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6 November 2014

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

**Subject: Response to Third Notice of Deficiency (NOD)**
**Permit Modification – Oil and Gas Waste Processing**
**Covel Gardens Landfill, MSW Permit No. 2093B**
**San Antonio, Bexar County, Texas**
**Tracking Nos. 18053589, 18358472, and 18505711; RN100218338/CN600127856**

Dear Mr. Russell:

On behalf of Waste Management of Texas, Inc. (WMTX), Geosyntec Consultants (Geosyntec) has prepared this letter in response to the notice of deficiency (NOD) comments on the above-referenced permit modification request transmitted in a 7 October 2014 letter from the Texas Commission on Environmental Quality (TCEQ) to Waste Management of Texas, Inc. (WMTX).

## RESPONSE TO COMMENTS

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

*Comment 1:* *In Comment No. 4 of our previous letter, we requested that the closure cost estimate for the oil and gas waste processing facility be revised to include the cost of offsite disposal of the contents of the designated wastewater evaporation pond. The response was that the approximately 3.5 million gallons of wastewater would be evaporated onsite and therefore, no cost would be associated with its disposal. Please note that the closure cost estimate is to document the cost for an independent third party to close the waste management components of a landfill facility in the event of sudden abandonment of the site. With regard to a surface impoundment containing wastewater resulting from the processing of oil and gas exploration liquid wastes, the cost estimate should reflect the collection and offsite disposal of the impoundment contents since there is no assurance that the impoundment will be capable of successfully evaporating the wastewater or that evaporation would be considered an appropriate remedy at the time of sudden facility*

*abandonment. Please provide in the cost estimate for the oil and gas waste processing facility an estimate of the cost for collection and disposition of the contents of the surface impoundment in accordance with 30 TAC §330.505(a).*

Response to Comment 1: The cost estimate has been revised as requested (affects Table IV-I-2 of the Oil and Gas Waste Processing Plan, and Section 4 of the Closure and Post Closure Cost Estimates). Please also note the following:

- WMTX has determined that they would like to only designate evaporation Pond C for holding wastewater resulting from the processing of oil and gas wastes. Accordingly, the capacity of Pond C is used in the cost estimate. Also, Table IV-I-1 and Section 3.2.1 of the Oil and Gas Waste Processing Plan have been revised accordingly to only reflect one pond (Pond C).
- WMTX's current actual transportation and disposal costs for off-site disposal of oil and gas wastewater is 7.5 cents per gallon. The unit rate used in Table IV-I-2 has been revised accordingly.

*Comment 2:* *In response to Comment No. 7 of our previous letter, the application was revised to propose NORM screening of the centrifuge solids using a scintillation meter with a sodium iodide detector or equivalent. Please provide a standard operating procedure for centrifuge solids screening using the radiation survey instrument. Please specify the monitoring frequency and the steps that will be taken to accurately measure and record the radiation levels to demonstrate compliance with 25 TAC§289.259 (e) pertaining to instrument sensitivity, calibration, and recordkeeping. Specific centrifuge solids sampling and laboratory test procedures should be provided to address 25 TAC § 289.259 (d)(1)(A) for situations where unacceptable radiation levels are identified with the radiation survey instrument. Procedures should be provided for handling centrifuge solids that do not meet NORM exemption limits. Finally, please either remove the term "equivalent" in the application or provide the specific criteria and procedures that will be used to determine equivalency to the proposed radiation survey instrument.*

Response to Comment 2: The Oil and Gas Waste Processing Plan has been revised as requested to provide the standard operating procedure for centrifuge solids screening (provided as an added appendix, "Appendix IV-I-B"). The operating procedures include monitoring frequency, methodology and recording of radiation levels to demonstrate compliance with 25 TAC §289.259. In addition, for centrifuge solids not meeting on site disposal criteria, the methodology is provided for further testing, storing, transporting and off-site disposal.

*Comment 3:* *In Comment No. 7 of our previous letter, we requested that the oil and gas waste inspection and recordkeeping procedures be revised as necessary for consistency with the RRC permit requirements. New information was provided in Section 3.12.1 of the application which states that the inspection and record keeping requirements will conform to the requirements of Section II.B and III. of the RRC permit. Please note that all information placed in the Site Operating Record (which includes inspections for special waste) must be retained for the life of the facility and post-closure period in accordance with 30 TAC § 330125(d), and it is requested that the application be revised*

*accordingly. Additionally, with regard to the inspection and testing of centrifuge solids prior to landfilling, we have the following two comments for the sentence "…the results of the testing required in Section 2.2 of the plan (showing passing results) will be document and maintained…as part of the Site Operating Record for a minimum period of three years as described in the RRC permit."*

*a. It is not clear why only the tests showing passing results appear to be proposed for retention in the Site Operating Record. Title 30 TAC § 330.125(b)(10) requires all information related to special waste to be placed in the Site Operating Record. Please revise the application to address this requirement.*

*b. The proposed record retention period of three years should be revised to state that records will be maintained for the life of the facility including the post-closure care period in accordance with 30 TAC § 330.125(d).*

Response to Comment 3:

a. The intention is for all information to be placed in the Site Operating Record. The parenthetical phrase in Section 3.12.1 was intended to emphasize that the required testing needs to demonstrate that passing results are ultimately achieved for solids disposed of in the landfill – not to limit the records kept. We apologize for the confusion, and have removed the parenthetical phrase from Section 3.12.1.
b. Section 3.12.1 has been further revised as requested to state that the records will be maintained for the life of the facility including the post-closure care period.

