Geosyntec consultants

8217 Shoal Creek Blvd, Suite 200
Austin, Texas 78757
PH 512.451.4003
FAX 512.306.8042
www.Geosyntec.com

4 April 2014

Ms. Christine Bergren
MSW Permits Section – MC 124
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Subject: Permit Modification with Notice Request
Oil and Gas Waste Processing
Covel Gardens Landfill (Permit No. MSW-2093B)
San Antonio, Bexar County, Texas

Dear Ms. Bergren:

On behalf of Waste Management of Texas, Inc. (WMTX), Geosyntec Consultants (Geosyntec) is submitting this request for a permit modification with notice to the above-referenced Type I landfill facility. The request is being made under the provisions of 30 TAC §305.70(l) – for a change not specifically listed in subsection (j) or (k) of Rule §305.70, but where the Texas Commission on Environmental Quality (TCEQ) has determined that the application should be processed as a permit modification with notice. The requested changes also involve Rule §305.70 (d) (for minor changes to the facility and operation that do not substantially alter the permit conditions and do not reduce the capability of the facility to protect human health and the environment).

A pre-application meeting was held with TCEQ on 5 February 2014 to discuss the requested revisions. Consistent with the topics discussed in the meeting, the permit modification request is summarized as follows. Currently, the facility is authorized to process liquid oil and gas waste through solidification and through centrifuging. Solidification is currently done in basins, and no changes to this operation are proposed (i.e., it is outside the scope of this modification). Centrifuging is currently permitted at two locations at the site, but this permit modification proposes to combine them into one oil and gas waste separation facility. This permit modification would also add thermal processing, at the same site location, to manage oil and gas waste that does not have the liquid consistency preferred for efficient processing by the centrifuges. The reason this modification is requested is that the facility has been experiencing an ongoing increase in liquid waste derived from the gas & oil exploration industry, some of which is not suitable for processing in centrifuges and required a thermal processing technique. Additionally, the aforementioned changes in layout are proposed to improve the logistics of the oil and gas waste processing. These changes will give the facility the ability to more efficiently process the incoming waste as well as the flexibility to process incoming waste by a different technique, depending on the properties of the waste. The permit modification affects the following portions of the permit:

The attached permit modification application submittal is composed of the following items:

- Permit Modification Application Form for an MSW Facility. The completed applicable items of the TCEQ Application Form, identifying relevant site information, the reason for and details of the permit modification request, and the applicant's signed and notarized statement.
- Attachment 1 to the Application Form: Land Ownership Map.
- Attachment 2 to the Application Form: Land Ownership List.
- Attachment 3 to the Application Form: Marked (redline/strikethrough) Pages. These are provided to highlight the requested text changes to the affected portions of the permit documents.
- Attachment 4 to the Application Form: Unmarked Revised Pages. These are clean copies of replacement/added pages for the portions of the permit that are affected by the above-referenced proposed changes.

CLOSURE

One original and two copies of this permit modification request are being submitted to the TCEQ MSW Permits Section in Austin. One copy has been sent directly to TCEQ Region 13 Office, as indicated on the distribution list at the end of this letter. If you have any questions regarding this permit modification request, 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

Copy to: Mr. Joel Anderson, TCEQ Region 13 Office
Mr. Tim Champagne, WMTX

engineers | scientists | innovators

PERMIT MODIFICATION APPLICATION FORM

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

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

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."

7. General Facility Information

Facility Name: Covel Gardens Landfill

MSW Authorization No.: 2093B

Regulated Entity Reference No.: RN100218338

Physical or Street Address (if available): 8611 Covel Road

City: San Antonio County: Bexar State: TX Zip Code: 78252

(Area code) Telephone Number: 210-623-8800

Latitude: 29° 20' 26" N Longitude: 98° 39' 40" W

8. Facility Type(s)

- ■ Type I
- ☐ Type IV
- ☐ Type V
- ☐ Type I AE
- ☐ Type IV AE
- ☐ Type VI

9. Description of the Revisions to the Facility

Provide a brief description of all revisions to the permit/registration conditions and supporting documents referred by the permit/registration, and a reference to the specific provisions under which the modification/temporary authorization application is being made. Also, provide an explanation of why the modification/temporary authorization is requested:

This permit modification request pertains only to processing/storage of oil and gas waste.

A permit modification is requested by Waste Management of Texas, Inc. (WMTX) to combine the two currently permitted oil and gas liquid waste separation facilities into one location at the site, to add a thermal unit to the separation facility, and to make related updates to the basins and to some of the pieces of equipment at the facility. This is requested as a "notice modification" under the provisions of 30 TAC §305.70(l) – for a change not specifically listed in subsection (j) or (k) of Rule §305.70, but where the TCEQ executive director has determined that the application should be processed as a permit modification with notice. The requested changes also involve Rule §305.70 (d) (for minor changes to the facility and operation that do not substantially alter the permit conditions and do not reduce the capability of the facility to protect human health and the environment).

Currently, the facility is authorized to process liquid oil and gas waste through solidification and through centrifuging. Solidification is currently done in basins, and no changes to this operation are proposed (i.e., it is outside the scope of this modification). Centrifuging is currently permitted at two locations at the site, but this permit modification proposes to combine them into one oil and gas waste separation facility. This permit modification would also add thermal processing, at the same site location, to manage oil and gas waste that does not have the liquid consistency preferred for efficient processing by the centrifuges. The reason this modification is requested is that the facility has been experiencing an ongoing increase in liquid waste derived from the gas & oil exploration industry, some of which is not suitable for processing in centrifuges and required a thermal processing technique. Additionally, the aforementioned changes in layout are proposed to improve the logistics of the oil and gas waste processing. These changes will give the facility the ability to more efficiently process the incoming waste as well as the flexibility to process incoming waste by a different technique, depending on the properties of the waste.

10. Facility Contact Information

Site Operator (Permittee/Registrant) Name: Waste Management of Texas, Inc.

Customer Reference No. (if issued)*: CN 600127856

Mailing Address: 8611 Covel Road

City: San Antonio County: Bexar State: TX Zip Code: 78252

(Area Code) Telephone Number: 210-623-8800

E-mail Address: tchampag@wm.com

TX Secretary of State (SOS) Filing Number: 22300000

*If the Site Operator (Permittee/Registrant) does not have this number, complete a TCEQ Core Data Form (TCEQ-10400) and submit it with this application. List the Site Operator (Permittee/Registrant) as the Customer.

Operator Name[1]: Same as Site Operator (Permittee/Registrant)

Customer Reference No. (if issued)*: CN

Mailing Address:

City: County: State: Zip Code:

(Area Code) Telephone Number:

E-mail Address:

Charter Number:

[1]If the Operator is the same as Site Operator/Permittee type "Same as "Site Operator (Permittee/Registrant)".
*If the Operator does not have this number, complete a TCEQ Core Data Form (TCEQ-10400) and submit it with this application. List the Operator as the customer.

Consultant Name (if applicable): Geosyntec Consultants, Inc.

Texas Board of Professional Engineers Firm Registration Number: 1182

Mailing Address: 8217 Shoal Creek Blvd, Suite 200

City: Austin County: Travis State: TX Zip Code: 78757

(Area Code) Telephone Number: 512-451-4003

E-Mail Address: sgraves@geosyntec.com

Agent in Service Name (required only for out-of-state):

Mailing Address:

City: County: State: Zip Code:

(Area Code) Telephone Number:

E-Mail Address:

11. Ownership Status of the Facility

Is this a modification that changes the legal description, the property owner, or the Site Operator (Permittee/Registrant)?

☐ Yes ☒ No

If the answer is "No", skip this section.

Does the Site Operator (Permittee/Registrant) own all the facility units and all the facility property?

☒ Yes ☐ No

If "No", provide the information requested below for any additional ownership.

Owner Name:

Street or P.O. Box:

City: County: State: Zip Code:

(Area Code) Telephone Number:

Email Address (optional):

Charter Number:

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: _____ Date: 4-4-2014

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 4th day of April, 2014

My commission expires on the 27th day of July, 2016

_____
Notary Public in and for

Harris County, Texas

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

NOTARY PUBLIC STATE OF TEXAS
JILL BEARDSLEY
My Commission Expires
July 27, 2016

Permit/Registration Modification with Public Notice

(See Instructions for P.E. seal requirements.)

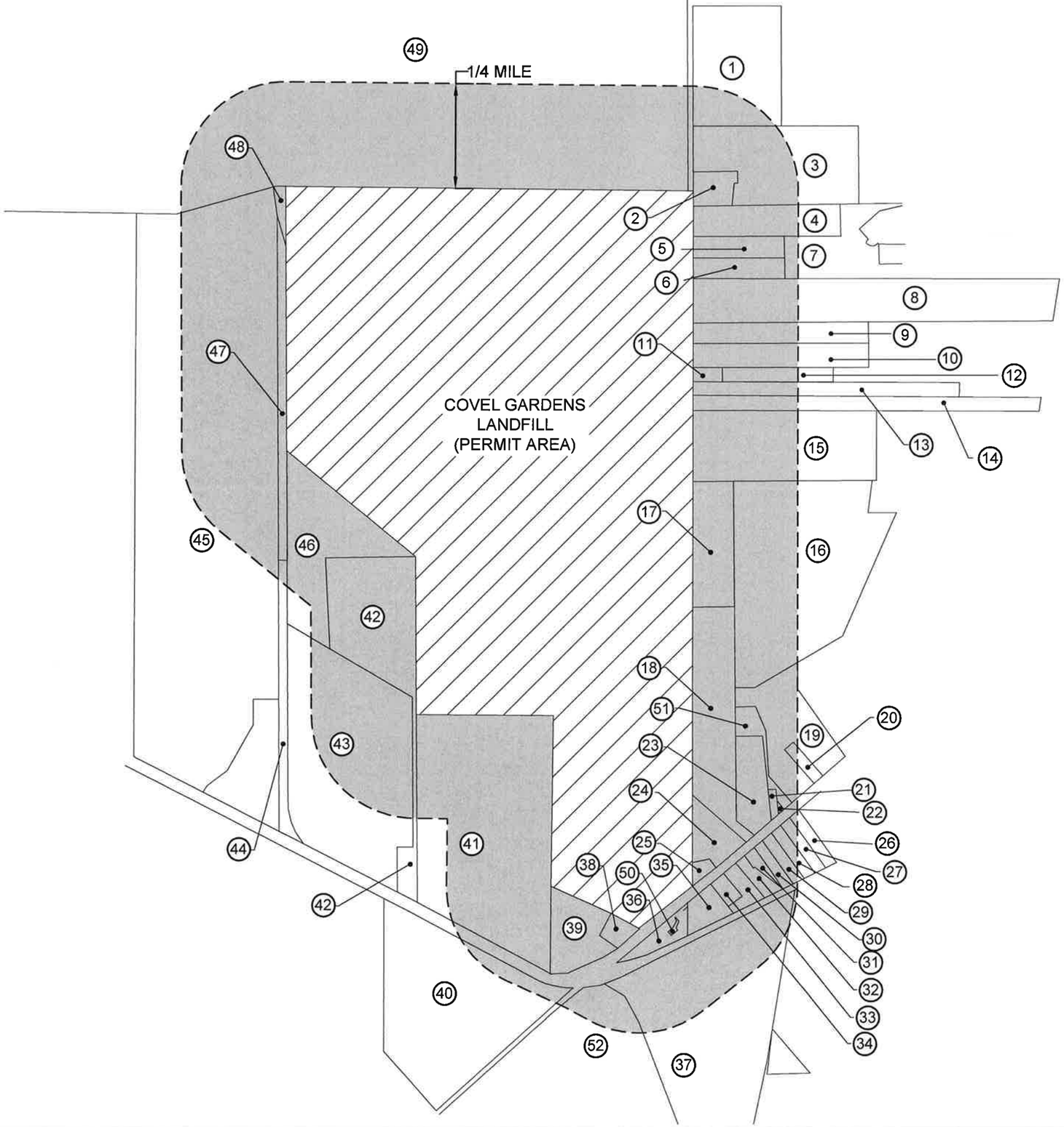
Required Attachments	Attachment No.
Land Ownership Map	1
Land Ownership List	2
Marked (Redline/Strikeout) Pages	3
Unmarked Revised Pages	4

Additional Attachments as Applicable- Select all those apply and add as necessary

☐ Signatory Authority
☐ Fee Payment Receipt
☐ Confidential Documents

ATTACHMENT 1

LAND OWNERSHIP MAP



LEGEND

(1) REFERS TO ADJACENT TRACT NUMBER. LAND OWNERS LIST, REFERENCED TO TRACT NUMBER, AND OBTAINED FROM BEXAR COUNTY APPRAISAL DISTRICT RECORDS, ATTACHED ON A SEPARATE PAGE

NOTE: LAND OWNERSHIP MAP BASED ON BEXAR COUNTY APPRAISAL DISTRICT RECORDS.

