



February 21, 2011
Project No. 11-02-21

Mr. Frank Zeng
Municipal Solid Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, Texas 78711-3087

**Re: Response to TCEQ Notice of Deficiency Letter Dated January 21, 2011,
Trinity Oaks Landfill, Groundwater Monitoring Well System Revision Permit
Modification; MSW Permit No. 556, Dallas County, Texas; Tracking No.
14525730; RN100217942/CN601541469**

Dear Mr. Zeng:

This letter is written on behalf of the Trinity Oaks Landfill in response to a Texas Commission on Environmental Quality (TCEQ) letter dated January 21, 2011. The TCEQ's comments are provided below in italics, with our response immediately following.

Comment 1: *The URL provided on page 4 of the Part I form was searched on January 10, 2011 and no information related to the permit modification application could be located. Please include necessary information/instruction to facilitate the search on the URL or revise the Part I form as necessary.*

Response: The document can now be found at the URL provided on page 4 of the Part I form.

Comment 2: *Section 2.2 on page 5-4 of the revised Attachment 5 states that "each new monitor well will be constructed in accordance with the requirements of 30 TAC §330.421." Section 2.3 on page 5-5 also states that "installation and construction of monitoring wells will be in accordance with 30 TAC §330.421." Please revise the application to include drawings to illustrate typical structures of the new groundwater monitoring well to be installed at this facility. Please also revise these sections to include general provisions to ensure that the well drilling/installation personnel will drill and install the new wells that meet the permit conditions including well spacing and other applicable requirements of 30 TAC Chapter 330, Subchapter J.*

Response: A typical monitoring well detail has been prepared and can be found as Figure 5.2. The diagram illustrates a typical monitor well that meets the

requirements of §330.421. Revisions regarding monitor wells being constructed in compliance with permit conditions including well spacing have also been made to Section 2.2. Revised pages are attached.

Comment 3: *Please revise Section 2.2 on page 5-5 to state that the 600-foot well spacing limit will still be satisfied when a well is installed at a location slightly different from the proposed location specified in Table 5.1. In addition, the proposed well locations may be adjusted to shorten the proposed spacing to allow some deviations and still meet the 600-foot limit in all situations (the existing wells MW-5 and MW-6A may be retained as point of compliance (POC) wells).*

Response: The requested change regarding maintaining the 600-foot well spacing limit has been made to Section 2.2. However, no change has been made regarding retaining MW-5 and MW-6A, as they will be superfluous after MW-11 and MW-12 have been installed.

Comment 4: *Please verify whether the contents shown in Drawing 5.1 are consistent with the current permit conditions (except for the proposed new wells). If inconsistent, please identify the inconsistent contents and explain/justify the inconsistencies or revise the drawing as necessary. Please revise the drawing to show the approved waste footprint.*

Response: Figure 5.1 has been modified to include the most recent topographic map for the facility (December 27, 2006). The new topographic map illustrates a few site features that were not illustrated on the previous figure. The new features illustrated include seven (7) surface water let-down structures located on the side slopes of the landfill. Call outs for other site features such as the leachate storage tank, flare station, and maintenance/storage building have been added to Figure 5.1 in addition to the gas monitoring probes.

Comment 5: *Figure 5.1 appears to show that some existing and proposed wells are located outside of the permit boundary. Please explain/justify their locations or revise the application to comply with the POC requirements included in §330.403.*

Response: All existing and proposed wells are consistent with the POC requirements included in §330.403. 30 TAC §330.403(a)(2) states that “*the point of compliance monitoring system must include monitoring wells installed to allow determination of the quality of groundwater passing the point of compliance as defined in §330.3...*” 30 TAC §330.3(106) defines the Point of Compliance (POC) as “*a vertical surface located no more than 500 feet from the hydraulically downgradient limit of the waste management unit boundary, extending down through the uppermost aquifer underlying the regulated units, and located on land owned by the*

owner of the facility.” All of the existing and proposed monitor wells contained in the permit modification are located within 500 feet and hydraulically downgradient of the waste management unit boundary and are on land owned by the owner of the facility. No revisions to the permit application are necessary.

Comment 6: *Figure 5.1 appears to show a slurry wall partially enclosing the southwest portion of the landfill. Please revise this application to discuss the slurry wall (please provide relevant information such as the purpose, the current conditions, depth, whether or not embedded in the underlying aquitard, etc.).*

Response: Limited information is available regarding the slurry wall, regardless, Section 1.2 has been revised to provide a discussion of it.

