

Texas Commission on Environmental Quality
Remediation Division Correspondence Identification Form

SITE & PROGRAM AREA IDENTIFICATION			
SITE LOCATION		REMEDIALATION DIVISION PROGRAM AND FACILITY IDENTIFICATION	
Site Name: Grand Park Site		Is This Site Being Managed Under A State Lead Contract? ☐ Yes ☒ No	
Address 1: 7275 Dallas Parkway		Program Area: VOLUNTARY CLEANUP PROGRAM	
Address 2:		Mail Code: MC-221	
City: Frisco	State: Texas	Is This A New Site To This Program Area? ☐ Yes ☒ No	
Zip Code: 75034	County: Collin	VCP No.:	2592
TCEQ Region: Region 4 - Dallas/Fort Worth		--Leave This Field Blank--	

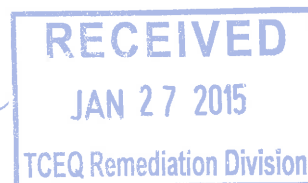
DOCUMENT(S) IDENTIFICATION	
PHASE OF REMEDIATION	DOCUMENT NAME
1. ASSESSMENT	AFFECTED PROPERTY ASSESSMENT REPORT (APAR) REVISION
2.	
3.	
4.	
5.	

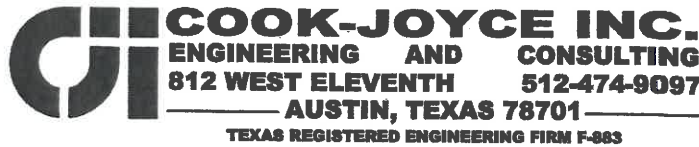
CONTACT INFORMATION			
RESPONSIBLE PARTY/APPLICANT/CUSTOMER			
Name:	Mr. Mack Borchardt	Phone Number:	972/292-5000
Company:	City of Frisco	Fax Number:	972/292-5122
Address 1:	6101 Frisco Square Boulevard	City:	Frisco
Address 2:		State:	TX
		Zip Code:	75034
		Email Address:	MBorchardt@friscotexas.gov
ENVIRONMENTAL CONSULTANT/REPORT PREPARER/AGENT			
Name:	Mr. Wade Wheatley	Phone Number:	512/474-9097
Company:	Cook-Joyce, Inc.	Fax Number:	None
Address 1:	812 West 11th Street	City:	Austin
Address 2:		State:	TX
		Zip Code:	78701
		Email Address:	wade.wheatley@cook-joyce.com

TCEQ INTERNAL USE ONLY			
Document No.	TCEQ Database Term	Document No.	TCEQ Database Term
1.	APAR REV	4.	
2.		5.	
3.			

HAND DELIVERED

JTC





27 January 2015

Via Hand Delivery

Texas Commission on Environmental Quality (TCEQ)
VCP-CA Section, MC-221
P.O. Box 13087
Austin, TX 78711-3087

Re: Affected Property Assessment Report (APAR) Section 5, Revision 1 for Partial Response Action Area 1 (PRAA 1), Grand Park Property, 7275 Dallas Parkway, Frisco, Texas 75034
VCP No. 2592

Dear Joanna Manning:

Cook-Joyce, Inc. (CJI) has reviewed your 2 December 2014 letter response to Section 5 of the Grand Park PRAA 1 APAR that was submitted to the TCEQ on 30 September 2014. CJI has performed the additional groundwater investigation that the TCEQ requested. The following items are attached for your review:

- APAR Table of Contents;
- Cover Page;
- Professional Signatures and Seals;
- Executive Summary (revised);
- Conclusions and Recommendations (revised);
- Chronology (revised);
- Section 5 Groundwater Assessment (revised);
- Table 5D (revised);
- Figures 5-1a, 5-1b, 5-2 (revised), 5-3; 5-4, and 5-5;
- Appendix 2a – CJI Boring Logs;
- Appendix 2b – Boring Logs from Others (electronic copies of the source documents are provided on a compact disk provided with hard copies of this submittal); and
- Appendix 4 – Well Reports.

Please contact us with questions or comments regarding this submittal.

Sincerely,

Richard Varnell

Cc: Mr. Mack Borchardt, City of Frisco, Texas
Mr. Kerry Russell, Russell & Rodriguez

RV:rv
Attachments

CERTIFIED HUB & WBE

HAND DELIVERED

RECEIVED

JAN 27 2015

TCEQ Remediation Division

AFFECTED PROPERTY ASSESSMENT REPORT
SECTION 5 – GROUNDWATER ASSESSMENT (UPDATED)
GRAND PARK - PARTIAL RESPONSE ACTION AREA 1 (PRAA 1)
7275 DALLAS PARKWAY, FRISCO, TEXAS
VCP #2592

26 JANUARY 2015

Prepared for:

City of Frisco
6101 Frisco Square Boulevard
Frisco, Texas

Prepared by:

Cook-Joyce, Inc.
812 West 11th Street
Austin, Texas



APAR Table of Contents¹	Check if included
Cover Page	✓
Professional Signatures and Seals	✓
Executive Summary	✓
Conclusions and Recommendations	✓
Chronology*	✓
Specialized Submittals Checklist	
Section 1 Property Information	
Discussion of site operations, release sources, and geology/hydrogeology	
Table 1A - Sources of Release	
Table 1B - Potential Off-Site Sources	
Figure 1A - On-Site Property Map*	
Figure 1B - Affected Property Map*	
Figure 1C - Regional Geologic Map*	
Figure 1D - Regional Geologic Cross Section(s)*	
Section 2 Exposure Pathways and Groundwater Resource Classification	
Discussion of potential receptors, groundwater classification, and exposure pathways	
Table 2A - Water Well Summary	
Table 2B - Affected Water Well Summary	
Table 2C - Complete or Reasonably Anticipated to be Complete Exposure Pathways	
Figure 2A - Potential Receptors Map*	
Figure 2B - Field Survey Photographs*	
Figure 2C - Water Well Map*	
Attachment 2A - Tier 1 Ecological Exclusion Criteria Checklist	
Attachment 2B - Tier 1 Ecological Exclusion Criteria Supporting Documentation*	
Section 3 Assessment Strategy	
Discussion of assessment strategies	
Table 3A. Underground Utilities	
Section 4 Soil Assessment	
Discussion of nature and extent of COCs in soil	
Table 4A - Surface Soil Residential Assessment Levels with no Ecological Component	
Table 4B - Surface Soil Residential Assessment Levels with Ecological Component	
Table 4C - Subsurface Soil Residential Assessment Levels	
Table 4D - Soil Data Summary*	
Table 4E - Soil Geochemical/Geotechnical Data Summary*	
Figure 4A - Surface Soil COC Concentration Maps*	
Figure 4B - Subsurface Soil COC Concentration Maps*	
Figure 4C - Cross Sections*	
Section 5 Groundwater Assessment	
Discussion of nature and extent of COCs in groundwater	✓
Table 5A - Groundwater Residential Assessment Levels	
Table 5B - Groundwater Data Summary*	
Table 5C - Groundwater Geochemical Data Summary*	
Table 5D - Groundwater Measurements*	✓
Figure 5A - Groundwater Gradient Map*	
Figure 5B - Groundwater COC Concentration Maps*	
Figure 5C - Groundwater Geochemistry Maps*	
Figure 5D - Cross Section Groundwater-to-Surface Water Pathway*	
Section 6 Surface Water Assessment and Critical PCL Development	
Discussion of nature and extent of COCs in surface water	
Table 6A - Surface Water Critical PCLs	

¹ Items marked with an asterisk do not have prescribed formats (for example, laboratory reports).



Table 6B - Surface Water Data Summary*	
Figure 6A - Surface Water PCLE Zone Map*	
Figure 6B - Photographs*	
Section 7 Sediment Assessment and Critical PCL Development	
Discussion of nature and extent of COCs in sediment	
Table 7A - Sediment Critical PCLs	
Table 7B - Sediment Data Summary*	
Figure 7A - Sediment PCLE Zone Map*	
Section 8 Air Assessment and Critical PCL Development	
Discussion of the nature and extent of COCs in outdoor air	
Table 8A - Outdoor Air Data Summary*	
Figure 8A - Outdoor Air COC Concentration Maps*	
Section 9 Ecological Risk Assessment	
Discussion of ecological risk assessment, expedited stream evaluation, and/or reasoned justification. Copies of SLERA or SSERA.	
Section 10 COC Screening	
Discussion of COC screening process and results	
Table 10A - COC Screening Summary Table	
Section 11 Soil Critical PCL Development	
Discussion of soil critical PCL evaluation	
Table 11A - Surface Soil Critical PCLs (On-Site/Off-Site)	
Table 11B - Subsurface Soil Critical PCLs (On-Site/Off-Site)	
Figure 11A - Surface Soil PCLE Zone Maps*	
Figure 11B - Subsurface Soil PCLE Zone Maps*	
Figure 11C - Cross Sections of the PCLE Zone*	
Section 12 Groundwater Critical PCL Development	
Discussion of groundwater critical PCL evaluation	
Table 12A - Groundwater Critical PCLs - Full Plume POE*	
Table 12B - Groundwater-to-Surface Water PCLs	
Table 12C - Groundwater-to-Sediment PCLs	
Table 12D - Groundwater Critical PCL Evaluation - Surface Water/Sediment Discharge POE	
Figure 12A - Groundwater PCLE Zone Map*	
Section 13 Notifications	
Discussion of notifications conducted	
Table 13A - Notification Summary	
Figure 13A - Notification Map*	
Appendices	
Appendix 1 Notifications*	
Appendix 2 Boring Logs and Monitor Well Completion Details*	✓
Appendix 3 Monitor Well Development and Purging Data*	
Appendix 4 Registration and Institutional Controls*	
Appendix 5 Water Well Records*	✓
Appendix 6 Monitor Well Records*	
Appendix 7 Aquifer Testing Data*	
Appendix 8 Statistics Data Tables and Calculations*	
Appendix 9 Development of Non-Default RBELs and PCLs*	
Appendix 10 Laboratory Data Packages and Data Usability Summary*	
Appendix 11 Miscellaneous Assessment*	
Appendix 12 Waste Characterization and Disposition Documentation*	
Appendix 13 Photographic Documentation*	
Appendix 14 Standard Operating Procedures*	
Appendix 15 OSHA Health and Safety Plan (§350.74(b)(1))*	
Appendix 16 Reference List*	

Cover Page

Program ID No. (Primary): VCP #2592 Report date: 26 January 2015
TCEQ Region No.: 4 MSD Certificate No.: _____
Additional Program ID Numbers: _____ SWR/Facility ID No.: _____ PST Facility ID No.: _____
DCRP ID No.: _____ VCP ID No.: 2592 LPST ID No.: _____
MSW Tracking No.: _____ HW Permit/CP No.: _____ Enforcement ID No.: _____
Other ID Nos.: _____

Reason for submittal (check all that apply):
☒ Initial submittal
☐ Revision
Notice of Deficiency Letter
Permit/Compliance Plan
Voluntary response
Enforcement/Agreed order
Directive/NOV letter
Other: _____

On-Site Property Information

On-Site Property (Facility) Name: Grand Park – Partial Response Action Area (PRAA 1)
Street no. 7275 Pre dir: East Street name: Dallas Parkway Street type: Parkway Post dir: _____
City: Frisco County: Collin and Denton County Code 43 and 61 Zip 75034
Nearest street intersection and location description: Subject property is situated in the northeast corner of the planned Grand Park development and is bound to the north by Cotton Gin Road and to the east by a Dallas Parkway (Dallas North Tollway) access road.
Latitude: Degrees - North 33° 08' 40.70"
Longitude: Degrees - West 96° 50' 30.39"

Contact Person for On-Site Property Information and Acknowledgment

Company Name or Person: City of Frisco
Contact Name: Mr. Mack Borchardt Title: Special Assistant to the City Manager
Mailing Address: 6101 Frisco Square Boulevard
City: Frisco State: TX Zip: 75034 Phone: (972) 292-5000
Email: MBorchardt@friscotexas.gov Fax: (972) 292-5122
Person is: ☒ property owner ☐ property manager ☐ potential purchaser ☐ tenant ☐ operator
Note: The City of Frisco is the property owner. Mr. Borchardt is the City's coordinator for this site.

By my signature below, I acknowledge the requirement of §350.2(a) that no person shall submit information to the executive director or to parties who are required to be provided information under this chapter which they know or reasonably should have known to be false or intentionally misleading, or fail to submit available information which is critical to the understanding of the matter at hand or to the basis of critical decisions which reasonably would have been influenced by that information. Violation of this rule may subject a person to the imposition of administrative, civil, or criminal penalties.