0 700' 1400'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
3	4/2014	REVISED PROPERTY BOUNDARIES AND TRACT NUMBERS	JJV	SMG
2	11/9/2012	REVISED PROPERTY BOUNDARIES AND TRACT NUMBERS	JJV	SMG
1	8/20/2010	REVISED ADDED 1/4 MILE BOUNDARY	JJV	SMG

WASTE MANAGEMENT
WASTE MANAGEMENT OF TEXAS, INC.
8611 COVEL ROAD
SAN ANTONIO, TEXAS 78252
PHONE: 210.623.6800

Geosyntec consultants
GEOSYNTEC CONSULTANTS, INC.
TEXAS ENG. FIRM REGISTRATION NO. 1182
8217 SHOAL CREEK BLVD, SUITE 200
AUSTIN, TEXAS 78757
PHONE: 512.451.4003

TITLE:

LAND OWNERSHIP MAP

PROJECT:

COVEL GARDENS LANDFILL
PERMIT NO. MSW – 2093B

PROJECT NO.: TXL0324.02	DESIGN BY: SMG	REVIEWED BY: SMG	ATTACHMENT NO: 1	FIGURE NO.: 1
FILE: 0007.01F01	DRAWN BY: JJV	APPROVED BY: SMG		

ATTACHMENT 2

LAND OWNERSHIP LIST

LANDOWNER'S LIST

1 Griffin, Steven E. & Tami Elaine
8050 Covel Road
San Antonio, TX 78252-2712

2 Griffin, Steven E. & Tami Elaine c/o Griffin Timothy J & Kelley P
8050 Covel Road
San Antonio, TX 78252-2712

3 Griffin Timothy James & Kelley Pagel c/o Griffin Steven Eugene & Tami Elaine
7920 Covel Road
San Antonio, TX 78252-2713

4 McMillion Teddy Nile
8290 Covel Road, #7
San Antonio, TX 78252-2700

5 TJFA LP c/o Dennis Hobbs
P.O. Box 17126
Austin, TX 78760

6 Marrs John Loyd Trust c/o John Lloyd Marrs Trustee
512 Fitzpatrick Ave
Waco, TX 76708-2241

7 KB Home Lone Star LP
4800 Fredericksburg Rd
San Antonio, TX 78229-3628

8 Plascenia Luis & Guillermo & Maria Del Carmen
5618 Ocean Side Street
San Antonio, TX 78242--3219

9 Plascenia Guillermo & Maria Del Carmen
830 S. San Augustine Ave
San Antonio, TX 78237-2933

10 Williams Evelyn Jayne
8880 Covel Road
San Antonio, TX 78252-2807

11 Williams Evelyn Jayne
8880 Covel Road
San Antonio, TX 78252-2807

12 Elkins Dennis Charles
218 Serna Park
San Antonio, TX 78218-2035

13 Jones John E. & Judy L. c/o Family Trust
1502 Townsend House Drive
San Antonio, TX 78251-4114

14 Jones John E.
1502 Townsend House Drive
San Antonio, TX 78251-4114

15 Jones John E.
1502 Townsend House Drive
San Antonio, TX 78251-4114

16 Neumann Frederick H & Wife
6851 FM 2536, #1
San Antonio, TX 78252-2725

17 Van Hecke Laurine M
7523 Old Pearsall Road
San Antonio, TX 78252-2792

18 Van Hecke Laurine M
7523 Old Pearsall Road
San Antonio, TX 78252-2792

NOTE: EACH LANDOWNER NUMBER REFERS TO THE TRACT NUMBER OF THE PROPERTY AS SHOWN ON THE LAND OWNERSHIP MAP THAT ACCOMPANIES THIS LIST.

LANDOWNER'S LIST

19 Neumann Frederick H & Margaret
6851 FM 2536, #1
San Antonio, TX 78252-2725

20 Neumann Mark A & Deborah
7265 Old Pearsall Road
San Antonio, TX 78252-2728

21 Olson Arthur C & Judith Elaine
159 Mountain Valley
San Antonio, TX 78227

22 Olson Arthur C & Judith Elaine
159 Mountain Valley
San Antonio, TX 78227

23 State of Texas
P.O. Box 29928
San Antonio, TX 78229-0928

24 Van Hecke Laurine Marie
7523 Old Pearsall Road
San Antonio, TX 78252-2792

25 Van Hecke Laurine Marie
7523 Old Pearsall Road
San Antonio, TX 78252-2792

26 Southwest ISD
11914 Dragon Lane
San Antonio, TX 78252-2612

27 Van Hecke Laurine M.
7523 Old Pearsall Road
San Antonio, TX 78252

28 Van Hecke Laurine M.
7523 Old Pearsall Road
San Antonio, TX 78252

29 Van Hecke Laurine M.
7523 Old Pearsall Road
San Antonio, TX 78252

30 Bexar County Appraisal District Records was contacted on October 17, 2008 and the mailing addresss for this property was not available

31 Pearsall Road Veterinary c/o Clinic
7402 Pearsall Road
San Antonio, TX 78252-2702

32 Munoz Julio
7404 Old Pearsall Road
San Antonio, TX 78252-2702

33 Van Hecke Laurine M
7523 Old Pearsall Road
San Antonio, TX 78252-2792

34 Van Hecke Laurine Marie
7523 Old Pearsall Road
San Antonio, TX 78252

35 Van Hecke Billy & Melissa K.
7560 Old Pearsall Road
San Antonio, TX 78252-2792

36 Moncada Margarito & Petra
7570 Old Pearsall Road
San Antonio, TX 78252-2792

NOTE: EACH LANDOWNER NUMBER REFERS TO THE TRACT NUMBER OF THE PROPERTY AS SHOWN ON THE LAND OWNERSHIP MAP THAT ACCOMPANIES THIS LIST.

LANDOWNER'S LIST

37 Union Pacific Railroad Co c/o Prop Tax Dept
1400 Douglas St Stop 1640
Omaha, NE 68179-0001

38 Plascencia Reynaldo
7119 Calypso Dawn
San Antonio, TX 78252-2276

39 Verstuyft Marvin G & Merlynn c/o Roger G & Patricia Verstuyft
8219 Somerset Rd, #3
San Antonio, TX 78211-4718

40 Union Pacific Railroad Co c/o Prop Tax Dept
1400 Douglas St Stop 1640
Omaha, NE 68179-0001

41 Verstuyft Roger & Marvin
8219 Somerset Rd, #3
San Antonio, TX 78211-4718

42 Alamo Commercial Prop Ltd.
121 Interpark Blvd, Suite 108
San Antonio, TX 78216-1844

43 Verstuyft Scott Alan & Knox Sherry Kay & Foster Judy Deanne
1102 Marchesi
San Antonio, TX 78258-3139

44 Alamo Commercial Properties, Ltd.
10843 Gulfdale
San Antonio, TX 78216

45 City of San Antonio
P.O. Box 839975
San Antonio, TX 78283-3975

46 Alamo Commercial Properties, Ltd.
10843 Gulfdale
San Antonio, TX 78216

47 Alamo Commercial Properties, Ltd.
10843 Gulfdale
San Antonio, TX 78216

48 City of San Antonio
P.O. Box 839975
San Antonio, TX 78283-3975

49 City of San Antonio
P.O. Box 839966
San Antonio, TX 78283-3966

50 Casillas Laura
7570 Pearsall Road
San Antonio, TX 78252-2364

51 State of Texas
P.O. Box 29928
San Antonio, TX 78229-0928

52 Union Pacific Railroad Co c/o Prop Tax Dept
1400 Douglas St Stop 1640
Omaha, NE 68179-0001

NOTE: EACH LANDOWNER NUMBER REFERS TO THE TRACT NUMBER OF THE PROPERTY AS SHOWN ON THE LAND OWNERSHIP MAP THAT ACCOMPANIES THIS LIST.

EASEMENT HOLDER'S LIST

NOTE: ACCORDING TO A SEARCH OF THE BEXAR COUNTY REAL PROPERTY RECORDS MAINTAINED BY THE BEXAR COUNTY APPRAISAL DISTRICT (BCAD) AND TELEPHONE CORRESPONDENCE WITH BCAD, THERE ARE NO RECORDS OF EASEMENT HOLDERS. HOWEVER, BASED ON PREVIOUS EASEMENT RESEARCH ASSOCIATED WITH PERMIT AMENDMENT APPLICATION 2093B, THE FOLLOWING EASEMENT HOLDERS MAY STILL EXIST (NOT RE-VERIFIED, BUT INCLUDED ON LIST BASED ON LAST KNOWN RECORD).

ENTERPRISE PRODUCTS OPERATING, L.P.
ATTN: CHESTER BLAIR
10647 GULFDALE
SAN ANTONIO, TX 78216

CITY OF SAN ANTONIO
REAL ESTATE SECTION
ATTN: STEVE HODGES
P.O. BOX 839966
SAN ANTONIO, TX 78283

SBC COMMUNICATIONS
ATTN: REBECKA SANDOVAL
4119 BROADWAY
RM. 760B
SN ANTONIO, TX 78209

ALAMO COMMERCIAL
PROPERTIES LTD
C/O HAYDEN & CUNNINGHAM PLLC
7750 BROADWAY
SAN ANTONIO, TX 78209

CITY PUBLIC SERVICE BOARD
ATTN: RUBY MOORE
P.O. BOX 1771
SAN ANTONIO, TX 78296

MINERAL INTEREST OWNERSHIP LIST

NOTE: ACCORDING TO A SEARCH OF THE BEXAR COUNTY REAL PROPERTY RECORDS MAINTAINED BY THE BEXAR COUNTY APPRAISAL DISTRICT (BCAD) AND TELEPHONE CORRESPONDENCE WITH BCAD, THERE ARE NO RECORDS OF MINERAL INTEREST OWNERS. HOWEVER, BASED ON PREVIOUS DEED RESEARCH ASSOCIATED WITH PERMIT AMENDMENT APPLICATION 2093B, THE FOLLOWING MINERAL INTEREST HOLDER MAY STILL EXIST (NOT RE-VERIFIED, BUT INCLUDED ON LIST BASED ON LAST KNOWN RECORD).

ALTON B. CRUSIUS, JR. &
MILDRED J. KRETZMEIER
7575 OLD PEARSALL RD.
SAN ANTONIO, TX 78252

ATTACHMENT 3

MARKED (REDLINE/STRIKETHOUGH) PAGES

To facilitate TCEQ's review, the attached pages present "redline/strikethough" versions of the affected pages in the following items, showing the proposed revisions to the text:

- Part III, Site Development Plan, Attachment 8 (Closure and Post-Closure Cost Estimates).

- Part IV, Appendix IV-I (Oil and Gas Waste Processing Plan).

Note: the page numbers reflected on the redline/strikethrough version are not necessarily correct and should be ignored. They are automatically generated due to re-pagination of the "redline/strikethrough" version of the document caused by the track-changes feature of the word processing software. Those shown on the "clean" replacement pages are the correct page numbers for the revised pages of the document.

Prepared for Applicant:
Waste Management of Texas, Inc.
8611 Covel 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 – ~~January 2013~~April 2014

1. INTRODUCTION

Pursuant to 30 TAC §330.56(h) and the requirements set forth in 30 TAC §330.281 and 283, this closure and post-closure care cost estimate for the Covel Gardens Landfill presents the estimated costs for:

- closure of the landfill during its operational life when the largest portion would ever require closure and in accordance with the Closure Plan presented in Part III, Attachment 12 of this permit application; and

- post-closure care monitoring and routine operations and maintenance activities in accordance with the Post-Closure Plan presented in Part III, Attachment 13 of this permit application.

This document also includes by reference, the cost estimates for: (i) closure of the brush and wood recycling area at the facility in accordance with the closure procedures and cost estimate described in Part IV, Appendix IV-G of this permit; and (ii) closure of the ~~centrifuge~~oil and gas waste processing areas at the facility in accordance with the closure procedures and cost estimate described in Part IV, Appendix IV-I of this permit. A combined total facility financial assurance amount for closure and post-closure care, in consistent dollars is also presented herein.

2.2B ~~Centrifuge~~Oil and Gas Waste Processing ~~Areas~~Area Closure Cost Estimate

In addition to the landfill, the facility also proposes ~~two centrifuge~~an oil and gas waste processing ~~areas~~area for the processing of certain liquid/solid wastes ~~(one in a fixed location, and one portable/moveable location),~~ as described in Part IV, Appendix IV-I of the permit. A closure plan and detailed cost estimate for the ~~centrifuge~~oil and gas waste processing ~~areas~~area is given in Part IV, Appendix IV-I.

Since the landfill closure cost estimate presented in Section 2.1 was based on then-current 2004 dollars, whereas the ~~centrifuge~~oil and gas waste processing ~~areas~~area closure and associated costs are presented in a subsequent permit modification with ~~2012~~2014 dollars, Section 4 of this document presents the total combined facility closure and post-closure cost estimate in consistent dollars.

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 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-cosure 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).

