350	37	600	5.4	2.1	<3	470	0.160	0.014
	3/5/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.94	1825	1313	0.94	370	34	600	4.8	1.7	<3	490	<0.100	<0.010
	9/9/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.42	1985	1358	1.10	400	34	610	4.8	1.8	<3	510	<0.100	<0.010
	3/24/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.47	1993	1274	1.20	350	34	590	5.0	1.9	<3	470	<0.100	0.010
	9/9/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.43	1996	1254	1.20	330	35	610	4.3	1.6	<3	440	<0.100	<0.010
	3/16/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.22	2011	1285	0.98	350	35	570	5.0	1.7	<3	500	<0.100	<0.010
	9/8/2016	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.37	2018	1380	1.10	370	30	670	5.0	1.7	<3	490	<0.100	0.010
	9/8/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.37	2018	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/9/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.50	1945	1279	1.10	360	35	600	4.7	1.5	<3	460	<0.100	<0.010
	9/13/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.11	2055	1273	1.00	330	34	620	4.5	1.7	<3	450	<0.100	<0.010
	3/21/2018	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.03	2033	1324	0.95	340	34	650	9.8	2.2	<3	460	<0.100	0.010
	9/11/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	2080	1338	0.94	380	34	610	5.1	1.6	<3	500	<0.100	<0.010
	3/27/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.46	2033	1308	1.00	360	34	620	4.7	1.6	<3	470	<0.100	<0.010
	9/4/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.40	1627	1346	0.91	370	37	650	4.6	1.6	<3	470	<0.100	<0.010
	3/26/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.64	1788	1268	2.00	390	28	530	4.8	1.6	<3	510	<0.100	<0.010
	9/15/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	9.14	1966	1289	1.80	330	28	620	4.8	1.7	<3	470	<0.100	0.010
	2/23/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.32	2238	1372	0.97	370	32	650	5.0	1.8	<3	500	<0.100	<0.010
	8/24/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	9.02	1934	1360	1.00	380	36	650	4.5	1.5	<3	480	0.450	0.012
	3/9/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.33	2062	1352	0.99	370	32	650	5.2	1.7	<3	480	<0.100	<0.010
	9/1/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.22	2033	1317	0.97	310	37	640	4.6	1.6	<3	480	<0.100	0.011
	2/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.49	2018	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/16/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.27	1942	n/a	1.10	340	38.0	640	5	1.7	<3	480	<0.100	0.011
	2/22/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.39	2041	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/28/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.52	2075	n/a	1.10	350	38	630	4.7	1.7	<3	510	<0.100	0.011

TASWA Solid Waste Disposal Recycling Facility
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Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-17	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.42	2000	1234	1.20	378	36.6	589	<5	<5	<5	421	n/a	n/a
	1/27/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	9.13	1790	1144	1.30	348	32.3	531	<5	<5	<5	408	n/a	n/a
	5/12/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.58	1780	1087	1.40	327	32.9	490	<5	<5	<5	402	n/a	n/a
	9/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.70	1625	1078	1.30	341	30.0	509	<5	<5	<5	370	n/a	n/a
	11/10/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.64	1696	1092	1.40	345	31.0	505	<5	<5	<5	385	n/a	n/a
	2/16/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.63	1717	1164	1.30	408	31.2	510	<5	<5	<5	421	n/a	n/a
	5/25/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.59	1885	1148	1.40	338	31.8	502	<5	<5	<5	447	n/a	n/a
	9/6/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.62	1650	1178	1.20	361	33.0	532	<5	<5	<5	434	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.65	1736	1149	1.20	341	31.4	506	<5	<5	<5	443	n/a	n/a
	3/21/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.60	1850	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/11/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.52	1902	1206	1.30	341	36.6	633	<5	<5	<5	367	n/a	n/a
	8/8/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.59	1956	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.60	1977	1132	1.30	346	37.2	551	<5	<5	<5	372	n/a	n/a
	3/5/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.48	1926	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.61	1638	1112	1.40	389	32.8	507	<5	<5	<5	380	n/a	n/a
	11/20/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.94	2599	1791	0.86	353	58.3	902	29.8	12.0	7.2	607	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.40	1872	1336	1.40	356	37.4	698	<5	<5	<5	424	n/a	n/a
	12/10/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	8.03	2267	1680	1.01	337	57.0	914	37.4	10.8	<5	494	n/a	n/a
	6/3/2010	<5	<5	<10	<4	<2	<20	5.50	<10	<15	<20	<50	<10	<1	<10	<100	8.06	2181	1497	1.19	341	45.9	800	22.7	7.6	<5	452	n/a	n/a
	12/2/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.09	2428	1311	1.12	298	42.1	561	27.4	6.9	<5	526	<0.259	0.0241
	5/25/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.29	3307	1277	1.16	323	38.2	642	8.78	<5	<5	428	0.104	0.0153
	5/25/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.29	3307	1313	1.18	323	36.9	661	9.42	<5	<5	446	0.193	0.0160
	11/11/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.53	1972	1195	1.24	330	33.7	560	6.38	<5	<5	431	0.113	<0.0150
	5/17/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.40	1997	1238	1.39	376	35.8	578	11.3	<5	<5	427	0.164	0.0353
	11/14/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.58	2064	1287	1.17	337	37.6	621	9.27	<5	<5	452	0.414	0.0472
	3/20/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.67	2039	1369	1.20	340	39	620	12	<5	<5	530	0.130	0.018
	9/18/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.27	2504	1639	0.93	380	48	830	21	8.8	3.8	540	<0.100	0.015
	3/6/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.42	2009	1279	1.50	370	37	570	6.2	2.4	<3	480	<0.100	0.014
	9/9/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.72	1895	1277	1.50	400	34	560	3.3	1.3	<3	480	<0.100	0.014
	3/24/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.49	2912	1862	1.00	360	58	970	71	20.0	4.9	560	0.120	0.068
	9/9/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.46	3504	1945	1.60	360	57	1000	56	17.0	6.0	630	<0.100	0.044
	3/17/2016	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.39	4070	2798	1.80	390	85	1600	94	28.0	7.5	790	0.350	0.085
	9/8/2016	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.16	4944	3321	2.20	440	93	1900	150	40.0	9.1	910	0.610	0.086
	3/9/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.34	4345	2719	1.60	420	78	1400	120	35.0	8.0	870	1.6	0.110
	9/14/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.51	3139	1714	1.80	350	48	890	28	11.0	3.6	560	1.8	0.018
	3/22/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.03	2272	1417	1.20	350	38	690	17	5.8	3.2	490	1.3	0.020
	9/11/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.59	2219	1382	1.40	370	36	630	15	4.5	3.3	510	0.730	0.012
	3/27/2019	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.13	4547	3130	1.60	400	95	1700	190	47.0	10	890	0.680	0.170
	9/5/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.82	2210	1829	1.30	390	55	930	44	13.0	4.4	590	0.190	0.017
	3/26/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.44	3468	2654	3.00	400	72	1400	130	35.0	7.6	810	0.570	0.082
	9/15/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.59	2338	1391	1.50	330	36	660	24	6.9	<3	500	0.390	0.017
	9/15/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.59	2338	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	2/23/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.68	2801	1725	1.20	390	44	880	26	8.9	3.2	570	0.610	0.022
	8/25/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.28	2453	1649	1.40	400	49	830	24	8.4	<3	540	0.390	0.015
	3/10/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.64	2797	1864	1.30	400	55	970	34	13.0	4.0	590	0.360	0.019
	9/9/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.52	1939	1231	1.30	350	31	570	4.8	1.7	<3	450	0.580	0.014
	2/16/2023	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.06	4794	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/17/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.63	2755	n/a	1.30	400	60	1100	37	13.0	3.8	600	1.700	0.037
	2/22/2024	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.07	4576	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/28/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.90	2738	n/a	1.30	370	52	910	34.0	12.0	4.3	600	0.950	0.028

TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-18	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.36	1980	1241	1.10	372	33.3	602	<5	<5	<5	422	n/a	n/a
	1/27/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	9.08	1800	1190	1.20	338	32.6	577	5.5	<5	<5	407	n/a	n/a
	5/12/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.56	1830	1111	1.30	323	31.7	512	5.2	<5	<5	402	n/a	n/a
	9/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.56	1713	1142	1.10	330	31.8	556	15.1	<5	<5	376	n/a	n/a
	11/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.95	2095	1549	0.90	314	58.7	797	87.0	15.3	<5	436	n/a	n/a
	2/17/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.4	<5	n/a	n/a	<20	7.03	2520	2357	0.31	354	160	1310	253	45.1	8.72	406	n/a	n/a
	5/26/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.39	2026	1182	1.40	334	32.2	550	18.7	<5	<5	415	n/a	n/a
	8/25/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.49	1887	1113	1.20	359	27.8	517	6.6	<5	<5	384	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.17	1888	1280	1.10	321	38.9	600	39.6	6.9	<5	436	n/a	n/a
	3/21/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.51	1899	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/11/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.97	2013	1341	1.20	322	45.2	702	39.6	6.0	<5	389	n/a	n/a
	8/9/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.54	1822	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.13	1761	1176	1.20	334	36.5	587	19.5	<5	<5	368	n/a	n/a
	3/6/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	8.65	1481	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.27	3903	3090	1.70	336	139	1830	151	35.8	8.84	758	n/a	n/a
	11/20/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.65	3368	1921	1.04	320	53.1	774	424	9.8	<5	502	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	9.44	<5	<1	<50	<20	6.86	3362	3157	<0.1	257	187	1960	391	61.3	6.90	424	n/a	n/a
	8/17/2009	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<5	n/a	n/a	n/a	n/a	7.59	3322	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	12/10/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.99	2108	1501	0.91	315	56.5	811	66.3	13.1	<5	398	n/a	n/a
	6/3/2010	<5	<5	10.7	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.39	2211	1551	0.91	310	52.2	839	78.4	16.8	<5	411	n/a	n/a
	12/3/2010	<5	10.3	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.98	2364	1483	0.93	340	51.4	812	36.6	<5	<5	415	<0.259	0.0259
	2/17/2011	n/a	<5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7.81	1430	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	5/25/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.83	3459	1547	0.61	290	55.2	835	84.1	15.4	<5	414	0.281	0.0158
	11/11/2011	<5	<5	18.6	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.18	3626	2938	0.76	248	152	1710	279	43.6	7.66	623	0.146	0.0477
	5/17/2012	<5	<5	14.4	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.37	2804	2092	0.42	306	94.2	1200	197	35.3	6.11	409	0.326	0.0577
	11/14/2012	<5	<5	16.8	<4	<2	<20	<5	<10	<15	20.5	<50	<10	<1	<10	<100	6.92	4008	3139	0.20	261	180	1870	396	59.6	6.13	499	0.837	0.0955
	3/20/2013	<5	<5	14.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.83	2748	3664	<0.10	260	200	2200	490	88.0	8.0	550	0.26	0.14
	9/18/2013	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.05	3890	3475	<0.10	270	200	2200	380	66.0	6.4	490	0.16	0.087
	3/6/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.65	2560	1746	0.84	330	<3	940	100	18.0	4.4	520	0.17	0.088
	9/9/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.43	2084	1439	0.71	250	50	730	70	12.0	3.6	450	<0.100	0.042
	3/24/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.25	2903	2143	0.52	300	100	1200	160	30.0	4.6	500	0.17	0.069
	9/9/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.53	2255	1441	0.68	320	50	760	68	11.0	3.8	390	<0.100	0.047
	3/17/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.08	2341	1783	0.68	290	63	950	120	22.0	4.7	480	0.16	0.110
	9/8/2016	<5	<5	10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.39	2725	1897	0.16	330	71	1000	190	29.0	4.8	440	<0.100	0.031
	3/10/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.73	2421	1749	0.32	310	50	930	150	22.0	4.3	440	<0.100	0.042
	9/14/2017	<5	<5	17	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.03	3795	3149	<0.10	250	140	2000	390	79.0	6.9	410	<0.100	0.059
	3/22/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.19	2820	2094	0.17	310	72	1200	200	34.0	5.1	430	<0.100	0.042
	9/12/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.62	2063	1397	1.40	340	38	670	65	11.0	4.0	440	0.280	0.049
	3/27/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.65	2397	1619	0.33	320	50	860	110	18.0	3.7	420	<0.100	0.043
	9/5/2019	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.52	2275	2337	0.12	280	89	1400	220	35.0	5.0	450	<0.100	0.022
	3/26/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.80	2039	1455	0.80	340	38	670	100	15.0	3.8	460	<0.100	0.034
	9/15/2020	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.98	2820	2129	0.24	280	69	1200	220	37.0	4.7	460	<0.100	0.031
	2/24/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.70	2246	1401	0.66	340	35	700	49	9.2	<3	440	<0.100	0.040
	8/25/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.04	2012	1396	0.84	360	40	680	41	7.1	<3	450	<0.100	0.030
	3/10/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.83	2101	1367	0.78	350	38	660	39	7.5	<3	450	<0.100	0.026
	9/9/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.18	2350	1648	0.57	320	44	890	79	14	3.3	460	0.180	0.150
	2/16/2023	<5	<5	18	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.19	3012	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/17/2023	<5	<5	18	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.21	2891	n/a	0.16	300	91	1600	300	56.0	6.0	520	<0.100	0.100
	2/23/2024	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.09	3017	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/28/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.65	2692	n/a	0.18	300	60	1100	170.0	29.0	4.9	490	0.110	0.110

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-19	10/20/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.01	2140	1319	0.97	367	37.7	655	16.5	<5	<5	428	n/a	n/a
	1/27/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.75	1750	1167	1.10	343	35.2	552	6.6	<5	<5	403	n/a	n/a
	5/12/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.44	1841	1141	1.20	346	33.4	529	5.2	<5	<5	402	n/a	n/a
	9/9/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.71	2957	2289	1.30	283	165	1220	120	17.9	<5	626	n/a	n/a
	11/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.14	2012	1364	1.10	329	53.4	645	19.7	<5	<5	483	n/a	n/a
	2/17/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	22.2	<5	n/a	n/a	<20	6.70	3353	3573	0.19	284	322	1980	465	60.9	9.09	596	n/a	n/a
	5/26/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	5.3	<5	n/a	n/a	<20	6.98	4796	3563	1.30	259	367	1930	280	42.2	10.1	805	n/a	n/a
	8/25/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.42	3213	2471	1.50	317	176	1250	86.8	13.6	5.91	781	n/a	n/a
	11/29/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	23.0	<5	<2	<50	<20	6.76	4165	3371	<0.10	230	316	2030	246	72.3	7.15	586	n/a	n/a
	3/21/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.25	4163	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/11/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.46	3110	1987	1.20	315	123	1100	51.9	8.5	<5	548	n/a	n/a
	8/9/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.71	2498	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/29/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.55	2190	1414	1.00	333	74.8	711	23.9	<5	<5	440	n/a	n/a
	3/10/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.97	1908	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	8.02	2471	1287	1.40	382	55.6	631	14.3	<5	<5	397	n/a	n/a
	11/19/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.95	2427	1253	1.07	334	43.6	589	11.6	<5	<5	444	n/a	n/a
	6/4/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	10.9	1666	1255	1.08	345	41.6	621	9.8	<5	<5	412	n/a	n/a
	12/10/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	23.7	8.24	1789	1588	1.15	348	41.0	967	10.0	<5	<5	398	n/a	n/a
	2/16/2010	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<20	7.88	1391	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/3/2010	<5	<5	10.3	<4	<2	<20	6.80	<10	<15	<20	<50	<10	<1	<10	<100	8.80	1844	1218	1.16	320	37.9	607	9.36	<5	<5	405	n/a	n/a
	12/1/2010	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.28	1888	1127	1.08	313	35.3	508	8.18	<5	<5	421	<0.259	0.0210
	5/24/2011	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.26	1777	1233	0.83	318	38.7	613	7.82	<5	<5	416	<0.100	0.0154
	11/10/2011	<5	<5	10.1	<4	<2	<20	5.90	<10	<15	<20	<50	<10	<1	<10	<100	8.39	1601	1068	1.06	315	33.1	479	7.19	<5	<5	393	<0.100	0.0219
	5/17/2012	<5	<5	11.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.52	1695	1107	1.48	359	34.8	518	6.65	<5	<5	370	<0.100	<0.0150
	11/14/2012	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.32	1728	1063	1.03	312	32.9	483	6.13	<5	<5	387	<0.228	0.0176
	3/20/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.69	1737	1128	1.30	340	33	470	6.3	<5	<5	450	<0.10	<0.015
	9/18/2013	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.49	1680	1054	1.10	350	34	470	5.5	1.3	<3	370	<0.100	0.011
	3/6/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.11	1502	1178	1.30	360	33	530	5.8	1.3	<3	430	<0.100	0.016
	9/9/2014	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.61	1775	1152	1.30	410	32	480	5.5	1.3	<3	430	<0.100	0.014
	3/24/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.54	1772	1125	1.60	330	34	500	5.5	1.5	<3	420	<0.100	0.010
	9/10/2015	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.65	1808	1176	1.70	330	35	530	5.4	1.3	<3	440	<0.100	<0.010
	3/17/2016	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.74	1864	1221	1.50	340	35	550	5.7	1.4	<3	460	<0.100	0.016
	9/8/2016	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.49	1923	1207	1.40	360	31	540	5.7	1.4	<3	450	<0.100	<0.010
	3/10/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.71	1766	1150	1.30	370	30	500	5.5	1.3	<3	430	<0.100	0.011
	9/14/2017	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.30	1902	1164	1.40	350	34	540	4.8	1.4	<3	410	<0.100	<0.010
	3/22/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.41	1800	1156	1.40	360	31	540	4.9	1.2	<3	400	<0.100	<0.010
	9/12/2018	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.23	1870	1202	1.50	370	32	520	5.1	1.3	<3	460	<0.100	<0.010
	3/28/2019	<5	<5	10	<4	<2	<20	<5	10	<15	<20	<50	<10	<1	<10	<100	8.71	1839	1169	1.60	360	34	530	4.8	1.3	<3	420	<0.100	<0.010
	9/5/2019	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.82	1472	1238	1.40	370	38	570	4.9	1.3	<3	440	0.350	<0.010
	3/26/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.85	1663	1141	4.40	370	28	470	5.0	1.3	<3	450	<0.100	<0.010
	9/15/2020	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	9.24	1762	1135	1.40	330	35	510	4.8	1.3	<3	420	<0.100	<0.010
	2/24/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.58	2005	1230	1.40	370	30	570	4.9	1.3	<3	440	<0.100	<0.010
	8/25/2021	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	9.08	1747	1179	1.40	380	35	510	4.7	1.2	<3	440	0.250	0.010
	3/10/2022	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.56	1851	1173	1.40	370	34	520	4.7	1.3	<3	430	<0.100	<0.010
	9/1/2022	<5	<5	11	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.34	2046	1310	0.95	290	55	620	27	4.6	<3	460	<0.100	<0.010
	2/17/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.61	1822	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/17/2023	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.54	1703	n/a	1.40	360	36	560	4.8	1.4	<3	440	<100	<0.010
	2/23/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.65	1838	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/28/2024	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	8.73	1854	n/a	1.30	350	35	520	4.7	1.4	<3	470	<100	0.011

