NM1-62

Permit Application

Volume 2
Part 1 of 3

STATE OF NEW MEXICO
DIRECTOR OF OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF SUNDANCE WEST, INC. FOR A SURFACE WASTE MANAGEMENT FACILITY PERMIT

APPLICATION FOR PERMIT
SUNDANCE WEST

AUGUST 2016

VOLUME II: FACILITY MANAGEMENT PLANS

Prepared For:

Sundance West, Inc.
1001 6th Street
Eunice, NM 88231

Submitted To:

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
(505) 476-3440

Prepared By:

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Bernalillo, NM 87004
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APPLICATION FOR PERMIT

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY

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SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY

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SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

1.0 INTRODUCTION

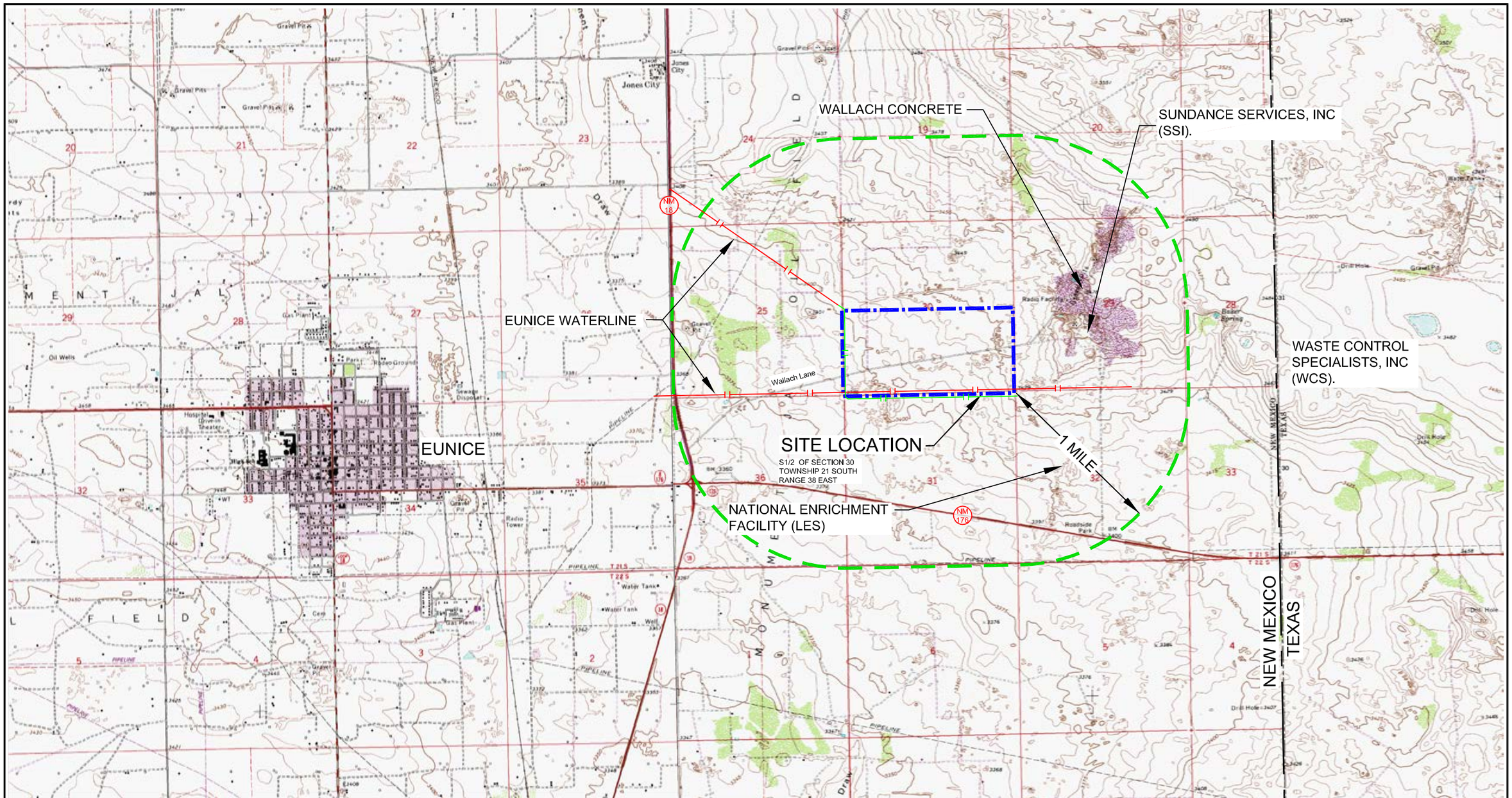
Sundance West is a proposed new commercial Surface Waste Management Facility for oil field waste processing and disposal services. The proposed Sundance West Facility is subject to regulation under the New Mexico Oil and Gas Rules, specifically 19.15.36 NMAC, administered by the Oil Conservation Division (OCD). The Facility is designed in compliance with 19.15.36 NMAC, and will be constructed and operated in compliance with a Surface Waste Management Facility Permit issued by the OCD. The Facility is owned by, and will be constructed and operated by, Sundance West, Inc.

1.1 Purpose

The purpose of this Operations, Inspection & Maintenance Plan (the Plan) is provide guidance to the Sundance West Facility staff in the daily operational procedures that have been established in compliance with 19.15.36.8 and 19.15.36.13 NMAC to provide protection of fresh water, public health, safety, and the environment. **Table II.1.1** (OCD Requirements) provides an outline of the specific 19.15.36 NMAC requirements addressed by this Plan.

1.2 Site Location

The Sundance West site is located approximately 3 miles east of Eunice, 18 miles south of Hobbs, and approximately 1.5 miles west of the Texas/New Mexico state line in unincorporated Lea County, New Mexico (NM). The Sundance West site is comprised of a 320-acre ± tract of land located in the South ½ of Section 30, Township 21 South, Range 38 East, Lea County, NM. Site access will be provided via NM 18 and Wallach Lane. A Site Location Map is provided as **Figure II.1.1**.



Based on Eunice NE, TX.- NM (1969) Photorevised (1979);
Eunice, NM (1969) Photorevised (1978);
Quadrangles, USGS 7.5' SERIES (1:24,000 Scale)

NOTE:

NO STREAMS, SPRINGS OR WATER COURSES WITHIN 1/2 MILE OF SITE

NORTH

0 1500' 3000'

SITE LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
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DATE: 07/22/2016	CAD: DWG NAME.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE II.1.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

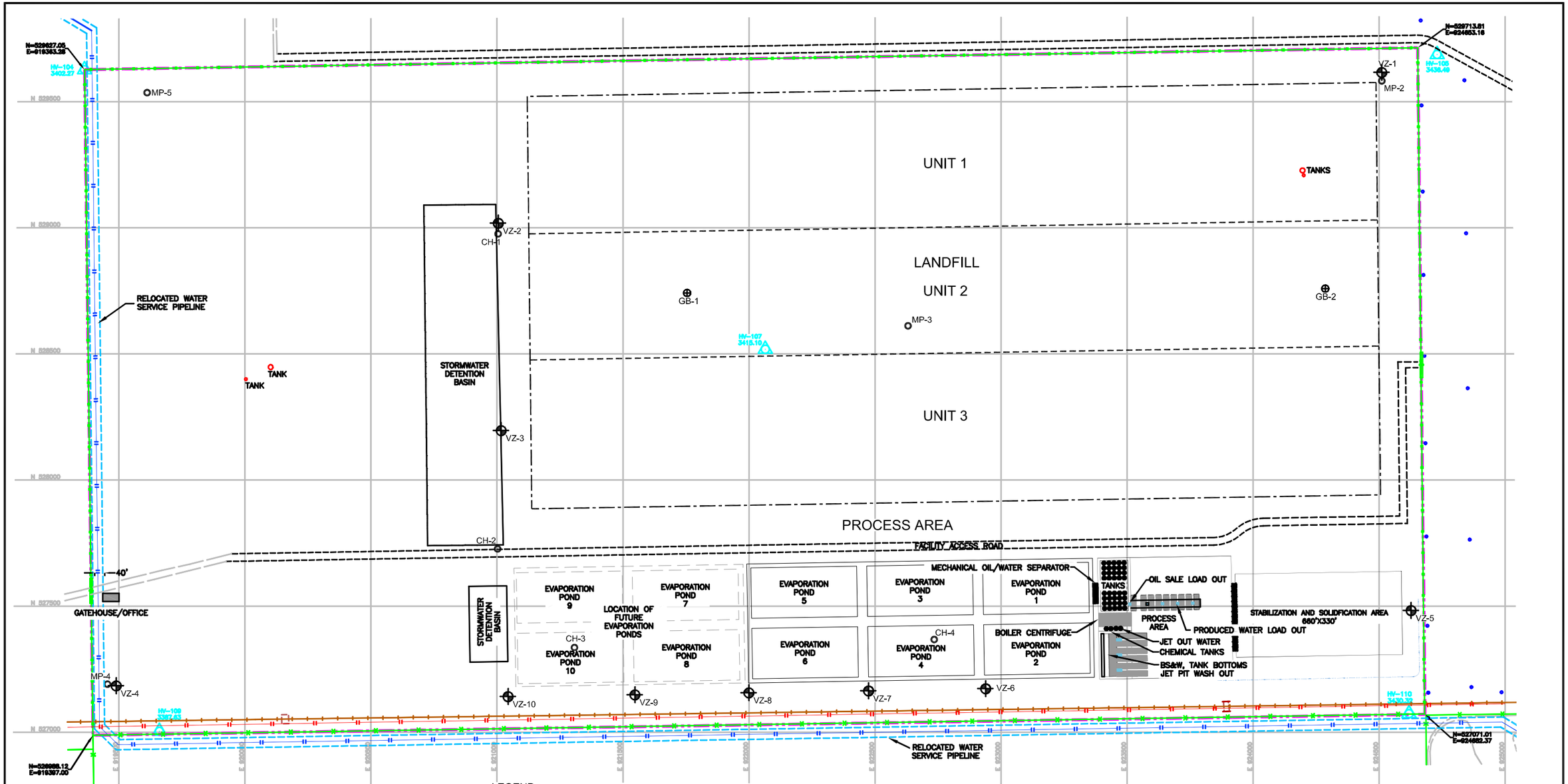
Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE LOC REVISED 11 x17.dwg
Date/Time:Aug. 09, 2016-12:36:00 ; LAYOUT: B (LS)

TABLE II.1.1
OCD Requirements: 19.15.36 NMAC
Sundance West

19.15.36.8.C(4)	*a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas;*
19.15.36.8.C(7)	*an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC;*
19.15.36.8.C(14)	*a best management practice plan to ensure protection of fresh water, public health, safety and the environment;*
19.15.36.13.L	*Each operator shall have an inspection and maintenance plan that includes the following:*
	(1) *monthly inspection of leak detection sumps including sampling if fluids are present with analyses of fluid samples furnished to the division; and maintenance of records of inspection dates, the inspector and the leak detection system's status;*
	(3) *inspections of the berms and the outside walls of pond levees quarterly and after a major rainfall or windstorm, and maintenance of berms in such a manner as to prevent erosion.*

1.3 Facility Description

The Sundance West Facility is a proposed new commercial Surface Waste Management Facility that will include two main components; an oil field waste Processing Area (80 acres ±), and an oil field waste Landfill (180 acres ±). Oil field wastes are anticipated to be delivered to the Sundance West Facility from oil and gas exploration and production operations in southeastern NM and west Texas. The Site Plan provided as **Figure I.1.2** identifies the locations of the Processing Area and Landfill facilities, which are further detailed on the **Permit Plans** (**Volume III.1**). The proposed facilities are detailed in **Table II.1.2**, and are anticipated to be developed in four primary phases as described in **Table II.1.3**.



LEGEND

FACILITY BOUNDARY		LOCKING GATE	
LIMIT OF WASTE BOUNDARY	GB-1	GEOTECHNICAL BOREHOLE	
UNIT BOUNDARY	MP-2	SOIL BORING	
FENCE (EXISTING)	CH-3	COREHOLE BORING	
PROPOSED 4-STRAND BARBED WIRE FENCING	VZ-1	VADOSE ZONE MONITORING WELL	
NEW UNPAVED ROAD		POWER POLE	
EXISTING PAVED ROAD		STORAGE TANK	
EXISTING UNPAVED ROAD		EXISTING BOX CULVERT	
RAILROAD TRACK	HV-109 3387.63	SURVEY CONTROL POINT	
RELOCATED WATER SERVICE PIPELINE	N 527500 / E 922000	SITE GRID	
EXISTING EUNICE WATERLINE			
PIPELINE EASEMENT			

NOTE

AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES, 5115 COPPER NE, ALBUQUERQUE, NM 87108
DATE OF PHOTOGRAPHY: 10-01-08

NORTH

0 200' 400'

SITE PLAN

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/18/2016	CAD: SITE DEV.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE DEV.dwg
Date/Time:Jul, 19, 2016-05:16:40

TABLE II.1.2
Proposed Facilities[1]
Sundance West

Description	No.
Oil field waste disposal landfill	1
Produced water load-out points	9
Produced water tanks	45
Mechanical oil/water separation unit	4
Evaporation ponds	10
Stabilization and Solidification Area	1
Oil treatment plant	1
Crude oil recovery tanks	3
Oil sales tanks	2
Customer jet wash	1 (6 bays)

Note:
[1]Subject to change. The proposed facilities are based on projected waste types and volumes; therefore this list may be modified in response to changes in waste streams, market conditions, technology, etc.

TABLE II.1.3

Sundance West Development Sequence (Phasing)[1]

Sundance West

Description	Summary	Year No.[2]
Phase I - Initial Landfill & Produced Water Processing Operation.		
• Initial Landfill Cell (13.5-acres) • Produced water load-out points (4) • Tank farm berm (complete) • Boiler (75 HP) running a heat transfer fluid tank farm • Produced Water Tanks (20), 1,000 bbl capacity[3] • Mechanical Oil/Water Separation Unit (2) • Evaporation Ponds (4) capable of evaporating 3,000 bbl of liquid per day • Crude Oil Recovery Tank (1), 1,000 bbl capacity • Oil Recovery Centrifuge • Oil Sale Tank (1), 1,000 bbl capacity	The oil recovered from the Produced Water Processing Operations process is anticipated to be 6 bbl per day. This material will be pumped to the heated crude oil recovery tank for further processing before being pumped to the oil sale tank.	1
Phase II - Jet-Out Pit Operation.		
• Jet-Out Pit (six-station) for handling basic sediment and water (BS&W), tank bottoms, oily drilling muds and tank wash-outs • Additional crude oil recovery tank (1), 1,000 bbl capacity • Install 5-acre Stabilization and Solidification Area	The oil recovered from the top of the Jet-Out Pit will be pumped to a heated Crude Oil Recovery Tank installed in the Tank Farm. Oil recovery from the Produced Water Tanks will also be plumed to this tank. Water recovered from the Pit will be pumped to the Produced Water Receiving Tanks. Sediments from the Pit will be bucket-loaded out of the pit and transferred to the Stabilization and Solidification Area for processing prior to landfilling.	2
Phase III - Expanded Produced Water Processing Operation.		
• Produced water load-out points (2) • Additional Produced Water Tanks (10), 1,000 bbl capacity • Additional (1) Mechanical Oil/Water Separation Unit • Additional ponds (4) capable of evaporating an additional 4,000 bbl per day of liquid • Additional Crude Oil Recovery Tank (1), 1,000 bbl capacity • Additional Oil Sales Tank (1), 1,000 bbl capacity	The additional oil recovered from the expanded Produced Water Processing Operation process, anticipated to be 6 bbl per day (for a total of 12 bbls per day), will pumped to the Crude Oil Recovery tanks for further processing.	3
Phase VI - Ultimate Produced Water Processing Facility.		
• Produced water load-out points (2) • Additional Produced Water Tanks (15), 1,000 bbl capacity • Additional (1) Mechanical Oil/Water Separation Unit • Additional ponds (2) capable of evaporating an additional 2,000 bbl per day of liquid • Additional Crude Oil Recovery Tank (1), 1,000 bbl capacity	The additional oil recovered from the ultimate Produced Water Processing Facility will be pumped to the Crude Oil Recovery Tank for further processing.	4

Notes:

[1] *The Sundance West site development sequence is subject to change. Different combination of these improvements may be constructed at any time.*

[2] *Estimated number of years after OCD Surface Waste Management Facility Permit issued*

[3] *bbl = barrels of oil*

2.0 GENERAL FACILITY INFORMATION

2.1 Land Use and Zoning

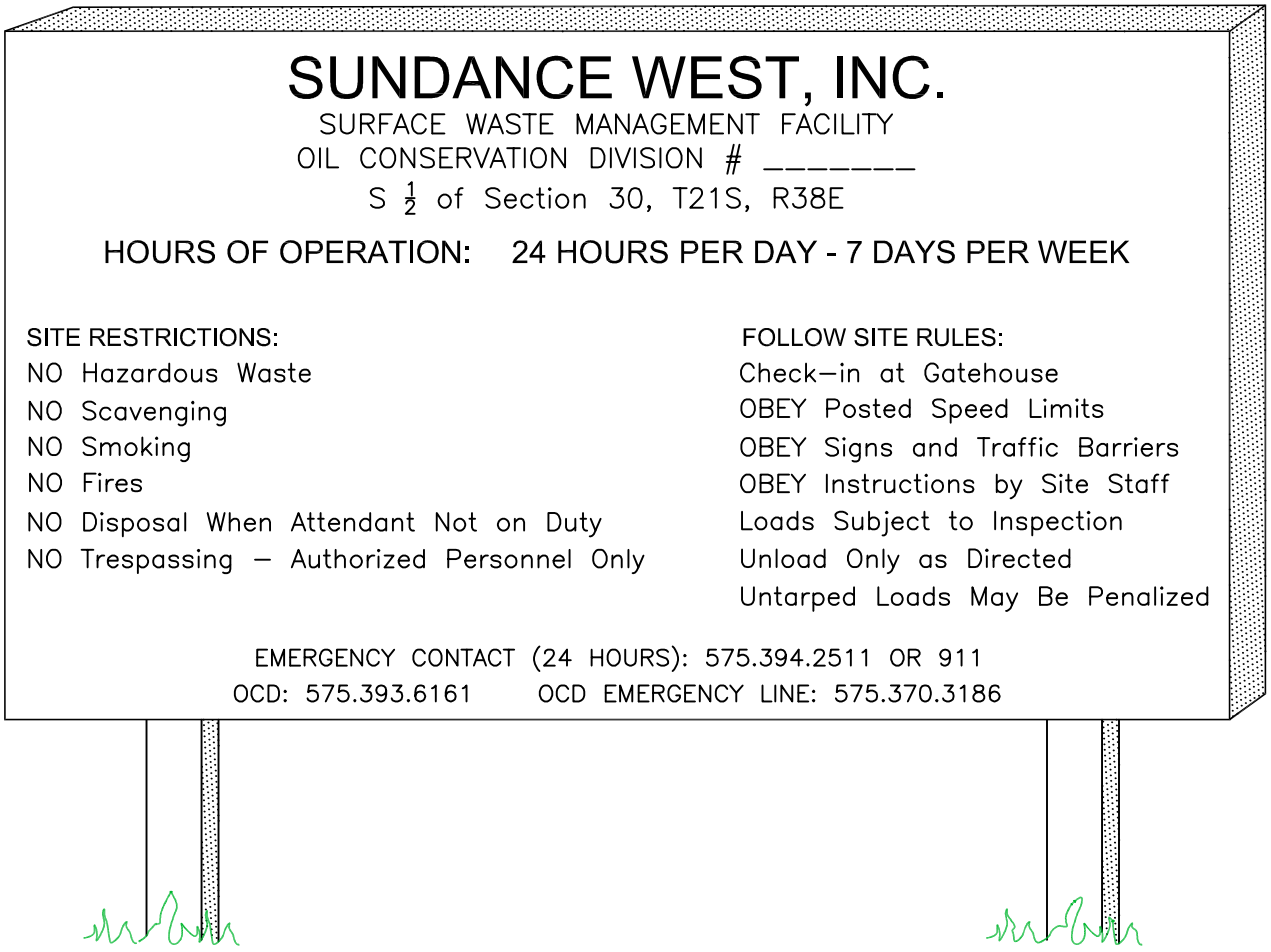
The Sundance West Facility is located within a 320 acre ± tract in unincorporated Lea County, approximately 3 miles east of Eunice, 18 miles south of Hobbs, and approximately 1.5 miles west of the Texas/New Mexico state line (**Figure II.1.1**). The Facility is surrounded by open space on the north, south and west perimeters. Wallach Concrete, Inc and the current Sundance Services, Inc. facility are located to the east. The closest permanent residence is located approximately 1.1 miles to the west-southwest near Eunice (**Figure IV.1.8**). Lea County does not have zoning specifications on land use in unincorporated areas.