Prepared for:

Waste Management of Texas, Inc.
8611 Covel Road
San Antonio, Texas 78252
(210) 623-8800

~~CENTRIFUGE~~OIL AND GAS WASTE PROCESSING PLAN ~~(for OIL AND GAS LIQUID WASTES)~~

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

Prepared by:

Geosyntec consultants

~~3600 Bee Caves Road~~8217 Shoal Creek Blvd, Suite ~~101~~200
Austin, Texas ~~7874~~78757
(512) 451-4003

~~January 2013~~
April 2014

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Drawing IV-I-5 Oil and Gas Waste Processing ~~Area~~Facility Details

APPENDIX

Appendix IV-I-A Manufacturer's Literature on Centrifuge Equipment

1. INTRODUCTION

1.1 Overview

The Covel Gardens Landfill facility is a Type I landfill located in Bexar County, Texas. This document presents ~~a Centrifuge~~an Oil and Gas Waste Processing Plan that describes how "oil and gas waste" liquid waste (defined subsequently in Section 1.3 of this plan) will be processed and handled at the facility using a ~~centrifuging~~centrifuge processing or thermal processing technique. This 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", so that operations are conducted in a manner consistent with the facility design and permit, and the Texas Commission on Environmental Quality (TCEQ) rules to protect human health and the environment.

For the purposes of this plan, a centrifuge ~~is~~unit and a ~~type~~thermal unit are types of equipment that ~~separates~~separate waste into a solid-phase and its liquid (oil and water) phases. As the centrifuge name suggests, the separation is accomplished though a high-speed rotating drum that induces centrifugal forces on the waste mass and divides the material into denser and lighter fractions (i.e., solid and liquids). ~~After centrifuging~~For wastes that do not meet the liquid consistency preferred for centrifuging, the thermal unit can be used to heat and subsequently cool or condense the waste into three phases solid (ash), water, and oil. After processing the oil and gas waste, the separated solids will be disposed of in a Class 1 non-hazardous industrial waste disposal landfill cell at the facility. The separated water and oil will go to the destinations described in Section 2.2 of this plan.

The remainder of this Plan is organized as follows:

- ~~locations~~location of the ~~centrifuge~~oil and gas waste processing ~~areas are~~facility is described in Section 1.2;
- waste acceptance and analysis is addressed in Section 1.3;
- descriptions of the centrifuge and thermal processing sequence, technique, equipment, and quantities/rates are presented in Section 2;
- other operational requirements (addressing applicable 30 TAC Chapter 330 Subchapter E sections) are presented in Section 3; and

- closure requirements and costs are presented in Section 4.

1.2 ~~Centrifuge~~Oil and Gas Waste Processing ~~Area Locations~~Facility Location

~~Two centrifuge~~ The oil and gas waste processing ~~areas are proposed to be allowed to simultaneously operate at the site, and thus there may be two centrifuge processing areas at the site occurring at any point in time. These two on-site locations are: (i) at a "fixed~~ facility~~" area located in the northwest portion of the site outside of the waste disposal footprint; and/or (ii) at a portable/moveable area~~ will be located on waste above lined and approved Class 1 waste cell landfill areas. A site map showing the ~~locations of each centrifuge processing area~~initial location of the facility is included with this plan as Drawing IV-I-1. The layout and features of the ~~centrifuge~~ processing ~~areas~~facility are presented on Drawings IV-I-2, IV-I-3, and IV-I-~~3~~4. Design details are shown on attached Drawing IV-I-~~4~~5.

1.3 Waste Acceptance and Analysis – Sources and Characteristics of Oil and Gas Waste

1.3.1 Oil and Gas Waste Defined

Oil and gas waste is a special waste defined by 30 TAC §330.3(148) as, "*waste from oil, gas, and geothermal activities subject to regulation by the Railroad Commission of Texas when those wastes are to be processed, treated, or disposed of at a solid waste management facility authorized under this chapter*". A similar definition of oil and gas wastes is provided in the Memorandum of Understanding (MOU) between the RRC and the TCEQ set forth in 16 TAC §3.30(b)(2)(A)(i) as follows: "*wastes resulting from activities associated with the exploration, development, or production of oil, gas, or geothermal resources, including storage, handling, reclamation, gathering, transportation, or distribution of crude oil or natural gas by pipeline prior to the refining of such oil or prior to the use of such gas…*" Only non-hazardous oil and gas wastes under the jurisdiction of RRC and authorized for management at a municipal solid waste landfill pursuant to applicable RRC and TCEQ memoranda of understanding and regulation may be accepted.

Through the Special Waste Acceptance Plan (Appendix IV-A of the Site Operating Plan (SOP)), the facility is authorized to accept this type of waste. The facility will follow the requirements of the Special Waste Acceptance Plan before accepting oil and gas waste.

1.3.2 Oil and Gas Waste to be Processed by Centrifuge or by Thermal Unit

A broad definition of oil and gas waste was provided above. Only a subset of this category of waste will be ~~centrifuged~~processed by centrifuge or by thermal unit, because not all oil and gas waste is composed of materials conducive to ~~centrifuging~~these processing techniques. For example, some oil and gas waste accepted at the facility is already solid (passes the paint filter test) and can be directly disposed without the need for processing. The oil and gas waste that will be processed by centrifuging will be liquid or semi-solid, and will be primarily made up of drilling fluids (including water-based and oil-based fluids), fracturing fluids, and flowback water. The oil and gas waste that will be processed by thermal unit will be waste that does not meet the liquid consistency preferred for efficient processing by the centrifuges.

1.4 ~~Centrifuge~~Oil and Gas Waste Processing Rates

30 TAC §330.203(b) requires that the owner or operator shall determine types and an estimate of the amount of each waste to be received daily; the maximum amount of waste to be stored at any one point in time; the maximum and average lengths of time that waste is to remain at the facility; the maximum and average waste processing times; and the intended destination of the solids and liquids generated by a facility. This information is presented subsequently in Sections 2.2 and 2.5 of this plan, because these topics are more easily described after explaining the processing method and providing a list of equipment and the associated sizes/capacities.

2. DESCRIPTION OF ~~CENTRIFUGE~~PROCESSING METHODS

2.1 Overview of Method and Processing Sequence

Oil and gas liquid waste separation will take place using a centrifuge (two or three-phase ~~centrifuge~~) or a thermal unit capable of separating liquids (water and oil) and solids for subsequent management. In addition to the centrifuge(s~~),~~) and thermal unit, other equipment will be used in the processing sequence. A description and list of equipment is provided subsequently in this section.

The layout of the ~~centrifuge~~oil and gas waste processing ~~area~~facility, identifying the various components, is shown on a plan view of the processing ~~area~~facility on Drawing IV-I-2. Once the oil and gas liquid waste is deemed appropriate for acceptance, drivers will be directed to the ~~centrifuge~~waste processing ~~area(s),~~facility , where the oil and gas liquid waste will be processed by the following sequence of activities:

Waste Receipt

- Step 1) oil and gas liquid waste will be offloaded from tanker trucks into designated basins that may only hold oil and gas wastes (i.e., no comingling);
- Step 2A) the waste may then be solidified in the designated basins in accordance with Sub-Appendix IV-A-1 of the SOP, followed by disposal at the Class 1 waste working face once it is confirmed that the solidified waste passes the paint filter test, or Step 2B may be used instead of Step 2A;
- Step 2B) depending on its liquid consistency, the oil and gas waste may be processed ~~using~~at the centrifuge ~~technique~~site or the thermal site by following ~~the remaining~~their respective steps identified below~~:~~.

Processing at Centrifuge Site

- Step ~~3~~1) oil and gas waste to be centrifuged will be pumped from the designated basins into to the Shaker Tank for initial separation of liquid and solid material;
- Step ~~4~~2) from the Shaker Tank, liquid will be transferred to the Feed Tank(s) which will be used to meter materials to the Centrifuge(s~~).~~);
- Step ~~5~~3) materials will be fed into the Centrifuge(s) for separation, and will be processed therein;

- Step ~~6~~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 ~~8~~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 the 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 ~~Centrifuge~~ Processing)

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

- ~~Separated solids will be tested using Method 9095B Paint Filter Test and after confirming no free liquids are present~~Separated solids will be disposed of at the Class 1 waste working face.
- 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 (Leachate and Contaminated Water Plan); or (iii) transported to a duly permitted/registered off-site disposal facility (e.g., a Class II injection well) that is authorized to accept this type of oil and gas related water waste.
- The separated oil-phase material (which is primarily spent diesel used in drilling fluids, along with incidental amounts of crude oil) that is recovered from the centrifuge process will be transported to an authorized off-site oil processing/reclamation facility that is permitted or authorized to receive this type of reclaimed material.

2.3 Off-Site Transport of Post-Processed Oil and Gas Wastes

The off-site transport of the post-processed oil and gas wastes (i.e., the reclaimed oil and the separated water) shall be subject to applicable RRC requirements. For as long as these materials are within the facility's custody, the facility shall comply with all applicable RRC requirements regarding management of this waste (manifesting, recordkeeping, reporting, quantity records, verification of movement, etc.). Recovered oil and gas waste that will be transported off-site shall not be comingled with other wastes (e.g., solid waste, or non-oil and gas wastes) and will be transported and managed as required by TCEQ, RRC and TXDOT rules and requirements.

2.4 Equipment and Processing Description

2.4.1 Centrifuge Description

High-speed centrifuges are used for separation of liquids (water and oil), while simultaneously removing solid particles down to approximately 1 micron size. The centrifuging process is described below in numerical sequence (1 through 8) of the internal steps/components within the centrifuge itself.

- The liquid waste is introduced to the rotating centrifuge bowl from the top via a stationary inlet pipe (1), and is accelerated in a distributor (2) before entering the

disc stack (3). It is between the discs that the separation of the liquids and the solids takes place.

- The liquid phase leaves the bowl over the top disc (4) and through a paring disc (5). The heavier solids phase is collected at the bowl periphery, from where it is discharged intermittently.
- The solids discharge is achieved by a hydraulic system below the separation space in the bowl, which at preset intervals forces the sliding bowl bottom (6) to drop down, thus opening the solids ports (7) at the bowl periphery. The bowl is mounted on a vertical spindle (8) driven by a vertically mounted motor, via a belt drive.

The centrifuge operates as a continuous process. This is done using centrifugal forces that can be well beyond 3000 times greater than gravity. When subject to such forces, the denser solid particles are pressed outwards against the rotating bowl wall, while the less dense liquid phase forms a concentric inner layer. Different dam plates are used to vary the depth of the liquid as required.

The sediment formed by the solid particles is continuously removed by the screw conveyor, which rotates at a different speed than the bowl. As a result, the solids are gradually "plowed" out of the lower part of the bowl and up the conical "beach". The centrifugal force compacts the solids and expels the surplus liquid. The dried solids then discharge from the bowl. The clarified liquid phases (water and oil) overflow the dam plates situated at the opposite end of the bowl. Manufacturer's literature on the Centrifuges is provided in Sub-Appendix IV-I-A of this plan.

2.4.2 Description of Other Processing Equipment

Shaker Tank: This type of tank is made of steel and is used for first-stage solids control processing, to separate out larger solids prior to processing through the centrifuge. Internally, the shaker tank commonly is divided into several sub-compartments using internal plates set at different heights to separate the tank into multiple sub-compartments. The liquid waste (e.g., drilling mud) will be processed by the shaking mechanism to remove large pieces, then the separated solids will be transferred for further processing and the separated mud and/or water will drop down into a shaker sub-compartment and be transferred to the feed tank for further processing.

Feed Tank: This type of tank is made of steel and is used to meter liquids into the centrifuge for further processing.

Dissolved Air Flotation (DAF) Unit: The DAF is a ~~polypropylene~~ tank that is used to clarify waste waters by removing suspended matter (e.g., oil). The removal is achieved by dissolving air in the water under pressure and then releasing the air at atmospheric pressure in a flotation tank. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it is then removed by a skimming device.

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 ~~Figures~~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 ~~Figures~~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.).

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

Note: Centrifuge throughput is dependent on solids content and can vary widely.

2.5 ~~Centrifuge~~ Processing Rates and Waste Quantities

This section has been prepared to address the topics of 30 TAC §330.203(b), with the exception of the destination of processed waste (which were already addressed in Section 2.2). ~~Centrifuge processing~~Processing rates and associated oil and gas waste quantities are estimated as follows:

- Estimated Amount of Waste to Be Received Daily.
    - Typical Day. For facility planning purposes, the facility estimates it may receive approximately 60,000,000 ~~21,300,000~~ gallons of oil and gas waste subject to centrifuge and/or thermal processing per year. This is equivalent to approximately 164,385 ~~75,000~~ gallons/~~-~~day on an average (i.e., typical) day ~~based on 284 normal working days year~~. This quantity is estimated using information on the actual quantities received during the temporary authorization (TA) period along with future market projections, and is not intended as a limiting value; the actual daily and annual quantity of liquid waste may be more or less than this estimated quantity.
    - Maximum Day. Based on the equipment capacities and allowable facility operating hours (24/7, per the SOP), the theoretical maximum amount of waste that could be received and processed in a day can be calculated. As described, the centrifuge process is a continuous process. From Table IV-I-1, at maximum operational capacity there will be up to ~~eight~~nine centrifuges (four at each location), each with capabilities to process between 50-250 gallons/minute. The range in capabilities is due to differences in centrifuge type and the specifics of the waste composition (solids content). For practical purposes, not every centrifuge will likely be operating at maximum capacity~~, nor will they likely all operate~~ continuously for 24 hours. Accordingly, a Maximum Day for the centrifuge site is calculated assuming ~~8~~(9 centrifuges x 24~~12~~ hrs/day of operation x ~~15~~100 gallons/minute = ~~864~~1,296,000 gallons/day. Additionally, for the thermal site, there will be one thermal unit with the capacity to process about 200 tons/day
- Maximum Amount of Waste to Be Stored at Any One Point in Time in the processing ~~area~~facility is ~~735,860~~833,016 gallons (see Table IV-I-1 for detailed breakdown by oil and gas waste type).