**OTHER MINOR TEXT REVISIONS**

Although not directly related to the above comments, minor text revisions have been made as indicated on the attached redline/strikethrough review copy of the Oil and Gas Waste Processing Plan to use a consistent term "oil and gas wastewater" to refer to the process water generated by the processing facility. The changes affect Sections 2.2 and 3.2.1. The previous version of the Plan used somewhat inconsistent terminology, and this minor change is requested in order to remedy the inconsistencies.

**PART I FORM AND CERTIFICATION STATEMENT**

Pages 1 and 5 of the Part I Form are being submitted with this response. Page 5, the Signature Page, provides the certification statement signed by the applicant's responsible official.

**CLOSURE**

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

Sincerely,

Scott M. Graves, P.E.
Associate, Geosyntec Consultants, Inc.

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

# PART I FORM UPDATE PAGES

# (includes Applicant's Certification Statement)

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

**Facility Name:** Covel Gardens Landfill
**Permittee/Registrant Name:** Waste Management of Texas, Inc.
**MSW Authorization #:** 2093B
**Initial Submittal Date:** 4-4-2014
**Revision Date:** 11-6-2014

# Texas Commission on Environmental Quality

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

### 1. Reason for Submittal

☐ Initial Submittal ☒ Notice of Deficiency (NOD) Response

### 2. Authorization Type

☒ Permit ☐ Registration

### 3. Application Type

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

### 4. Application Fees

☐ Pay by Check ☒ Online Payment

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

### 5. Application URL

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

☒ Yes ☐ No

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

### 6. Confidential Documents

Does the application contain confidential documents?

☐ Yes ☒ No

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

## Signature Page

I, Steve Jacobs, Director of Disposal Operations,
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (Title)

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

Signature: _____ Date: 11-6-2014

---

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 6th day of November, 2014
My commission expires on the 27th day of July, 2016

Jill Beardsley
Notary Public in and for
Travis County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)

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

# REDLINE/STRIKETHROUGH PAGES

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

- Part III (Site Development Plan), Attachment 8 – Closure and Post Closure Cost Estimates (Cover Page and Section 4); and

  Part IV – Appendix IV-I, Oil and Gas Waste Processing Plan (Cover Page; Section 2.2; Table IV-I-1; Sections 3.2.1, and 3.12.1; Table IV-I-2; and Appendix IV-I-B).

*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 – November~~September~~ 2014

## 4. FACILITY COMBINED CLOSURE AND POST-CLOSURE COST ESTIMATE

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

**COVEL GARDENS LANDFILL**

**COMBINED CLOSURE & POST-CLOSURE COST ESTIMATE FOR FACILITY**

| ITEM | COST ESTIMATE AT TIME SUBMITTED | | COMPOUNDED INFLATION FACTOR FOR ADJUSTMENT TO 2013 DOLLARS (Notes 2 and 3) | UPDATED COST, 2013 DOLLARS (Note 3) |
|---|---|---|---|---|
| | Amount | Year | | |
| Landfill Closure | $11,558,854 | 2004 | 1.197 | $13,838,406 |
| Landfill Post-Closure | $6,648,642 | 2004 | 1.197 | $7,959,838 |
| Brush and Wood Recycling Area | $507,576 | 2009 | 1.066 | $540,832 |
| Oil and Gas Waste Processing Facility | $119,277 | 2014 | 1.00 | $119,277 |
| | | | **FACILITY CLOSURE/POST-CLOSURE COST ESTIMATE:** | **$22,458,352** |

(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 June 2014, the latest year for which TCEQ has published inflation factors is 2013. Even though the oil and gas waste processing facility closure costs are calculated in 2014 dollars, they are conservatively reported as 2013 dollars (instead of de-flating them from 2014 to 2013 dollars).

**COVEL GARDENS LANDFILL**

**COMBINED CLOSURE & POST-CLOSURE COST ESTIMATE FOR FACILITY**

| ITEM | COST ESTIMATE AT TIME SUBMITTED | | COMPOUNDED INFLATION FACTOR FOR ADJUSTMENT TO 2013 DOLLARS (Notes 2 and 3) | UPDATED COST, 2013 DOLLARS (Note 3) |
|---|---|---|---|---|
| | Amount | Year | | |
| Landfill Closure | $11,558,854 | 2004 | 1.197 | $13,838,406 |
| Landfill Post-Closure | $6,648,642 | 2004 | 1.197 | $7,959,838 |
| Brush and Wood Recycling Area | $507,576 | 2009 | 1.066 | $540,832 |
| Oil and Gas Waste Processing Facility | $399,509 | 2014 | 1.00 | $399,509 |
| | | | **FACILITY CLOSURE/POST-CLOSURE COST ESTIMATE:** | **$22,738,584** |

(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 June 2014, the latest year for which TCEQ has published inflation factors is 2013. Even though the oil and gas waste processing facility closure costs are calculated in 2014 dollars, they are conservatively reported as 2013 dollars (instead of de-flating them from 2014 to 2013 dollars).