Comment 7: *Please clarify whether the proposed MW-10 will be inside or outside of the slurry wall.*

Response: MW-10 and all other proposed monitor wells proposed proximal to the slurry wall are intended to be installed on the outside of it. Minor adjustments have been made to Figure 5-1 to illustrate the well locations relative to the slurry wall.

Comment 8: *Figure 5.1 shows that the spaces between MW-3 and MW-14, and MW-4 and MW-7A are not marked as POC and no wells are installed or proposed. The spacing between the adjacent wells is more than 600 feet. Please explain/justify the absence of the POC and wells over these spaces. The applicant may address this comment by simply extending the POC to the specified spaces and meeting the 600-foot well spacing requirement.*

Response: The spaces between MW-3 and MW-14, and MW-4 and MW-7A are not delineated as POC and no wells are installed or proposed between wells MW-3 and MW-14 or between MW-4 and MW-7A because they are not located along the POC. As previously stated 30 TAC §330.3(106) defines the Point of Compliance (POC) as *“a vertical surface located no more than 500 feet from the hydraulically downgradient limit of the waste management unit boundary, extending down through the uppermost aquifer underlying the regulated units, and located on land owned by the owner of the facility.”*

As can be seen from the historical groundwater contour maps contained in Appendix 5C, the section of the landfill between MW-3 and MW-14 is not downgradient but rather upgradient of the 60 acre Subtitle D area. The section of the landfill between MW-3 and MW-14 may be hydraulically downgradient of the pre-Subtitle D area, but this section will be monitored

by the proposed POC wells (MW-8 and MW-14 through MW-18) located along the western side of the facility.

Similarly the section of the landfill between MW-4 and MW-7A is upgradient to the 60 acre Subtitle D area and downgradient of the pre-Subtitle D area. However, the downgradient portion of the pre-Subtitle D area is intended to be monitored by proposed POC wells MW-7A and MW-9. Hence, no changes to the proposed groundwater monitoring network in these areas are anticipated.

Comment 9: *Figure 5.1 does not appear to show a continuous POC between MW-11 (MW-5) and MW-6A. Please explain the discontinuation of the POC or revise the drawing as appropriate.*

Response: A continuous POC is intended in the southwestern portion of the facility between wells MW-5 and MW-6A. The POC was not well illustrated in the original submittal do to visual interference caused by proximal topographic contours. Figure 5-1 has been modified to include an enlarged view (Inset A) of that portion of the site.

Comment 10: *Please revise Figure 5.1 to show the well spacing distance between adjacent wells by measuring around the corner, not cutting the corner.*

Response: All measurements are made around the corners of the facility, where applicable. No measurements are made across the limits of waste.

Comment 11: *Please explain/justify why the proposed POC does not extend on both ends beyond the proposed POC wells MW-9 and MW-18 to the corners. The spaces north of MW-18 and east of MW-9 till the corners of the unit can be viewed as downgradient based on the groundwater flow directions shown in this application.*

Response: Based on the groundwater contour maps provided in Appendix 5C, Historical Groundwater Contour Maps, the groundwater flow direction in the vicinity of MW-9 is southwesterly. Therefore it is not necessary for the POC to extend to the eastern boundary of the site. MW-9 is positioned at the downgradient location of the southeast corner of the facility.

Similarly the groundwater flow direction in the vicinity of proposed well MW-18 is south-southwesterly based on the maps provided in Appendix 5C. Hence, it is not necessary for the POC to extend to the northern boundary of the site. MW-18 is positioned at the downgradient location of the northwest corner of the facility.

Comment 12: *The application proposes to decommission two existing monitoring wells. Please revise this application to discuss how well decommission (plugging*

and abandonment) will be conducted in compliance with requirements of §330.421(g).

Response: Section 2.2 has been modified to include a discussion of the well decommissioning procedures.