TASWA Solid Waste Disposal Recycling Facility

Historical Groundwater Analytical Data

Inorganics

Well ID	Date	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)	pH (s.u.)	Spec. Conductance (µmho/cm	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Alkalinity (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Iron (mg/L)	Manganese (mg/L)
MW-26	10/22/2004	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.23	1320	875	3.50	212	21.0	489	81.5	46.1	7.99	122	n/a	n/a
	1/25/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	8.02	1180	812	3.50	196	22.7	445	73.9	40.8	6.81	123	n/a	n/a
	5/11/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.24	1160	764	3.60	189	21.6	401	72.6	40.5	7.34	124	n/a	n/a
	9/8/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.25	1064	789	3.30	197	19.9	420	78.2	42.2	7.19	121	n/a	n/a
	11/10/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.39	1088	780	3.60	199	21.3	409	78.0	42.9	8.06	119	n/a	n/a
	11/10/2005	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.39	1088	772	3.60	198	21.4	404	77.2	42.3	8.02	118	n/a	n/a
	2/15/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	7.33	1086	785	3.50	231	21.4	411	74.9	39.6	7.51	114	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.55	1194	795	3.60	192	20.4	426	78.7	44.1	8.63	119	n/a	n/a
	5/24/2006	n/a	<10	<200	n/a	<2	<5	n/a	<25	<3	<40	<5	<5	n/a	n/a	<20	6.55	1194	790	3.50	196	20.2	416	78.9	44.1	8.49	122	n/a	n/a
	8/23/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.45	2212	731	3.60	111	19.9	402	76.8	40.6	8.15	125	n/a	n/a
	11/28/2006	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.43	1150	789	3.60	191	21.1	404	82.4	44.7	7.92	131	n/a	n/a
	3/20/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.38	1150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.36	1196	782	3.40	198	21.1	408	77.7	41.7	7.66	125	n/a	n/a
	6/8/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.36	1196	759	3.40	189	21.8	398	75.5	40.5	7.46	119	n/a	n/a
	8/7/2007	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.49	1130	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.38	1300	800	4.00	182	30.0	422	75.1	43.1	8.14	128	n/a	n/a
	3/10/2008	<6	n/a	n/a	<4	n/a	n/a	<50	n/a	n/a	n/a	n/a	n/a	<2	<50	n/a	7.47	1107	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	6/10/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.31	1176	758	3.70	180	21.0	409	72.2	40.4	7.71	115	n/a	n/a
	11/18/2008	<6	<10	<200	<4	<2	<5	<50	<25	<3	<40	<5	<5	<2	<50	<20	7.48	1387	792	3.31	195	21.1	423	78.1	44.2	8.85	118	n/a	n/a
	6/3/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.27	989	799	3.88	203	23.5	429	74.4	42.1	7.50	119	n/a	n/a
	12/1/2009	<1	<10	<200	<1	<2	<5	<50	<25	<3	<40	<5	<5	<1	<50	<20	7.56	1172	845	4.12	195	23.8	480	72.2	39.7	7.30	122	n/a	n/a
	6/2/2010	<5	<5	12.8	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.41	1135	778	3.70	192	21.9	414	76.4	41.7	7.52	118	n/a	n/a
	6/2/2010	<5	<5	13.2	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.41	1135	789	3.35	185	22.1	434	74.8	40.6	7.52	116	n/a	n/a
	12/1/2010	<5	<5	13.1	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.61	1243	775	3.75	179	23.5	397	78.4	44.8	8.62	131	1.05	0.0415
	5/24/2011	<5	<5	12.9	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.38	1015	866	3.06	182	22.3	491	80.1	43.9	8.43	128	0.915	0.0432
	11/9/2011	<5	<5	12.1	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.57	1093	805	3.88	182	21.4	431	77.5	44.0	8.48	129	0.726	0.0404
	5/16/2012	<5	<5	14.0	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.49	1022	835	4.11	199	21.5	439	83.4	47.4	9.31	132	0.445	0.0370
	11/13/2012	<5	<5	12.4	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.02	1163	791	3.58	192	22.2	434	73.9	39.5	7.06	116	0.838	0.0371
	3/19/2013	<5	<5	11.8	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.16	982	830	3.80	190	22	440	78	44.0	8.3	140	0.85	0.042
	9/17/2013	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.21	972	823	3.60	210	25	450	72	42.0	7.5	120	0.90	0.043
	3/5/2014	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	6.57	1028	900	3.90	200	22	510	76	42.0	7.9	140	1.50	0.046
	9/8/2014	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.03	1140	824	3.50	190	22	440	75	42.0	8.1	140	0.58	<0.010
	3/25/2015	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.36	1243	817	4.10	200	23	430	77	47.0	7.7	130	0.49	0.046
	9/10/2015	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.23	1234	774	4.80	190	22	440	61	36.0	6.8	110	0.44	0.033
	3/16/2016	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.44	1235	823	3.90	190	22	430	81	44.0	8.8	140	0.57	0.042
	3/16/2016	<5	<5	<10	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.44	1235	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/7/2016	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.36	1230	826	3.90	200	18	430	81	46.0	8.4	140	0.54	0.043
	3/8/2017	<5	<5	12	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.62	1196	833	4.00	200	23	450	79	41.0	7.9	130	0.56	0.044
	9/13/2017	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.35	1257	826	3.70	190	23	450	72	46.0	7.7	130	0.50	0.038
	3/21/2018	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.35	1203	826	4.30	210	21	440	77	42.0	8.2	130	0.53	0.044
	3/21/2018	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.35	1203	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	9/11/2018	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.29	1255	826	4.40	200	22	430	80	43.0	8.7	140	0.60	0.040
	9/11/2018	<5	<5	15	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.29	1255	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
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	9/4/2019	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.33	1000	887	3.90	210	26	480	80	45.0	8.5	140	0.49	0.043
	9/4/2019	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.33	1000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/24/2020	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.57	1116	779	7.20	210	19	380	79	43.0	7.9	140	0.71	0.045
	9/15/2020	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.46	1220	817	4.00	190	21	440	77	44.0	7.9	130	0.92	0.044
	2/22/2021	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.35	1342	872	3.80	210	20	470	81	46.0	8.0	140	2.5	0.048
	8/23/2021	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.41	1189	839	4.00	210	24	450	78	42.0	7.4	130	0.95	0.046
	3/9/2022	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.29	1262	830	3.90	210	21	440	79	45.0	7.9	130	0.78	0.045
	8/29/2022	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.30	1196	819	3.80	200	21	450	75	43	7.9	120	0.55	0.042
	2/15/2023	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.39	1189	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/15/2023	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.55	1081	n/a	3.90	200	30.0	480	84	47.0	8.1	130	0.65	0.046
	2/21/2024	<5	<5	13	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.44	1225	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	8/26/2024	<5	<5	14	<4	<2	<20	<5	<10	<15	<20	<50	<10	<1	<10	<100	7.61	1239	n/a	4.20	200	25	460	74.0	41.0	7.6	120	0.67	0.042

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/l	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
MW-1	10/20/2004	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<2	<2	<1	<1	<5	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	1/25/2005	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<2	<2	<1	<1	<5	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
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	2/15/2006	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<2	<2	<1	<1	<5	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	5/24/2006	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<2	<2	<1	<1	<5	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
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Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/l	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)
MW-2	10/20/2004	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
	1/25/2005	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
	5/11/2005	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
	9/7/2005	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
	11/9/2005	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
	2/15/2006	<5	<10	<1	<1	<1	<2	<1	<1	<1	<2	<1	<1	<5	<1	<1	<1
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	5/17/2012	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2
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	2/22/2021	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2
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Well ID	Date	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)
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	2/21/2024	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5
	8/27/2024	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5

Well ID	Date	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
MW-2	10/20/2004	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	1/25/2005	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	5/11/2005	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	9/7/2005	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	11/9/2005	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
	2/15/2006	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<2
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	6/4/2009	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<3
	12/1/2009	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<2	<2	<3
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	3/26/2015	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/9/2015	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/16/2016	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/20/2016	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/8/2017	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/14/2017	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/21/2018	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/11/2018	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	2/22/2021	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	8/23/2021	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/8/2022	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/1/2022	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	2/15/2023	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	8/27/2024	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10

TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
MW-3	10/20/2004	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	1/25/2005	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	9/7/2005	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	11/9/2005	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	2/15/2006	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	5/24/2006	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	6/10/2008	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	11/18/2008	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	12/1/2009	<5	<10	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<0.342	<0.298	<1	<1	<5	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	9/14/2017	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/21/2018	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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	1/25/2005	<5	<10	<1	<1	<1	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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	9/7/2005	<5	<10	<1	<1	<1	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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	1/25/2005	<5	<10	<1	<1	<1	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L)	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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	3/27/2019	<20	<50	<1	<1	<1	<5	<5	<1	<1	<2	<5	<1	<5	<5	<1	<1	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L)	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
MW-19	10/20/2004	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	1/27/2005	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	5/12/2005	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	9/9/2005	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	11/11/2005	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	2/17/2006	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	5/26/2006	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	8/25/2006	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	11/29/2006	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	6/11/2007	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	11/29/2007	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	6/18/2008	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	11/19/2008	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	6/4/2009	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	<0.342	<0.298	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
	12/10/2009	≤5	≤10	≤1	≤1	≤1	≤2	≤5	≤1	≤1	≤1	≤1	≤1	<0.342	<0.298	≤1	≤1	≤5	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤1	≤5	≤5	≤2	≤2	≤5	≤5	≤5	≤5	≤2	≤1	≤5	≤1	≤1	≤1	≤5	≤10	≤1	≤100	≤2	≤10
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TASWA Solid Waste Disposal Recycling Facility
Historical Groundwater Analytical Data
Organics

Well ID	Date	Acetone (ug/L)	Acrylonitrile (ug/L)	Benzene (ug/L)	Bromochloromethane (ug/L)	Bromodichloromethane (ug/L)	Bromoform (ug/L)	Carbon disulfide (ug/L)	Carbon tetrachloride (ug/L)	Chlorobenzene (ug/L)	Chloroethane (ug/L)	Chloroform (ug/L)	Dibromochloromethane (ug/L)	1,2-Dibromo-3-chloropropane (ug/L)	1,2-Dibromoethane (ug/L)	1,2-Dichlorobenzene (ug/L)	1,4-Dichlorobenzene (ug/L)	trans-1,4-Dichloro-2-butene (ug/L)	1,1-Dichloroethane (ug/L)	1,2-Dichloroethane (ug/L)	1,1-Dichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,2-Dichloropropane (ug/L)	cis-1,3-Dichloropropene (ug/L)	trans-1,3-Dichloropropene (ug/L)	Ethylbenzene (ug/L)	2-Hexanone (ug/L)	Bromomethane (ug/L)	Chloromethane (ug/L)	Dibromomethane (ug/L)	Methylene chloride (ug/L)	2-Butanone (MEK) (ug/L)	Iodomethane (ug/L)	4-Methyl-2-pentanone (ug/L)	Styrene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	1,1,2,2-Tetrachloroethane (ug/L)	Tetrachloroethene (ug/L)	Toluene (ug/L)	1,1,1-Trichloroethane (ug/L)	1,1,2-Trichloroethane (ug/L)	Trichloroethene (ug/L)	Trichlorofluoromethane (ug/L)	1,2,3-Trichloropropane (ug/L)	Vinyl acetate (ug/L)	Vinyl chloride (ug/L)	Xylenes (total) (ug/L)
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	9/11/2018	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/11/2018	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/26/2019	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/4/2019	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/4/2019	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/24/2020	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	9/15/2020	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	2/22/2021	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	8/23/2021	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	3/9/2022	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	8/29/2022	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	2/15/2023	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	8/15/2023	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	2/21/2024	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10
	8/26/2024	<20	<50	<1	<1	<1	<5	<5	<5	<1	<5	<1	<2	<5	<1	<2	<2	<100	<1	<1	<1	<1	<1	<1	<2	<5	<2	<5	<10	<5	<1	<5	<5	<5	<5	<2	<2	<1	<5	<1	<1	<1	<5	<10	<1	<100	<2	<10

APPENDIX E8

PREVIOUS PERMIT DATA

STATE HIGHWAY NO. 56

OLD SANBORN RANCH ROAD

UTLEY ROAD

N 5000
N 4500
N 4000
N 3500
N 3000
N 2500
N 2000
N 1500
N 1000
N 500
N 000

E 000
E 500
E 1000
E 1500
E 2000
E 2500
E 3000
E 3500
E 4000
E 4500
E 5000

A A' B B' C C' D D' E E' F F' G G' H H' I I' J J'

F-40 P-40 L-35 U-35 EE-35 00-35 YY-35
F-30 P-30 U-30 Z-30 JJ-30 00-30 TT-30
L-25 U-25 Z-25 EE-25 JJ-25 00-25 YY-25
P-20 Z-20 JJ-20 TT-20
L-15 U-15 Z-15 EE-15 JJ-15 00-15 YY-15
F-10 P-10 U-10 Z-10 JJ-10 00-10 TT-10

0 300 600
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMIT OF WASTE
- EXISTING CONTOUR
- ELECTRIC LINE AND EASEMENT
- N 3000 SITE GRID
- BORINGS > 30' BELOW EDE
- BORINGS > 5' BELOW EDE
- WOODBINE PIEZOMETERS
- SHALLOW PIEZOMETERS

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JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST

12-20-00

ISSUED FOR PERMITTING PURPOSES ONLY

GEOLOGIC CROSS-SECTION LOCATION MAP

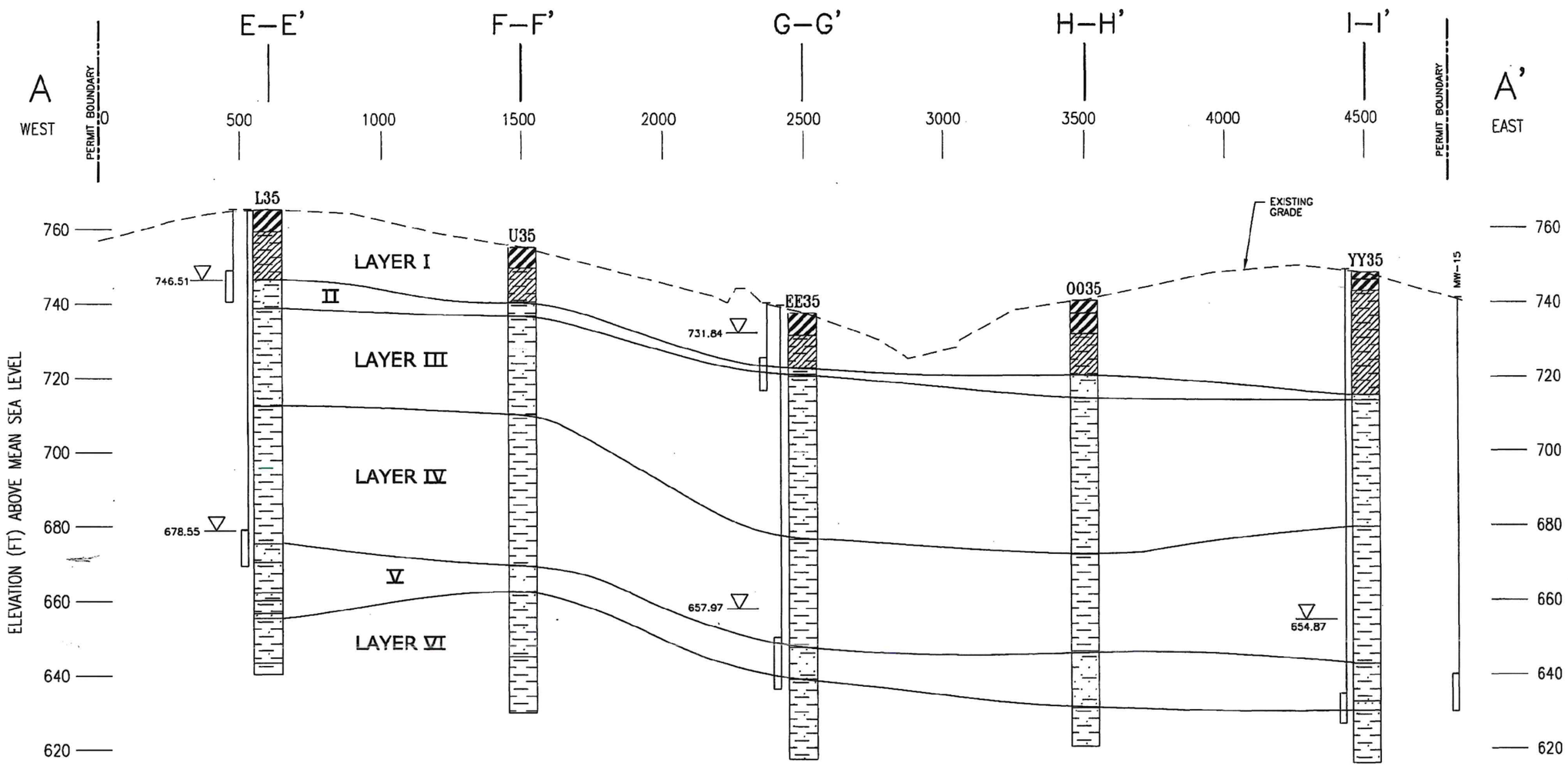
TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
PERMIT APPLICATION

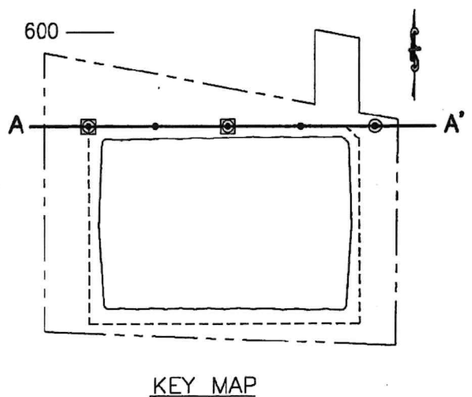
BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.1
CHK. JMS	DWG : GEOLOGICCROSS.DWG	

F:\DWG\202\01\100\GEOLOGICCROSS.DWG





KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
7963
AIPG
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST

12-20 00

0 15 30
SCALE IN FEET
VERTICAL

0 200 400
SCALE IN FEET
HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION A–A'

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

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CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.2
CHK. JMS	DWG : GEOSECTA.DWG	

F:\DWG\202 ب\100\GEOSECTA.DWG

B WEST — B' EAST

E–E' F–F' G–G' H–H' I–I'

PERMIT BOUNDARY — PERMIT BOUNDARY

0 500 1000 1500 2000 2500 3000 3500 4000 4500

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600

Elevation (ft)

F30 P30 U30 Z30 JJ30 0030 TT30 MW-16 MW-8

743.47 731.06

EXISTING GRADE

LIMIT OF EXCAVATION

LAYER I
II
LAYER III
LAYER IV
V
LAYER VI

B B'

KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY
SHALY CLAY
SHALY SAND
SHALE W/ SAND
SHALE
SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER 7963
AIPG
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST
12-20-00

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION B–B'

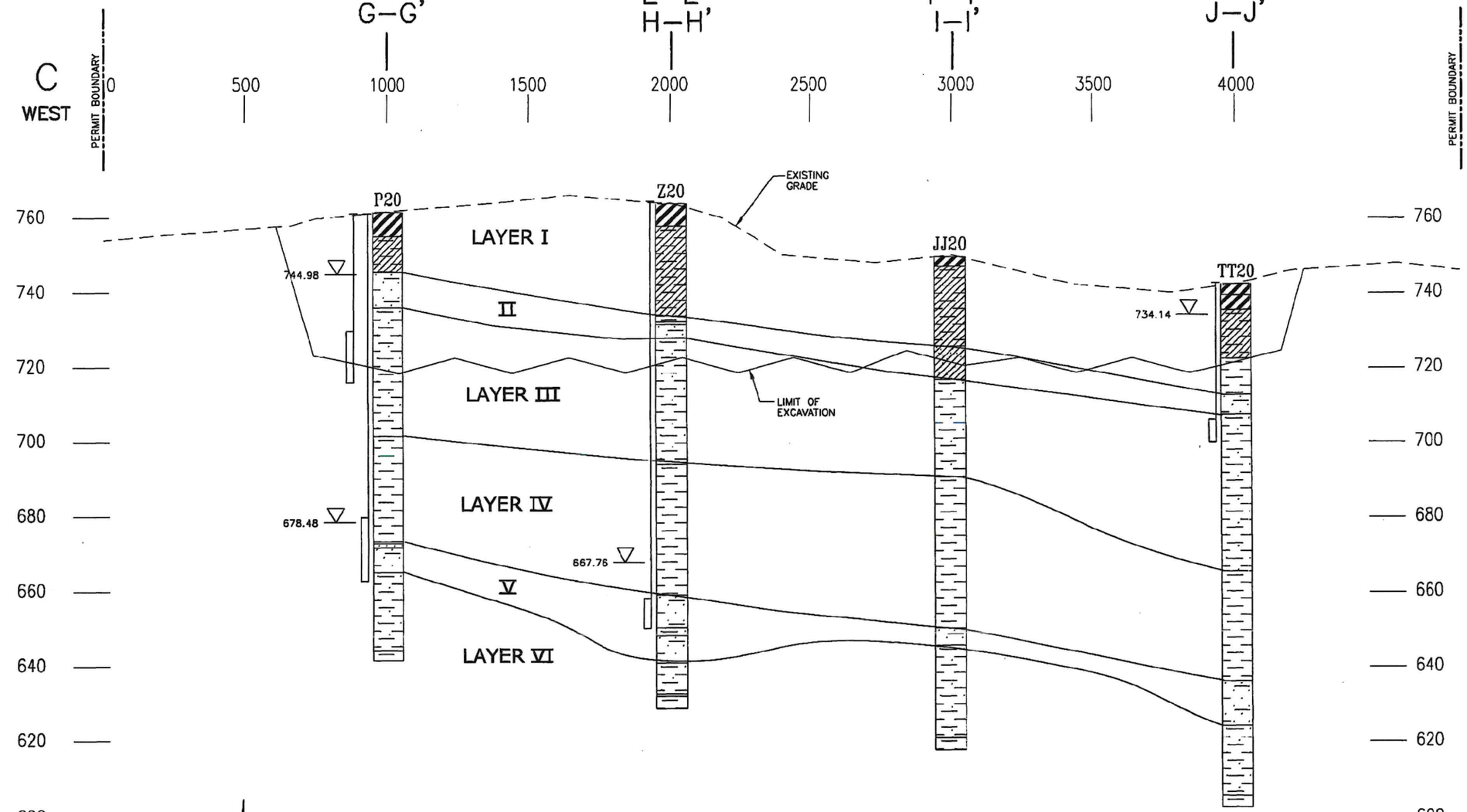
TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
PERMIT APPLICATION

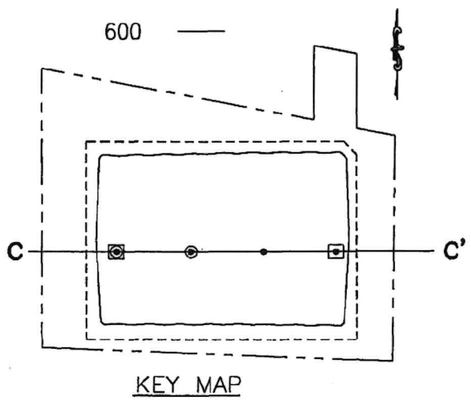
BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.3
CHK. JMS	DWG : GEOSECTB.DWG	

F:\DWG\202\01\100\GEOSECTB.DWG





KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY
SHALY CLAY
SANDY CLAY
SHALY SAND
SHALE W/ SAND
SHALE
SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
7963
AIPG
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST
12-20-00

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION C–C'

TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
PERMIT APPLICATION

BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS					
REV	DATE	DESCRIPTION	DWN BY	DES BY | CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE	
DWN. GLW	SCALE : GRAPHIC	4C.4	
CHK. JMS	DWG : GEOSECTC.DWG		

F:\DWG\202\01\100\GEOSECTC.DWG

G–G' H–H' I–I' J–J' E–E' F–F'

D WEST — D' EAST

PERMIT BOUNDARY 0 500 1000 1500 2000 2500 3000 3500 4000 4500 PERMIT BOUNDARY

EXISTING GRADE

F10 P10 U10 Z10 JJ10 QQ10 TT10 MW-20 MW-11

LAYER I

LAYER II

LAYER III

LAYER IV

LAYER V

LAYER VI

744.33

675.68

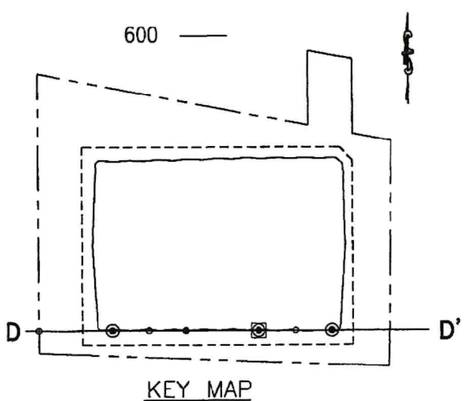
655.89

655.40

LIMIT OF EXCAVATION

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600



KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY
SHALY CLAY
SHALY SAND
SHALE W/ SAND
SHALE
SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
7963
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST
5-23-01

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

GEOLOGIC CROSS SECTION D–D'

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.5
CHK. JMS	DWG : GEOSECTD.DWG	

F:\DWG\202\01\100\GEOSECTD.DWG

A–A' B–B' G–G' C–C', H–H' I–I' D–D', J–J'

E NORTHWEST

E' SOUTHEAST

0 500 1000 1500 2000 2500 3000 3500 4000 4500

PERMIT BOUNDARY

PERMIT BOUNDARY

EXISTING GRADE

L35 P30 U25 Z20 EE15 JJ10 MW-22

F40

LAYER I

II

LAYER III

LAYER IV

V

LAYER VI

746.51

744.33

678.55

667.76

658.25

655.89

LIMIT OF EXCAVATION

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600

E

E'

KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
7963
AIPG
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST

12-20-00

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

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GEOLOGIC CROSS SECTION E–E'

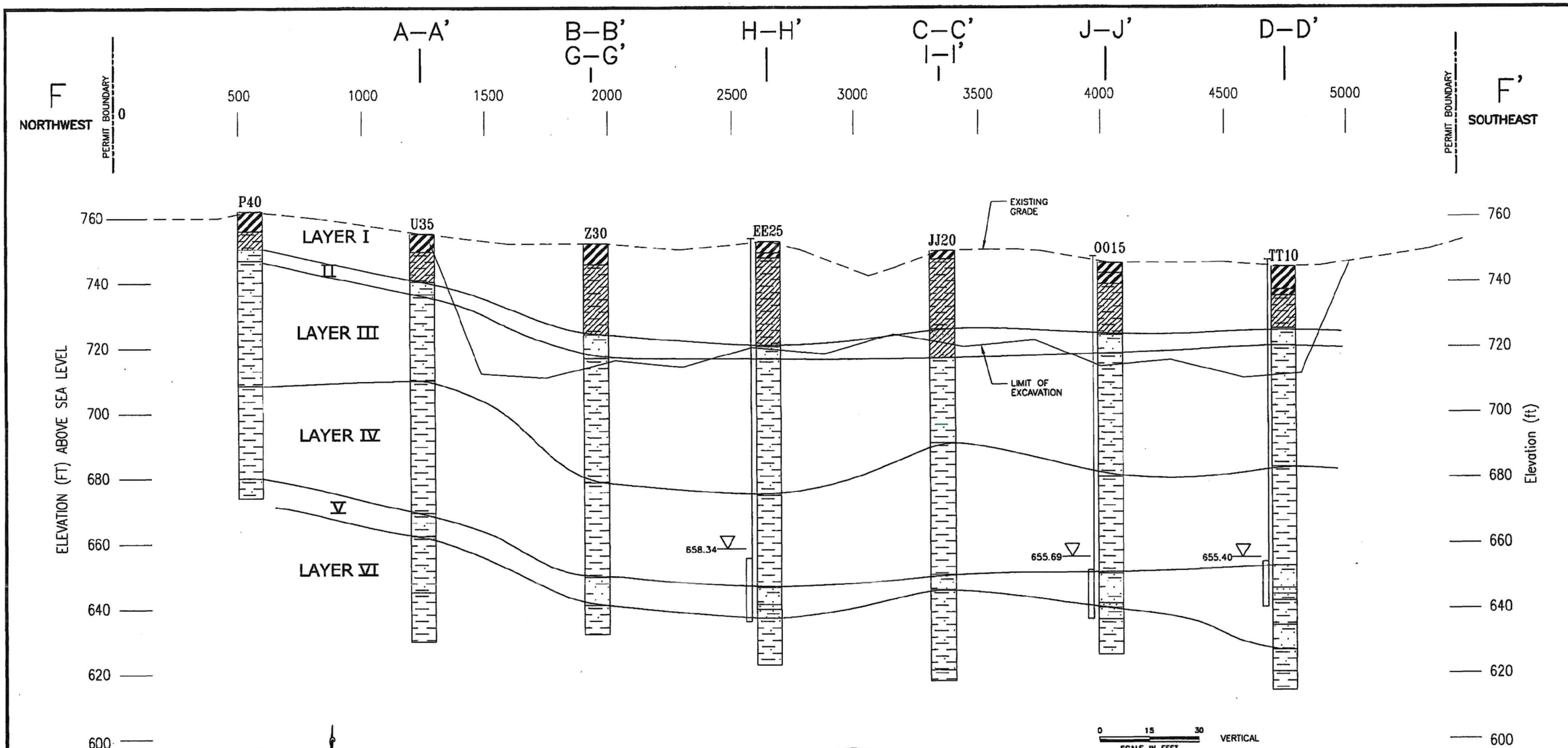
TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

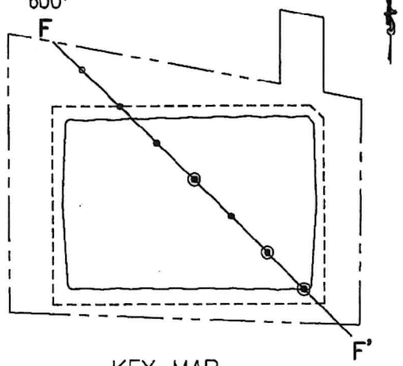
BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.6
CHK. JMS	DWG : GEOSECTE.DWG	

F:\DWG\202\01\100\GEOSECTE.DWG





KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SANDY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER
7963
AIPG
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST

12-20-00

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION F–F'

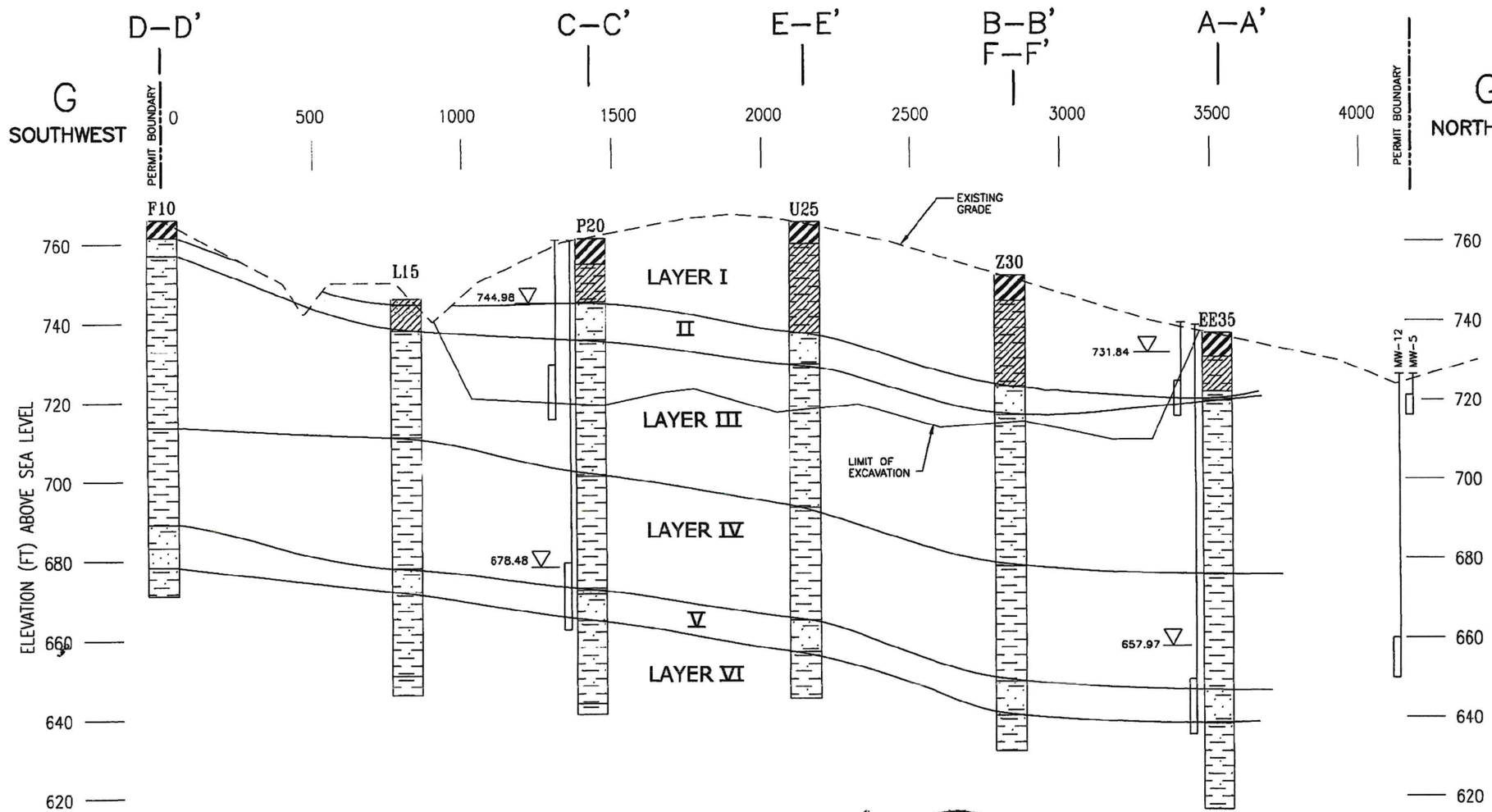
TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
PERMIT APPLICATION

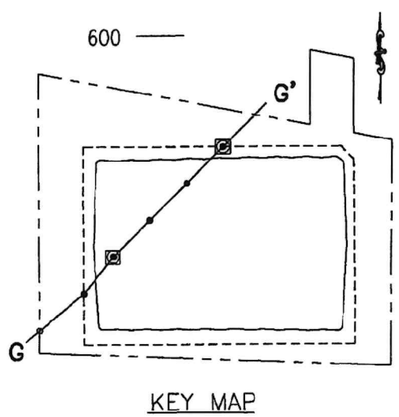
BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE	
DWN. GLW	SCALE : GRAPHIC	4C.7	
CHK. JMS	DWG : GEOSECTF.DWG		

F:\DWG\202\01\100\GEOSECTF.DWG





KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS
CERTIFICATE NUMBER 7963
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST
5-23-01

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION G–G'

TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
PERMIT APPLICATION

BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. MJS	DATE : 12/CO	FIGURE	4C.8
DWN. GLW	SCALE : GRAPHIC		
CHK. MJS	DWG : GEOSECTG.DWG		

F:\DWG\202\01\100\GEOSECTG.DWG

D–D' C–C' E–E' F–F' B–B' A–A'

H SOUTHWEST — PERMIT BOUNDARY — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500 — 4000 — 4500 — PERMIT BOUNDARY — H' NORTHEAST

ELEVATION (FT) ABOVE SEA LEVEL

760 740 720 700 680 660 640 620 600

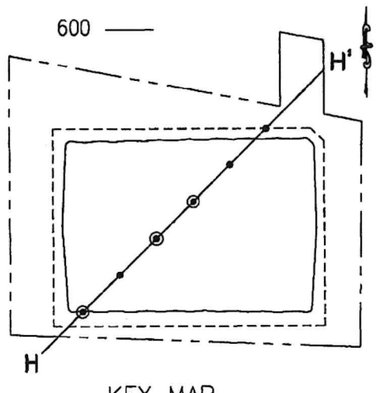
P10 U15 Z20 EE25 JJ30 0035 MW-13 MW-6

LAYER I
II
LAYER III
LAYER IV
V
LAYER VI

EXISTING GRADE

LIMIT OF EXCAVATION

675.68 667.76 655.34



KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY
SHALY CLAY
SHALY SAND
SHALE W/ SAND
SHALE
SANDSTONE

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7963
JOHN MICHAEL SNYDER
CERTIFIED PROFESSIONAL GEOLOGIST
5-23-01

0 15 30 SCALE IN FEET VERTICAL

0 200 400 SCALE IN FEET HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

GEOLOGIC CROSS SECTION H–H'

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

BIGGS & MATHEWS, INC.
CONSULTING ENGINEERS
2500 BROOK AVE. WICHITA FALLS, TEXAS
5450-A E. LOOP 820 S. FORT WORTH, TEXAS

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.9
CHK. JMS	DWG : GEOSECTH.DWG	

F:\DWG\202\01\100\GEOSECTH.DWG

SOUTHWEST

NORTHEAST

D–D'

E–E'

C–C'
F–F'

B–B'

A–A'

PERMIT BOUNDARY

PERMIT BOUNDARY

0 500 1000 1500 2000 2500 3000 3500 4000

EXISTING GRADE

Z10 EE15 JJ20 0025 TT30 YY35

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600

LAYER I

II

LAYER III

LAYER IV

V

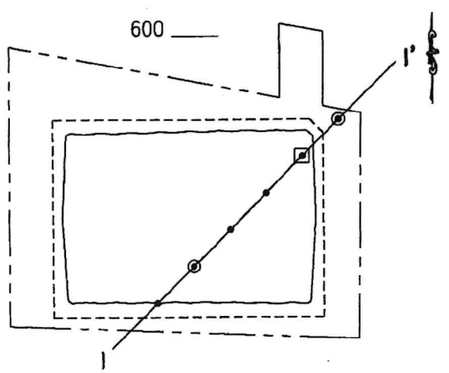
LAYER VI

LIMIT OF EXCAVATION

731.06

658.25

654.87



KEY MAP

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

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AIPG
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CERTIFIED PROFESSIONAL GEOLOGIST

12-20-00

0 15 30
SCALE IN FEET
VERTICAL

0 200 400
SCALE IN FEET
HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS–SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

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GEOLOGIC CROSS SECTION I–I'

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REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.10
CHK. JMS	DWG : GEOSECTI.DWG	

F:\DWG\202\01\100\GEOSECTI.DWG

J
SOUTHWEST

D–D'
E–E'

F–F'

C–C'

J'
NORTHEAST

PERMIT BOUNDARY

0 500 1000 1500 2000 2500 3000

PERMIT BOUNDARY

ELEVATION (FT) ABOVE MEAN SEA LEVEL

760 740 720 700 680 660 640 620 600

VW-24

JJ10

0015

TT20

YY25

EXISTING GRADE

744.33

734.14

655.89

655.69

655.09

LAYER I

II

LAYER III

LAYER IV

V

LAYER VI

LIMIT OF EXCAVATION

KEY MAP

J

J'

LEGEND

PIEZOMETER

GROUNDWATER LEVEL ON JUNE 29, 2000

CLAY

SHALY CLAY

SHALY SAND

SHALE W/ SAND

SHALE

SANDSTONE

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CERTIFIED PROFESSIONAL GEOLOGIST

12-20-00

0 15 30
SCALE IN FEET
VERTICAL

0 200 400
SCALE IN FEET
HORIZONTAL

NOTES:

1. CROSS SECTION CORRELATIONS ARE INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS-SECTION LOCATION MAP IS FIGURE 4C.1.
3. BOREHOLES DRILLED WITH MUD ROTARY. STABLE WATER LEVELS SHOWN ARE FROM THE INSTALLED WATER LEVEL PIEZOMETER.

Copy

GEOLOGIC CROSS SECTION J–J'

TEXOMA AREA SOLID WASTE AUTHORITY
DISPOSAL AND RECYCLING FACILITY
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REVISIONS						
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.11
CHK. JMS	DWG : GEOSECTJ.DWG	

F:\DWG\202\01\100\GEOSECTJ.DWG

Copy

STATE HIGHWAY NO. 56

OUTCROP OF LAYERS II & III

LAYER II ABSENT

OLD SANBORN RANCH ROAD

UTLEY ROAD

0 300 600
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMIT OF WASTE
- EXISTING CONTOUR
- E — ELECTRIC LINE AND EASEMENT
- N 3000 — SITE GRID
- BORINGS > 30' BELOW EDE
- BORINGS > 5' BELOW EDE
- LAYER V PIEZOMETERS
- SHALLOW PIEZOMETERS
- 705 — CONTOURS - 5' INTERVAL
- OUTCROP OF LAYERS II & III
- LAYER II ABSENT

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STRUCTURAL CONTOUR MAP ELEVATION--TOP OF LAYER II

TEXOMA AREA SOLID WASTE AUTHORITY RECYCLING AND DISPOSAL FACILITY PERMIT APPLICATION

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5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS					
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE 4C.12
DWN. GLW	SCALE : GRAPHIC	
CHK. JMS	DWG : LAYER1.DWG	

F:\DWG\202\01\100\LAYER1.DWG

Copy

STATE HIGHWAY NO. 56

0 300 600
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMIT OF WASTE
- EXISTING CONTOUR
- ELECTRIC LINE AND EASEMENT
- N 3000 — SITE GRID
- BORINGS > 30' BELOW EDE
- BORINGS > 5' BELOW EDE
- LAYER V PIEZOMETERS
- SHALLOW PIEZOMETERS
- 690 — CONTOURS - 10' INTERVAL

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STRUCTURAL CONTOUR MAP ELEVATION TOP LAYER IV

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

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REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
REVISIONS						

DSN. JMS	DATE : 12/00	FIGURE 4C.13
DWN. GLW	SCALE : GRAPHIC	
CHK. JMS	DWG : LAYERIVSHALE.DWG	

F:\DWG\202\V01\100\LAYERIVSHALE.DWG

Copy

STATE HIGHWAY NO. 56

OLD SANBORN RANCH ROAD

UTLEY ROAD

0 300 600
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMIT OF WASTE
- EXISTING CONTOUR
- E — ELECTRIC LINE AND EASEMENT
- N 3000 — SITE GRID
- BORINGS > 30' BELOW EDE
- BORINGS > 5' BELOW EDE
- LAYER V PIEZOMETERS
- SHALLOW PIEZOMETERS
- 690 — CONTOURS - 10' INTERVAL

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STRUCTURAL CONTOUR MAP ELEVATON TOP OF LAYER V

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

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5450-A E. LOOP 820 S. FORT WORTH, TEXAS

REVISIONS					
REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE
DWN. GLW	SCALE : GRAPHIC	4C.14
CHK. JMS	DWG : LAYERVSAND.DWG	

F:\DWG\202\01\100\LAYERVSAND.DWG

Copy

STATE HIGHWAY NO. 56

OLD SANBORN RANCH ROAD

UTLEY ROAD

0 300 600
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMIT OF WASTE
- EXISTING CONTOUR
- ELECTRIC LINE AND EASEMENT
- N 3000 SITE GRID
- BORINGS > 30' BELOW EDE
- BORINGS > 5' BELOW EDE
- WOODBINE PIEZOMETERS
- SHALLOW PIEZOMETERS
- 705 CONTOURS - 10' INTERVAL

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STRUCTURAL CONTOUR MAP ELEVATION OF TOP OF LAYER VI

TEXOMA AREA SOLID WASTE AUTHORITY DISPOSAL AND RECYCLING FACILITY PERMIT APPLICATION

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REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DSN. JMS	DATE : 12/00	FIGURE	
DWN. GLW	SCALE : GRAPHIC	4C.15	
CHK. JMS	DWG : FIG4C15.DWG		

F:\DWG\202\01\100\FIG4C15.DWG

TASWA DISPOSAL AND RECYCLING FACILITY
GRAYSON COUNTY, TEXAS
MSW PERMIT NO. 2290A

PERMIT AMENDMENT APPLICATION

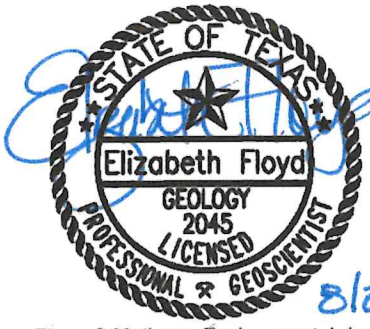
PART III – FACILITY INVESTIGATION AND DESIGN

ATTACHMENT F
GROUNDWATER CHARACTERIZATION REPORT

Prepared for

TEXOMA AREA SOLID WASTE AUTHORITY, INC.

February 2025
Revised June 2025
Revised August 2025



8/20/2025

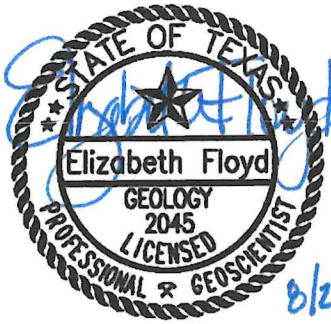
Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222

Prepared by

BIGGS & MATHEWS ENVIRONMENTAL
1700 Robert Road • Mansfield, Texas 76063 • 817-563-1144

TEXAS BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
FIRM REGISTRATION NO. F-256 AND NO. 10194895

TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS
FIRM REGISTRATION NO. 50222



8/20/2025

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2 **GROUNDWATER MONITORING SYSTEM** 4

3 **GROUNDWATER QUALITY** 10

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Permit 2290 Groundwater Monitoring Network Layer II/III F1.1
Permit 2290 Groundwater Monitoring Network Layer V F1.2
Permit 2290A Groundwater Monitoring Network Layer II/III F1.3
Permit 2290A Groundwater Monitoring Network Layer V F1.4
Monitoring Well Detail F1.5

APPENDIX F2
Groundwater Sampling and Analysis Plan

GROUNDWATER MONITORING SYSTEM DESIGN CERTIFICATION

General Site Information

Site: TASWA Disposal and Recycling Facility

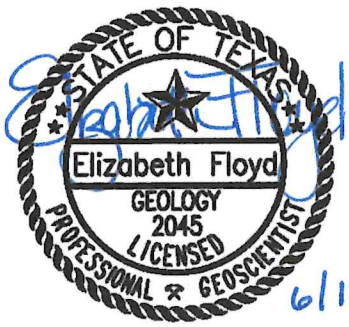
Site Location: Grayson County, Texas

MSW Permit No.: 2290A

Qualified Groundwater Scientist Statement

I, Elizabeth Floyd, am a licensed professional geoscientist in the State of Texas and a qualified groundwater scientist as defined in §330.3. I have reviewed the groundwater monitoring system and supporting data contained herein. In my professional opinion, the groundwater monitoring system is in compliance with the groundwater monitoring requirements specified in 30 TAC §330.401 through §330.421. This system has been designed for specific application to the TASWA Disposal and Recycling Facility (Permit No. MSW 2290A). The only warranty made by me in connection with this document is that I have used that degree of care and skill ordinarily exercised under similar conditions by reputable members of my profession, practicing in the same or similar locality. No other warranty, expressed or implied, is intended.

Firm/Address: Biggs and Mathews Environmental, Inc.
1700 Robert Road, Suite 100
Mansfield, Texas 76063



6/12/2025

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1 SITE HYDROGEOLOGY

1.1 Hydrogeologic Units

Site stratigraphy is discussed in detail in Section 4.3 of Attachment E. The hydrogeologic interpretation of the site is discussed in Section 5.6 of Attachment E and is summarized below.

Layer II/III - Groundwater Zone

Groundwater occurs in the Layer II sandstone and the upper, more sandy parts of the Layer III shale. These units are continuous across the site. This zone, while not an aquifer, is the uppermost groundwater-bearing unit beneath the site. Groundwater in Layer II and III is generally confined and locally unconfined. Groundwater in this zone is confined by the less permeable parts of the Layer III and Layer IV shales. Layer III is in communication with Layer II; however, groundwater flows preferentially through the more permeable Layer II sandstones. Potentiometric surface maps of Layer II/III and Layer V (included in Attachment E, Appendix E6) show that groundwater flows generally to the northeast. Groundwater is estimated to flow approximately 24 feet per year. Shallow groundwater in Layers II and III would generally not produce enough water to be a reliable water supply source. However, the shallow cisterns found previously on the site indicate that individual wells or cisterns might be used for minor water use.