2.2 Access Control

Access control for Sundance West Facility will be provided by perimeter fencing for both the Processing Area and the Landfill; cattle guards; locking gates; and employee presence when open for waste receipts. No oil field waste will be accepted unless an attendant is on duty. The Facility will be gated and locked when the site is not attended. The Site Location Map is plotted on the most recent United States Geological Survey (USGS) map (**Figure II.1.1**) and shows the Facility location in relation to state roads and adjacent features. The Site Plan, provided as **Figure II.1.2,** provides a plan view of the Facility showing the proposed layout, fencing, and gates.

2.3 Site Signs

A sign will be posted at the Facility entrance which identifies the location of the site, hours of operation, emergency telephone numbers, and delivery instructions (**Figure II.1.3A**). Additional site rules that are applicable to both Facility personnel and customers will be posted at the receiving areas and along the access roads to advise drivers concerning speed limits, prohibited activities, acceptable waste types, delivery instructions, and other health and safety precautions. Example signs are provided in **Figure II.1.3B**. Identification and cautionary signs for pits, ponds, and tanks in the Processing Area will also be installed at the Facility once constructed.



SITE ENTRANCE SIGN

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 04/04/16	CAD: ENTRANCE SIGN.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.3A
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\ENTRANCE SIGN.dwg
Date/Time:Jul, 18, 2016-13:49:20

SUNDANCE WEST
LEA COUNTY, NEW MEXICO

S ½ SECTION 30, T21S, R 38E

OIL CONSERVATION DIVISION PERMIT NO. NM-_____

SITE SIGNS (TYPICAL)

SUNDANCE WEST SURFACE WASTE
MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 01/05/2015	CAD: SITE SIGNSdwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.3B
APPROVED BY: IKG	gei@gordonenvironmental.com	

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Date/Time:Jan. 05, 2015-10:58:57

2.4 Traffic

Traffic will arrive at the Sundance West Facility by traveling north or south on NM 18 turning east on Wallach Lane to the Facility access point for the Processing Area and Landfill. Traffic for the Facility is not anticipated to have an impact on current public transportation patterns. Turning acceleration/deceleration lanes maybe provided at the intersection along with other improvements recommended by NMDOT. Vehicles accessing the Facility, including staff, are anticipated initially to average 100 vehicles per day (vpd). Daily traffic flow into the Facility may increase to over 500 vpd as oil field production activities continue to increase and more companies utilize the Facility. Traffic flow for the Sundance West Facility is depicted on **Figure II.1.4**.

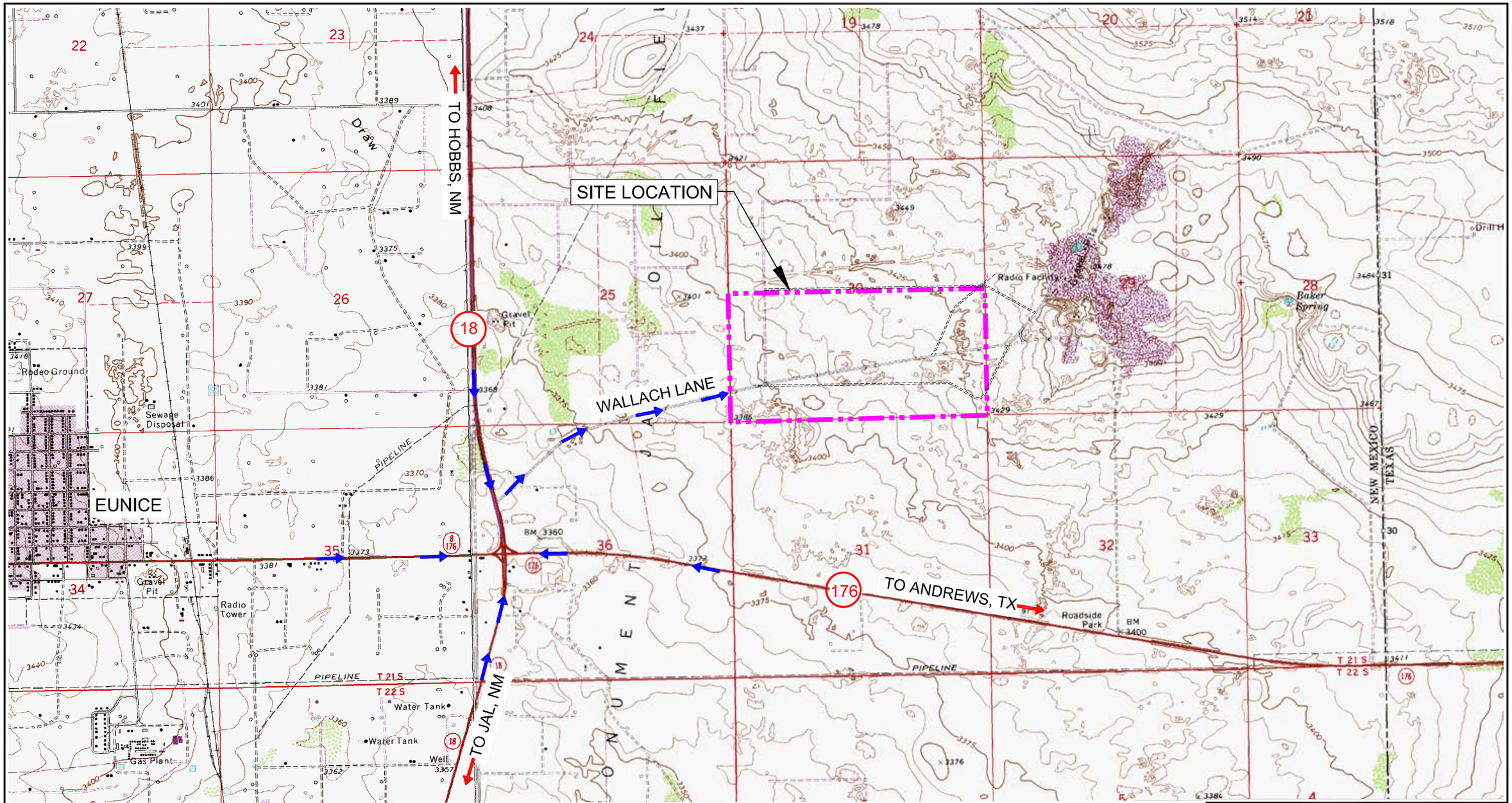
3.0 FACILITY PERSONNEL

3.1 Requirements and Duties

Daily operations at the Facility will be supervised by the Sundance West management team located onsite in the Facility Gatehouse (**Figure II.1.2**). Management and administrative support will be provided by Sundance West personnel routinely on-site. Disposal operations will only be conducted when an attendant is on duty. Acceptance criteria for the oil field waste are described in the Oil Field Waste Management Plan (**Volume II.2**). The initial general staffing list for the Facility is provided in **Table II.1.4**, subject to adjustment in response to changes in incoming waste volumes, market demands, technology updates, etc.

TABLE II.1.4
Facility Staffing List
Sundance West

Description	Number
General Manager	1
Plant Supervisor	1-2
Equipment Operator	4-6
Laborer	2-4



MAP BASE:
EUNICE N. MEX. 1969, PHOTOREVISED 1979 AND EUNICE NE, TEX.-N. MEX. 1969, PHOTOREVISED 1979, 1:24000, USGS 7.5 MIN. SERIES TOPOGRAPHIC QUADRANGLES

LEGEND

- FACILITY BOUNDARY
- UNPAVED ROADS
- TRAFFIC FLOW DIRECTION

NORTH

0 1000' 2000'

TRAFFIC FLOW PLAN

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 06/13/2016	CAD: TRAFFIC.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.4
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\TRAFFIC.dwg
Date/Time:Jul. 19, 2016-07:27:34

3.2 Training Requirements

Annual personnel training will include health and safety protection, waste screening, fire prevention, emergency response, etc. Emergency Coordinators for the proposed Facility are identified in the Contingency Plan (**Volume II.5**). A trained operator or designated representative with full knowledge of the 19.15.36 NMAC Rules and the Sundance West Permit requirements will be present at all times while the Facility is in operation. Facility staff will be required to read this Plan, the Oil Field Waste Management Plan (**Volume II.2**), the Hydrogen Sulfide (H_2S) Prevention and Contingency Plan (**Volume II.3**), and the Contingency Plan (**Volume II.5**). Signature sheets acknowledging that this requirement has been met will be retained in the Facility Operating Record in accordance with the Safety Communications Program (**Attachment II.1.A**).

4.0 FACILITY OPERATIONAL PROCEDURES

The operational procedures for the Sundance West Facility are designed to maximize the efficiency of waste receiving, processing, and disposal; and to protect the health and safety of Facility staff and delivery personnel. Detailed operational procedures are enumerated in each of the applicable sections of this Plan for oil field waste stream processing, landfill disposal, contingency planning, recordkeeping, personnel training, etc. Oil field waste disposal operations will be conducted in a safe and environmentally sound manner in accordance with 19.15.36 NMAC.

4.1 Noise Control

There are no permanent residences within 1.1 miles of the Facility, and most heavy equipment operations (i.e., the landfill) will be conducted behind berms. Surrounding land uses are not occupied, or are industrial in nature (i.e., SSI, LES, WCS), and the site is situated one mile east of the closest highway (NM 18).

4.2 Odor Control

Prior to oil field waste acceptance, vehicles will be screened for the presence of hydrogen sulfide (H_2S). If H_2S is detected above 10 parts per million (ppm), the load will be treated with calcium hypochlorite [$Ca(ClO)_2$] to lower the H_2S to acceptable levels prior to unloading operations. In addition, at least 1,000 gallons of chemicals such as bleach will be maintained on-site to control H_2S and its associated odors originating from the evaporation ponds or other operating units. Downwind land uses (i.e., primarily to the north and northwest) are vacant.

4.3 Dust Control

The access roads and active areas within the Facility will be treated with water, approved recycled waters or dust palliatives, as needed, from a water truck to reduce dust. The posted speed limit will be 15 miles per hour (mph) inside the Facility which will assist in limiting the amount of dust generated by onsite traffic. Routine operations listed on **Table II.1.5** are the most likely sources of dust, along with recommended primary and secondary control measures:

TABLE II.1.5
Dust Control
Sundance West

A water truck will be available to apply water, approved recycled waters, or dust palliatives to the access roads and active areas within the Sundance West Facility as needed to reduce dust. In addition, the posted speed limit will be 15 mph inside the Facility. Listed below are routine operations that are the most likely sources of dust, along with recommended primary and secondary control measures:

Disposal Operations -

- Primary Control Measure: Paving of high-traffic areas, apply water to unpaved roads as necessary, enforce speed limit posted on-site.
- Secondary Control Measure: Apply dust palliatives to unpaved portions of the Facility, provide additional pavement.

Excavations -

- Primary Control Measure: Water areas prior to and during excavation. Water areas of excavation and haul roads during and at the end of each day to form a dust-binding soil crust.
- Secondary Control Measure: Phase work to reduce the amount of disturbed surfaces, apply additional water, work at lower elevations and higher areas when wind velocity is low.

Stockpiles -

- Primary Control Measure: Pre-water areas prior to excavation. Apply water to short-term stockpiles and when transporting soils, stockpile below-grade or behind berms.
- Secondary Control Measure: Control vehicle access to the area. Apply dust surfactant to long-term stockpiles or apply seed/mulch to prevent erosion.

Track out extending onto public roadways –

- Primary Control Measure: Pave permanent on-site entrance roadways, sweep as necessary.
- Secondary Control Measure: Apply recycled asphalt, caliche/gravel pads or similar materials at the transition from unpaved to paved roadways.

Unpaved roadways and parking areas –

- Primary Control Measure: Limit vehicle speed via posting speed limits; apply water, use aggregate or caliche.
- Secondary Control Measure: Apply water and surfactants to unpaved roads and parking lots, as needed, provide additional pavement.

4.4 Minor Spills/Releases

The spill or release of a potentially hazardous material at the Facility is most likely to involve fuel or various vehicle fluids (i.e., engine oil, hydraulic oil, antifreeze, etc.). Other materials most likely to present a concern as a result of normal operations include petroleum products and petroleum wastes delivered to the Facility. Spills involving these types of materials could occur during fueling, routine maintenance operations or during unloading for processing/disposal of waste. These minor spills will be cleaned up immediately upon discovery.

The Facility will maintain spill clean-up kits on-site that include absorbent materials, shovels, and small containment buckets. Waste materials resulting from minor spills and clean-up will be managed and disposed of in accordance with the Oil Field Waste Management Plan (**Volume II.2**). Although highly unlikely, large spill/releases from onsite ponds and tanks may occur. The response procedures for this type of release are detailed in the Contingency Plan (**Volume II.5**).

5.0 LANDFILL OPERATIONS

The proposed Sundance West Landfill operation will provide for the permanent disposal of exempt solid waste generated in the development and production of oil and gas resources and properly documented non-exempt, non-hazardous, oil field wastes. The Landfill operation will be guided by the Landfill design presented in **Volume III** (Engineering Design and Calculations); and detailed in the **Permit Plans** (**Volume III.1**).

5.1 Landfill Equipment

Table II.1.6 identifies the equipment proposed for the landfill operations. This inventory has proven effective at similar facilities in managing ongoing construction and operations. Pieces of equipment may be added or subtracted from the list corresponding to the rate of waste flow, projected earthmoving activities, changes in technology, etc. Some operating and construction functions, such as mass excavation and geosynthetic liner installation, will be subcontracted to qualified firms. The equipment inventory demonstrates both the redundancy and back-up capabilities of the on-site Landfill equipment. Following is a summary of functions and capabilities of the major units:

- The compactors are high-ground-pressure pieces of equipment specially designed for waste receiving; compaction, daily cover application, and related fill face activities.
- The scrapers are used primarily for earthmoving activities, such as excavation of new cells and hauling of cover material from designated stockpiles. Scrapers will often deliver soil directly from the excavation of a new cell to an area near the active fill face. The scrapers can apply daily, intermediate, and final cover at a high rate of delivery.
- Dozers are tracked pieces of equipment that are used to move soil and waste, usually for short distances. The dozers assist the scrapers in preparation of new cells, and can apply cover at the fill face. Dozers are versatile pieces of equipment that are also valuable in cover maintenance, road grading, and waste compaction as back-ups to the compactors, graders, and front-end loaders.
- Front-end loaders are used for earthmoving activities and cell construction tasks. They can be used for excavation of soil or movement of waste, and for delivery and application of cover material. Front-end loaders can provide back-up to scrapers and dozers, and can be used for road and drainage maintenance, if necessary.
- The water wagon will be used on a daily basis to control dust that could originate from on-site roads, active excavations, covered areas, etc. The water sources for the wagon will be on-site tanks and ponds.
- The motor grader is effective in temporary roadway construction, maintenance, and drainage improvements.

TABLE II.1.6
Landfill Equipment (Typical)
Sundance West

Type	Number	Primary Purpose
CAT 970 Loader	1	Earthmoving
CAT 950 Loader	1	Earthmoving
CMI 390 Compacter	2	Waste compaction
CAT 627 Scrapers	2	Daily cover operations/earthmoving
CAT 621 Water Wagon	1	Dust control
CAT D8 Dozer	1	Waste and soil spreading/compaction
CAT D6 Dozer	1	Waste and soil spreading/compaction
CAT MG140 Motor Grader	1	Road and drainageway maintenance

Notes:
1. *Equivalent models may be substituted.*
2. *The number of each equipment type is matched to the projected waste types and volumes; the list may be modified in response to changes in waste streams, technology, etc.*
3. *Equipment is subject to routine replacement.*
4. *There will be arrangements made with local equipment vendors for maintenance and back-up leasing.*

5.2 Waste Characteristics

Sundance West Landfill will accept exempt oil field wastes generated from oil and gas exploration and production operations. No hazardous waste will be accepted at Sundance West. The Facility will require documentation for accepting oil field wastes, including OCD Form C-138 *(Request for Approval to Accept Solid Waste)*, and will screen incoming waste in accordance with the Oil Field Waste Management Plan (**Volume II.2**). **Table II.1.7** lists proposed waste receipts sorted by type with a corresponding estimate of volume and proportion. The initial average daily solid waste disposal (oil field waste) acceptance rate is anticipated to be 500 cubic yards (yd^3) per day, equal to approximately 500 tons per day (2,000 pounds per yd^3).

TABLE II.1.7
Landfill Waste Characterization and Anticipated Daily Waste Receipts[1]
Sundance West

Origin	Approximate Proportion	Daily Average (yd^3)[1,2]
Contaminated Soil	60%	300
Stabilized Drilling Mud	30%	150
Stabilized Tank Bottoms	5%	25
Other Wastes	5%	25
Totals	**100%**	**500**

Notes:
[1]Values based on anticipated initial volumes of waste that will be delivered from area oil field production activities.
[2]yd^3 = cubic yards
[3]1 yd^3 oil field waste = 2,000 pounds (lbs)

5.3 Sequence of Landfill Development

The Sundance West Landfill site development plan is presented on the Site Plan (**Figure II.1.2**) and on the **Permit Plans** (**Volume III.1**); and is further described in **Table II.1.8**. The Landfill will consist of three Units (I-III), each of which will contain several waste cells. Landfill development will commence with the "North Phase" as shown on the **Permit Plans** (**Volume III.1**). Unit I will be developed first with the construction of Cell 1 in the northeast corner of Unit I. Cell development will progress westward through Unit I before continuing in Units II and III. The proposed disposal process is the "area fill" method for all cells. Each cell will be equipped with a composite liner/leachate collection system and stormwater controls demonstrated to meet applicable engineering standards and OCD requirements.

Cells may be developed in segments and combinations, and more than one cell may be in operation at any one time in response to incoming waste volumes, the progress of site development, and providing available disposal volume below-grade. The objective is to provide a sufficient area for disposal while keeping the total disturbed area to a minimum. When cells reach interim or final grade, additional cover will be applied as needed to achieve the required cover thickness, and the area will be graded and vegetated within 12 months once the final grade is achieved. Non-contaminated soils may be temporarily stored above interim or final grade.

TABLE II.1.8
Landfill Development Sequence
Sundance West

Planning

- Confirm that the cell area has been cleared for excavation (e.g., utilities).
- Review Permit Plans, Construction Plans, and any pertinent Permit Documents and Permit Conditions.
- Establish survey line/grade controls, construction benchmarks, etc.
- Develop cell-specific sequence of development, contractor coordination, equipment, and staffing requirements.

