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21 April 2008

Via Electronic Mail

Mr. Mark R. Riggle, P.G.
Project Manager
Team 3, Environmental Cleanup Section II
Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Re: Monitoring Well Installation
Leander ISD - Grandview Hills Elementary School, Austin, Texas

Dear Mr. Riggle:

On behalf of the Leander Independent School District (LISD), Weston Solutions, Inc. (WESTON) is pleased to present the Texas Commission on Environmental Quality (TCEQ) with this report of the results of the recent monitoring well installation at the LISD Grandview Hills Elementary School property. This letter also formally documents our response to your 31 March 2008 letter regarding the criterion used to select a completion interval for the monitoring well.

Development of Well Specifications

The well was initially requested by the TCEQ in their letter dated 14 November 2007. Preliminary well specifications were developed between TCEQ and WESTON during a series of meetings and an electronic mail message in December 2007. In a letter dated 28 February 2008, TCEQ requested that the well be installed within 60 days of the date of the letter, or 28 April 2008.

WESTON submitted a well installation proposal to LISD on 28 March 2008, which included final proposed well specifications based on earlier discussions with TCEQ. A copy is attached for reference. TCEQ was provided with a copy of the proposal in order to review and approve the well specifications and the proposed approach to identifying water-bearing zones prior to commencing work. TCEQ submitted a letter to LISD on 31 March 2008 indicating that one aspect of the approach regarding water-bearing zone identification was not acceptable. A copy of that letter is attached. You and I spoke by telephone on 1 April 2008 regarding TCEQ's position that our proposed 3-foot water column criterion was insufficient for judging whether or not to complete a well. Our understanding of TCEQ's position is that the column of accumulated water in a borehole or a well was not an adequate indicator of the potential productivity of a water-bearing zone, based on the concept that a very thin, permeable zone (such as a saturated fracture or solution cavity) could potentially produce a sufficient amount of water for sampling while only creating a thin water column.

With that in mind, TCEQ and WESTON agreed to base the well completion decision on an evaluation (in the field) of the approximate rate at which water accumulates in the open borehole over a period of minutes to hours, using periodic readings of water level in the open borehole. The water level measurements would be conducted if a potential water-bearing zone were identified by using the amount of observed dust generated during drilling and moisture in the cuttings as the primary indicators. If water accumulated in the borehole, it would be evacuated (pumped or bailed), followed by additional gauging of the water level over a period of minutes to hours to see if water returned to the hole at a rate that would suggest water might eventually accumulate in sufficient volume for sampling.

At that point, the decision would be made in the field by TCEQ and WESTON whether to complete a well at that depth or set a surface casing at that depth to seal off the wet zone and drill deeper to complete the well. If no evidence of water was detected down to the Edwards/Walnut contact, the specifications for completing a well under that scenario would be followed as previously written in our 28 March 2008 letter, except that the well would be completed regardless of water accumulation in the borehole. Also, any water that accumulated in the well would be sampled (i.e., the 3-ft criterion would not be used).

Borehole Drilling and Installation of Monitoring Well

Site Geology

To assist in identifying subsurface geologic contacts and other possible subsurface features, WESTON had obtained boring logs from the City of Austin that were developed during site characterization work at the former proposed Water Treatment Plant #4 site located approximately 1 mile southeast of the LISD property. These logs, as well as published descriptions of the Edwards Limestone and Walnut Formation in Travis County, were consulted before and during drilling.

The Edwards Limestone outcrops at the site of Grandview Hills Elementary, according to the Geologic Atlas of Texas, Austin Sheet map (UT-BEG, 1974). According to the map and several other sources reviewed, most of the Edwards in the Austin area consists of dolomite, dolomitic limestone, and hard, gray limestone, with gray to black chert common (Garner and Young, 1976, UT-BEG). The Edwards also contains several void or vug zones.

According to the same sources, the Walnut Formation is comprised of at least two members in the Austin area, the Bull Creek below and the Bee Caves above. The Bee Cave Member is a marly limestone (slightly clayey limestone or slightly clayey biomicrite) from 10 to 15 meters (30 to 45 feet) thick, overlying the Bull Creek Member.

Borehole Drilling

The well location (Figure 1) was approximately 10 to 15 ft northwest of the former Acid Neutralization Tank (ANT). A slight adjustment of the well location relative to the original

proposed location was made in the field based on the location of underground utilities and construction equipment traffic.