Layer IV - Confining Unit

Layer IV is a dark gray, dense shale that is correlatable across the site and stratigraphically below Layer III. The unit ranges in thickness from 3-79 feet and serves as the lower confining unit to the shallow groundwater in Layers II and III. It also serves as the upper confining layer to the Layer V sandstone aquifer.

Layer V – Uppermost Aquifer

Groundwater is contained in the Layer V sandstone. This unit is continuous and correlatable across the site. Layer V is the uppermost aquifer beneath the site and is the uppermost part of the Woodbine aquifer. The Woodbine is determined by the Texas Water Development Board to be a minor aquifer. Groundwater in the Woodbine in the area is used primarily by individuals for domestic or livestock purposes. Drinking water supply wells in the area generally produce groundwater from the deeper Antlers sand. Groundwater in Layer V is confined by the overlying and underlying shales of Layers IV and VI. Groundwater within Layer V flows generally to the east as shown on potentiometric surface maps of Layer V included in Appendix E6 of Attachment E and is estimated to flow approximately 13 feet per year.

Layer VI – Confining Unit

Layer VI consists of a dark gray, dense shale with occasional seams of sand in the upper parts of the unit. This unit serves as the lower confining unit to groundwater in the Layer V sandstone aquifer.

1.2 Aquifer Characteristics

Slug tests were conducted by measuring the rising head or falling head of water levels with time following removal of a water column using a bailer or addition of a slug displacing a water volume. At each piezometer, a depth to static water level was measured to the nearest 0.01-foot prior to testing. A pressure transducer probe was placed near the base of the well to record initial water column heights and changes in water column heights as water levels fell or rose to static water levels. Data were recorded using a Hermit 3000 Datalogger.

Hydraulic conductivity values were calculated using the Bouwer-Rice method. Calculated values for the Layer II uppermost groundwater zone (four test results) range from 9.44×10^{-4} to 6.28×10^{-5} centimeters per second (cm/sec) and have a geometric mean of 3.16×10^{-4} cm/sec. The calculated value for the Layer III zone (one test result) is 2.17×10^{-7} cm/sec. Calculated values for the Layer V zone (eight test results) range from 5.75×10^{-4} cm/sec to 5.08×10^{-5} cm/sec, with a geometric mean of 1.22×10^{-4} cm/sec.

1.2.1 Groundwater Flow Direction and Rate

Groundwater flow direction in Layer II was evaluated by constructing potentiometric surface maps representing a period from March 2022 to December 2024.

Groundwater is contained in the Layer II shaly sandstone and the Layer III shale with sand. Groundwater enters Layer II at its outcrop on the western part of the TASWA Disposal & Recycling Facility (TASWA DRF) property and flows to the northeast. In addition to the recharge to Layer II and III from infiltration on their surface outcrops, infiltration from the surface may penetrate Layer I in localized areas where Layer I does not contain lower permeability material. Layer III contains shale with sand. Layer III generally contains more sand near the top of the layer. The amount of sand grades generally downward toward its base as it transitions into the Layer IV shale. Groundwater found in the upper parts of Layer III is apparently in direct communication with groundwater in Layer II and acts as one hydrogeologic unit. Groundwater would move preferentially in a lateral direction in the Layer II material since it is significantly more permeable than Layer III. Groundwater flow in Layer II is generally to the northeast and is estimated to be approximately 24 feet per year.

Groundwater flow direction in Layer V was evaluated by constructing potentiometric surface maps for a period representing March 2022 to December 2024.

Groundwater enters the Layer V sandstone at its outcrop west of the site. The groundwater moves downdip, generally to the east. Groundwater is confined in Layer V by the overlying Layer IV shale and the underlying Layer VI shale. Slug tests were conducted in the piezometers, which were screened in Layer V. The geometric mean of hydraulic conductivity values (K) calculated from the Layer V slug tests is 1.22×10^{-4} cm/sec.

Groundwater flow in Layer V is generally to the east and is estimated to flow 13 feet per year.

Groundwater flow direction in both Layer II/III and Layer V is consistent with the general flow direction presented in the original permit and included on the historic potentiometric surface maps presented in Appendix E8 of Attachment E.

2 GROUNDWATER MONITORING SYSTEM

2.1 Permit 2290 Groundwater Monitoring System

The groundwater monitoring system monitors both the Layer II sandstone (Uppermost groundwater bearing zone) and the Layer V sandstone (Uppermost aquifer). A total of 26 groundwater monitoring wells are currently permitted for the monitoring system at the site. Location of the 26 wells is shown in Drawings F1.1 and F1.2. The approved permit includes a phasing of monitoring well installation. MW-1 through MW-7 and MW-12 are currently installed in Layer II/III. MW-13 through MW-19 and MW-26 are currently installed in Layer V.

2.1.1 Monitoring Well Design

Groundwater monitoring well details are shown in Drawing F1.5 of this attachment. Typically, the wells consist of 2-inch diameter, flush-threaded PVC (schedule 40) with 0.01-inch slotted PVC screens. Layer II wells generally have 5-foot screens (MW-1, MW-6, and MW-12 have 10-foot screens). Layer V monitoring wells have 10-foot screens. The filter-pack sand is 20-40 grade silica sand and placed from total well depth to about 3 feet above the top of the well screen. A 3-foot-thick bentonite seal consisting of bentonite pellets is hydrated in place on top of the filter-pack sand. The remainder of the well boring is pressure grouted with bentonite grout to within 2 feet of the surface. Surface completions will be 4-foot x 4-foot by 6-inch-thick concrete pads and steel, lockable housings on the existing monitoring wells. A groundwater monitoring well installation report will be completed and submitted to TCEQ following well installation.

2.2 Operational Considerations for Groundwater Monitoring System Design

2.2.1 Relationship of Excavation Bottom to Uppermost Aquifer

The excavation of the TASWA DRF is designed to remain in the Layers II, III, or IV and to be separated from the Layer V uppermost aquifer by 30 to 80 feet of low permeable clayey materials in Layers III and IV. On the downgradient side of the site, Layer II groundwater occurs above the sump level and an underdrain is utilized to control groundwater until sufficient waste is placed to ballast. All of the saturated thickness of Layer V occurs below the excavation and sumps. As such the excavation has no effect on the upper parts of the Layer V groundwater table and groundwater continues to flow beneath the site in its natural pattern. The relationship between groundwater and the excavation are depicted on geologic cross-sections, Drawings E3.2 through E3.10 in

Appendix E3 of Attachment E. A geologic cross-section location map is shown in Drawing E3.1 in Appendix E3 of Attachment E.

2.2.2 Leachate Sump Design and Location

The TASWA DRF containment system and excavation are designed to accommodate a Subtitle D leachate collection system (LCS). The excavation bottom is lined with a composite liner and is sloped to direct leachate flow to the lowest areas where sumps are designed to collect the leachate. Leachate is then pumped out of the sumps. While leachate will not remain for lengthy periods of time nor at significant depths, the sump locations are the lowest areas of the excavation. While a leak from the Subtitle D cell is unlikely, if one were to occur, it would be more likely to be at the lowest leachate collection points in the sumps. For that reason, sump locations on the downgradient side of the site are considered in the design of the groundwater monitoring system. Sump locations at the TASWA DRF are shown on Drawings F1.3 and F1.4.

2.2.3 Critical Receptors

Critical receptors to groundwater flow downgradient of a landfill could include public drinking water supply wells, individual drinking water or livestock wells, and surface water bodies used for drinking water supply. A comprehensive water well search was conducted by Biggs and Mathews Environmental for this permit amendment. That study identified a total of nine individual industrial or domestic wells within one mile of the facility. An additional nine water wells that could possibly be located within one mile of the facility were identified through the TCEQ database. Forty-six of these located or possible locations of wells are located downgradient of the facility. There are two public drinking water wells identified just outside the one-mile radius of the site. Both of these wells are located about one-mile upgradient from the site. There are no public drinking water wells within one mile downgradient of the site. While there were no records of some of the depths or screened intervals of the domestic or livestock wells downgradient within one mile of the site, most of the known screened intervals of water wells within one mile of the site are more than 100 feet vertically below our uppermost aquifer wells in Layer V. As stated previously, Layer V is separated from the base of the landfill excavation by about 30 to 80 feet of low permeable clayey materials of Layer III and IV. A tributary of Mustang Creek is the nearest surface water body to the facility and lies to the west of the facility (upgradient). There appears to be no possibility of discharge of groundwater beneath the TASWA DRF to discharge to a surface water source.

2.3 Proposed Permit 2290A Monitoring System

2.3.1 Design Criteria

In accordance with §330.403(a) and (e), *a groundwater monitoring system must be installed that consists of a sufficient number of monitoring wells installed at appropriate locations and depths to yield representative samples from the uppermost aquifer. The design of the system shall be based on site specific technical information that includes a*

thorough characterization of : aquifer thickness, groundwater flow rate, groundwater flow direction, including seasonal and temporal fluctuations in flow, effect of site construction and operations on groundwater flow direction and rates, and thickness, stratigraphy, lithology and hydraulic characteristics of saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials of the uppermost aquifer, and materials of the lower confining unit of the uppermost aquifer.

The existing groundwater monitoring system for the TASWA DRF was designed and is operated in accordance with those rules and was certified by a qualified groundwater scientist.

The proposed modifications to the TASWA DRF groundwater monitoring system are also designed in accordance with the required elements of the stated regulations and have also been designed so that the monitoring well spacing does not exceed 600 feet or has otherwise been demonstrated to be adequate. Groundwater flow at the POC along the north and east side of the site approaches the POC at an oblique angle. The result of this is that the monitoring wells are effectively spaced much closer (between 400-550 feet) than 600 feet as measured from groundwater flowlines perpendicular to contour lines.

In order to achieve a groundwater monitoring system design to comply with §330.403, the criteria listed in the table below were followed. The table lists the location of the appropriate section where the required information is located in this modification.

Groundwater Monitoring System
Design Criteria

Criterion	Location of Information in this Report
Identify and Characterize the Uppermost Aquifer	Section 1 – Site Hydrogeology
Establish Groundwater Flow Direction and Rate	Section 1.2 – Aquifer Characteristics Section 1.2.1 – Groundwater Flow Direction and Rate
Evaluate Potential Impacts of Operational Attributes of the Facility on Groundwater Flow	Section 2.2.1 – Relationship of Excavation Bottom to Uppermost Aquifer Section 2.2.2 – Leachate Sump Design and Location
Determine Impacts to Critical Receptors	Section 2.2.3 – Critical Receptors
Determine the Appropriate Locations and Screened Intervals of Groundwater Monitoring Wells	Section 2.1 – Permit 2290 Groundwater Monitoring System Section 2.3.3 – Monitoring Well Locations Drawing F1-5 – Monitoring Well Detail

2.3.2 Contaminant Pathway Analysis

In the unlikely event that the liner and leachate collection systems were to allow an escape of leachate from the facility, the most likely pathway of groundwater flow in Layer II/III is toward the north, northeast, and east boundaries of the site. Groundwater monitoring wells are proposed to monitor this zone. In a narrow area on the far eastern

side of the site, the excavation bottoms in the very lowest portions of the shaly clays of Layer I, just above the Layer II sand. Layer I permeability was found to be 3.84 $x10^{-8}$ cm/sec. If leachate were to escape the bottom of the excavation in this area it would move slowly downward into the more permeable sand of Layer II where it would be detected in Layer II/III monitoring wells. Groundwater and potential contaminants are not likely to move laterally in Layer I. If leachate were to escape the bottom of the facility below the Layer II sandstone, it would move slowly downward in Layer III and would attempt to migrate through the low permeability shale of Layers III and IV. Groundwater in Layers II and III is separated from groundwater in Layer V by the very low permeability Layer IV shale. Recharge to Layer V comes from its outcrop west of the site as opposed to infiltration through overlying materials. However, because Layer V is a part of a minor aquifer in the area, groundwater monitoring wells are proposed for this zone. Because groundwater flow in Layer V is generally to the east, a contaminant entering the groundwater in Layer V would move downgradient laterally to the east.

2.3.3 Monitoring Well Locations

The uppermost aquifer beneath the TASWA DRF has been identified as Layer V and is the uppermost part of the Woodbine aquifer. Layer V at the site consists of cemented sandstone, interbedded with shaly sandstones. As shown in the cross-sections (Drawings E3.2 through E3.10 in Appendix E3 of Attachment E), Layer V is present and correlatable across the site.

The monitoring network for Permit 2290 consists of 16 monitoring wells. Eight monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-12) monitor the Layer II/III groundwater zone, and eight monitoring wells (MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, and MW-20) monitor the Layer V, the uppermost aquifer. Monitoring well locations are shown on Drawings F1.1 and F1.2.

The groundwater monitoring network for Permit 2290A network will consist of 42 monitoring wells. Eighteen monitoring wells (MW-3R, MW-3A, MW-4R, MW-5R, MW-6R, MW-6A, MW-7R, MW-7A, MW-8, MW-8A, MW-9, MW-9A, MW-10, MW-10B, MW-10A, MW-11, MW-12, and MW-12A) will monitor the Layer II/III groundwater zone. While 24 monitoring wells (MW-13R, MW-14R, MW-14A, MW-15R, MW-16R, MW-16A, MW-17R, MW-18R, MW-19R, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26, MW-26A, MW-27, MW-28, MW-29, MW-30, MW-31, MW-32, and MW-33) will monitor Layer V, the uppermost aquifer. Three monitoring wells will be considered upgradient: MW-12 and MW-12A monitor Layer II/III and monitoring well MW-26 monitors Layer V. To accommodate the proposed expansion, seven monitoring wells will be plugged (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7) in Layer II/III, and an additional five monitoring wells (MW-13, MW-14, MW-17, MW-18, and MW-19) will be plugged in Layer V. Twelve replacement wells (MW-3R, MW-4R, MW-5R, MW-6R, MW-7R, MW-13R, MW-14R, MW-15R, MW-16R, MW-17R, MW-18R, and MW-19R) will be installed along the point of compliance. Layer II/III proposed monitoring wells (MW-3R, MW-3A, MW-4R, MW-5R, MW-6R, MW-6A, MW-7R, MW-11, and MW-12A) and Layer V proposed monitoring wells (MW-13R, MW-14R, MW-14A, MW-15R, MW-16R, MW-16A, MW-17R, MW-18R, MW-19R, MW-20, MW-31, MW-32, and MW-33) will be installed within 180 days of permit approval. The remaining 18 monitoring wells in both Layer II/III and V will be installed prior to waste being accepted in Sector 6 (Phase II).

In summary, the groundwater monitoring system for the TASWA DRF will consist of a total of 42 monitoring wells, 18 wells will monitor Layer II/III and 24 wells will monitor Layer V. The groundwater monitoring system has been designed so that monitoring wells have been placed downgradient of each of the leachate sumps. In some cases, downgradient wells are actually on similar flow paths and will monitor more than on sump.

The proposed monitoring system for Permit 2290A is shown on Drawings F1.3 and F1.4. As shown in the table below, the system will ultimately consist of 42 wells of which three are upgradient wells and 39 are downgradient wells. Details of the construction of all monitoring wells included in the groundwater monitor network for Permit 2290A are shown on Drawing F1.5.

Proposed Groundwater Monitoring System

Upgradient Monitoring Wells	Downgradient Monitoring Wells				
Layer II/III					
MW-12 & MW-12A	MW-3R	MW-6R	MW-7A*	MW-9*	MW-10A*
	MW-3A	MW-6A	MW-8*	MW-9A*	MW-10B*
	MW-4R	MW-7R	MW-8A*	MW-10*	MW-11
	MW-5R				
Layer V					
MW-26	MW-13R	MW-16A	MW-21*	MW-26A*	MW-31
	MW-14R	MW-17R	MW-22*	MW-27*	MW-32
	MW-14A	MW-18R	MW-23*	MW-28*	MW-33
	MW-15R	MW-19R	MW-24*	MW-29*	
	MW-16R	MW-20	MW-25*	MW-30*	

* Monitoring well proposed to be installed during Phase II.

2.3.4 Monitoring Well Construction

All monitoring well design and construction will be done in accordance with §330.421. As such, a licensed Texas driller will install monitoring wells. Wells will be drilled by a method that will not introduce contaminants into the borehole or casing. A licensed professional geoscientist or engineer who is familiar with the geology of the area will supervise monitoring well installation and development and will provide a log of the boring. Equivalent alternatives to commission rules may be used if prior written approval is obtained from the Executive Director. Monitoring well construction details, including the protective collar and protective barrier, are shown on Drawing F1.5.

The borehole diameter will be at least four inches larger than the diameter of the casing.

In accordance with 30 TAC §330.421(a), monitoring wells will be constructed in such a manner as to provide integrity, representative samples, prevent migration of water in borehole, and well construction must follow prescribed specifications.

All wells will be drilled by a qualified Texas licensed driller and will be supervised by a licensed professional geologist (P.G.) or professional engineer (P.E.).

If any fluid is required in the drilling of monitoring wells, clean, treated city water shall be used and a chemical analysis provided to the Executive Director. No glue or solvents will be used in monitoring well construction.

After installation, monitoring wells will be developed to remove drilling artifacts and open the water-bearing zone for maximum flow into the well. Development should continue until all water used or affected during drill activities is removed and field measurements of pH, specific conductance, and temperature have stabilized.

Within 60 days of completion of a monitoring well or any other part of a monitoring system, an installation report will be submitted. The report will include construction and installation details for each well on forms available from the commission, a site map drawn to scale showing the location of all monitoring wells and the relevant point(s) of compliance, well elevations to the nearest 0.01 foot above msl (with year of datum shown), latitude and longitude or landfill grid location of each well, copies of detailed geologic logs including soil sample data, and copies of drillers reports required by other agencies.

As part of each monitoring well installation report, a boring log will be included and will be signed, sealed, and dated by a P.G. or P.E.

Damaged monitoring wells that are no longer usable will be reported to the Executive Director for a determination whether to replace or repair the well. In accordance with 30 TAC §305.70, if a compromised well requires replacement a permit modification request will be submitted within 45 days of the discovery.

Plugging and abandonment of monitoring wells will be performed in accordance with 16 TAC §76.702 and §76.104. No abandonment will be performed without prior written authorization.

All parts of the groundwater monitoring system will be operated and maintained so that they perform at least to design specifications through the active life and any required post-closure care period of that solid waste management unit.

When monitoring wells are installed in unusual conditions, all aspects must be approved in writing by the Executive Director.

The facility must notify the Executive Director and local pollution agency with jurisdiction that has requested to be notified, in writing, if changes in site construction or operation or changes in adjacent property that affect or are likely to affect the direction and rate of groundwater flow and the potential for detecting groundwater contamination from the facility and that may require installation of additional monitoring wells or sampling points. Such additional wells or sampling points require a modification of the site development plan.

2.4 Sampling and Analysis Procedures

A Groundwater Sampling and Analysis Plan is included in Appendix F2. This plan contains the general requirements, sampling procedures and methods required in 30 TAC §330.405(a)(f). A copy of the approved plan will be placed in the site operating record.

wells and two metals (barium and selenium) have been verified in the samples from the Layer V wells during facility monitoring events. Each detection (verified and unverified) is listed in the historical tabulation of analytical data provided in Appendix E7. In each instance, the detection was reported in accordance with the requirements of the facility Groundwater Sampling and Analysis Plan in effect at the time of the detection. Of those Appendix I total metals detected, only two (arsenic and selenium) have been reported at concentrations above a National Primary Maximum Contaminant Level (MCL) (see the table below). As illustrated by the analytical data table provided in Appendix E7, both arsenic and selenium concentrations at Layer II/III monitoring well MW-7 exceeded the MCL during initial background period, demonstrating a background condition and natural variation in groundwater.

The intermittent selenium concentrations exceeding an MCL at MW-6 have been demonstrated to be due to natural variation in groundwater and not from the landfill unit, by comparisons to upgradient concentrations and historical leachate results. As illustrated by the table below, no MCL exceedances have occurred for those wells screened in Layer V.

Historical Detections Above the MCL of Appendix I Constituents

Well	Sample Date	Constituent	Result (µg/L)	MCL (µg/L)
Layer II/III – Groundwater Zone				
MW-6	9/12/2018	Selenium	51	50
	9/4/2019		90	
	9/15/2020		55	
	2/22/2021		56	
	8/24/2021		61	
	3/8/2022		74	
	8/31/2022		82	
	2/15/2023		78	
	3/16/2023		130	
	11/6/2023		100	
	2/21/2024		81	
	8/27/2024		91	
MW-7	10/20/2004	Arsenic	12.3	10
	1/25/2005		13.2	
	5/11/2005		13.6	
	11/9/2005		13.7	
	2/15/2006		10.5	
	6/2/2010		20.2	
	8/10/2010		11.6	
	5/25/2011		25.0	
	11/10/2011		26.2	
	5/17/2012		12.4	
	3/26/2015		19	
	9/9/2015		10	
	9/7/2016		20	
	5/24/2006	Selenium	56.4	50
	8/23/2006		67.5	
	9/4/2019		94	
	3/25/2020		80	
	8/16/2023		69	
	8/27/2024		51	
Layer V - Uppermost Aquifer				
None				

In addition, appropriate statistical evaluations have been performed in accordance with the facility GWSAP. The table below summarizes the historical verified statistical exceedances and further action taken (i.e., assessment monitoring initiated, alternate source demonstration (ASD) submitted, etc.) for the facility point of compliance wells through the February 2024 monitoring event. The Alternate Source Demonstrations Submitted table provides a summary of the ASDs prepared, due to statistical exceedances. To date, there has been no need to place the facility in assessment monitoring as a result of any detection or statistical exceedance.

Historical Verified Statistically Significant Increases

Sampling Date	Well ID	Parameter	Statistical Limit (µg/L)	Result (µg/L)	Further Action
Nov-07	MW-15	Chloride	60100	66800	ASD submitted and approved[1]
Nov-07	MW-15	Sulfate	909300	1040000	ASD submitted and approved[1]
Jun-08	MW-15	Chloride	60100	74700	Updated ASD submitted and approved[1].
Sep-16	MW-17	Barium	10	11	ASD submitted and approved.
Mar-17	MW-3	Barium	54.5	62	Verified September 2016 exceedance. ASD previously submitted and approved.
Mar-18	MW-16	Barium	10	11	ASD submitted and approved.
Sept-20	MW-6	Selenium	50	55	ASD submitted and approved.
Feb-23	MW-17	Barium	11	14	Updated ASD submitted and approved.
Nov-23	MW-6	Selenium	90	100	Verified August 2023 exceedance. Updated ASD submitted and approved.
Feb-24	MW-17	Barium	11	12	Previously approved ASD still applies. No further action.