**Shading is for review copy only, to identify which items were revised.**

*Prepared for:*

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

# OIL AND GAS WASTE PROCESSING PLAN
# PART IV – APPENDIX IV-I

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

*Prepared by:*

Geosyntec consultants
8217 Shoal Creek Blvd, Suite 200
Austin, Texas 78757
(512) 451-4003

April 2014
Revised November~~September~~ 2014

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**TABLES**



**DRAWINGS**



**APPENDICESX**

2. Scanning for the presence of naturally occurring radioactive material (NORM) using a scintillation meter with a sodium iodide detector, or equivalent. Operating procedures for the radiation testing of separated solids are provided in Appendix IV-I-B of this Plan. This includes identifying the radiation survey instrument types that may be used, along with the monitoring frequency, methodology, and recording of radiation levels to demonstrate compliance with the oil and gas NORM waste exemption concentration requirements of 25 TAC §289.259(d). In addition, Appendix IV-I-B provides the methodology for further testing, storing, transporting and off-site disposal of separated solids with radiation levels not meeting criteria for on-site disposal.~~Material with a maximum reading of 50 microroentgens per hour will be further evaluated to demonstrate that the waste does not exceed 30 picocuries per gram Radium 226 combined with Radium 228 and 150 picocuries per gram of all other radionuclides following the procedures described in 25 TAC §289.259(d). Waste not meeting these requirements must be shipped off-site to a duly-permitted disposal facility that can accept this type of waste.~~

- The separated water-phase oil and gas wastewater (i.e., process water, 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, (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 wastewater~~ 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,

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

| ITEM | DESCRIPTION OF MAXIMUM SIZE | CAPACITY (gallons, unless noted) | MAXIMUM NUMBER OF ITEMS | TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted) |
|---|---|---|---|---|
| METAL BASIN | 30' X 21' X 9' (7' depth of holding capacity) | 32,989 | 4 | 131,956 |
| REINFORCED CONCRETE BASIN WITH SACRIFICIAL METAL LINING | 25' X 24' X 8' (6' depth of holding capacity) | 26,930 | 8 | 215,439 |
| SHAKER TANKS | 400 Barrels | 16,800 | 2 | 33,600 |
| FEED TANKS | 400 Barrels | 16,800 | 8 | 134,400 |
| CENTRIFUGES | 50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x 90 gal catch tanks) | | 11 | 1,980 |
| DISSOLVED AIR FLOTATION (DAF) | Trailer or skid-mounted unit with 3600 gal. tank | 3,600 | 2 | 7,200 |
| ROLL-OFF CONTAINER | 40-yard Dumpster | 40 cubic yards (solid material, not reported in gallons) | 6 | 240 cubic yards |
| 3-SIDED BOX CONTAINER | 30' X 20' X 10' tall (open side, capacity smaller than full dimensions) | 200 cubic yards (solid material, not reported in gallons) | 1 | 200 cubic yards |
| RECOVERED LIQUID TANKS | 500 Barrels | 21,000 | 16 | 336,000 |
| FRAC TANKS | 500 Barrels | 21,000 | 15 | 315,000 |
| MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT OIL AND GAS WASTE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons): | | | | 828,180 |
| QUANTITY ESTIMATES: MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE OIL AND GAS WASTE PROCESSING AREAS | | | | |
| UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons): | | | | 830,395 |
| PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons): | | | | 345,180 |
| PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards): | | | | 440 |
| COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons): | | | | 1,175,575 |
| QUANTITY ESTIMATES: OIL AND GAS WASTEWATER THAT MAY BE PRESENT IN ONE OF THE FOLLOWING ON-SITE LINED EVAPORATION PONDS AT A TIME (SEE SECTION 3.2.1 FOR PROVISIONS OF POND USAGE) | | | | |
| POND C (gallons): | | | | 2,939,300 |
| POND D (gallons): | | | | 3,823,200 |
| POND E (gallons): | | | | 3,652,200 |
| POND F (gallons): | | | | 3,329,200 |
| MAXIMUM QUANTITY POTENTIALLY PRESENT AT ONE TIME IN EVAPORATION POND (I.E., THE LARGEST POND CAPACITY) (gallons): | | | | 3,823,200 |

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

| ITEM | DESCRIPTION OF MAXIMUM SIZE | CAPACITY (gallons, unless noted) | MAXIMUM NUMBER OF ITEMS | TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted) |
|---|---|---|---|---|
| METAL BASIN | 30' X 21' X 9' (7' depth of holding capacity) | 32,989 | 4 | 131,956 |
| REINFORCED CONCRETE BASIN WITH SACRIFICIAL METAL LINING | 25' X 24' X 8' (6' depth of holding capacity) | 26,930 | 8 | 215,439 |
| SHAKER TANKS | 400 Barrels | 16,800 | 2 | 33,600 |
| FEED TANKS | 400 Barrels | 16,800 | 8 | 134,400 |
| CENTRIFUGES | 50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x 90 gal catch tanks) | | 11 | 1,980 |
| DISSOLVED AIR FLOTATION (DAF) | Trailer or skid-mounted unit with 3600 gal. tank | 3,600 | 2 | 7,200 |
| ROLL-OFF CONTAINER | 40-yard Dumpster | 40 cubic yards (solid material, not reported in gallons) | 6 | 240 cubic yards |
| 3-SIDED BOX CONTAINER | 30' X 20' X 10' tall (open side, capacity smaller than full dimensions) | 200 cubic yards (solid material, not reported in gallons) | 1 | 200 cubic yards |
| RECOVERED LIQUID TANKS | 500 Barrels | 21,000 | 16 | 336,000 |
| FRAC TANKS | 500 Barrels | 21,000 | 15 | 315,000 |
| MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT OIL AND GAS WASTE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons): | | | | 828,180 |
| QUANTITY ESTIMATES: MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE OIL AND GAS WASTE PROCESSING AREAS | | | | |
| UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons): | | | | 830,395 |
| PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons): | | | | 345,180 |
| PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards): | | | | 440 |
| COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons): | | | | 1,175,575 |
| ~~QUANTITY ESTIMATES: OIL AND GAS WASTEWATER THAT MAY BE PRESENT IN ONE OF THE FOLLOWING ON-SITE LINED EVAPORATION PONDS AT A TIME (SEE SECTION 3.2.1 FOR PROVISIONS OF POND USAGE)~~ | | | | |
| ~~POND C (gallons):~~ | | | | ~~2,939,300~~ |
| ~~POND D (gallons):~~ | | | | ~~3,823,200~~ |
| ~~POND E (gallons):~~ | | | | ~~3,652,200~~ |
| ~~POND F (gallons):~~ | | | | ~~3,329,200~~ |
| MAXIMUM QUANTITY **OF OIL AND GAS WASTEWATER** POTENTIALLY PRESENT ~~AT ONE TIME~~ IN EVAPORATION POND (I.E., ~~THE LARGEST~~ POND **C AT FULL** CAPACITY) (gallons): | | | | **2,939,300** |