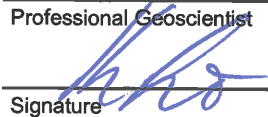
Signature of Person  Name (print): Mack Borchardt Date: 1-26-15

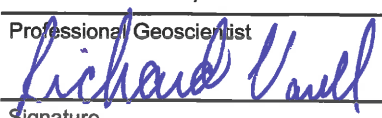
Consultant Contact Person

Consultant Company Name: Cook-Joyce, Inc.
Contact Person: Wade M. Wheatley, P.E. Title: Vice President
Mailing Address: 812 West 11th Street
City: Austin State: TX Zip: 78701
Phone: (512) 474-9097 Fax: None E-mail address wade.wheatley@cook-joyce.com

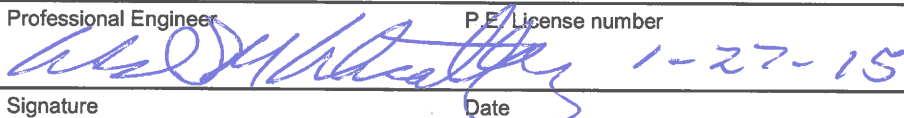
Professional Signatures and Seals

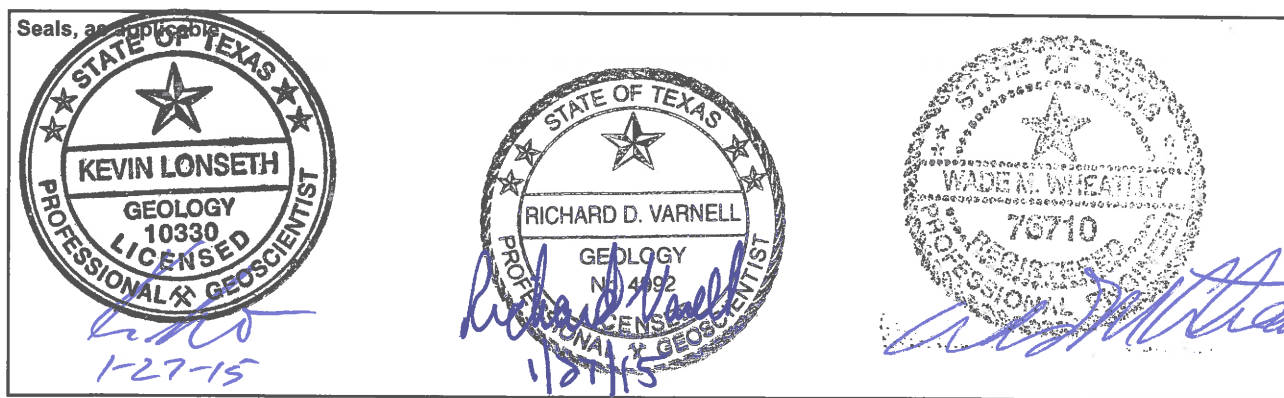
Professional Geoscientists

Kevin Lonseth, P.G.	10330	5/31/2015
Professional Geoscientist	Geoscientist License number	Expiration date
	1-27-15	
Signature	Date	
512/474-9097	None	kevin.lonseth@cook-joyce.com
Telephone number	FAX number	E-mail

Richard Varnell, P.G.	4992	12/31/2015
Professional Geoscientist	Geoscientist License number	Expiration date
	1/27/15	
Signature	Date	
512/474-9097	None	richard.varnell@cook-joyce.com
Telephone number	FAX number	E-mail

Professional Engineer

Wade Wheatley, P.E.	76710	6/30/2015
Professional Engineer	P.E. License number	Expiration date
	1-27-15	
Signature	Date	
512/474-9097	None	wade.wheatley@cook-joyce.com
Telephone number	FAX number	E-mail





Executive Summary

Environmental Media	Actual or Probable Exposures On-Site?		Actual or Probable Exposures Off-Site?		Have notifications for actual or probable exposures been completed? (\$350.55(e))		
	Yes	No	Yes	No	Yes	No	N/A
Soil		✓		✓			✓
Groundwater		✓		✓			✓
Sediment		✓		✓			✓
Surface Water		✓		✓			✓

Is there, or has there been, an affected or potentially affected water well? ___ Yes ☒ No

If yes, what is the well used for?

Actual land use: On-site: ___ Res ☒ C/I Off-site affected property: ___ Res ☒ C/I ___ N/A

Land use for critical PCL determination: On-site: ☒ Res ___ C/I Off-site affected property: ___ Res ___ C/I ☒ N/A

Did the affected property pass the Tier 1 ecological exclusion criteria checklist? ☒ Yes ___ No

Affected groundwater-bearing unit(s) (in order from depth below ground surface), or uppermost groundwater-bearing unit if none affected

Unit No.	Name	Depth below ground surface (ft)	Resource Classification (1, 2, or 3)
1	Surface alluvium (groundwater not encountered within PRAA 1))	>17'	Unknown (assumed to be 1 or 2)
2			
3			

Assessment

Environmental Media		Assessment Levels Exceeded?						Affected property defined to RAL?			Is COC extent stable or expanding?	General classes of COCs (VOCs SVOCs, metals, etc.)
		On-Site?			Off-Site?							
		Yes	No	Not sampled	Yes	No	Not sampled	Yes	No	N/A		
Soil	Surface		✓				✓	✓			NA	No Affected Property
	Subsurface			✓			✓			✓	---	---
Groundwater				✓			✓			✓	---	---
Sediment				✓			✓			✓	---	---
Surface Water				✓			✓			✓	---	---



NAPL Occurrence Matrix

		NAPL Occurrence		Description
NAPL in vadose zone	✓	No NAPL in vadose zone		There is no direct or indirect evidence of NAPL in the vadose zone
		NAPL in/on soil		NAPL detected in or on unsaturated, unconsolidated clay-, silt-, sand-, and/or gravel-dominated soils
		NAPL in fractured clay		NAPL detected in fractures of unsaturated fine-grained soils
		NAPL in fractured or porous rock		NAPL detected in unsaturated lithologic material
		NAPL in karst		NAPL detected in karst environment
NAPL at capillary fringe	✓	No NAPL at capillary fringe		There is no direct or indirect evidence of NAPL at the capillary fringe
		NAPL at capillary fringe		NAPL detected at vadose-saturated zone transition, capillary fringe (in contact with water table)
NAPL in saturated zone	✓	No NAPL in saturated zone		There is no direct or indirect evidence of NAPL in the saturated zone
		NAPL in soil		NAPL detected in saturated unconsolidated clay-, silt-, sand-, and/or gravel-dominated soils
		NAPL in fractured clay		NAPL detected in fractures of saturated fine-grained soil or other double-porosity sediments
		NAPL in saturated fractured or porous rock		NAPL detected in saturated lithologic material
		NAPL in saturated karst		NAPL detected in karst environment within the saturated zone
NAPL in surface water or sediment	✓	No NAPL in surface water or sediment		There is no direct or indirect evidence of NAPL in surface water or sediments
		NAPL in surface water		NAPL detected in surface water at exceedance concentration levels or visual observation
		NAPL in sediments		NAPL detected in sediments at exceedance concentration levels or visual observation via migration pathway or a direct release

Remedy Decision

Environmental Media		Critical PCL exceeded on-site?			Critical PCL exceeded off-site?			PCLE zones defined?			General class (VOCs, SVOCs, metals, etc.) of COCs requiring remedy
		Yes	No	N/A	Yes	No	N/A	Yes	No	N/A	
Soil	Surface		✓				✓			✓	---
	Subsurface			✓			✓			✓	---
Groundwater				✓			✓			✓	---
Sediment				✓			✓*			✓	---
Surface Water				✓			✓			✓	---

*There are no sediment impacts in Grand Park PRAA 1. Sediment impacts within the Grand Park site (but outside of PRAA 1) will be addressed in the APAR generated for the overall Grand Park site.



NAPL Triggers

NAPL Response Action Triggers		Description of Triggers
✓	No NAPL response action triggers	No NAPL triggers have been observed in any assessment zones (vadose, capillary fringe and saturated), nor in surface water or sediments
	NAPL vapor accumulation is explosive	NAPL vapors accumulate in buildings, utility and other conduits, other existing structures, or within anticipated construction areas at levels that are potentially explosive ($\geq 25\%$ LEL)
	NAPL zone expanding	NAPL zone is observed to be expanding using time-series data
	Mobile NAPL in vadose zone	NAPL zone is observably mobile, or is theoretically mobile based on COC concentrations and residual saturation
	NAPL creating an aesthetic impact or causing nuisance condition	NAPL is responsible for objectionable characteristics (e.g., taste, odor, color, etc.) resulting in making a natural resource or soil unfit for intended use
	NAPL in contact with Class 1 groundwater	NAPL has come in actual contact with saturated zone or capillary fringe of a Class 1 GWBU
	NAPL in contact with Class 2 or 3 groundwater	NAPL has come in actual contact with saturated zone or capillary fringe of a Class 2 or Class 3 GWBU
	NAPL in contact with surface water	Liquid containing COC concentrations that exceed the aqueous solubility in contact with surface water via various migration pathways or direct release to surface water
	NAPL in or on sediments	Liquid containing COC concentrations that exceed the aqueous solubility impact surface water sediments via migration pathway or a direct release



Conclusions and Recommendations

Assessment Results

The ~26-acre Partial Response Action Area (PRAA 1) portion of the Grand Park property (VCP #2592) is located in the northeast corner of the Grand Park site at the intersection of Cotton Gin Road and an access road for the Dallas North Tollway. PRAA 1 (the subject property) is currently a wheat field that has historically been used for farming or ranchland. The City of Frisco (Frisco) owns the approximately 320 acres of contiguous property that make up the Grand Park site. The City currently plans to develop the Grand Park site into park lands, retail, and residential properties. PRAA 1 will be the initial property developed. The Grand Park site is located to the south of Cotton Gin Road, to the west of Dallas North Tollway and a BNSF Railway, to the north of Stonebrook Parkway, and to the east of Legacy Drive. Based on sediment sampling of Stewart Creek, it appears that Stewart Creek sediment within Grand Park has been impacted by past operations at the upstream former Exide Battery Recycling Facility (Exide). In addition, historic stack emissions from Exide may have impacted surface soils within the Grand Park site. These known and potential impacts will be assessed as part of the affected property assessment for the larger Grand Park property.

The affected property assessment consisted of a focused investigation of the surface soils at the PRAA 1 site. The purpose of the assessment was to determine if contaminants of concern (COCs) were present in PRAA 1 surface soils and if so, to fully delineate the vertical and lateral extent of contamination. Based on the assessment findings, no COCs exceed residential assessment levels. The site layout and assessment sampling locations are depicted on Figures 1A and 1B, respectively. In May 2014, monitoring well GP-MW-3 was installed to evaluate groundwater at the PRAA 1 site. No groundwater was encountered when drilled and the well has remained dry as of 12 January 2015.

Two additional monitoring wells were installed at the PRAA 1 site (GP-MW-14 and GM-MW-15). Three monitoring wells were also installed in relatively close proximity to the PRAA 1 site (GP-MW-6, GP-MW-7, and GP-MW-12). Monitoring well GP-MW-6 was installed just south of the PRAA 1 site to the west of the Dallas North Tollway access road. Wells GP-MW-6, GP-MW-14, and GP-MW-15 were installed on 16 December 2014. Monitoring well GP-MW-7 was installed just to the west of the southwest corner of PRAA 1 on 19 November 2014. Monitoring well GP-MW-12 was installed to the south of PRAA 1 and just south of Stewart Creek on 17 December 2014. As of 12 January 2015, each of these wells was measured to be dry. No groundwater has been intercepted in any boring within PRAA 1 or in close proximity to PRAA 1, and all COCs have been delineated vertically in surface soils to MQLs or background prior to encountering groundwater.

Water was encountered in PZ-8, a piezometer that is located just south of PRAA 1 on its western side and in close proximity to Stewart Creek. This piezometer was installed by Alpha Testing on 24 September 2012 to observe groundwater levels at a proposed dam location to be constructed within Grand Park. PZ-8 was installed 40' bgs and screened entirely within the Eagle Ford Shale Formation. A surface completion was not installed when the piezometer was constructed, leaving only a PVC stickup with a well cap extending up from the ground surface. The Alpha boring log for this boring (boring 8) shows clays with minor amounts of gravel and sand in the clay above the shale. There was no indication of moisture on the drilling rods, and



the well was noted as dry after drilling. It was also found to be dry when measured by Alpha in October 2012, January 2013, and March 2013.