- Maximum and Average Lengths of Time that Waste is to Remain in the processing ~~area~~facility.
    - Unprocessed Waste. ~~The~~Processing by centrifuge or by thermal unit is a continuous process. The maximum length of time that a given quanta of unprocessed waste will remain at the facility before processing is 24 hours. The average length of time is estimated to be 8-12 hours.
    - Processed Waste. As the ~~centrifuge is a~~waste processing alternatives are continuous ~~process~~techniques, there will be ongoing quantities of processed waste ready for disposal at the working face, or going to the storage tanks. The maximum length of time that post-processed solids will remain at the ~~centrifuge~~processing facility prior to their disposal is 24 hours, and the estimated average time is 12 hours. The maximum length of time that processed liquids will be held in the storage tanks is 120 hours, and the estimated average time is 72 hours.
- Maximum and Average Waste Processing Times. It is estimated that on average, it will take 8-12 hours to process a given quanta of waste (i.e., the time ~~between Step 1 and Step 5 from~~for a given waste to complete the processing sequence outlined in Section 2.1). The maximum processing time is 24 hours.

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 ~~centrifuge~~oil and gas waste processing ~~area~~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 ~~centrifuge process at 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 ~~centrifuge~~oil and gas waste processing ~~areas~~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 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 ~~centrifuge~~oil and gas waste processing ~~areas~~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 ~~centrifuge~~oil and gas waste processing ~~areas~~facility), and earthen berms surrounding the processing ~~areas~~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-~~4~~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 ~~Processing Equipment Area~~Site and Thermal Site – Secondary Containment Liner. As shown on Drawings IV-I-2 through ~~4~~5, the centrifuge ~~processing equipment area~~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 which is from National Weather Service Technical Paper Number 40 (TP-40) data for Bexar County). The secondary containment liner area will be sloped to drain to a low-point (sump), to allow for collection and removal of spilled or leaked waste and to prevent overflow of the containment. Spilled ~~or~~ /leaked waste~~,~~ or contaminated water~~,~~ must be removed from the secondary containment system within 24 hours. Spilled or leaked waste will be cleaned up using soil or other absorbent material/solidifying agents to remove free liquids, followed by disposal in the landfill.

Compacted Clay Quality Control/Quality Assurance (QA/QC). The QA/QC procedures, specifications, and requirements for the compacted clay liner secondary containment surrounding the basins and when used as secondary containment for the centrifuge ~~processing equipment area~~site or the thermal site will be performed in accordance with the applicable sections of the Soils and Liner Quality Control Plan (SLQCP) – refer to Drawing IV-I-4 for details.

3.3 Storage Requirements at the ~~Centrifuge~~Oil and Gas Waste Processing ~~Areas~~Facility

The facility will not accumulate waste (both unprocessed and processed) in quantities that cannot be managed in a timely manner as set forth below. Additionally, the facility will not accumulate these wastes for such time as to cause the creation of odors, insect breeding, or harborage of other vectors. Care shall be taken such that the storing of waste does not constitute a fire, safety, or health hazard or provide food or harborage for animals and vectors. Maximum allowable storage times are as follows:

- Unprocessed waste to be centrifuged will not be stored for more than 24 hours.
- The maximum length of time that post-processed solids will remain at the ~~centrifuge~~oil and gas waste processing ~~area~~facility prior to their disposal is 24 hours;
- The maximum length of time that post-processed liquids will be held in the storage tanks is 120 hours.

3.4 Fire Protection

The fire protection procedures that shall be followed are as follows: ~~These steps apply to both the fixed facility and the portable/moveable centrifuge processing facility.~~

- Follow the General Fire Prevention methods described in Section 6.2 of the SOP.
- In the event of a fire, follow the General Fire Fighting Procedures described in Section 6.3 of the SOP.
- In addition to the General Fire Fighting Procedures, in the event of a fire at ~~a centrifuge~~the oil and gas waste processing ~~area~~facility , assess the extent of the fire and the potential for the fire to spread, and take appropriate action to contain/extinguish the fire as follows:
    - Smother the fire with soil transported by a dump truck, bulldozer, or other available equipment;
    - Apply water using a water truck or hose;
    - Use a fire extinguisher; or
    - If a fire cannot be extinguished by on-site facility personnel, the local fire department may be contacted by telephoning 911.

3.5 Subchapter E Requirements Addressed in SOP

The following Subchapter E requirements shall apply to ~~centrifuge~~oil and gas waste processing ~~area~~facility, and are addressed in the facility's SOP (with reference to the relevant section of the SOP noted).

- Access Control – See Section 7 of the SOP;
- Unloading of Waste – See Section 8.5 of the SOP;
- Operating Hours – See Section 9 of the SOP;
- Facility Sign – See Section 10 of the SOP;
- Control of Windblown Material and Litter – See Section 11 of the SOP;
- Materials Along the Route to the Facility – See Section 14 of the SOP; and

- Facility Access Roads – See Section 18 of the SOP.

3.6 Noise Pollution and Visual Screening

Overall screening features at the Covel Gardens facility are presented in Section 29 of the SOP. ~~With respect to the fixed facility centrifuge processing area, the location in a portion of the site that is set back substantially from public roads, and this distance, along with other existing site features, will help screen the operations and minimize adverse visual and noise impacts. Similarly, the portable/moveable area of centrifuge processing~~ The oil and gas waste processing facility will initially be located in a portion of the site (see Drawing IV-I-1) that is a substantial distance from public roads and that will be screened by the existing landfill. If/when the ~~portable/moveable area~~facility is relocated, it will be to other appropriately lined landfill areas (as noted on Drawing IV-I-1), and the resulting set-back from the permit boundary and public roads will serve to screen the operations and minimize adverse visual and noise impacts.

3.7 Overloading and Breakdown

In the event that equipment of critical importance associated with the centrifuge ~~processing facility~~site or thermal site breaks down or is otherwise unavailable, equipment with equivalent performance that is performing a non-critical function may be temporarily reassigned to the critical function until the primary equipment is repaired. ~~The facility will limit the receiving of oil and gas wastes to be processed by centrifuging when~~If a significant work stoppage of centrifuge or thermal processing occurs and~~. If the work stoppage~~ is anticipated to last long enough to exceed the allowable storage times, create objectionable odors, insect breeding, or harborage of vectors, the situation will be remedied by processing the waste by the solidification technique (Appendix IV-A of the SOP) ~~instead of by centrifuging, or by~~; alternatively, the waste may be divert~~ed~~ed~~ing the incoming oil and gas waste~~ to another approved processing or disposal facility.

3.8 Sanitation

When in use, the oil and gas waste processing basins are ~~centrifuge processing area basins will be washed down on a weekly basis (~~recommended to be washed down on an annual basis~~to occur~~ in conjunction with the basin inspections discussed subsequently in Section 3.12.1~~)~~. During times when ~~the centrifuge~~ processing equipment is operating

on a continuous basis, the processing area will be kept tidy by sweeping the floor areas and washing down the equipment to maintain sanitary conditions. Wash water which will drain to the low spot (sump) within the secondary containment area (see Drawing IV-I-4~~),~~ and IV-I-5) will be removed in a timely manner~~,~~ and collected and disposed of in an authorized manner.

3.9 Ventilation and Air Pollution Control

No significant odors or air pollution emissions are expected to result from the ~~centrifuge~~oil and gas waste processing ~~areas~~facility based on experience during the ~~TA period,~~previous year's operation and the operational techniques that will be employed. The continuous process of liquids processing and removal are expected to minimize the chance for "stagnation" of liquid and any odors that could result. Care shall be taken to minimize fugitive dust from the area. Also, the various tanks associated with the process are enclosed, which will prevent the escape of odors. If nuisance odors from ~~centrifuge~~ processing operations are detected at the facility permit boundary, the site will immediately take action to abate the nuisance, for example, by making the processing of those liquids the immediate priority in order to alleviate that odor.

3.10 Health and Safety

Training requirements of site personnel are discussed in Section 5.4, of the SOP. This includes training on health and safety topics.

3.11 Employee Sanitation Facilities

Potable water and sanitary facilities are provided for all employees and visitors within the office building at the site. Additional facilities may be added to the ~~centrifuge~~oil and gas waste processing ~~area~~facility for the convenience of site personnel and visitors.

3.12 Inspections, Recordkeeping, and Reporting Requirements

3.12.1 ~~Centrifuge~~Oil and Gas Waste Processing ~~Area~~Facility Inspections

Basins: At least once per month, the Site Manager or designated alternate will conduct a visual inspection of the basins to check for holes, cracks, gaps, spalls, or other signs of damage, and if found to be significant enough to potentially compromise the structural integrity of the basin, the basin will not be used until repairs are made. Once per year, a

more thorough ~~The~~ inspection of the basins will be made by emptying each basin and visually inspecting the walls and floor.

Secondary Containment: At least once per month, the Site Manager or Designated alternate will inspect the secondary containment (concrete or earthen liner as described in Section 3.2.2) surrounding the centrifuge ~~processing equipment~~site and thermal site to verify the integrity, ensure that controls are in place, and that housekeeping is adequate.

Processing Equipment: At least once per month, the Site Manager or designated alternate will conduct a visual inspection of the centrifuge(s), thermal unit, associated processing equipment, and the storage tanks. The purpose of the visual inspection will be to ensure no leaking valves or connections exist in the equipment.

If the results of any of the above inspections reveal non-compliances or problems with the function of the equipment/feature, corrective action shall be promptly taken to remedy/repair the issue and restore adequate function and compliance of the area operations.

3.12.2 Recordkeeping, Reporting, and Notification Requirements

The results of the inspections described herein will be documented in writing and placed in the Site Operating Record.

Also, TCEQ shall be notified in writing at least 30 days prior to relocation of the ~~portable/moveable centrifuge~~oil and gas waste processing ~~area~~facility. The notification will include an updated Drawing IV-I-1 or equivalent plan of the site, to show the new location.

4. CLOSURE

4.1 ~~Centrifuge~~Oil and Gas Waste Processing ~~Areas~~Facility Closure Activities

When it is time to close the ~~centrifuge~~ oil and gas waste processing ~~areas~~facility, any remaining unprocessed waste will be processed ~~through centrifuging~~at the centrifuge site or the thermal site, or solidified in the designated basins as needed to pass the paint filter test and transported to the landfill for disposal. Then the equipment, basins, and any concrete surfaces will be washed down to clean them. The wash waters shall be collected and disposed of in an authorized manner. Rented/leased items will be removed from the site and returned to the vendors/Lessors. Items having market value/salvage value (e.g., recovered oil, metal basins) will be removed from the site and the sale proceeds used to offset closure expenses.

Mixing basins will be either: (i) removed and sold for salvage value; (ii) removed and disposed of in the landfill; or (iii) remain in-place and will be filled with clean inert backfill soil to grade level. ~~For~~As discussed, the ~~fixed~~ facility ~~area, disturbed areas will be revegetated. This is not applicable to the portable/moveable area since it~~ will be located on waste ~~(~~which will be capped and closed in accordance with landfill closure procedures~~).~~.

4.2 Closure Scenarios and Waste Inventory at Closure

For expected scenario at the facility, termed “routine” (a.k.a., “planned”) closure, the facility will stop receiving oil and gas waste and ~~centrifuging~~processing prior to closure. Therefore, for the routine closure scenario, the liquid waste inventory at the time of closure will be zero. The worst-case scenario would be unplanned closure, if the facility were to close at an unforeseen time and has an inventory of processed and unprocessed oil and gas waste at the site. For this worst-case scenario, the estimated quantities were presented in Table IV-I-1, and will be used as the basis of quantities for the most expensive ~~centrifuge~~oil and gas waste processing ~~area~~facility closure cost estimate.

4.3 Closure Cost Estimate

A detailed cost estimate in current dollars, for hiring a third party to close the ~~centrifuge~~oil and gas waste processing ~~areas~~facility, for the worst-case scenario when closure would be most expensive, is presented in Table IV-I-2 below.

TABLE IV-I-2
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 WASTE 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.

