

2 July 2014

Mr. Dwight C. Russell, P.E.
MC-124
Texas Commission on Environmental Quality
MSW Permits Section, Waste Permits Division
P.O. Box 13087
Austin, Texas 78711-3087

**Subject: Response to Notice of Deficiency (NOD)
Permit Modification – Oil and Gas Waste Processing
Covel Gardens Landfill, MSW Permit No. 2093B
San Antonio, Bexar County, Texas
Tracking No. 18053589; RN100218338/CN600127856**

Dear Mr. Russell:

On behalf of Waste Management of Texas, Inc. (WMTX), Geosyntec Consultants (Geosyntec) has prepared this letter in response to the notice of deficiency (NOD) comments on the above-referenced permit modification request transmitted in a 3 June 2014 letter from the Texas Commission on Environmental Quality (TCEQ) to Waste Management of Texas, Inc. (WMTX).

RESPONSE TO COMMENTS

TCEQ's comments are presented below in italicized type, with responses immediately following the comments in regular type. Additionally, the resulting replacement pages to the permit modification application are enclosed with this letter to replace the previously submitted versions of the applicable pages. These revisions have an updated date reflecting the revision. A working copy is also attached to this submittal that uses an underline/strikethrough format, in order to mark the revised text, to highlight the revision and facilitate TCEQ's review.

Comment 1: There appears to be an inconsistency in the closure cost estimate update on Page 8-9. The chart of closure cost estimates includes a title heading "Updated Cost, 2011 Dollars (See Note 3)." Note 3 discusses updating the cost numbers to 2013 dollars. Please clarify that the updated cost estimates are in 2013 dollars and make any necessary revisions to the chart for consistency.

Response to Comment 1: To confirm, the updated costs have indeed been inflated to 2013 dollars. The typographical errors to the column headings of the table on Page 8-9 have been corrected accordingly.

Comment 2: The chart on Page 9 lists the equipment to be used in the processing of oil and gas liquid wastes. It is noted that the water fraction remaining after the hydrocarbons and solids

are removed are proposed to be stored in tanks or placed in up to three existing leachate evaporation surface impoundments that are to be dedicated for oil and gas liquid waste. The impoundments which are dedicated for this use and their capacities should be listed on this chart as components of the oil and gas liquid waste processing facility.

Response to Comment 2: As requested, the list of equipment on Page 9 has been revised to identify these evaporation ponds and their capacities. Also for clarification, Section 3.2.1 indicates that oil and gas waste water may be managed by placing it into one of the existing on-site lined evaporation ponds that will be reserved for exclusive use to hold processed oil and gas waste water only (i.e., not in three ponds at the same time). Also for clarification, additional lined evaporation ponds have been installed at the site. Thus, there are now additional ponds that are available and planned for potential use. Section 3.2.1 has been revised to reflect the updated number of available ponds, and to make it clear that it is proposed to use just one dedicated pond at any given time.

Comment 3: On Page 6, a statement in the current permit providing for testing of separated solids for the presence of free liquids prior to landfilling is proposed to be removed. Testing of processed waste for the presence of free liquids is necessary to ensure that free liquids are not placed in the landfill. Please either retain the statement or explain in the application what alternative evaluation will be performed to ensure that the separated solids do not contain free liquids.

Response to Comment 3: To clarify the location of this statement – it refers to the first bullet of Section 2.2 (Page 5 of the clean copy). In response to this comment, we agree that it is important to retain the requirement to verify that no free liquids are present, and therefore a revision has been made to include the phrase “after verifying that no free liquids are present”. However, we are requesting to not explicitly require paint filter testing, because the verification can be easily made visually without the need for paint filter testing. Experience shows that this material is very dry, and without question does not possess free liquids. Unlike solidification methods which rely on operator judgment of the degree of reagent additive and mixing needed, the centrifuge process is a controlled mechanical process that is very effective in driving out liquids by high centrifugal forces, and produces a very consistent dry solids output. Therefore we are requesting to eliminate the testing, and instead allow for a visual verification.

Comment 4: The oil and gas waste being processed reasonably could contain naturally occurring radioactive materials (NORM) and/or radioactive tracers. Please discuss in the application how the facility addresses the regulatory requirements for disposing of exempt NORM waste and waste containing radioactive tracers to include the solids generated from the centrifuge and heating units. This discussion should include testing procedures to be performed to ensure that all oil and gas related waste meets the radiation limits for exemption prior to landfilling. Please also indicate if the facility has received a TCEQ exemption concurrence pursuant to 30 TAC § 336.5(c), and if so, please provide a copy of the exemption concurrence. If you have questions about NORM waste and waste containing radioactive tracers, information may be found in the TCEQ guidance document RG-486. Mr. Hans Weger in our Radioactive Materials Division (ph.

512-239-6465) may also be contacted with questions.

Response to Comment 4: Overview. The oil and gas waste being received and processed is exempt exploration and production (E&P) waste that Texas regulations place under the RRC's jurisdiction. This waste is managed pursuant to the MOU between the Texas Department of State Health Services (TDHS) and the RRC and the TDHS exemption criteria under 25 TAC 289.259(d)(1)(B) and (d)(2). The recognition of RRC jurisdiction of E&P was what led to Covel Gardens obtaining a RRC permit to operate this oil and gas waste separation facility, based on the memorandum of understanding (MOU) between RRC and TCEQ. Therefore, at a fundamental level, TCEQ's requirements from issues raised by the above comment should not be inconsistent with requirements established by RRC, who regulates the waste. The RRC requirement as described in Covel Garden's current RRC processing permit addresses NORM waste management as follows:

"Each load of incoming waste, other than water based drilling fluid and the associated cuttings, or oil based drilling fluid and the associated cuttings [emphasis added], must be scanned for the presence of naturally occurring radioactive material (NORM) using a scintillation meter with a sodium iodide detector. Any load with a maximum reading of 50 microrentgens per hour or more may not be unloaded or processed at the facility unless further analysis of the waste demonstrates that the waste does not exceed 30 picocuries per gram Radium-226 combined with Radium-228 and 150 picocuries per gram of all other radionuclides."

Based on RRC language, they exclude the drill cuttings and fluids because they are not likely sources of NORM waste. RRC requires testing for other types of E&P waste or waste from other sources (tank bottoms, pipes scale, equipment, sludges, etc.) in order to confirm that the waste meets the radiation limits exemption prior to receipt for processing and or disposal. WMTX follows the RRC permit provisions, and by doing so, assures that the waste being routed through the RRC permitted process does not contain radioactive waste above the threshold levels. The next section below addresses how the waste retains its exemption after processing (i.e., a new waste stream is not being generated by the separation process into its solid and liquid components).

Oil and Gas E&P Waste Exemption. In addition to the fact that the drilling fluid and cuttings waste stream is not regarded by the RRC as a likely source of radioactivity, it is important to note that only exempt waste is being processed. Once exempt, the exemption remains, per EPA interpretation of the rule. Please note this Q&A response on the EPA webpage (<http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf>) regarding RCRA Exempt E&P waste:

Q: Do exempt wastes lose their exempt status if they undergo custody transfer and are transported offsite for disposal?

A: No. Custody transfer is used to define the endpoint of production operations for crude oil and applies only to the change in ownership of the product (e.g., crude oil). Exempt wastes maintain their exempt status even if they undergo custody transfer and are transported off-site for disposal or treatment.

The exempt oil and gas E&P wastes being processed at Covell Gardens do not lose their exemption by being separated into their solid and liquid components. Thus, Covell Gardens' processing activities are not resulting in a new waste stream being generated. Once the waste is deemed acceptable for receipt at the facility in accordance with the RRC permit (and provisions of the current Covell Gardens TCEQ permit), it is not subject to new waste profiling, evaluation, or testing prior to disposal.

Additional Information. While the above response is believed to be sufficient, we wish to provide additional information to show that the current TCEQ permit for this facility has provisions for excluding the receipt of radioactive waste of any type. Per the MSW permit, the Covell Gardens facility shall not accept radioactive waste (regardless of whether it is generated from an oil and gas waste stream, or any other waste stream, and regardless of whether it is man-made such as a tracer, or NORM exceeding radiation limits for an exemption). The facility follows the approved Special Waste Acceptance Plan to screen for and prevent the acceptance of radioactive waste. This includes Waste Management's (WM's) technical services center chemists' evaluation of the information provided by the generator on the waste profile sheet, which asks the generator if the waste is 'NRC regulated radioactive or NORM waste'. The answer to this question, in conjunction with the type of waste being profiled (process knowledge) is considered to address this question and determine if acceptable. If the response to the question is 'yes', or the waste appears to be one where NORM would be expected (produced sands and waters, pipe scale, sludge from produced waters, contaminated equipment), then WM requests a copy of the radiation survey done on the waste, and a copy of TCEQ's written concurrence to radiation licensing exemption under 25 TAC §289. Thus, the current TCEQ permit already has the provisions in place to prevent the receipt and subsequent disposal of radioactive waste – and based on the discussion above, Covell Gardens is not generating a new waste stream through the separation process of the exempt waste.

Comment 5: It does not appear that the clean copy of the revised permit modification pages have been three-hole punched to allow their inclusion in the D-ring binders in which the approved permit application is located. In the future, please submit all pages that are intended to be placed in the approved permit application with the necessary holes punched.

Response to Comment 4: We apologize for this mistake and the inadvertent lack of three-hole punching. The clean copies provided with this submittal are three-hole punched.

ADDITIONAL REQUESTED CHANGES

We are also requesting additional revisions at this time, not specifically related to the above comments. The purpose of these revisions is to make the TCEQ permit items consistent with the latest proposed oil and gas processing facility layout and equipment list that is contained in the Railroad Commission of Texas (RRC) Separation Facility Permit. The RRC permit has been undergoing revisions on a similar regulatory review timeframe as this TCEQ permit modification. As part of this process, WMTX has identified other layout and equipment changes that are proposed to better manage and operate the facility. The specific changes being requested are identified below:

- Revised Permit Drawing IV-I-1. Note 6 on this drawing is being revised to indicate that a 10-ft

(min) separation clearance distance should be provided between the top of the liner and processing area components (including basins). The reason for this change is that the previous 15-ft separation distance was arbitrary and did not have a technical basis for that distance, and it has been determined that one of the proposed basins would be best suited for an area with less than 15-ft (but more than 10-ft) of separation. It is noted that a 10-ft separation distance is believed to be technically adequate to prevent inadvertent damage to the liner such as due to equipment operations and loads. For example, the approved Soils and Liner Quality Control Plan (SLQCP) allows unrestricted equipment ground pressures to operate as close as 3-ft above the liner.

- Revised Permit Drawing IV-I-2 through IV-I-4. These drawings are revised to reflect changes in the site layout (pit orientation/location, frac tank locations, thermal site layout) and to incorporate the addition of frac tanks.
- Revised Permit Drawing IV-I-5. This drawing is revised to reflect changed pit (basin) dimensions as well as a removal of the clay secondary containment option.
- Attachment 8 – Closure Cost Estimate. The addition of the frac tanks and the modified pit (basin) dimensions resulted in changes to the waste volumes used to calculate the closure cost of the facility. Therefore, the facility combined closure and post closure cost estimate, Section 4 of Attachment 8, has been updated to reflect the new cost estimate.

PART I FORM AND CERTIFICATION STATEMENT

Pages 1 and 9 of the Part I Form are being submitted with this response. Page 9, the Signature Page, provides the certification statement signed by the applicant's responsible official.

CLOSURE

One original and two copies of this submittal are being provided to the TCEQ MSW Permits Section in Austin. Also, one copy has been sent directly to TCEQ Region 13 Office, as indicated on the distribution list at the end of this letter. An electronic copy of this submittal has also been posted to the internet at the same URL as the initial posting of the application. Geosyntec trusts that the above responses to TCEQ's comments provide the necessary information requested by TCEQ to complete their technical review of the permit modification. If you have any questions regarding the information presented in this letter, please do not hesitate to contact the undersigned by telephone at (512) 451-4003, or by E-mail at sgraves@geosyntec.com.

Sincerely,



Scott M. Graves, P.E.

Associate, Geosyntec Consultants, Inc.

Copy to: Mr. Cameron Lopez, TCEQ Region 13 Office
Mr. Tim Champagne, WMTX

PART I FORM UPDATE PAGES
(includes Applicant's Certification Statement)

The pages that follow are updates to the Part I Form which include the applicant's certification statement for this submittal.