**Shading is for review copy only, to identify which items were revised.**

Notes: (1) Centrifuge throughput is dependent on solids content and can vary widely.

# 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, oil and gas ~~the processed~~ waste ~~–~~water (i.e., process water) will be managed as contaminated water in accordance with 30 TAC §330.207 by following the Leachate and Contaminated Water Plan. ~~Processed o~~Oil and gas waste ~~-~~water **shall not be comingled** with other waters, contaminated waters, leachate, or wastes. Oil and gas waste ~~–~~water will be transported to an existing on-site lined evaporation pond via dedicated tanker truck(s) (i.e., tankers not containing other contaminated waters or leachate). The oil and gas waste ~~-~~water will then be managed by placing it into ~~one of~~

~~either~~ Pond C, ~~D, E, or F (i.e., one of the existing on-site lined evaporation ponds that~~ which will be reserved for exclusive use to hold ~~processed~~ oil and gas waste ~~water~~ only~~)~~. Only ~~one evaporation p~~Pond C may be used ~~at any one time~~, and all leachate and/or contaminated water must be removed from that pond prior to its use for storage of oil and gas ~~processed~~ wastewater. 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.

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 Waste Recordkeeping

Incoming wastes associated with the oil and gas waste separation facility will be subject to the testing and recordkeeping requirements set forth in the RRC Permit Conditions II.B and III.

For separated solids that are disposed of in the landfill, the results of all~~the~~ testing required in Section 2.2 and Appendix IV-I-B of this plan ~~(showing passing results)~~ will be documented and maintained in hardcopy or electronic format as part of the Site Operating Record for ~~a minimum period of three years as described in the RRC permit~~ the life of the facility and the post-closure care period.

### 3.12.2 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.

**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 | 261,180 | $26,118 |
| 2.3 | Sale of Processed Oil (proceeds will offset other closure costs) | Gal. | $0.00 | 60,000 | $0 |
| 2.4 | Solidification of Unprocessed Liquid Waste | C.Y. | $2.50 | 8,223 | $20,557 |
| 2.5 | On-Site Disposal of Solidified Waste (haul to working face) | C.Y. | $2.00 | 8,223 | $16,446 |
| 2.6 | On-Site Disposal of Solid-Fraction Processed Waste (haul to working face) | C.Y. | $2.00 | 440 | $880 |
| 2.7 | Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters. | L.S. | $5,000 | 1 | $5,000 |
| 2.8 | Re-Sale Value of Equipment (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.9 | Salvage Value of Metal Basins (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.10 | In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil) | C.Y. | $2.50 | 600 | $1,499 |
| 2.11 | Revegetate Fixed Facility Disturbed Area (half of 375' x 550') | Ac. | $1,500 | 2.4 | $3,551 |
| | | | | CONSTRUCTION TOTAL | $84,051 |
| | | | | ENGINEERING AND CONSTRUCTION TOTAL | $91,051 |
| 3 | Contingency, Contract, and Legal | | | | |
| 3.1 | Contingency (10% of Eng and Construction) | | | | $9,105 |
| 3.2 | Contract Performance Bond (1% of Eng and Construction) | | | | $911 |
| 3.3 | Legal Fees (15% of Eng and Construction) | | | | $13,658 |
| 3.4 | TCEQ Administration Cost (5% of Eng and Construction) | | | | $4,553 |
| | | | | CONTINGENCY, CONTRACT, LEGAL TOTAL | $28,226 |
| | **TOTAL LIQUID WASTE SOLIDIFICATION AREA CLOSURE COST** | | | | **$119,277** |