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):			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 procesed 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 ~~Centrifuge~~Oil and Gas Waste Processing ~~Area~~Facility Plan
- Drawing IV-I-3 Centrifuge ~~Processing Area~~Site – Detailed Layout Plan
- Drawing IV-I-4 ~~Centrifuge~~Thermal Site – Detailed Layout Plan
- Drawing IV-I-5 Oil and Gas Waste Processing ~~Area~~Facility Details

ATTACHMENT 4

UNMARKED REVISED PAGES

(REPLACEMENT PAGES)

The items that follow are to completely replace the previous versions of these pages presented in the noted attachments of the permit application.

- Part III, Site Development Plan, Attachment 8 (Closure and Post-Closure Cost Estimates).

- Part IV, Appendix IV-I (Oil and Gas Waste Processing Plan).

Prepared for Applicant:
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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.
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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
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Permit Issued – 29 June 2006
Revised – April 2014

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FOR PERMIT PURPOSES ONLY

GEOSYNTEC CONSULTANTS, INC.
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1. INTRODUCTION

Pursuant to 30 TAC §330.56(h) and the requirements set forth in 30 TAC §330.281 and 283, this closure and post-closure care cost estimate for the Covel Gardens Landfill presents the estimated costs for:

- closure of the landfill during its operational life when the largest portion would ever require closure and in accordance with the Closure Plan presented in Part III, Attachment 12 of this permit application; and

- post-closure care monitoring and routine operations and maintenance activities in accordance with the Post-Closure Plan presented in Part III, Attachment 13 of this permit application.

This document also includes by reference, the cost estimates for: (i) closure of the brush and wood recycling area at the facility in accordance with the closure procedures and cost estimate described in Part IV, Appendix IV-G of this permit; and (ii) closure of the oil and gas waste processing areas at the facility in accordance with the closure procedures and cost estimate described in Part IV, Appendix IV-I of this permit. A combined total facility financial assurance amount for closure and post-closure care, in consistent dollars is also presented herein.

2.2B Oil and Gas Waste Processing Area Closure Cost Estimate

In addition to the landfill, the facility also proposes an oil and gas waste processing area for the processing of certain liquid/solid wastes, as described in Part IV, Appendix IV-I of the permit. A closure plan and detailed cost estimate for the oil and gas waste processing area is given in Part IV, Appendix IV-I.

Since the landfill closure cost estimate presented in Section 2.1 was based on then-current 2004 dollars, whereas the oil and gas waste processing area closure and associated costs are presented in a subsequent permit modification with 2014 dollars, Section 4 of this document presents the total combined facility closure and post-closure cost estimate in consistent dollars.

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 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-cosure 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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OIL AND GAS WASTE PROCESSING PLAN

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

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April 2014

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Appendix IV-I-A Manufacturer's Literature on Centrifuge Equipment

1. INTRODUCTION

1.1 Overview

The Covel Gardens Landfill facility is a Type I landfill located in Bexar County, Texas. This document presents an Oil and Gas Waste Processing Plan that describes how "oil and gas waste" liquid waste (defined subsequently in Section 1.3 of this plan) will be processed and handled at the facility using a centrifuge processing or thermal processing technique. This 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", so that operations are conducted in a manner consistent with the facility design and permit, and the Texas Commission on Environmental Quality (TCEQ) rules to protect human health and the environment.

For the purposes of this plan, a centrifuge unit and a thermal unit are types of equipment that separate waste into a solid-phase and its liquid (oil and water) phases. As the centrifuge name suggests, the separation is accomplished though a high-speed rotating drum that induces centrifugal forces on the waste mass and divides the material into denser and lighter fractions (i.e., solid and liquids). For wastes that do not meet the liquid consistency preferred for centrifuging, the thermal unit can be used to heat and subsequently cool or condense the waste into three phases solid (ash), water, and oil. After processing the oil and gas waste, the separated solids will be disposed of in a Class 1 non-hazardous industrial waste disposal landfill cell at the facility. The separated water and oil will go to the destinations described in Section 2.2 of this plan.

The remainder of this Plan is organized as follows:

- location of the oil and gas waste processing facility is described in Section 1.2;
- waste acceptance and analysis is addressed in Section 1.3;
- descriptions of the centrifuge and thermal processing sequence, technique, equipment, and quantities/rates are presented in Section 2;
- other operational requirements (addressing applicable 30 TAC Chapter 330 Subchapter E sections) are presented in Section 3; and
- closure requirements and costs are presented in Section 4.

1.2 Oil and Gas Waste Processing Facility Location

The oil and gas waste processing facility will be located on waste above lined and approved Class 1 waste cell landfill areas. A site map showing the initial location of the facility is included with this plan as Drawing IV-I-1. The layout and features of the processing facility are presented on Drawings IV-I-2, IV-I-3, and IV-I-4. Design details are shown on attached Drawing IV-I-5.

1.3 Waste Acceptance and Analysis – Sources and Characteristics of Oil and Gas Waste

1.3.1 Oil and Gas Waste Defined

Oil and gas waste is a special waste defined by 30 TAC §330.3(148) as, "*waste from oil, gas, and geothermal activities subject to regulation by the Railroad Commission of Texas when those wastes are to be processed, treated, or disposed of at a solid waste management facility authorized under this chapter*". A similar definition of oil and gas wastes is provided in the Memorandum of Understanding (MOU) between the RRC and the TCEQ set forth in 16 TAC §3.30(b)(2)(A)(i) as follows: "*wastes resulting from activities associated with the exploration, development, or production of oil, gas, or geothermal resources, including storage, handling, reclamation, gathering, transportation, or distribution of crude oil or natural gas by pipeline prior to the refining of such oil or prior to the use of such gas…*" Only non-hazardous oil and gas wastes under the jurisdiction of RRC and authorized for management at a municipal solid waste landfill pursuant to applicable RRC and TCEQ memoranda of understanding and regulation may be accepted.

Through the Special Waste Acceptance Plan (Appendix IV-A of the Site Operating Plan (SOP)), the facility is authorized to accept this type of waste. The facility will follow the requirements of the Special Waste Acceptance Plan before accepting oil and gas waste.

1.3.2 Oil and Gas Waste to be Processed by Centrifuge or by Thermal Unit

A broad definition of oil and gas waste was provided above. Only a subset of this category of waste will be processed by centrifuge or by thermal unit, because not all oil and gas waste is composed of materials conducive to these processing techniques. For example, some oil and gas waste accepted at the facility is already solid (passes the paint filter test) and can be directly disposed without the need for processing. The oil

and gas waste that will be processed by centrifuging will be liquid or semi-solid, and will be primarily made up of drilling fluids (including water-based and oil-based fluids), fracturing fluids, and flowback water. The oil and gas waste that will be processed by thermal unit will be waste that does not meet the liquid consistency preferred for efficient processing by the centrifuges.

1.4 Oil and Gas Waste Processing Rates

30 TAC §330.203(b) requires that the owner or operator shall determine types and an estimate of the amount of each waste to be received daily; the maximum amount of waste to be stored at any one point in time; the maximum and average lengths of time that waste is to remain at the facility; the maximum and average waste processing times; and the intended destination of the solids and liquids generated by a facility. This information is presented subsequently in Sections 2.2 and 2.5 of this plan, because these topics are more easily described after explaining the processing method and providing a list of equipment and the associated sizes/capacities.

2. DESCRIPTION OF PROCESSING METHODS

2.1 Overview of Method and Processing Sequence

Oil and gas liquid waste separation will take place using a centrifuge (two or three-phase) or a thermal unit capable of separating liquids (water and oil) and solids for subsequent management. In addition to the centrifuge(s) and thermal unit, other equipment will be used in the processing sequence. A description and list of equipment is provided subsequently in this section.

The layout of the oil and gas waste processing facility, identifying the various components, is shown on a plan view of the processing facility on Drawing IV-I-2. Once the oil and gas liquid waste is deemed appropriate for acceptance, drivers will be directed to the waste processing facility, where the oil and gas liquid waste will be processed by the following sequence of activities:

Waste Receipt

- Step 1) oil and gas liquid waste will be offloaded from tanker trucks into designated basins that may only hold oil and gas wastes (i.e., no comingling);
- Step 2A) the waste may then be solidified in the designated basins in accordance with Sub-Appendix IV-A-1 of the SOP, followed by disposal at the Class 1 waste working face once it is confirmed that the solidified waste passes the paint filter test, or Step 2B may be used instead of Step 2A;
- Step 2B) depending on its liquid consistency, the oil and gas waste may be processed at the centrifuge site or the thermal site by following their respective steps identified below.

Processing at Centrifuge Site

- Step 1) oil and gas waste to be centrifuged will be pumped from the designated basins into to the Shaker Tank for initial separation of liquid and solid material;
- Step 2) from the Shaker Tank, liquid will be transferred to the Feed Tank(s) which will be used to meter materials to the Centrifuge(s);
- Step 3) materials will be fed into the Centrifuge(s) for separation, and will be processed therein;

- 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 the 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.
- 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

(Leachate and Contaminated Water Plan); or (iii) transported to a duly permitted/registered off-site disposal facility (e.g., a Class II injection well) that is authorized to accept this type of oil and gas related water waste.

- The separated oil-phase material (which is primarily spent diesel used in drilling fluids, along with incidental amounts of crude oil) that is recovered from the centrifuge process will be transported to an authorized off-site oil processing/reclamation facility that is permitted or authorized to receive this type of reclaimed material.

2.3 Off-Site Transport of Post-Processed Oil and Gas Wastes

The off-site transport of the post-processed oil and gas wastes (i.e., the reclaimed oil and the separated water) shall be subject to applicable RRC requirements. For as long as these materials are within the facility's custody, the facility shall comply with all applicable RRC requirements regarding management of this waste (manifesting, recordkeeping, reporting, quantity records, verification of movement, etc.). Recovered oil and gas waste that will be transported off-site shall not be comingled with other wastes (e.g., solid waste, or non-oil and gas wastes) and will be transported and managed as required by TCEQ, RRC and TXDOT rules and requirements.

2.4 Equipment and Processing Description

2.4.1 Centrifuge Description

High-speed centrifuges are used for separation of liquids (water and oil), while simultaneously removing solid particles down to approximately 1 micron size. The centrifuging process is described below in numerical sequence (1 through 8) of the internal steps/components within the centrifuge itself.

- The liquid waste is introduced to the rotating centrifuge bowl from the top via a stationary inlet pipe (1), and is accelerated in a distributor (2) before entering the disc stack (3). It is between the discs that the separation of the liquids and the solids takes place.
- The liquid phase leaves the bowl over the top disc (4) and through a paring disc (5). The heavier solids phase is collected at the bowl periphery, from where it is discharged intermittently.

- The solids discharge is achieved by a hydraulic system below the separation space in the bowl, which at preset intervals forces the sliding bowl bottom (6) to drop down, thus opening the solids ports (7) at the bowl periphery. The bowl is mounted on a vertical spindle (8) driven by a vertically mounted motor, via a belt drive.

The centrifuge operates as a continuous process. This is done using centrifugal forces that can be well beyond 3000 times greater than gravity. When subject to such forces, the denser solid particles are pressed outwards against the rotating bowl wall, while the less dense liquid phase forms a concentric inner layer. Different dam plates are used to vary the depth of the liquid as required.

The sediment formed by the solid particles is continuously removed by the screw conveyor, which rotates at a different speed than the bowl. As a result, the solids are gradually "plowed" out of the lower part of the bowl and up the conical "beach". The centrifugal force compacts the solids and expels the surplus liquid. The dried solids then discharge from the bowl. The clarified liquid phases (water and oil) overflow the dam plates situated at the opposite end of the bowl. Manufacturer's literature on the Centrifuges is provided in Sub-Appendix IV-I-A of this plan.

2.4.2 Description of Other Processing Equipment

Shaker Tank: This type of tank is made of steel and is used for first-stage solids control processing, to separate out larger solids prior to processing through the centrifuge. Internally, the shaker tank commonly is divided into several sub-compartments using internal plates set at different heights to separate the tank into multiple sub-compartments. The liquid waste (e.g., drilling mud) will be processed by the shaking mechanism to remove large pieces, then the separated solids will be transferred for further processing and the separated mud and/or water will drop down into a shaker sub-compartment and be transferred to the feed tank for further processing.

Feed Tank: This type of tank is made of steel and is used to meter liquids into the centrifuge for further processing.

Dissolved Air Flotation (DAF) Unit: The DAF is a tank that is used to clarify waste waters by removing suspended matter (e.g., oil). The removal is achieved by dissolving air in the water under pressure and then releasing the air at atmospheric pressure in a flotation tank. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it is then removed by a skimming device.

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.).

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

Note: Centrifuge throughput is dependent on solids content and can vary widely.