Facility Name: Covel Gardens Landfill
Permittee/Registrant Name: Waste Management of Texas, Inc.
MSW Authorization #: 2093B
Initial Submittal Date: 4-4-2014
Revision Date: 7-2-2014



Texas Commission on Environmental Quality

Permit/Registration Modification and Temporary Authorization Application Form for an MSW Facility

1. Reason for Submittal

- Initial Submittal Notice of Deficiency (NOD) Response

2. Authorization Type

- Permit Registration

3. Application Type

- Modification with Public Notice Modification without Public Notice
 Temporary Authorization (TA) Modification for Name Change/Transfer

4. Application Fees

- Pay by Check Online Payment

If paid online, e-Pay Confirmation Number: 582EA000164351

5. Application URL

Is the application submitted for a permit/registration modification with public notice?

- Yes No

If the answer is "Yes", enter the URL address of a publicly accessible internet web site where the application and all revisions to that application will be posted in the space provided: [http:// www0.wm.com/wm/texas/permits.asp](http://www0.wm.com/wm/texas/permits.asp)

6. Confidential Documents

Does the application contain confidential documents?

- Yes No

If "Yes", cross-reference the confidential documents throughout the application and submit as a separate attachment in a binder clearly marked "CONFIDENTIAL."

Signature Page

I, Steve Jacobs, Director of Disposal Operations,
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (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: 7/2/14

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 Steve Jacobs

On this 2nd day of July, 2014

My commission expires on the 26th day of July, 2014

Jill Beardsley
Notary Public in and for

Tarrant County, Texas

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



REDLINE/STRIKETHOUGH PAGES

To facilitate TCEQ's review, the attached pages present a "redline/strikethrough" version of the following items, showing the proposed revisions:

- Part III (Site Development Plan), Attachment 8 – Closure and Post Closure Cost Estimates (Section 4); and
- Part IV – Appendix IV-I, Oil and Gas Waste Processing Plan (Sections 3.2.1 and 4.3).



Prepared for Applicant:
Waste Management of Texas, Inc.
8611 Covell Road
San Antonio, Texas 78252
(210) 623-8800

**PERMIT AMENDMENT APPLICATION
PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 8**

**CLOSURE AND POST-CLOSURE CARE
COST ESTIMATE**

**COVEL GARDENS LANDFILL
SAN ANTONIO, BEXAR COUNTY, TEXAS
PERMIT NO. MSW - 2093B**

Prepared by:



GEOSYNTEC CONSULTANTS
3600 Bee Caves Road, Suite 101
Austin, Texas 78746
(512) 451-4003

Rev. 0, Initial Application Submittal – 31 March 2005
Response to NOD 1 – 27 July 2005
Response to NOD 2 – 30 August 2005
Technically Complete – 28 October 2005
Permit Issued – 29 June 2006
Revised – ~~April~~ July 2014

COVEL GARDENS LANDFILL				
COMBINED CLOSURE & POST-CLOSURE COST ESTIMATE FOR FACILITY				
ITEM	COST ESTIMATE AT TIME SUBMITTED		COMPOUNDED INFLATION FACTOR FOR ADJUSTMENT TO 2011 DOLLARS (Notes 2 and 3)	UPDATED COST, 2011 DOLLARS (Note 3)
	Amount	Year		
Landfill Closure/Post-Closure	\$18,207,506	2004	1.197	\$21,798,256
Brush and Wood Recycling Area	\$507,576	2009	1.066	\$540,832
Oil and Gas Waste Processing Facility	\$98,940	2014	1.00	\$98,940
FACILITY CLOSURE/POST-CLOSURE COST ESTIMATE:				\$22,438,027

(1) The purpose of this table is to adjust the facility closure/post-closure costs to a consistent dollar (year) basis.

(2) Inflation factors are provided by TCEQ on the following webpage:

https://www.tceq.texas.gov/adminservices/financial-assurance/revenue/annual_inflation_factors.html.

Year	TCEQ Inflation Factor	Compounding factor from 2004	Compounding factor from 2009
2004	2.6%	1	
2005	2.8%	1.028	
2006	2.9%	1.058	
2007	2.7%	1.086	
2008	2.2%	1.110	
2009	1.2%	1.124	1
2010	1.0%	1.135	1.010
2011	2.1%	1.159	1.031
2012	1.8%	1.180	1.050
2013	1.5%	1.197	1.066

(3) At the time of the initial submittal of the permit modification associated with the revision to this table in March 2014, the latest year for which TCEQ has published inflation factors is 2013. Even though the oil and gas waste processing facility closure costs are calculated in 2014 dollars, they are conservatively reported as 2013 dollars (instead of de-flating them from 2014 to 2013 dollars).

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Prepared for:

Waste Management of Texas, Inc.

8611 Covell Road

San Antonio, Texas 78252

(210) 623-8800

OIL AND GAS WASTE PROCESSING PLAN

COVEL GARDENS LANDFILL

MSW PERMIT NO. 2093B

SAN ANTONIO, BEXAR COUNTY, TEXAS

Prepared by:

Geosyntec 
consultants

8217 Shoal Creek Blvd, Suite 200

Austin, Texas 78757

(512) 451-4003

April 2014

Revised July 2014

- Step 4) solids from both the Shaker Tank(s) and Centrifuge(s) will accumulate at the solids discharge areas into a container/box for disposal at the appropriate working face (after verifying that no free liquids are present); and
- Step 5) separated liquids remaining after initial centrifuge processing will be in two phases – water and oil. Additional centrifuging may be utilized as needed to separate oil and water. Also, a Dissolved Air Flotation (DAF) unit will be used to help separate oil and water. The separated liquid will be either transferred back to the designated oil and gas waste basins for solidification, or transferred to the appropriate tank (Recovered Water Tank or the Recovered Oil Tank) and further managed/disposed of as described in Section 2.2 below.

Processing at Thermal Site

- Step 1) oil and gas waste to be processed by the thermal unit will be transported from the designated basins into the thermal unit for subsequent heating;
- Step 2) solids will move into the Ash Cooler for cooling, and will accumulate at the solids discharge area into a container/box for disposal at the appropriate working face (after verifying that no free liquids are present);
- Step 3A) separated liquids will be condensed, and if further processing is necessary, will be transported to the centrifuge site to achieve better separation of the water and oil;
- Step 3B) if the separation of the water and oil is deemed satisfactory, the separated liquid will be either transferred back to the designated oil and gas waste basins for solidification, or transferred to the appropriate tank (Recovered Water Tank or the Recovered Oil Tank) and further managed/disposed of as described in Section 2.2 below.

2.2 Destinations of Processed Waste (Post Processing)

The destination of the processed oil and gas waste materials is as follows:

- Separated solids will be disposed of at the Class 1 waste working face (after verifying that no free liquids are present).
- The separated water-phase oil and gas waste (which is primarily a briny water) will be either: (i) solidified in accordance with Part IV, Sub-Appendix IV-A-1; (ii) managed as contaminated water as described in Part III, Attachment 15

Recovered Water Tank: This type of tank will be made of steel will be used to receive and store the water-phase liquids that have been separated during centrifuging. These tanks may consist of vertical static tanks, mobile frac tanks or some combination up to the capacity limits shown in Table IV-I-1 and on Drawings IV-I-2 and IV-I-3.

Recovered Oil Tank: Any oil recovered through the various centrifuging, separation, and skimming processes will be placed in this type of tank, made of steel, for subsequent transportation off-site for further processing/recovery at a permitted oil waste reclamation facility. These tanks may consist of vertical static tanks, mobile frac tanks or some combination up to the capacity limits shown in Table IV-I-1 and on Drawings IV-I-2 and IV-I-3.

Other ancillary pieces of equipment will be used to effectively manage the area (e.g., washout water system tanks, transfer pumps, air compressors, etc.).

Frac Tank: This type of tank will be used either to hold washout water to clean out the trucks or tankers or to temporarily store unprocessed waste in the event that the pits are filled to capacity during times of peak receipt of incoming wastes.

2.4.3 List of Equipment and Capacity

Table IV-I-1 below provides a list of the maximum numbers of equipment and summarizes the capacity/volume of these items, the maximum number of each item, and the resulting calculated maximum inventory of unprocessed and processed waste that may be on-site at any point in time. The facility may elect to do phase installation of these maximum numbers of equipment over time, based on the rates of incoming oil and gas waste experienced at the site and the equipment capabilities to effectively and properly manage and process the waste and conduct related operations within the required timeframes.

TABLE IV-I-1				
LIST OF EQUIPMENT - OIL AND GAS WASTE PROCESSING FACILITY				
COVEL GARDENS LANDFILL				
ITEM	DESCRIPTION OF MAXIMUM SIZE	CAPACITY (gallons, unless noted)	MAXIMUM NUMBER OF ITEMS	TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted)
METAL BASIN	30' X 21' X 9' (7' depth of holding capacity)	32,989	6	197,935
METAL BASIN	20' X 15' X 9' (7' depth of holding capacity)	15,709	2	31,418
REINFORCED CONCRETE BASIN	25' X 24' X 8' (23' X 22' X 6' of holding capacity)	22,711	4	90,843
SHAKER TANKS	400 Barrels	16,800	2	33,600
FEED TANKS	400 Barrels	16,800	8	134,400
CENTRIFUGES	50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x 90 gal catch tanks)		9	1,620
DISSOLVED AIR FLOTATION (DAF)	Trailer or skid-mounted unit with 3600 gal. tank	3,600	2	7,200
ROLL-OFF CONTAINER	40-yard Dumpster	40 cubic yards (solid material, not reported in gallons)	3	120 cubic yards
3-SIDED BOX CONTAINER	30' X 20' X 10' tall (open side, capacity smaller than full dimensions)	200 cubic yards (solid material, not reported in gallons)	1	200 cubic yards
RECOVERED LIQUID TANKS	500 Barrels	21,000	16	336,000
MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT CENTRIFUGE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons):				512,820
QUANTITY ESTIMATES: MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE CENTRIFUGE PROCESSING AREAS				
UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons):				488,196
PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons):				344,820
PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards):				320
COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons):				833,016

TABLE IV-I-1
LIST OF EQUIPMENT - OIL AND GAS WASTE PROCESSING FACILITY
COVEL GARDENS LANDFILL

ITEM	DESCRIPTION OF MAXIMUM SIZE	CAPACITY (gallons, unless noted)	MAXIMUM NUMBER OF ITEMS	TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted)
METAL BASIN	30' X 21' X 9' (7' depth of holding capacity)	32,989	4	131,956
REINFORCED CONCRETE BASIN WITH SACRIFICIAL METAL LINING	25' X 24' X 8' (6' depth of holding capacity)	26,930	8	215,439
SHAKER TANKS	400 Barrels	16,800	2	33,600
FEED TANKS	400 Barrels	16,800	8	134,400
CENTRIFUGES	50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x90 gal catch tanks)		11	1,980
DISSOLVED AIR FLOTATION (DAF)	Trailer or skid-mounted unit with 3600 gal. tank	3,600	2	7,200
ROLL-OFF CONTAINER	40-yard Dumpster	40 cubic yards (solid material, not reported in gallons)	6	240 cubic yards
3-SIDED BOX CONTAINER	30' X 20' X 10' tall (open side, capacity smaller than full dimensions)	200 cubic yards (solid material, not reported in gallons)	1	200 cubic yards
RECOVERED LIQUID TANKS	500 Barrels	21,000	16	336,000
FRAC TANKS	500 Barrels	21,000	15	315,000
MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT CENTRIFUGE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons):				828,180
<u>QUANTITY ESTIMATES</u> : MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE CENTRIFUGE PROCESSING AREAS				
UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons):				830,395
PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons):				345,180
PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards):				440
COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons):				1,175,575

- Notes: (1) Centrifuge throughput is dependent on solids content and can vary widely.
(2) Capacities of ancillary components – on-site lined evaporation ponds (See Section 3.2.1 for provisions of pond usage).
Pond C: 2,939,300 gallons;
Pond D: 3,823,200 gallons;
Pond E: 3,652,200 gallons;
Pond F: 3,329,200 gallons.

3. OTHER OPERATIONAL REQUIREMENTS

This section of the Plan has been developed to address the applicable sections of 30 TAC Chapter 330 Subchapter E of the TCEQ Municipal Solid Waste Management Regulations (MSWMR) "Operational Standards for Solid Waste Storage and Processing Units." The following sections of Subchapter E are not applicable and not discussed further, because the requirements covered by these sections are for items not associated with the oil and gas waste processing facility/operations:

- 330.211 (Approved Containers);
- 330.213 (Citizen's Collection Stations);
- 330.215 (Requirements for Stationary Compactors); and
- 330.217 (Pre-Operation Notice).

3.1 Facility-Generated Wastes

The waste processing facility will separate the oil and gas waste into three phases: solid, water, and oil (i.e., petroleum products). The destination of these materials will be as discussed in Section 2.2. As noted, when the processed water from the centrifuge or thermal site is generated, it will be managed as contaminated water (in accordance with 30 TAC §330.207), as was described in Section 2.2. Also, more information on the control of contaminated water is presented below in Section 3.2.