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

**TABLE IV-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. | $0.075 | 261,180 | $19,589 |
| 2.3 | Off-Site Disposal of Wastewater from Evaporation Pond | Gal. | $0.075 | 2,939,300 | $220,448 |
| ~~2.3~~ | ~~Sale of Processed Oil (proceeds will offset other closure costs)~~ | ~~Gal.~~ | ~~$0.00~~ | ~~60,000~~ | ~~$0~~ |
| 2.4 | Solidification of Unprocessed Liquid Waste | C.Y. | $2.50 | 8,223 | $20,557 |
| 2.5 | On-Site Disposal of Solidified Waste (haul to working face) | C.Y. | $2.00 | 8,223 | $16,446 |
| 2.6 | On-Site Disposal of Solid-Fraction Processed Waste (haul to working face) | C.Y. | $2.00 | 440 | $880 |
| 2.7 | Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters. | L.S. | $5,000 | 1 | $5,000 |
| 2.8 | Re-Sale Value of Equipment (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.9 | Salvage Value of Metal Basins (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.10 | In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil) | C.Y. | $2.50 | 600 | $1,499 |
| 2.11 | Revegetate Fixed Facility Disturbed Area (half of 375' x 550') | Ac. | $1,500 | 2.4 | $3,551 |
| | | | | CONSTRUCTION TOTAL | $297,969 |
| | | | | ENGINEERING AND CONSTRUCTION TOTAL | $304,969 |
| 3 | Contingency, Contract, and Legal | | | | |
| 3.1 | Contingency (10% of Eng and Construction) | | | | $30,497 |
| 3.2 | Contract Performance Bond (1% of Eng and Construction) | | | | $3,050 |
| 3.3 | Legal Fees (15% of Eng and Construction) | | | | $45,745 |
| 3.4 | TCEQ Administration Cost (5% of Eng and Construction) | | | | $15,248 |
| | | | | CONTINGENCY, CONTRACT, LEGAL TOTAL | $94,540 |
| | **TOTAL ~~LIQUID WASTE SOLIDIFICATION AREA OIL~~ AND GAS WASTE PROCESSING FACILITY CLOSURE COST** | | | | **$399,509** |

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

## Notes for Table IV-I-2:

| | | | | |
|---|---|---|---|---|
| Assumptions and Cost Backup: | | | | |
| Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure] | | | | |
| Maximum inventory of wastes assumed as follows (based on Table IV-I-1): | | | | |
| | Unprocessed Oil and Gas Waste (gallons): | | 830,395 | |
| | Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons): | | 261,180 | |
| | Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank): | | 84,000 | |
| | Processed Oil and Gas Waste - Separated Solids (cubic yards): | | 440 | |
| | Assumed Solidification Bulking Factor: | | 2.0 | |
| | Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards): | | 8,223 | |
| | | | | |
| Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects. | | | | |
| Item 2.2. The facility is currently paying $0.077/gal to transport and off-site dispose of the processed water. This was rounded up 23% to an even $0.10/gal. | | | | |
| Item 2.3. The current price the facility receives for recovered 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. | | | | |

| | | |
|---|---|---|
| Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure] | | |
| Maximum inventory of wastes assumed as follows (based on Table IV-I-1): | | |
| Unprocessed Oil and Gas Waste (gallons): | 830,395 | |
| Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons): | 261,180 | |
| Oil and Gas Wastewater in Evaporation Pond (gallons): | 2,939,300 | |
| Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank): | 84,000 | |
| Processed Oil and Gas Waste - Separated Solids (cubic yards): | 440 | |
| Assumed Solidification Bulking Factor: | 2.0 | |
| Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards): | 8,223 | |

Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects.

Item 2.2. The facility is currently paying $0.075~~7~~/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.

**Shading is for review copy only, to identify which items were revised.**

# SUB-APPENDIX IV-I-B

# OPERATING PROCEDURES FOR SEPARATED SOLIDS SCREENING

# OPERATING PROCEDURES FOR SEPARATED SOLIDS SCREENING

The following procedures will be performed to manage separated solids resulting from the oil and gas waste processing described in this Plan:

- Material will be allowed to accumulate daily in the solids area and will be batch tested prior to disposal. Testing will occur on average twice per day depending on volume of material accumulated in the solids box.
- Testing will consist of passing the radiation survey instrument(see Note 1) (hereafter referred to as the "NORM meter") across the surface area of the soil within the three sided box containing solids from the process.
- The NORM meter will be set to measure milliRoentgens per hour (mR/hr) (conversion to microRoentgens per hour (uR/hr) requires multiplying results by 1000).
- Once turned on, the meter will take approximately 30 seconds to warm up and stabilize to ensure statistical validity.
- The NORM meter can be used to measure mR/hr directly or as counts per minute (CPM) and converted to mR/hr. Typical operation mode will be in mR/hr.
- To perform a general survey of the separated solids, the NORM meter will be placed within 2 inches of the surface of the pile and moved around the pile for approximately 30 seconds. The highest value detected will be logged.
- If the result of the survey indicates the presence of radiation below 50 uR/hr, the separated solids will be disposed of in the landfill. If the survey indicates the presence of radiation at or above 50 uR/hr, the next steps will be taken as outlined below.
- If the result of the survey indicates the presence of radiation at or above 50 uR/hr, a confirmatory survey will be performed using counts per minute to confirm the results. If the results indicate levels above 50 uR/hr, the material will be isolated by placement into a roll off container and covered with a tarp. The following label will be applied:
  1. yellow and black stating "Caution NORM (Naturally Occurring Radioactive Material) Is Present", or;
  2. orange and black stating "Warning Contains NORM (Naturally Occurring Radioactive Material)" or;
  3. by marking the letters "NORM" legibly with a waterproof paint or ink.

- The isolated material will then be further tested in accordance with the procedures outlined in 25 TAC 289.259(d)(1)(A).
- If radionuclide testing results are below 30 picocuries per gram (pCi/gm) or less of radium 226 or radium 228 and 150 pCi or less of any other NORM radionuclide, material will be disposed of in the landfill.
- If radionuclide testing results are at or above 30 pCi/gm of radium 226 or radium 228 or 150 pCi of any other radionuclide, the material will be transported and disposed of at a licensed facility authorized to accept this waste.
- Non-exempt NORM waste (i.e., NORM waste having radiation levels greater than the thresholds given in the two preceding bullet points) will be managed and disposed in accordance with applicable state and federal regulatory requirements by transfer of the wastes for disposal to a land disposal facility licensed by the state regulatory department/agency; the U.S. Nuclear Regulatory Commission; an agreement state; a licensing state, or alternative methods authorized by The Railroad Commission of Texas, who has has jurisdiction over the handling and disposal of NORM wastes produced during the exploration and production of oil and gas.