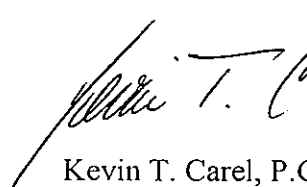
Comment 13: *Please revise other pertinent portions of the permit to accommodate the changes proposed by this application (for example, but not limited to, the cost estimates for closure (if applicable) and post-closure care).*

Response: Consistent with other permit modifications that were prepared in response to 30 TAC §330.403 the pertinent portions of the permit have been modified to accommodate the changes proposed by this application. The closure/post-closure cost estimates for 2011 are planned to be submitted in April 2011. If this permit modification is approved by that date the closure/post-closure cost estimates will include the new wells. If this permit modification is approved after the 2011 closure/post closure care cost estimates are submitted, they will be revised to include the new wells within 90 days of the date of the approval of the permit modification.

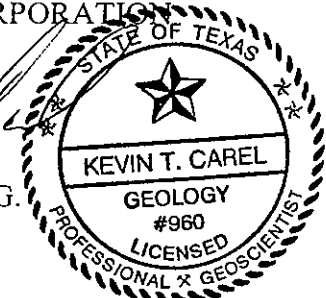
We trust this information meets your needs, please call Mr. Mark Meadows at (972) 434-2015 or us at (817) 337-0112 if you have any questions.

Sincerely,

THE CAREL CORPORATION



Kevin T. Carel, P.G.
President



2-21-11

Att: TCEQ Part 1 Application Page 1 and Signature Page
Permit Attachment 5 - Underline/Strikeout Pages
Permit Attachment 5 - Clean/Replacement Pages

cc: TCEQ Region 4 Office
Mark Meadows – Trinity Oaks Landfill TX, LP
Eduardo Choquis – Trinity Oaks Landfill TX, LP
Mark Allendorf – Republic Services, Inc. (e-copy)

TCEQ Part 1 Application Page 1 and Signature Page



Texas Commission on Environmental Quality

Permit or Registration Application for Municipal Solid Waste Facility

Part I

A. General Information

Facility Name:	Trinity Oaks Landfill			
Physical or Street Address (if available):	11340 C F Hawn Freeway			
(City) (County) (State) (Zip Code):	Dallas	Dallas	TX	75253
(Area Code) Telephone Number:	972-436-4217			
Charter Number:				

If the application is submitted on behalf of a corporation, provide the Charter Number as recorded with the Office of the Secretary of State for Texas.

Operator Name ¹ :	Mesquite Landfill TX, L.P.			
Mailing Address:	801 E. College Street			
(City) (County) (State) (Zip Code):	Lewisville	Denton	TX	75057
(Area Code) Telephone Number:	972-436-4217			
(Area Code) FAX Number:	972-436-8129			
Charter Number:				

If the permittee is the same as the operator, type "Same as Operator".

Permittee Name:	Same as Operator			
Physical or Street Address (if available):				
(City) (County) (State) (Zip Code):			TX	
(Area Code) Telephone Number:				
Charter Number:				

If the application is submitted by a corporation or by a person residing out of state, the applicant must register an Agent in Service or Agent of Service with the Texas Secretary of State's office and provide a complete mailing address for the agent. The agent must be a Texas resident.

Agent Name:	CT Corporation System			
Mailing Address:	1021 Main Street, Suite 1150			
(City) (County) (State) (Zip Code):	Houston	Harris	TX	77002
(Area Code) Telephone Number:	713-658-9486			
(Area Code) FAX Number:	713-658-9720			

Application Type:

<input type="checkbox"/> Permit	<input type="checkbox"/> Major Amendment	<input type="checkbox"/> Minor Amendment	
<input type="checkbox"/> Registration	<input checked="" type="checkbox"/> Modification	<input type="checkbox"/> Temporary Authorization	
	<input checked="" type="checkbox"/> Public Notice		
	<input type="checkbox"/> Written Public Notice	<input type="checkbox"/> Notice of Deficiency Response	

¹ The operator has the duty to submit an application if the facility is owned by one person and operated by another [30 TAC 305.43(b)]. The permit will specify the operator and the owner who is listed on this application [Section 361.087 Texas Health and Safety Code].

Signature Page

I, Mark Meadows, Environmental Manager
(Operator) (Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: [Handwritten Signature] Date: 2/18/11

TO BE COMPLETED BY THE OPERATOR IF THE APPLICATION IS SIGNED BY AN AUTHORIZED REPRESENTATIVE FOR THE OPERATOR

I, _____, hereby designate _____
(Print or Type Operator Name) (Print or Type Representative Name)

as my representative and hereby authorize said representative to sign any application, submit additional information as may be requested by the Commission; and/or appear for me at any hearing or before the Texas Commission on Environmental Quality in conjunction with this request for a Texas Water Code or Texas Solid Waste Disposal Act permit. I further understand that I am responsible for the contents of this application, for oral statements given by my authorized representative in support of the application, and for compliance with the terms and conditions of any permit which might be issued based upon this application.