3.2 Contaminated Water Management, Spill Prevention and Control

3.2.1 Contaminated Water Management

The facility will take the steps necessary to control and prevent the discharge of contaminated water from the oil and gas waste processing facility. Any water (e.g., stormwater, wash water) that has come in contact with waste will be managed as contaminated water and accordingly, will be handled as contaminated water in accordance with Part III, Attachment 15 (Leachate and Contaminated Water Plan). Furthermore, the processed waste water will be managed as contaminated water in accordance with 30 TAC §330.207 by following the Leachate and Contaminated Water Plan. Processed oil and gas waste water **shall not be comingled** with other waters, contaminated waters, leachate, or wastes. Oil and gas waste water will be transported to an existing on-site lined evaporation pond via dedicated tanker truck(s) (i.e., tankers not containing other contaminated waters or leachate). The oil and gas waste water will then be managed by placing it into one of either Pond C, D, E, or F (i.e., one of the three

existing on-site lined evaporation ponds that will be reserved for exclusive use to hold processed oil and gas waste water only). Any oil and gas waste water that is transported off-site for disposal must not be mixed with contaminated water or leachate.

Contaminated water shall not be discharged from the site without specific written TCEQ authorization. Furthermore, the oil and gas waste processing facility will be operated in accordance with 30 TAC §330.15(h) regarding the prohibition of discharges of solid wastes or pollutants into waters of the United States.

The generation of contaminated water will be minimized by a combination of site grading (to direct stormwater run-on away from and around the oil and gas waste processing facility), and earthen berms surrounding the processing facility to intercept and divert stormwater run-on from entering the areas).

3.2.2 Spill Prevention and Control (Containment)

Vehicle Unloading and Basin Secondary Containment Liner. Vehicle unloading of oil and gas waste will take place at the designated basins. The basins will be recessed below-grade and will be surrounded by a secondary containment liner composed of a minimum of 3-ft thick low permeability ($k \leq 1 \times 10^{-7}$ cm/s) compacted clay liner around the sides and bottom as shown on Drawing IV-I-5. For surface containment and control, the concrete basins have a concrete approach ramp sloped to drain into the basins. At the steel basins, the ground surface immediately adjacent to the basins where they unload will be graded to drain towards the basins. Spilled or leaked waste in and around the vehicle unloading area and basins will be cleaned up using soil or other absorbent material/solidifying agents to remove free liquids, followed by disposal in the landfill.

Centrifuge Site and Thermal Site – Secondary Containment Liner. As shown on Drawings IV-I-2 through 5, the centrifuge site and the thermal site will have a secondary containment liner surrounding the floor and sides of the area, composed of either concrete or compacted clay liner. The secondary containment liner is sized according to the following design criteria (whichever is greater):

- (i) the volume of the 25-year, 24-hour storm plus the volume of the largest storage container; or
- (ii) the volume of the 25-year, 24-hour storm plus 10% of the combined volume of all the containers within the contained area.

For reference, the 25-year, 24-hour storm is 7.8 inches (taken from the facility storm water management calculations in Part III, Attachment 6 of the permit; the source of

TABLE IV-L2					
CLOSURE COST ESTIMATE - OIL AND GAS WASTE PROCESSING FACILITY					
COVEL GARDENS LANDFILL					
ITEM No.	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
1	Engineering				
1.2	Contract Administration, Bidding and Award	L.S.	\$4,000	1	\$4,000
1.3	Administrative Costs	L.S.	\$3,000	1	\$3,000
	ENGINEERING TOTAL				\$7,000
2	Closure Construction Activities (dispose of unprocessed waste, decon, remove equipments)				
2.1	Mobilization & Demobilization of Contractor	L.S.	\$10,000	1	\$10,000
2.2	Off-Site Disposal of Processed Oil/Gas Waste Water	Gal.	\$0.10	261,180	\$26,118
2.3	Sale of Processed Oil (proceeds will offset other closure costs)	Gal.	\$0.00	60,000	\$0
2.4	Solidification of Unprocessed Liquid Waste	C.Y.	\$2.50	8,223	\$20,557
2.5	On-Site Disposal of Solidified Waste (haul to working face)	C.Y.	\$2.00	8,223	\$16,446
2.6	On-Site Disposal of Solid-Fraction Processed Waste (haul to working face)	C.Y.	\$2.00	440	\$880
2.7	Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters.	L.S.	\$5,000	1	\$5,000
2.8	Re-Sale Value of Equipment (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.9	Salvage Value of Metal Basins (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.10	In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil)	C.Y.	\$2.50	600	\$1,499
2.11	Revegetate Fixed Facility Disturbed Area (half of 375' x 550')	Ac.	\$1,500	2.4	\$3,551
	CONSTRUCTION TOTAL				\$84,051
	ENGINEERING AND CONSTRUCTION TOTAL				\$91,051
3	Contingency, Contract, and Legal				
3.1	Contingency (10% of Eng and Construction)				\$9,105
3.2	Contract Performance Bond (1% of Eng and Construction)				\$911
3.3	Legal Fees (15% of Eng and Construction)				\$13,658
3.4	TCEQ Administration Cost (5% of Eng and Construction)				\$4,553
	CONTINGENCY, CONTRACT, LEGAL TOTAL				\$28,226
	TOTAL LIQUID WASTES SOLIDIFICATION AREA CLOSURE COST				\$119,277

Above costs are in 2014 dollars. Oil and Gas Waste Processing Facility Closure Cost on this Table shall be added to the other facility Closure Costs - See Part III, Attachment 8.

TABLE IV-L2					
CLOSURE COST ESTIMATE - OIL AND GAS WASTE PROCESSING FACILITY					
COVEL GARDENS LANDFILL					
ITEM No.	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
1	Engineering				
1.2	Contract Administration, Bidding and Award	L.S.	\$4,000	1	\$4,000
1.3	Administrative Costs	L.S.	\$3,000	1	\$3,000
	ENGINEERING TOTAL				\$7,000
2	Closure Construction Activities (dispose of unprocessed waste, decon, remove equipments)				
2.1	Mobilization & Demobilization of Contractor	L.S.	\$10,000	1	\$10,000
2.2	Off-Site Disposal of Processed Oil/Gas Waste Water	Gal.	\$0.10	260,820	\$26,082
2.3	Sale of Processed Oil (proceeds will offset other closure costs)	Gal.	\$0.00	60,000	\$0
2.4	Solidification of Unprocessed Liquid Waste	C.Y.	\$2.50	4,834	\$12,086
2.5	On-Site Disposal of Solidified Waste (haul to working face)	C.Y.	\$2.00	4,834	\$9,668
2.6	On-Site Disposal of Solid-Fraction Processed Waste (haul to working face)	C.Y.	\$2.00	320	\$640
2.7	Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters.	L.S.	\$5,000	1	\$5,000
2.8	Re-Sale Value of Equipment (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.9	Salvage Value of Metal Basins (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.10	In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil)	C.Y.	\$2.50	600	\$1,499
2.11	Revegetate Fixed Facility Disturbed Area (half of 375' x 550')	Ac.	\$1,500	2.4	\$3,551
	CONSTRUCTION TOTAL				\$68,526
	ENGINEERING AND CONSTRUCTION TOTAL				\$75,526
3	Contingency, Contract, and Legal				
3.1	Contingency (10% of Eng and Construction)				\$7,553
3.2	Contract Performance Bond (1% of Eng and Construction)				\$755
3.3	Legal Fees (15% of Eng and Construction)				\$11,329
3.4	TCEQ Administration Cost (5% of Eng and Construction)				\$3,776
	CONTINGENCY, CONTRACT, LEGAL TOTAL				\$23,413
	TOTAL LIQUID WASTES SOLIDIFICATION AREA CLOSURE COST				\$98,940

Above costs are in 2014 dollars. Oil and Gas Waste Processing Facility Closure Cost on this Table shall be added to the other facility Closure Costs - See Part III, Attachment 8.

Assumptions and Cost Backup:	
Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure]	
Maximum inventory of wastes assumed as follows (based on Table IV-I-1):	
Unprocessed Oil and Gas Waste (gallons):	830,395
Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons):	261,180
Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank):	84,000
Processed Oil and Gas Waste - Separated Solids (cubic yards):	440
Assumed Solidification Bulking Factor:	2.0
Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards):	8,223
Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects.	
Item 2.2. The facility is currently paying \$0.077/gal to transport and off-site dispose of the processed water. This was rounded up 23% to an even \$0.10/gal.	
Item 2.3. The current price the facility receives for recovered processed oil is \$75.20/barrel, or \$1.79/gallon. (1 bbl = 42 gallons) Even though the material inventory is based on having the oil tank completely full (21,000 gallons), to be conservative, this quantity was reduced. Furthermore, in accordance with TCEQ's request, it is conservatively assumed that the recovered oil has no market value at the time of third-party closure.	
Item 2.4. Basis for Solidification Unit Rate: Solidification on-site soil needs are 2500CY @ \$2.00/CY = \$5000. Mixing Needs: 1 Excavator + 1 Loader can solidify 2000 CY/day. Round up to 3 days total time. From RS Means Construction Cost Data, typical heavy equipment operator rate = \$350/day. 1 CY Loader = \$380/day. 3 CY capacity excavator = \$1275/day. Solidification Cost = \$5000 material + [3 days x (2 operators x 350/day) + \$380/day + \$1275/day] = \$12,065. Expressed on a CY basis, \$12065/4834CY = \$2.50/CY Unit Rate.	
Item 2.7. Basis for Decontamination Costs. Pressure washing unit rates from RS Means Construction Cost Data = \$0.04/S.F. For simplicity, the estimated square footage to be decontaminated (basins, concrete slab, above-ground equipment) assumed as the equivalent of 50,000 S.F. (conservative - equivalent of more than one acre of pressure washing). Pressure washing cost = 0.04 x 50,000 S.F. = \$2000. Assume 10,000 gallons of wash water generated, and off-site dispose of at \$0.30/gallon (conservatively assume triple the unit rate of disposing processed water off-site) = \$3,000. Total = \$5,000.	
Item 2.8. For worst-case (most expensive) cost estimate, assume all equipment is leased, not owned. Therefore, salvage cost = \$0 (i.e., return to Lessor). If equipment is owned, it will have substantial market Re-Sale Value.	
Item 2.9. Metal Basin Salvaging. Typical market pricing of scrap metal (ferrous plate steel scrap) at a scrap yard = \$0.05 to 0.10/lb. Therefore it is likely that the scrap basins can be sold and the proceeds could offset closure costs. However, in accordance with TCEQ's request, it is conservatively assumed that the basin scrap metal has no market value at the time of third-party closure (i.e., the salvage value is \$0).	
Item 2.11. Basis for revegetation: the disturbed area of the waste processing facility is approximated to be half the total area. Mechanical seeding unit rate from RS Means Site Work & Landscape Cost Data = \$1250/acre. This was rounded up 20% to \$1500/acre.	

Assumptions and Cost Backup:	
Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure]	
Maximum inventory of wastes assumed as follows (based on Table IV-I-1):	
Unprocessed Oil and Gas Waste (gallons):	488,196
Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons):	260,820
Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank):	84,000
Processed Oil and Gas Waste - Separated Solids (cubic yards):	320
Assumed Solidification Bulking Factor:	2.0
Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards):	4,834
Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects.	
Item 2.2. The facility is currently paying \$0.077/gal to transport and off-site dispose of the processed water. This was rounded up 23% to an even \$0.10/gal.	
Item 2.3. The current price the facility receives for recovered processed oil is \$75.20/barrel, or \$1.79/gallon. (1 bbl = 42 gallons) Even though the material inventory is based on having the oil tank completely full (21,000 gallons), to be conservative, this quantity was reduced. Furthermore, in accordance with TCEQ's request, it is conservatively assumed that the recovered oil has no market value at the time of third-party closure.	
Item 2.4. Basis for Solidification Unit Rate: Solidification on-site soil needs are 2500CY @ \$2.00/CY = \$5000. Mixing Needs: 1 Excavator + 1 Loader can solidify 2000 CY/day. Round up to 3 days total time. From RS Means Construction Cost Data, typical heavy equipment operator rate = \$350/day. 1 CY Loader = \$380/day. 3 CY capacity excavator = \$1275/day. Solidification Cost = \$5000 material + [3 days x (2 operators x 350/day) + \$380/day + \$1275/day] = \$12,065. Expressed on a CY basis, \$12065/4834CY = \$2.50/CY Unit Rate.	
Item 2.7. Basis for Decontamination Costs. Pressure washing unit rates from RS Means Construction Cost Data = \$0.04/S.F. For simplicity, the estimated square footage to be decontaminated (basins, concrete slab, above-ground equipment) assumed as the equivalent of 50,000 S.F. (conservative - equivalent of more than one acre of pressure washing). Pressure washing cost = 0.04 x 50,000 S.F. = \$2000. Assume 10,000 gallons of wash water generated, and off-site dispose of at \$0.30/gallon (conservatively assume triple the unit rate of disposing processed water off-site) = \$3,000. Total = \$5,000.	
Item 2.8. For worst-case (most expensive) cost estimate, assume all equipment is leased, not owned. Therefore, salvage cost = \$0 (i.e., return to Lessor). If equipment is owned, it will have substantial market Re-Sale Value.	
Item 2.9. Metal Basin Salvaging. Typical market pricing of scrap metal (ferrous plate steel scrap) at a scrap yard = \$0.05 to 0.10/lb. Therefore it is likely that the scrap basins can be sold and the proceeds could offset closure costs. However, in accordance with TCEQ's request, it is conservatively assumed that the basin scrap metal has no market value at the time of third-party closure (i.e., the salvage value is \$0).	
Item 2.11. Basis for revegetation: the disturbed area of the waste processing facility is approximated to be half the total area. Mechanical seeding unit rate from RS Means Site Work & Landscape Cost Data = \$1250/acre. This was rounded up 20% to \$1500/acre.	