Note 1: Two types of instruments, equivalent in their ability to measure radiation, may be used to measure radiation levels as follows:

A **scintillation counter**, which consists of a scintillator that generates photons of light in response to incident radiation, a sensitive photomultiplier tube which converts the light to an electrical signal, and the necessary electronics to process the photomultiplier tube output.

**Geiger Mueller tube**, which consists of a an instrument that generates a pulse of electrical current each time radiation passes through the halogen quenched tube and causes inoization.

Each type of instrument will be calibrated and operable to meet the calibration requirements of 25 TAC §289.259(e)(3) and will be capable of measuring microRotegens per hour within the required range specified in 25 TAC §289.259(e)(1).

# REPLACEMENT PAGES

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

- Part III (Site Development Plan), Attachment 8 – Closure and Post Closure Cost Estimates (Cover Page and Section 4); and

  Part IV – Appendix IV-I, Oil and Gas Waste Processing Plan (Cover Page; Section 2.2; Table IV-I-1; Sections 3.2.1, and 3.12.1; Table IV-I-2; and Appendix IV-I-B (newly added)).


*Prepared for Applicant:*
**Waste Management of Texas, Inc.**
8611 Covel Road
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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:*

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


11/6/2014

FOR PERMIT PURPOSES ONLY

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

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 – November 2014

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## TABLES



## APPENDIX




FOR PERMIT PURPOSES ONLY

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

# 4. FACILITY COMBINED CLOSURE AND POST-CLOSURE COST ESTIMATE

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

**COVEL GARDENS LANDFILL**

**COMBINED CLOSURE & POST-CLOSURE COST ESTIMATE FOR FACILITY**

| ITEM | COST ESTIMATE AT TIME SUBMITTED | | COMPOUNDED INFLATION FACTOR FOR ADJUSTMENT TO 2013 DOLLARS (Notes 2 and 3) | UPDATED COST, 2013 DOLLARS (Note 3) |
|---|---|---|---|---|
| | Amount | Year | | |
| Landfill Closure | $11,558,854 | 2004 | 1.197 | $13,838,406 |
| Landfill Post-Closure | $6,648,642 | 2004 | 1.197 | $7,959,838 |
| Brush and Wood Recycling Area | $507,576 | 2009 | 1.066 | $540,832 |
| Oil and Gas Waste Processing Facility | $399,509 | 2014 | 1.00 | $399,509 |
| | | | **FACILITY CLOSURE/POST-CLOSURE COST ESTIMATE:** | **$22,738,584** |

(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 June 2014, the latest year for which TCEQ has published inflation factors is 2013. Even though the oil and gas waste processing facility closure costs are calculated in 2014 dollars, they are conservatively reported as 2013 dollars (instead of de-flating them from 2014 to 2013 dollars).

*Prepared for:*

**Waste Management of Texas, Inc.**
8611 Covel Road
San Antonio, Texas 78252
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# OIL AND GAS WASTE PROCESSING PLAN
# PART IV – APPENDIX IV-I

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

*Prepared by:*

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STATE OF TEXAS
SCOTT M. GRAVES
86557
LICENSED PROFESSIONAL ENGINEER
11/6/2014

FOR PERMIT PURPOSES ONLY

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

April 2014
Revised November 2014

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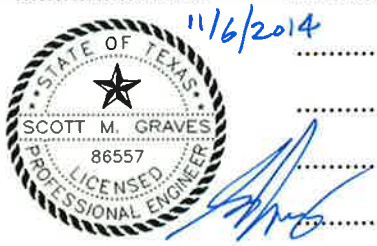


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TEXAS ENG. FIRM REGISTRATION NO. F-1182

**TABLES**



**DRAWINGS**



11/6/2014

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

FOR PERMIT PURPOSES ONLY

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

**APPENDICES**

2. Scanning for the presence of naturally occurring radioactive material (NORM) using a scintillation meter with a sodium iodide detector, or equivalent. Operating procedures for the radiation testing of separated solids are provided in Appendix IV-I-B of this Plan. This includes identifying the radiation survey instrument types that may be used, along with the monitoring frequency, methodology, and recording of radiation levels to demonstrate compliance with the oil and gas NORM waste exemption concentration requirements of 25 TAC §289.259(d). In addition, Appendix IV-I-B provides the methodology for further testing, storing, transporting and off-site disposal of separated solids with radiation levels not meeting criteria for on-site disposal.

- The separated water-phase oil and gas wastewater (i.e., process water, 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, (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 wastewater.
- 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.