Earthwork

- Clear and dispose of vegetation.
- Stockpile select surface soils for later use as topsoil.
- Excavate cell to design grades.

- Install stormwater management systems (e.g., drainage basins and drainageways).
- Extend on-site access roads to provide cell ingress and egress.

Environmental Control Systems

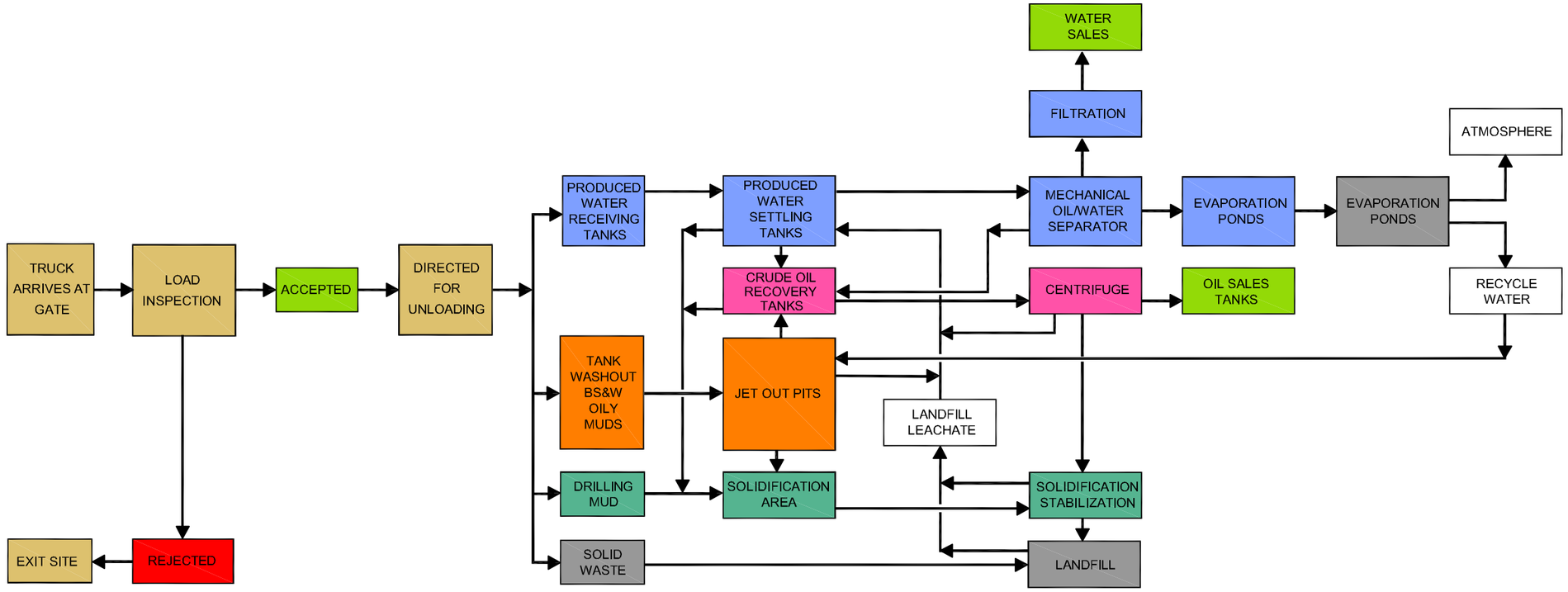
- Compact and test subgrade, prepare for liner installation (CQA Plan, **Volume II.7**).
- Notify OCD via a milestone schedule and at least 72 hours prior to liner installation.
- Install GCL/FML/Geonet composite liner system on cell floor.
- Construct leachate collection systems for cells, including risers and sumps as shown on the **Permit Plans** (**Volume III.1**).
- Install protective soil layer from designated stockpile (and stormwater segregation systems if applicable).
- Submit Engineering Certification of completed construction to OCD.

Operations

- Use excavated soil from next cell for daily, intermediate, and final cover for current or previously filled cells.
- Use stockpiles as necessary to supplement cover supplies.
- Install subsequent cells consistent with 1, 2, and 3 above.
- Extend roadways, drainage systems, etc., in advance of need.

5.4 Daily Landfill Operating Procedures

Vehicles delivering waste will approach the Sundance West Facility entrance from the north or south on NM 18, which is located one mile west of the western boundary of the site. NM 18 is a paved, four-lane highway with no special weight restrictions, and paved, full-width shoulders. The site entrance sign will identify prohibited materials and rules of conduct on-site (**Figure II.1.3**). Disposal operations will only be conducted when an attendant is on duty. At the Gatehouse, waste loads will be screened to confirm that the solid waste materials are acceptable for disposal at Sundance West. Waste identification, tracking, and screening are addressed in the Oil Field Waste Management Plan provided in **Volume II.2**. Vehicles with acceptable loads will be directed to proceed on the interior roads in accordance with signs and direction by facility personnel to the working face for unloading. A description of the solid waste disposal process is included on the Process Flow Diagram and Process Flow Description (**Figures II.1.5A** and **II.1.5B**).



PROCESS FLOW DIAGRAM

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 12/12/2014	CAD: PROCESS FLOW.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.5A
APPROVED BY: IKG	gek@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\PERMIT FIGURES\PROCESS FLOW.dwg
Date/Time:Jan. 05, 2015-12:47:28 ; LAYOUT: B (LS)

PROCESS DESCRIPTION:

1. A WASTE VEHICLE ARRIVES AT THE GATE.
2. PAPERWORK IS CHECKED AGAINST SUNDANCE WEST RECORDS TO CONFIRM ACCEPTABLE DOCUMENTATION.
3. THE WASTE LOAD IS VISUALLY AND PHYSICALLY INSPECTED, AND EITHER ACCEPTED TO PROCEED FOR UNLOADING, OR REJECTED AND RETURNED TO THE GENERATOR.
4. ACCEPTED LOADS ARE DIRECTED TO ONE OF FOUR LOCATIONS:

TANKERS CONTAINING PRODUCED WATER ARE DIRECTED TO ONE OF EIGHT LOAD OUT POINTS AT THE PRODUCED WATER TANKS MANIFOLD.
PRODUCED WATER IS DISCHARGED INTO A 1,000 BBL TANK FOR INITIAL SETTLING AND SEPARATION.
OIL ACCUMULATING AT THE TOP OF THE TANKS IS TRANSFERRED TO THE CRUDE OIL RECOVERY TANKS IF ADDITIONAL PROCESSING IS REQUIRED.
PRODUCED WATER IS TRANSFERRED IN SERIES THROUGH FOUR ADDITIONAL 1,000 BBL PRODUCED WATER TANKS.
UP TO FIVE DAYS TOTAL SETTLING TIME IS PROVIDED FOR THE PRODUCED WATER WITH AT LEAST ONE DAY HEATED.
LIQUIDS ARE REMOVED FROM THE PRODUCED WATER TANKS AND TRANSFERRED TO FILTRATION OR THE EVAPORATION PONDS THROUGH A MECHANICAL OIL/WATER SEPARATOR.
SLUDGES AND SEDIMENT SETTLING TO THE BOTTOM OF THE TANK IS TRANSFERRED TO THE SOLIDIFICATION AND STABILIZATION AREA.
MECHANICAL EVAPORATORS CIRCULATE THE WATER WITHIN THE EVAPORATION PONDS TO ENHANCE EVAPORATION TO THE ATMOSPHERE.
SOME WATER IS RECYCLED TO THE TANKER JET OUT FOR TANK CLEANING.

TANKERS CONTAINING BS&W PROCESS WATER AND LIQUID TANK BOTTOMS ARE DIRECTED TO THE JET OUT PIT.
ALL BS&W TANK BOTTOM LIQUIDS RECEIVED ARE DISCHARGED INTO THE JET OUT PIT.
TANK TRUCKS ACCEPTED FOR WASHOUT ARE DIRECTED TO ONE OF SIX JET OUT PITS.
APPROXIMATELY 10 BBLS OF FRESH/RECYCLED WATER ARE PROVIDED TO RINSE OUT THE INTERIOR OF THE TANKS.
THE CLEANED TANK TRAILER IS RETURNED FOR SERVICE.
OIL THAT ACCUMULATES AT THE TOP OF THE JET OUT PITS IS TRANSFERRED TO THE CRUDE OIL RECOVERY TANK FOR PROCESSING, IF REQUIRED.
WATER THAT SETTLES TO THE BOTTOM OF THE TANKS IS TRANSFERRED TO THE PRODUCED WATER TANKS.
SLUDGES AND SEDIMENT SETTLING TO THE BOTTOM OF THE TANK IS TRANSFERRED TO THE SOLIDIFICATION AND STABILIZATION AREA.

THE CRUDE OIL RECOVERY TANKS FEED THE CENTRIFUGE WHICH SEPARATES THE OIL FROM ANY REMAINING WATER. WATER IS RETURNED TO THE PRODUCED WATER TANKS.
SOLIDS RECOVERED FROM THE CRUDE OIL RECOVERY TANKS AND CENTRIFUGE ARE REMOVED TO THE STABILIZATION/SOLIDIFICATION PROCESSING AREA.
OIL RECOVERED FROM THE CRUDE OIL RECOVERY TANKS AND CENTRIFUGE IS TRANSFERRED TO THE OIL SALES TANKS.

TANKERS CONTAINING DRILLING MUD AND CUTTINGS ARE DIRECTED TO THE SOLIDIFICATION AND STABILIZATION AREA.
SLUDGES AND SEDIMENT COLLECTED FROM THE BOTTOM OF THE TANKS ARE SOLIDIFIED WITH A BULKING MATERIAL LIKE SAND OR FLY ASH.
DRILLING MUDS ARE SOLIDIFIED AND STABILIZED USING THREE PARTS SOIL TO ONE PART MUD PRIOR TO LANDFILLING.
LIQUIDS RECOVERED FROM THE SOLIDIFICATION/STABILIZATION PROCESS ARE TRANSFERRED TO THE PRODUCED WATER TANKS.

LOADS OF CONTAMINATED SOIL AND SOLID WASTE ARE DIRECTED TO THE LANDFILL FOR DISPOSAL.
LEACHATE GENERATED BY LANDFILL OPERATION MAY BE TRANSFERRED TO PRODUCED WATER TANKS.

PROCESS FLOW DESCRIPTION

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 01/07/2015	CAD: PROCESS FLOW DESCRIPTION.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.1.5B
APPROVED BY: IKG	gei@gordonenvironmental.com	

Unacceptable waste loads will be managed in accordance with the Contingency Plan (**Volume II.5**). If a load is rejected it will be returned to the generator. The width of the daily cell and working face will be maintained to the minimum dimensions necessary to accommodate traffic. At the initial anticipated rate of waste receipts (500 gate yd^3/day), the unloading area will generally be maintained at a width of 50-100 ft to accommodate peak hourly traffic flow. Soil cover (or an appropriate alternate cover) will be applied to the Landfill's active face on an as-needed basis to control dust, debris, odors, vectors or other potential nuisances.

The **Permit Plans** (**Volume III.1**) illustrate that the Facility will utilize the "area method" of filling in vertical lifts. The first lift of waste placed over a newly constructed liner segment will be a minimum of 5 ft in thickness, and will then be carefully worked out over the leachate collection protective soil layer from the edge of the cell (i.e., uncompacted). The first lift of waste over the leachate pipe may be pushed off from prior fill areas to avoid landfill equipment traffic over the pipe. If necessary, temporary "ramps" of waste and/or clean fill will be constructed over the leachate pipes and protective layer in order to facilitate traffic flow. The waste in the first lift will be carefully inspected to ensure that waste types that could impact the liner system (e.g., pipes and metal debris) are excluded from the initial lift. This layer will be placed in a manner that protects the liner and leachate collection system.

Waste placement will generally move from the lower (downgradient) portions of the cell to the higher (upgradient) elevations. With the exception of the first lift of oil field waste being spread on a newly constructed cell, waste will be compacted in shallow lifts (e.g., 2 – 3 ft thick) by specialized waste compaction equipment. Repeated passes by the waste compactor or dozer will consolidate the material to the smallest practical volume. This practice will confine the dimensions of the working face, maximize the use of available capacity, reduce the potential for future settlement, and limit the amount of cover required.

In order to control litter and mitigate potential odors, the active working face will be covered with 6 inches of soil cover, or an approved alternate cover, as needed. Sundance West will place an intermediate cover at least 6-inches thick, in addition to daily cover, over areas of the landfill that will not receive further oil field waste for one month or more, but have not reached

final elevation. Areas of intermediate cover will be properly sloped to promote clean run-off and minimize leachate generation, and may be used for temporary cover stockpiles. Intermediate cover may be seeded with temporary grasses such as rye if the area will not be subject to additional landfilling within 12 months. If long-term re-vegetation is required, native grass will be applied after consultation with the local Natural Resources Conservation Service (NRCS) representative (see Closure/Post-closure Plan, **Volume II.4**). Areas of intermediate cover will be inspected periodically for erosion and settlement, and prompt regrading and maintenance action will be initiated as required. An Intermediate Cover Inspection and Maintenance Plan is provided as **Attachment II.1.G**.

5.5 Waste Capacity and Longevity

Table II.1.6 provides a projection of daily waste receipts and lists the categories of anticipated wastes that will be received at this facility. This estimate uses initial projected daily waste receipts of 500 yd^3 per day average. Volumetrics (**Volume III.2**), summarizes the capacity and longevity calculations for the engineering design provided in this Application for Permit. The volume of excavation (cut) from the cells and drainage basins is designed to provide more than sufficient soil for daily, intermediate, and final cover for all Units. The Sundance West Landfill (Units I-III) gross capacity is approximately 20,575,000 yd^3, with approximately 17,382,300 yd^3 (17,382,300 tons) of net airspace (i.e., waste capacity). The longevity of the Landfill, operating 365 days per year, is projected as follows:

- 95.2 years @ 500 tons per day
- 47.6 years @ 1,000 tons per day
- 19.0 years @ 2,500 tons per day

There are many factors that can have an impact on the duration of operations of the Sundance West Landfill. Oil field activity, the price of oil in the marketplace spurring new development activities, closure of other disposal facilities, new processing technologies and the introduction of new waste streams have the potential to increase or decrease the rate at which airspace is depleted. In response to these factors, Sundance West may make arrangements for the lease of additional equipment to accommodate variations in waste receipts.

5.6 Landfill Gas Safety Management

Surface waste management facilities that include a landfill are required to have a gas safety management plan per 19.15.36.13.O NMAC. The Plan should describe in detail the procedures and methods that will be used to prevent landfill-generated gases (H_2S) from interfering or conflicting with the landfill's operation, and methods to protect fresh water, public health, safety and the environment.

Landfill Gas (LFG) is typically produced when there is a significant supply of readily putrescible organic material, moisture; and a lack of oxygen in the fill. Oil field wastes do not contain significant amounts of putrescible (organic) wastes and will not provide a suitable environment for LFG production. Typical oil field wastes do not generate significant quantities of LFG, nor the requisite pressure to promote migration. Conventional landfill gas monitoring and control systems will not be effective at the Sundance West Facility. The waste matrix itself will inhibit migration or collection of LFG if it is comprised primarily of soils with <5% degradable organics, as anticipated; therefore no conventional LFG monitoring or controls are proposed in this Application for Permit.

However, Sundance West will implement a gas monitoring program consisting of testing incoming vehicles during unloading to ensure that hydrogen sulfide (H_2S) gas concentrations do not exceed 10 ppm on-site or at the property boundary. H_2S monitors that issue a visual and audible signal at 10 ppm will be installed in areas around the solid waste disposal cells, treating plant, liquid solidification, and evaporation ponds to ensure compliance with regulatory alert levels. Monitoring points may be added or replaced as operations are extended. Details of the H_2S gas monitoring program are presented in the Hydrogen Sulfide (H_2S) Prevention and Contingency Plan provided in **Volume II.3.**

5.7 Leachate Monitoring

A leachate management plan that describes the anticipated amount of leachate, leachate handling, storage and disposal is required for new landfills per 19.15.36.8.C(12) NMAC. A Leachate Management Plan for the Sundance West Landfill is provided as **Volume II.9**. The Leachate Management Plan details the procedures that will be used to manage contact waters

generated at the Sundance West Landfill during the permit period and following closure. The Leachate Management Plan has been developed to address the design and performance requirements of 19.15.36.14 NMAC; and to addresses leachate management, including amounts and rates of leachate generation, treatment alternatives, disposal options, etc.

5.8 Waste Disposal Alternatives

Sundance West Landfill is designed to operate as an all-weather facility under most foreseeable conditions. The site's proposed layout, paved roadways, and operating practices will provide flexibility with regard to fill face location and access. In the event of a temporary disruption to service such as storms or high winds, the following alternatives may be implemented:

- In the event of inclement weather, select a daily fill face location that is readily accessible to established roadways.
- The proposed equipment available for daily operations (see **Table II.1.6**) includes significant back-up for any unplanned downtime.
- Additional waste compacting and earthmoving equipment can be leased under routine arrangements with suppliers.
- Temporary storage of waste at the fill face could be implemented to address short-term equipment shortages.
- Waste compaction and covering tasks could be extended beyond normal hours to complete the day's activities.

In the unlikely event of a complete disruption of access, the Facility would be temporarily closed and the customers notified. The commercial waste flow could be temporarily stored at generator sites, or diverted to other OCD permitted facilities.

5.9 Operating Hours

Sundance West plans to have continuous waste disposal services available twenty-four hours per day, seven days per week. These hours will be posted at the site entrance and will be subject to routine review and adjustment as required to match the availability of waste for disposal. Sundance West may truncate operating hours due to reduced waste receipts, inclement weather conditions (e.g., high winds), etc. Site maintenance and construction activities, including cell preparation and application of cover, may take place at any time, even if the Landfill is not open for receiving waste.

5.10 Vadose Zone Monitoring

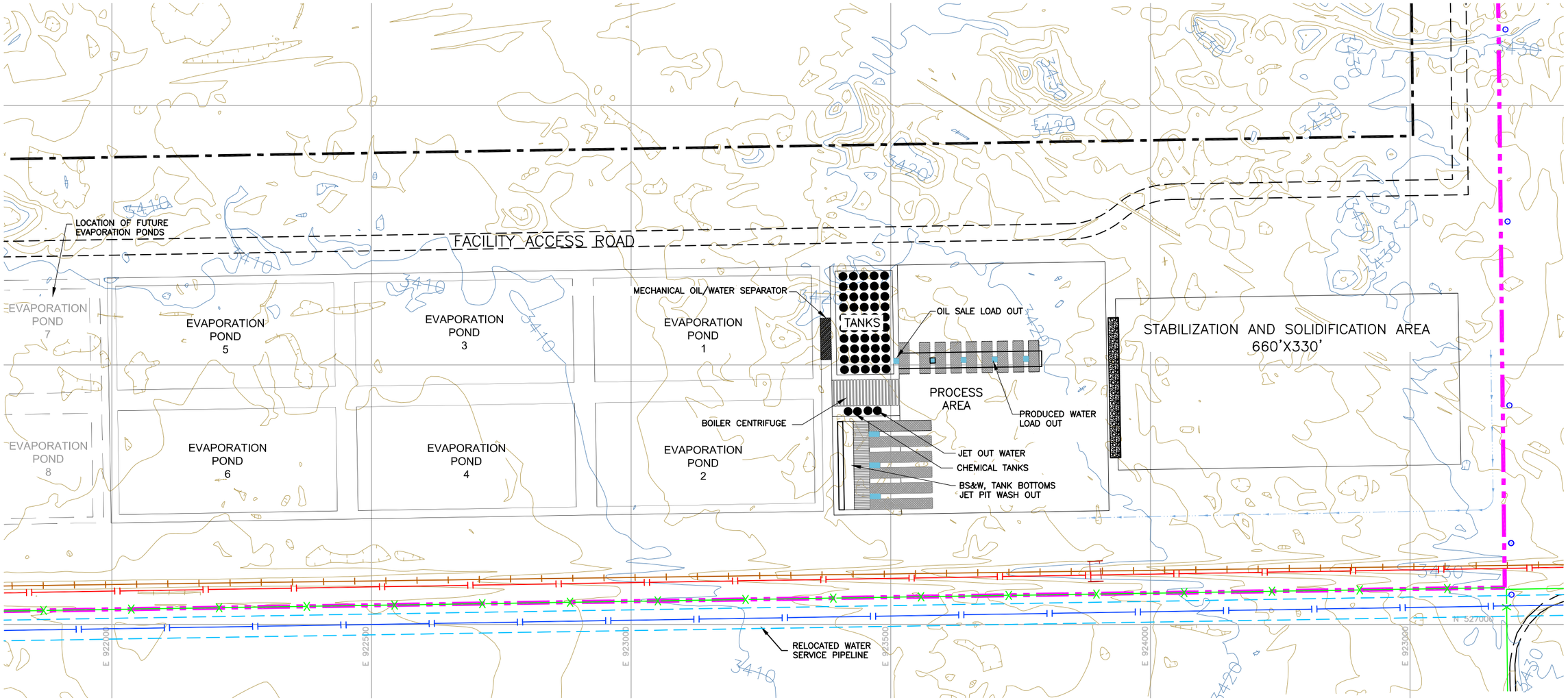
Vadose zone monitoring is described in detail in the Vadose Zone Monitoring Plan provided as **Volume II.8**. The proposed vadose zone monitoring program will initially consist of monitoring the vadose zone wells for water level on a monthly basis, with a reduced frequency once trends can be established. Additional details are provided in **Volume II.8**.