REPLACEMENT PAGES

The items that follow are to completely replace the previous versions of these pages.

- Part III (Site Development Plan), Attachment 8 – Closure and Post Closure Cost Estimates (Section 4); and
- Part IV – Appendix IV-I, Oil and Gas Waste Processing Plan (Sections 3.2.1 and 4.3; and Sub-Appendix IV-I-A new Page 12).



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**PERMIT AMENDMENT APPLICATION
PART III – SITE DEVELOPMENT PLAN
ATTACHMENT 8**

**CLOSURE AND POST-CLOSURE CARE
COST ESTIMATE**

**COVEL GARDENS LANDFILL
SAN ANTONIO, BEXAR COUNTY, TEXAS
PERMIT NO. MSW - 2093B**

Prepared by:



FOR PERMIT PURPOSES ONLY

GEOSYNTEC CONSULTANTS, INC.
TEXAS ENGINEERING FIRM
REGISTRATION NO. F-1182



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Rev. 0, Initial Application Submittal – 31 March 2005
Response to NOD 1 – 27 July 2005
Response to NOD 2 – 30 August 2005
Technically Complete – 28 October 2005
Permit Issued – 29 June 2006
Revised – July 2014

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4. FACILITY COMBINED CLOSURE AND POST-CLOSURE COST ESTIMATE

The purpose of this section is to present the combined closure and post-closure costs consistent dollars, for the purposes of identifying the amount of financial assurance required for the facility in consistent dollars. This adjustment calculation is presented below:

COVEL GARDENS LANDFILL				
COMBINED CLOSURE & POST-CLOSURE COST ESTIMATE FOR FACILITY				
ITEM	COST ESTIMATE AT TIME SUBMITTED		COMPOUNDED INFLATION FACTOR FOR ADJUSTMENT TO 2013 DOLLARS (Notes 2 and 3)	UPDATED COST, 2013 DOLLARS (Note 3)
	Amount	Year		
Landfill Closure/Post-Closure	\$18,207,506	2004	1.197	\$21,798,256
Brush and Wood Recycling Area	\$507,576	2009	1.066	\$540,832
Oil and Gas Waste Processing Facility	\$98,940	2014	1.00	\$119,277
FACILITY CLOSURE/POST-CLOSURE COST ESTIMATE:				\$22,458,364
(1) The purpose of this table is to adjust the facility closure/post-closure costs to a consistent dollar (year) basis.				
(2) Inflation factors are provided by TCEQ on the following webpage: https://www.tceq.texas.gov/adminservices/financial-assurance/revenue/annual_inflation_factors.html .				
Year	TCEQ Inflation Factor	Compounding factor from 2004	Compounding factor from 2009	
2004	2.6%	1		
2005	2.8%	1.028		
2006	2.9%	1.058		
2007	2.7%	1.086		
2008	2.2%	1.110		
2009	1.2%	1.124	1	
2010	1.0%	1.135	1.010	
2011	2.1%	1.159	1.031	
2012	1.8%	1.180	1.050	
2013	1.5%	1.197	1.066	
(3) At the time of the initial submittal of the permit modification associated with the revision to this table in June 2014, the latest year for which TCEQ has published inflation factors is 2013. Even though the oil and gas waste processing facility closure costs are calculated in 2014 dollars, they are conservatively reported as 2013 dollars (instead of de-flating them from 2014 to 2013 dollars).				



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OIL AND GAS WASTE PROCESSING PLAN

**COVEL GARDENS LANDFILL
MSW PERMIT NO. 2093B
SAN ANTONIO, BEXAR COUNTY, TEXAS**

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REGISTRATION NO. F-1182

April 2014
Revised July 2014

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 TEXAS ENGINEERING FIRM
 REGISTRATION NO. F-1182

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7/2/2014

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GEOSYNTEC CONSULTANTS, INC.
 INC.
 TEXAS ENGINEERING FIRM
 REGISTRATION NO. F-1182

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Appendix IV-I-A	Manufacturer’s Literature on Centrifuge Equipment
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- Step 4) solids from both the Shaker Tank(s) and Centrifuge(s) will accumulate at the solids discharge areas into a container/box for disposal at the appropriate working face (after verifying that no free liquids are present); and
- Step 5) separated liquids remaining after initial centrifuge processing will be in two phases – water and oil. Additional centrifuging may be utilized as needed to separate oil and water. Also, a Dissolved Air Flotation (DAF) unit will be used to help separate oil and water. The separated liquid will be either transferred back to the designated oil and gas waste basins for solidification, or transferred to the appropriate tank (Recovered Water Tank or the Recovered Oil Tank) and further managed/disposed of as described in Section 2.2 below.

Processing at Thermal Site

- Step 1) oil and gas waste to be processed by the thermal unit will be transported from the designated basins into the thermal unit for subsequent heating;
- Step 2) solids will move into the Ash Cooler for cooling, and will accumulate at the solids discharge area into a container/box for disposal at the appropriate working face (after verifying that no free liquids are present);
- Step 3A) separated liquids will be condensed, and if further processing is necessary, will be transported to the centrifuge site to achieve better separation of the water and oil;
- Step 3B) if the separation of the water and oil is deemed satisfactory, the separated liquid will be either transferred back to the designated oil and gas waste basins for solidification, or transferred to the appropriate tank (Recovered Water Tank or the Recovered Oil Tank) and further managed/disposed of as described in Section 2.2 below.

2.2 Destinations of Processed Waste (Post Processing)

The destination of the processed oil and gas waste materials is as follows:

- Separated solids will be disposed of at the Class 1 waste working face (after verifying that no free liquids are present).
- The separated water-phase oil and gas waste (which is primarily a briny water) will be either: (i) solidified in accordance with Part IV, Sub-Appendix IV-A-1; (ii) managed as contaminated water as described in Part III, Attachment 15

Recovered Water Tank: This type of tank will be made of steel will be used to receive and store the water-phase liquids that have been separated during centrifuging. These tanks may consist of vertical static tanks, mobile frac tanks or some combination up to the capacity limits shown in Table IV-I-1 and on Drawings IV-I-2 and IV-I-3.

Recovered Oil Tank: Any oil recovered through the various centrifuging, separation, and skimming processes will be placed in this type of tank, made of steel, for subsequent transportation off-site for further processing/recovery at a permitted oil waste reclamation facility. These tanks may consist of vertical static tanks, mobile frac tanks or some combination up to the capacity limits shown in Table IV-I-1 and on Drawings IV-I-2 and IV-I-3.

Other ancillary pieces of equipment will be used to effectively manage the area (e.g., washout water system tanks, transfer pumps, air compressors, etc.).

Frac Tank: This type of tank will be used either to hold washout water to clean out the trucks or tankers or to temporarily store unprocessed waste in the event that the pits are filled to capacity during times of peak receipt of incoming wastes.

2.4.3 List of Equipment and Capacity

Table IV-I-1 below provides a list of the maximum numbers of equipment and summarizes the capacity/volume of these items, the maximum number of each item, and the resulting calculated maximum inventory of unprocessed and processed waste that may be on-site at any point in time. The facility may elect to do phase installation of these maximum numbers of equipment over time, based on the rates of incoming oil and gas waste experienced at the site and the equipment capabilities to effectively and properly manage and process the waste and conduct related operations within the required timeframes.

TABLE IV-I-1				
LIST OF EQUIPMENT - OIL AND GAS WASTE PROCESSING FACILITY				
COVEL GARDENS LANDFILL				
ITEM	DESCRIPTION OF MAXIMUM SIZE	CAPACITY (gallons, unless noted)	MAXIMUM NUMBER OF ITEMS	TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted)
METAL BASIN	30' X 21' X 9' (7' depth of holding capacity)	32,989	4	131,956
REINFORCED CONCRETE BASIN WITH SACRIFICIAL METAL LINING	25' X 24' X 8' (6' depth of holding capacity)	26,930	8	215,439
SHAKER TANKS	400 Barrels	16,800	2	33,600
FEED TANKS	400 Barrels	16,800	8	134,400
CENTRIFUGES	50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x90 gal catch tanks)		11	1,980
DISSOLVED AIR FLOTATION (DAF)	Trailer or skid-mounted unit with 3600 gal. tank	3,600	2	7,200
ROLL-OFF CONTAINER	40-yard Dumpster	40 cubic yards (solid material, not reported in gallons)	6	240 cubic yards
3-SIDED BOX CONTAINER	30' X 20' X 10' tall (open side, capacity smaller than full dimensions)	200 cubic yards (solid material, not reported in gallons)	1	200 cubic yards
RECOVERED LIQUID TANKS	500 Barrels	21,000	16	336,000
FRAC TANKS	500 Barrels	21,000	15	315,000
MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT CENTRIFUGE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons):				828,180
<u>QUANTITY ESTIMATES:</u> MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE CENTRIFUGE PROCESSING AREAS				
UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons):				830,395
PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons):				345,180
PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards):				440
COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons):				1,175,575

- Notes: (1) Centrifuge throughput is dependent on solids content and can vary widely.
 (2) Capacities of ancillary components – on-site lined evaporation ponds (See Section 3.2.1 for provisions of pond usage).
 Pond C: 2,939,300 gallons;
 Pond D: 3,823,200 gallons;
 Pond E: 3,652,200 gallons;
 Pond F: 3,329,200 gallons.

3. OTHER OPERATIONAL REQUIREMENTS

This section of the Plan has been developed to address the applicable sections of 30 TAC Chapter 330 Subchapter E of the TCEQ Municipal Solid Waste Management Regulations (MSWMR) "Operational Standards for Solid Waste Storage and Processing Units." The following sections of Subchapter E are not applicable and not discussed further, because the requirements covered by these sections are for items not associated with the oil and gas waste processing facility/operations:

- 330.211 (Approved Containers);
- 330.213 (Citizen's Collection Stations);
- 330.215 (Requirements for Stationary Compactors); and
- 330.217 (Pre-Operation Notice).

3.1 Facility-Generated Wastes

The waste processing facility will separate the oil and gas waste into three phases: solid, water, and oil (i.e., petroleum products). The destination of these materials will be as discussed in Section 2.2. As noted, when the processed water from the centrifuge or thermal site is generated, it will be managed as contaminated water (in accordance with 30 TAC §330.207), as was described in Section 2.2. Also, more information on the control of contaminated water is presented below in Section 3.2.

3.2 Contaminated Water Management, Spill Prevention and Control

3.2.1 Contaminated Water Management

The facility will take the steps necessary to control and prevent the discharge of contaminated water from the oil and gas waste processing facility. Any water (e.g., stormwater, wash water) that has come in contact with waste will be managed as contaminated water and accordingly, will be handled as contaminated water in accordance with Part III, Attachment 15 (Leachate and Contaminated Water Plan). Furthermore, the processed waste water will be managed as contaminated water in accordance with 30 TAC §330.207 by following the Leachate and Contaminated Water Plan. Processed oil and gas waste water **shall not be comingled** with other waters, contaminated waters, leachate, or wastes. Oil and gas waste water will be transported to an existing on-site lined evaporation pond via dedicated tanker truck(s) (i.e., tankers not containing other contaminated waters or leachate). The oil and gas waste water will then be managed by placing it into one of either Pond C, D, E, or F (i.e., one of the

existing on-site lined evaporation ponds that will be reserved for exclusive use to hold processed oil and gas waste water only). Any oil and gas waste water that is transported off-site for disposal must not be mixed with contaminated water or leachate.