On 2 April 2008, representatives from the TCEQ (Mark Riggle), Weston (Jeff Henke, Brent Ferry and Seth Hopkins), URS (Mike Zappa), and American Constructors (Micah Ditmore) were present on site to commence the drilling activities. The drilling services were provided by Vortex Drilling Inc. of San Antonio.

Drilling was conducted using a Mobil B-59, truck-mounted, air rotary rig. The drilling method employed compressed air as the drilling fluid, which was supplied by an industrial air compressor provided by Vortex. No water, foam or other fluids were used in the drilling so as to allow accurate identification of water-bearing zones with minimal potential interference. The borehole was advanced using a 4-inch diameter, tri-cone roller bit. Rock cores were not collected during the drilling; however, drill cuttings were monitored continuously to identify major lithologic changes and potential presence of water. In addition, qualitative factors such as rig pull-down pressure, rig noise, "bit drops", and dust levels were observed as general indications of the nature of the material encountered in the subsurface. A bit drop is a sudden downward movement of the drill string as voids or cavities are encountered that provide no resistance to the pull-down pressure applied to the pipe and bit to advance the boring. Dust from the borehole was contained at ground surface using a plastic shroud wrapped around the drill pipe, with a small portal for collecting and observing drill cuttings. Drill pipe connections were made approximately every 5 feet of depth. The cuttings were collected using a shovel and were examined closely for color, lithology, and evidence of a water-bearing zone (moisture level).

Limestone was encountered within 4 ft of ground surface. The cuttings indicated the presence of brown to tan, hard limestone with no moisture down to a depth of approximately 43 feet, with trace amounts of reddish clay that is commonly associated with the vugs and small solution cavities that form in the Edwards. Brown to gray chert particles were also observed. Short bit drops (less than 6 inches) occurred between approximately 10 ft bgs to 43 ft bgs, indicating the presence of small solution cavities or voids characteristic of the Edwards Limestone. Numerous bit drops are mentioned in the boring logs from WTP#4, providing confirmation that the geologic stratum at that depth was the Edwards.

At approximately 43 ft bgs, a slight decrease in the amount of drilling-derived dust observed at the ground surface suggested possible water-bearing zones at that depth. No free water had been produced or observed down to this depth. The borehole was then advanced to 48 ft to further evaluate the possible wet zone. Cuttings from the 43 to 48 ft bgs interval appeared to be damp to slightly moist. Based on the presence of the damp cuttings and suspected voids in the rock, the drilling was temporarily stopped at 48 ft bgs and the drill string was removed as the borehole was observed for the presence of water.

The boring was allowed to sit open for a period of 1 hour and 15 minutes to evaluate whether or not any part of the 0-48 ft bgs interval would produce water. After approximately 45 minutes, a water level gauging probe was lowered in to the open borehole to detect any accumulated water. No

water accumulated during this time; however, moisture was detected at the very bottom of the borehole (mud), and paste-like mud was observed on the probe cable at 48 to 38 ft bgs after it was brought back up to the surface. An additional 30 minutes were allowed to pass, after which the probe was reinserted into the borehole. As before, no evidence of accumulated water was observed. The paste-like mud was not observed on the second gauging attempt. Based on the absence of accumulated water, TCEQ and WESTON agreed that the borehole could be advanced deeper. Both parties agreed that a surface casing would not be necessary at 48 ft because there was no water to seal off in the upper intervals.

Drilling resumed using the same approach for identifying water-bearing zone and changes in lithology. At approximately 55 ft bgs, the cuttings were observed to be slightly lighter in color (light tan to beige-colored) and contained few to no obvious rock chips, but primarily powder-like silt to clay-sized particles. The cuttings did not indicate the presence of water or moisture, as compared to the shallower interval that had been evaluated. In addition, the pull-down pressure needed to advance the boring had decreased substantially and the rig noise had diminished relative to intervals above 55 ft bgs. Drilling was smooth, with no bit drops below about 55 ft bgs. These factors suggested that the boring had penetrated beyond the harder limestone of the Edwards and encountered the clayey, shaley limestone indicative of the Walnut Formation.

Drilling continued until a depth of 67.5’ bgs was reached, with similar conditions observed as those starting at 55 ft bgs. Based on the changes observed in cuttings and drill rig response, TCEQ and WESTON agreed that the Edwards/Walnut contact was at approximately 55 ft bgs, and that the boring had advanced more than 10 feet into the Walnut. No free water had been encountered to this depth and no evidence of a water-bearing zone was observed at or below the interpreted Edwards/Walnut contact. A boring log with description of cuttings and other drilling observations is attached.