6.0 PROCESSING AREA OPERATIONS

The proposed Sundance West Processing Facility operation will provide for the treatment and permanent disposal of exempt liquid oil field wastes (produced water, basic sediment and water (BS&W), jet-out liquids and sediments, and drilling muds) generated in the development and production of oil and gas resources. The Processing Area operation will be guided by the process design presented in **Volume III** (Engineering Design and Calculations); and detailed in the **Permit Plans** (**Volume III.1**).

6.1 Processing Equipment

The equipment that is anticipated to be used for processing oil field waste is listed in **Table II.1.9**. Oil field waste receiving and processing activities will take place within the fenced Facility (**Figures II.1.2** and **II.1.6**). A description of the Processing Area operation is provided on the Process Flow Diagram and Process Flow Description (**Figures II.1.5A** and **II.1.5B**). The location of the liquid waste processing facilities at Sundance West is provided on the Processing Facility Layout provided as **Figure II.1.6** and detailed in the **Permit Plans** (**Volume III.1**).



NOTE

AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES, 5115 COPPER NE, ALBUQUERQUE, NM 87108
DATE OF PHOTOGRAPHY 10-01-08

LEGEND

- FACILITY BOUNDARY
- LIMIT OF LANDFILL
- 10' CONTOUR (3410)
- 2' CONTOUR
- FENCE
- NEW UNPAVED ROAD
- RAILROAD TRACKS
- RELOCATED WATER SERVICE PIPELINE
- EXISTING EUNICE WATERLINE
- PIPELINE EASEMENT
- SITE GRID (N 527500 / E 922000)

NORTH

0 100' 200'

PROCESS FACILITY LAYOUT

SUNDANCE WEST.
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
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Fax: 505-867-6991

DATE: 07/18/2016	CAD:PROCESS FACILITY.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: MRH	FIGURE II.1.6
APPROVED BY: IKG	gei@gordonenvironmental.com	

TABLE II.1.9
Processing Equipment
Sundance West

Description	Number	Capacity
Stationary		
Produced Water Tanks	45	1,000 bbl
Crude Oil Recovery Tanks	3	1,000 bbl
Oil Sales Tanks	2	1,000 bbl
Mechanical Oil/Water Separation Units	4	100 bbl
Evaporation Ponds (1-10)	10	73,700 bbl
Mechanical Evaporation Units	40	275 bbl/day/unit
Jet-Out Pit	1	1,200 bbl
Stabilization and Solidification Area	-	10 Acres
Solidification Process Equipment	1	500 cy/day
-Screens	1	1,500 bbl/day
- Belt Press	1	2,500 bbl/day
-Surge Tanks	5	10,000 bbl
Centrifuge	1	1,000 bbl/day
Boiler/Heat Exchanger (75 hp)	1	Each
Boiler Fuel Tank	1	238 bbl
Mobile		
Rubber Tired Loader	1	CAT 950 or equivalent
Floatation Track-Dozer	1	CAT D-6 or equivalent
Off Road Dump Truck	1	CAT 725 or equivalent
Roll-off Boxes	5	5-40 cy
Roll-off Tilt-frames	1	Up to 40 cy boxes

Note: The number, type, and capacity of the processing may be adjusted in response to changes in waste receipts, waste types, new technologies, etc.

Following is a summary of functions and capabilities of the major units:

- The Produced Water Tanks receive liquid waste (typically produced water) delivered to Sundance West Facility. This waste stream is transferred from the load-out stations via double contained piping to the Produced Water Tanks in the Tank Farm. The Produced Water Tanks rely on a modified "Gun Barrel" design and heat to facilitate the initial separation of oil from the water. Heat for these tanks is provided by a 75 hp Boiler/Heat Exchanger fueled from the Boiler Fuel Tank. The Produced Water Tanks are installed in a series of at least three connected tanks to provide sufficient settlement time to allow for gravity separation of the oil from water and other constituents. Piping within the Tank Farm affords the opportunity to connect additional Produced Water Tanks, providing extra time for gravity separation that may be required for the particular waste stream received.

- Discharges from the Produced Water Tanks will be piped to the Mechanical Oil/Water Separation Units. One of these units will be installed for every ten Produced Water Tanks that are placed in service. These units will rely on dissolved air floatation (DAF) and clarification principals to extract residual oil from the produced water, returning the oil (to the Crude Oil Recovery Tanks) for further processing and discharging the water to the Evaporation Ponds.
- The Evaporation Ponds are equipped with floating Mechanical Evaporation Units. These units are designed to create extremely fine water droplets that enhance evaporation. The units are situated within the ponds to allow for maximum evaporation and to capture any droplets that do not evaporate within the lined area of the Evaporation Ponds. Controls are provided to monitor weather conditions and shut down the Mechanical Evaporation Units when wind conditions have the potential to blow droplets outside the lined areas, or temperatures are conducive to the formation of ice. (**Volume III.11 Evaporation**)
- An alternative water treatment process (relying on filtration) may be provided in an effort to recycle the water for re-use in oilfield operations.
- Oil recovered from the Produced Water Tanks and the Mechanical Oil/Water Separators is transferred to the heated Crude Oil Recovery Tanks prior to further processing through the Centrifuge. Water discharged from the Centrifuge will be returned to the Produced Water Tanks. Solids will be deposited in a roll-off box for transfer to the landfill or collected for further processing at the Stabilization and Solidification Area. Purified oil recovered from the Centrifuge is pumped to the Oil Sales Tanks for collection by an oil recycling company.
- The Jet-out Pit is used for the processing of BS&W. This material is deposited in the Jet-Out Pit for separation of liquids from solids. Recovered liquids are discharged to the Produced Water Tanks for processing. Solids are recovered from the pit by the Rubber Tired Loader and transferred to the Stabilization and Solidification Area for further processing. The Jet-Out Pit is also used for tank truck and dump truck wash-out. Fresh water (hot and cold) is available for customers to use in flushing out their equipment after depositing their waste products at this facility. Recycled Water is also available for washout.
- The Stabilization and Solidification Area receives drilling muds and other semi-solid wastes for stabilization and solidification prior to disposal at the Landfill. These materials may be processed through one or more mechanical units (storage tanks, shakers, screens, trommels, filter presses, etc.), depending on the solids content, to separate the liquid fraction from the solids. Liquids produced from this process will be transferred to the Produced Water process while solids that pass the Paint Filter Test (**Attachment II.1.F**) will be delivered by Roll-Off Box or Off Road Dump Trucks to the Landfill.

6.2 Waste Characteristics

The Sundance West Processing Area will accept exempt oil field wastes generated from oil and gas exploration and production operations. No hazardous waste will be accepted at Sundance West. The Facility will require documentation for accepting oil field wastes,

including OCD Form C-138 *(Request for Approval to Accept Solid Waste)*, and will screen incoming waste in accordance with the Oil Field Waste Management Plan (**Volume II.2**). **Table II.1.10** lists proposed waste receipts sorted by type with a corresponding estimate of volume and proportion.

Produced Water will be accepted for processing at the Sundance West Facility. The average operational rate for the fully developed Sundance West Facility is estimated at 9,000 barrels per day (bbl/day) of liquid oil field waste. The operational rate may increase to over 10,000 bbl/day dependent upon weather conditions and the ability of the facility to manage the quantities received.

Basic Sediments and Water (BS&W) wastes will be accepted for processing at the Sundance West Jet-Out Pit. The average operational rate for the fully developed Jet-Out operation is estimated at 1,000 bbl/day of BS&W wastes. The operational rate may increase to over 2,000 bbl/day dependent upon the ability of the Facility to manage the quantities received.

Drilling Mud waste will also be accepted for stabilization and solidification. This material is typically delivered by two methods; bulk tankers and closed-loop containment boxes. The average operational process rate for the fully developed stabilization and solidification area is estimated at 2,000 bbl/day dependent upon weather conditions and the ability of the Facility to manage the quantities received.

TABLE II.1.10
Process Waste Characterization and Anticipated Daily Waste Receipts[1]
Sundance West

Origin	Approximate Proportion	Daily Average (gal.)[1]
Produced Water	75%	9,000
BS&W	8%	1,000
Drilling Mud	17%	2,000
Totals	**100%**	**12,000**

Notes:
[1]Values based on anticipated initial volumes of waste that will be delivered from area oil field production activities.

6.3 Sequence of Process Area Development

The Sundance West Processing Area site development will take place within the fenced Facility (**Figures II.1.2** and **II.1.6**). A description of the liquid waste processing operation is provided on the Process Flow Diagram and Process Flow Description (**Figures II.1.5A** and **II.1.5B**). The location of the liquid waste processing facilities at Sundance West is depicted on the Processing Area Layout provided as **Figure II.1.6** and detailed in the **Permit Plans** (**Volume III.1**). The Process Area is composed of three distinct operations that interact to provide the processing necessary prior to disposal of the particular waste material delivered.

- Produced Water - Development of the produced water process area will require the construction of the produced water load-out facility; installation of the tank farm which contains produced water tanks, crude oil recovery tanks, oil sale tanks, and the associated piping to connect all of the tanks; installation of the mechanical oil/water separation units; construction of the evaporation ponds and installation of the mechanical evaporation units. To support the produced water processing operation, an operations building will be constructed to house the installation of the boiler/heat exchanger and the centrifuge. The boiler fuel tank will be installed adjacent to the operations building along with storage vessels for miscellaneous processes related chemicals (Hypo-chlorite, etc.).
- Jet-Out Pit - The jet-out pit will be constructed to manage the BS&W wastes received and to facilitate the wash-out of tankers and dump trucks that have delivered wastes to this facility. This pit and associated access ramps will be constructed out of concrete and underlain with a HDPE liner system to provide double containment for the liquids managed by this process.
- Stabilization and Solidification – The stabilization and solidification area will be excavated to the grades and dimensions depicted in the **Permit Plans (Volume III.1).** This pit will then be lined with a double composite HDPE liner system consisting of a geosynthetic clay liner (GCL) placed on the compacted pit subgrade. The GCL will be covered by a 60-mil HDPE liner. A 200-mil geocomposite drainage layer will be installed between a second 60-mil HDPE liner to provide a leak detection zone that can be monitored to confirm pond liner integrity, A 200-mil geocomposite and two-foot drainage layer of suitable material will be placed on top of the liner to collect any liquids that seep out of the materials that are being stabilized or solidified. An additional tire chip detection zone (1 ft) and two feet of protective cover will be placed on top of the drainage layer to provide an operational surface to work on. The materials delivered for stabilization and solidification will typically be deposited on the operational surface for mixing with dry soil or in a holding tank that provides surge capacity for the filter presses. Materials contaminated with trash may be processed directly on the operational surface by mixing with dry soil or through a screen prior to placement in the surge tanks. Materials coming off the belt press or screens that do not that pass the paint filter test will be will be mixed with additional soil until they can pass this test. Once materials are processed to the point that they pass the paint filter

test, they will be transported to the Landfill for disposal. Liquids recovered from the belt press or screens will be piped to the produced water tanks for further processing.

Development of the Processing Area will proceed in the following four phases:

TABLE II.1.11
Process Area Development Sequence
Sundance West

1. **Planning**
   a. Confirm that the process area has been cleared for excavation and construction (e.g., utilities).
   b. Review Permit Plans, Construction Plans, and any pertinent Permit Documents and Permit Conditions.
   c. Establish survey line/grade controls, construction benchmarks, etc.
   d. Develop process area-specific sequence of development, contractor coordination, equipment, and staffing requirements.
2. **Earthwork**
   a. Clear and dispose of vegetation.
   b. Stockpile select surface soils for later use as topsoil.
   c. Excavate ponds and pits to design grades.
   d. Install stormwater management systems (e.g., drainage basins and drainageways).
   e. Extend on-site access roads to provide process area ingress and egress as needed.
3. **Environmental Control Systems**
   a. Compact and test subgrade, prepare for liner installation (CQA Plan, **Volume II.7**).
   b. Notify OCD via a milestone schedule and at least 72 hours prior to liner installation.
   c. Install FML composite liner system on pond and pit floor.
   d. Construct leachate collection systems for ponds and pits, including risers and sumps as shown on the **Permit Plans** (**Volume III.1**).
   e. Install protective soil layer for pits from designated stockpile (and stormwater segregation systems if applicable).
   f. Submit Engineering Certification of completed construction to OCD.
4. **Operations**
   a. Unload liquid wastes and drilling muds at the appropriate process.
   b. Process liquids to remove oils and solids prior to discharge for evaporation.
   c. Recover oil for sale.
   d. Process solids to pass Paint Filter Test.
   e. Dispose of solids in Landfill.

6.4 Daily Process Area Operating Procedures

Vehicles delivering waste will approach the Sundance West Facility entrance from the north or south on NM 18. NM 18 is a paved, four-lane highway with no special weight restrictions, and paved, full-width shoulders. The site entrance sign will identify prohibited materials and rules of conduct on-site (**Figure II.1.3**). Disposal operations will only be conducted when an attendant is on duty. At the facility Gatehouse, waste loads will be screened to confirm that

the liquid waste materials and drilling muds are acceptable for disposal at Sundance West. Waste identification, tracking, and screening are addressed in the Oil Field Waste Management Plan provided in **Volume II.2**. Vehicles with acceptable loads will be directed to proceed on the interior roads in accordance with signs and direction by facility personnel to the processing area for unloading. A description of the liquid waste disposal process is included on the Process Flow Diagram (**Figures II.1.5A** and **II.1.5B**).

Unacceptable waste loads will be managed in accordance with the Contingency Plan (**Volume II.5**). If a load is rejected it will be returned to the generator.

6.5 Waste Capacity

The produced water processing rate is highly dependent upon evaporation, which is also influenced by climate and seasonal fluctuations (Evaporation Calculations, **Volume III.9**). At "build-out" the tank farm will have 45,000 bbl of produced water tank capacity, 3,000 bbl of Crude Oil Recovery Tank capacity and 2,000 bbl of Oil Sale Tank capacity. Each evaporation pond has a maximum capacity of 9.5 acre-feet (73,704 bbl). Waste capacity for the Jet-Out and Stabilization and Solidification operations is dependent on the capacity of the produced water process and will control when waste processing at these operations may be limited. When tanks and ponds are approaching capacity, acceptance of liquid oil field waste may be temporarily suspended. Specifications for the proposed treatment plant equipment, including the produced water processing tanks, boiler, the mechanical oil/water separators, water filtration equipment, centrifuges, drilling mud separation units, filter presses, screens and mechanical evaporation systems are included in **Attachment II.1.B**. Storage tanks used at the Facility will be leak-proof; compatible with the proposed waste stream; and manufactured of non-biodegradable materials (e.g., fiber reinforced plastics or steel).

6.6 Waste Disposal Alternatives

The Sundance West Processing Area is designed to operate as an all-weather facility under most foreseeable conditions. The site's proposed layout, paved roadways, and operating practices will provide flexibility with regard to discharge facilities and access. In the event of a temporary disruption to service such as storms or high winds, the following alternatives may be implemented:

- In the event of inclement weather, operations will continue unless lightning and high winds conditions represent an imminent danger to customers or employees at which times operations will be suspended until the weather condition dissipates.

The proposed equipment and installed process available for daily operations (see **Table II.1.9**) includes significant back-up/excess capacity for any unplanned downtime.

In the unlikely event of a complete disruption of access, the Facility would be temporarily closed and the customers notified. The commercial waste flow could be temporarily stored at generator sites, or diverted to other OCD permitted facilities.

6.7 Operating Hours

Sundance West plans to have continuous waste disposal services available twenty-four hours per day, seven days per week. These hours will be posted at the site entrance and will be subject to routine review and adjustment as required to match the availability of waste for disposal. Sundance West may truncate operating hours due to reduced waste receipts, inclement weather conditions (e.g., high winds, lightning, etc.). Site maintenance and construction activities may take place at any time, even if the Processing Area is not open for receiving waste.

6.8 Vadose Zone Monitoring

Vadose zone monitoring is described in detail in the Vadose Zone Monitoring Plan provided as **Volume II.8**. The proposed vadose zone monitoring program will initially consist of monitoring the vadose zone wells for water level on a monthly basis, with a reduced frequency once trends can be established. Additional details are provided in **Volume II.8**.

7.0 FACILITY INSPECTION AND MAINTENANCE

General inspection of the overall physical condition of the Sundance West Facility, including pond operations, treatment plant, tank farm, evaporation system, jet-out pit, stabilization and solidification area and the landfill will be conducted on an ongoing basis by Sundance West personnel when operations are active. Additional formal inspections will be conducted and recorded on the appropriate recordkeeping forms as listed in **Table II.1.12**. Templates for the inspection forms are provided as **Attachments II.1.C** and **II.1.D** and will include the inspection date, and the name and signature of the inspector. Inspections and maintenance operations will be completed in compliance with 19.15.36.13.L NMAC. The following sections describe the formal inspections for each component of the Sundance West Facility.

7.1 Overall Facility Operation

A thorough inspection of the Landfill and processing area will be conducted on a weekly basis when operations are active and documented on the Facility Inspection Form included as **Attachment II.1.C.** The overall Facility inspection portion of the form will, at a minimum, document the items listed in **Table II.1.12**. Should the inspector note on the inspection form construction, planned construction or major design or operational changes, OCD will be notified and approvals obtained, if necessary. Inspection forms will be kept and maintained at the Sundance West Facility Administrative Office or other secure location and be made available for OCD review upon request.