In October 2014 approximately 6 feet of water was present in PZ-8. Due to the presence of this water PZ-8 was surface completed with a 4'x4' concrete pad and a stickup protective casing in November 2014. PZ-8 is now monitoring well GP-MW-4.

CJI believes that the water found in GP-MW-4 resulted from surface water infiltration because there was no surface seal. To test this theory (and the monitoring well's ability to recharge), the water present in GP-MW-4 was bailed on 18 December 2014. The following morning the well was gauged to contain 2.18' of water. After gauging, the well was bailed again. The well was gauged again on 12 January 2015, with approximately 2.22' of water measured in the well. After 24 days, the water level in the monitoring well had only changed 0.04'. Based on this information CJI believes the water present in GP-MW-4 to be non-formational and a result of surface infiltration that occurred prior to the surface completion of the well. Water levels in GP-MW-4 will continue to be monitored. If it is determined that the well is naturally recharging, then the well will be sampled for the appropriate chemicals of concern.

COCs in surface soils at the PRAA 1 site are below residential assessment levels. Therefore, the site is not an affected property and there are no affected or potentially affected receptors.

NAPL Discussion

No evidence of NAPL was observed during the investigation activities.

Response Actions and Recommendations

Based on the affected property assessment results, no response actions are required for the PRAA 1 portion of the Grand Park site. There were no listed or characteristically hazardous wastes that were identified at the site. The results of the affected property assessment reveal the property is protective of ecological receptors. The affected property assessment also documented that COCs in surface soils across the site are less than residential assessment levels that are protective of human health and the environment.

A certificate of completion is requested for the PRAA 1 portion of the Grand Park property.



CHRONOLOGY

Unknown	City of Frisco acquires PRAA 1 property located in the northeast corner of the planned Grand Park development, located to the south of Cotton Gin Road and to the west of Dallas North Parkway.
8 July 2013	VCP Application submitted for Grand Park site.
10 July 2013	VCP Application for Grand Park site accepted by TCEQ.
28 January 2014	CJI submits a revised Affected Property Assessment Workplan for the Grand Park site which includes the PRAA 1 property. The original workplan was submitted in October 2013.
April 2014 – June 2014	CJI conducts assessment sampling of PRAA 1 area surface soils to determine COC concentrations to obtain the necessary data needed to complete an affected property assessment.
24 June 2014	The City of Frisco submits Affected Property Assessment Report.
15 August 2014	TCEQ letter received requesting the submittal of Section 5 – Groundwater Assessment for the PRAA 1 portion of the Grand Park site.
8 September 2014	CJI gauges monitoring well GP-MW-3. The PRAA 1 site well remains dry.
30 September 2014	CJI submits Section 5.0, Groundwater Assessment for the PRAA 1 section of the Grand Park property.
November 2014	Monitoring well GP-MW-7 installed. No groundwater encountered. Piezometer PZ-8 surface completions installed, now monitoring well GP-MW-4.
2 December 2014	TCEQ review letter of the 30 September 2014 submittal. The TCEQ review letter requested additional groundwater investigation at PRAA 1.
16 December 2014	Monitoring wells GP-MW-6, GP-MW-14, and GP-MW-15 installed. No groundwater encountered.
18 December 2014	Water in GP-MW-4 (PZ-8) purged to evaluate recharge.
12 January 2015	Monitoring wells gauged. PRAA 1 wells, GP-MW-6, and GP-MW-7 remain dry. Very little change in water level is observed in GP-MW-4.



Section 5 Groundwater Assessment

PRAA 1 Monitoring Wells

All target COCs in surface soils across the PRAA 1 site were delineated to levels below MQLs or background within the top two feet of soil. During PRAA 1 site investigational activities, one deeper boring was drilled to a depth of 20' below ground surface (bgs) at sample location 5J-e. During boring advancement, soil cores were screened for the presence of organic vapors using a Photo-Ionization Detector (PID). The PID showed no evidence of contamination. The boring was lithologically logged using the Unified Soil Classification System (USCS). Groundwater was not noted at the time of drilling. A monitoring well, GP-MW-3, was installed in this boring and screened from 7 to 17 feet bgs to intercept sand stringers encountered between 8.5 and 10 feet bgs. The well was dry when drilled and remained dry when last gauged in January 2015. The boring log including well completion information for GP-MW-3 is provided in Appendix 2.

In November and December 2014, additional monitoring wells were installed in and around the PRAA 1 site. Monitoring well GP-MW-14 was installed at sample location 6H-h in the southwestern corner of the PRAA 1 site. Monitoring well GP-MW-15 was installed in the northwest corner of PRAA 1 in the area of Alpha Testing geotechnical boring 13 (discussed below). Monitoring well GP-MW-6 was installed at sample location 5M-b, just south of PRAA 1 near the Dallas North Tollway. Monitoring well GP-MW-7 was installed at sample location 7E-c, just to the west of the southwest corner of the PRAA 1 site. Monitoring well GP-MW-12 was installed at sample location 7L-a2 (P4), to the south of PRAA 1 and just south of Stewart Creek. Each of these borings was screened for the presence of organic vapors using a PID and sampled for target metals. The PID showed no evidence of contamination in these borings. The borings were lithologically logged using the USCS. Groundwater was not noted at the time of drilling in any of these wells, and the wells remained dry when last gauged on 12 January 2015. Boring logs including well completion information for these wells are provided in Appendix 2.

Additional Borings, Monitoring Wells, and Piezometers

Alpha Testing, Inc. (Alpha) installed 35 borings at depths between 10 and 60 feet during a geotechnical investigation of Grand Park for park infrastructure items (bridges, dams, sewers, etc.). The Alpha report (*Geotechnical Exploration on Grand Park Infrastructure (Bridges, Small Structures, Sewers, Etc.)*), was included in Appendix B of the Phase I Environmental Site Assessment for Grand Park (VCP #2592) prepared by CJI and submitted to the TCEQ in January 2014. Data collected from the Alpha report are referenced herein. The Alpha investigation reported that groundwater was intercepted in only three of the 35 borings. In boring 6, groundwater was measured at 9' bgs after drilling. In boring 13, which was installed just to the west of PRAA 1 along Cotton Gin Road, groundwater was measured at 7' bgs on the drilling rods and at 17' bgs after drilling. In boring 15, groundwater was gauged at 24' bgs after drilling. Boring 6 was converted into piezometer PZ-6. Boring 8, a boring where no groundwater was observed during or just after drilling, was converted into piezometer PZ-8. Alpha boring logs for borings 6, 8, 13, and 15 are provided in Appendix 2.

Piezometers PZ-6 and PZ-8 were installed to observe groundwater levels at proposed dam locations for two lakes to be constructed within Grand Park. According to Alpha, both piezometers were screened at depths between 25 and 40 feet bgs. A sand filter was installed to



a depth of 5' bgs. Bentonite chips were installed from 5' bgs up to the ground surface. A PVC pipe stick-up was installed at the ground surface for each piezometer, however, neither piezometer has a surface completion. Cook-Joyce, Inc. (CJI) converted these piezometers to permanent wells in November 2014. PZ-8 and PZ-6 are now identified as monitoring wells GP-MW-4 and GP-MW-5, respectively.

Groundwater levels provided by Alpha indicated groundwater at elevations between 572 and 574 feet above mean sea level (amsl) in GP-MW-4 between October 2012 and March 2013. No groundwater was observed in GP-MW-4 during any of the gauging events performed by Alpha. However, in May 2014, CJI measured approximately 2.5 feet of groundwater in GP-MW-4. The presence of water in GP-MW-4 was confirmed by CJI in September 2014. Based on the lithology recorded for boring 8 and the completion description provided by Alpha, this water is believed to be non-formational and to have resulted from surface water infiltration.

On 18 December 2014 GP-MW-4 was gauged to contain just under 6' of water. The well was then bailed to evaluate any groundwater recovery. Approximately 1 gallon of water was removed from the well on 18 December. On the follow day, the well was gauged and approximately 2.18' of water was present. After gauging, the well was evacuated again. The well was gauged again on 12 January 2015, with approximately 2.22' of water measured in the well.

Well GP-MW-4 was installed 40' bgs and screened (15' length) entirely within the Eagle Ford Shale Formation. Shale was encountered at 14.5' bgs, and the well is screened from 25' bgs to 40' bgs. A sand filter was installed from depth to 5' bgs. Granular bentonite was installed from 5' to the ground surface. The Alpha boring log for this boring (boring 8) shows clays with minor amounts of gravel and sand in the clay above the shale. There was no indication of moisture on the drilling rods, and the well was noted as dry after drilling. It was also found to be dry when measured by Alpha in October 2012, January 2013, and March 2013. CJI believes the water present in GP-MW-4 to be non-formational and a result of surface infiltration prior to the surface completion of the well. This well will continue to be gauged to assess any recharge, and if groundwater is deemed to be present, the well will be sampled and analyzed during future investigational activities for the Grand Park site.

In addition to the borings, wells, and piezometers installed at the overall Grand Park VCP site, there are also multiple borings and wells that have been installed at nearby properties. Three monitoring wells (Track MW-1, Track MW-2, and Track MW-3) were installed during an affected property assessment of Phase 1 of the Museum of the American Railroad (MARR) property located approximately 1,700 feet to the east of the PRAA 1 site. Boring logs for these monitoring wells were obtained from the Affected Property Assessment Report for the MARR site¹. These borings ranged in depth from 16 to 22 feet below ground surface. Groundwater was reported in two of the three monitoring wells (Track MW-1 and Track MW-2). Boring logs for the three MARR monitoring wells are provided in Appendix 2. The Phase 1 MARR APAR is not appended to this document, rather, it is incorporated by reference.

Cross Sections

Four cross sections were constructed depicting subsurface lithology and hydrology in the area of PRAA 1. Cross section location maps are provided as Figure 5-1a and Figure 5-1b. Cross Section A-A' was constructed using Alpha borings 6 (PZ-6/GP-MW-5), 8 (PZ-8/GP-MW-4), 13,

¹ *Affected Property Assessment Report, City of Frisco – Museum of the American Railroad, 6299 Cotton Gin Road, Frisco, Collin County, Texas, by Southwest Geoscience, dated 25 October 2011.*



15, 23, 25, and CJI boring GP-MW-3. The two additional Alpha borings (23 and 25) were installed in proposed Grand Park festival lawn areas on the east side of Stewart Creek. Both borings 23 and 25 were installed to a depth of 25 feet. No groundwater was observed when these borings were installed. Boring logs for borings 23 and 25 are provided in Appendix 2. Groundwater is only present in GP-MW-5. The suspected non-formational water is also depicted in GP-MW-4. Cross Section A-A' runs north-south across the central portion of Grand Park and across PRAA-1. It is provided as Figure 5-2.

Cross Section B-B' was constructed using CJI boring GP-MW-3, and Phase 1 MARR monitoring wells Track MW-1, Track MW-2, and Track MW-3. Cross Section B-B' runs generally west to east/northeast from the PRAA 1 site to the MARR site. Due to the distance between Grand Park PRAA-1 and the MARR site the elevation of the Eagle Ford Shale across much of this cross section is inferred. Cross Section B-B' is provided as Figure 5-3.

Cross Section C-C' was constructed using CJI borings GP-MW-7, GP-MW-4, GP-MW-3, and GP-MW-6. Cross Section C-C' generally runs west to east and crosses the southern portion of PRAA 1 just north of Stewart Creek. The Eagle Ford Shale was encountered at elevations of approximately 588' to 597' amsl in this cross section. Clays were encountered from the ground surface down to the shale. The only logged sand was a thin stringer observed in GP-MW-3. No evidence of groundwater was observed when these borings were installed. No groundwater has been gauged in any of these wells since completion. Logs for borings utilized to construct cross section C-C' are provided in Appendix 2. Cross Section C-C' is provided as Figure 5-4.

Cross Section D-D' was constructed using borings GP-MW-15, 5J-e / GP-MW-3, and GP-MW-4 (PZ-8). This cross section is similar to the northern most portion of cross section A-A' except that CJI boring and monitoring well GP-MW-15 has replaced Alpha boring 13. CJI installed GP-MW-13 in close proximity to this Alpha boring which indicated groundwater at a depth of 17' bgs after drilling was completed. No groundwater was intercepted in the CJI boring and the installed well was dry as of 12 January 2015. The suspected non-formational water is depicted in GP-MW-4. Logs for borings utilized to construct cross section D-D' are provided in Appendix 2. Cross Section D-D' is provided as Figure 5-5.