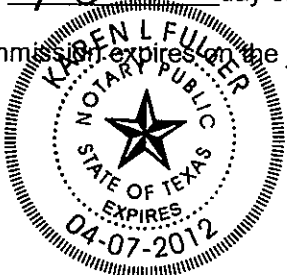
Printed or Typed Name of Operator or Principal Executive Officer

Signature

SUBSCRIBED AND SWORN to before me by the said Mark Meadows

On this 18 day of February, 2011

My commission expires on the 7 day of April, 2012



Karen L. Fuller
Notary Public in and for
Hill County, Texas

(Note: Application Must Bear Signature & Seal of Notary Public)

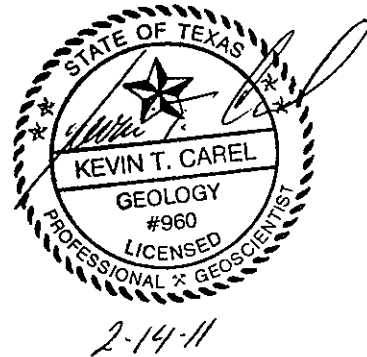
Attachment 5
Underlined/Strikeout Pages

**TRINITY OAKS LANDFILL
DALLAS COUNTY, TEXAS
MSW PERMIT NO. 556**

**SITE DEVELOPMENT PLAN
ATTACHMENT 5
GROUNDWATER CHARACTERIZATION REPORT**

Prepared for:
Mesquite Landfill TX, L.P.

February 2011



Prepared by:



136 Pecan Street
Keller, Texas 76248
(817) 337-0112

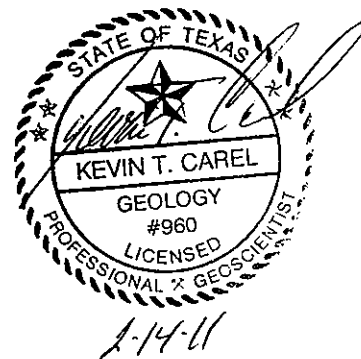
CONTENTS

TABLES AND ILLUSTRATIONS	III
1 SITE HYDROGEOLOGY	1
1.1 Uppermost Groundwater Zone	1
1.2 Groundwater Flow Direction and Rate	1
1.3 Historical Groundwater Monitoring	2
1.4 Groundwater Quality	32
2 GROUNDWATER MONITORING SYSTEM	54
2.1 Existing Groundwater Monitoring System	54
2.2 Proposed Groundwater Monitoring System	54
2.3 Monitoring Well Design	65
2.4 Groundwater Sampling and Analysis Plan	75
3 REFERENCES	86

APPENDIX 5A – Time Series Plots

APPENDIX 5B – Piper and Stiff Diagrams

APPENDIX 5C – Historical Groundwater Contour Maps



TABLES AND ILLUSTRATIONS

Tables

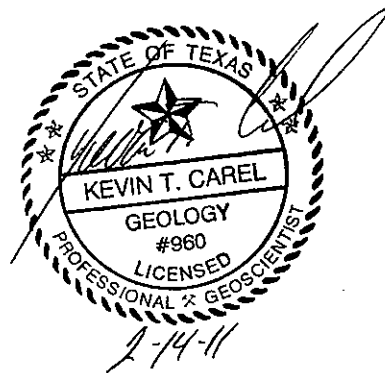
5.1 Groundwater Monitoring System Details

Figures

5.1 Monitoring Well Location Map

5.2 Typical Monitoring Well Detail

5.25.3 Groundwater Monitoring System Design Certification



1 SITE HYDROGEOLOGY

This Groundwater Characterization Report has been prepared for the Trinity Oaks Landfill consistent with 30 TAC Chapter 330.