Contaminated water shall not be discharged from the site without specific written TCEQ authorization. Furthermore, the oil and gas waste processing facility will be operated in accordance with 30 TAC §330.15(h) regarding the prohibition of discharges of solid wastes or pollutants into waters of the United States.

The generation of contaminated water will be minimized by a combination of site grading (to direct stormwater run-on away from and around the oil and gas waste processing facility), and earthen berms surrounding the processing facility to intercept and divert stormwater run-on from entering the areas).

3.2.2 Spill Prevention and Control (Containment)

Vehicle Unloading and Basin Secondary Containment Liner. Vehicle unloading of oil and gas waste will take place at the designated basins. The basins will be recessed below-grade and will be surrounded by a secondary containment liner composed of a minimum of 3-ft thick low permeability ($k \leq 1 \times 10^{-7}$ cm/s) compacted clay liner around the sides and bottom as shown on Drawing IV-I-5. For surface containment and control, the concrete basins have a concrete approach ramp sloped to drain into the basins. At the steel basins, the ground surface immediately adjacent to the basins where they unload will be graded to drain towards the basins. Spilled or leaked waste in and around the vehicle unloading area and basins will be cleaned up using soil or other absorbent material/solidifying agents to remove free liquids, followed by disposal in the landfill.

Centrifuge Site and Thermal Site – Secondary Containment Liner. As shown on Drawings IV-I-2 through 5, the centrifuge site and the thermal site will have a secondary containment liner surrounding the floor and sides of the area, composed of either concrete or compacted clay liner. The secondary containment liner is sized according to the following design criteria (whichever is greater):

- (i) the volume of the 25-year, 24-hour storm plus the volume of the largest storage container; or
- (ii) the volume of the 25-year, 24-hour storm plus 10% of the combined volume of all the containers within the contained area.

For reference, the 25-year, 24-hour storm is 7.8 inches (taken from the facility storm water management calculations in Part III, Attachment 6 of the permit; the source of

TABLE IV-L2					
CLOSURE COST ESTIMATE - OIL AND GAS WASTE PROCESSING FACILITY					
COVEL GARDENS LANDFILL					
ITEM No.	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
1	Engineering				
1.2	Contract Administration, Bidding and Award	L.S.	\$4,000	1	\$4,000
1.3	Administrative Costs	L.S.	\$3,000	1	\$3,000
	ENGINEERING TOTAL				\$7,000
2	Closure Construction Activities (dispose of unprocessed waste, decon, remove equipments)				
2.1	Mobilization & Demobilization of Contractor	L.S.	\$10,000	1	\$10,000
2.2	Off-Site Disposal of Processed Oil/Gas Waste Water	Gal.	\$0.10	261,180	\$26,118
2.3	Sale of Processed Oil (proceeds will offset other closure costs)	Gal.	\$0.00	60,000	\$0
2.4	Solidification of Unprocessed Liquid Waste	C.Y.	\$2.50	8,223	\$20,557
2.5	On-Site Disposal of Solidified Waste (haul to working face)	C.Y.	\$2.00	8,223	\$16,446
2.6	On-Site Disposal of Solid-Fraction Processed Waste (haul to working face)	C.Y.	\$2.00	440	\$880
2.7	Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters.	L.S.	\$5,000	1	\$5,000
2.8	Re-Sale Value of Equipment (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.9	Salvage Value of Metal Basins (proceeds will offset other closure costs)	L.S.	\$0	1	\$0
2.10	In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil)	C.Y.	\$2.50	600	\$1,499
2.11	Revegetate Fixed Facility Disturbed Area (half of 375' x 550')	Ac.	\$1,500	2.4	\$3,551
	CONSTRUCTION TOTAL				\$84,051
	ENGINEERING AND CONSTRUCTION TOTAL				\$91,051
3	Contingency, Contract, and Legal				
3.1	Contingency (10% of Eng and Construction)				\$9,105
3.2	Contract Performance Bond (1% of Eng and Construction)				\$911
3.3	Legal Fees (15% of Eng and Construction)				\$13,658
3.4	TCEQ Administration Cost (5% of Eng and Construction)				\$4,553
	CONTINGENCY, CONTRACT, LEGAL TOTAL				\$28,226
	TOTAL LIQUID WASTES SOLIDIFICATION AREA CLOSURE COST				\$119,277

Above costs are in 2014 dollars. Oil and Gas Waste Processing Facility Closure Cost on this Table shall be added to the other facility Closure Costs - See Part III, Attachment 8.

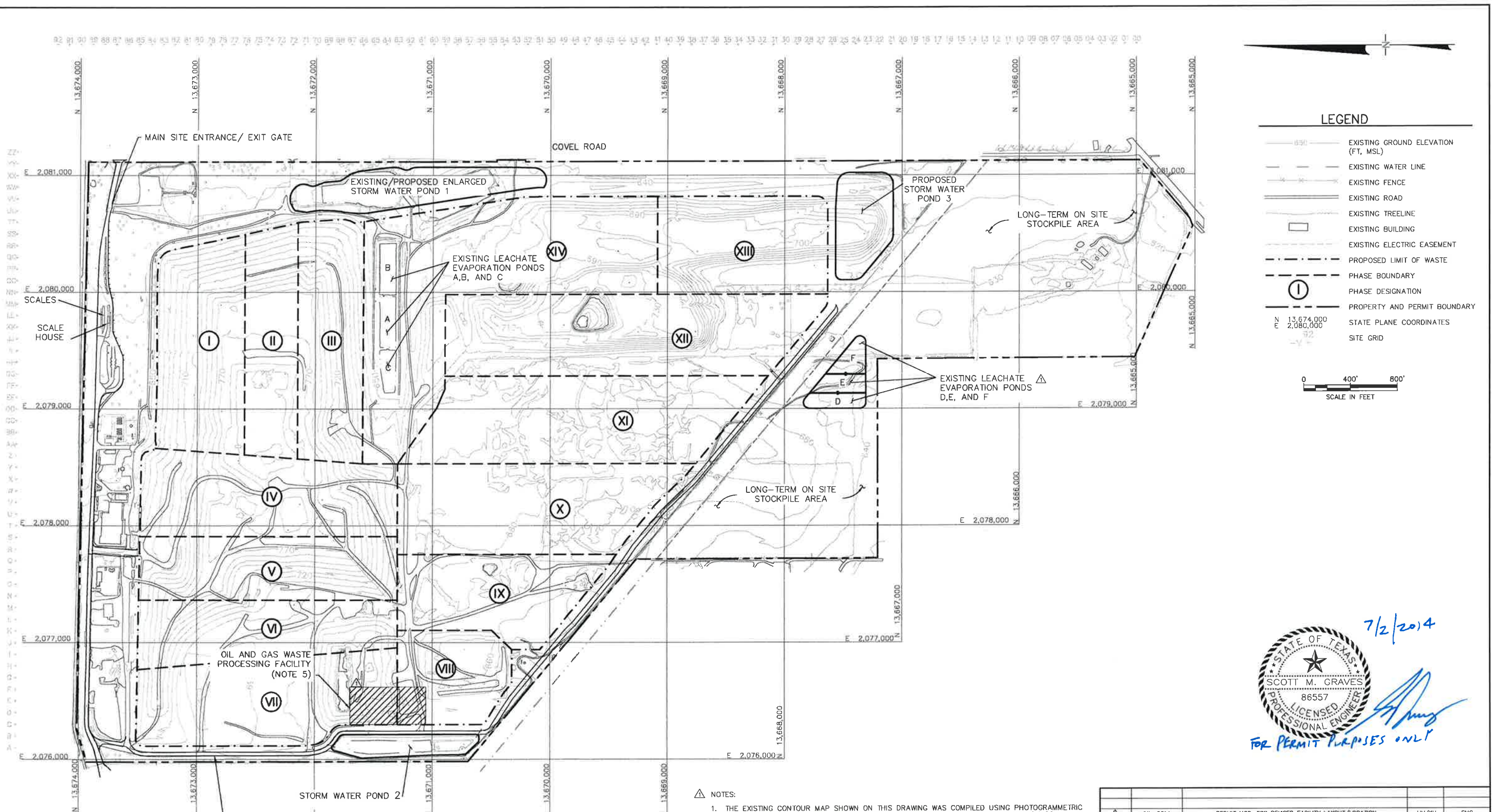
Notes for Table IV-I-2:

Assumptions and Cost Backup:	
Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure]	
Maximum inventory of wastes assumed as follows (based on Table IV-I-1):	
Unprocessed Oil and Gas Waste (gallons):	830,395
Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons):	261,180
Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank):	84,000
Processed Oil and Gas Waste - Separated Solids (cubic yards):	440
Assumed Solidification Bulking Factor:	2.0
Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards):	8,223
Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects.	
Item 2.2. The facility is currently paying \$0.077/gal to transport and off-site dispose of the processed water. This was rounded up 23% to an even \$0.10/gal.	
Item 2.3. The current price the facility receives for recovered processed oil is \$75.20/barrel, or \$1.79/gallon. (1 bbl = 42 gallons) Even though the material inventory is based on having the oil tank completely full (21,000 gallons), to be conservative, this quantity was reduced. Furthermore, in accordance with TCEQ's request, it is conservatively assumed that the recovered oil has no market value at the time of third-party closure.	
Item 2.4. Basis for Solidification Unit Rate: Solidification on-site soil needs are 2500CY @ \$2.00/CY = \$5000. Mixing Needs: 1 Excavator + 1 Loader can solidify 2000 CY/day. Round up to 3 days total time. From RS Means Construction Cost Data, typical heavy equipment operator rate = \$350/day. 1 CY Loader = \$380/day. 3 CY capacity excavator = \$1275/day. Solidification Cost = \$5000 material + [3 days x (2 operators x 350/day) + \$380/day + \$1275/day] = \$12,065. Expressed on a CY basis, \$12065/4834CY = \$2.50/CY Unit Rate.	
Item 2.7. Basis for Decontamination Costs. Pressure washing unit rates from RS Means Construction Cost Data = \$0.04/S.F. For simplicity, the estimated square footage to be decontaminated (basins, concrete slab, above-ground equipment) assumed as the equivalent of 50,000 S.F. (conservative - equivalent of more than one acre of pressure washing). Pressure washing cost = 0.04 x 50,000 S.F. = \$2000. Assume 10,000 gallons of wash water generated, and off-site dispose of at \$0.30/gallon (conservatively assume triple the unit rate of disposing processed water off-site) = \$3,000. Total = \$5,000.	
Item 2.8. For worst-case (most expensive) cost estimate, assume all equipment is leased, not owned. Therefore, salvage cost = \$0 (i.e., return to Lessor). If equipment is owned, it will have substantial market Re-Sale Value.	
Item 2.9. Metal Basin Salvaging. Typical market pricing of scrap metal (ferrous plate steel scrap) at a scrap yard = \$0.05 to 0.10/lb. Therefore it is likely that the scrap basins can be sold and the proceeds could offset closure costs. However, in accordance with TCEQ's request, it is conservatively assumed that the basin scrap metal has no market value at the time of third-party closure (i.e., the salvage value is \$0).	
Item 2.11. Basis for revegetation: the disturbed area of the waste processing facility is approximated to be half the total area. Mechanical seeding unit rate from RS Means Site Work & Landscape Cost Data = \$1250/acre. This was rounded up 20% to \$1500/acre.	