Monitoring Well Construction

In accordance with the agreed specifications, TCEQ and WESTON designed the temporary well so that the screened interval would straddle the Edwards/Walnut contact and also extend high enough above the contact to capture the suspected damp zone at 48’ bgs. The bottom of the borehole was filled with bentonite (clay) pellets to a depth of 60.5 ft bgs. A thin layer (0.5 ft) of filter sand was placed on top of the bentonite to isolate it from the well screen above. The 2-inch diameter, flush-threaded, PVC well casing and screen were set at 60 ft bgs, and the screened interval extended from 60 to 45 ft bgs. The well screen consisted of 15 ft of mill-slotted PVC pipe with 0.01-inch diameter openings. Size 12-20 filter sand was placed in the well annulus from 60 to 43 ft bgs. A layer of bentonite pellets was added from 43 to 38 ft bgs. The pellets were hydrated with approximately 3-5 gallons of tap water to allow the pellets to swell to form a seal above the filter media. No grout or cement was placed above the bentonite seal because the well was initially completed as a temporary well. A temporary surface completion was installed consisting of a 3-ft length of 4-inch PVC pipe to form a “sleeve” that was inserted into a thin grout layer placed in the annulus at approximately 2 ft bgs. The well pipe was capped with a temporary cap overnight. The attached well log illustrates the construction of the well.

Well Gauging

In accordance with the approved specifications, the temporary well was allowed to sit undisturbed for a period of 24 hours to allow water to accumulate. Representatives from the TCEQ, WESTON and URS were present on 3 April 2008 at approximately 1 pm, when the well was gauged 24 hours after completion. No measurable water had accumulated in the well.

In accordance with the specifications, the temporary well was plugged and abandoned on 4 April 2008 according to state requirements, using a track-mounted direct-push drilling rig. At that time, no water had accumulated in the well. The well casing and screen were removed from the borehole, and it was filled with Portland Cement from bottom to ground surface. A formal well report is in preparation by Vortex and will be submitted to the state under separate cover. We will also obtain a copy of the report and forward that to TCEQ at a later date.

Conclusion

In accordance with our agreement with TCEQ, with the completion of this work as described, LISD has completed its obligations regarding assessment of the potential environmental issues at the Grandview Hills Elementary School property. We appreciate TCEQ's cooperation and assistance in reaching this important milestone. Please contact me at (512) 651-7125 if you have any questions or require any additional information.

Very Truly Yours,

WESTON SOLUTIONS, INC.

Jeffrey R. Henke, P.G.
Principal Project Manager

Attachments

cc: Ms. Ellen Skoviera, LISD
Mr. Alan Batcheller, P.G., TCEQ
Mr. Steve Morton, Moltz Morton O'Toole

Authorization to Proceed:

Name

Title

Date

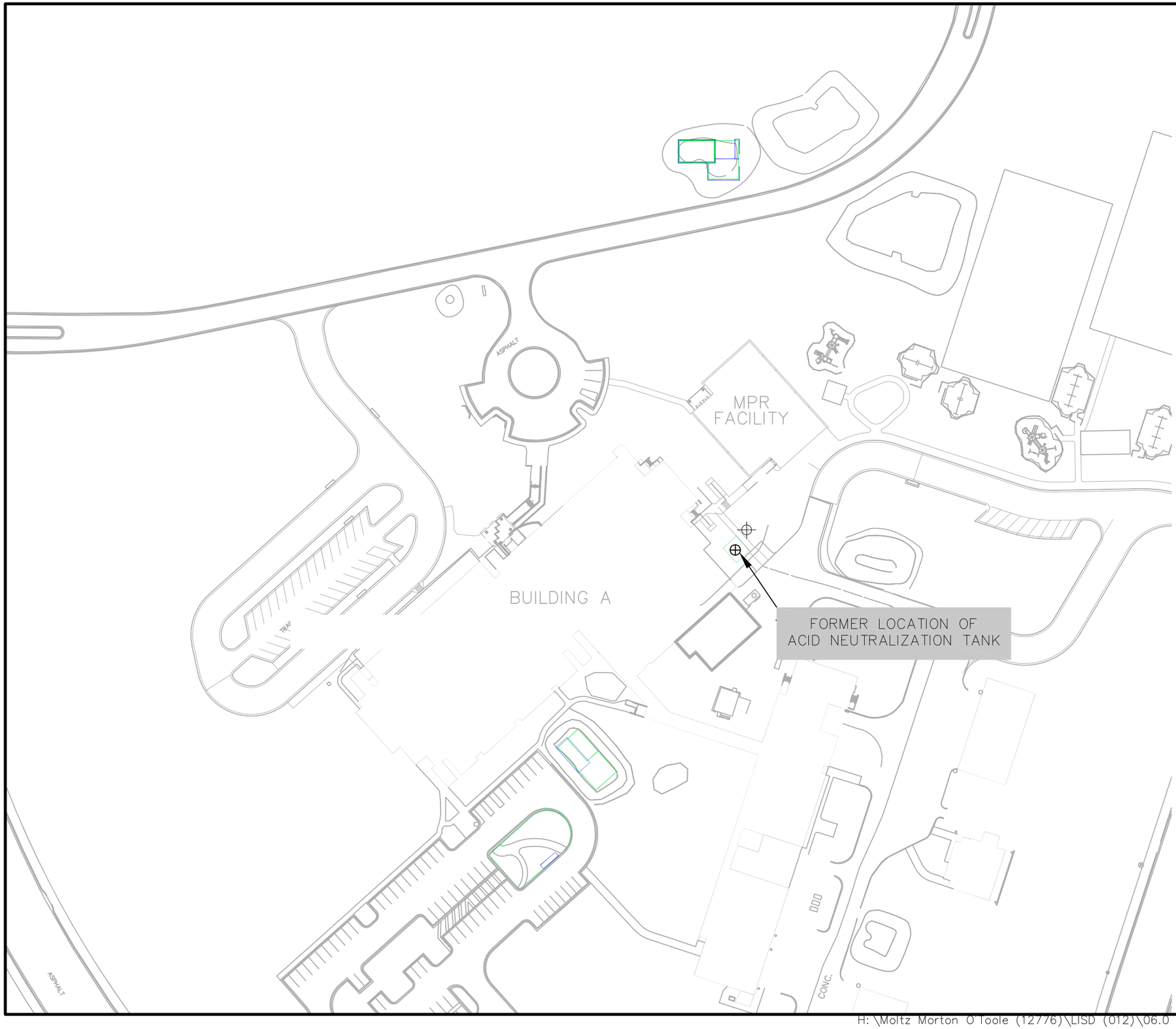

FIGURE 1
PROPOSED WELL LOCATION MAP

GRANDVIEW HILL ELEMENTARY SCHOOL
AUSTIN, TEXAS

DATE	PROJECT NO.	SCALE
MARCH 08	127760120010003	AS SHOWN

H:\Moltz Morton O'Toole (12776)\LISD (012)\06.0 Data and Figures\Figures\Mark's Files\BASE_NEW FIGURE 1.dwg

ATTACHMENT A

GROUNDWATER MONITORING WELL SPECIFICATIONS
GRANDVIEW HILLS ELEMENTARY SCHOOL PROPERTY
AUSTIN, TEXAS

- Location: Northeast of former acid neutralization tank area (northeast of Building A; Figure 1).

- Drilling Method: Air rotary (dry method unless cuttings removal requires the addition of small amounts of water)

- Depth: Drill until adequate volume of groundwater is encountered in the Edwards Formation or to a depth that penetrates 10 ft into the Walnut Formation. If an adequate amount of groundwater (3 feet or more of water column standing in the open borehole) is encountered at a shallower depth, complete the well in the shallower zone. The Edwards is estimated to be 60 ft to 70 feet thick at the site.

    - If groundwater or shallow perched water is obviously encountered at a depth that is above the Edwards-Walnut contact, the borehole will be allowed to remain open and undisturbed at that depth for a period of 4 hours minimum to accumulate water. If sufficient water column (3 feet minimum) accumulates in the open borehole to suggest a significant water-bearing zone is present, the borehole will be reamed (if necessary) and the well will be completed at the depth of the shallower water-bearing zone. If water is encountered, but with less than a 3-ft accumulation in the borehole, a surface casing may be installed to the appropriate depth to seal off the shallow water, and then the borehole will be advanced as described above. TCEQ and LISD representatives will be on-site to jointly determine the need for surface casing and select the screened interval for the well.

- Soil Samples: None required for laboratory analysis, but lithologic log (description of cuttings) if possible. No rock coring is anticipated at this time.

- Well Construction: A temporary well will be constructed using 2-inch diameter well casing and well screen. A 15-foot long well screen will be set across the Edwards/Walnut contact (most of screen in Edwards) if adequate groundwater has not been encountered before reaching the Walnut Clay. A smaller screen length may be used if a shallower water-bearing zone is encountered, to be determined by TCEQ and WESTON representatives in the field. No less than 5 feet of screen will be used in this case.