The cross sections indicate that site lithology typically consists of clays at the surface extending down to the Eagle Ford Shale Formation. The shale is typically observed at depths of approximately 18 feet bgs. As previously stated, groundwater was only observed in three of the thirty-five borings installed by Alpha. Groundwater has not been observed in any of the PRAA 1 monitoring wells (GP-MW-3, GP-MW-14, or GP-MW-15), or in the wells in close proximity to the PRAA 1 site (GP-MW-6, GP-MW-7, and GP-MW-12). Water observed in GP-MW-4 is believed to be a result of surface infiltration prior to the well being surface completed in November 2014. This water will continue to be monitored to determine if subsurface recharge is occurring. Groundwater was observed in two of the three Phase 1 MARR wells, but at a considerable distance from the PRAA 1 site.

A continuous shallow groundwater bearing unit does not appear to be present at the PRAA 1 portion of the Grand Park site. Therefore, a groundwater gradient direction is indeterminable. Potential groundwater impacts from offsite properties are unlikely due to the limited extent of near surface groundwater in and around PRAA 1.

Summary

All target COCs in surface soils across the PRAA 1 site were vertically delineated to levels below MQLs or background. Groundwater was not encountered in any of the three monitoring



well installed at the PRAA 1 site or in the wells in close proximity to PRAA 1. Groundwater was only encountered in three of thirty-five geotechnical borings previously installed at the overall Grand Park site and 4 of the 15 monitoring wells installed at the Site. Groundwater does not appear to be laterally continuous across the PRAA 1 portion of Grand Park.

A groundwater gradient direction cannot be determined due to the limited nature of near surface groundwater in PRAA 1. Potential groundwater impacts from offsite properties are unlikely due to the apparent limited extent of groundwater at PRAA 1.

Additional groundwater assessment (groundwater sampling and analysis) will be conducted during future investigational phases for the Grand Park site.



**Table 5A - Groundwater Residential Assessment Levels
(NOT APPLICABLE)**

**Table 5B - Groundwater Data Summary
(NOT APPLICABLE)**

**Table 5C - Groundwater Geochemical Data Summary
(NOT APPLICABLE)**

Table 5D – Groundwater Measurements (Updated)



TABLE 5D (UPDATED)
GROUNDWATER MEASUREMENTS
PARTIAL RESPONSE ACTION AREA 1 (PRAA 1) APAR - GRAND PARK - FRISCO, TEXAS

Well ID	Approximate Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Date Gauged	Depth to Water from Top of Casing (TOC) (ft)	Measured Total Depth from TOC (ft)	Water Height in Well (ft)	Total Depth from Ground Surface (ft)	Approximate Groundwater Elevation (ft amsl)
GP-MW-3 (5J-e)	616.345	616.200	5/5/2014	Dry	NM	NA	~17	Dry @ 599.0
			5/6/2014	Dry	17.22	NA	~17	Dry @ 599.0
			6/3/2014	Dry	17.20	NA	~17	Dry @ 599.0
			9/8/2014	Dry	17.21	NA	~17	Dry @ 599.0
			11/10/2014	Dry	17.20	NA	~17	Dry @ 599.0
			1/12/2015	Dry	17.21	NA	~17	Dry @ 599.0
GP-MW-4 (PZ-8)	596.33	600.328	5/6/2014	42.86	45.39	2.53	~43	558.37
			9/5/2014	40.91	45.35	4.44	~41	560.32
			12/15/2014	38.82	NM	---	~39	561.51
			12/18/2014 ¹	38.81	44.45	5.64	~39	561.52
			12/19/2014 ²	42.31	44.49	2.18	~42	558.02
			1/12/2015	42.27	44.49	2.22	~42	558.06
GP-MW-5 (PZ-6)	586.28	590.275	9/5/2014	13.67	43.65	29.98	~8.5	577.79
			12/15/2014	12.25	42.47	30.22	~8.25	578.03
			12/17/2014 ¹	12.25	42.47	30.22	~8.25	578.03
			12/17/2014 ³	38.98	42.47	3.49	~35	551.30
			12/18/2014	38.50	42.47	3.97	~34.5	551.78
			1/12/2015	36.03	43.20	7.17	~32	554.25
GP-MW-6 (5M-b)	603.15	607.152	12/18/2014	Dry	19.09	NA	~16	Dry @ 588
			1/12/2015	Dry	19.09	NA	~16	Dry @ 588
GP-MW-7 (7E-c)	615.80	619.802	12/15/2014	Dry	22.47	NA	~20	Dry @ 597.3
			12/18/2014	Dry	22.47	NA	~20	Dry @ 597.3
			1/12/2015	Dry	22.47	NA	~20	Dry @ 597.3
GP-MW-12 (7L-a2 [P4])	599.18	603.180	12/18/2014	Dry	17.21	NA	~14	Dry @ 586
			1/12/2015	Dry	17.21	NA	~14	Dry @ 586
GP-MW-14 (6H-h)	613.84	617.838	12/18/2014	Dry	23.26	NA	~20	Dry @ 594.6
			1/12/2015	Dry	23.26	NA	~20	Dry @ 594.6
GP-MW-15	614.31	618.310	12/18/2014	Dry	28.30	NA	~25	Dry @ 590
			1/12/2015	Dry	28.30	NA	~25	Dry @ 590

Notes:

- GP-MW-4 (formerly PZ-8) and GP-MW-5 (formerly PZ-6) were surface completed in November 2014. The well depths changed at that time, because a portion of the stick-up riser pipe was removed for the pipe to fit in the steel protective casing.
 - GP-MW-4 was bailed on 18 December 2014 to evaluate recharge, and then again on 19 December 2014 (after gauging). The water present in GP-MW-4 is believed to be non-formational as the well is screened entirely in the Eagle Ford Shale.
 - GP-MW-5 was pumped on 17 December 2014 to evaluate recharge. This measurement was taken after the pump dewatered the well and was removed.
- NM - Not Measured



Figure 5-1a – Cross Section Location Map (A-A' and B-B')

Figure 5-1b – Cross Section Location Map (C-C' and D-D')

Figure 5-2 – Cross Section A – A'

Figure 5-3 – Cross Section B – B'

Figure 5-4 – Cross Section C – C'

Figure 5-5 – Cross Section D – D'

**Figure 5A – Groundwater Gradient Map
(NOT APPLICABLE)**

**Figure 5B - Groundwater COC Concentration Maps
(NOT APPLICABLE)**

**Figure 5C – Groundwater Geochemistry Maps
(NOT APPLICABLE)**

**Figure 5d – Cross Section Groundwater-to-Surface Water Pathway
(NOT APPLICABLE)**



APPENDICES



LEGEND

- MONITOR WELL
- PIEZOMETERS
- BORINGS
- GRAND PARK SITE BOUNDARY

NOTE:
LOCATIONS ARE APPROXIMATE.

				 COOK-JOYCE INC. ENGINEERING AND CONSULTING 812 WEST ELEVENTH 512-474-9097 AUSTIN, TEXAS 78701 HUB & WBE CERTIFIED TEXAS REGISTERED ENGINEERING FIRM F-883	PROJECT: GRAND PARK FRISCO, TEXAS		DES BY		SCALE: 1" = 400'	
					SHEET TITLE: CROSS SECTION LOCATION MAP A-A' AND B-B'		DR BY	SDB		PROJECT NO. 13048.01
							CHK BY	KLL	CJI NO. 13048051	
							APP BY	RDV	SHEET 1 OF 1 SHEETS	
							DATE ISSUED: 01-13-2015		FIGURE NO.	
							PURPOSE:		5-1a	
REV.	DATE	DESCRIPTION	DR BY	APP BY						



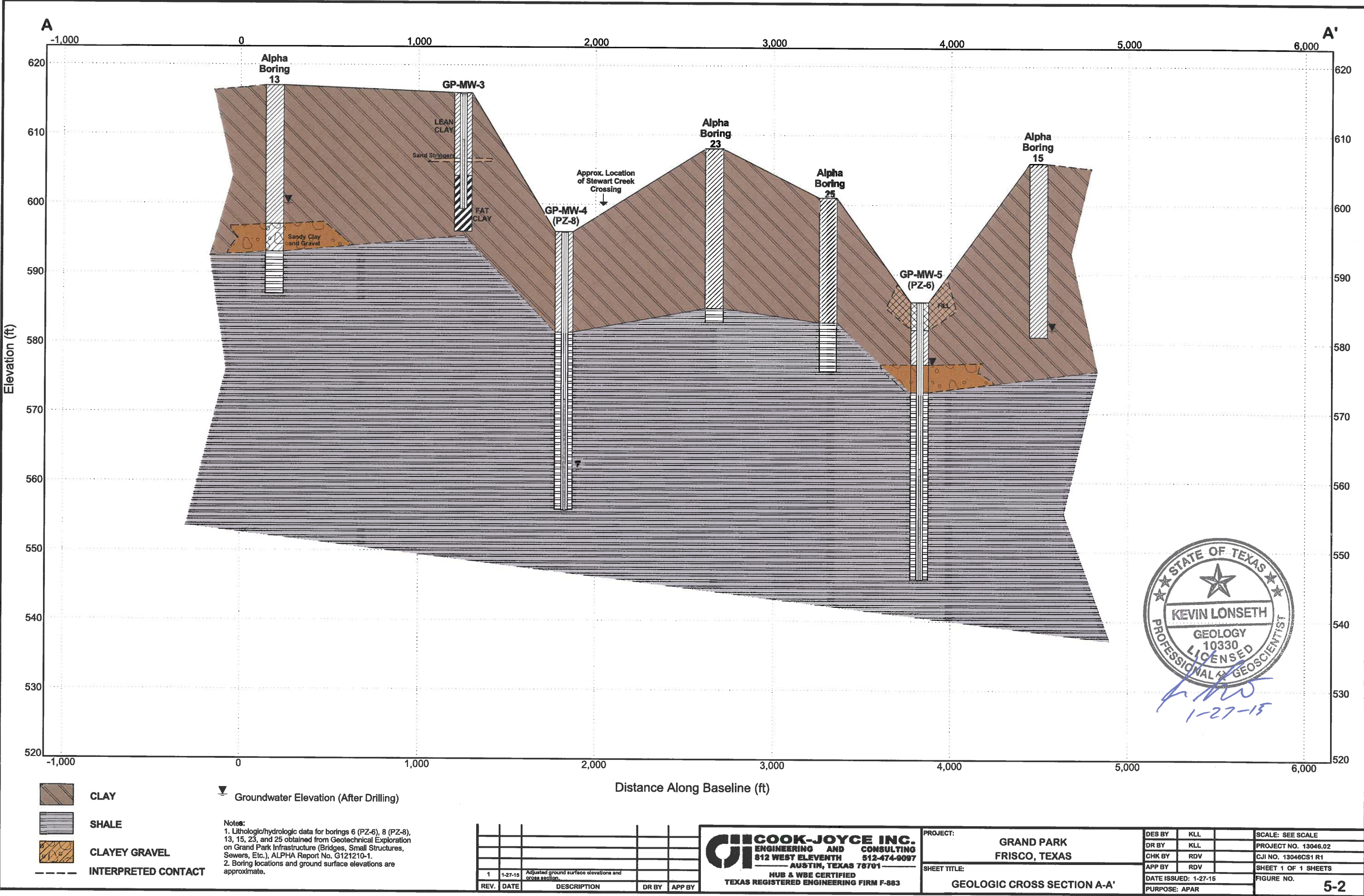
LEGEND

MONITOR WELL

GRAND PARK SITE BOUNDARY

NOTE:
LOCATIONS ARE APPROXIMATE.