DRAWINGS

- Drawing IV-I-1 Site Plan – Oil and Gas Waste Processing Facility
- Drawing IV-I-2 Oil and Gas Waste Processing Facility Plan
- Drawing IV-I-3 Centrifuge Site – Detailed Layout Plan
- Drawing IV-I-4 Thermal Site – Detailed Layout Plan
- Drawing IV-I-5 Oil and Gas Waste Processing Facility Details

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LEGEND

- EXISTING GROUND ELEVATION (FT, MSL)
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING ROAD
- EXISTING TREELINE
- EXISTING BUILDING
- EXISTING ELECTRIC EASEMENT
- PROPOSED LIMIT OF WASTE
- PHASE BOUNDARY
- PHASE DESIGNATION
- PROPERTY AND PERMIT BOUNDARY
- STATE PLANE COORDINATES
- SITE GRID

N 13,674,000
E 2,080,000

0 400' 800'
SCALE IN FEET

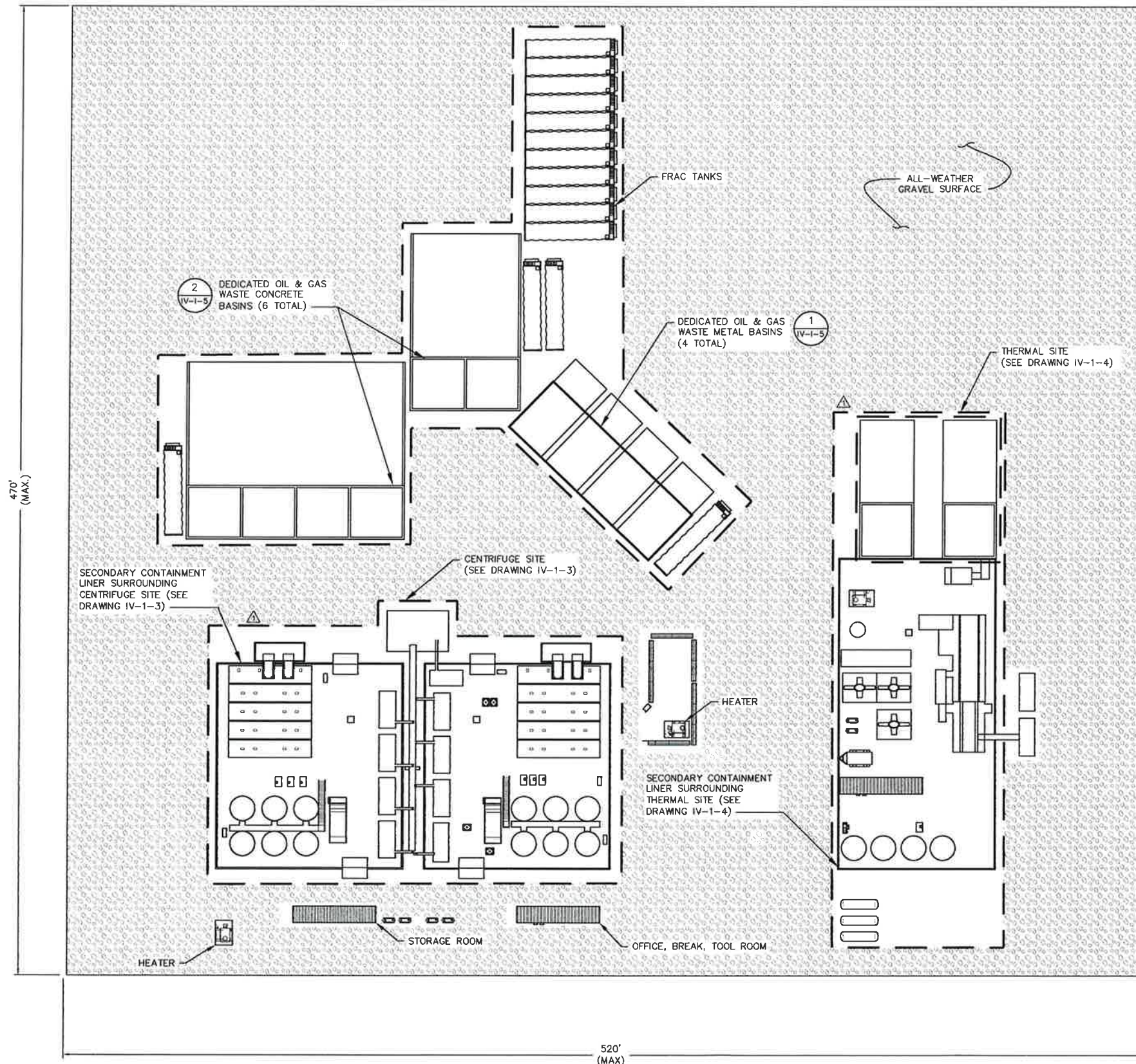
- △ NOTES:
- THE EXISTING CONTOUR MAP SHOWN ON THIS DRAWING WAS COMPILED USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 04 MARCH 2012 AND ON 06 FEBRUARY 2010 BY SURVEYING AND MAPPING, INC. OF AUSTIN, TEXAS.
 - ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL) AS DEFINED BY THE USCS NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929. STATE PLANE COORDINATE GRID CORRESPONDS TO TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM (NAD) 1983.
 - PROPERTY BOUNDARY AND EASEMENT INFORMATION PROVIDED BY SURVEYING AND MAPPING INC., AUSTIN, TEXAS, DATED SEPTEMBER 2003.
 - PERMIT BOUNDARY AND PROPERTY BOUNDARY COINCIDE.
 - OIL AND GAS WASTE PROCESSING FACILITY SHALL BE LOCATED ON LINED LANDFILL AREAS HAVING A CLASS 1 WASTE LINDER SYSTEM. AREA SHALL BE SET-BACK AT LEAST 50-FT FROM THE LIMIT OF WASTE AND ALL COMPONENTS INCLUDING BASINS SHALL HAVE A 10-FT (MIN) SEPARATION FROM THE TOP OF LINER SYSTEM.

7/2/2014

Scott M. Graves

FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	ENGINEER	BY	APPROVED
△	JUL. 2014	PERMIT MOD. FOR REVISED FACILITY LAYOUT/LOCATION	JJV/KH	SMG	
OWNER / SITE ADDRESS: WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623-8800					
ENGINEER: Geosyntec CONSULTANTS, INC. 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 (512) 451-4003 TEXAS ENG. FIRM REGISTRATION # 1182					
PROJECT: COVEL GARDENS LANDFILL PERMIT AMENDMENT APPLICATION - PERMIT NO. MSW - 2093 B					
TITLE: SITE PLAN - OIL AND GAS WASTE PROCESSING FACILITY					
PROJECT NO.: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO.	DRAWING NO:	
FILE NO.: TXL0303.01P010	CHECKED BY: SMG	APPROVED BY: SMG	IV	IV-1-1	



△ NOTES:

1. REFER TO DRAWING IV-1-3 FOR A MORE DETAILED LAYOUT OF THE CENTRIFUGE SITE, INCLUDING IDENTIFICATION OF INDIVIDUAL COMPONENTS.
2. REFER TO DRAWING IV-1-4 FOR A MORE DETAILED LAYOUT OF THE THERMAL SITE, INCLUDING IDENTIFICATION OF INDIVIDUAL COMPONENTS.
3. REFER TO SECTION 2 OF THE OIL AND GAS WASTE PROCESSING PLAN FOR A DESCRIPTION OF THE PROCESSING SEQUENCE.
4. THE FACILITY FEATURES SHOWN ON THIS DRAWING MAY BE PHASED-IN OVER TIME (I.E., NOT INSTALLED ALL AT ONCE). LAYOUT MAY VARY SLIGHTLY, BUT WILL BE CONSISTENT WITH THE LAYOUT SHOWN.



7/2/2014

[Signature]
FOR PERMIT PURPOSES ONLY

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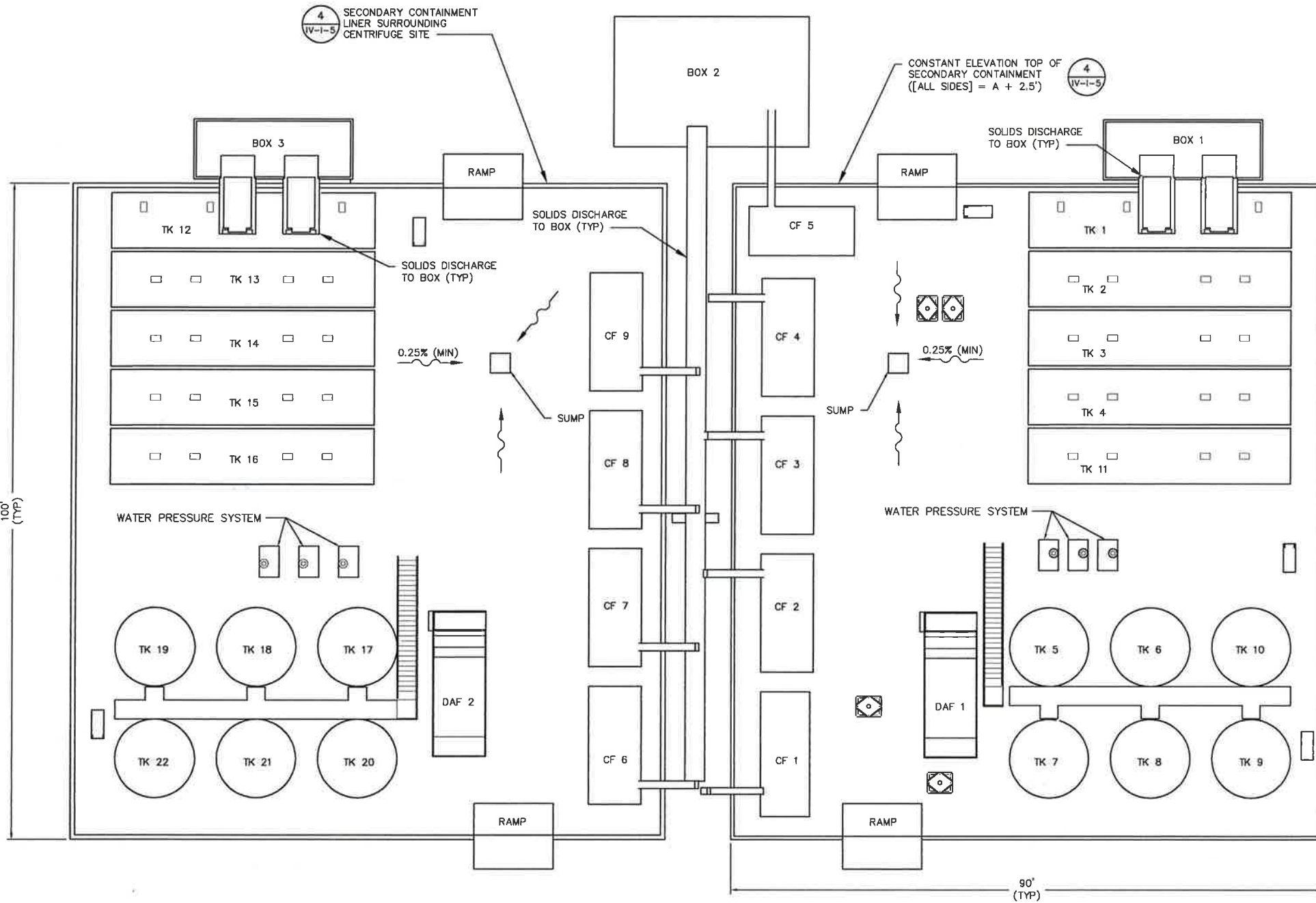
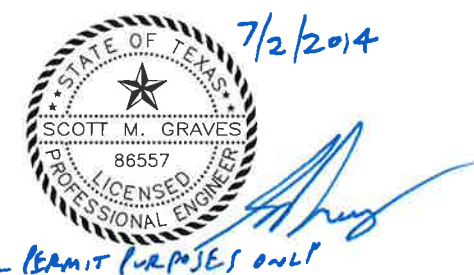
△ PLAN
OIL AND GAS WASTE PROCESSING FACILITY – SCHEMATIC LAYOUT
SCALE: N.T.S.

△	JUL 2014	EXPANDED OPERATIONS, ADDED THERMAL SITE	JJV/XH	SMG
MARK	DATE	REVISION	BY	APPROVED
OWNER / SITE ADDRESS:			ENGINEER:	
		WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623-8800		GEOSYNTEC CONSULTANTS, INC. 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 (512) 451-4003 TEXAS ENG. FIRM REGISTRATION # 1182
PROJECT: COVEL GARDENS LANDFILL PERMIT AMENDMENT APPLICATION – PERMIT NO. MSW – 2093 B				
TITLE: OIL AND GAS WASTE PROCESSING FACILITY PLAN				
PROJECT NO: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO.	DRAWING NO:
FILE NO: TXL0303.01P020	CHECKED BY: SMG	APPROVED BY: SMG	IV	IV-1-2

LIST OF COMPONENTS (NOTE 1)	
TANKS	
TK 1 - SHAKER TANK	TK 18 - RECOVERED WATER
TK 2 - MUD FEED 1	TK 19 - RECOVERED WATER
TK 3 - MUD FEED 2	TK 20 - FLOAT/WATER
TK 4 - MUD FEED 3	TK 21 - FLOAT/WATER
TK 5 - RECOVERED WATER	TK 22 - RECOVERED OIL
TK 6 - RECOVERED WATER	DAF 1 - DISSOLVED AIR FLOTATION
TK 7 - FLOAT/WATER	DAF 2 - DISSOLVED AIR FLOTATION
TK 8 - FLOAT/WATER	FRAC TANKS
TK 9 - RECOVERED OIL	PROCESSING
TK 10 - RECOVERED WATER	CENTRIFUGES 1-9
TK 11 - FLOAT FEED	
TK 12 - SHAKER TANK	CONTAINERS/OTHER
TK 13 - MUD FEED 1	ROLL-OFF CONTAINERS
TK 14 - MUD FEED 2	THREE-SIDED BOX
TK 15 - MUD FEED 3	WATER PRESSURE SYSTEM
TK 16 - FLOAT FEED	AIR COMPRESSORS
TK 17 - RECOVERED WATER	HEATERS