- If groundwater is not encountered at the depth of 10 ft below the Edwards-Walnut contact during borehole advancement, at least 24 hours will be allowed for groundwater to enter the well bore. If, after this time, an adequate volume of groundwater for development and sampling has not accumulated in the borehole (more than 3 feet of water column), therefore making well development and collection of a representative groundwater sample infeasible, no additional attempts will be required to assess groundwater at the site.

- The temporary well will be completed with no more than 15 ft of 0.01-inch mill slotted screen. The annular space around the screen will be filled with appropriately sized filter sand to a depth of 2 feet above the top of the screen. A 2-ft thick layer of bentonite pellets (hydrated) will be placed above the sand as a seal. Cement-bentonite grout may be added above the bentonite seal after the results of the water sampling/analysis is completed, and only if the groundwater analytical results exceed the Analytical Level of Performance stated below. Otherwise, the well casing will be pulled and the borehole will be grouted from bottom to ground surface and abandoned. A variance of the 48-hour temporary well provision in the state well driller's regulations will be obtained if necessary.

- Groundwater Sample: If an adequate amount of representative groundwater is present in the well after development (defined as a minimum of 3 feet of water column in a 2-inch diameter well), one groundwater sample and one field duplicate will be collected to be analyzed by SW-846 Method 8260 for concentrations of the volatile organic compounds (VOCs) listed below. Sample Quantitation Limits (SQLs) will be set at or below the Analytical Level of Performance described below. Analyses and reporting will be conducted pursuant to the TRRP-13 guidance document.

- Analytical Level of Performance: Analytical results will be compared to the most recent TRRP Tier 1 groundwater ingestion ($^{GW}GW_{Ing}$) Protective Concentration Levels (PCLs) published by TCEQ.

1,1,1-Trichloroethane	Ethylacetate
1,1,2-Trichloroethane	Ethylbenzene
1,2,3-Trimethylbenzene	Isopropylbenzene
1,2,4-Trimethylbenzene	Methyl tert-butyl ether (MTBE)
1,3,5-Trimethylbenzene	Methylcyclohexane
2-Butanone (MEK)	Methylene chloride
2-Hexanone	Naphthalene
Acetaldehyde	n-Propylbenzene
Acetone	o-Xylene
Benzene	p-Xylene/m-Xylene
Bromochloromethane	Styrene
Bromodichloromethane	Tetrahydrofuran
Chloroform	Toluene
Dichlorodifluoromethane	Trichlorofluoromethane
	Vinyl Acetate

Boring/Well Log

BORING ID:

WELL ID: **MW-01**

PROJECT INFORMATION

PROJECT NAME:	**Grandview Hills Elementary**
LOCATION:	**Austin, TX**
JOB NUMBER:	**12776.012.001.0006**
PROJECT MANAGER:	**Jeff Henke**
LOGGED BY:	**SPH**
DATE(S) DRILLED:	**04/02/2008**

DRILLING INFORMATION

DRILLER:	**Vortex Drilling/Jim Neal**
METHOD:	**Air Rotary**
BORING DEPTH:	**67.5' bgs**
WELL DEPTH:	**60' bgs**
BORING DIAMETER:	**4"**
WELL DIAMETER:	**2"**

TOP OF CASING ELEV:

GROUND ELEVATION:

LATITUDE	LONGITUDE
30.4196049	-97.852903

REMARKS: Located directly northwest of former Acid Nuetralization Tank.

STATIC WATER LEVEL: **Dry (04/03/2008)**

INITIAL WATER LEVEL: **Dry**

DEPTH	LITHOLOGY	USCS	DESCRIPTION	SAMPLE NAME	REC. %	OVM	WELL COMPLETION	INSTALLATION NOTES
0		SC	Sandy CLAY, light brown, very fine grained, dry, with gravel (0.25-0.5").				Temporary Well completion Schd 80 1.85' stick up.	
5			Hard, gray limeston. Evidence of black chert. Edwards formation.					
10								
15			Vug 6"					
20								
25			Vug 6"					
30								
35			Vug 6"					
40			Vug 6"				Slightly hydrated bentonite (38-43')	
45							12/20 silica sand filter pack (43-60')	
50								
55			Light brown clayey limestone, easily drilled. Walnut formation.				0.010-slot Schd 40 PVC screen (45-60')	
60							Cap (60' bgs)	
65							Backfilled with bentonite (60.5-67.5")	