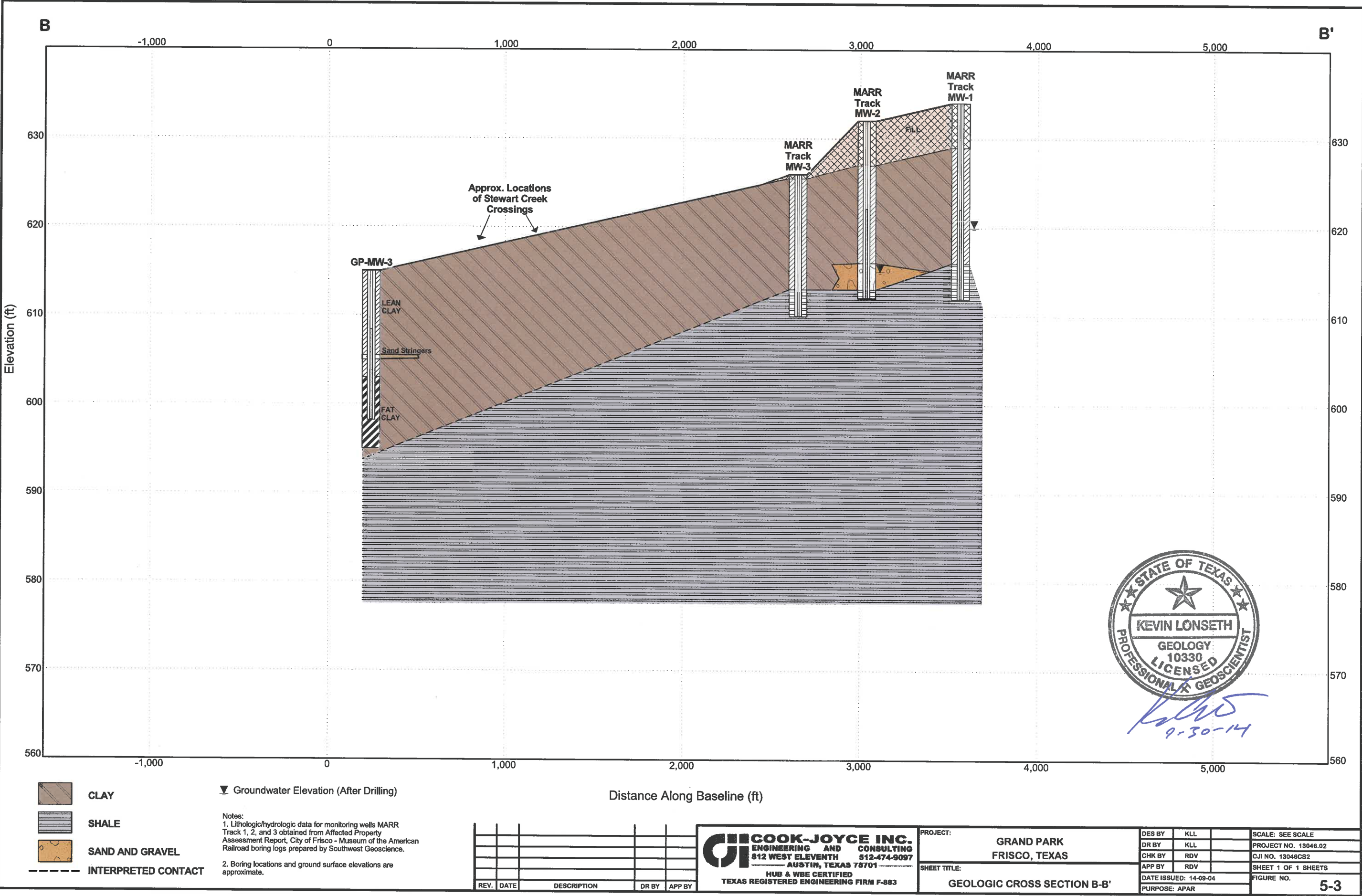
						COOK-JOYCE INC. ENGINEERING AND CONSULTING 812 WEST ELEVENTH 512-474-9097 AUSTIN, TEXAS 78701 HUB & WBE CERTIFIED TEXAS REGISTERED ENGINEERING FIRM F-883	PROJECT: GRAND PARK FRISCO, TEXAS	SHEET TITLE: CROSS SECTION LOCATION MAP C-C' AND D-D'	DES BY DR BY SDB CHK BY KLL APP BY RDV DATE ISSUED: 01-13-2015 PURPOSE:			SCALE: 1" = 400' PROJECT NO. 13046.01 CJ NO. 13046112 SHEET 1 OF 1 SHEETS FIGURE NO. 5-1b
REV.	DATE	DESCRIPTION	DR BY	APP BY								



REV.	DATE	DESCRIPTION	DR BY	APP BY
1	1-27-15	Adjusted ground surface elevations and cross section.		

**COOK-JOYCE INC.**
ENGINEERING AND CONSULTING
812 WEST ELEVENTH
AUSTIN, TEXAS 78701
HUB & WBE CERTIFIED
TEXAS REGISTERED ENGINEERING FIRM F-883

PROJECT:	GRAND PARK FRISCO, TEXAS	DES BY	KLL	SCALE: SEE SCALE
		DR BY	KLL	PROJECT NO. 13046.02
		CHK BY	RDV	CJI NO. 13046CS1 R1
SHEET TITLE:	GEOLOGIC CROSS SECTION A-A'	APP BY	RDV	SHEET 1 OF 1 SHEETS
		DATE ISSUED:	1-27-15	FIGURE NO.
		PURPOSE:	APAR	5-2

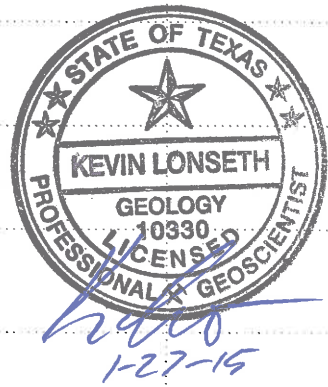
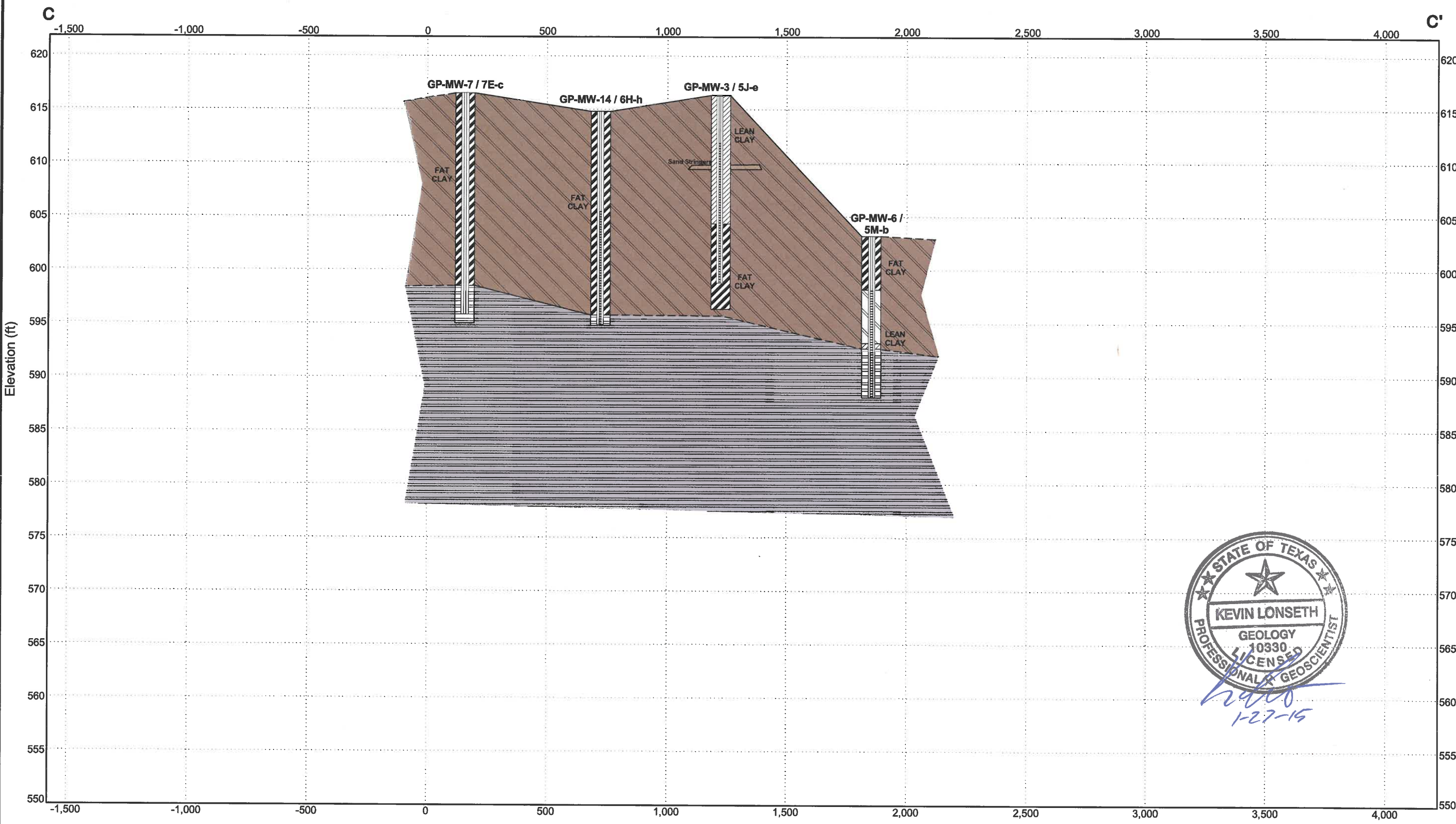


REV.	DATE	DESCRIPTION	DR BY	APP BY



COOK-JOYCE INC.
ENGINEERING AND CONSULTING
812 WEST ELEVENTH 512-474-9097
AUSTIN, TEXAS 78701
HUB & WBE CERTIFIED
TEXAS REGISTERED ENGINEERING FIRM F-883

PROJECT:	GRAND PARK FRISCO, TEXAS	DES BY	KLL	SCALE:	SEE SCALE
SHEET TITLE:	GEOLOGIC CROSS SECTION B-B'	DR BY	KLL	PROJECT NO.	13046.02
		CHK BY	RDV	CJI NO.	13046CS2
		APP BY	RDV	SHEET 1 OF 1 SHEETS	
		DATE ISSUED:	14-09-04	FIGURE NO.	5-3
		PURPOSE:	APAR		



 **CLAY**

 **SHALE**

--- INTERPRETED CONTACT

 Groundwater Elevation (After Drilling)

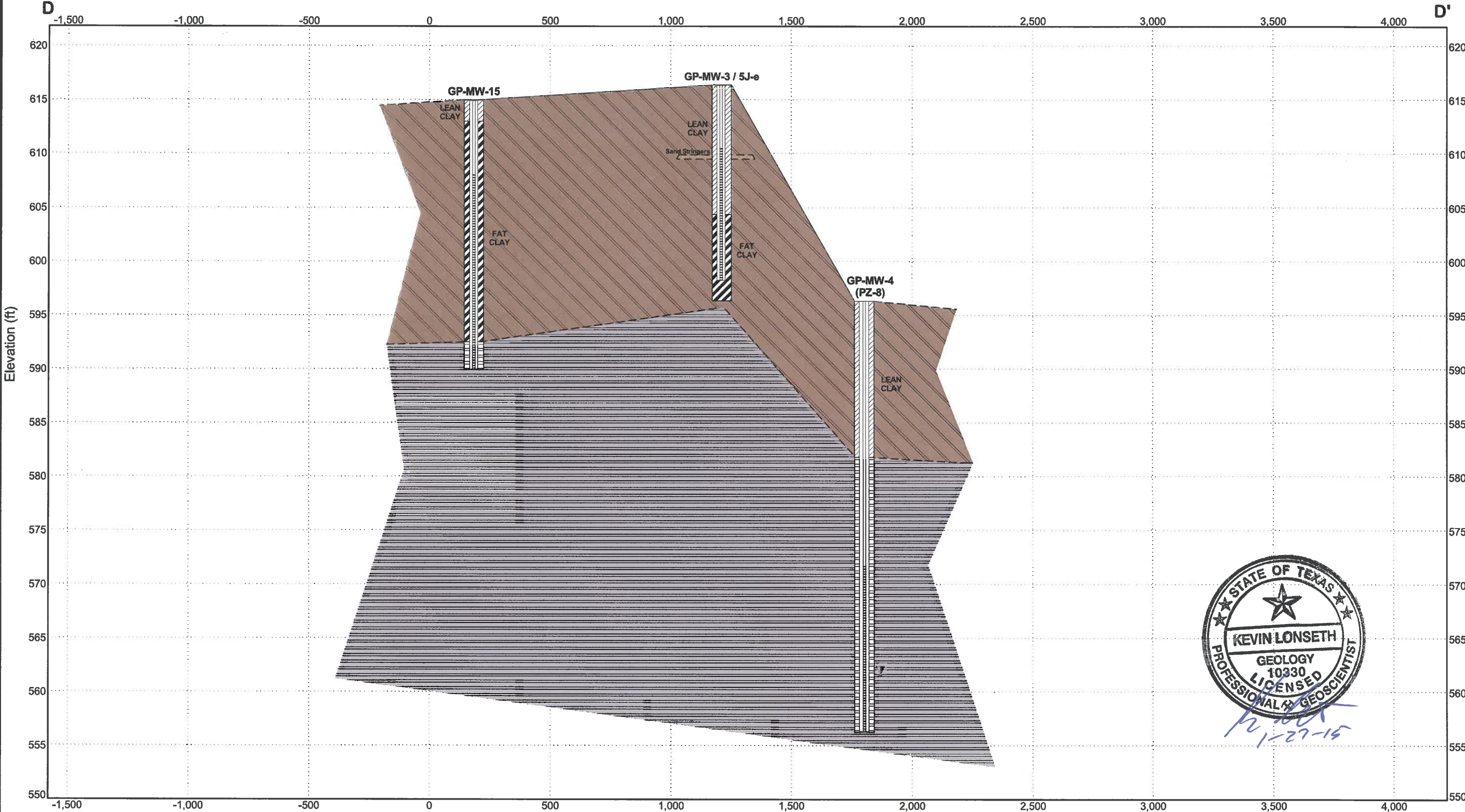
Notes:
1. Ground surface elevations are approximate.