1.1 Uppermost Groundwater Zone

The Trinity Oaks Landfill is excavated into Quaternary age alluvium and the underlying Taylor Marl Formation. The alluvium comprises the uppermost water-bearing zone under the waste management unit. It consists of interbedded gravel, sand, silt, and clay. The thickness of the alluvium ranges from approximately 11 to 41 feet. The thicker areas are reported to be in the northern portion of the facility. The alluvium exhibits a fining upward sequence, beginning with a basal gravel transitioning upward into finer grained sediments. However, strata thickness and transitions are not generally uniform or continuous. All monitor wells are completed in the uppermost water-bearing zone. Underlying the alluvium are shales of the Taylor Marl, which act as an aquitard to vertical groundwater movement. The geology of the site is described more thoroughly in the 1994 Permit Modification Report for the facility (HDR, 1994).

1.2 Groundwater Flow Direction and Rate

In general, groundwater in the alluvium flows south-southwest towards the Trinity River. The northern portion of the facility is hydraulically upgradient, whereas the southern and western boundaries of the facility are hydraulically downgradient.

Hydraulic conductivity for the uppermost water-bearing zone was estimated by HDR (1994) to average about 1×10^{-3} cm/sec. The average effective porosity was estimated to be 40 percent, based on values provided by HDR (1994). The gradient for a particular part of the site was determined by calculating the difference between the groundwater contours (head difference) and dividing by the horizontal distance between the contours. The values are in ft/ft; multiplied by 5,280 for the gradient in feet per mile.

Maximum groundwater velocities were estimated for the uppermost water-bearing zone using the above values and calculated hydraulic gradients from November 1999 to August 2010. The estimated maximum groundwater velocity from the aforementioned time frame is 0.14 +/- 0.03 ft/day, or 51 +/- 11 ft/year. Maximum rates of groundwater movement were calculated using the groundwater velocity equation (Driscoll, 1986).



$$v = 2,830 K i / n_e$$

Where:

v = groundwater velocity (ft/day);
 K = hydraulic conductivity (cm/sec);
 i = hydraulic gradient (ft/ft);
 n_e = effective porosity (percent); and
2,830 converts cm/sec to ft/day.

1.3 A slurry wall was constructed prior to development of the 60 acre Subtitle D area. Its original purpose is believed to have been to aid in the construction of the landfill cells by preventing groundwater inflow into the excavations. To be effective in controlling groundwater inflow, the slurry wall was constructed outside of the proposed waste cell location. The slurry wall was not removed or damaged during cell excavation or construction. The slurry wall's presence provides an impediment to groundwater flow.

1.3 Historical Groundwater Monitoring

Groundwater monitor wells MW-1A through MW-8 were installed in accordance with a Class I permit modification to install groundwater monitor wells (HDR, 1994), approved by the Texas Commission on Environmental Quality (TCEQ) (formerly the Texas Natural Resource Conservation Commission (TNRCC)). Collection and analysis of initial background samples commenced in late 1995 and continued until eight (8) quarterly background samples were available. Monitor well MW-7 was decommissioned and replaced by MW-7A in August 1999. Monitor well MW-6 was decommissioned and replaced by MW-6A in June 2006.

The facility sampled and analyzed groundwater samples for water quality parameters not listed in Appendix I of 40 CFR Part 258 (Appendix I) in addition to Appendix I parameters from December 1995 to March 2009. In August 2009, monitoring parameters were revised to total metals and VOCs listed in Appendix I in accordance with 30 TAC §330.419, 30 TAC §330.421, and the facility Groundwater Sampling and Analysis Plan (GWSAP) (Carel Corp., 2008).

Barium is the most commonly detected metal. Random detections of antimony, arsenic, cobalt, and nickel have occurred in one (1) or more site wells since groundwater monitoring began in 1995. Time-series plots of the aforementioned Appendix I metal concentrations are provided in Appendix 5A. Most of the random detections are thought to be associated with formation fines and natural groundwater quality.

No VOCs have been confirmed in any site monitor well since detection monitoring was initiated following background monitoring.