[1]The TNRCC guidance document (MSW Monitoring Procedures, 1998) required assessment monitoring or additional action to be taken only if two or more non-30 TAC §330.241 Table 1 constituents had verified statistical exceedances from a well.

Organics Summary:

Based on the analytical data tabulation, the only volatile organic compounds (VOCs) detected have been; acetone at MW-14, bromomethane at MW-14, and carbon disulfide at MW-14, MW-15, and MW-16. All historical VOC detections were well below the groundwater protection standards and no detections were verified. The unverified detections of acetone, bromomethane, and carbon disulfide may have been a result of a laboratory-induced bias.

Alternate Source Demonstrations Submitted

Event	Well	Constituent	ASD dated	ASD approved
11/2007	MW-15	Chloride	4/10/2008	6/27/2008
11/2007	MW-15	Sulfate	4/10/2008	6/27/2008
6/2008	MW-15	Chloride	11/4/2008	1/2/2009
6/2008	MW-15	Sulfate	11/4/2008	1/2/2009
11/2012	MW-7	Nickel*	1/28/2013	3/27/2013
3/2016	MW-13	Barium*	5/17/2016	6/24/2016
3/2016	MW-17	Barium	5/17/2016	6/24/2016
3/2016	MW-19	Barium*	5/17/2016	6/24/2016
9/2016	MW-3	Barium*	11/8/2016	1/2/2017
3/2018	MW-16	Barium*	5/21/2018	7/17/2018
9/2020	MW-6	Selenium*	11/6/2020	12/11/2020
2/2023	MW-17	Barium*	4/17/2023	8/2/2023
8/2023	MW-6	Selenium	3/11/2024	4/8/2024

*Due to demonstrated natural variability, an ASD was prepared and submitted in lieu of completing a verification re-sampling event.

3.4 Assessment Monitoring

All detections at the facility of hazardous constituents in 40 CFR Part 258, Appendix I, and 30 TAC §330.419 have been either unverified one-time detections, occurred in upgradient wells not located on the facility's point of compliance, or have been demonstrated to have been caused by a source other than the MSW unit. Should such hazardous constituents be detected in the future, and should such detections support the implementation of assessment monitoring, information to establish an assessment monitoring program under §330.409 will be submitted, including a description of special wastes previously handled at the landfill and a characterization of the contaminated groundwater, including any detected concentration(s) of assessment constituents defined in §330.409.

Detailed plans and an engineering report describing the groundwater monitoring program under §330.405 are included in this plan as well as the sampling, analysis, and statistical comparison procedures.

Should statistically significant increases or increasing trends of hazardous constituents be detected in point of compliance wells in the future groundwater monitoring events and absent an approved alternate source demonstration, the TASWA DRF will establish an assessment monitoring program under §330.409 in accordance with the procedures described in Appendix F2 that will include sampling for Appendix II constituents.

3.5 Corrective Action Program

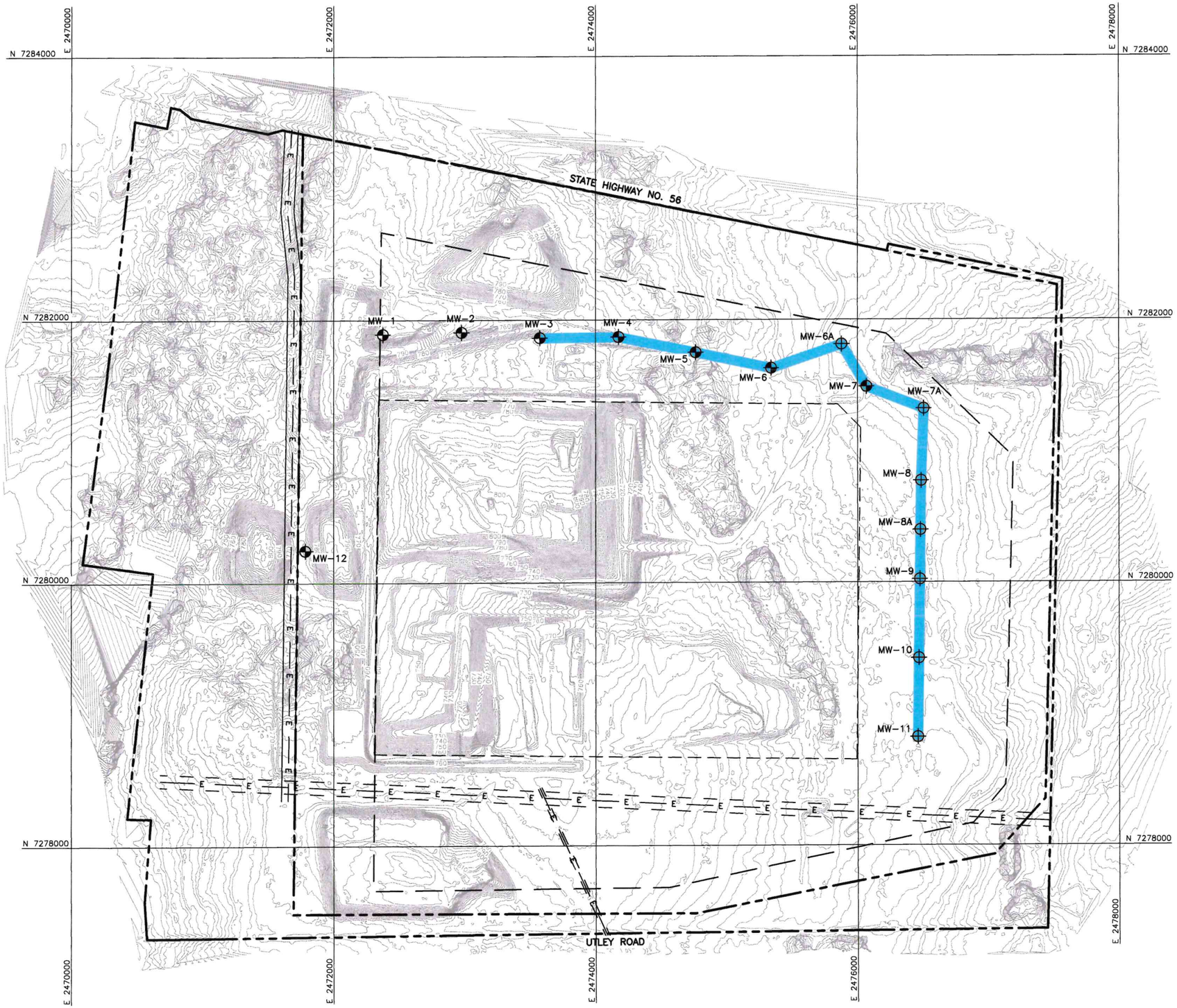
In accordance with §330.63(f)(7), the required information is provided. Should such hazardous constituents be detected in point of compliance wells in the future groundwater monitoring events above the concentration limits established in 30 TAC §330.409, and absent an approved alternate source demonstration, information, data, and analysis to establish a corrective action program meeting the requirements of §330.411 and §330.413 will be submitted, including a description of special wastes previously handled at the landfill and a characterization of the contaminated groundwater, including any detected concentration(s) of assessment constituents defined in §330.409.

Detailed plans and an engineering report describing the corrective action to be taken will be addressed if hazardous constituents have been measured in the groundwater at levels exceeding the limits established in 30 TAC §330.409. The following will be submitted to comply with 30 TAC §330.411:

- Characterization of the contaminated groundwater, including concentrations of assessment constituents as defined by 30 TAC §330.409.
- The concentration limit for each constituent found in the groundwater.
- Detailed plans and an engineering report describing the corrective action to be taken.
- A description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action.
- A schedule for a submittal of the information required.

APPENDIX F1

Permit 2290 Groundwater Monitoring Network Layer II/III F1.1
Permit 2290 Groundwater Monitoring Network Layer V F1.2
Permit 2290A Groundwater Monitoring Network Layer II/III F1.3
Permit 2290A Groundwater Monitoring Network Layer V F1.4
Monitoring Well Detail F1.5



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SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT
- 700 — EXISTING 10' GROUND CONTOUR
- N 7282000 — STATE PLANE COORDINATES
- E E — ELECTRIC LINE EASEMENT
- MW-1 — EXISTING MONITORING WELL
- MW-7A — APPROVED MONITORING WELL TO BE INSTALLED IN ACCORDANCE WITH PHASING PLAN
- POINT OF COMPLIANCE

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST

2/26/2025

ISSUED FOR PERMITTING PURPOSES ONLY

PERMIT 2290 GROUNDWATER MONITORING NETWORK – LAYER II/III

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
1700 ROBERT ROAD, STE. 100
MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
F1.1

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SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT
- 700 EXISTING 10' GROUND CONTOUR
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-13 EXISTING MONITORING WELL
- MW-22 APPROVED MONITORING WELL TO BE INSTALLED IN ACCORDANCE WITH PHASING PLAN
- EXPANSION AREA
- POINT OF COMPLIANCE

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.

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2/26/2025

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PERMIT 2290 GROUNDWATER MONITORING NETWORK – LAYER V

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BIGGS & MATHEWS ENVIRONMENTAL
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MANSFIELD, TEXAS 76063
817-563-1144

TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
F1.2

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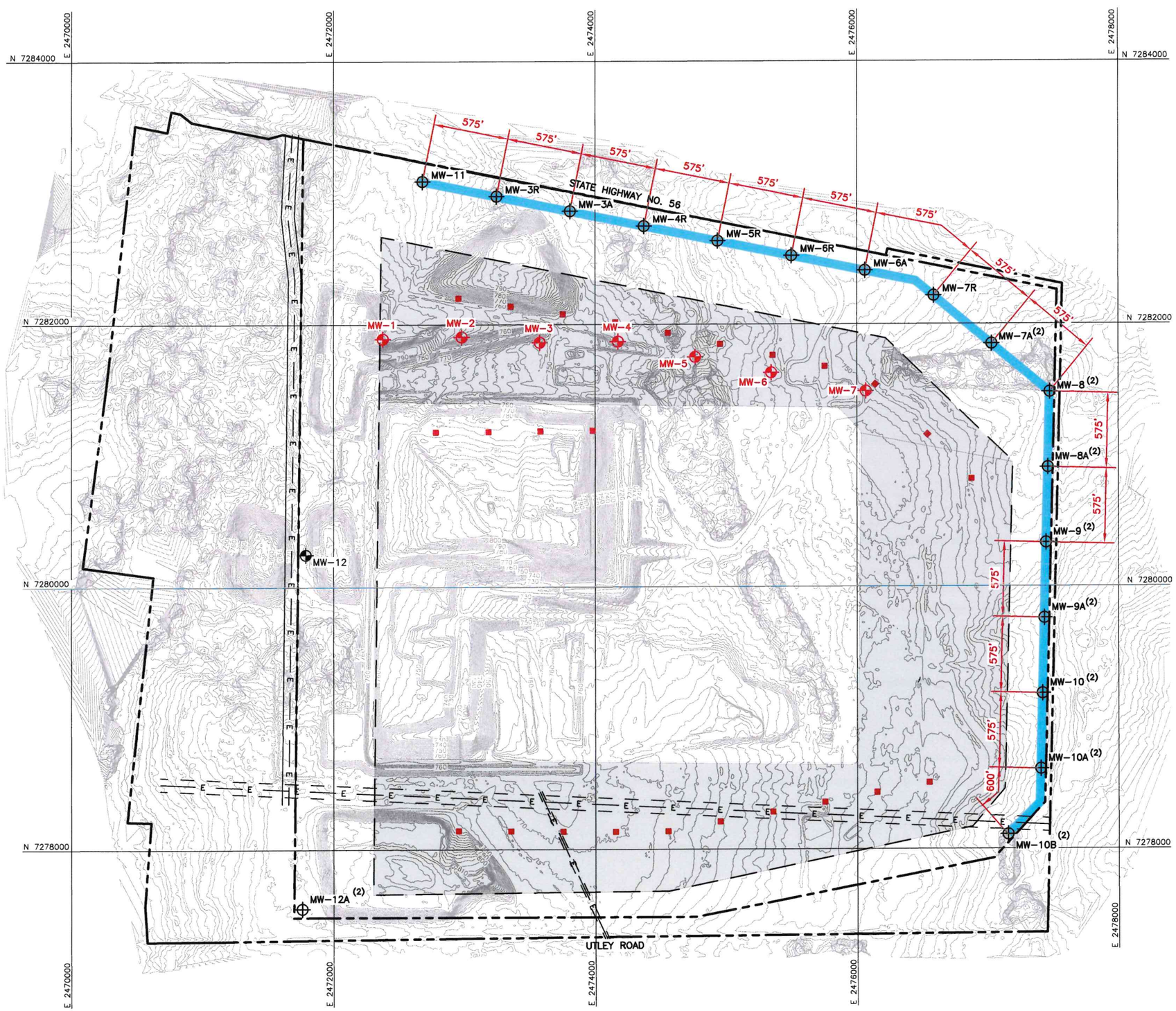

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SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT
- 700 EXISTING 10' GROUND CONTOUR
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-12 EXISTING MONITORING WELL
- MW-11 PROPOSED MONITORING WELL
- MW-1 MONITORING WELL TO BE PLUGGED OR RELOCATED
- LEACHATE SUMP LOCATION
- POINT OF COMPLIANCE
- EXPANSION AREA

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.
2. MONITORING WELL TO BE INSTALLED IN THE FUTURE IN ACCORDANCE WITH PHASING PLAN DISCUSSED IN ATTACHMENT F.

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6/12/2025

PERMIT 2290A GROUNDWATER MONITORING NETWORK LAYER II/III

TEXOMA AREA SOLID WASTE AUTHORITY TASWA DRF PERMIT AMENDMENT

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TBPG FIRM NO. 50222

DRAWING F1.3

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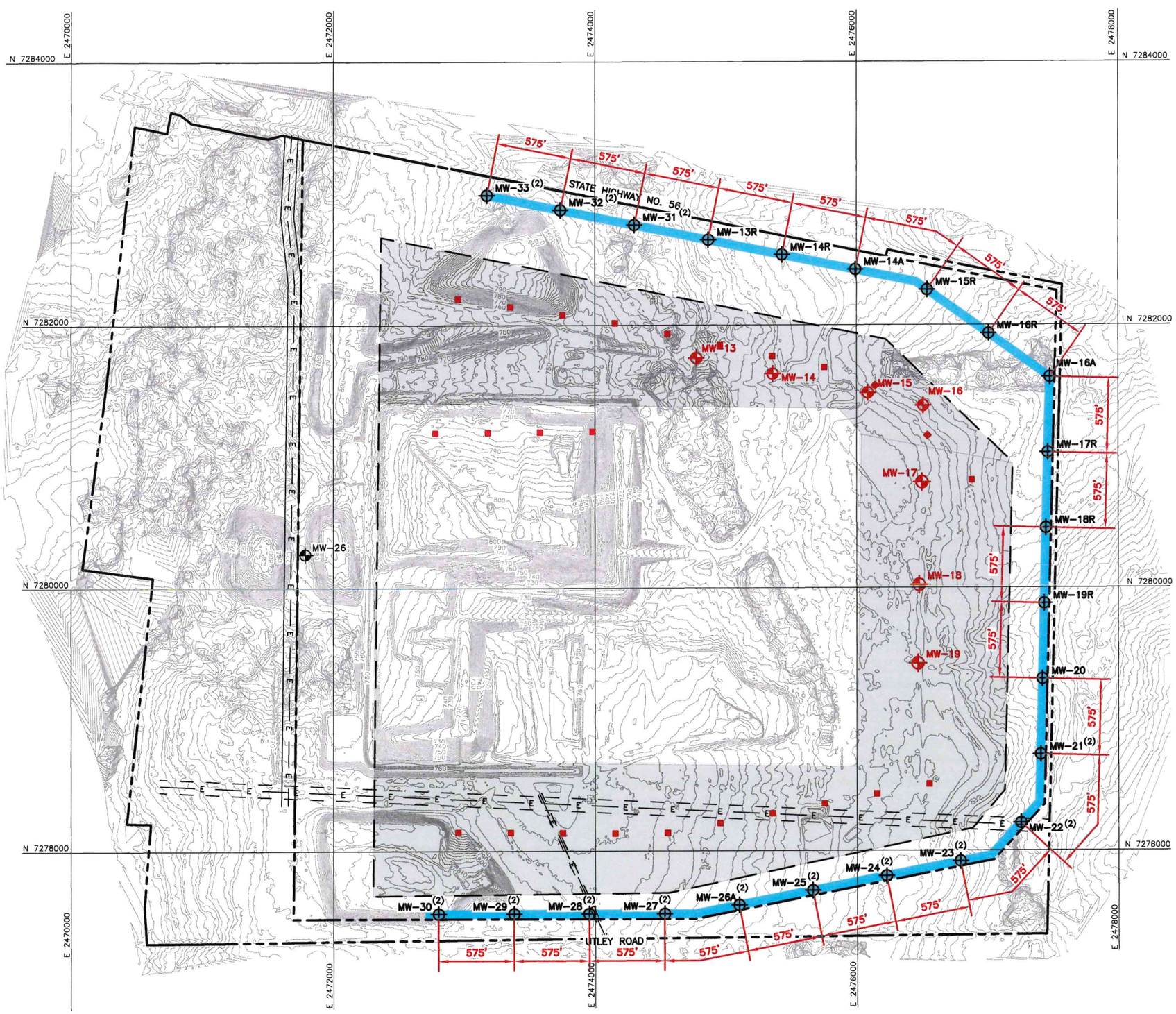

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SCALE IN FEET

LEGEND

- PERMIT BOUNDARY
- PROPERTY BOUNDARY
- LANDFILL FOOTPRINT
- 700 EXISTING 10' GROUND CONTOUR
- N 7282000 STATE PLANE COORDINATES
- E E ELECTRIC LINE EASEMENT
- MW-26 EXISTING MONITORING WELL
- MW- PROPOSED MONITORING WELL
- MW-13 MONITORING WELL TO BE PLUGGED OR RELOCATED
- LEACHATE SUMP LOCATION
- POINT OF COMPLIANCE
- EXPANSION AREA

NOTE(S):

1. EXISTING GROUND CONTOURS PROVIDED BY BIGGS & MATHEWS ENVIRONMENTAL FROM DRONE SURVEY FLOWN ON JUNE 1, 2022.
2. MONITORING WELL TO BE INSTALLED IN THE FUTURE IN ACCORDANCE WITH PHASING PLAN DISCUSSED IN ATTACHMENT F.

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6/12/2025

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PERMIT 2290A GROUNDWATER MONITORING NETWORK LAYER V

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

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TBPE FIRM NO. F-256
TBPG FIRM NO. 50222

DRAWING
F1.4

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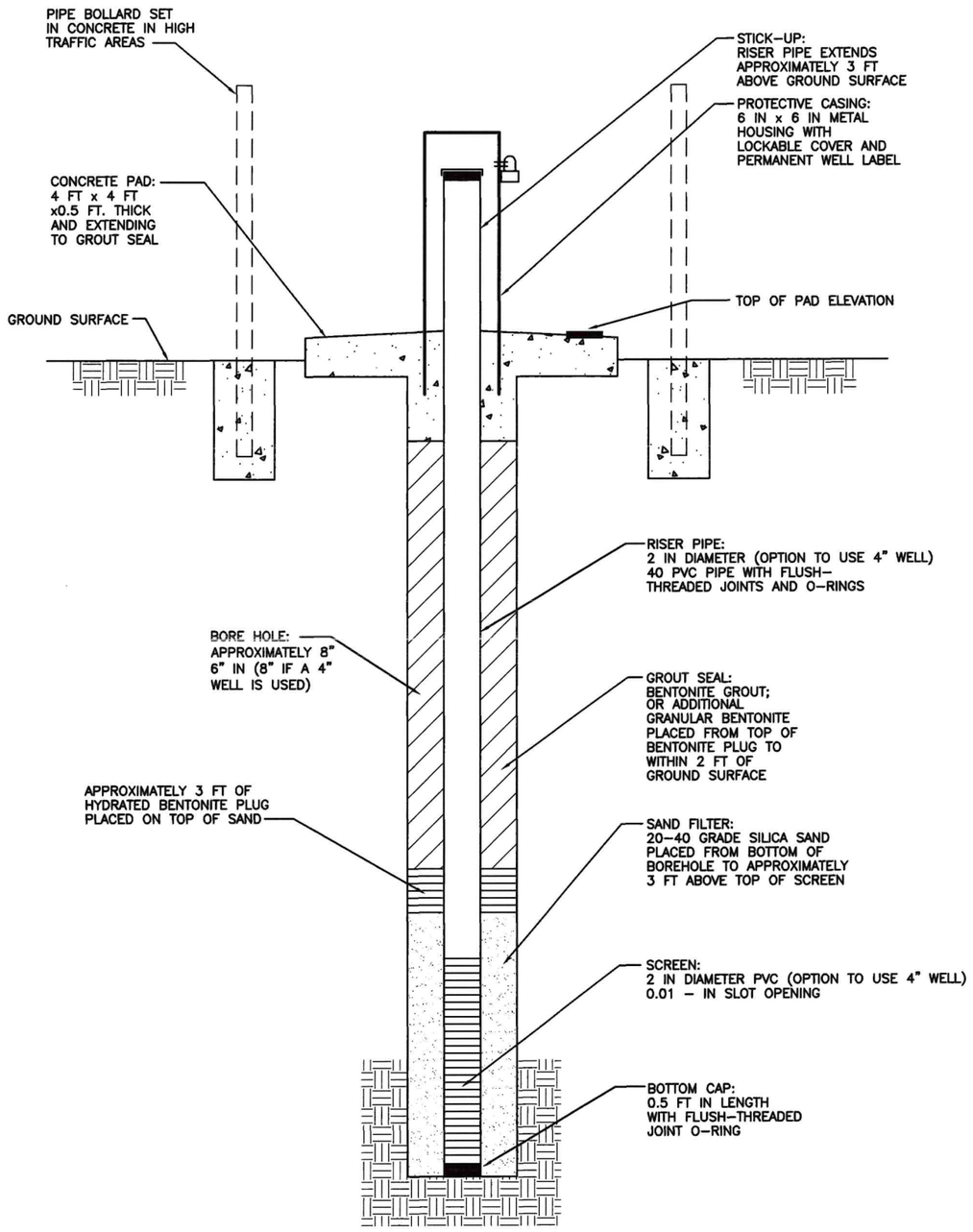