REV.	DATE	DESCRIPTION	DR BY	APP BY

**COOK-JOYCE INC.**
ENGINEERING AND CONSULTING
812 WEST ELEVENTH 512-474-9097
AUSTIN, TEXAS 78701

HUB & WBE CERTIFIED
TEXAS REGISTERED ENGINEERING FIRM F-883

PROJECT:		GRAND PARK FRISCO, TEXAS		DES BY	KLL	SCALE: SEE SCALE
SHEET TITLE:		GEOLOGIC CROSS SECTION C-C'		DR BY	KLL	PROJECT NO. 13048.02
				CHK BY	RDV	CJI NO. 13048CS3
				APP BY	RDV	SHEET 1 OF 1 SHEETS
				DATE ISSUED: 15-01-12		FIGURE NO.
				PURPOSE: APAR		5-4



 CLAY
 SHALE

 Groundwater Elevation (After Drilling)
Notes:
1. Ground surface elevations are approximate.

--- INTERPRETED CONTACT

REV.	DATE	DESCRIPTION	DR BY	APP BY

**COOK-JOYCE INC.**
ENGINEERING AND CONSULTING
812 WEST ELEVENTH 512-474-9097
AUSTIN, TEXAS 78701

HUB & WBE CERTIFIED
TEXAS REGISTERED ENGINEERING FIRM F-893

PROJECT:		GRAND PARK FRISCO, TEXAS		DES BY	KLL	SCALE: SEE SCALE
SHEET TITLE:		GEOLOGIC CROSS SECTION D-D'		DR BY	KLL	PROJECT NO. 13046.02
				CHK BY	RDV	CJIN. 13046CS4
				APP BY	RDV	SHEET 1 OF 1 SHEETS
				DATE ISSUED: 15-01-12		FIGURE NO.
				PURPOSE: APAR		5-5



APPENDIX 2-A

CJI BORING LOGS

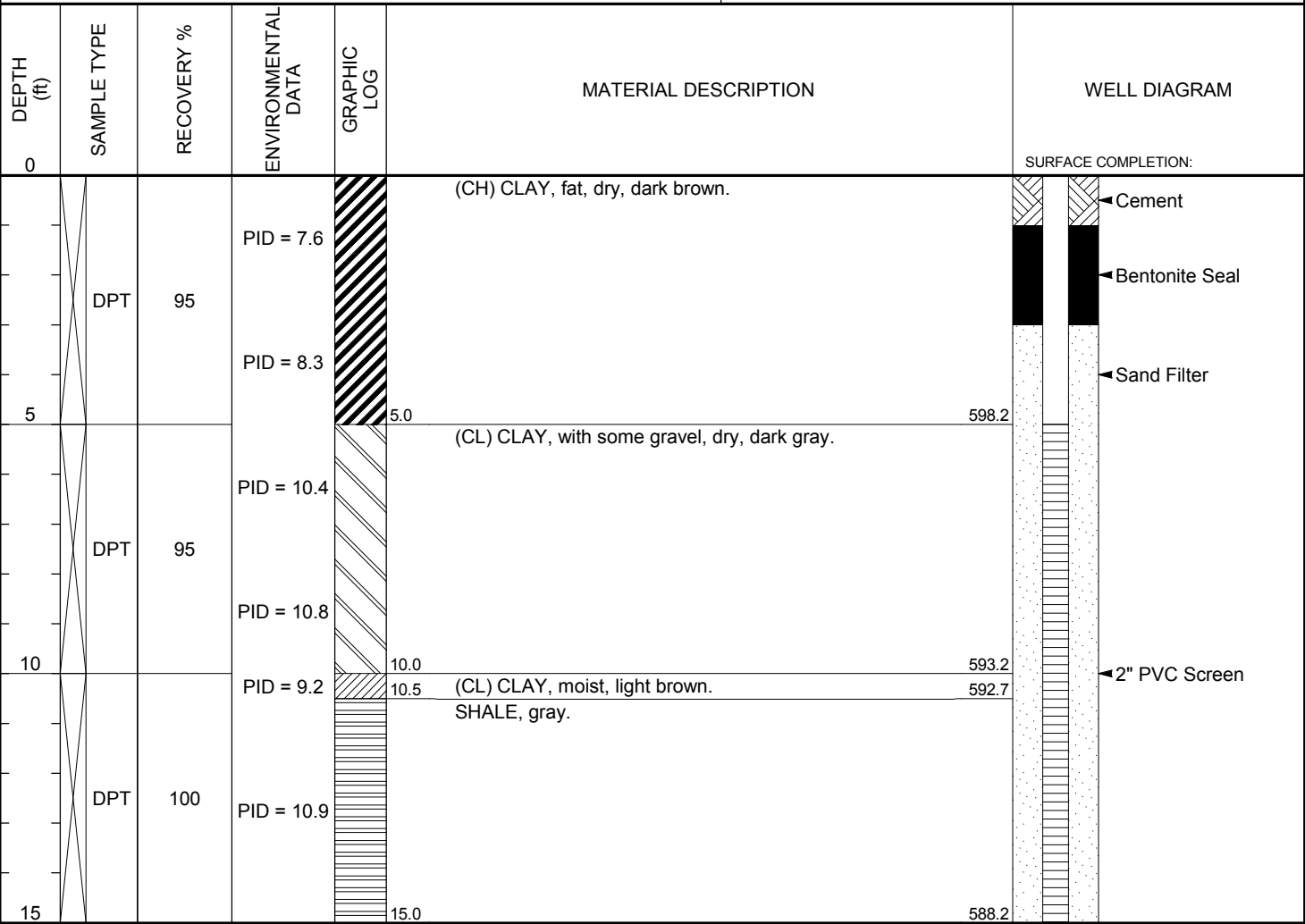
PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-3 / 5J-e	
DATE: 5/5/14		GROUND ELEVATION: 616.4 ft NORTHING: 7102809.593	
DRILLING COMPANY: Sunbelt		TOC ELEVATION: 616.2 ft EASTING: 2475923.705	
DRILLING EQUIPMENT: Geoprobe		TOTAL DEPTH: 20 ft	
DRILLING METHOD: Direct Push/Auger		LOGGED BY: R. Varnell/K. Ashely	

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						SURFACE COMPLETION:
	DPT	100	PID = 0		(CL) CLAY, loamy, dry, brown.	Cement
5	DPT	100	PID = 0		Similar to above (STA), increased sand, moist, darker.	Bentonite Seal
	DPT	100	PID = 0			Sand Filter
10	DPT	100	PID = 0		STA, sandy CLAY, lighter color. STA, with sand stringer, moist. STA, sand stringer from 9.5' to 10'.	
	DPT	100	PID = 0		12.0	604.4
15	DPT	100	PID = 0		(CH) CLAY, calcareous, moist, tan/gray. STA, progressively harder with depth.	2" PVC Screen
	DPT	100	PID = 0			
20					20.0	596.4

Bottom of borehole at 20.0 feet.

CJ LOG WITH WELL - GINT STD US LAB.GDT - 1/27/15 12:00 - S:\BORING LOGS\PROJECT NAME\FRISCO\GRAND PARK.GPJ

PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-6 / 5M-b	
DATE: 12/16/14		GROUND ELEVATION: 603.2 ft NORTHING: 7102877.199	
DRILLING COMPANY: Roddy Qualls Drilling		TOC ELEVATION: 607.15 ft EASTING: 2476549.053	
DRILLING EQUIPMENT: Geoprobe		TOTAL DEPTH: 15 ft	
DRILLING METHOD: Direct Push/Auger		LOGGED BY: K. Ashley	



Bottom of borehole at 15.0 feet.

Note: Ground surface elevations are approximate.

CJ LOG WITH WELL - GINT STD US LAB.GDT - 1/27/15 12:00 - S:\BORING LOGS\PROJECT NAME\FRISCO\GRAND PARK.GPJ

PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-7 / 7E-c	
DATE: 11/19/14		GROUND ELEVATION: 616.8 ft NORTHING: 7102465.56	
DRILLING COMPANY: Total Support Services		TOC ELEVATION: 619.8 ft EASTING: 2474946.856	
DRILLING EQUIPMENT: Mobile B-57		TOTAL DEPTH: 21.5 ft	
DRILLING METHOD: Direct Flight Augers		LOGGED BY: E. Hughes	

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						SURFACE COMPLETION:
	SH	60	PID = 0		(CH) CLAY, high plasticity, firm, moist, black, with some small gravel (mm scale).	
	SH	100	PID = 0			◀ Cement
5	SH	100	PID = 0			◀ Bentonite Seal
	SH	80	PID = 0		Similar to above, light brown, tan, and orange.	
	SH	80	PID = 0			◀ Sand Filter
10						
15	AU					◀ 2" PVC Screen
					18.0	598.8
					Clayey SHALE, brittle, dry, dark gray.	
20						
	SS	100	PID = 0		21.5	595.3

Bottom of borehole at 21.5 feet.

Note: Ground surface elevations are approximate.