7.2 Solid Waste Disposal Landfill

The solid waste disposal area will typically be inspected on a daily basis when operations are active. The inspections will be documented on the Inspection Form, included as **Attachment II.1.C**. At a minimum, the items listed in **Table II.1.12** will be checked during the daily inspection. During the inspection, current disposal locations and operations will be compared to the OCD-approved Sundance West Permit, with any deviations recorded and reported to the Facility Manager. The inspector will also evaluate and record the potential presence of free liquids derived from disposal activities; the condition of stormwater run-on/runoff controls;

TABLE II.1.12
Facility Inspections
Sundance West

Section	Component/Details	Frequency[1]	Recording Form
7.1	**Evaporation Spray System** Weather station Plume height Over spray	Daily	Facility Inspection Form (Attachment II.1.C)
7.2	**Solid Waste Disposal Landfill** Disposal operations and location Free liquids Stormwater controls Litter, vectors, odors Daily cover	Daily	Facility Inspection Form (Attachment II.1.C)
7.3	**Overall Facility Operation** Signs Security (fencing/gates) Stormwater control systems (runon/runoff) Access roads OCD Permit compliance Construction activity	Weekly	Facility Inspection Form (Attachment II.1.C)
7.4	**Treatment Plant, Tanks and Sumps** Containment berm Tank condition Tank leak test (annual) Signage Pipe and valve condition Sump condition	Weekly	Facility Inspection Form (Attachment II.1.C)
7.5	**Tank Farm & Pump System (Process Area)** Containment and liner Tank condition Tank leak test (annual) Signage Pipe and valve condition Sump condition	Weekly	Facility Inspection Form (Attachment II.1.C)
7.6	**Pit and Pond Operation** Depth of liquids in sumps Pond levees Piping condition and status Sacrificial Riser	Weekly	Pond Integrity/Leak Detection Inspection Form (Attachment II.1.D)
7.7	**Solid Waste Disposal Landfill** Leachate Collection Sump	Monthly	Facility Inspection Form (Attachment II.1.C)
7.8	**Pond Containment System** Rainfall Wind speed/direction Damage assessment	Quarterly	Pond Integrity/Leak Detection Inspection Form (Attachment II.1.D)
7.9	**Landfill and Process Area** Vadose Zone Monitoring	Quarterly	Facility Inspection Form (Attachment II.1.C)

Notes:

[1] *When operations are active.*

[2] *Report discovery of liquid in the leak detection system to OCD within 24-hrs of observation.*

and the presence of windblown debris, vectors, or odors. Finally, the inspector will record the condition of previously applied soil cover and need for additional cover, grading or vegetation. Deficiencies will be repaired or addressed as soon as practical.

7.3 Process Area

7.3.1 Produced Water Load-Out, Tank Farm and Pump System

The Produced Water Load-Out is designed as a double contained system. Concrete load-out pads are constructed around each load-out point to collect liquids that may spill during the load-out process. Pipes transferring liquids from the load-out point to the Tank Farm are double contained to prevent leakage. The entire load-out area is built on a secondary containment liner system. The Tank Farm is designed to contain the capacity of the maximum number of interconnected tanks plus 30%. In this case, there is a maximum of five 1,000 bbl tanks connected for a total of 5,000 bbl. The tank farm is designed to accommodate in excess of 6,500 bbl before flowing to the evaporation ponds. Once the Sundance West Facility is permitted; a Spill Prevention, Control, and Countermeasures (SPCC) Plan that applies to petroleum product storage and distribution systems will be developed. Weekly inspections of the tank farm will be conducted in compliance with the SPCC Plan. At a minimum the inspections will include and document the items listed in **Table II.1.12**. The inspections will be documented on the Inspection Form included as **Attachment II.1.C**. Any items identified during inspections which require corrective action will be addressed immediately, and if required, the specific process equipment will be taken offline until repairs are completed. The Load-out and Tank Farm detection sumps will be inspected monthly. If the liner system has failed and liquids are found in the detection sumps, OCD will be notified within 48 hours of discovery, and the sump contents and contaminated sediments will be removed and disposed of at Sundance West or another OCD-approved facility. A report describing subsequent investigations and remedial actions taken will be submitted to the OCD.

7.3.2 Pond Operation

A thorough inspection of the leak detection system and sumps will be conducted on a weekly basis and documented on the Pond Integrity/Leak Detection Inspection Form included in **Attachment II.1.D**. At a minimum, the items listed in **Table II.1.12** will be documented.

Prior to placing a newly constructed pond or a pond that has undergone repair or cleaning into service, liquids will be removed from above the primary liner and from the leak detection system. Once in service, it is anticipated liquid may be present at all times due to condensation and nominal leakage through the primary liner. The sumps are 2 ft deep and have a capacity of >1,200 gallons (gal) using a porosity of 35% for the granular material (3/4" – 2" select aggregate. **Attachment II.1.E** is a summary table from an authoritative publication on potential geomembrane liner leakage for 40 mil high density polyethylene (HDPE) lined ponds. As shown on the table, the combined projected permeation/pinhole leakage rate ranges from 9.5 to 138 gal/acre/day. Using a very conservative value of 75 gal/acre/day for the combined leakage/permeation rate (**Attachment II.1.E**), this provides 16 days of storage at a depth of 2 ft in the sump. The rate of 75 gal/acre/day is considered very conservative as it is based on 40 mil HDPE (vs. the actual 60 mil HDPE pond liner provided); a fluid depth of 10 ft; and a high number of large pin holes. As additional protection, a geosynthetic clay liner (GCL) will be installed under the leak detection sumps (**Volume III.1**, **III.3,** and **Permit Plans**).

7.3.3 Mechanical Evaporation System

The evaporation ponds will rely on mechanical evaporators to enhance the rate of evaporation of the overall system. Specifications for the spray systems are included in **Attachment II.1.B**. The mechanical evaporation system will be inspected on a daily basis when operations are active with maintenance performed on an as-needed basis. The inspections will be documented on the Inspection Form included as **Attachment II.1.C**. At a minimum, the mechanical evaporation system weather station (set at a wind velocity threshold of 12 mph) and spray system plume height will be checked during the daily inspection. The plume height will be adjusted to an elevation that prevents overspray from leaving the confines of the evaporation ponds.

7.3.4 Treatment Plant, Tanks and Sumps

The processing area physically separates oil from water through the use of tanks and other equipment (i.e., mechanical oil/water separators, centrifuges, etc.). In addition, process that recycle the water for reuse (i.e., water filtration systems) and remove trash and water from the drilling muds (i.e., screens, shakers, filter presses, centrifuges, etc.) may be incorporated into

the treatment plant as their viability is proven. Weekly inspections of the processing area and tanks will be conducted. The inspections will be documented on the Inspection Form included as **Attachment II.1.C**. At a minimum, the inspections will include and document the items listed in **Table II.1.12**. Any equipment identified during inspections or mechanical testing which require corrective action will be taken offline until repairs are completed as necessary.

The Treatment Plant will be inspected for proper function of the boiler, piping and proper liquid flow operation. Should any defect that seriously jeopardizes the plant operation or safety of the operation be identified, the system will be shut down until repairs are completed. Pond detection sumps will be inspected at least weekly, and fluid will be removed as necessary to prevent overflow. If the sump integrity has failed, OCD will be notified within 48 hours of discovery, and the sump contents and associated contaminated soil will be removed and disposed of in the solid waste disposal area. A report describing subsequent investigations and remedial actions taken will be submitted to OCD.

The liquid levels in the sumps will be monitored approximately weekly immediately after ponds are put into service and documented. Should the lack of liquids become apparent after a series of inspections, the monitoring frequency may be extended to monthly. Upon discovery of excessive liquid presence in a leak detection system (i.e., > 2 ft), OCD will be notified within 24 hours and the affected pond area drained. Prior to placing the pond back into service, Sundance West will initiate corrective action which may include but is not limited to:

- Actions undertaken to locate source(s) of leakage
- Repair procedures
- More frequent sump liquid level monitoring and/or pumping
- Liquids testing
- Vadose monitoring (if required)

7.7 Pond Containment System

A thorough inspection of the berms and the outside walls of pond levees will be conducted at least quarterly, and after any major rainfall or windstorm. For purposes of this inspection frequency, a major rainfall is defined as a documented 25-year, 24-hour rainfall event, and a major windstorm is defined as sustained wind gusts in excess of 45 mph. The inspections will be documented and retained on the Pond Integrity/Leak Detection Inspection Form included in **Attachment II.1.D**. At a minimum, the inspection shall consist of the items listed in **Table**

II.1.12. The inspection will address any erosion, liner damage and maintenance required with a timeframe to complete required repairs. In addition, the depth of sludge build-up in the bottom of the pond will be measured during the quarterly inspections and documented. Sludge in excess of 12 inches will be removed, dewatered, stabilized and disposed of on-site or at an OCD-approved facility.

7.8 Below-grade Tanks and Sumps

No below-grade tanks or sumps, other than the sumps previously mentioned with the leak detection system, are proposed for the Sundance West Facility.

8.0 EMERGENCY SITUATIONS AND EQUIPMENT BREAKDOWN

Response to emergency situations involving the actions of the Emergency Coordinator, fire prevention and protection, incident response, and notification procedures are described in detail in the Contingency Plan (**Volume II.5**).

8.1 Equipment Breakdown

In the case of unplanned equipment downtime, the following measures will be deployed:

- Delivery of liquid oil field waste will be delayed if storage capacity is unavailable in the receiving tanks.
- Downtime associated with mobile equipment (i.e., skid-steer loader, forklift) will be addressed by deploying alternative on-site units (e.g., end loaders) and arrangements with local equipment vendors for immediate maintenance and lease of temporary replacement units.
- Sundance West's proposed preventive maintenance plan has proven to be highly effective at preventing unplanned downtime through routine inspection and regular maintenance of processing equipment.

9.0 RECORD KEEPING REQUIREMENTS

Sundance West, Inc. is required to keep detailed records for the Sundance West Facility as described throughout this Application. In addition, the Facility will meet the OCD requirements for reporting as detailed in the Management Plans provided in **Volume II** of this Application. Records will be retained for a minimum of 5 years and will be made available for OCD review and inspection upon request.

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.A

SAFETY COMMUNICATIONS PROGRAM (TYPICAL)

ATTACHMENT II.1.A
Safety Communications Program (Typical)
Sundance West

Safety Meeting Attendance Sheet

Date: _____ Time: _____

Topic: _____

Presenter: _____ Department: _____

Instructions:

1. This form must be completed at each safety meeting.
2. Make additional copies as required.
3. Keep copy of completed attendance sheets in binder.

Printed Name	Signature

Absent	Date Covered

ATTACHMENT II.1.A
Safety Communications Program (Typical)
Sundance West

Annual Training Schedule[1]

Month	Yard Topics	Office Topics
January	Lockout/Tagout Program	Lockout/Tagout Program
	SWPPP	SWPPP
	Good Housekeeping	Good Housekeeping
		Permit Conditions
February	Material Acceptance & Handling	Material Acceptance & Handling
	Form C-133 & C-138 reconciliation	Form C-133 & C-138 reconciliation
	H_2S screening	H_2S screening
March	Non-exempt liquids recognition	Non-exempt liquids recognition
	H_2S Treatment Procedures	H_2S Treatment Procedures
April	Site Contingency Plan	Site Contingency Plan
	H_2S Contingency Plan	H_2S Contingency Plan
	Hazard Communications	Hazard Communications
	Emergency Evacuation Drill	Emergency Evacuation Drill
May	Spill Prevention & Control	Spill Prevention & Control
	Site Generated Waste Disposal	Site Generated Waste Disposal
	Heat Stress	Heat Stress
June	Confined Space	Confined Space
	Site Inspection	Site Inspection
	Incident & Injury reporting	Incident & Injury reporting
	First Aid/Bloodborne Pathogens	First Aid/Bloodborne Pathogens
July	Migratory Bird Prevention	Migratory Bird Prevention
August	Employee Safety	Employee Safety
	PPE	PPE
	3-Point Contact	3-Point Contact
September	Industrial Powered Trucks	Recordkeeping
	Skid Loader	
	Sky Trak	
	Loader	
	High Voltage Training	
October	Cold Weather Stress	Cold Weather Stress
	Fire Extinguisher Use	Fire Extinguisher Use
November	Sexual Harassment	Sexual Harassment
	Drug & Alcohol	Drug & Alcohol
	Cell Phone usage	Cell Phone usage
December	Employee Benefits	Employee Benefits
	Temp. Employee Safety	Temp. Employee Safety

Note:
[1] Typical training schedule and content subject to change

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.B

EQUIPMENT SPECIFICATIONS

Fulton®

Thermal Fluid Heaters

Vertical Coil, Vertical Tubeless, Electric and Horizontal

Sizes from 75,000 to 40,000,000 BTU/HR

The heat transfer innovators.

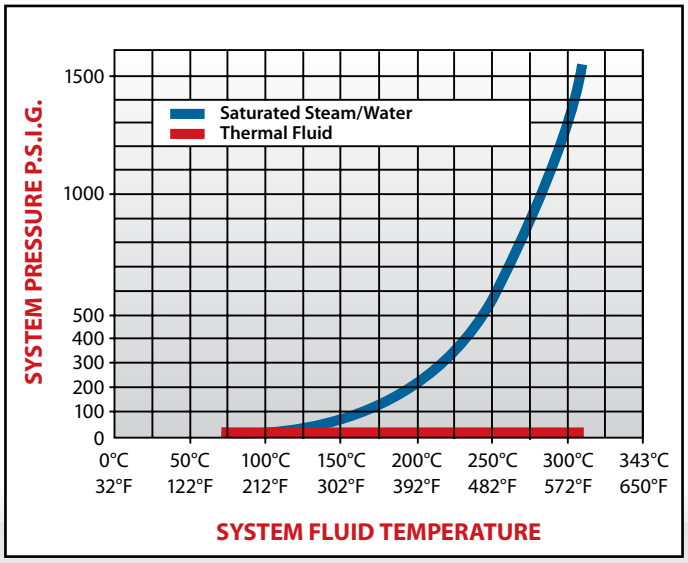
THERMAL FLUID FEATURES AND BENEFITS

KEY FEATURES

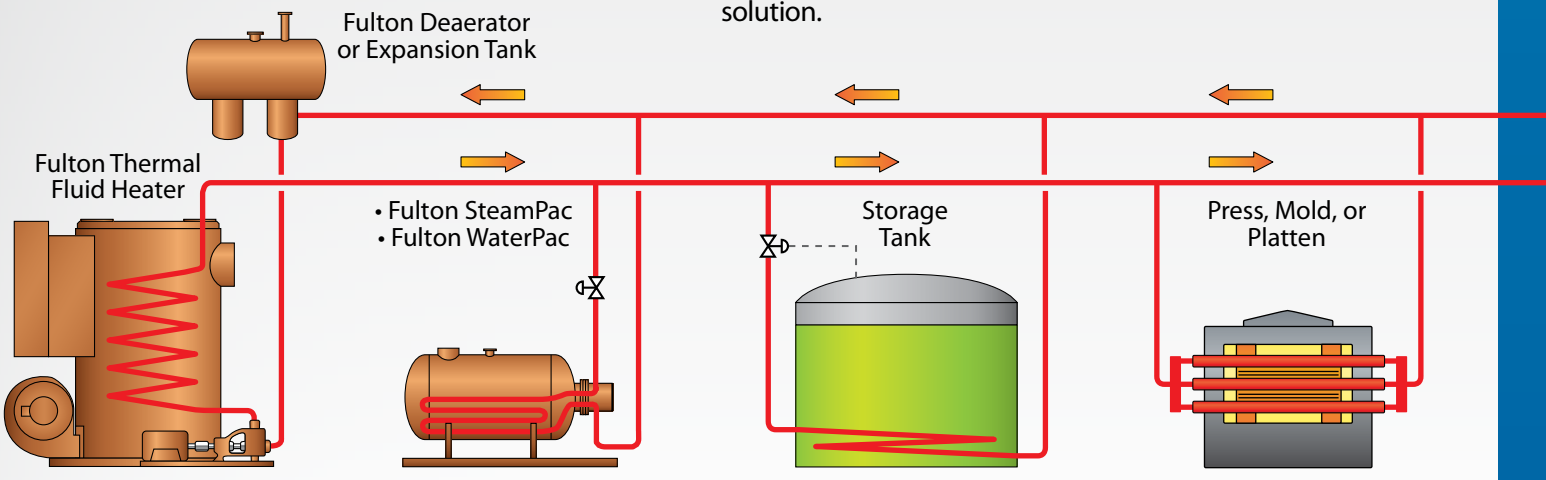
- No Corrosion or Freezing
- High Operating Temperatures (up to 750° F) with Low System Pressure
- Minimum Maintenance - Burner, Pump and Controls
- Simple Circuit; No Blow-Downs, Steam Traps or Condensate Return Systems
- Fulton's Combination Expansion / Deaerator Thermal Buffer Tank Provides Pipework Simplification, Protection of Thermal Fluid from Oxidation and Continuous Deaeration of Fluid to Avoid Pump Cavitation
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request
- Fulton Heaters are Manufactured Individually for Maximum Flexibility and to Customer Specifications
- Fulton Heaters and Accessory Components (Pumps, Expansion Tanks, Control Valves, etc.) Can Be Skid Mounted to Save Time and On-Site Fabrication

THERMAL FLUID VS. STEAM

A thermal fluid (hot oil) system operates in a closed loop circulation system with minimal pressure. Fulton thermal fluid systems can reach 750° F (345° C) making them an ideal choice for many process heat applications.



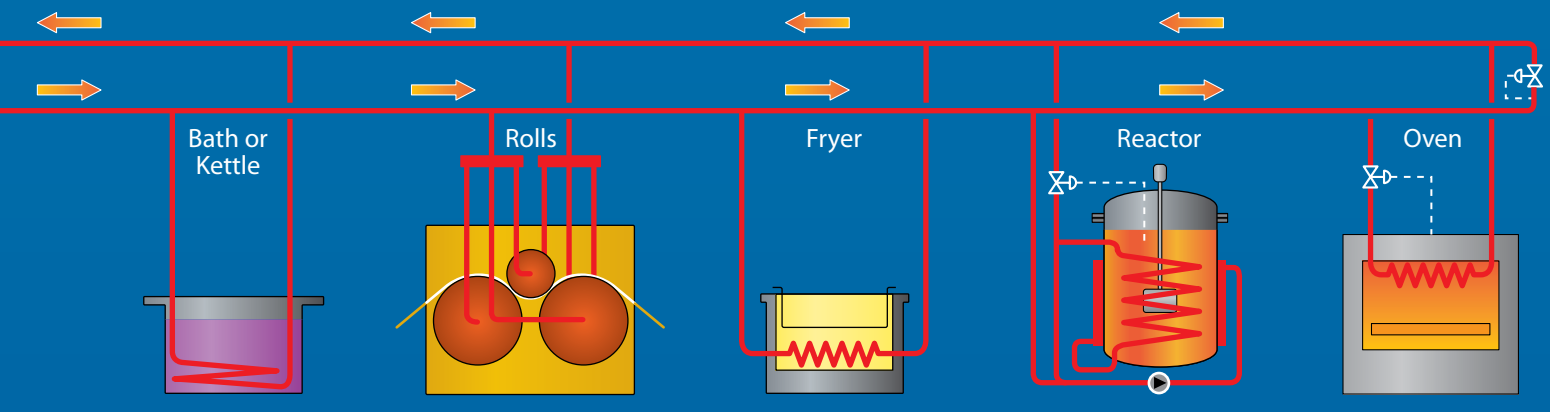
The choice between a steam system or a thermal fluid system is governed by the process requirements. The range or process temperature is a deciding factor. If the system's required temperature is above the freezing point of water (32° F) and below approximately 350° F, the choice is usually steam. However, if the required temperature is below 32° F or above 350° F, thermal fluid may be a better solution.



APPLICATIONS

Fulton heaters are used in a variety of applications throughout many industries. Food, plastic and chemical processing, as well as pharmaceutical and bio-fuel production, are only a few examples of the many existing applications using Fulton equipment.