Monitoring Well No.	Northing	Easting	Ground Elevation	Total Depth	Top of Casing Elevation	"Screened Interval (ft/msl)"		"Filter Pack Interval (ft/msl)"	
			(ft/msl)	(ft bgs)	(ft/msl)	From	To	From	To
Existing Layer II/III Monitoring Wells									
MW-12	7280247.1	2471785.4	758.36	20.00	760.32	749.71	739.71	752.71	739.71
Existing Layer V Monitoring Wells									
MW-26	7280247.1	2471785.4	759.76	90.00	762.20	679.76	669.76	682.76	669.76
Proposed Layer II/III Monitoring Wells									
MW-3A	7282862.60	2473807.10	732.50	30.50	735.00	712.00	702.00	715.00	702.00
MW-3R	7282976.20	2473243.40	749.10	44.10	751.60	715.00	705.00	718.00	705.00
MW-4R	7282749.0	2474370.80	720.50	20.50	723.00	710.00	700.00	713.00	700.00
MW-5R	7282635.4	2474934.40	744.00	44.00	746.50	710.00	700.00	713.00	700.00
MW-6A	7281845.5	2475876.3	750.00	33.00	752.50	722.00	717.00	725.00	717.00
MW-6R	7282521.9	2475498.100	752.60	37.60	755.10	725.00	715.00	728.00	715.00
MW-7A	7281375.6	2476631.5	741.00	33.00	743.50	713.00	708.00	716.00	708.00
MW-7R	7282216.4	2476588.1	743.10	38.10	745.60	715.00	705.00	718.00	705.00
MW-8	7281260.6	2477194.9	735.50	33.00	737.00	707.00	702.00	710.00	702.00
MW-8A	7280907.4	2477459.1	727.50	36.00	729.00	696.50	691.50	699.50	691.50
MW-9	7280332.6	2477445.0	737.00	36.00	739.50	706.00	701.00	709.00	701.00
MW-9A	7279757.7	2477431.0	725.00	36.00	727.50	694.00	689.00	697.00	689.00
MW-10	7279182.9	2477416.9	728.00	30.00	730.50	703.00	698.00	706.00	698.00
MW-10A	7278608.1	2477402.8	731.00	35.00	733.50	701.00	696.00	704.00	696.00
MW-10B	7278109.2	2477152.7	744.00	44.00	746.50	695.00	700.00	692.00	700.00
MW-11	7283089.7	2472679.8	750.90	40.90	753.40	720.00	710.00	723.00	710.00
MW-12A	7277551.1	2471757.7	774.99	38.99	777.49	746.00	736.00	749.00	736.00
Proposed Layer V Monitoring Wells									
MW-13R	7282649.7	2474863.7	742.30	99.80	744.80	652.50	642.50	655.50	642.50
MW-14A	7281706.3	2475926.8	749.00	110.00	751.50	649.00	639.00	652.00	639.00
MW-14R	7282536.1	2475427.3	752.30	110.30	754.80	652.00	642.00	655.00	642.00
MW-15R	7282268.9	2476537.4	745.20	105.20	747.70	650.00	640.00	653.00	640.00
MW-16A	7281604.7	2477476.2	736.00	113.00	738.50	633.00	523.00	636.00	623.00
MW-16R	7281936.8	2477006.8	727.80	95.80	730.30	642.00	632.00	645.00	632.00
MW-17R	7281029.9	2477460.3	726.50	120.00	729.00	616.50	606.50	619.50	606.50
MW-18R	7280455.1	2477446.2	736.00	120.00	738.50	626.00	616.00	629.00	616.00
MW-19R	7279880.3	2477432.2	726.00	115.00	728.50	621.00	611.00	624.00	611.00
MW-20	7279305.4	2477418.1	727.00	120.00	729.50	617.00	607.00	620.00	607.00
MW-21	7278730.6	2477404.0	732.00	120.00	734.50	622.00	612.00	625.00	612.00
MW-22	7278211.2	2477252.3	731.00	120.00	733.50	621.00	611.00	624.00	611.00
MW-23	7277918.9	2476790.1	748.00	115.00	750.50	643.00	633.00	646.00	633.00
MW-24	7277808.9	2476225.7	758.50	115.00	760.00	658.00	643.50	656.00	643.50
MW-25	7277698.9	2475661.3	750.00	115.00	752.50	645.00	635.00	648.00	635.00
MW-26A	7277588.9	2475097.0	757.00	115.00	759.50	612.00	602.00	615.00	602.00
MW-27	7277523.7	2474528.3	764.00	125.00	767.50	649.00	639.00	652.00	639.00
MW-28	7277523.7	2473953.3	772.00	125.00	775.50	657.00	647.00	660.00	647.00
MW-29	7277523.7	2473378.3	778.00	125.00	780.50	663.00	653.00	666.00	653.00
MW-30	7277523.7	2472803.3	806.00	125.00	808.50	691.00	681.00	694.00	681.00
MW-31	7282096.3	2473083.5	755.50	96.00	757.00	670.00	660.00	673.00	660.00
MW-32	7281981.3	2473646.9	752.00	112.00	754.50	650.00	640.00	653.00	640.00
MW-33	7281866.4	2474210.3	740.00	90.00	742.50	660.00	650.00	663.00	650.00

NOTES:

1. SCREEN ELEVATIONS AND FILTER PACK ELEVATIONS SHOWN FOR THE PROPOSED WELLS ARE ESTIMATES. ACTUAL ELEVATIONS WILL BE DETERMINED BY LOCATION OF LAYER II AND LAYER V SANDS AS DETERMINED DURING INSTALLATION. WELL CONSTRUCTION MAY VARY IN ORDER TO MEET LOCAL CONDITION; INCLUDING USING A 5 FOOT SCREEN IN LAYER V INSTEAD OF A 10 FOOT SCREEN.
2. LAYER II WELLS WILL HAVE FILTER PACKS PLACED IN THE SATURATED ZONE NEAR THE TOP OF LAYER II. ACTUAL PLACEMENT WILL BE FIELD DETERMINED AT THE TIME OF WELL INSTALLATION.

STATE OF TEXAS
Elizabeth Floyd
GEOLOGY
2045
LICENSED
PROFESSIONAL GEOSCIENTIST
6/12/2025

ISSUED FOR PERMITTING PURPOSES ONLY

MONITORING WELL DETAIL

TEXOMA AREA SOLID WASTE AUTHORITY
TASWA DRF
PERMIT AMENDMENT

BME
BIGGS & MATHEWS ENVIRONMENTAL
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TBPG FIRM NO. 50222

DRAWING
F1.5

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TASWA SOLID WASTE DISPOSAL AND RECYCLING FACILITY
GRAYSON COUNTY, TEXAS
TCEQ PERMIT NO. MSW 2290A

PERMIT AMMENDMENT APPLICATION

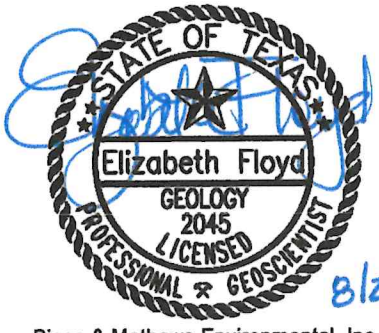
ATTACHMENT F

APPENDIX F2
GROUNDWATER SAMPLING AND ANALYSIS PLAN

Prepared for

TEXOMA AREA SOLID WASTE AUTHORITY, INC.

February 2025
Revised June 2025
Revised August 2025



8/20/2025

Biggs & Mathews Environmental, Inc.
Firm Registration No. 50222

Prepared by

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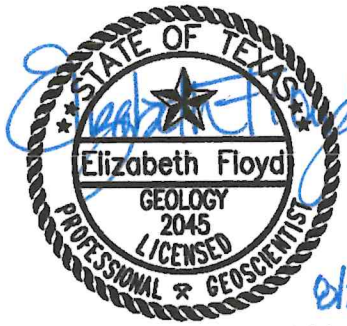

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1 GROUNDWATER SAMPLING PROCEDURES

This Groundwater Sampling and Analysis Plan (GWSAP) has been prepared for the TASWA Solid Waste Disposal and Recycling Facility (TASWA DRF) consistent with 30 TAC Chapter 330.

The following sampling procedures are designed to aid in obtaining representative groundwater samples at each well location. These procedures are to be followed by all personnel conducting groundwater monitoring well sampling.

1.1 Field Setup

Do not use insect repellent or other topical skin applications that contain organic compounds during purging or sampling. Smoking is not permitted.

Examine the well-head area for anything unusual such as damage to the well head, spilled materials, etc., and record all observations in the field log book or field data sheets. Note the following:

- Is the well number clearly labeled on outer casing or lid?
- Is protective casing intact and not bent or excessively corroded?
- Is weep hole, if present, open?
- Is concrete pad intact (no evidence of cracking or erosional undercutting)?
- Is padlock functional?
- Is inner casing intact?
- Is inner casing properly capped and vented?

Place plastic sheeting around the well riser and sample handling area to reduce the possibility of contact of the sampling equipment with the surrounding ground.

Calibrate pH and specific conductance instruments, following manufacturer's instructions, prior to sampling and at least once daily during a sampling event.

Use a calibrated 5-gallon bucket for measuring bailed or purged well fluids and a small glass container for measuring temperature, specific conductance, and pH.

For decontamination, use a clean water bucket, rinsing bucket, phosphate-free detergent, and additional rinsing bottles.

1.2 Water-Level Measurements

Prior to purging each monitoring well, measure the depth to groundwater from a permanently marked point of known elevation on the top of the well casing and record the measurement in the field log book or data sheets. Decontaminate the water-level measuring device between wells. Water levels are to be measured and reported to the nearest hundredth of a foot.

1.3 Low-Flow Well Purging

Wells will be equipped with a dedicated PVC bladder pump and HDPE discharge tubing. The wells will be purged using low-flow methods. Prior to commencement of sampling, a demonstration will be provided to the TCEQ for its review and approval prior to implementation of low-flow sampling.

The wells that are approved for low-flow sampling will be purged at a rate of <0.5 liter per minute until at least two pump and tubing volumes have been withdrawn from the well. Purge rates will be determined as part of the low-flow sampling demonstration, in coordination with the TCEQ. The pumping rate will be adjusted to prevent more than one-third foot of total drawdown and to ensure that there is no continuous drawdown of the water level. Drawdown will be monitored continually during purging. Measurements will be made of pH, specific conductance, dissolved oxygen, and temperature about every 3 to 5 minutes during purging. Purging will continue until three consecutive measurements are within ±3 percent for specific conductance, ±10 percent for dissolved oxygen, and ±0.1 units for pH. An inline flow-through cell will be used for measurements of pH, specific conductance, and dissolved oxygen. All field measurements and volume of purged water are to be recorded in the field log book or field data sheets.

Wells that are not approved for low-flow sampling will be purged of three well volumes of groundwater with a dedicated pump. A non-dedicated submersible pump or appropriate bailer may be used as a backup for purging, if dedicated pumps are inoperable. For wells that produce less than three well volumes of groundwater, purging will be deemed complete after the well has been purged to dryness. The field parameters of pH, specific conductance, and temperature will be measured during purging.

Water purged from each well, along with unused water obtained during sampling, is to be collected and disposed of in accordance with TCEQ rules and directives.

1.3.1 Bladder Pump Instructions

This section provides specific instructions for a bladder pump that can be used for low-flow well purging and sample collection. In wells with adequate water column, dedicated pumps will be positioned with the pump intake near the middle of the screened interval. In low-yield wells, the pump will be placed about 1 foot above the bottom of the screen.

Purging Instructions:

1. Connect the compressed air source and pump controller to the pump per manufacturer's instructions.

2. Put on a new pair of gloves after handling the gasoline-powered compressor.

3. Set up a water-level indicator to provide continual water-level measurements during purging.

4. Start the pump by opening the regulator on the controller, which allows compressed air to flow into the system.

5. Adjust the controller to the appropriate flow rate (not to exceed 0.5 liter per minute) that will not result in continuous drawdown of the water level in the well and that will limit total drawdown to not more than one-third foot, except as may be authorized by the TCEQ. This rate will generally be based on data from previous events.

6. Direct the pump discharge to a calibrated container to determine the flow volume.

7. Using an inline flow-through cell, measure temperature, pH, specific conductance, and dissolved oxygen approximately every 3 to 5 minutes.

8. Continue purging until at least two pump-and-tubing volumes have been removed, drawdown is not continuous, three consecutive measurements of specific conductance are within 3 percent, three consecutive measurements of dissolved oxygen are within 10 percent, and three consecutive measurements of pH are within ±0.1 units.

9. Record all measurements in the field log book or field data sheets.

Sampling Instructions:

1. Adjust the regulator to reduce the pumping rate to less than 0.25 liter per minute, as necessary to control sampling and filtration (where used). The pump should be set to discharge a continuous thin stream during filling of the VOC sample containers. If the purge rate was greater than 0.25 liter per minute, clear the flowlines at a flow rate of less than 0.25 liter per minute before sampling for VOCs.

2. Collect the samples by pumping directly into each of the required containers. Record the measurements in the field log book or field data sheets.

Fill the sample containers in the order specified in Section 1.4.

Any non-dedicated, reusable purging equipment is to be decontaminated in accordance with Section 1.9. A new pair of appropriate disposable gloves is to be worn at each separate well and replaced after each purging and sampling event to reduce the possibility of cross-contamination between wells.

1.4 Sample Collection

For wells that are approved for low-flow sampling, samples will be collected by low-flow methods immediately upon completion of low-flow purging. For wells that are not approved for low-flow sampling, samples will be collected with a dedicated pump or with a disposable bailer, if the dedicated pump is inoperable. Based upon water-level measurements taken prior to well purging, sampling will typically proceed from the well with the highest groundwater elevation to those with successively lower elevations. If contamination is known to be present, monitoring wells not likely to be contaminated must be sampled before those that are known to be contaminated.

Efforts shall be made to minimize turbulence and aeration during sampling. Specific instructions for the use of low-flow pumps are presented in Section 1.3.1.

The sample bottles should be filled in the order of decreasing volatilization sensitivity. Generally, that will be in the following order, as applicable:

- Volatile organic compounds (VOCs)
- Other organic compounds
- Total metals
- Other inorganic constituents

Filling the VOC sample containers requires extra care. Gently fill each vial until a positive meniscus is formed over the top of the container. After the cap has been placed on the vial and tightened, check the vial for air bubbles by turning it upside down and tapping with your finger. If an air bubble is present, discard the sample and repeat the process outlined above. If no air bubbles are seen in each vial, the process is complete.

1.5 Sample Containers and Labeling

Water samples collected in the field are to be placed into laboratory-cleaned bottles of the appropriate size and construction for the chemical constituents to be analyzed. A list of chemical constituents and corresponding recommended types and sizes of sample containers are shown the Recommended Containers, Presentation, and Storage of Groundwater Monitoring table. Sample containers must be marked as described below.

Sample labels are to be affixed to each sample container with the following information in waterproof ink, as appropriate:

- Project name and number (includes site name)
- Sample and well number
- Date and time of sample collection
- Type of preservatives added
- Special handling instructions

QA/QC samples, such as trip and equipment blanks, will be labeled accordingly. Blind well duplicates, if any, will be labeled with a nonexistent well number and will be properly identified only in the field log book or data sheets.

1.6 Sample Preservation and Shipment

Chill the groundwater samples to about 4°C upon containment in the field and during transport to the testing laboratory.

Many constituents to be analyzed require a chemical additive for preservation. The Recommended Containers, Presentation, and Storage of Groundwater Monitoring table shows preservation requirements for common organic and inorganic chemical constituents. Samples that are to be analyzed for the background or detection monitoring constituents listed in the Background and Detection Monitoring Constituents table, or any other detection or assessment monitoring constituents not listed, are not to be filtered either in the field or in the laboratory.

Samples to be shipped are to be packed in a hard-sided insulated shipping container pre-cooled with water ice. The sample containers must be packed to prevent breakage. Discard the water ice used to pre-cool the shipping container and add adequate chemical icepacks or water ice to maintain the temperature at about 4°C during the shipment. Dry ice must not be used.

1.7 Quality Assurance and Quality Control

To document that sample collection and handling procedures used in the field have not affected the quality of groundwater samples, blanks are to be prepared and analyzed. These blanks consist of one trip blank per sampling event and one field blank per day of sampling per event.

A trip blank is prepared by filling a water sample container with laboratory-grade distilled water before going to the site (preferably by the laboratory), transporting the container to the site, handling it as a sample, and transporting it to the laboratory for analysis. A field blank is prepared by pouring laboratory-grade distilled water into a sample container at a well *downwind* of waste. Trip and field blanks are to be analyzed for VOCs only.

One blind duplicate will be collected at each sampling event. A blind duplicate will be a second set of samples from the same well that are labeled differently so that the laboratory is unaware that the samples are duplicates.

If non-dedicated, reusable purging or sampling equipment is used, one equipment blank per sampling event will be collected and analyzed for VOCs. An equipment blank is prepared by pouring or pumping laboratory-grade distilled water through the purging or sampling equipment and collecting it in a sample container.

As needed, split-samples will be collected. Analytical parameters for these samples will be selected to meet specific needs and concerns prior to sample collection.

1.8 Chain-of-Custody Documentation

A chain-of-custody (COC) form must be maintained in order to track possession and handling of samples from field collection through laboratory testing. COC records show the custody of samples at all times. Samples are in custody of an individual when they are either in the individual's sight or locked securely under the individual's control.

COC documentation is maintained on a COC record form. Each sample must be logged onto the COC record form as it is collected. The COC record form includes at least the following information, as appropriate:

- Project name and number (includes site name)
- Site location
- Sample number
- Sample date and time
- Sample type
- Number and type of sample containers
- Analyses required
- Sample preservative
- Lab destination
- Carrier/shipping number
- Special instructions
- Spaces for signatures of sampler(s) and everyone assuming sample custody

The COC record must contain the signatures of anyone assuming custody of the samples. Each time custody changes hands, the party releasing the sample signs under "Relinquished By" and records the date and time. The party receiving the samples signs under the heading "Received By" and records the date and time. The COC form is typically provided by the analytical laboratory.

1.9 Equipment Decontamination

Reusable purging equipment (except dedicated equipment) and measurement instruments coming in contact with the groundwater in wells or in samples are to be decontaminated before use at each well location. Non-dedicated, reusable sampling equipment is not to be used. Wash the equipment with a nonphosphate detergent and rinse with tap water and distilled water.

Properly discard any disposable equipment along with disposable health and safety garments. Dispose of water and cleaning agents in accordance with applicable regulations.

1.10 Field Documentation

Field activities must be thoroughly documented in the field log book or field data sheets. Below is a list of the information to be documented during field activities, as appropriate for the conditions.

- Site name
- Date and time of purging and sampling activities
- Weather conditions
- Sampling personnel
- Field instrument calibration methods and remarks
- Initial equipment decontamination remarks
- Well identification number
- Well description, including casing size
- Description of well condition
- Initial water-level measurement with point of reference (top of casing) and date of measurement
- Depth to the well bottom with point of reference (from well records)
- Presence and thicknesses of immiscible layers, if present
- Physical description of groundwater (color, odor, turbidity)
- Time starting and ending well purging, volume purged, and method of removal
- Water containment and disposal, if required
- Sampling equipment and remarks
- Field parameter measurements
- Sample time and date
- Description of sample
- Quality control remarks
- Samples collected (number of bottles)
- Analyses to be performed
- Preservatives added, if any
- Mode of sample transport

2 GROUNDWATER ANALYSIS PROCEDURES

TASWA has historically utilized a NELAC (National Environmental Laboratory Accreditation Council) certified laboratoryforanalysis of groundwater samples and will continue to use a NELAC certified laboratory for future groundwater analyses.

Laboratory data and analyses will be prepared by a TCEQ accredited environmental testing laboratory and in accordance with accreditation standards (e.g., NELAC).

All analytical data submitted under the requirements of this permit will be examined by the owner and/or operator to ensure that the data quality objectives are considered and met prior to submittal for the commission to review. The owner or operator will determine if the results represent the sample and are accurate and complete. The quality control results, supporting data, and data review by the laboratory must be included when the owner/operator reviews the data. Any potential impacts will be reported such as the bias on the quality of the data, footnotes in the report, and anything of concern that was identified in the laboratory case narrative summary.

The owner or operator will ensure that the laboratory documents and reports all problems and observed anomalies associated with the analysis. If analysis of the data indicates that the data fails to meet the quality control goals for the laboratory's analytical data analysis program, the owner or operator will determine if the data is usable. If the owner and/or operator determines the analytical data may be utilized, any and all problems and corrective action that the laboratory identified during the analysis will be included in the report submitted to the TCEQ.

A Laboratory Case Narrative (LCN) report for all problems and anomalies observed must be submitted by the owner and/or operator. The LCN will report the following information:

1. The exact number of samples, testing parameters and sample matrix.

2. The name of the laboratory involved in the analysis. If more than one laboratory is used, all laboratories shall be identified in the case narrative.

3. The test objective regarding samples.

4. Explanation of each failed precision and accuracy measurement determined to be outside of the laboratory and/or method control limits.

5. Explanation if the effect of the failed precision and accuracy measurements on the results induces a positive or negative bias.

6. Identification and explanation of problems associated with the sample results, along with the limitations these problems have on data usability.

7. A statement on the estimated uncertainty of analytical results of the samples when appropriate and/or when requested.

8. A statement of compliance and/or noncompliance with the requirements and specifications. Exceedance of holding times and identification of matrix interferences must be identified. Dilutions shall be identified and if dilutions are necessary, they must be done to the smallest dilution possible to effectively minimize matrix interferences and bring the sample into control for analysis.

9. Identification of any and all applicable quality assurance and quality control samples that will require special attention by the reviewer.

10. A statement on the quality control of the analytical method of the permit and the analytical recoveries information shall be provided when appropriate and/or when requested.

In addition to the LCN, the following information must be submitted for all analytical data:

1. A laboratory checklist. The Laboratory Data Package Cover Page and Data Review Checklist may be included with the TCEQ-0312 forms for each groundwater monitoring event. For every response of "No, NA, or NR" that is reported on the checklist, the permittee will ensure the laboratory provides a detailed description of the "exception report" in the summary of the LCN. The permittee will require the laboratory to do an equivalent of an EPA Level 3 review regarding quality control analysis.

2. Chain of custody.

3. Analytical report that documents the results and methods for each sample and analyte to be included for every analytical testing event. These test reports must document the reporting limit/method detection limit the laboratory used.