1.4 Groundwater Quality

More than 90% of the dissolved solids in groundwater can be attributed to eight ions: sodium, calcium, potassium, magnesium, sulfate, chloride, bicarbonate, and carbonate (Fetter, 2001). Thus, the aforementioned ions are considered the major ions in groundwater. Piper diagrams and Stiff diagrams were utilized to determine the chemical composition of major ions in the existing groundwater monitoring wells at the facility. In order to effectively compare the major ions of groundwater, mass/volume (e.g. mg/L) concentrations are converted to equivalent concentrations (e.g. meq/L). Piper and Stiff Diagrams for each existing groundwater monitoring well are provided in Appendix 5B. The plots for each well, except MW-6A, are provided at five (5) year intervals from 1995 to 2005 along with a plot from ~~one of the last~~ previous monitoring events when major ions were analyzed. A brief summation is provided below:

Background Wells

MW-1A – The major ions consisted of calcium and chloride ~~with~~ followed by sodium plus potassium, and bicarbonate plus carbonate in December 1995. Calcium and chloride gradually decreased with time though the relative proportions of the remaining major ions maintained general stability. Nearly equivalent compositions of calcium, chloride, sodium plus potassium, and bicarbonate plus carbonate were present in March 2009.

MW-2 – The major ions consisted primarily of calcium and bicarbonate plus carbonate with some increase in the composition of sodium plus potassium, and chloride.

Existing Point of Compliance Wells

MW-3 – The major ions consisted primarily of equal compositions of sodium plus potassium, calcium, chloride, and bicarbonate plus carbonate.

MW-4 - The major ions consisted of calcium and sulfate in each plot. Near equivalent compositions of remaining major ions are present on each date.

MW-5 – Sodium plus potassium, calcium, and chloride compositions, constituted the major ionic species for each date.

MW-6A – Equivalent major ion chemical compositions were present in September 2006 and March 2007. The major ions consisted of calcium and chloride.

MW-7A - Sodium plus potassium and bicarbonate plus carbonate compositions primarily constituted the major ionic species for each date though chloride and sulfate anion compositions increased with time.



MW-8 - The major ions consisted of calcium and bicarbonate plus carbonate in December 1995 and August 2000. Sodium plus potassium and chloride increase to near equivalent compositions as calcium and bicarbonate plus carbonate in September 2005 and September 2008.

Overall, the major cation at the facility consists of calcium though sodium plus potassium are also common. Magnesium ionic compositions are minute compared to the aforementioned major cations. Bicarbonate plus carbonate in addition to chloride make up the major anion compositions at the site except well MW-4. Sulfate is the major anion in MW-4. In summary, groundwater quality is somewhat variable at the site.



2 GROUNDWATER MONITORING SYSTEM

2.1 Existing Groundwater Monitoring System

A groundwater monitoring system consisting of eight (8) monitoring wells currently exists at the site. Existing monitor wells include MW-1A through MW-5, MW-6A, MW-7A, and MW-8. All eight (8) wells monitor the groundwater in the Quaternary age alluvium.

MW-1A and MW-2 are background wells. MW-3, MW-4, MW-5, MW-6A, MW-7A, and MW-8 are point of compliance (POC) wells.

The existing monitoring well system for the site is summarized in Table 5-1. Existing monitoring well locations are shown in Figure 5.1 of this attachment.

2.2 Proposed Groundwater Monitoring System

The Trinity Oaks Landfill will comply with 30 TAC §330.403(a)(2) by modifying the ground water monitoring system appropriately. The Trinity Oaks Landfill will utilize the ground water monitoring system to monitor the uppermost ground water in accordance with 30 TAC §§330.403-407 to protect human health and the environment.

The proposed groundwater monitoring system was based on the potentiometric surfaces illustrated on eight historical groundwater contour maps provided in Appendix 5C. The maps were constructed using water-level data collected during semi-annual groundwater monitoring events conducted from May 2007 to October 2010. As previously stated, groundwater flows south-southwest towards the Trinity River. The northern portion of the facility is hydraulically upgradient, whereas the southern and western boundaries of the facility are hydraulically downgradient. Groundwater flow characteristics were addressed in Section 1.2 of this attachment.

The proposed ground water monitoring system will be comprised of ~~sixteen~~ 16 monitor wells (see Table 5-1). This will be done by decommissioning two (2) of the eight (8) existing monitoring wells (MW-5 and MW-6A) and installing ~~ten~~ ten ~~ten~~ 10 new monitoring wells (MW-9 through MW-18). Existing and proposed monitoring wells and the POC are depicted on Figure 5.1, Monitoring Well Location Map. Figure 5.2 illustrates a typical groundwater monitoring well. Each new monitor well will be constructed in accordance with the permit conditions including well spacing requirements and the requirements of 30 TAC §330.421.