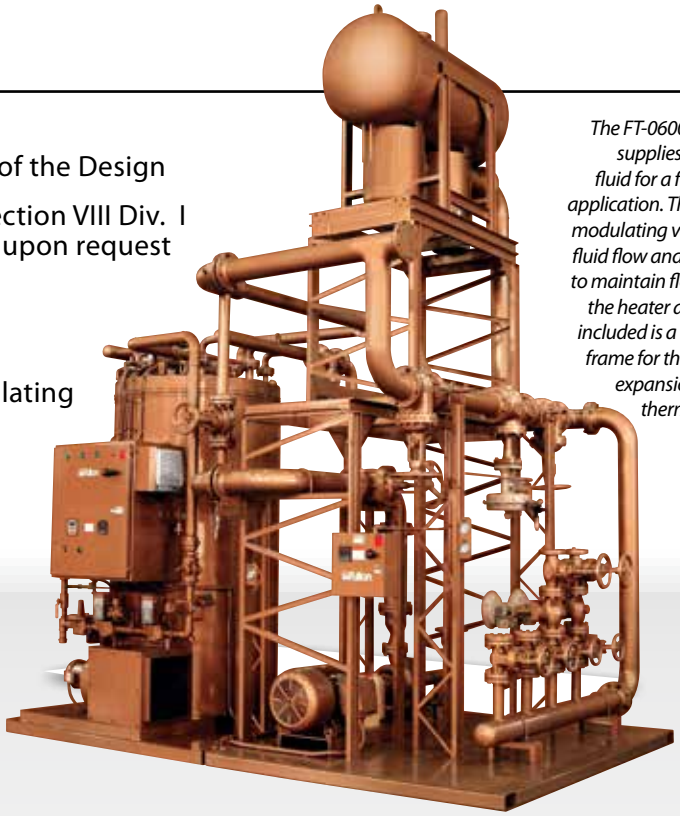
- Adhesives
- Asphalt
- Autoclaves
- Bio-fuel
- Chemical Reactors
- Deodorization
- Distillation
- Food Processing (frying, baking, etc.)
- Gas Processing / Oil Processing
- Inks & Dyes
- Laminating
- Laundry
- Marine Heating and Shipboard Services
- Metal Finishing
- Mining
- Ovens
- Paint and Varnish Manufacture
- Paper Converting Machinery
- Plastics
- Printing and Packaging Machinery
- Rubber and Rubber Compounds
- Surface Pre-Treatment and Finishing
- Tank Farms/Pipe and Pump Tracing
- Textile Machinery
- Unfired Steam or Hot Water Generation
- Uranium Processing
- Waste Treatment/Dryers



C-MODEL
VERTICAL COIL DESIGN

KEY FEATURES

- Vertical 4-Pass Design
- Preheated Combustion Air is an Integral Part of the Design
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request
- 800,000 BTU/Hr to 14,000,000 BTU/Hr Output
- Operating Temperatures to 750° F
- Gas, Oil or Dual Fuel Burners; On/Off or Modulating
- Low Emission Natural Gas Burners are Available
- Minimal Refractory Results in Low Thermal Inertia and Prevents Overheating of the Fluid in the Event of a Pump or Power Failure
- Customized Controls Available
- Customized Heaters Available
- High Efficiencies
- Even Heating



The FT-0600-C shown here supplies 600° F thermal fluid for a food processing application. The skid includes modulating valves to control fluid flow and a bypass valve to maintain flow throughout the heater at all times. Also included is a custom 3-piece frame for the top-mounted expansion / deaerator / thermal buffer tank.

MODELS	FT-C	0080	0120	0160	0240	0320	0400	0600	0800	1000	1200	1400
Specifications												
Heat Output	1,000 BTU/HR	800	1,200	1,600	2,400	3,200	4,000	6,000	8,000	10,000	12,000	14,000
	1,000 KCAL/HR	200	300	400	600	800	1,000	1,500	2,000	2,500	3,000	3,500
Thermal Fluid Content	Gallons	10	21	19	31	68	76	132	201	290	383	460
	Liters	38	80	72	116	258	288	498	648	1,097	1,448	1,741
Recommended Flow Rate	GPM	50	75	100	150	250	250	375	500	615	730	800
	M3/HR	11.4	17	22.7	34	56.8	56.8	85.2	113.6	139	167	182
Approximate Fuel Usage												
Light Oil *	GPH	7.1	10.7	14.3	21.4	28	35.3	53	69.3	87.1	104.5	122
	LPH	27	40.6	54.1	81	108.8	136	201	263.7	329.6	395.5	461.5
Natural Gas *	FT3/HR	998	1,498	1,998	2,999	4,000	4,997	7,498	9,997	12,496	14,998	17,500
	M3/HR	38.3	42.4	56.5	84.9	113.2	141.5	212.3	283	353.8	424.6	495.5
Power												
Typical Circulating Pump	HP	10	10	15	15	20	20	30	40	50	50	60
	KW	7.5	7.5	11.2	11.2	14.9	14.9	22.5	29.5	37.3	37.3	45
Typical Burner Motor	HP	1.5	3	3	3	5	7.5	7.5	15	20	20	20
	KW	1.1	2.2	2.2	2.2	3.7	5.6	5.6	11.2	11.2	15	15

* Please consult factory for additional fuel options. Fuel up to No. 6 Oil available for large units (FT-0600-C and larger). Voltage 3 Phase for Burner and Pump - Each unit has an incorporated step down transformer. Efficiency up to 80% Minimum Based on High Heating Value of the Fuel (No. 2 Oil @ 140,000 BTU/GHHV; Natural Gas @ 1,000 BTU/ft3HHV) Circulating pump motor sizes based on standard pressure (55 PSIG) and viscosity 1 cs, specific gravity 0.7, with 25-37 PSID available head for installation. All Units are Modulated. Operating specifications may change based on field conditions.

A LOOK INSIDE

THE COMBUSTION PROCESS

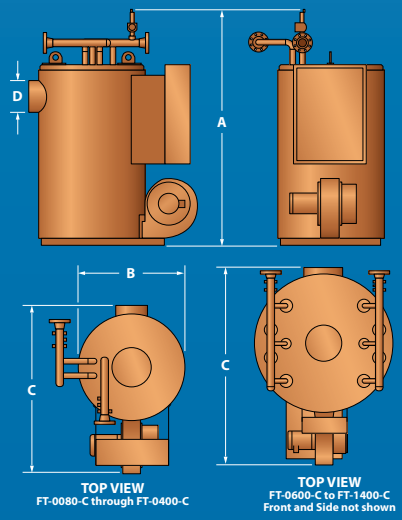
1 The combustion air enters the burner fan inlet, travels upward between the inner and outer jacket, preheating the air before it enters the top mounted burner.

2 Hot gases travel down the full length of the vessel creating the first (radiant) pass.

3 The gases then travel back across the inner row of coils, creating the second (convection) pass.

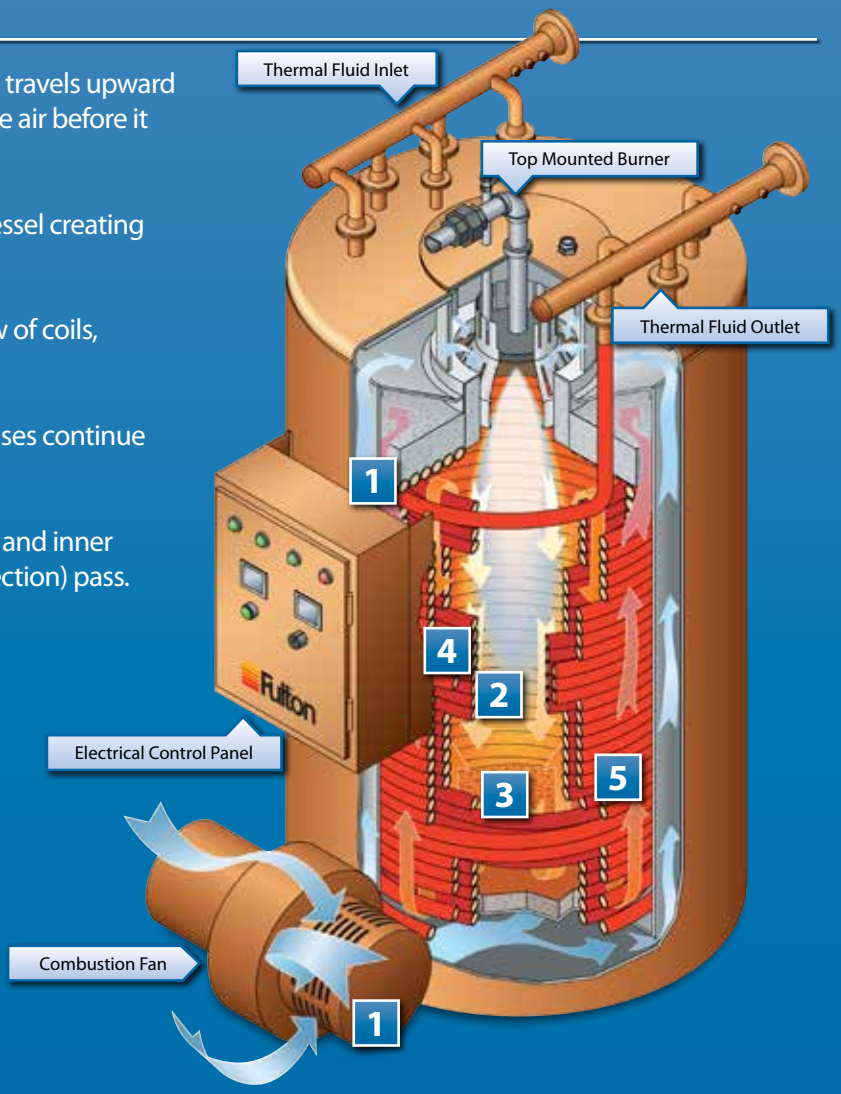
4 The third (convection) pass is created as the gases continue back down between the inner and outer coil.

5 The last pass is upward between the outer coil and inner jacket to the flue outlet, creating the fourth (convection) pass.



TOP VIEW
FT-0080-C through FT-0400-C

TOP VIEW
FT-0600-C to FT-1400-C
Front and Side not shown



MODELS	FT-C	0080	0120	0160	0240	0320	0400	0600	0800	1000	1200	1400
Dimensions												
Heater Inlet/Outlet Connections	IN	1.25	1.5	2	2.5	3	3	4	4	6	6	6
	MM	32	38	51	64	76.3	76	102	102	152	152	152
(A) Overall Height	IN	73.7	80.7	80.6	89.7	100.6	112.4	143.6	143	146.5	146.4	163.1
	MM	1,872	2,050	2,046	2,278	2,556	2,856	3,648	3,632	3,721	3,718	4,144
(B) Heater Width	IN	31.6	34.4	45.9	50.1	49.3	49.3	63.4	70.5	95	108.4	108.4
	MM	803	873	1,165	1,273	1,252	1,252	1,611	1,791	2,413	2,753	2,753
(C) Overall Depth	IN	46.2	60.6	60.6	66.6	80.6	80.6	88.1	107.75	135.1	152.9	152.9
	MM	1,173	1,540	1,540	1,691	2,046	2,046	2,237	2,736	3,432	3,882	3,882
(D) Flue Outlet Diameter	IN	10	10	10	12	14	14	18	20	20	22	22
	MM	254	254	254	305	356	356	457	508	508	559	559
Recommended Stack Diameter	IN	10	12	12	14	18	18	22	24	24	26	26
	MM	254	304	304	356	457	457	558	609	609	661	661
Approximate Dry Weight	LB	1,500	2,100	2,550	3,400	5,300	5,300	8,250	11,450	19,250	21,700	23,000
	KG	700	950	1,150	1,550	2,400	2,400	3,750	5,200	8,750	9,850	10,455

Specifications and Dimensions are approximate. Consult factory for model specific electrical requirements. We reserve the right to change specifications and/or dimensions without notice. Diagram for guidance purposes only. Comprehensive details of dimensions, connections, etc. for each model are given on product dimension data sheets available from Fulton.

A-MODEL
VERTICAL TUBELESS DESIGN

KEY FEATURES

- Vertical Annular Design
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request
- 207,000 BTU/Hr to 1,736,000 BTU/Hr Output
- Operating Temperatures to 600° F
- Gas or Oil Fired Burners, On/Off or Modulating
- Low Emission Gas Burners are Available
- Customized Controls Available
- Customized Heaters Available

Pictured here is a skid mounted FT-0690-A thermal fluid heater with a deaerator / thermal buffer tank and a circulation pump.

MODELS	FT-A	0200	0380	0520	0690	1050	1740
Specifications							
Heat Output	1,000 BTU/HR	207	348	519	693	1,052	1,736
	1,000 KCAL/HR	52	88	131	175	265	437
Thermal Fluid Content	Gallons	23	38	45	65	98	117
	Liters	87	144	170	246	371	443
Recommended Flow Rate	GPM	90	90	125	125	150	200
	M3/HR	21	21	28	28	34	46
Approximate Fuel Usage • Light Oil	GPH	2.2	3.2	4.7	6.7	9.4	15.8
	LPH	8.3	11.9	17.8	25.4	35.6	60
Approximate Fuel Usage • Natural Gas	FT3/HR	259	435	649	866	1,315	2,170
	M3/HR	7.2	12.2	18.4	24.2	36.8	60.8
Power							
Typical Circulating Pump	HP	10	10	15	15	15	20
	KW	7.5	7.5	11.2	11.2	11.2	14.9
Typical Burner Motor	HP	.33	.33	.33	.75	.75	1.5
	KW	.248	.248	.248	.56	.56	1.1

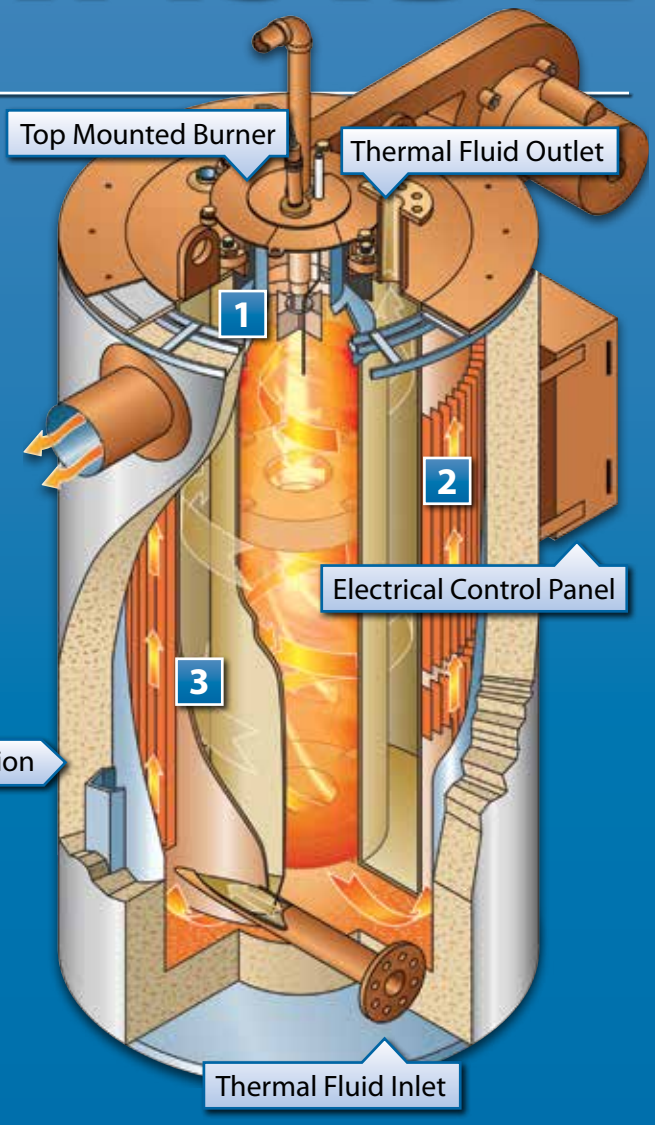
A LOOK INSIDE

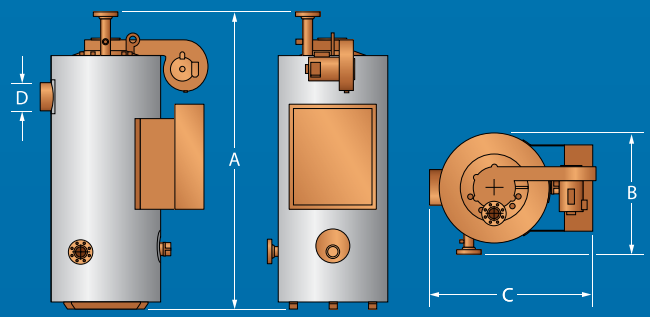
THE COMBUSTION PROCESS

1 The top-mounted down-fired burner delivers a spinning flame down the length of the furnace. As the flame swirls downward in a controlled flow pattern, the fluid spirals upward in the pressure vessel.

2 Hot gases from the flame are carried up the outside of the vessel in the secondary flue passage convection area.

3 Convection fins welded along the full length of the vessel transmit the remaining heat through the outer side of the fluid vessel and into the fluid. The result is even heating of thermal fluids for optimum thermal efficiency.





Specifications and Dimensions are approximate. Consult factory for model specific electrical requirements. We reserve the right to change specifications and/or dimensions without notice.

Diagram for guidance purposes only. Comprehensive details of dimensions, connections, etc. for each model are given on product dimension data sheets available from Fulton.

MODELS	FT-A	0200	0380	0520	0690	1050	1740
Dimensions							
Heater Inlet/Outlet Connections	IN	1.5	1.5	2	2	2	2.5
	MM	38	38	51	51	51	64
(A) Overall Height	IN	69	75	85	86	86	110
	MM	1,752	1,905	2,159	2,185	2,185	2,794
(B) Heater Width	IN	26	28	30	36	44	44
	MM	660	710	760	915	1,120	1,120
(C) Overall Depth	IN	43	45.5	46	56	64	64
	MM	1,092	1,156	1,168	1,422	1,626	1,626
(D) Flue Outlet Diameter	IN	6	6	8	10	12	12
	MM	152	152	203	254	305	305
Approximate Dry Weight	LB	1,850	2,100	2,300	3,400	4,400	7,200
	KG	840	955	1,045	1,540	1,995	3,275

N-MODEL
VERTICAL ELECTRIC DESIGN

KEY FEATURES

- Compact Vertical Design
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request
- 74,000 BTU/Hr to 1,685,000 BTU/Hr Output
- Operating Temperatures to 650° F
- Low Watt Density Elements Result in Low Film Temperatures and Long Element Life
- Customized Controls Available, Including (but not limited to) Class 1, Division 1 or 2 groups C&D of NEC Code
- Customized Heaters Available

Pictured here is a skid mounted FT-0640-N electric thermal fluid heater with an expansion / deaerator / thermal buffer tank and a circulation pump.