Reporting Limits: Practical Quantitation Limits (PQL)

Reporting limits will be quantitation limits that meet the requirements of 30 TAC §330.405(f)(5). Analytical results must be reported to the lowest concentration levels that can be reliably quantified (practical quantitation limits). Practical quantitation limit (PQL) is defined as the lowest concentration reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.. The PQL is method, instrument, and analyte specific and may be updated as more data becomes available.

- The PQL will be at or below the groundwater protection standard established for each analyte in accordance with 30 TAC §330.409(h) unless approved otherwise by the TCEQ.

- The precision and accuracy of the PQL initially will be determined from the PQLs

reported over the course of a minimum of eight groundwater monitoring events. The results obtained from these events will be used to demonstrate that the PQLs meet the specified precision and accuracy:

Constituents/Chemicals of Concern	Precision (percent RSD)	Accuracy (percent recovery)
Metals	10	70-130
Volatiles	20	50-150
Semi- Volatiles	30	50-150

- The PQL will be supported by analysis of a PQL check sample, consisting of a laboratory reagent grade sample matrix spiked with constituents/chemicals of concern at concentrations equal to or less than the PQL. At a minimum, a PQL check sample will be performed quarterly during the calendar year to demonstrate that the PQL continues to meet the specified limits for precision and accuracy.

- Analytical results for data below the limit of detection ("non-detect" results) must be reported as less than the established PQL limit that meets those precision and accuracy requirements.

If a PQL cannot meet specified precision and accuracy limits, the owner or operator will ensure that the laboratory provides sufficient documentation to justify the alternate precision and accuracy limits. This information will be reported to the TCEQ by the owner or operator and will be evaluated on a case-by-case basis.

3 GROUNDWATER MONITORING REQUIREMENTS

Groundwater monitoring for the current and proposed monitoring well system is to follow the TCEQ requirements for background, detection, assessment, and corrective action monitoring as outlined in applicable parts of 30 TAC §§330.401-421.

3.1 Background and Detection Monitoring Parameters and Analytical Methods

In accordance with §330.419, all monitoring wells at the site are to be sampled and analyzed for the total metals and VOCs listed in 40 CFR Part 258, Appendix I. EPA methods are listed for each constituent in the Background and Detection Monitoring Constituents; equivalent or better methods may be substituted. The analytical method used must be able to attain the reporting limits (PQLs), as defined in Section 2.

The water quality parameters, listed in the Water Quality Parameters List, may be sampled and analyzed at the discretion of the facility operator, but the results will not be subject to statistical evaluation.

Background groundwater quality will be established for all new and replacement upgradient and downgradient wells in the groundwater monitoring system.

In accordance with §330.407(a)(1), upon completion of background monitoring and during background updates, the facility will evaluate the background data to ensure that the data are representative of background groundwater constituent concentrations unaffected by waste disposal activities or other sources of contamination. The evaluation will be documented in a report and submitted to the TCEQ before the next subsequent groundwater monitoring event following the updated (or initial) background period.

Once monitoring wells are approved for detection monitoring, those constituents "not reasonably expected to be in or derived from the waste contained in the unit" may be deleted from the detection monitoring list with approval from the executive director, in accordance with 30 TAC §330.419(b). At a future date, when leachate data are further evaluated, the detection monitoring parameter list may be revised to exclude compounds not found in the site leachate in sufficient quantity for statistical contrast.

A permit amendment or modification will be submitted if the detection monitoring program no longer satisfies 30 TAC §330.407.

3.2 Monitoring Frequency

Background sampling will consist of eight background samples taken from each well at approximately three-month intervals. This interval is estimated to be sufficient to obtain "statistically independent" samples. For slow recovery wells that have not completed background collection within two years (due to lack of sufficient groundwater for sampling), the wells will then be sampled, or attempted to be sampled, for background during the subsequent regularly scheduled semiannual events.

Background sampling, as described above, will be implemented for new wells or wells that have had major repairs not later than the calendar quarter after installation or repair, except as may be otherwise required by the TCEQ.

Semiannual detection monitoring of the groundwater monitoring wells will begin about six months after the last background sampling event. An effort will be made to sample consistently in the same two quarters each year.

3.3 Statistical Methods

Statistical evaluation of detection groundwater-monitoring constituents is required by 30 TAC §330.405(e) and (f). Statistical analysis will be performed on each of the analyzed constituents, except as may be otherwise approved by the TCEQ, using methods appropriate for the distribution of the concentration values of the constituents. An appropriate statistical method will be selected once the background samples have been collected and approved. The method selected will be based upon the nature of the constituent, the data available, and the site conditions. In selecting an appropriate statistical test, the following criteria will be met:

1. The statistical method used will be appropriate for the distribution of the data.

2. Multiple comparison procedures (excluding tolerance or prediction intervals and control charts) will use a Type-I error rate of no less than 0.05 for each sampling period, and comparisons between individual wells and background concentrations or groundwater protection standards will use a Type-I error rate of no less than 0.01.

3. If a control-chart approach is used, the control chart parameter values will be protective of human health and the environment.

4. If a tolerance or prediction interval is used, the levels of confidence and/or the percentage of the population that the interval must contain, will be protective of human health and the environment.

5. The statistical test will account for data below the detection limit with procedure(s) that are protective of human health and the environment. Any PQL

used will be the lowest concentration reliably achievable with routine laboratory levels of precision and accuracy.

6. The statistical test will control or correct for seasonal and spatial variability, if necessary, and for temporal correlation in the data.

Figures 1-6 at the end of this section, diagram the decision points and the rational which will be used in selecting an appropriate statistical test for each monitored constituent.

3.4 Reporting Requirements

In accordance with 30 TAC §330.407(a)(1), upon completion of background monitoring and during background updates, TASWA will evaluate the background data to ensure that the data are representative of background groundwater constituent concentrations unaffected by waste management activities or other sources of contamination. The evaluation will be documented in a report and submitted to the executive director before the next subsequent groundwater monitoring event following the updated (or initial) background period.

Within 60 days of each groundwater sampling event, a determination will be made whether an apparent or verified exceedance of a statistically calculated background limit has occurred. The terms "apparent SSI", "apparent exceedance", and “initial exceedance” all correspond to the statistically significant increase (SSI) referred to in the first sentence of 30 TAC §330.407(b) and are based on the statistical evaluation of an initial sample during a detection monitoring event that has not yet been confirmed by verification resampling. Timelines for actions listed in the subsections of §330.407(b) are counted from the date of the initial sampling event. An SSI over background of any tested constituent at any monitoring well, including background wells, is not recorded until the initial exceedance has been verified with verification re-sampling. If an apparent SSI is observed, the executive director and any local pollution agency with jurisdiction that has requested notification, will be notified in writing within 14 days of the apparent SSI determination. If an apparent SSI of any tested constituent at any monitoring well has occurred, the following actions will be initiated, as appropriate for each separate apparent SSI incident, in accordance with 30 TAC §330.407(b).

(1) The facility shall immediately place a notice in the site operating record describing the release and establish an assessment monitoring program meeting the requirements of §330.409, for the well(s) exhibiting the SSI and at the immediately adjacent wells on each side of the well(s) exhibiting the SSI, unless an alternative subset of wells is designated by the executive director, within 90 days of the date of the notice to the TCEQ, except as provided in (2) and (3) below:

(2) The facility shall submit results of resampling as appropriate for the statistical method within 60 days of determining the apparent SSI. The resample data may be used to statistically confirm or disprove the apparent SSI. Resampling will be completed, and the results submitted to the executive director within 60 days of the determination of an initial exceedance.

(3) If there is reasonable cause to think that another source or an error(s) in sampling, analysis, statistical evaluation, or natural variation in groundwater quality caused the SSI, then the facility may submit a report documenting the error or alternate source in accordance with §330.407(b)(3), as follows:

(A) Notify, in writing, the executive director and any local pollution agency with jurisdiction that has requested to be notified within 14 days of determining the SSI.

(B) Submit the demonstration, prepared and certified by a qualified groundwater scientist, within 90 days of SSI determination.

(C) Do not filter the sample for constituents addressed by the demonstration prior to laboratory analysis.

(D) Continue detection monitoring.

If the report is approved, then the monitoring well may remain in detection monitoring. If the owner/operator does not make a demonstration satisfactory to the executive director within 90 days after the date of notice, as evidenced by a letter of denial from the TCEQ, the owner/operator shall initiate an assessment monitoring program within 90 days of the date of the notice, in accordance with §330.409. If the owner/operator receives a response from the executive director that a demonstration is not satisfactory after the deadline for initiating assessment monitoring, then assessment monitoring will be initiated at the next regularly scheduled semiannual monitoring event following receipt of the response.

3.4.1 Assessment Monitoring and Corrective Action

Groundwater sampling for assessment monitoring and corrective action will be done in accordance with 30 TAC 330 Subchapter J rules.

Assessment monitoring is required whenever the owner or operator determines there has been a statistically significant increase over background for one or more of the constituents listed in 30 TAC §330.419.

Within 90 days of determining that an SSI has occurred, the owner or operator must sample and analyze each affected well and the two wells adjacent to each affected well for the full set up constituents listed in Appendix II to 40 CFR Part 258. After sampling for the full set of Appendix II constituents, the executive director may delete any of Appendix II constituents.

The executive director may specify an appropriate alternative frequency for repeated sampling and analysis for the full set of 40 CFR Part 258, Appendix II constituents during the active and the closure and post-closure care period of the unit.

If any new constituents are detected in the well as a result of the Appendix II analysis, a background level must be established for the additional constituents.

This background level consists of four statistically independent samples from each background well.

If the concentration of any 40 CFR Part 258, Appendix II constituent is above its respective background limit, but below its GWPS, the facility must continue assessment monitoring. If the concentrations of all 40 CFR Part 258, Appendix II constituents are shown to be at or below background values for two (2) consecutive sampling events, the owner or operator may return the well to detection monitoring status, after notifying the executive director and receiving approval.

If any 40 CFR Part 258, Appendix II constituents were detected at statistically significant levels above the groundwater protection standard, the facility must notify the executive director and appropriate local government officials within 7 days of the determination.

Groundwater protection standards will be established for Appendix II constituents in the point of compliance monitoring wells. Groundwater protection standards will be provided for constituents for which a maximum (MCL) has been promulgated under 40 CFR Part 141, Safe Drinking Water Act Maximum Contaminant Level (MCL). Groundwater protection standards will be provided for constituents for which no MCL is promulgated. Groundwater protection standards will be provided for background constituents that are higher than MCL or health-based level. The Executive Director may establish alternative groundwater protection standards in accordance with 30 TAC §330.409(i).

No later than 60 days after each sampling event, the owner or operator shall determine whether any Appendix II constituents were detected at statistically significant levels above the groundwater protection standard previously established. If the groundwater protection standard has been exceeded, the owner or operator shall notify the executive director and appropriate local government officials in writing, within 7 days of this determination.

The owner or operator shall also install any additional monitoring wells necessary to characterize the nature and extent of the release, notify in writing all persons that own or occupy the land that directly overlies any part of the plume of contamination, and initiate an assessment of corrective measures within 90 days of the notice to the executive director.

The owner or operator shall also install any additional monitoring wells necessary to characterize the nature and extent of the release and install at least one additional monitoring well between the monitoring well with the statistically significant level and the next adjacent wells along the point of compliance before the next sampling event.

Within 90 days of the notification to the executive director, an assessment of corrective measures will be initiated.

The owner or operator may demonstrate that a source other than the monitored solid waste management unit caused the contamination or that the statistically significant level resulted from error in sampling analysis, statistical evaluation or natural variation in groundwater quality.

The executive director must be notified within 14 days of determining a statistically significant level above the groundwater protection standard that the owner or operator intends to make a demonstration.

A report that demonstrates that a source other than the monitored solid waste management unit caused the contamination or that the statistically significant level resulted from error in sampling, statistical evaluation, or natural variation in groundwater quality. The report shall be prepared and certified by a qualified groundwater scientist.

Groundwater samples for constituents addressed by the demonstration will not be filtered prior to laboratory analysis. In addition, the executive director may require the owner operator to provide analysis of leachate to support the demonstration.

Groundwater monitoring will continue in accordance with the assessment monitoring program.

If a successful demonstration is made, the owner or operator shall continue monitoring in accordance with the assessment monitoring program and may return to detection monitoring if the Appendix II constituents are at or below background concentrations.

Within 90 days of reporting Appendix II results, and semiannually thereafter, all wells will be resampled for Appendix I and any new constituent detected from Appendix II. The results of resampling will be submitted within 60 days after each sampling event.

An annual assessment monitoring report will be submitted within 60 days of 2nd semiannual sampling event that includes the following information;

1. A Statement of any statistically significant exceedances of groundwater protection standards in accordance with 30 TAC §330.409(i).

2. Groundwater monitoring results, summary of background, statistical calculations, graphs, and drawings.

3. Groundwater flow rate and direction based on data from sampling events and supporting documentation.

4. A piezometric water level contour map and supporting documentation.

5. Recommendations for any changes.

6. Any other information required by the Executive Director.

If the owner or operator determines that the assessment monitoring program no longer satisfies the requirements of this section, the owner or operator must, within 90 days, submit an application for a permit amendment or modification to make any appropriate changes to the program.

3.4.2 Annual Report

In accordance with 30 TAC §330.407(c), the annual report will include the results of all groundwater monitoring, testing, and analytical work obtained or prepared under the requirements of the permit (that is, all facility groundwater sample and field quality control sample analytical data in hard-copy format on form TCEQ- 0312, Groundwater Sampling Report, and in any other format requested by the executive director, for example, electronic format). The annual report will include a summary of background groundwater quality values, groundwater monitoring analyses, and statistical calculations, as well as graphs, and drawings.

Annually, within 90 days after the facility's last groundwater monitoring event in a calendar year, a report will be submitted that includes the following information gathered since the previous annual report:

(1) A statement regarding SSI(s) in any well and the status of same.

(2) The facility will submit the laboratory case narrative and either a laboratory checklist or a copy of the laboratory QA/QC and analytical data. The analytical data will be submitted in either electronic or in hard copy format, as requested by the executive director.

(3) The facility will explain any problems encountered in the laboratory analysis, either by adding additional explanations to the laboratory checklist or by extending the laboratory case narrative.

(4) Any information required in the laboratory case narrative that cannot be completed by the laboratory will be completed by the permittee.

(5) Groundwater flow rate and direction in the uppermost aquifer, using the previous year's data collected, including documentation used to determine the flow rate and direction.

(6) Contour map(s) of piezometric water levels in the uppermost aquifer based on concurrent measurements at all monitoring wells, including supporting data.

(7) Any recommendations for changes to the groundwater monitoring program.

(8) Any other items requested by the executive director.

Recommended Containers, Preservation, and Storage for Groundwater Monitoring

Parameter	Recommended Containers	Preservation	Maximum Holding Time	Minimum Volume
pH	P, G	None	Analyze immediately	25 ml
Spec. cond.	P, G	None	Analyze immediately	100 ml
Temperature	P, G	None	Analyze immediately	
Heavy metals (includes iron and manganese)	P, G	Acidify w/HNO_3 to pH<2, 4°C	6 months except 28 days for Hg	1 liter
Calcium, magnesium, sodium, potassium, fluoride, sulfate, chloride, and hardness	P, G	4°C	28 days	1 liter
TDS (may be included with above parameters)	P, G	4°C	7 days	1 liter
Nitrate	P, G	4°C	48 hrs	100 ml
Ammonia	P, G	Acidify w/H_2SO_4 to pH<2, 4°C	7 days; 28 days if acidified	500 ml
Alkalinity	P, G	4°C	14 days	200 ml
NPOC	G amber, T-lined caps	Acidify w/HCl to pH<2, 4°C	48 hrs; 28 days if acidified	100 ml/replicate
COD	P, G	Acidify w/H_2SO_4 to pH<2, 4°C	48 hrs; 28 days if acidified	100 ml
SVOC	G, T-lined caps	4°C	7 days until extraction, then analyze within 40 days	1 liter
BOD	P, G	4°C	24 hrs	1 liter
VOC	G, T-lined septa	Acidify w/HCl to pH<2, 4°C	14 days	2 x 40 ml
P = Polyethylene, G = Glass, T = Teflon				

Background and Detection Monitoring Constituents

Parameter	CAS RN	Method[1]
Appendix I Metals:		
Antimony	Total	EPA 6010B
Arsenic	Total	EPA 6010B
Barium	Total	EPA 6010B
Beryllium	Total	EPA 6010B
Cadmium	Total	EPA 6010B
Chromium	Total	EPA 6010B
Cobalt	Total	EPA 6010B
Copper	Total	EPA 6010B
Lead	Total	EPA 6010B
Nickel	Total	EPA 6010B
Selenium	Total	EPA 6010B
Silver	Total	EPA 6010B
Thallium	Total	EPA 6010B
Vanadium	Total	EPA 6010B
Zinc	Total	EPA 6010B
Appendix I Volatile organic compounds:		
Acetone	67-64-1	EPA 8260B
Acrylonitrile	107-13-1	EPA 8260B
Benzene	71-43-2	EPA 8260B
Bromochloromethane	74-97-5	EPA 8260B
Bromodichloromethane	75-27-4	EPA 8260B
Bromoform (tribromomethane)	75-25-2	EPA 8260B
Carbon disulfide	75-15-0	EPA 8260B
Carbon tetrachloride	56-23-5	EPA 8260B
Chlorobenzene	108-90-7	EPA 8260B
Chloroethane (ethyl chloride)	75-00-3	EPA 8260B
Chloroform (tichloromethane)	67-66-3	EPA 8260B
Dibromochloromethane (chlorodibromomethane)	124-48-1	EPA 8260B

Background and Detection Monitoring Constituents (continued)

Parameter	CAS RN	Method[1]
1,2-Dibromo-3-chloropropane (DBCP)[2]	96-12-8	EPA 8260B
1,2-Dibromoethane (ethylene dibromide, EDB)[2]	106-93-4	EPA 8260B
o-Dichlorobenzene (1,2-dichlorobenzene)	95-50-1	EPA 8260B
p-Dichlorobenzene (1,4-dichlorobenzene)	106-46-7	EPA 8260B
trans-1, 4-Dichloro-2-butene	110-57-6	EPA 8260B
1,1-Dichlorethane (ethylidene chloride)	75-34-4	EPA 8260B
1,2-Dichlorethane (ethylene dichloride)	107-06-2	EPA 8260B
1,1-Dichloroethylene (1,1-dichloroethene, vinylidene chloride)	75-35-4	EPA 8260B
cis-1,2-Dichloroethylene (cis-1,2-dichloroethene)	156-59-2	EPA 8260B
trans-1, 2-Dichloroethylene (trans-1,2-dichloroethene)	156-60-5	EPA 8260B
1,2-Dichloropropane (propylene dichloride)	78-87-5	EPA 8260B
cis-1,3-Dichloropropene	10061-01-5	EPA 8260B
trans-1,3-Dichloropropene	10061-02-6	EPA 8260B
Ethylbenzene	10041-4	EPA 8260B
2-Hexanone (methyl butyl ketone)	591-78-6	EPA 8260B
Methyl bromide (bromomethane)	74-83-9	EPA 8260B
Methyl chloride (chloromethane)	74-87-3	EPA 8260B
Methylene bromide (dibromomethane)	74-95-3	EPA 8260B
Methylene chloride (dichloromethane)	75-09-2	EPA 8260B
Methyl ethyl ketone (MEK, 2-butanone)	78-93-3	EPA 8260B
Methyl iodide (iodomethane)	74-88-4	EPA 8260B
4-Methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	EPA 8260B
Styrene	100-42-5	EPA 8260B
1,1,1,2-Tetrachloroethane	630-20-6	EPA 8260B
1,1,2,2-Tetrachloroethane	79-34-5	EPA 8260B
Tetrachloroethylene (tetrachloroethene, perchloroethylene)	127-18-4	EPA 8260B
Toluene	108-88-3	EPA 8260B
1,1,1-Trichloroethane (methychloroform)	71-55-6	EPA 8260B

Background and Detection Monitoring Constituents (continued)

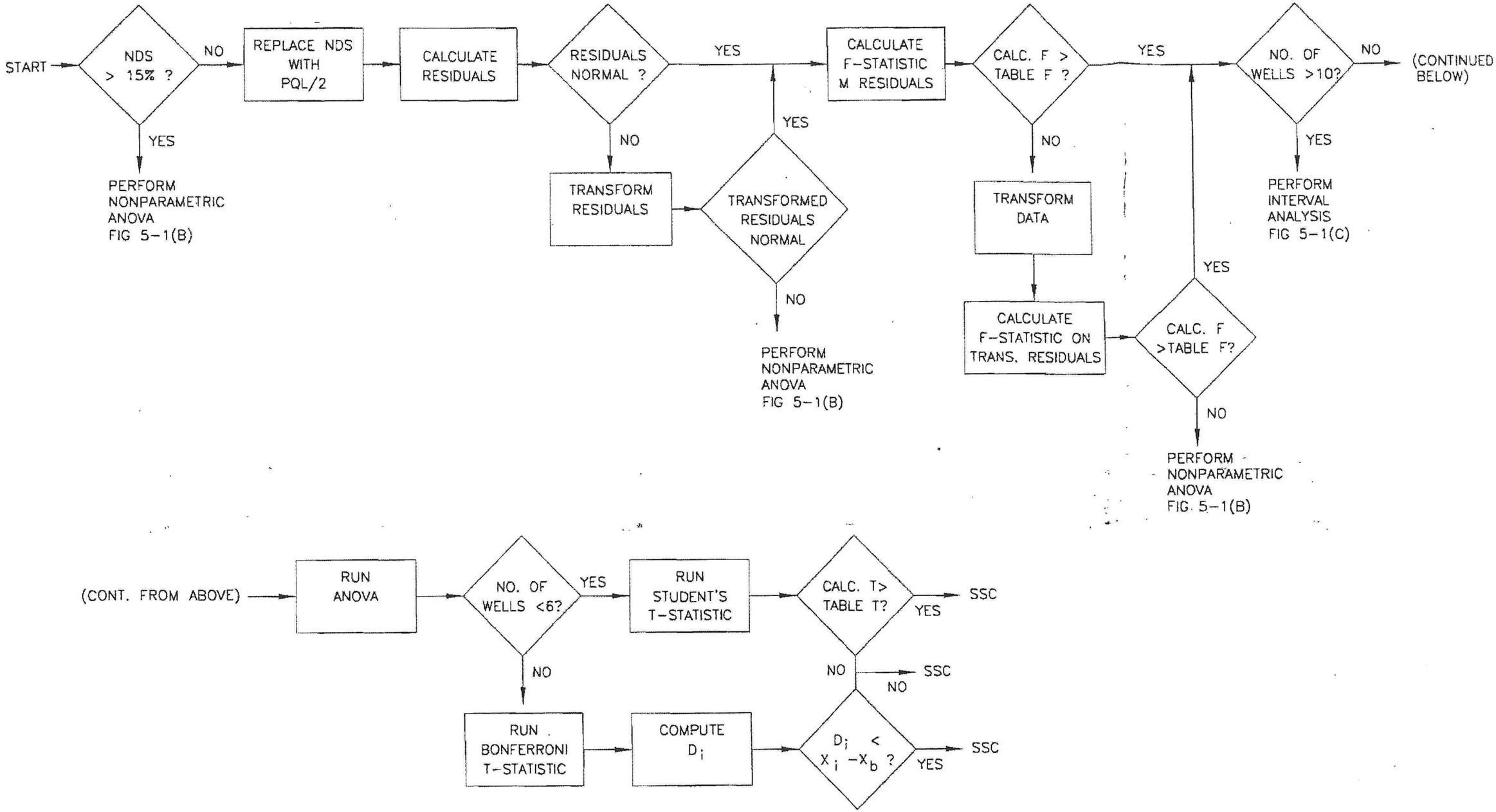
Parameter	CAS RN	Method[1]
1,1,2-Trichloroethane	79-00-5	EPA 8260B
Trichloroethylene (trichloroethene)	79-01-6	EPA 8260B
Trichlorofluoromethane (CFC-11)	75-69-4	EPA 8260B
1,2,3-Trichloropropane	96-18-4	EPA 8260B
Vinyl acetate	108-05-4	EPA 8260B
Vinyl chloride	75-01-4	EPA 8260B
Xylenes	1330-20-7	EPA 8260B

Notes:
[1] Equivalent or better methods may be substituted.
[2] For DBCP and EDB, any detections between the MDL (method detection limit) and PQL will be reported and flagged as estimated values.