SECONDARY CONTAINMENT CAPACITY CALCULATOR:

- DESIGN CRITERIA: SECONDARY CONTAINMENT MUST CONTAIN THE LARGER OF EITHER:
 - (I) THE VOLUME OF THE LARGEST TANK PLUS THE 25-YR, 24-HR STORM; OR
 - (II) THE VOLUME OF 10% OF THE COMBINED TANK VOLUME PLUS THE 25-YR, 24-HR STORM.
- LARGEST TANK = 21,000 GALLONS (2,807 FT³)
- COMBINED TANK/EQUIPMENT = 214,500 GALLONS (10% = 21,450 GALLONS (2,867 FT³)) [GOVERNS]
- 25-YR, 24-HR STORM = 7.8 IN (I.E., 0.65 FT) [SOURCE: Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (TP-40) for Bexar County, Texas]
- GROSS SIZE OF CONTAINMENT FLOOR AREA: 100' X 90' = 9,000 FT².
- FLOOR AREA OCCUPIED BY EQUIPMENT/COMPONENTS (DISPLACED AREA, NOT AVAILABLE FOR CONTAINMENT) = 3,228 FT².
- NET SIZE OF CONTAINMENT FLOOR AREA: 9,000 - 3,228 = 5,772 FT².
- SIZE OF CONTAINMENT "DRAINAGE AREA" RECEIVING THE DESIGN STORM (CONSERVATIVELY SIZE THE CONTAINMENT DRAINAGE AREA FOR THE LARGEST-SIZE SCENARIO OF USING CLAY BERMS INSTEAD OF VERTICAL CONCRETE WALLS; 3-FT AVERAGE HEIGHT AND 3:1 SLOPES. THIS RESULTS IN CONTAINMENT DRAINAGE AREA DIMENSIONS THAT ARE 18-FT WIDER THAN THE FLOOR AREA (I.E. 118' X 108") = 12,744 FT².
- VOLUME OF 25-YR, 24-HR STORM = 0.65 FT X 12,744 FT² = 8,284 FT³.
- CONTAINMENT VOLUME REQUIRED: 2,867 + 8,284 = 11,151 FT³.
- CONTAINMENT VOLUME PROVIDED:
 - 100' X 90' CONTAINMENT STORAGE AREA (I.E., DO NOT INCLUDE ADDITIONAL CONTAINMENT VOLUME PROVIDED BY THE WIDER SLOPES OF EARTHEN BERMS. SO THAT THE CALCULATION CONSERVATIVELY APPLIED TO BOTH EARTH BERMS AND VERTICAL CONCRETE WALL DESIGNS).
 - USE FLOOR ELEVATIONS SLOPED TO LOW POINT AS SHOWN.
 - USE CONSTANT WALL ELEVATION THAT IS 2.5 FT ABOVE THE LOW POINT FLOOR ELEVATION (RESULTS IN MINIMUM WALL HEIGHT OF 1.85 FT TALL AT HIGH POINT CORNER).
 - CADD-CALCULATED CONTAINMENT VOLUME OF SLOPED FLOOR SURFACE AND CONSTANT WALL ELEVATION NOTED ABOVE, AND AFTER SUBTRACTING-OUT DISPLACED AREA OCCUPIED BY EQUIPMENT/COMPONENTS = 11,502 FT³.
- ACTUAL CONTAINMENT CAPACITY ≥ MINIMUM REQUIRED (11,502 FT³ > 11,151 FT³). **CONFIRMED ACCEPTABLE.**

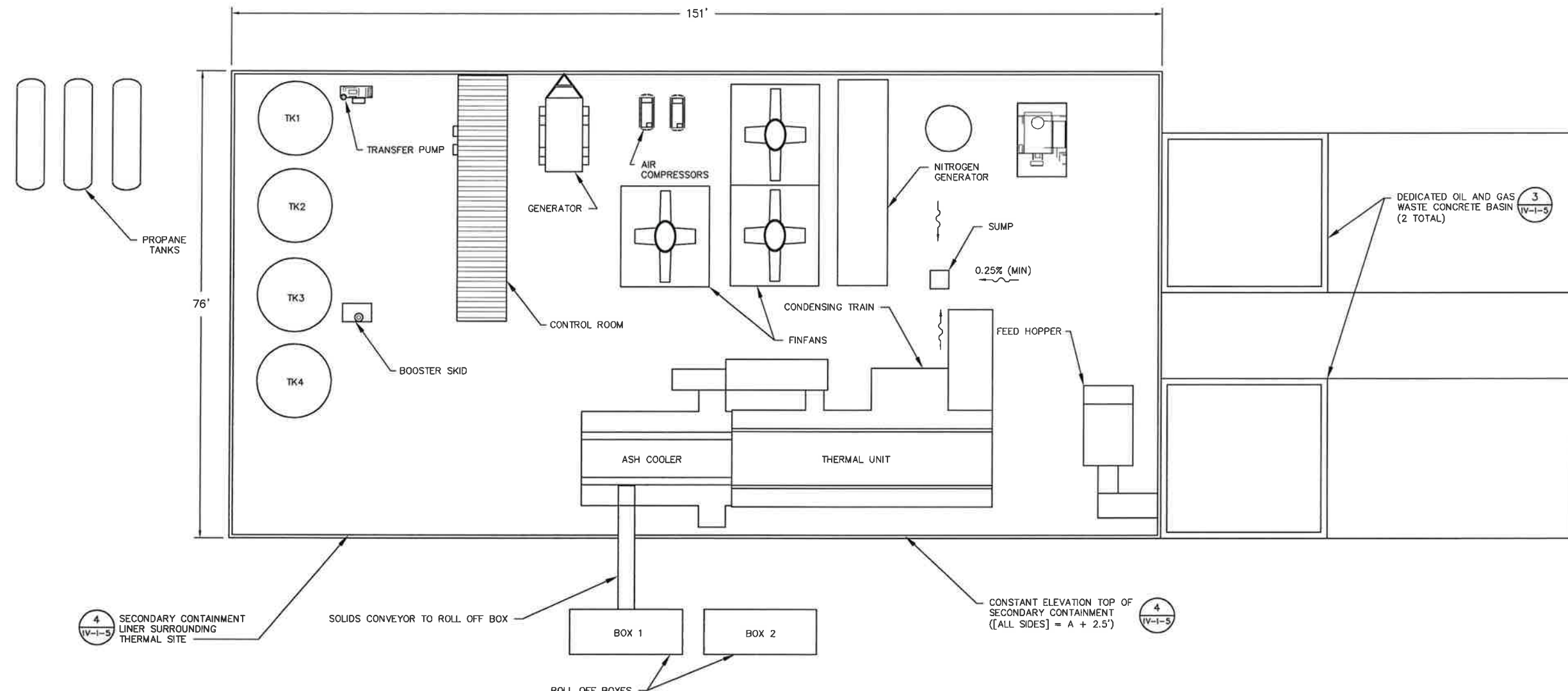


△ PLAN DETAIL
CENTRIFUGE SITE - SCHEMATIC LAYOUT
SCALE: N.T.S.

- △ NOTES:
- A MORE DETAILED EQUIPMENT DESCRIPTION INCLUDING SIZE/CAPACITY, IS PRESENTED ON TABLE IV-1-1 AND DISCUSSED IN SECTION 2.4 OF THE OIL AND GAS WASTE PROCESSING PLAN.
 - THE FACILITY FEATURES SHOWN ON THIS DRAWING MAY BE PHASED-IN OVER TIME (I.E., NOT INSTALLED ALL AT ONCE). LAYOUT MAY VARY SLIGHTLY, BUT WILL BE CONSISTENT WITH THE LAYOUT SHOWN.

MARK	DATE	REVISION	BY	APPROVED
	JUL, 2014	EXPANDED OPERATIONS	JJV/KH	SMG
OWNER / SITE ADDRESS:		ENGINEER:		
WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623-8800		GEOSYNTEC CONSULTANTS, INC. 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 (512) 451-4003 TEXAS ENG. FIRM REGISTRATION # 1182		
PROJECT: COVEL GARDENS LANDFILL PERMIT AMENDMENT APPLICATION - PERMIT NO. MSW - 2093 B				
TITLE: CENTRIFUGE SITE - DETAILED LAYOUT PLAN				
PROJECT NO.: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO. IV	DRAWING NO. IV-1-3
FILE NO.: TXL0303.01P030	CHECKED BY: SMG	APPROVED BY: SMG		

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4
IV-1-5
SECONDARY CONTAINMENT LINER SURROUNDING THERMAL SITE

4
IV-1-5
CONSTANT ELEVATION TOP OF SECONDARY CONTAINMENT ([ALL SIDES] = A + 2.5')

PLAN DETAIL
THERMAL SITE - SCHEMATIC LAYOUT
SCALE: N.T.S.

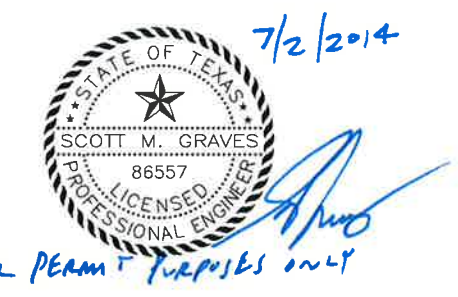
SECONDARY CONTAINMENT CAPACITY CALCULATOR:

- DESIGN CRITERIA: SECONDARY CONTAINMENT MUST CONTAIN THE LARGER OF EITHER:
 - (I) THE VOLUME OF THE LARGEST TANK PLUS THE 25-YR, 24-HR STORM; OR
 - (II) THE VOLUME OF 10% OF THE COMBINED TANK VOLUME PLUS THE 25-YR, 24-HR STORM.
 - LARGEST TANK = 21,000 GALLONS (2,807 FT³) [GOVERNS]
 - COMBINED TANK/EQUIPMENT = 84,000 GALLONS (10% = 8,400 GALLONS (1,123 FT³))
 - 25-YR, 24-HR STORM = 7.8 IN (L.E. 0.65 FT) [SOURCE: Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (TP-40) for Bexar County, Texas]
- GROSS SIZE OF CONTAINMENT FLOOR AREA: 151' X 61' = 9,211 FT².
- FLOOR AREA OCCUPIED BY EQUIPMENT/COMPONENTS (DISPLACED AREA, NOT AVAILABLE FOR CONTAINMENT) = 3,285 FT².
- NET SIZE OF CONTAINMENT FLOOR AREA: 9,211 - 3,285 = 5,926 FT².
- SIZE OF CONTAINMENT "DRAINAGE AREA" RECEIVING THE DESIGN STORM (CONSERVATIVELY SIZE THE CONTAINMENT DRAINAGE AREA FOR THE LARGEST-SIZE SCENARIO OF USING CLAY BERMS INSTEAD OF VERTICAL CONCRETE WALLS; 3-FT AVERAGE HEIGHT AND 3:1 SLOPES. THIS RESULTS IN CONTAINMENT DRAINAGE AREA DIMENSIONS THAT ARE 18-FT WIDER THAN THE FLOOR AREA (L.E. 169' X 79') = 13,351 FT².
 - VOLUME OF 25-YR, 24-HR STORM = 0.65 FT X 13,351 FT² = 8,678 FT³.
- CONTAINMENT VOLUME REQUIRED: 2,807 + 8,678 = 11,485 FT³.
- CONTAINMENT VOLUME PROVIDED:
 - 151' X 61' CONTAINMENT STORAGE AREA (L.E., DO NOT INCLUDE ADDITIONAL CONTAINMENT VOLUME PROVIDED BY THE WIDER SLOPES OF EARTHEN BERMS, SO THAT THE CALCULATION CONSERVATIVELY APPLIED TO BOTH EARTH BERMS AND VERTICAL CONCRETE WALL DESIGNS).
 - USE FLOOR ELEVATIONS SLOPED TO LOW POINT AS SHOWN.
 - USE CONSTANT WALL ELEVATION THAT IS 2.5 FT ABOVE THE LOW POINT FLOOR ELEVATION (RESULTS IN MINIMUM WALL HEIGHT OF 1.85 FT TALL AT HIGH POINT CORNER).
 - CADD-CALCULATED CONTAINMENT VOLUME OF SLOPED FLOOR SURFACE AND CONSTANT WALL ELEVATION NOTED ABOVE, AND AFTER SUBTRACTING-OUT DISPLACED AREA OCCUPIED BY EQUIPMENT/COMPONENTS = 11,907 FT³.
- ACTUAL CONTAINMENT CAPACITY ≥ MINIMUM REQUIRED (11,907 FT³ > 11,485 FT³). CONFIRMED ACCEPTABLE.