MODELS	FT-N	0075	0150	0225	0300	0375	0430	0640	0860	1070	1290	1500	1720
Specifications													
	KW	22	44	66	88	110	126	189	252	315	378	441	504
Heat Input	1,000 BTU/HR	75	150	225	300	375	429	644	859	1,074	1,289	1,504	1,719
	1,000 KCAL/HR	18.9	37.8	56.7	75.6	94.5	108	162	216	271	325	379	433
Heat Output	1,000 BTU/HR	74	148	222	294	368	420	631	842	1,053	1,263	1,474	1,685
	1,000 KCAL/HR	18.6	37.3	59.9	74.1	92.7	105.8	159	212.2	265.4	318.3	371.4	424.6
Thermal Fluid Content	Gallons	18	36	42	54	63	79	79	102	127	152	168	185
	Liters	68	136	159	204	238	299	299	386	480	575	636	700
Recommended Flow Rate	GPM	50	50	50	90	90	125	125	150	150	175	200	200
	M3/HR	11.4	11.4	11.4	20.5	20.5	28.4	28.4	34	34	39.8	45.5	45.5
Power													
Typical Circulating Pump Motor	HP	7.5	7.5	7.5	10	10	15	15	15	15	15	20	20
	KW	5.6	5.6	5.6	7.5	7.5	11.2	11.2	11.2	11.2	11.2	14.9	14.9
Amps	208V	61	122	183	245	306	350	525	700	875	1,050	1,224	1,399
	220V	53	106	159	212	265	303	455	607	758	910	1,061	1,212
	480V	26	53	79	106	132	151	228	303	379	455	531	606

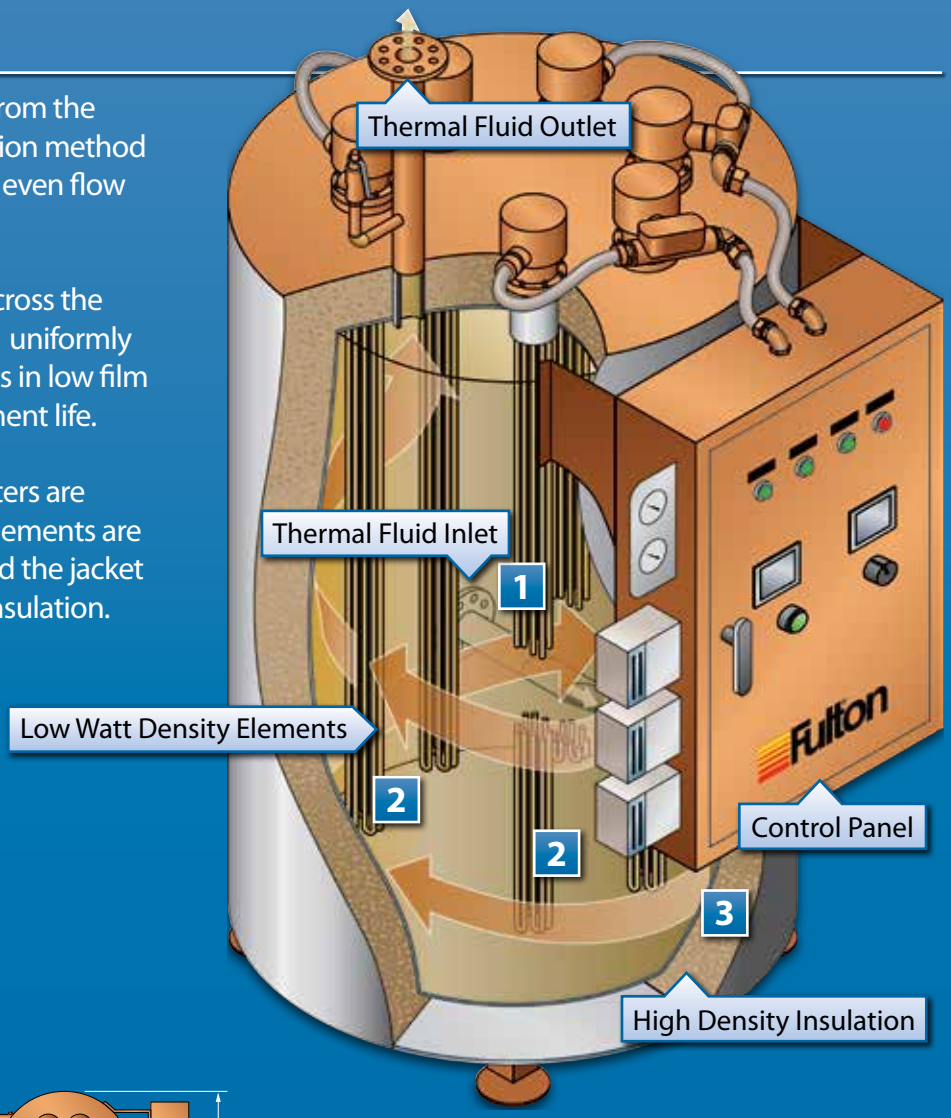
A LOOK INSIDE

OPERATING PRINCIPLE

1 Thermal fluid enters the heater from the lower right side. This unique circulation method (upward spiraling fluid) results in an even flow of thermal fluid within the vessel.

2 The thermal fluid flows evenly across the multiple low watt density elements, uniformly heating the thermal fluid. This results in low film temperatures and assures long element life.

3 Fulton electric thermal fluid heaters are nearly 100% efficient because the elements are totally immersed in thermal fluid and the jacket is fully insulated with high density insulation.



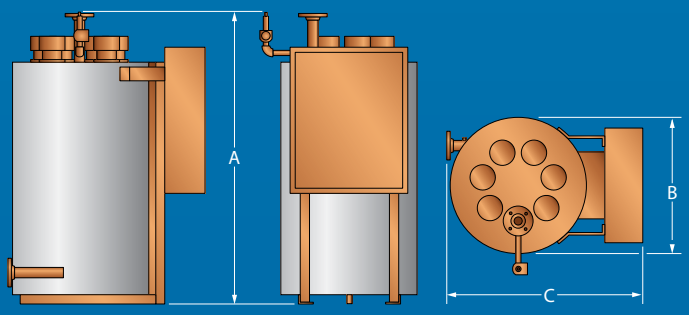


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Diagram for guidance purposes only. Comprehensive details of dimensions, connections, etc. for each model are given on product dimension data sheets available from Fulton.

MODELS	FT-N	0075	0150	0225	0300	0375	0430	0640	0860	1070	1290	1500	1720
Dimensions													
Heater Inlet	IN	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2.5	2.5
	MM	38	38	38	38	38	51	51	51	51	51	64	64
(A) Overall Height	IN	70	70	70.5	70	70	90.5	90.4	90.8	89.8	91.2	93	93
	MM	1,778	1,778	1,791	1,778	1,778	2,299	2,296	2,306	2,281	2,317	2,362	2,362
(B) Heater Width	IN	20	26	28	32	32	32	32	38	44	50	54	58
	MM	508	660	711	813	813	813	813	965	1,118	1,270	1,372	1,473
(C) Overall Depth	IN	37.5	43	43.5	47.5	47.5	47.5	49.5	53.8	58.4	65.7	71.8	75.7
	MM	953	1,092	1,105	1,207	1,207	1,207	1,257	1,365	1,257	1,669	1,823	1,993
Approximate Dry Weight	LB	1,060	1,220	1,400	1,540	1,660	2,040	2,200	2,370	2,650	2,950	2,950	3,600
	KG	481	555	636	700	756	927	1,000	1,077	1,205	1,341	1,341	1,636

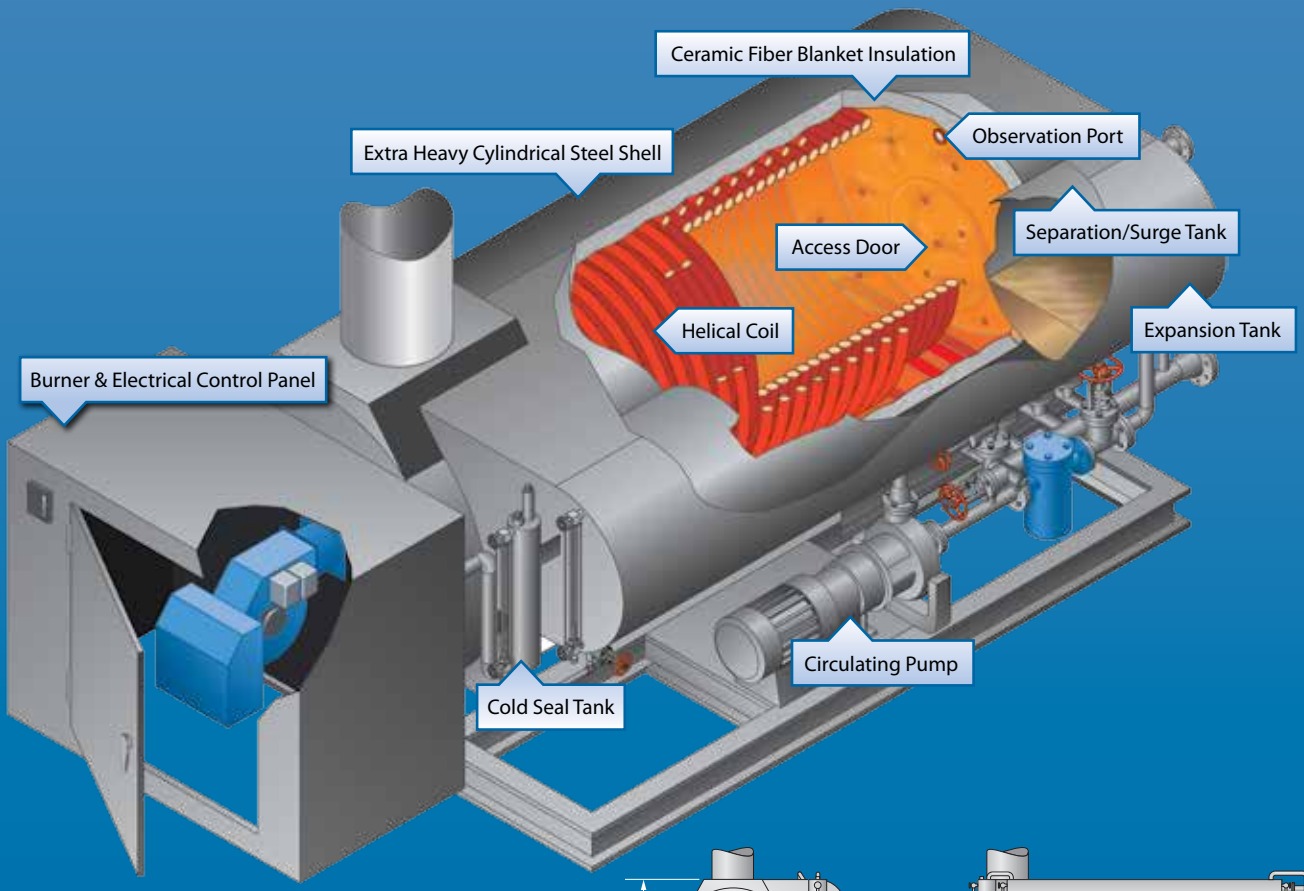
HOPKINS
HORIZONTAL COIL DESIGN

KEY FEATURES

- Horizontal 2-Pass Design
- 1,000,000 BTU/Hr to 40,000,000 BTU/Hr Output
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request
- Operating Temperatures to 650° F
- Modulating Gas, Oil or Dual Fuel Burners
- Alternative Fuel Capabilities
- Open Protocol Burner
- Skid-Mounted Systems Available, Including Circulating Pump and Expansion Tank
- Customized Controls and Coil Designs Available
- Water - Glycol Heaters Available
- Available With or Without Integral Expansion Tank

MODELS	HPN	100S	200S	350S	600S	800S	1000S	1200S	1400S	1600S	2000S	2400S	3000S	4000S
Specifications														
Heat Output	Million BTU/hr	1	2	3.5	6	8	10	12	14	16	20	24	30	40
	Million Kcal/hr	.25	.5	.875	1.5	2	2.5	3	3.5	4	5	6	7.5	10
Flow Rate-Standard *1	GPM	75	150	265	425	600	725	900	1050	1200	1500	1800	2250	3000
	M3/min	18	35	61	97	137	165	205	239	273	341	409	511	682
Flow Rate-Low Flow *2	GPM	40	75	135	225	300	375	450	525	600	750	900	1125	1500
	M3/min	10	18	31	52	69	86	103	120	97	171	205	256	341
Circulating Pump Motor-STD	HP	7.5	15	20	30	40	50	60	75	100	100	125	150	200
	kW	5.6	11.2	14.9	22.5	29.8	37.3	45	56	74.5	74.5	93.2	111.8	149
Circulating Pump Motor-LF	HP	7.5	7.5	15	20	30	30	40	30	40	50	60	75	100
	kW	5.6	5.6	11.2	14.9	22.5	22.5	29.8	22.5	29.8	37.3	45	56	74.5
Blower Motor	HP	1/3	1	2	7.5	10	10	5	7.5	7.5	15	20	25	30
	kW	.25	.7	1.5	5.6	7.5	7.5	4.3	5.6	5.6	11.2	14.9	18.6	22.5
Light Oil (approx. fuel usage)*3	GPH	8.8	17.5	30.6	52.5	70	87.5	104.9	122.4	139.9	174.9	209.8	262.3	349.7
	LPH	33.3	66.2	115.8	198.7	265	331.2	397	463.3	529.5	662	794	992.8	1324
Natural Gas (approx. fuel usage)*3	FT3/hr	1,334	2,667	4,667	8,000	10,667	13,334	16,000	18,667	21,334	26,667	32,000	40,000	53,334
	M3/hr	37.4	75	131	224	299	373.4	448	522.7	597.4	747	896	1120	1493.4

A LOOK INSIDE



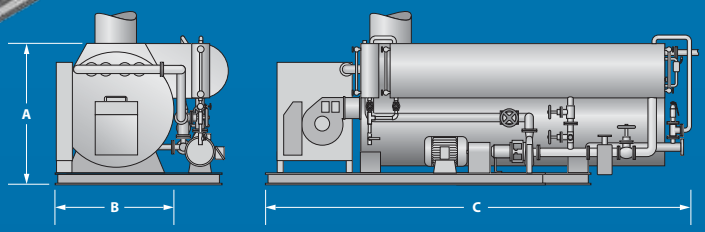


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Diagram for guidance purposes only. Comprehensive details of dimensions, connections, etc. for each model are given on product dimension data sheets available from Fulton.

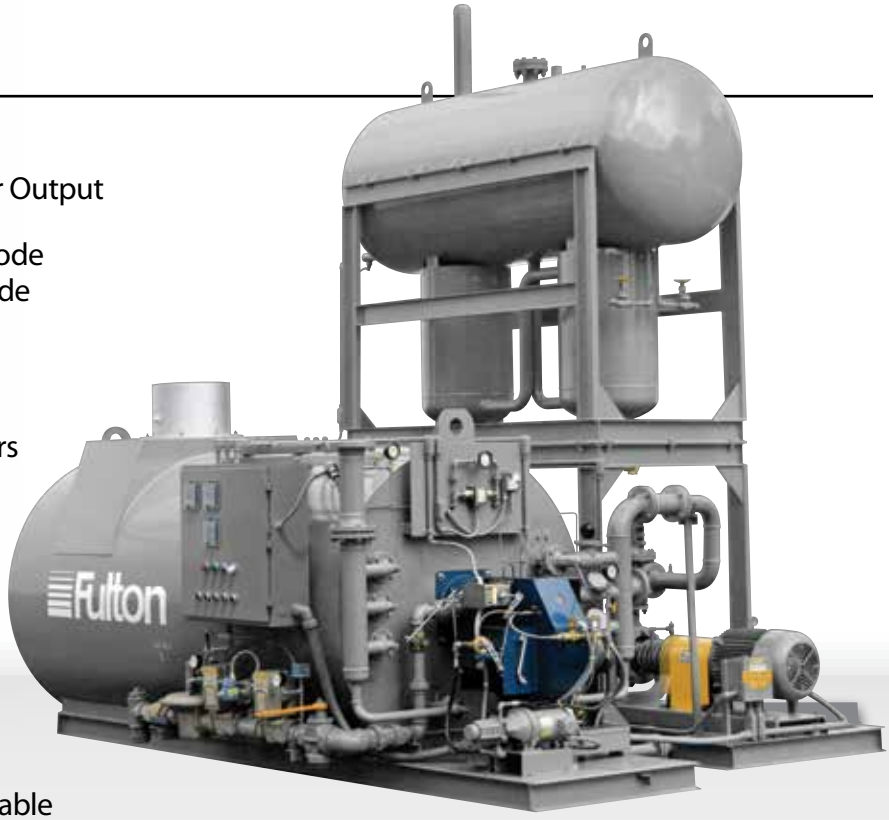
***NOTE:** Dimensions shown are for the Hopkins model without the integral expansion tank.

MODELS	HPN	100S	200S	350S	600S	800S	1000S	1200S	1400S	1600S	2000S	2400S	3000S	4000S
Dimensions														
(A) Overall Height (w/o Stack)	IN	51	60	62	82	82	105	105	106	106	125	133	133	142
	MM	1,295.4	1,524	1,575	2,083	2,083	2,667	2,667	2,692.4	2,692.4	3,175	3,378	3,378	3,607
(B) Overall Width	IN	42	50	50	74	93	87	103	110	110	123	130	130	142
	MM	1,067	1,270	1,270	1,880	2,362	2,210	2,617	2,794	2,794	3,124	3,302	3,302	3,607
(C) Overall Length	IN	115	152	211	231	302	311	360	408	444	450	550	575	648
	MM	2,921	3,861	5,359	5,867	7,671	7,899	9,144	10,363	11,278	11,430	13,970	14,605	16,459
Inlet/Outlet Connections	IN	2	3	3	4	6	6	8	8	8	10	12	12	12
	MM	51	76.2	76.2	102	152.4	152.4	203	203	203	254	305	305	305
Thermal Liquid Volume	Gallons	45	86	168	426	661	724	853	1,168	1,400	1,721	2,322	3,180	4,626
	Liters	170	325	635	1,612	2,502	2,740	3,228	4,421	5,299	6,514	8,789	12,037	17,511
Approx. Dry Weight	LB	3,936	6,800	9,052	14,350	18,500	23,100	26,800	30,500	32,600	41,400	68,000	74,000	80,000
	KG	1,785	3,084	4,106	6,509	8,392	10,478	12,156	13,835	14,787	18,779	30,844	33,566	36,287
Approx. Flooded Weight	LB	4,310	7,514	10,447	17,886	23,987	29,110	33,880	40,195	44,220	55,685	87,273	100,394	118,396
	KG	1,955	3,408	4,739	8,113	10,880	13,204	15,368	18,232	20,058	25,258	39,586	45,538	53,704
Floor Loading	LB/FT3	129	143	143	151	123	155	132	129	131	145	176	194	186
	KG/M3	2,066	2,291	2,291	2,419	1,970	2,483	2,115	2,066	2,099	2,323	2,819	3,108	2,980

ALLIANCE
HORIZONTAL COIL DESIGN

KEY FEATURES

- Compact Horizontal 3-Pass Design
- 2,400,000 BTU/Hr to 20,000,000 BTU/Hr Output
- Heaters are Built and Tested to ASME Code Section VIII Div. I as standard. ASME Code Section I is available upon request.
- Operating Temperatures to 650° F
- Modulating Gas, Oil or Dual Fuel Burners
- Low Emission Gas Burners
- Alternative Fuel Capabilities
- Open Protocol Burner
- Skid Mounted Systems Available, Including Circulating Pump and Expansion Tank
- Customized Controls and Heaters Available



Shown here is an FT-0600-HC horizontal heater skid mounted with circulation pump and a combination expansion / deaerator / thermal buffer tank, designed for barge cargo heating.