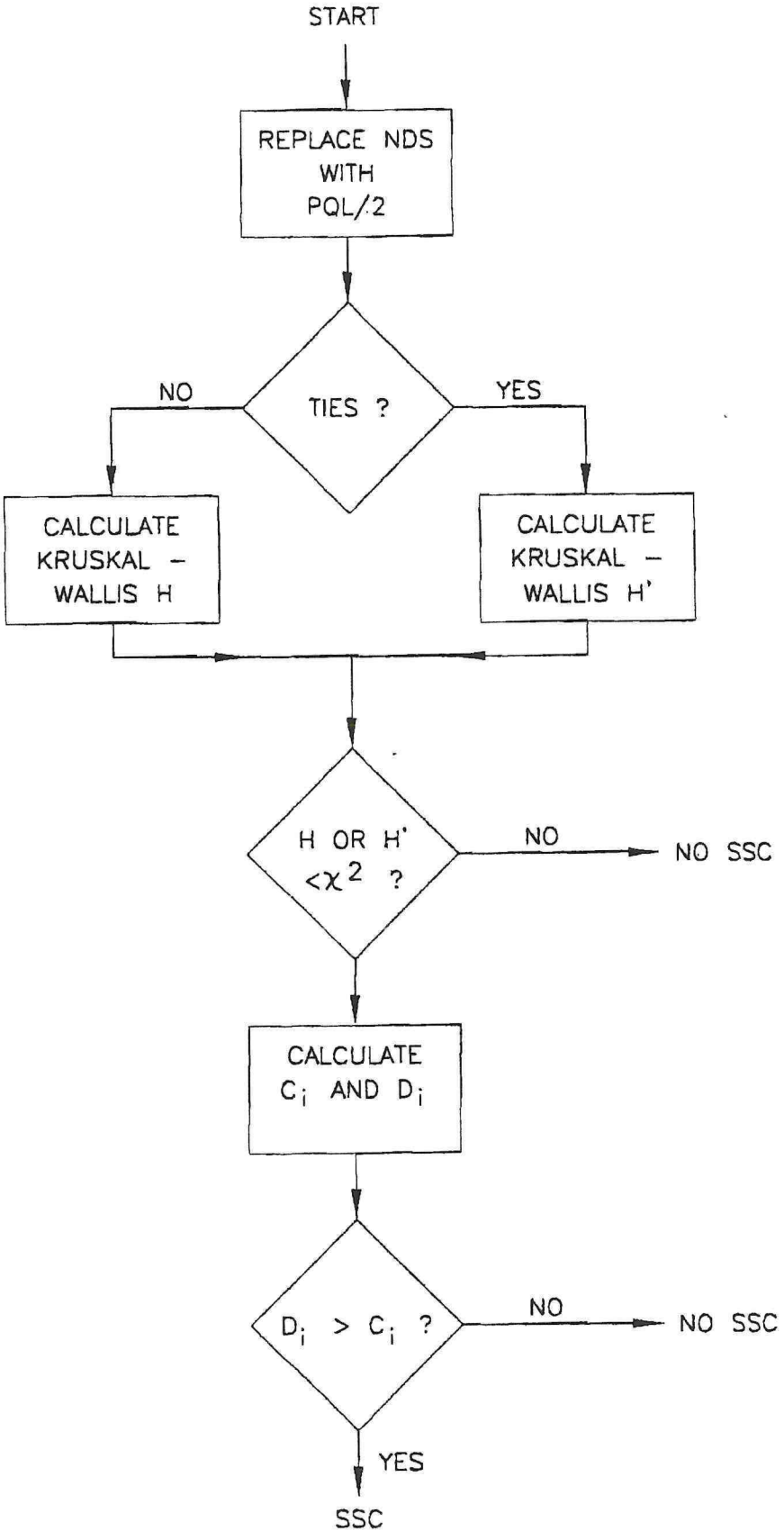
Water Quality Parameters List

Parameter	Method[1]	CAS RN
Inorganic Indicator Constituents:		
Ammonia	EPA 350.1	Total
Calcium	EPA 6010	Total
Magnesium	EPA 6010	Total
Sodium	EPA 6010	Total
Potassium	EPA 6010	Total
Chloride	EPA 300.0	
Sulfate	EPA 300.0	
Alkalinity	EPA 310.1	Total

Notes:
[1] Equivalent or better methods may be substituted.

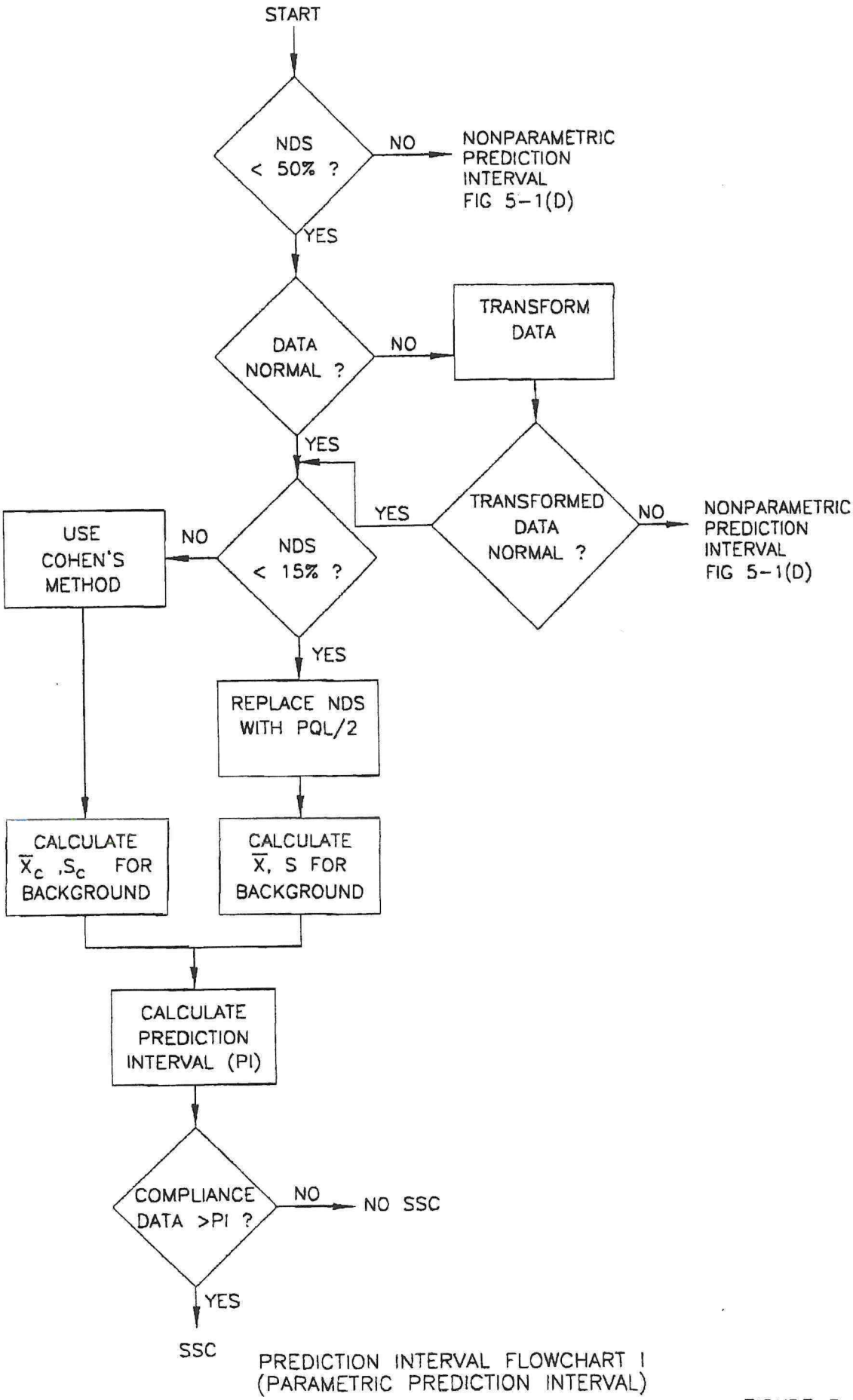


ANOVA FLOWCHART I
(PARAMETRIC ONE-WAY ANOVA)
FIGURE 1



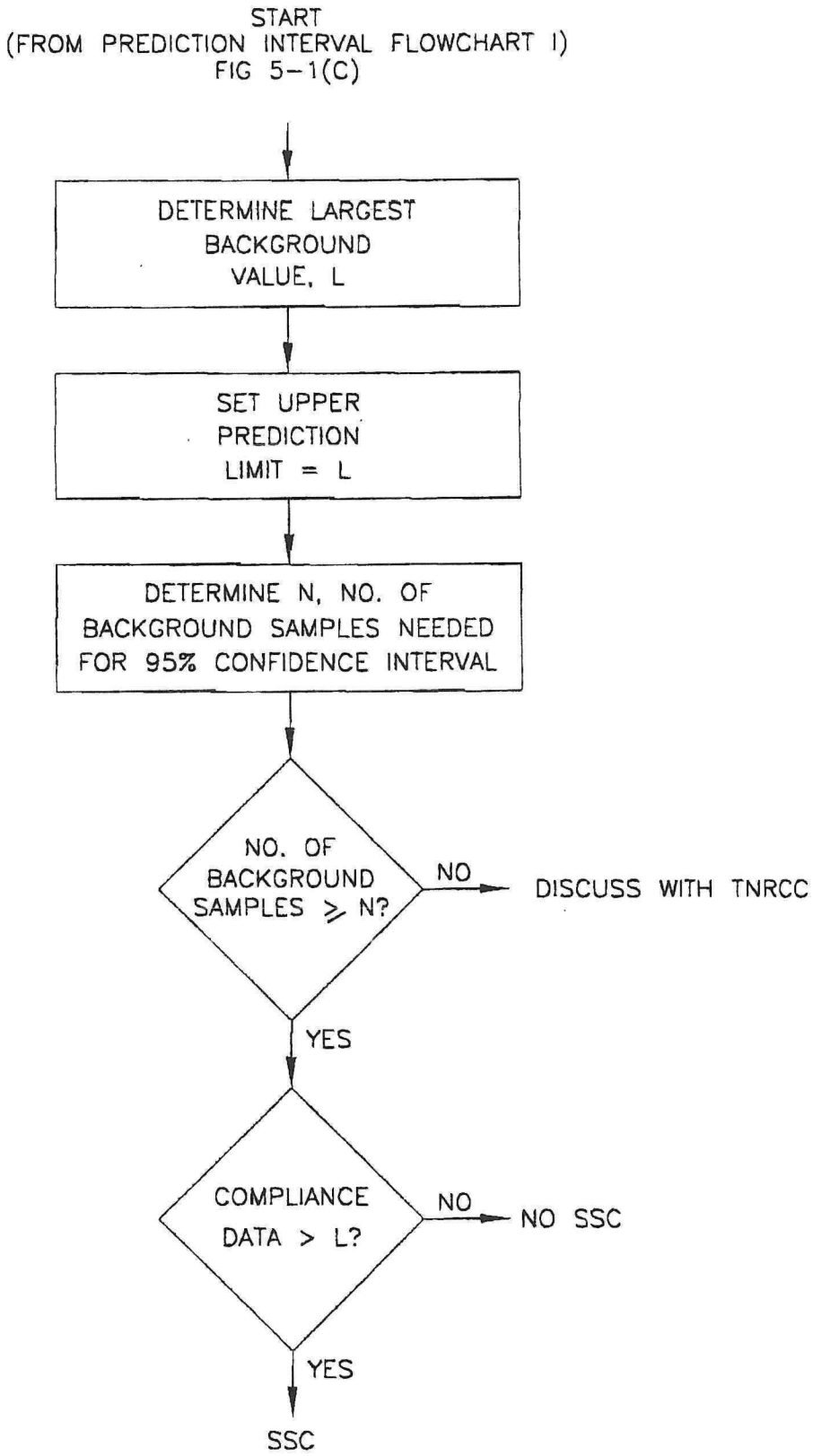
ANOVA FLOWCHART II
(NONPARAMETRIC ONE–WAY ANOVA)

FIGURE 2



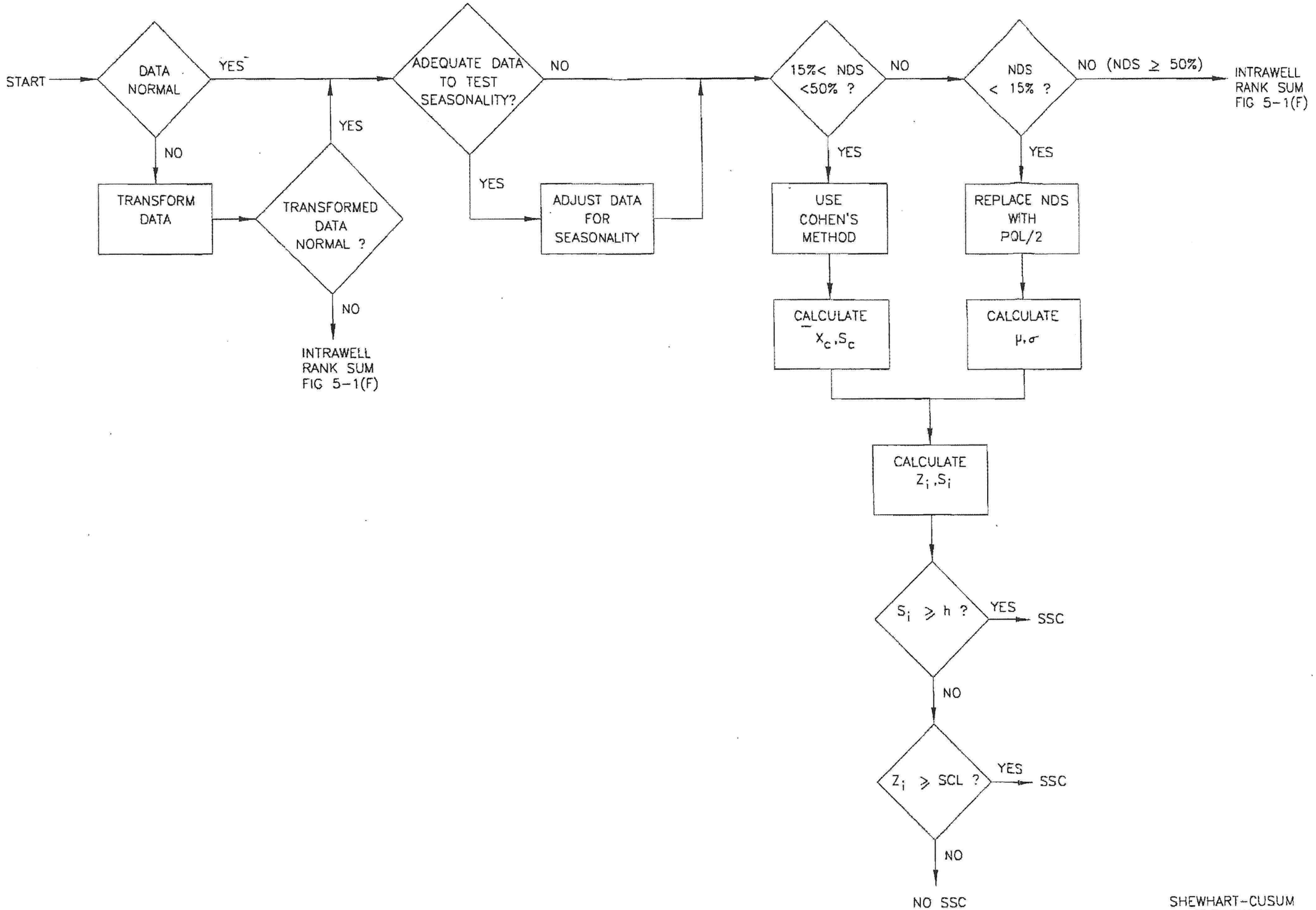
PREDICTION INTERVAL FLOWCHART I
(PARAMETRIC PREDICTION INTERVAL)

FIGURE 3



PREDICTION INTERVAL FLOWCHART II
(NONPARAMETRIC PREDICTION INTERVAL)

FIGURE 4



SHEWHART-CUSUM FLOWCHART

FIGURE 5

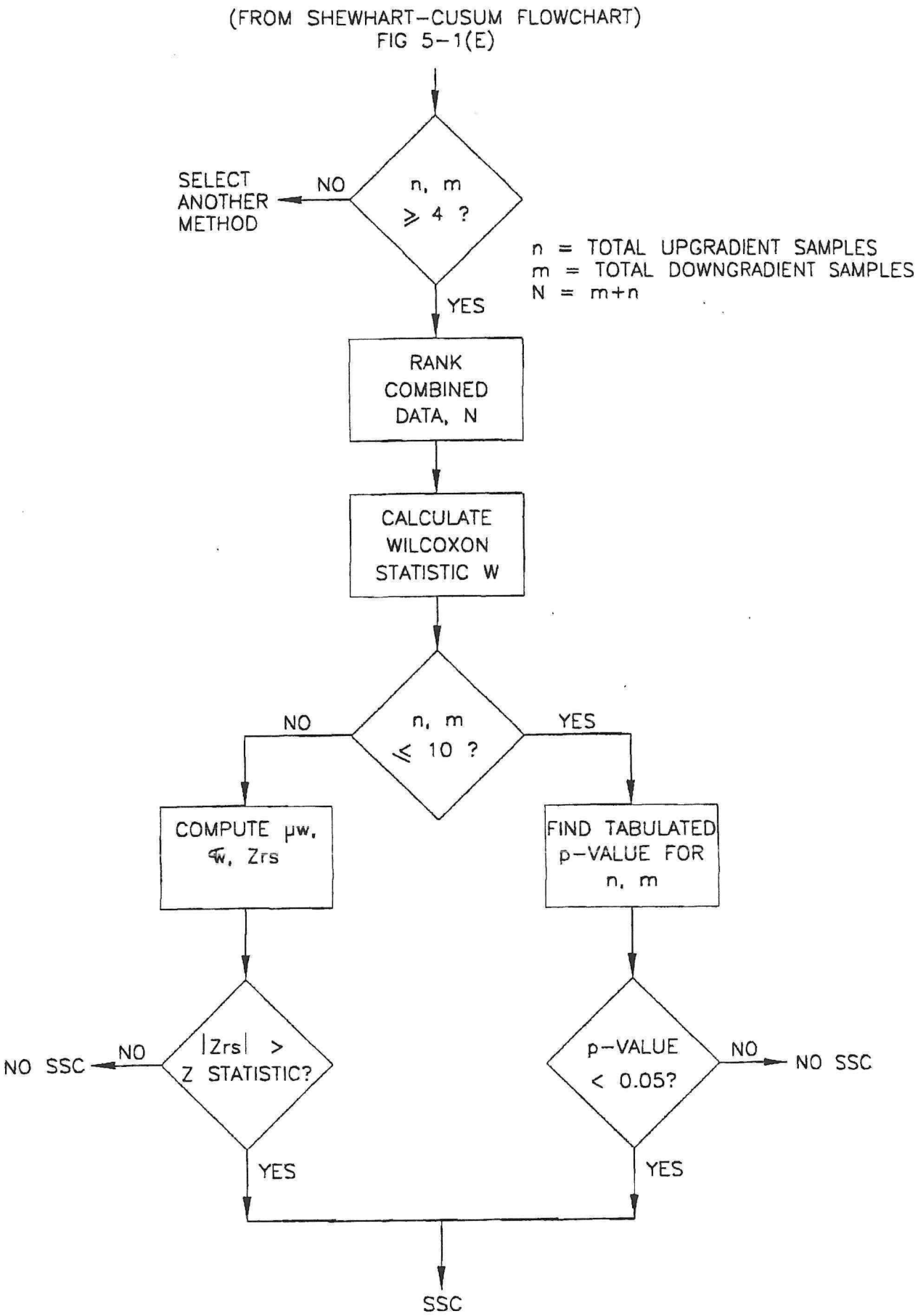

(FROM SHEWHART-CUSUM FLOWCHART)
FIG 5-1(E)
n, m ≥ 4 ?
NO
SELECT ANOTHER METHOD
YES
n = TOTAL UPGRADIENT SAMPLES
m = TOTAL DOWNGRADIENT SAMPLES
N = m+n
RANK COMBINED DATA, N
CALCULATE WILCOXON STATISTIC W
n, m ≤ 10 ?
NO
YES
COMPUTE μw, σw, Zrs
FIND TABULATED p-VALUE FOR n, m
|Zrs| > Z STATISTIC?
NO
NO SSC
YES
p-VALUE < 0.05?
NO
NO SSC
YES
SSC
MANN-WHITNEY OR INTRAWELL WELL RANK-SUM FLOWCHART

FIGURE 6