- NOTES:
- A MORE DETAILED EQUIPMENT DESCRIPTION INCLUDING SIZE/CAPACITY, IS PRESENTED ON TABLE IV-1-1 AND DISCUSSED IN SECTION 2.4 OF THE OIL AND GAS WASTE PROCESSING PLAN.
 - THE FACILITY FEATURES AND EQUIPMENT SHOWN ON THIS DRAWING MAY BE PHASED-IN OVER TIME (I.E., NOT INSTALLED ALL AT ONCE). LAYOUT MAY VARY SLIGHTLY, BUT WILL BE CONSISTENT WITH THE LAYOUT SHOWN.

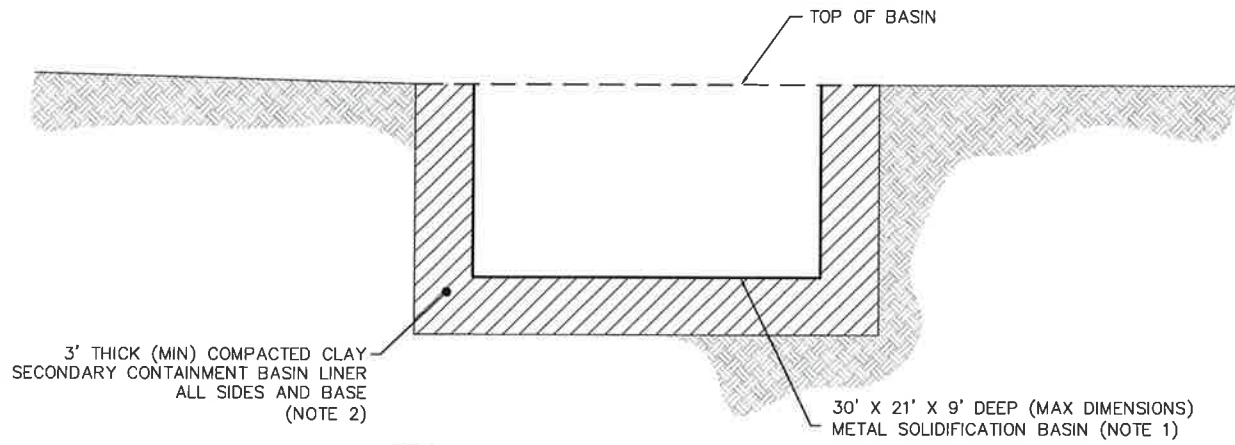
LIST OF COMPONENTS (NOTE 1)

TANKS	
TK 1 - RECOVERED OIL	
TK 2 - RECOVERED OIL	
TK 3 - RECOVERED WATER	
TK 4 - RECOVERED WATER	
PROCESSING	
THERMAL UNIT	
CONDENSING TRAIN	
ASH COOLER	
CONTAINERS/OTHER	
PROPANE TANKS	
FINFANS	
BOOSTER PUMP	
TRANSFER PUMP	
AIR COMPRESSORS	
GENERATORS	
ROLL-OFF CONTAINER	
FEED HOPPER	

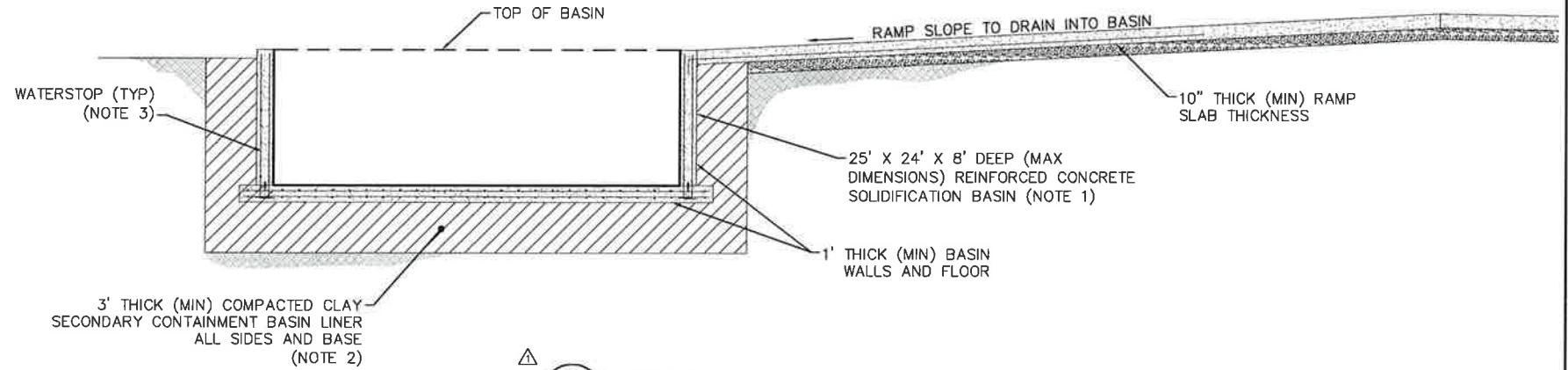


MARK	JUL 2014	FIGURE ADDED - THERMAL SITE	JJV/KH	SMG
DATE		REVISION	BY	APPROVED
OWNER / SITE ADDRESS:		ENGINEER:		
WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623-8800		GEOSYNTEC CONSULTANTS, INC. 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 (512) 451-4003 TEXAS ENG. FIRM REGISTRATION # 1182		
PROJECT: COVEL GARDENS LANDFILL PERMIT AMENDMENT APPLICATION - PERMIT NO. MSW - 2093 B				
TITLE: THERMAL SITE - DETAILED LAYOUT PLAN				
PROJECT NO.: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO.	DRAWING NO:
FILE NO.: TXL0303.01P050	CHECKED BY: SMG	APPROVED BY: SMG	IV	IV-1-4

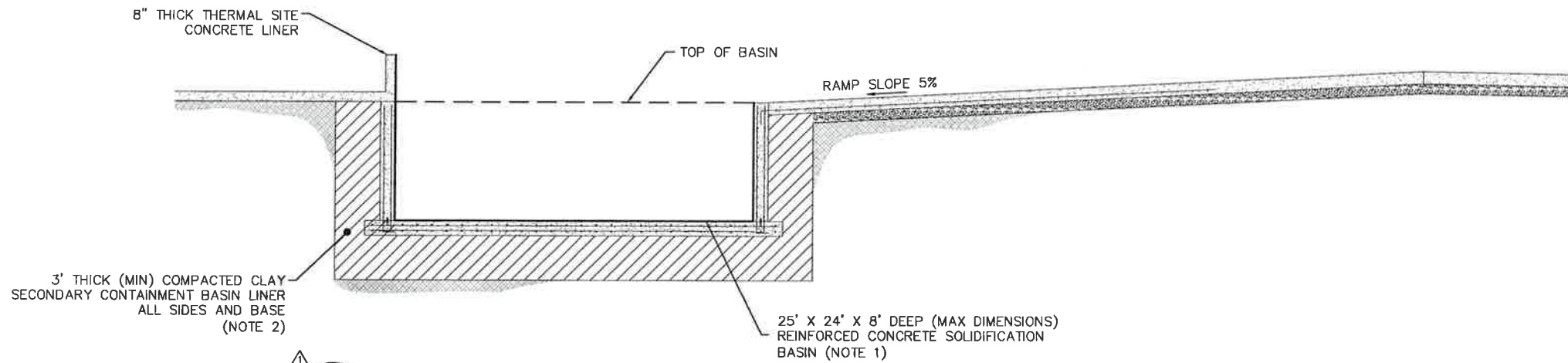
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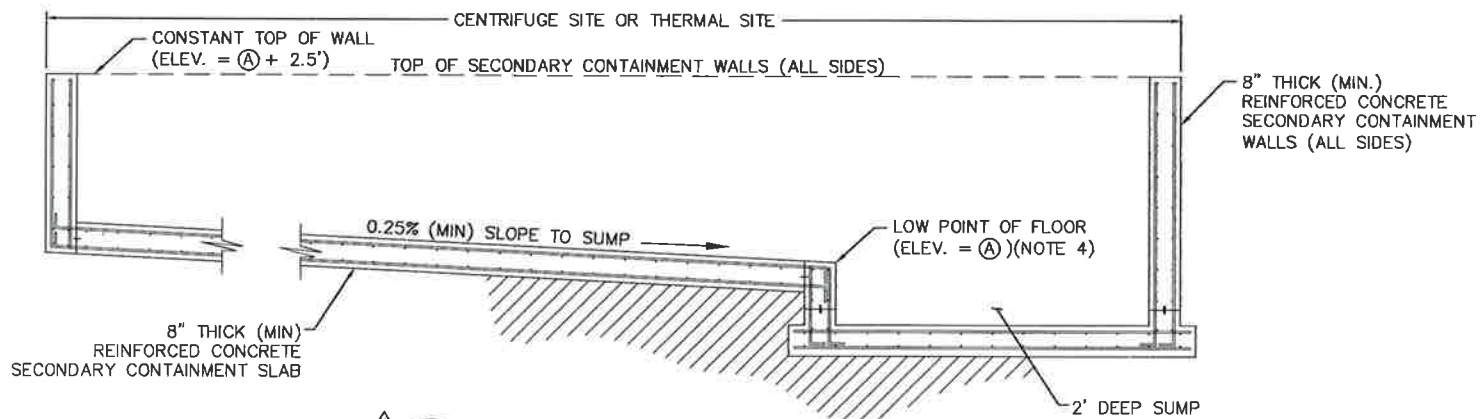
1
IV-1-2
DETAIL
TYPICAL SECTION—METAL BASIN
SCALE: N.T.S.



2
IV-1-2
DETAIL
TYPICAL SECTION—CONCRETE BASIN
SCALE: N.T.S.



3
IV-1-4
DETAIL
TYPICAL SECTION—THERMAL SITE BASIN
SCALE: N.T.S.



4
IV-1-3
DETAIL
CONCRETE SECONDARY CONTAINMENT LINER
SCALE: N.T.S.

NOTES:

- FEATURES SHOWN ON THESE TYPICAL SECTIONS ARE REQUIRED FOR ALL BASINS AT OIL AND GAS WASTE PROCESSING FACILITY. COMPACTED CLAY LINER MAY BE COMBINED TO SURROUND MULTIPLE BASINS THAT ARE ADJACENT TO EACH OTHER WITH A CONTIGUOUS CLAY-LINED ZONE.
- COMPACTED CLAY REQUIREMENTS:
 - MATERIAL AND COMPACTION SPECIFICATIONS SHALL BE IN ACCORDANCE WITH SECTIONS 2.2.1 AND 2.2.2 OF THE SOILS AND LINER QUALITY CONTROL PLAN (SLQCP).
 - QA/QC MONITORING, TESTING, AND REPORTING SHALL BE IN ACCORDANCE WITH THE SLQCP.
- CONCRETE REQUIREMENTS:
 - ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI) BUILDING CODE 318-08.
 - CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
 - NO BACKFILL SHALL BE PLACED AGAINST CONCRETE STRUCTURES UNTIL THE CONCRETE HAS BEEN IN PLACE FOR 7 DAYS OR HAS ATTAINED 80% OF THE SPECIFIED COMPRESSIVE STRENGTH BY CYLINDER TESTS.
 - ALL CONSTRUCTION AND EXPANSION JOINTS SHALL HAVE WATER-TIGHT SEALS USING 2-BULB, SPLIT DUMB-BELL OR EQUIVALENT WATERSTOPS.
- AT TIME OF CONSTRUCTION, THE ELEVATION OF POINT (A) WILL BE ESTABLISHED IN FEET ABOVE MEAN SEA LEVEL. THE ELEVATIONS OF THE FLOOR AND SIDES OF THE SECONDARY CONTAINMENT WILL BE CONSTRUCTED ACCORDINGLY, AND SHALL MEET THE ELEVATION REQUIREMENTS SHOWN ON THIS DRAWING RELATIVE TO POINT (A).



7/2/2014
FOR PERMIT PURPOSES ONLY

MARK	JUL 2014	PERMIT MOD FOR REVISED BASINS AND SECONDARY CONTAINMENT OPTIONS	JJV/KH	SMG
DATE		REVISION	BY	APPROVED
OWNER / SITE ADDRESS:	ENGINEER:			
WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623-8800		GEOSYNTEC CONSULTANTS, INC. 8217 SHAD CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 (512) 451-4003 TEXAS ENG. FIRM REGISTRATION # 1182		
PROJECT:	COVEL GARDENS LANDFILL PERMIT AMENDMENT APPLICATION - PERMIT NO. MSW - 2093 B			
TITLE:	OIL AND GAS WASTE PROCESSING FACILITY DETAILS			
PROJECT NO.: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO. IV	DRAWING NO. IV-1-5
FILE NO.: TXL0303.01P040	CHECKED BY: SMG	APPROVED BY: SMG		