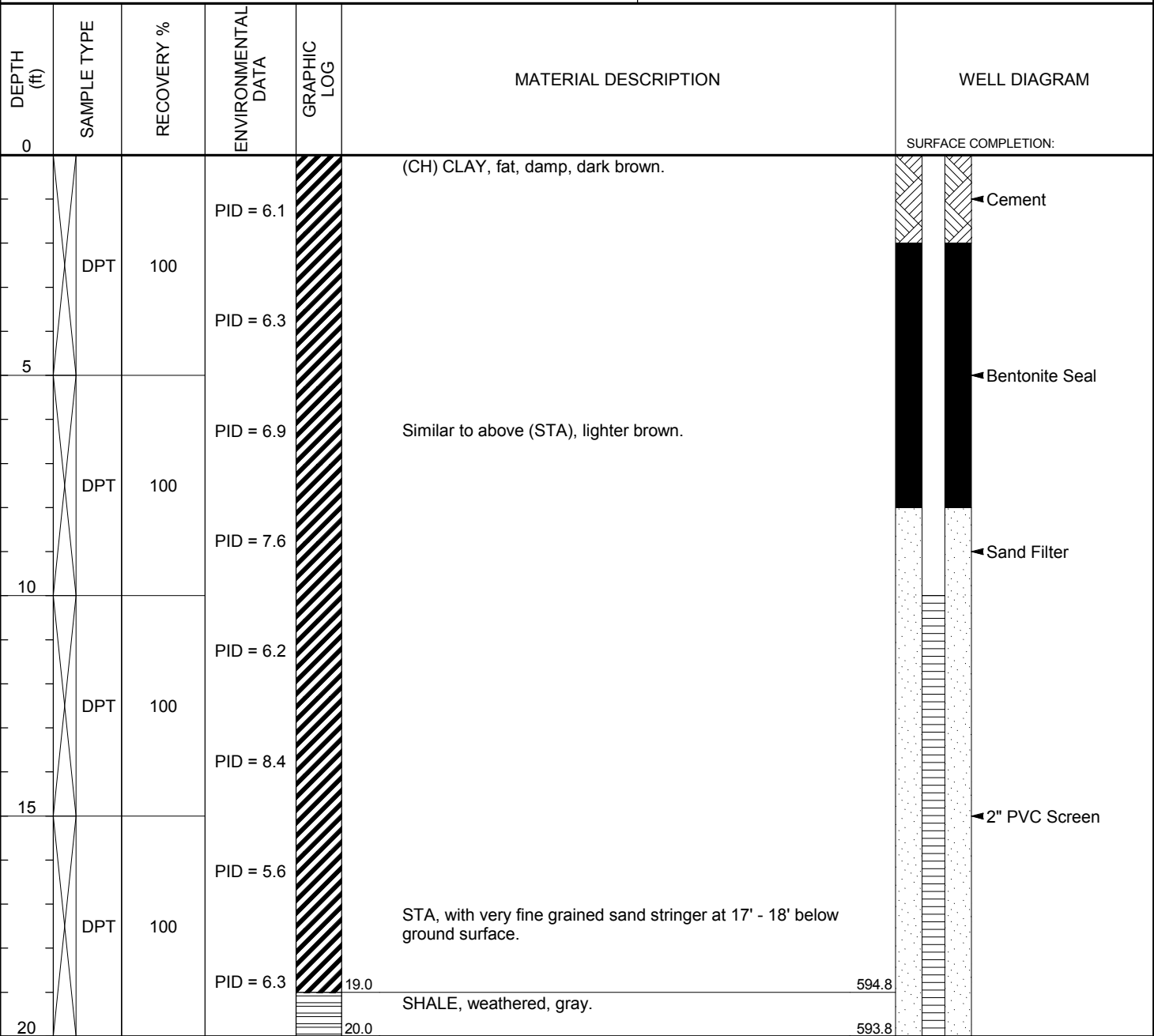
PROJECT NO. 13046

PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-12 / 7L-a2 (P4)	
DATE: 12/17/14		GROUND ELEVATION: 599.1 ft NORTHING: 7102283.796	
DRILLING COMPANY: Roddy Qualls Drilling		TOC ELEVATION: 603.18 ft EASTING: 2476443.317	
DRILLING EQUIPMENT: Geoprobe		TOTAL DEPTH: 14 ft	
DRILLING METHOD: Direct Push/Auger		LOGGED BY: K. Ashley	

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						SURFACE COMPLETION:
			PID = 3.6		(CL) CLAY, damp, dark brown. Some sand from 0 - 2' below ground surface.	
	DPT	100	PID = 6.3			Cement
			PID = 6.4			Bentonite Seal
5			PID = 8.4		Similar to above (STA), with some gravel.	Sand Filter
	DPT	100				
10			PID = 7.2			
	DPT	100	PID = 6.7		Weathered SHALE, gray with small fine sand stringers throughout shale.	2" PVC Screen
					10.0	589.1
					14.0	585.1
					Refusal at 14' below ground surface.	
					Bottom of borehole at 14.0 feet.	

Note: Ground surface elevations are approximate.

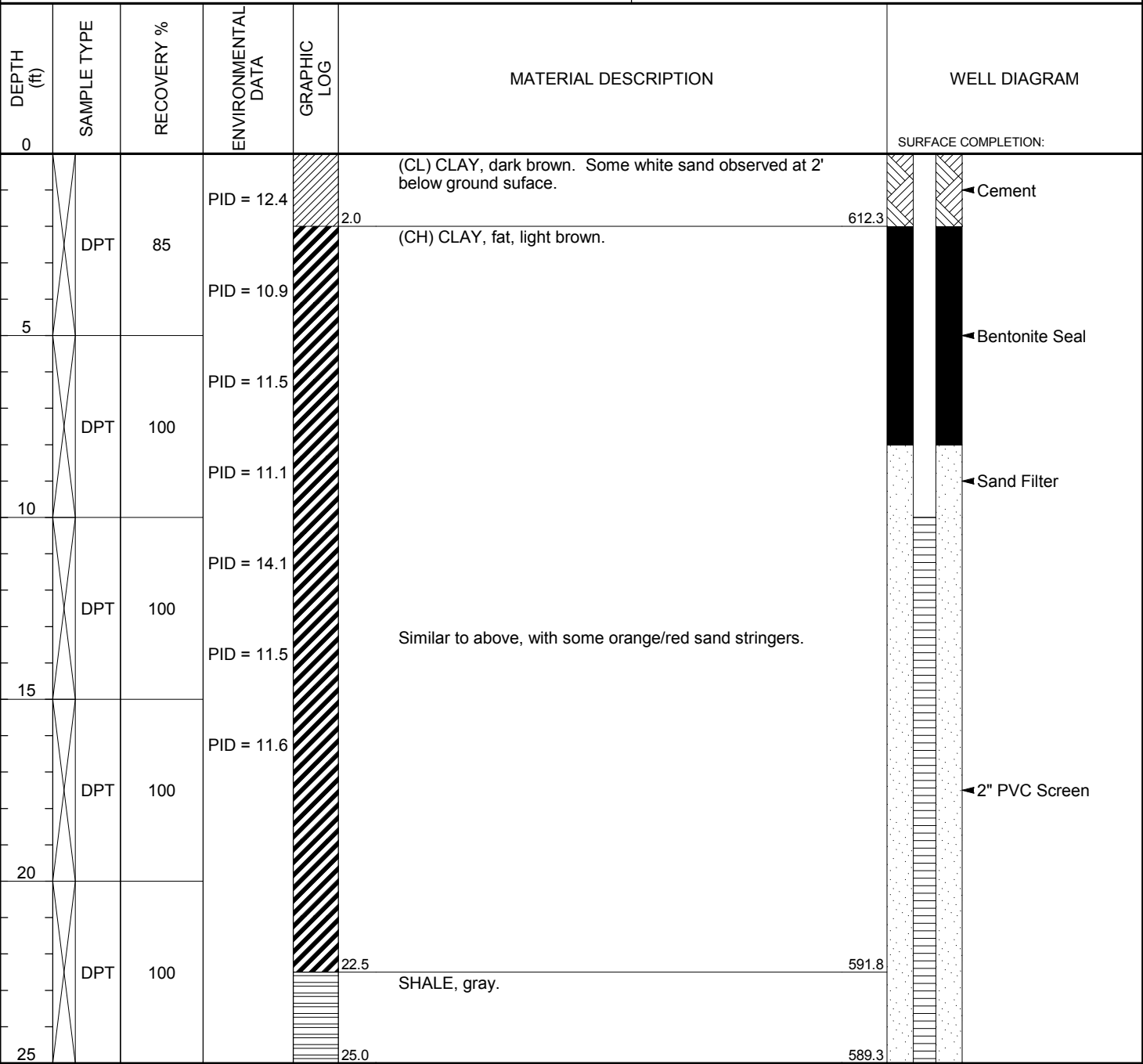
PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-14 / 6H-h	
DATE: 12/16/14		GROUND ELEVATION: 613.8 ft NORTHING: 7102531.095	
DRILLING COMPANY: Roddy Qualls Drilling		TOC ELEVATION: 617.84 ft EASTING: 2475510.332	
DRILLING EQUIPMENT: Geoprobe		TOTAL DEPTH: 20 ft	
DRILLING METHOD: Direct Push/Auger		LOGGED BY: K. Ashley	



Bottom of borehole at 20.0 feet.

Note: Ground surface elevations are approximate.

PROJECT: City of Frisco		BORING/WELL ID:	
LOCATION: Grand Park		GP-MW-15	
DATE: 12/16/14		GROUND ELEVATION: 614.3 ft NORTHING: 7103705.914	
DRILLING COMPANY: Roddy Qualls Drilling		TOC ELEVATION: 618.31 ft EASTING: 2475419.369	
DRILLING EQUIPMENT: Geoprobe		TOTAL DEPTH: 25 ft	
DRILLING METHOD: Direct Push/Auger		LOGGED BY: K. Ashley	



Bottom of borehole at 25.0 feet.

Note: Ground surface elevations are approximate.



APPENDIX 2-B

BORING LOGS FROM OTHER SOURCES

Paper copies of boring logs generated by others but used by CJI in this report are provided in this Appendix. In addition, electronic copies of the entire document that the boring logs in Appendix 2-B were obtained from are also provided in this Appendix.



Sheet 1 of 1

Hammer Drop (lbs / in): 170 / 24

[illegible]

2209 Wisconsin Street
Suite 100
Dallas, Texas
75229
Phone: 972-620-8911
Fax: 972-620-1302
www.alphatesting.com

LOG OF BORING NO.: 8
Sheet 1 of 1
PROJECT NO.: G121210

Client: THE CITY OF FRISCO, TEXAS

Location: FRISCO, TEXAS

Project: GRAND PARK INFRASTRUCTURE

Surface Elevation:

Start Date: 9/24/2012 **End Date:** 9/24/2012

West:

Drilling Method: CONTINUOUS FLIGHT AUGER

North:

Hammer Drop (lbs / in): 170 / 24

[illegible]



2209 Wisconsin Street
Suite 100
Dallas, Texas
75229
Phone: 972-620-8911
Fax: 972-620-1302
www.alphatesting.com

Sheet 1 of 1

PROJECT NO.: G121210

Location: FRISCO, TEXAS

Surface Elevation:

West:

North:

Hammer Drop (lbs / in): 170 / 24

[illegible]



Hammer Drop (lbs / in): _____

[illegible]



LOG OF BORING NO.: 23
Sheet 1 of 1
PROJECT NO.: G121210

Location: _____ FRISCO, TEXAS

Surface Elevation:

West:

North:

Hammer Drop (lbs / in):

[illegible]

Client: THE CITY OF FRISCO, TEXAS

Location: FRISCO, TEXAS

Project: GRAND PARK INFRASTRUCTURE

Surface Elevation: _____

Start Date: 8/29/2012 End Date: 8/29/2012

West: _____

Drilling Method: CONTINUOUS FLIGHT AUGER

North: _____

Hammer Drop (lbs / in): _____

Depth, feet	Graphic Log	GROUND WATER OBSERVATIONS			Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index			
		▽ On Rods (ft):	NONE															
		▼ After Drilling (ft):	DRY															
		▼ After _____ Hours (ft):																
MATERIAL DESCRIPTION																		
5		Brown CLAY with calcareous nodules						4.5										
								4.5				15						
6.0								4.5	8.3		115	18	70	25	45			
10		Tan and Gray SHALY CLAY						4.5				24						
								4.0				24						
15								4.5				24						
18.0		Dark Gray CLAY SHALE						4.5										
20																		
25								4.5										
25		TEST BORING TERMINATED AT 25 FT																
30																		
35																		
40																		
45																		
50																		
55																		
60																		
65																		

Client: City of Frisco
 Project Name: Museum of the American Railroad
 Project Location: Frisco, TX
 Project Manager: L. Scaggs

MONITORING WELL LOG

DRILLING & SAMPLING INFORMATION

Date Started: 9/29/2011
 Date Completed: 9/30/2011
 Drilling Company: Riomar
 Driller: D. Stark

Monitoring Well Number: Track MW-1
 Project #: 0111231T
 Drawn By: RDH
 Approved By: RLS

Geologist: J. Minter Well Diam: 2"
 Boring Method: GP/HSA Screen Size: 0.010"
 Bore Hole Dia: 8.25" Screen Length: 10'
 Casing Length: 12'

BORING METHOD	SAMPLER TYPE	GROUNDWATER DEPTH
HSA - HOLLOW STEM AUGERS	CB - FIVE FOOT CORE BARREL	▽ AT COMPLETION
CFA - CONTINUOUS FLIGHT AUGERS	SS - DRIVEN SPLIT SPOON	▽ AT WELL STABILIZATION
GP - GEOPROBE	ST - PRESSED SHELBY TUBE	
AR - AIR ROTARY		

BORING AND SAMPLING NOTES

Monitor Well Detail	SOIL CLASSIFICATION		Stratum Depth	Depth Scale	Sample No.	Sample Interval	% Recovery	Groundwater Depth	PID/PID Readings (ppm)	BORING AND SAMPLING NOTES							
	SURFACE ELEVATION:																
	SILTY CLAY FILL, Dark Grayish Brown, Yellowish Brown & Pale Yellowish Brown with <0.25" Rounded/Subrounded Gravel, Occasional Weathered Limestone Fragments, Moist, No Odor			5 10 15 20 25 30	14-15 21-22	14-15 21-22	14-15 21-22	3.9 4.7 4.7 4.7 3.9 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.9 3.1 3.1 5.5 5.5 4.7 4.7 3.9 - 7.1									
	SILTY CLAY, Dark Grayish Brown & Light Olive Brown with Occasional <0.5" Subangular Gravel, Very Moist @ 7 ft bgs to Wet, No Odor,																
	WEATHERED SHALE, Dark Gray with Dark Reddish Brown Lamnations, Blocky, Moist, No Odor																
	Bottom of Boring @ 22 ft bgs																

NOTE: This log is not to be used outside of the original report.