2.5 Processing Rates and Waste Quantities

This section has been prepared to address the topics of 30 TAC §330.203(b), with the exception of the destination of processed waste (which were already addressed in Section 2.2). Processing rates and associated oil and gas waste quantities are estimated as follows:

- Estimated Amount of Waste to Be Received Daily.
    - Typical Day. For facility planning purposes, the facility estimates it may receive approximately 60,000,000 gallons of oil and gas waste subject to centrifuge and/or thermal processing per year. This is equivalent to approximately 164,385 gallons/day on an average (i.e., typical) day. This quantity is estimated using information on the actual quantities received during the temporary authorization (TA) period along with future market projections, and is not intended as a limiting value; the actual daily and annual quantity of liquid waste may be more or less than this estimated quantity.
    - Maximum Day. Based on the equipment capacities and allowable facility operating hours (24/7, per the SOP), the theoretical maximum amount of waste that could be received and processed in a day can be calculated. As described, the centrifuge process is a continuous process. From Table IV-I-1, at maximum operational capacity there will be up to nine centrifuges (four at each location), each with capabilities to process between 50-250 gallons/minute. The range in capabilities is due to differences in centrifuge type and the specifics of the waste composition (solids content). For practical purposes, not every centrifuge will likely be operating at maximum capacity continuously for 24 hours. Accordingly, a Maximum Day for the centrifuge site is calculated assuming (9 centrifuges x 24 hrs/day of operation x 100 gallons/minute = 1,296,000 gallons/day. Additionally, for the thermal site, there will be one thermal unit with the capacity to process about 200 tons/day
- Maximum Amount of Waste to Be Stored at Any One Point in Time in the processing facility is 833,016 gallons (see Table IV-I-1 for detailed breakdown by oil and gas waste type).
- Maximum and Average Lengths of Time that Waste is to Remain in the processing facility.

- Unprocessed Waste. Processing by centrifuge or by thermal unit is a continuous process. The maximum length of time that a given quanta of unprocessed waste will remain at the facility before processing is 24 hours. The average length of time is estimated to be 8-12 hours.
- Processed Waste. As the waste processing alternatives are continuous techniques, there will be ongoing quantities of processed waste ready for disposal at the working face, or going to the storage tanks. The maximum length of time that post-processed solids will remain at the processing facility prior to their disposal is 24 hours, and the estimated average time is 12 hours. The maximum length of time that processed liquids will be held in the storage tanks is 120 hours, and the estimated average time is 72 hours.

- Maximum and Average Waste Processing Times. It is estimated that on average, it will take 8-12 hours to process a given quanta of waste (i.e., the time for a given waste to complete the processing sequence outlined in Section 2.1). The maximum processing time is 24 hours.

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 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

which is from National Weather Service Technical Paper Number 40 (TP-40) data for Bexar County). The secondary containment liner area will be sloped to drain to a low-point (sump), to allow for collection and removal of spilled or leaked waste and to prevent overflow of the containment. Spilled/leaked waste or contaminated water must be removed from the secondary containment system within 24 hours. Spilled or leaked waste will be cleaned up using soil or other absorbent material/solidifying agents to remove free liquids, followed by disposal in the landfill.

Compacted Clay Quality Control/Quality Assurance (QA/QC). The QA/QC procedures, specifications, and requirements for the compacted clay liner secondary containment surrounding the basins and when used as secondary containment for the centrifuge site or the thermal site will be performed in accordance with the applicable sections of the Soils and Liner Quality Control Plan (SLQCP) – refer to Drawing IV-I-4 for details.

3.3 Storage Requirements at the Oil and Gas Waste Processing Facility

The facility will not accumulate waste (both unprocessed and processed) in quantities that cannot be managed in a timely manner as set forth below. Additionally, the facility will not accumulate these wastes for such time as to cause the creation of odors, insect breeding, or harborage of other vectors. Care shall be taken such that the storing of waste does not constitute a fire, safety, or health hazard or provide food or harborage for animals and vectors. Maximum allowable storage times are as follows:

- Unprocessed waste to be centrifuged will not be stored for more than 24 hours.
- The maximum length of time that post-processed solids will remain at the oil and gas waste processing facility prior to their disposal is 24 hours;
- The maximum length of time that post-processed liquids will be held in the storage tanks is 120 hours.

3.4 Fire Protection

The fire protection procedures that shall be followed are as follows:

- Follow the General Fire Prevention methods described in Section 6.2 of the SOP.
- In the event of a fire, follow the General Fire Fighting Procedures described in Section 6.3 of the SOP.

- In addition to the General Fire Fighting Procedures, in the event of a fire at the oil and gas waste processing facility , assess the extent of the fire and the potential for the fire to spread, and take appropriate action to contain/extinguish the fire as follows:
    - Smother the fire with soil transported by a dump truck, bulldozer, or other available equipment;
    - Apply water using a water truck or hose;
    - Use a fire extinguisher; or
    - If a fire cannot be extinguished by on-site facility personnel, the local fire department may be contacted by telephoning 911.

3.5 Subchapter E Requirements Addressed in SOP

The following Subchapter E requirements shall apply to oil and gas waste processing facility, and are addressed in the facility's SOP (with reference to the relevant section of the SOP noted).

- Access Control – See Section 7 of the SOP;
- Unloading of Waste – See Section 8.5 of the SOP;
- Operating Hours – See Section 9 of the SOP;
- Facility Sign – See Section 10 of the SOP;
- Control of Windblown Material and Litter – See Section 11 of the SOP;
- Materials Along the Route to the Facility – See Section 14 of the SOP; and
- Facility Access Roads – See Section 18 of the SOP.

3.6 Noise Pollution and Visual Screening

Overall screening features at the Covel Gardens facility are presented in Section 29 of the SOP. The oil and gas waste processing facility will initially be located in a portion of the site (see Drawing IV-I-1) that is a substantial distance from public roads and that will be screened by the existing landfill. If/when the facility is relocated, it will be to other appropriately lined landfill areas (as noted on Drawing IV-I-1), and the resulting

set-back from the permit boundary and public roads will serve to screen the operations and minimize adverse visual and noise impacts.

3.7 Overloading and Breakdown

In the event that equipment of critical importance associated with the centrifuge site or thermal site breaks down or is otherwise unavailable, equipment with equivalent performance that is performing a non-critical function may be temporarily reassigned to the critical function until the primary equipment is repaired. If a significant work stoppage of centrifuge or thermal processing occurs and is anticipated to last long enough to exceed the allowable storage times, create objectionable odors, insect breeding, or harborage of vectors, the situation will be remedied by processing the waste by the solidification technique (Appendix IV-A of the SOP); alternatively, the waste may be diverted to another approved processing or disposal facility.

3.8 Sanitation

When in use, the oil and gas waste processing basins are recommended to be washed down on an annual basis in conjunction with the basin inspections discussed subsequently in Section 3.12.1. During times when processing equipment is operating on a continuous basis, the processing area will be kept tidy by sweeping the floor areas and washing down the equipment to maintain sanitary conditions. Wash water which will drain to the low spot (sump) within the secondary containment area (see Drawing IV-I-4 and IV-I-5) will be removed in a timely manner and collected and disposed of in an authorized manner.

3.9 Ventilation and Air Pollution Control

No significant odors or air pollution emissions are expected to result from the oil and gas waste processing facility based on experience during the previous year's operation and the operational techniques that will be employed. The continuous process of liquids processing and removal are expected to minimize the chance for "stagnation" of liquid and any odors that could result. Care shall be taken to minimize fugitive dust from the area. Also, the various tanks associated with the process are enclosed, which will prevent the escape of odors. If nuisance odors from processing operations are detected at the facility permit boundary, the site will immediately take action to abate the nuisance, for example, by making the processing of those liquids the immediate priority in order to alleviate that odor.

3.10 Health and Safety

Training requirements of site personnel are discussed in Section 5.4, of the SOP. This includes training on health and safety topics.

3.11 Employee Sanitation Facilities

Potable water and sanitary facilities are provided for all employees and visitors within the office building at the site. Additional facilities may be added to the oil and gas waste processing facility for the convenience of site personnel and visitors.

3.12 Inspections, Recordkeeping, and Reporting Requirements

3.12.1 Oil and Gas Waste Processing Facility Inspections

Basins: At least once per month, the Site Manager or designated alternate will conduct a visual inspection of the basins to check for holes, cracks, gaps, spalls, or other signs of damage, and if found to be significant enough to potentially compromise the structural integrity of the basin, the basin will not be used until repairs are made. Once per year, a more thorough inspection of the basins will be made by emptying each basin and visually inspecting the walls and floor.

Secondary Containment: At least once per month, the Site Manager or Designated alternate will inspect the secondary containment (concrete or earthen liner as described in Section 3.2.2) surrounding the centrifuge site and thermal site to verify the integrity, ensure that controls are in place, and that housekeeping is adequate.

Processing Equipment: At least once per month, the Site Manager or designated alternate will conduct a visual inspection of the centrifuge(s), thermal unit, associated processing equipment, and the storage tanks. The purpose of the visual inspection will be to ensure no leaking valves or connections exist in the equipment.

If the results of any of the above inspections reveal non-compliances or problems with the function of the equipment/feature, corrective action shall be promptly taken to remedy/repair the issue and restore adequate function and compliance of the area operations.

3.12.2 Recordkeeping, Reporting, and Notification Requirements

The results of the inspections described herein will be documented in writing and placed in the Site Operating Record.

Also, TCEQ shall be notified in writing at least 30 days prior to relocation of the oil and gas waste processing facility. The notification will include an updated Drawing IV-I-1 or equivalent plan of the site, to show the new location.

4. CLOSURE

4.1 Oil and Gas Waste Processing Facility Closure Activities

When it is time to close the oil and gas waste processing facility, any remaining unprocessed waste will be processed at the centrifuge site or the thermal site, or solidified in the designated basins as needed to pass the paint filter test and transported to the landfill for disposal. Then the equipment, basins, and any concrete surfaces will be washed down to clean them. The wash waters shall be collected and disposed of in an authorized manner. Rented/leased items will be removed from the site and returned to the vendors/Lessors. Items having market value/salvage value (e.g., recovered oil, metal basins) will be removed from the site and the sale proceeds used to offset closure expenses.

Mixing basins will be either: (i) removed and sold for salvage value; (ii) removed and disposed of in the landfill; or (iii) remain in-place and will be filled with clean inert backfill soil to grade level. As discussed, the facility will be located on waste which will be capped and closed in accordance with landfill closure procedures.

4.2 Closure Scenarios and Waste Inventory at Closure

For expected scenario at the facility, termed “routine” (a.k.a., “planned”) closure, the facility will stop receiving oil and gas waste and processing prior to closure. Therefore, for the routine closure scenario, the liquid waste inventory at the time of closure will be zero. The worst-case scenario would be unplanned closure, if the facility were to close at an unforeseen time and has an inventory of processed and unprocessed oil and gas waste at the site. For this worst-case scenario, the estimated quantities were presented in Table IV-I-1, and will be used as the basis of quantities for the most expensive oil and gas waste processing facility closure cost estimate.

4.3 Closure Cost Estimate

A detailed cost estimate in current dollars, for hiring a third party to close the oil and gas waste processing facility, for the worst-case scenario when closure would be most expensive, is presented in Table IV-I-2 below.

TABLE IV-I-2
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 WASTE SOLIDIFICATION AREA CLOSURE COST				**$98,940**

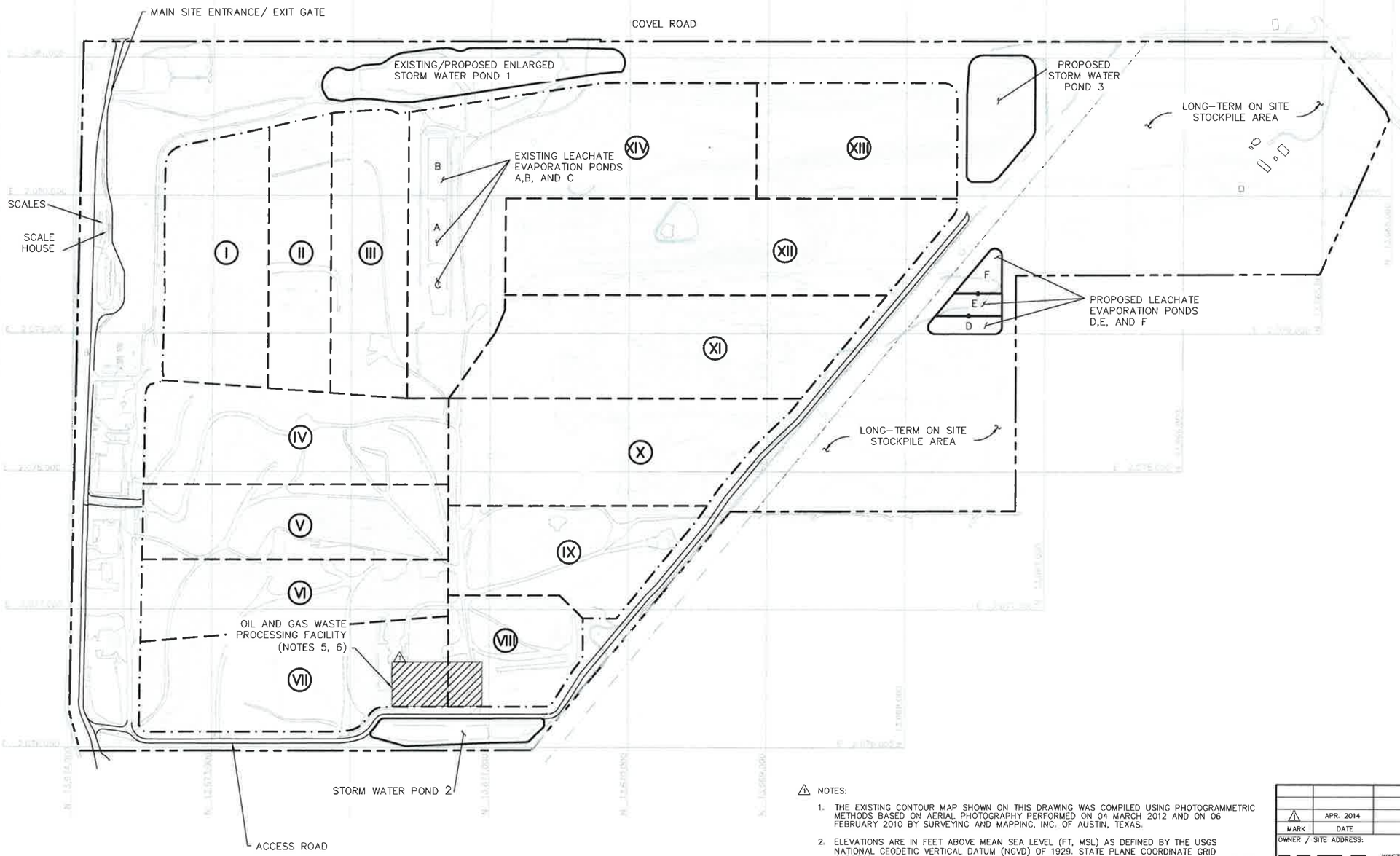
Above costs are in 2014 dollars. Oil and Gas Waste Processing Facility Closure Cost on this Table shall be added to the other facility Closure Costs - See Part III, Attachment 8.