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

| ITEM | DESCRIPTION OF MAXIMUM SIZE | CAPACITY (gallons, unless noted) | MAXIMUM NUMBER OF ITEMS | TOTAL MAXIMUM WASTE HOLDING CAPACITY (gallons, unless noted) |
|---|---|---|---|---|
| METAL BASIN | 30' X 21' X 9' (7' depth of holding capacity) | 32,989 | 4 | 131,956 |
| REINFORCED CONCRETE BASIN WITH SACRIFICIAL METAL LINING | 25' X 24' X 8' (6' depth of holding capacity) | 26,930 | 8 | 215,439 |
| SHAKER TANKS | 400 Barrels | 16,800 | 2 | 33,600 |
| FEED TANKS | 400 Barrels | 16,800 | 8 | 134,400 |
| CENTRIFUGES | 50 - 100 gpm for single phase centrifuge (with 150 gal catch tank); 150 - 250 gpm for dual phase centrifuge (with two x 90 gal catch tanks) | | 11 | 1,980 |
| DISSOLVED AIR FLOTATION (DAF) | Trailer or skid-mounted unit with 3600 gal. tank | 3,600 | 2 | 7,200 |
| ROLL-OFF CONTAINER | 40-yard Dumpster | 40 cubic yards (solid material, not reported in gallons) | 6 | 240 cubic yards |
| 3-SIDED BOX CONTAINER | 30' X 20' X 10' tall (open side, capacity smaller than full dimensions) | 200 cubic yards (solid material, not reported in gallons) | 1 | 200 cubic yards |
| RECOVERED LIQUID TANKS | 500 Barrels | 21,000 | 16 | 336,000 |
| FRAC TANKS | 500 Barrels | 21,000 | 15 | 315,000 |
| MAXIMUM COMBINED OIL AND GAS LIQUID WASTE QUANTITY AT OIL AND GAS WASTE PROCESSING AREA HELD IN TANKS/EQUIPMENT WITHIN SECONDARY CONTAINMENT AREA (gallons): | | | | 828,180 |
| QUANTITY ESTIMATES: MAXIMUM QUANTITY OF OIL AND GAS WASTES PRESENT AT ANY ONE POINT IN TIME AT THE OIL AND GAS WASTE PROCESSING AREAS | | | | |
| UNPROCESSED OIL AND GAS WASTE (basins, shaker tanks, feed tanks) (gallons): | | | | 830,395 |
| PROCESSED OIL AND GAS WASTE - SEPARATED LIQUIDS (WATER AND OIL) (recovered liquids tanks and centrifuge catch tanks) (gallons): | | | | 345,180 |
| PROCESSED OIL AND GAS WASTE - SEPARATED SOLIDS (box containers) (cubic yards): | | | | 440 |
| COMBINED OIL AND GAS LIQUID WASTES (BOTH UNPROCESSED AND PROCESSED) (gallons): | | | | 1,175,575 |
| MAXIMUM QUANTITY OF OIL AND GAS WASTEWATER POTENTIALLY PRESENT IN EVAPORATION POND (I.E., POND C AT FULL CAPACITY) (gallons): | | | | 2,939,300 |

Notes: (1) Centrifuge throughput is dependent on solids content and can vary widely.

# 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, oil and gas wastewater (i.e., process water) will be managed as contaminated water in accordance with 30 TAC §330.207 by following the Leachate and Contaminated Water Plan. Oil and gas wastewater **shall not be comingled** with other waters, contaminated waters, leachate, or wastes. Oil and gas wastewater 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 wastewater will then be managed by placing it into Pond C, which will be reserved for

exclusive use to hold oil and gas wastewater only. Only Pond C may be used, and all leachate and/or contaminated water must be removed from that pond prior to its use for storage of oil and gas wastewater. Any oil and gas wastewater 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.

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 Waste Recordkeeping

Incoming wastes associated with the oil and gas waste separation facility will be subject to the testing and recordkeeping requirements set forth in the RRC Permit Conditions II.B and III.

For separated solids that are disposed of in the landfill, the results of all testing required in Section 2.2 and Appendix IV-I-B of this plan will be documented and maintained in hardcopy or electronic format as part of the Site Operating Record for the life of the facility and the post-closure care period.

### 3.12.2 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

**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. | $0.075 | 261,180 | $19,589 |
| 2.3 | Off-Site Disposal of Wastewater from Evaporation Pond | Gal. | $0.075 | 2,939,300 | $220,448 |
| 2.4 | Solidification of Unprocessed Liquid Waste | C.Y. | $2.50 | 8,223 | $20,557 |
| 2.5 | On-Site Disposal of Solidified Waste (haul to working face) | C.Y. | $2.00 | 8,223 | $16,446 |
| 2.6 | On-Site Disposal of Solid-Fraction Processed Waste (haul to working face) | C.Y. | $2.00 | 440 | $880 |
| 2.7 | Decontamination (Wash Basins, Equipment, and Containment Area). Off-Site Disposal of Wash Waters. | L.S. | $5,000 | 1 | $5,000 |
| 2.8 | Re-Sale Value of Equipment (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.9 | Salvage Value of Metal Basins (proceeds will offset other closure costs) | L.S. | $0 | 1 | $0 |
| 2.10 | In-Place Closure of 4 x 150 CY Concrete Basins (Backfill with Soil) | C.Y. | $2.50 | 600 | $1,499 |
| 2.11 | Revegetate Fixed Facility Disturbed Area (half of 375' x 550') | Ac. | $1,500 | 2.4 | $3,551 |
| | | | | CONSTRUCTION TOTAL | $297,969 |
| | | | | ENGINEERING AND CONSTRUCTION TOTAL | $304,969 |
| 3 | Contingency, Contract, and Legal | | | | |
| 3.1 | Contingency (10% of Eng and Construction) | | | | $30,497 |
| 3.2 | Contract Performance Bond (1% of Eng and Construction) | | | | $3,050 |
| 3.3 | Legal Fees (15% of Eng and Construction) | | | | $45,745 |
| 3.4 | TCEQ Administration Cost (5% of Eng and Construction) | | | | $15,248 |
| | | | | CONTINGENCY, CONTRACT, LEGAL TOTAL | $94,540 |
| | **TOTAL OIL AND GAS WASTE PROCESSING FACILITY CLOSURE COST** | | | | **$399,509** |