Southwest
 GEOSCIENCE

Project Manager: L. Scaggs

MONITORING WELL LOG

DRILLING & SAMPLING INFORMATION

Date Started: 9/29/2011Date Completed: 9/30/2011Drilling Company: RiomarDriller: D. Stark

Geologist: J. Minter Well Diam: _____

Boring Method: GP/HAS/HA Screen Size: _____

Bore Hole Dia: 8.25" Screen Length: _____

Monitoring Well Number: Track MW-2

Project #: 0111231T

Drawn By: RDH

Approved By: RLS

HSA - HOLLOW STEM AUGERS

CFA - CONTINUOUS FLIGHT AUGERS

GP - GEOPROBE

AR - AIR ROTARY

CB - FIVE FOOT COBE BARREL

SS-DRIVEN SPLIT SPOON.

ST - PRESSED SHEET BY TUBE

ST-PRESSED SHELBY TUBE

COMPLETION

▽ AT COMPLETION

AT WELL STABILIZATION

WELL STABILIZATION

BORING AND
SAMPLING NOTES[illegible]

NOTE: This log is not to be used outside of the original report.

Southwest GEOSCIENCE

Client: City of Frisco
 Project Name: Museum of the American Railroad
 Project Location: Frisco, TX
 Project Manager: L. Scaggs

MONITORING WELL LOG

DRILLING & SAMPLING INFORMATION

Date Started: 9/29/2011
 Date Completed: 9/30/2011
 Drilling Company: Riomar
 Driller: D. Stark

Monitoring Well Number: Track MW-3
 Project #: 0111231T
 Drawn By: RDH
 Approved By: RLS

Geologist: J. Minter Well Diam: 2"
 Boring Method: GP/HSA Screen Size: 0.010"
 Bore Hole Dia: 8.25" Screen Length: 10'
 Casing Length: 6'

BORING METHOD
 HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGERS
 GP - GEOPROBE
 AR - AIR ROTARY

SAMPLER TYPE
 CB - FIVE FOOT CORE BARREL
 SS - DRIVEN SPLIT SPOON
 ST - PRESSED SHELBY TUBE

GROUNDWATER DEPTH
 ∇ AT COMPLETION
 ∇ AT WELL STABILIZATION

BORING AND SAMPLING NOTES

Monitor Well Detail	SOIL CLASSIFICATION		Stratum Depth	Depth Scale	Sample No.	Sample Interval	% Recovery	Groundwater Depth	PID/PID Readings (ppm)	BORING AND SAMPLING NOTES
	SURFACE ELEVATION:									
	SILTY CLAY FILL, Grayish Brown Slightly Moist, No Odor			5 10 15 20 25 30	5-6 7-8 9-10		0.7 2.3 3.1 3.1 3.1 1.5 1.5 1.5 0 0 0 0 6.7 0.7 0.7			
	SILTY CLAY, Dark Grayish Brown, Slightly Moist, No Odor									
	CALCAREOUS CLAY, Pale Yellow & White with Calcareous Nodules & Precipitate, Becoming Blocky with Depth, Slightly Moist, No Odor									
	WEATHERED SHALE, Dark Gray, Slightly Moist, No Odor									
	SHALE, Dark Gray, Slightly Moist, No Odor									
	Bottom of Boring @ 16 ft bgs									

NOTE: This log is not to be used outside of the original report.

Southwest
 GEOSCIENCE



APPENDIX 4

WELL REPORTS

STATE OF TEXAS WELL REPORT for Tracking #366955

Owner:	City of Frisco	Owner Well #:	5J-E
Address:	6101 Frisco Square Blvd Frisco , TX 75034	Grid #:	18-50-7
Well Location:	SW Cotton Gin Rd & Dallas N Tollway Frisco , TX 75034	Latitude:	33° 08' 47" N
Well County:	Denton	Longitude:	096° 50' 27" W
Elevation:	622 ft.	GPS Brand Used:	Google Earth
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **5/5/2014**
Completed: **5/5/2014**

Diameter of Hole: Diameter: **6.25 in From Surface To 17 ft**

Drilling Method: Other: **Flight Augers**

Borehole Completion: Other: **16/30 Sand Pack**

Annular Seal Data: 1st Interval: **From 0 ft to 3 ft with 1 Concrete (#sacks and material)**
2nd Interval: **From 3 ft to 5 ft with 1 Bentonite (#sacks and material)**
3rd Interval: **From 5 ft to 17 ft with 3 Sand (#sacks and material)**
Method Used: **Gravity**
Cemented By: **Juan R. Alcalá**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **Sunbelt Industrial Services**
2415 Cullen St
Fort Worth , TX 76107

Driller License Number: **59430**

Licensed Well Driller Signature: **Juan R. Alcala**

Registered Driller Apprentice Signature: **No Data**

Apprentice Registration Number: **No Data**

Comments: **DE14123**

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 (Tracking #366955) 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
0-9'		Brown Clay
9-17'		Gray/Brown Clay

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2"	New	PVC Riser	0-7' SCH 40
2"	New	Screen	7-17' 0.010 Slot

STATE OF TEXAS WELL REPORT for Tracking #386428

Owner:	City of Frisco	Owner Well #:	MW6H-h
Address:	6101 Frisco Square Blvd. Frisco , TX 75034	Grid #:	18-50-7
Well Location:	7275 Dallas Parkway Frisco , TX 75034	Latitude:	33° 08' 15" N
Well County:	Collin	Longitude:	096° 50' 42" W
Elevation:	No Data	GPS Brand Used:	Google Earth
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **12/16/2014**
Completed: **12/16/2014**

Diameter of Hole: Diameter: **6 in From Surface To 25 ft**

Drilling Method: Other: **Flight auger**

Borehole Completion: **No Data**

Annular Seal Data: 1st Interval: **From 25 ft to 8 ft with 4 bags of sand (#sacks and material)**
2nd Interval: **From 8 ft to 2 ft with 2 bgs bentonite (#sacks and material)**
3rd Interval: **From 2 ft to 0 ft with 1 bag concrete (#sacks and material)**
Method Used: **Mixed by hand**
Cemented By: **Gilbert Robles**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **Roddy Qualls Environmental Drilling**
2790 Zion Hill Road
Weatherford , TX 76086

Driller License Number: **52694**

Licensed Well Driller Signature: **Gilbert M. Robles**

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 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 (Tracking #**386428**) 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	to 12'	Dk brown silty clay
12'	to 18'	brown clay
18'	to 25'	Tan clay

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2"	New	PVC slotted screen	25 to 10
2"	New	PVC Riser	10 to 0

STATE OF TEXAS WELL REPORT for Tracking #386429

Owner:	City of Frisco	Owner Well #:	GP- MW-15
Address:	6101 Frisco Square Blvd. Frisco , TX 75034	Grid #:	18-50-7
Well Location:	7275 Dallas Parkway Frisco , TX 75034	Latitude:	33° 08' 15" N
Well County:	Collin	Longitude:	096° 50' 42" W
Elevation:	No Data	GPS Brand Used:	Google Earth
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **12/16/2014**
Completed: **12/16/2014**

Diameter of Hole: Diameter: **6 in From Surface To 25 ft**

Drilling Method: Other: **Flight auger**

Borehole Completion: **No Data**

Annular Seal Data: 1st Interval: **From 25 ft to 8 ft with 4 bags of sand (#sacks and material)**
2nd Interval: **From 8 ft to 2 ft with 2 bgs bentonite (#sacks and material)**
3rd Interval: **From 2 ft to 0 ft with 1 bag concrete (#sacks and material)**
Method Used: **Mixed by hand**
Cemented By: **Gilbert Robles**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **Roddy Qualls Environmental Drilling**
2790 Zion Hill Road
Weatherford , TX 76086

Driller License Number: **52694**

Licensed Well Driller Signature: **Gilbert M. Robles**

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 #386429) 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	to 12'	Dk brown silty clay
12'	to 18'	brown clay
18'	to 25'	Tan clay

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2"	New	PVC slotted screen	25 to 10
2"	New	PVC Riser	10 to 0

STATE OF TEXAS WELL REPORT for Tracking #386431

Owner:	City of Frisco	Owner Well #:	5MB-b
Address:	6101 Frisco Square Blvd. Frisco , TX 75034	Grid #:	18-50-7
Well Location:	7275 Dallas Parkway Frisco , TX 75034	Latitude:	33° 08' 15" N
Well County:	Collin	Longitude:	096° 50' 42" W
Elevation:	No Data	GPS Brand Used:	Google Earth
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **12/16/2014**
Completed: **12/16/2014**

Diameter of Hole: Diameter: **6 in From Surface To 15 ft**

Drilling Method: Other: **Flight auger**

Borehole Completion: **No Data**

Annular Seal Data: 1st Interval: **From 15 ft to 3 ft with 3 bags of sand (#sacks and material)**
2nd Interval: **From 3 ft to 1 ft with 1 bag bentonite (#sacks and material)**
3rd Interval: **From 1 ft to 0 ft with 1 bag concrete (#sacks and material)**
Method Used: **Mixed by hand**
Cemented By: **Gilbert Robles**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **Roddy Qualls Environmental Drilling**
2790 Zion Hill Road
Weatherford , TX 76086

Driller License Number: **52694**

Licensed Well Driller Signature: **Gilbert M. Robles**

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 #**386431**) 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	to 10'	Dk brown silty clay
10'	to 15'	Tan clay

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2"	New	PVC slotted screen	15 to 5
2"	New	PVC Riser	5 to 0

STATE OF TEXAS WELL REPORT for Tracking #386624

Owner:	City of Frisco	Owner Well #:	GP-MW-7
Address:	Frisco , TX	Grid #:	18-50-7
Well Location:	Cotton Gin Rd @ Legacy Frisco , TX	Latitude:	33° 08' 45" N
Well County:	Collin	Longitude:	096° 50' 53" W
Elevation:	No Data	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **11/19/2014**
Completed: **11/19/2014**

Diameter of Hole: Diameter: **6 in From Surface To 21.5 ft**

Drilling Method: Other: **solid flights**

Borehole Completion: Other: **20/40 silica sand**

Annular Seal Data: 1st Interval: **From 0 ft to 2 ft with cement 1 bag (#sacks and material)**
2nd Interval: **From 2 ft to 8 ft with chips 2 bags (#sacks and material)**
3rd Interval: **No Data**
Method Used: **hand mix**
Cemented By: **tss**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **total support Services inc**
3801 N. Capital of tx hwy 454
austin , TX 78746

Driller License Number: **54611**
Licensed Well Driller Signature: **brian kern**
Registered Driller Apprentice Signature: **Chester Westbrook**
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 #**386624**) 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
0-18 clay
18-21.5 shale

td 21.5 ft.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2 n	pvc	0-10 riser	
2 n	pvc	10-21.5 screen	

STATE OF TEXAS WELL REPORT for Tracking #386628

Owner:	City of Frisco	Owner Well #:	GP-MW-12
Address:	Frisco , TX	Grid #:	18-50-7
Well Location:	Cotton Gin Rd @ Legacy Frisco , TX	Latitude:	33° 08' 45" N
Well County:	Collin	Longitude:	096° 50' 53" W
Elevation:	No Data	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **11/18/2014**
Completed: **11/18/2014**

Diameter of Hole: Diameter: **6 in From Surface To 21.5 ft**

Drilling Method: Other: **solid flights**

Borehole Completion: Other: **20/40 silica sand**

Annular Seal Data: 1st Interval: **From 0 ft to 2 ft with cement 1 bag (#sacks and material)**
2nd Interval: **From 2 ft to 8 ft with chips 2 bags (#sacks and material)**
3rd Interval: **No Data**
Method Used: **hand mix**
Cemented By: **tss**
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 Data**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No Data**

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: **total support Services inc**
3801 N. Capital of tx hwy 454
austin , TX 78746

Driller License Number: **54611**
Licensed Well Driller Signature: **brian kern**
Registered Driller Apprentice Signature: **Chester Westbrook**
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 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 (Tracking #**386628**) 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
0-18 clay
18-21.5 shale

td 21.5 ft.

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
2 n	pvc	0-10 riser	
2 n	pvc	10-21.5 screen	