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):			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 procesed 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



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
- (I) PHASE DESIGNATION
- PROPERTY AND PERMIT BOUNDARY
- STATE PLANE COORDINATES
- SITE GRID

0 400' 800'
SCALE IN FEET

⚠ NOTES:

1. 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.
2. ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL) AS DEFINED BY THE USGS NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929. STATE PLANE COORDINATE GRID CORRESPONDS TO TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM (NAD) 1983.
3. PROPERTY BOUNDARY AND EASEMENT INFORMATION PROVIDED BY SURVEYING AND MAPPING INC., AUSTIN, TEXAS, DATED SEPTEMBER 2003.
4. PERMIT BOUNDARY AND PROPERTY BOUNDARY COINCIDE.
5. OIL AND GAS WASTE PROCESSING FACILITY REFERS TO THE INITIAL PLANNED LOCATION. PRIOR TO MOVING THE OIL AND GAS WASTE PROCESSING FACILITY, THE TCEQ NOTIFICATION DESCRIBED IN SECTION 3.12.2 OF THE OIL AND GAS WASTE PROCESSING PLAN SHALL BE MADE.
6. OIL AND GAS WASTE PROCESSING FACILITY SHALL BE LOCATED ON LINED LANDFILL AREAS HAVING A CLASS 1 WASTE LINER SYSTEM. AREA SHALL BE SET-BACK AT LEAST 50-FT FROM THE LIMIT OF WASTE AND ALL COMPONENTS INCLUDING BASINS SHALL HAVE A 15-FT (MIN) SEPARATION FROM THE TOP OF LINER SYSTEM.

STATE OF TEXAS
SCOTT M. GRAVES
86557
LICENSED
PROFESSIONAL ENGINEER

4/4/2014

FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	BY	APPROVED
⚠	APR. 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
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

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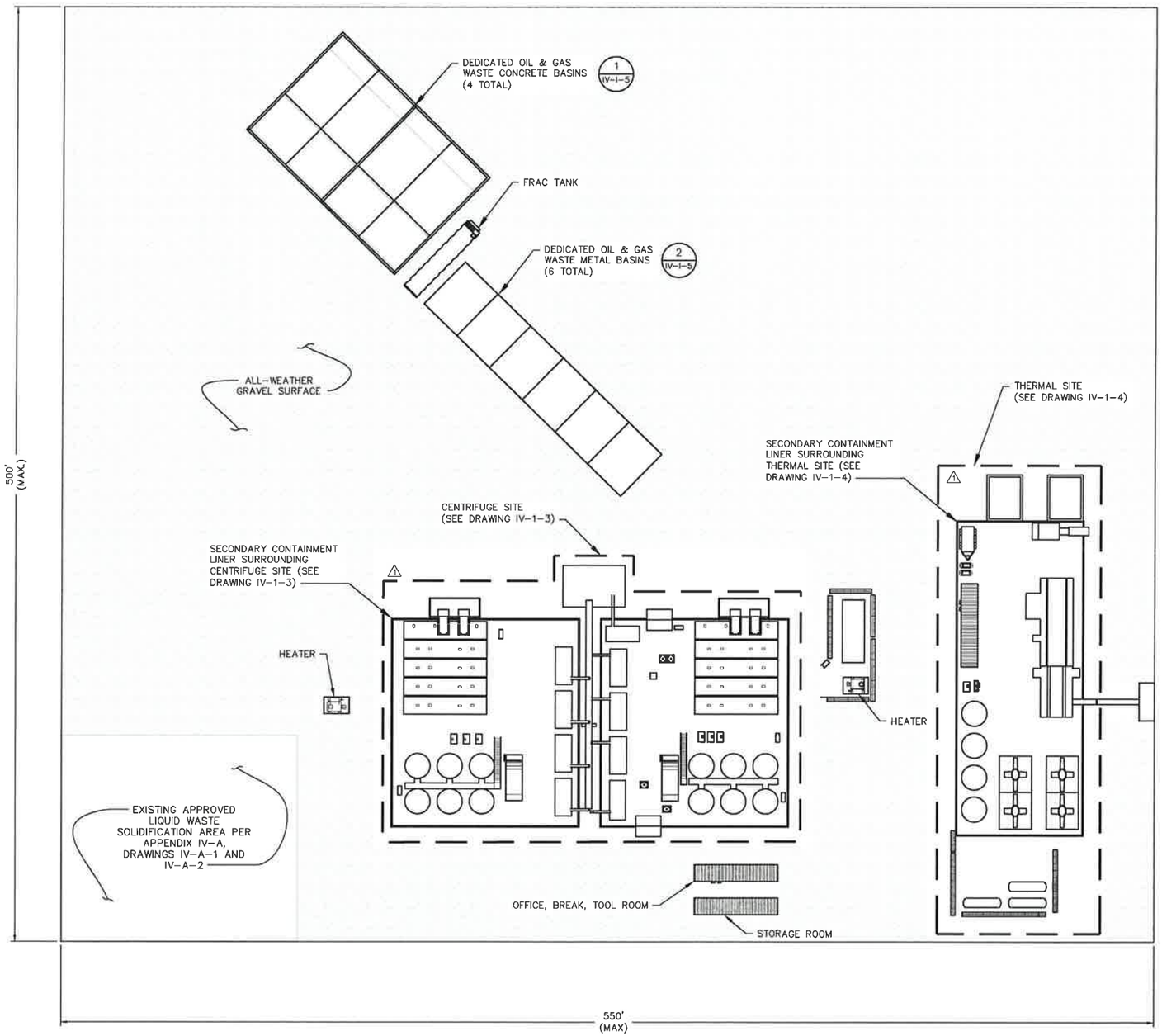

⚠ PLAN

OIL AND GAS WASTE PROCESSING FACILITY – SCHEMATIC LAYOUT

SCALE: N.T.S.

⚠ 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.

STATE OF TEXAS
SCOTT M. GRAVES
86557
LICENSED PROFESSIONAL ENGINEER
4/4/2014

FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	BY	APPROVED
⚠1	APR. 2014	EXPANDED OPERATIONS, ADDED THERMAL SITE	JJV/KH	SMG

OWNER / SITE ADDRESS:

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(210) 623-8800

ENGINEER:

Geosyntec consultants
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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. IV	DRAWING NO: IV-1-2
FILE NO.: TXL0303.01P020	CHECKED BY: SMG	APPROVED BY: SMG		

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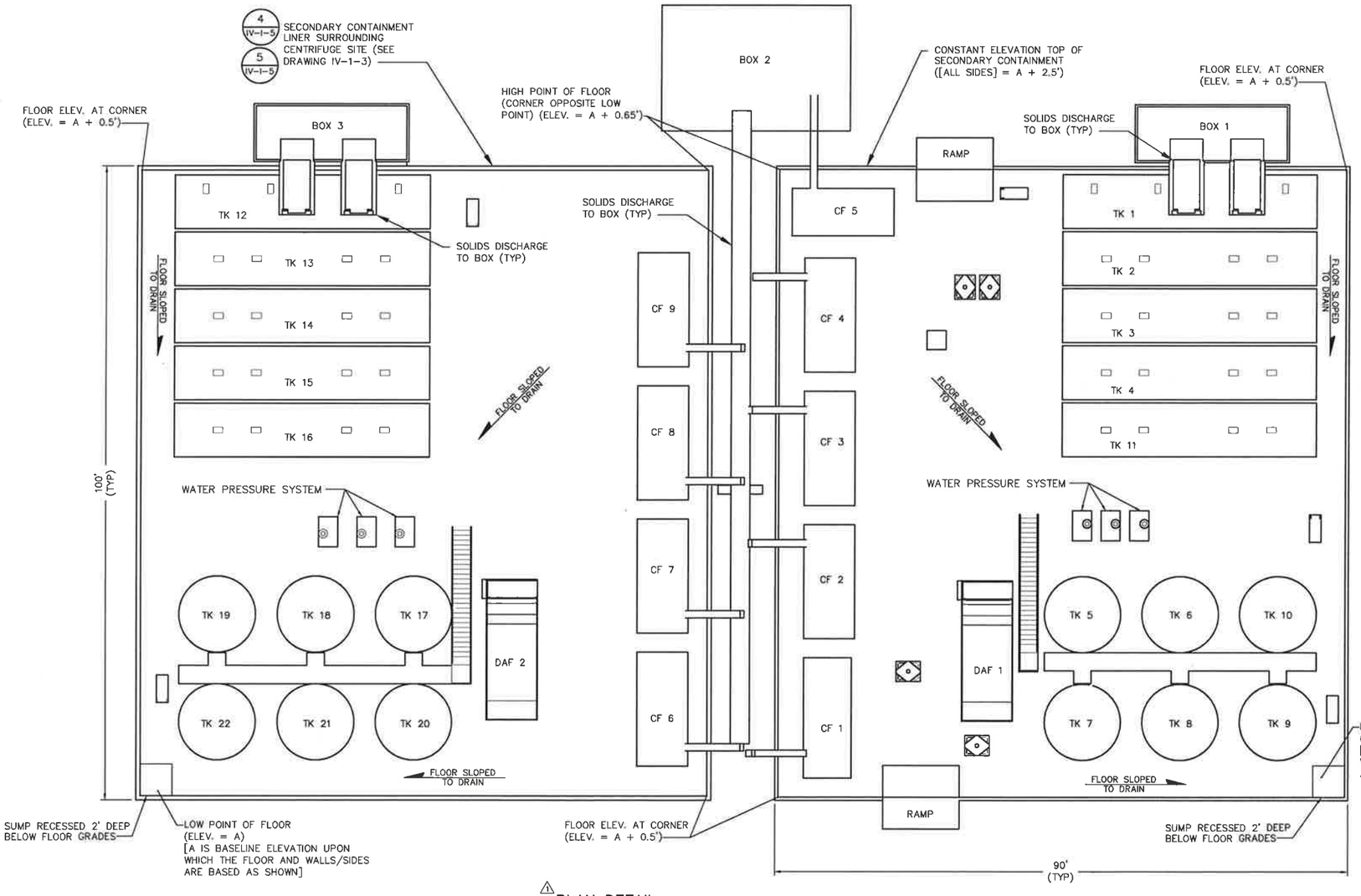

⚠ PLAN DETAIL

CENTRIFUGE SITE – SCHEMATIC LAYOUT

SCALE: N.T.S.

⚠ NOTES:

1. A MORE DETAILED EQUIPMENT DESCRIPTION INCLUDING SIZE/CAPACITY, IS PRESENTED ON TABLE IV-I-1 AND DISCUSSED IN SECTION 2.4 OF THE OIL AND GAS WASTE PROCESSING PLAN.
2. 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.