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:

| | | | | | |
|---|---|---|---|---|---|
| Closure is "premature" (i.e., unplanned) which is most expensive [because under routine planned final closure at the end of the facility life, the oil and gas waste processing facility will cease accepting oil and gas liquids and dispose of materials before the start of closure] | | | | | |
| Maximum inventory of wastes assumed as follows (based on Table IV-I-1): | | | | | |
| | Unprocessed Oil and Gas Waste (gallons): | | | 830,395 | |
| | Processed Oil and Gas Waste - Separated Liquids, Water-Phase (gallons): | | | 261,180 | |
| | Oil and Gas Wastewater in Evaporation Pond (gallons): | | | 2,939,300 | |
| | Processed Oil and Gas Waste - Separated Liquids, Oil-Phase (gallons) (4 tanks full @ 21,000 gal/tank): | | | 84,000 | |
| | Processed Oil and Gas Waste - Separated Solids (cubic yards): | | | 440 | |
| | Assumed Solidification Bulking Factor: | | | 2.0 | |
| | Quant of Solidified Mat'l for On-Site Disp (i.e., unprocessed vol x bulking factor; converted to cubic yards): | | | 8,223 | |
| | | | | | |
| Basis for unit rates for off-site disposal is based on Facility experience. Basis for unit rates for "conventional" construction items (involving soil & waste, revegetation) is based on experience from similar construction projects. | | | | | |
| Item 2.2. The facility is currently paying $0.075/gal to transport and off-site dispose of the processed water. | | | | | |
| 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. | | | | | |

# SUB-APPENDIX IV-I-B

# OPERATING PROCEDURES FOR SEPARATED SOLIDS SCREENING

# OPERATING PROCEDURES FOR SEPARATED SOLIDS SCREENING

The following procedures will be performed to manage separated solids resulting from the oil and gas waste processing described in this Plan:

- Material will be allowed to accumulate daily in the solids area and will be batch tested prior to disposal. Testing will occur on average twice per day depending on volume of material accumulated in the solids box.
- Testing will consist of passing the radiation survey instrument(see Note 1) (hereafter referred to as the "NORM meter") across the surface area of the soil within the three sided box containing solids from the process.
- The NORM meter will be set to measure milliRoentgens per hour (mR/hr) (conversion to microRoentgens per hour (uR/hr) requires multiplying results by 1000).
- Once turned on, the meter will take approximately 30 seconds to warm up and stabilize to ensure statistical validity.
- The NORM meter can be used to measure mR/hr directly or as counts per minute (CPM) and converted to mR/hr. Typical operation mode will be in mR/hr.
- To perform a general survey of the separated solids, the NORM meter will be placed within 2 inches of the surface of the pile and moved around the pile for approximately 30 seconds. The highest value detected will be logged.
- If the result of the survey indicates the presence of radiation below 50 uR/hr, the separated solids will be disposed of in the landfill. If the survey indicates the presence of radiation at or above 50 uR/hr, the next steps will be taken as outlined below.
- If the result of the survey indicates the presence of radiation at or above 50 uR/hr, a confirmatory survey will be performed using counts per minute to confirm the results. If the results indicate levels above 50 uR/hr, the material will be isolated by placement into a roll off container and covered with a tarp. The following label will be applied:
    1. yellow and black stating "Caution NORM (Naturally Occurring Radioactive Material) Is Present", or;
    2. orange and black stating "Warning Contains NORM (Naturally Occurring Radioactive Material)" or;
    3. by marking the letters "NORM" legibly with a waterproof paint or ink.

- The isolated material will then be further tested in accordance with the procedures outlined in 25 TAC 289.259(d)(1)(A).
- If radionuclide testing results are below 30 picocuries per gram (pCi/gm) or less of radium 226 or radium 228 and 150 pCi or less of any other NORM radionuclide, material will be disposed of in the landfill.
- If radionuclide testing results are at or above 30 pCi/gm of radium 226 or radium 228 or 150 pCi of any other radionuclide, the material will be transported and disposed of at a licensed facility authorized to accept this waste.
- Non-exempt NORM waste (i.e., NORM waste having radiation levels greater than the thresholds given in the two preceding bullet points) will be managed and disposed in accordance with applicable state and federal regulatory requirements by transfer of the wastes for disposal to a land disposal facility licensed by the state regulatory department/agency; the U.S. Nuclear Regulatory Commission; an agreement state; a licensing state, or alternative methods authorized by The Railroad Commission of Texas, who has has jurisdiction over the handling and disposal of NORM wastes produced during the exploration and production of oil and gas.

Note 1: Two types of instruments, equivalent in their ability to measure radiation, may be used to measure radiation levels as follows:

A **scintillation counter**, which consists of a scintillator that generates photons of light in response to incident radiation, a sensitive photomultiplier tube which converts the light to an electrical signal, and the necessary electronics to process the photomultiplier tube output.

**Geiger Mueller tube**, which consists of a an instrument that generates a pulse of electrical current each time radiation passes through the halogen quenched tube and causes inoization.

Each type of instrument will be calibrated and operable to meet the calibration requirements of 25 TAC §289.259(e)(3) and will be capable of measuring microRotegens per hour within the required range specified in 25 TAC §289.259(e)(1).