⚠

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	
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 RPESSURE 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 FT^3)
  - COMBINED TANK/EQUIPMENT = 214,500 GALLONS (10% = 21,450 GALLONS (2,867 FT^3)) [GOVERNS]
  - 25-YR, 24-HR STORM = 7.81N (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 FT^2
- FLOOR AREA OCCUPIED BY EQUIPMENT/COMPONENTS (DISPLACED AREA, NOT AVAILABLE FOR CONTAINMENT) = 3,228 FT^2
- NET SIZE OF CONTAINMENT FLOOR AREA: 9,000 – 3,228 = 5,772 FT^2
- 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 FT^2
  - VOLUME OF 25-YR, 24-HR STORM = 0.65 FT X 12,744 FT^2 = 8,284 FT^3
- CONTAINMENT VOLUME REQUIRED: 2,867 + 8,284 = 11,151 FT^3
- CONTAIMENT 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 FT^3
- ACTUAL CONTAINMENT CAPACITY ≥ MINIMUM REQUIRED (11,502 FT^3 > 11,151 FT^3) CONFIRMED ACCEPTABLE

STATE OF TEXAS
SCOTT M. GRAVES
86557
LICENSED
PROFESSIONAL ENGINEER

4/4/2014

FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	BY	APPROVED
⚠	APR. 2014	EXPANDED OPERATIONS	JJV/KH	SMG

OWNER / SITE ADDRESS:

WASTE MANAGEMENT OF TEXAS, INC.
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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.	DRAWING NO:
FILE NO.: TXL0303.01P030	CHECKED BY: SMG	APPROVED BY: SMG	IV	IV-I-3

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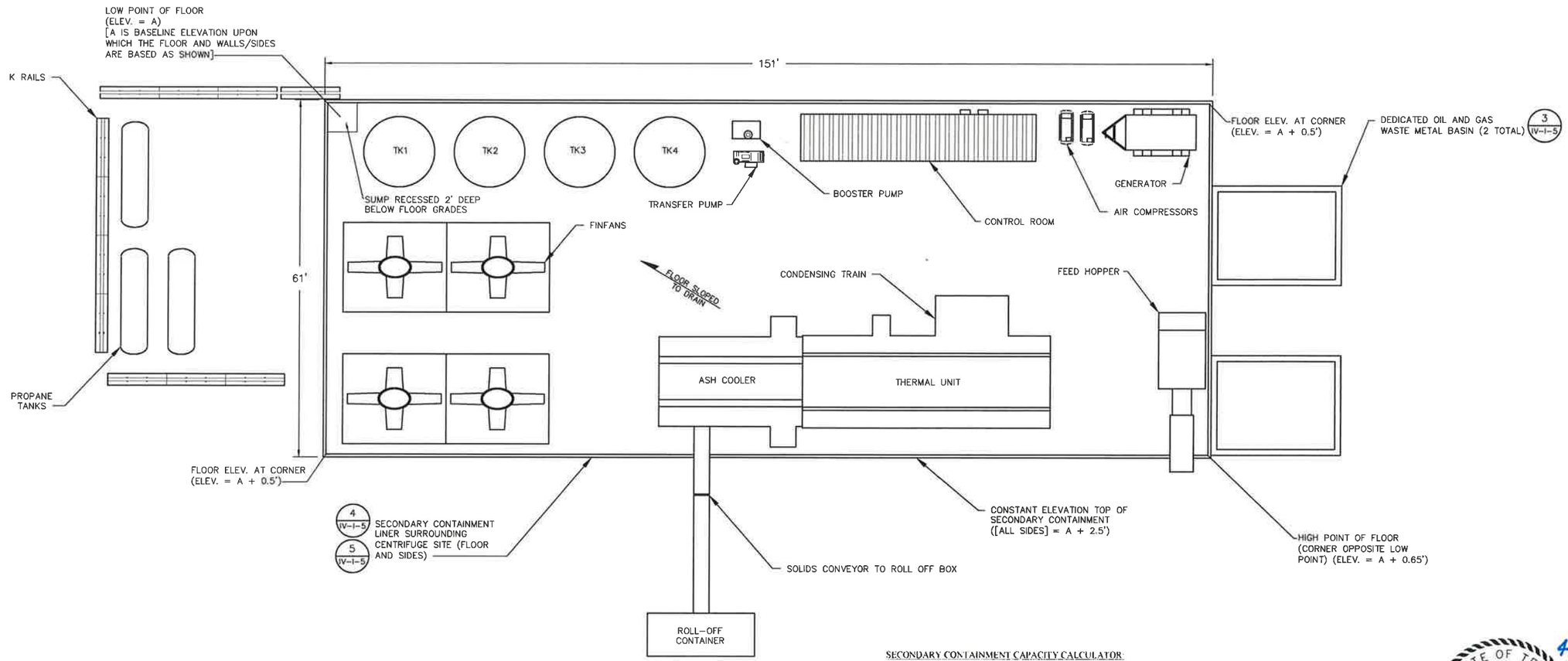

PLAN DETAIL
THERMAL SITE – SCHEMATIC LAYOUT
SCALE: N.T.S.

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

NOTES:

1. A MORE DETAILED EQUIPMENT DESCRIPTION INCLUDING SIZE/CAPACITY, IS PRESENTED ON TABLE IV–I–1 AND DISCUSSED IN SECTION 2.4 OF THE OIL AND GAS WASTE PROCESSING PLAN.
2. 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.

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 (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: 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 (I.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
- CONTAIMENT VOLUME PROVIDED:
  - 151' X 61' 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 = 11,907 FT³
- ACTUAL CONTAINMENT CAPACITY > MINIMUM REQUIRED (11,907 FT³ > 11,485 FT³). CONFIRMED ACCEPTABLE

STATE OF TEXAS
SCOTT M. GRAVES
86557
LICENSED
PROFESSIONAL ENGINEER
4/4/2014

FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	BY	APPROVED
1	APR. 2014	FIGURE ADDED – THERMAL SITE	JJV/KH	SMG

OWNER / SITE ADDRESS:
WASTE MANAGEMENT OF TEXAS, INC.
8611 COVEL ROAD
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ENGINEER:
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(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–I–4

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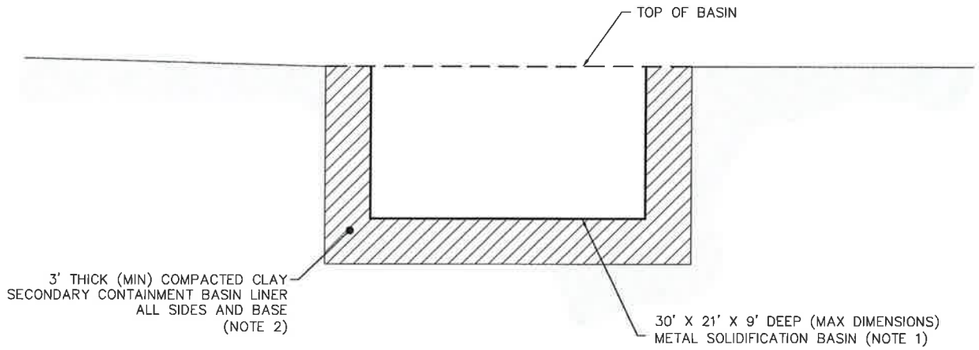
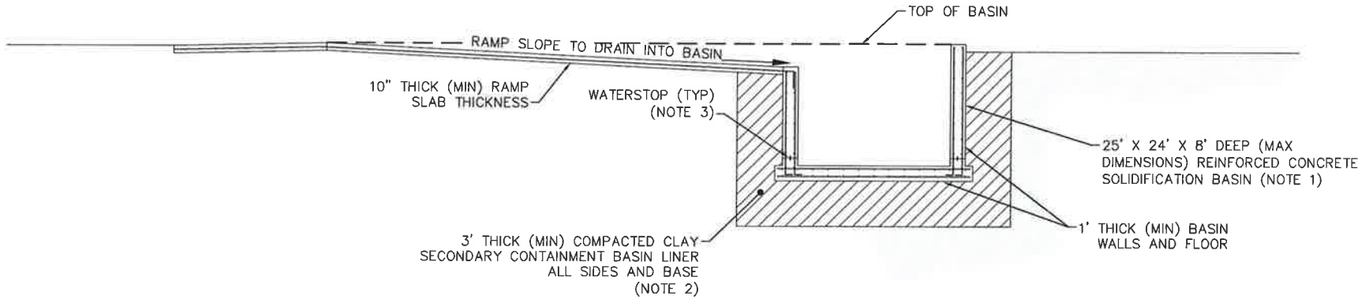
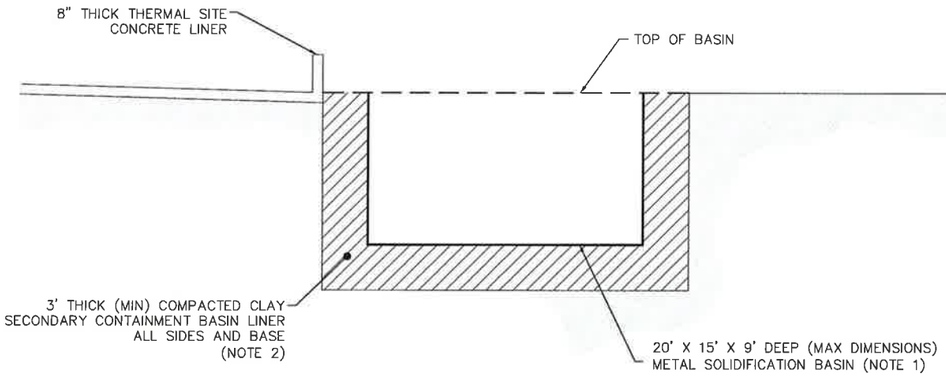


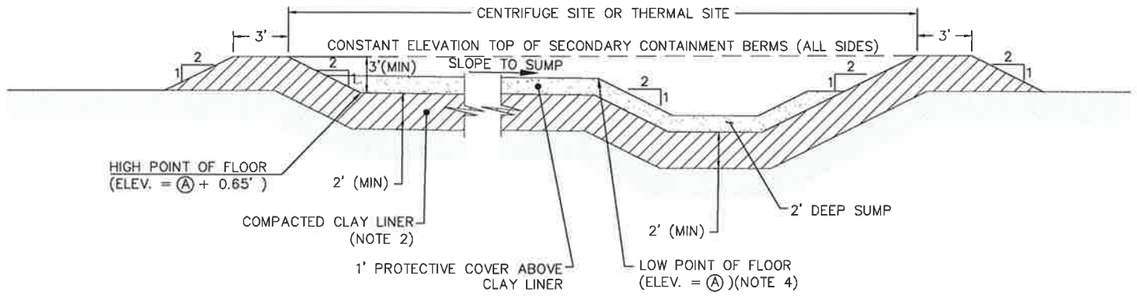
1 / IV-I-2 DETAIL
TYPICAL SECTION–METAL BASIN
SCALE: N.T.S.



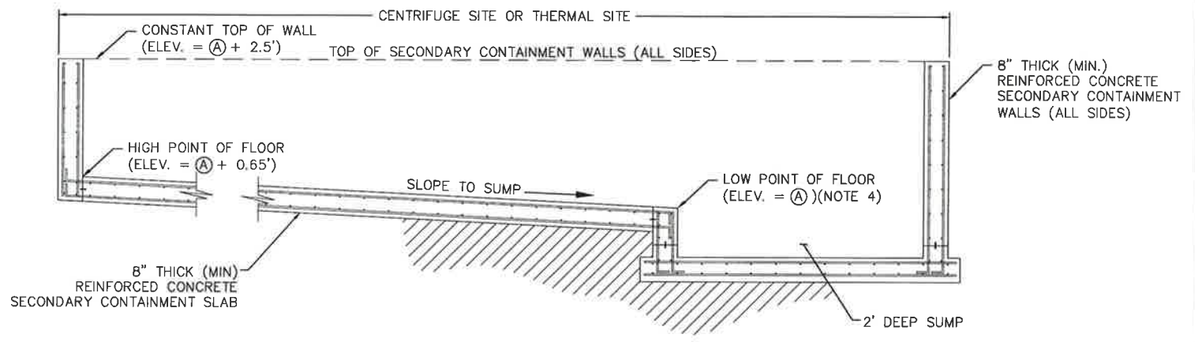
⚠ 2 / IV-I-2 DETAIL
TYPICAL SECTION–CONCRETE BASIN
SCALE: N.T.S.



⚠ 3 / IV-I-4 DETAIL
TYPICAL SECTION–THERMAL SITE BASIN
SCALE: N.T.S.



⚠ 5 / IV-I-3 DETAIL
OPTION 2: CLAY LINER SECONDARY CONTAINMENT
SCALE: N.T.S.



⚠ 4 / IV-I-3 DETAIL
OPTION 1: CONCRETE SECONDARY CONTAINMENT
SCALE: N.T.S.

NOTES:

1. 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.
2. 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.
3. 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.
4. AT TIME OF CONSTRUCTION, THE ELEVATION OF POINT Ⓐ 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 Ⓐ.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
4/4/2014
FOR PERMIT PURPOSES ONLY

MARK	DATE	REVISION	BY	APPROVED
⚠	APR. 2014	PERMIT MOD FOR REVISED BASINS AND SECONDARY CONTAINMENT OPTIONS	JJV/KH	SMG

OWNER / SITE ADDRESS: WASTE MANAGEMENT OF TEXAS, INC. 8611 COVEL ROAD SAN ANTONIO, TEXAS 78252 (210) 623–8800

ENGINEER: Geosyntec consultants — 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 DETAILS

PROJECT NO.: TXL0303.01	DRAWN BY: JJV	REVIEWED BY: SMG	PART NO.	DRAWING NO:
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