MODELS	HC	0240	0400	0600	0800	1000	1200	1600	2000
Specifications									
Heat Output	1,000 BTU/HR	2,400	4,000	6,000	8,000	10,000	12,000	16,000	20,000
	1,000 KCAL/HR	600	1,000	1,500	2,000	2,500	3,000	4,032	5,040
Thermal Fluid Content	Gallons	75	115	190	264	325	508	480	1,150
	Liters	284	435	719	998	1,230	1,921	1,817	4,353
Recommended Flow Rate	GPM	150	300	400	600	850	1,200	1,200	1,500
	M3/HR	35	69	91	137	193	273	273	341
Approximate Fuel Usage									
Light Oil	GPH	23	39	58	77	96	115	143	179
	LPH	88	148	220	292	364	436	542	678
Natural Gas	FT3/HR	3,200	5,340	8,000	10,700	13,340	16,000	20,000	25,000
	M3/HR	91	152	227	304	378	454	566	708
Power									
Typical Circulating Pump Motor	HP	15	25	30	50	60	75	100	125
	KW	11.2	18.7	22.5	37.3	45	56	74.5	93.2
Typical Burner Motor	HP	2	5	7.5	10	15	15	30	30
	KW	1.5	3.7	5.6	7.5	11.2	11.2	22.4	22.4

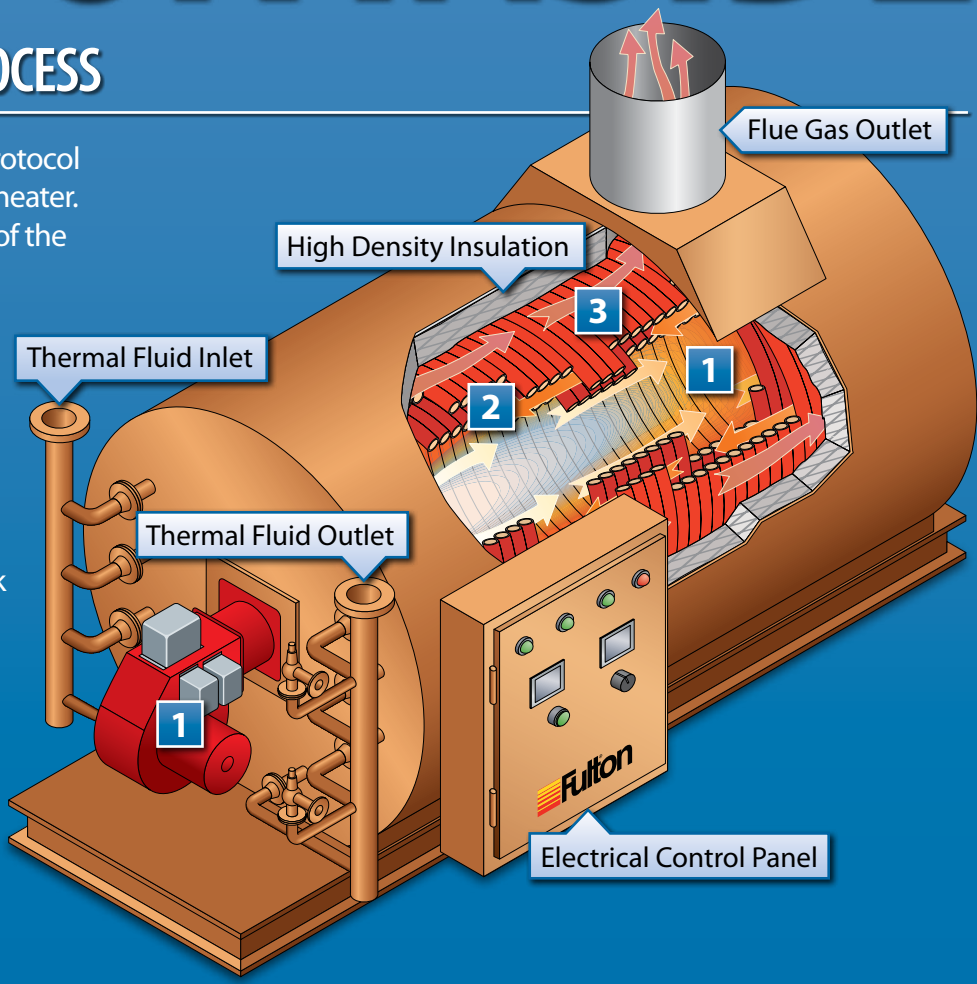
A LOOK INSIDE

THE COMBUSTION PROCESS

1 Air and fuel mix in the open protocol burner located at the front of the heater. The burner fires down the center of the vessel forming the first pass.

2 The hot gases turn at the rear of the vessel and return between two rolls of coils to the front end plate forming the second pass.

3 The hot gases then flow along the outside of the coils to the back of the heater, forming the third pass and then exit out the flue.



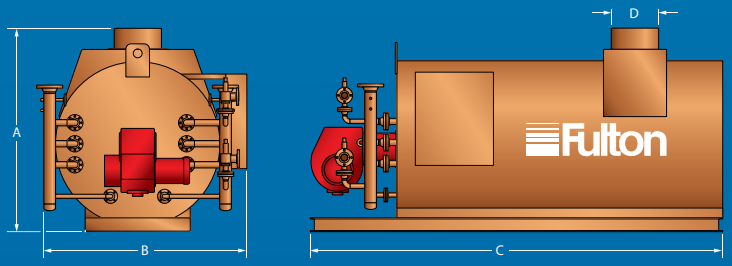


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Diagram for guidance purposes only. Comprehensive details of dimensions, connections, etc. for each model are given on product dimension data sheets available from Fulton.

MODELS	HC	0240	0400	0600	0800	1000	1200	1600	2000
Dimensions									
Heater Inlet/Outlet Connections	IN	2.5	3	4	6	6	6	8	8
	MM	64	76	102	152	152	152	203	203
(A) Overall Height	IN	64	68	78	107	107	131	114	118
	MM	1,626	1,727	1,981	2,718	2,718	3,327	2,896	2,997
(B) Heater Width	IN	62	62	81	95	95	130	118.5	119.5
	MM	1,575	1,575	2,057	2,413	2,413	3,302	3,010	3,035
(C) Overall Depth	IN	134	137	157	208	182	240	327	351
	MM	3,404	3,480	3,988	4,623	4,623	6,096	8,306	8,915
(D) Flue Outlet Diameter	IN	12	14	18	22	22	22	36	36
	MM	305	356	457	559	559	559	914	914
Approximate Dry Weight	LB	5,000	7,500	9,500	12,500	19,250	21,700	39,000	39,000
	KG	2,272	3,409	5,455	5,682	8,750	9,864	17,728	17,728

UNFIRED STEAM AND HOT WATER GENERATORS

STEAM GENERATOR KEY FEATURES

- Vertical Design 10 HP to 100 HP
- Horizontal Design 70 HP to 415 HP (Custom sizes are available)
- Standard Designs 15 PSIG to 150 PSIG (custom operating pressures are available)
- Built and Stamped to ASME Code Section VIII Div. I
- Complete with Modulating Thermal Fluid Control Valve and Custom Control Panel
- May be Skid Mounted with Blowdown Separators, Return Tanks, Deaerator Tanks, Feedwater Pumps, Chemical Tanks and Water Softeners

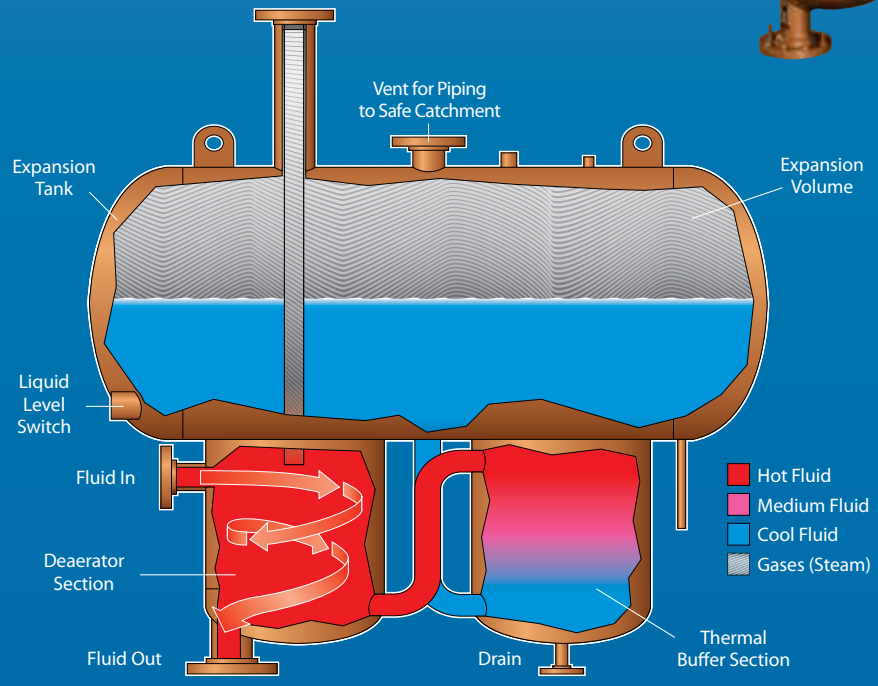
HOT WATER GENERATOR KEY FEATURES

- Custom Designs Available
- Carbon Steel or Stainless Steel
- Built and Stamped to ASME Code Section VIII Div. I
- Complete with Modulating Thermal Fluid Control Valve
- Instantaneous Hot Water Generation, or Can Be Used with a Storage Tank

EXPANSION/DEAERATOR/ THERMAL BUFFER TANK

KEY FEATURES

- Designed to Work as an Open-Atmospheric System Where Applicable, Eliminating the Expense of an Inert Gas Blanket
- Continuous Deaeration of Steam and Other Non-Condensibles
- Protects Fluid from Oxidation
- Simplification of Pipework
- Ease of Installation
- Standard 2-Pipe Expansion Tanks also Available



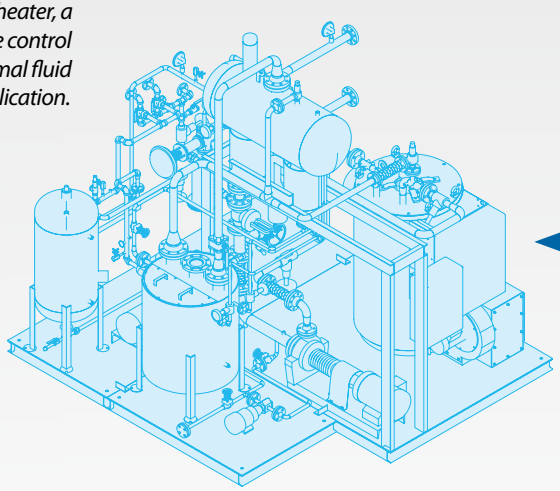
MODELS	FT-L	0200	0500	1000	1500	2000	3000	5000
Tank Sizing and Capacities								
Capacity	Gallons	52	132	264	397	528	793	1,310
	Liters	196	499	999	1,502	1,998	3,001	4,958
Initial Fill	Gallons	25	40	80	90	145	215	300
	Liters	94	151	302	340	548	813	1,135
Available for Expansion	Gallons	46	121	232	380	444	717	1,168
	Liters	174	458	878	1,438	1,680	2,714	4,421
Max System Volume	Gallons	184	525	1,000	1,400	1,700	2,600	4,600
	Liters	696	1,987	3,785	5,299	6,435	9,842	17,412
Dry Weight	LB	636	970	1,350	1,710	2,550	3,200	5,300
	KG	289	440	612	776	1,134	1,451	1,637

CUSTOM ENGINEERED SKIDDED SYSTEMS

Fulton's engineering and design capabilities are unmatched in the industry, providing comprehensive solutions to custom-designed thermal fluid systems. Our team of engineers and project managers assist in the specification and design of a "turnkey" system for each application. All engineered systems come with state-of-the-art operating controls and can have single-point electric, fuel supply, thermal fluid drain/fill, inlet/outlet, and any other applicable connection. From design to complete fabrication, trust Fulton and our many years of experience to build a system you can rely on for years to come.

The skid system shown here included one FT-0240-C heater, a circulating pump, expansion tank and a temperature control unit (TCU). This system was designed to provide thermal fluid and hot water to several dryers for a wastewater application.

This system includes two FT-0600-C thermal fluid heaters skid mounted with three circulating pumps (one pump acts as a backup for either heater), and one FT-5000-L expansion tank (not shown). These heaters are used to provide process heat for the manufacture of asphalt roofing shingles.



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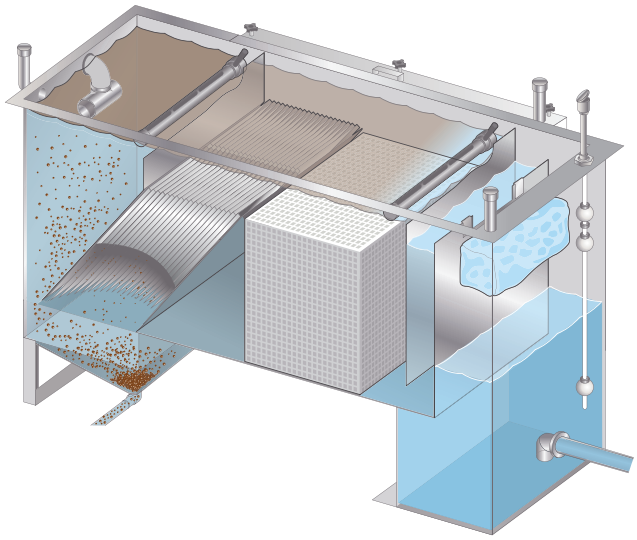
FTC-BRO_2013-1218

Clarification Separator

A HIGH-EFFICIENCY OIL WATER SEPARATOR

- Reduces coalescing media failure
- Reduces pretreatment needs
- Reduces posttreatment needs
- Lowers total cost of ownership



HQI Clarification Separator is recommended for any application that has oil and a high concentration of settleable and suspended solids.

DESIGN

The HQI Clarification Separator is a horizontal gravity flow pretreatment solution designed to separate settleable solids (specific gravity greater than water), suspended solids (specific gravity the same as water), and free and dispersed (non-emulsified) oil.

Units are built out of stainless steel or carbon steel. We offer several coating solutions for your specific application, such as brine water or frac water.

For a full list of options, such as pump packages and control panels, see: www.hydroquipinc.com/HQI-CS

Our Clarification Separator, when used in conjunction with posttreatment filtration, such as reverse osmosis (RO), dissolved air flotation (DAF) or electrocoagulation (EC), treats wastewater so it can be recycled or discharged.

This unit lowers the total cost of ownership of the entire water treatment system by:

- preventing large amounts of solids from entering coalescing chamber, reducing coalescing media failure.
- eliminating need of inefficient settling basins or frac tanks prior to treatment process.
- decreasing amount of carry-over entering into posttreatment process.

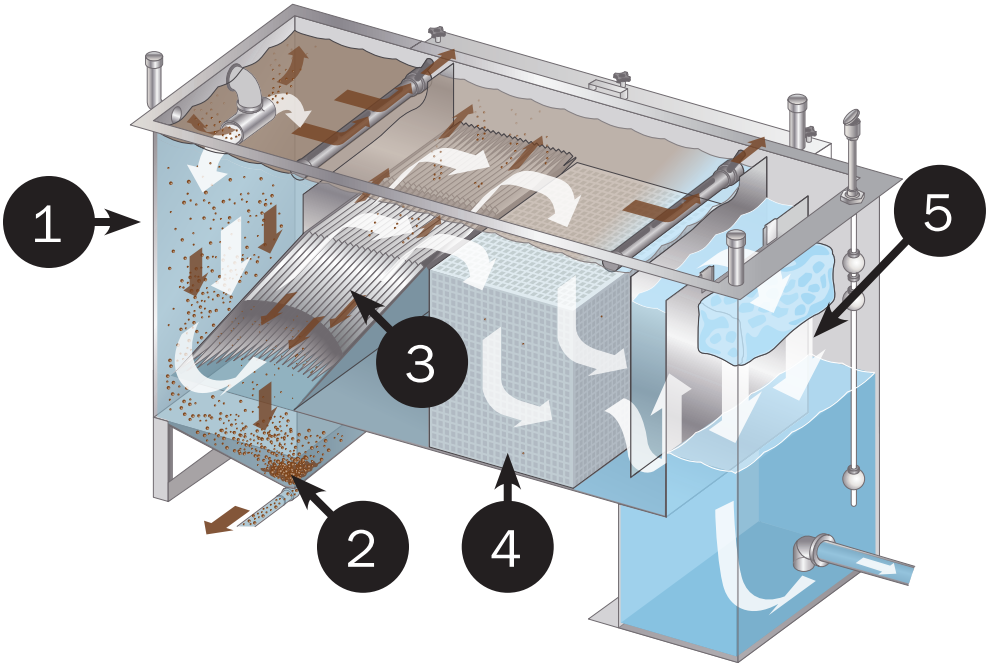
OIL & GAS APPLICATIONS

- Onshore and Offshore Drilling Operations
- Oil Refineries
- Flowback Water from Hydraulic Fracturing
- Produced Water
- Waste Oil Processing Facilities
- Frac Water

OTHER APPLICATIONS

- Washing Applications
- Industrial Applications

5 STAGES OF SEPARATION



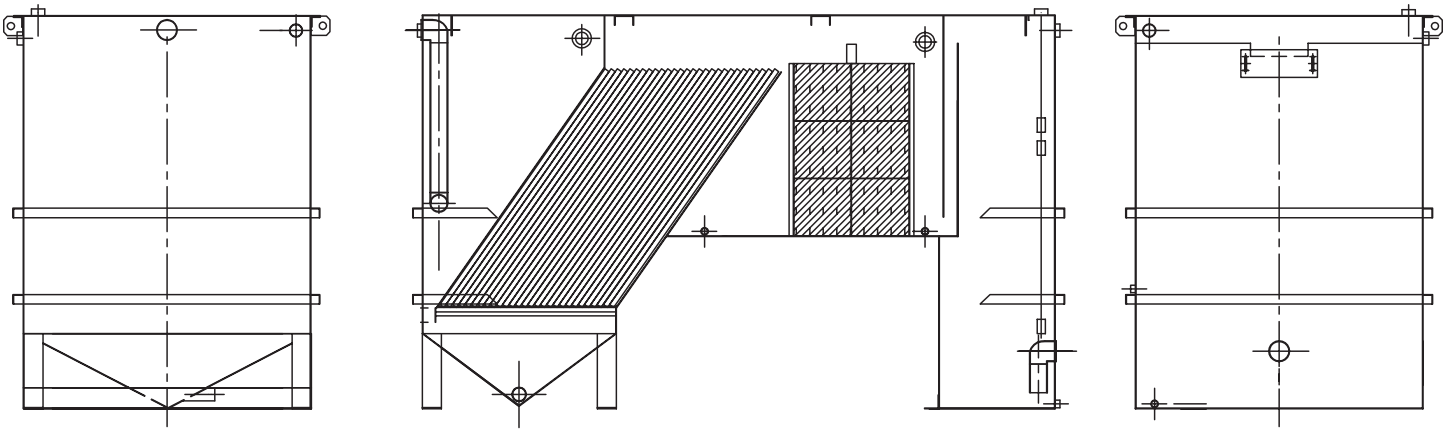
1. The **free oil** (150 micron in size or greater) is separated in the inlet quiescent zone. (Pipe skimmer provided to decant oil.)

2. The **settleable solids** will flow downward into the hopper section for removal.

3. The **suspended solids** and dispersed oil will flow upward through the inclined plates section, where most of the suspended solids will slide down the plates into the hopper (based on a design of .25 gpm per square foot of projected plate surface area).

4. The **remaining suspended solids** and **dispersed oil** will flow into the separation compartment where the coalescing plates will separate the oil 30 micron or greater to the surface for removal and the remaining suspended solids will be captured in the coalescing plates. The amount of solids in the plates will determine the frequency of plate cleaning. (Pipe skimmer for removal of separated oil.)

5. The flow of water will go over the overflow weir plate into the **clean water** compartment where absorption bags will prevent any carryover from being discharged. (Optional float switch shown.)



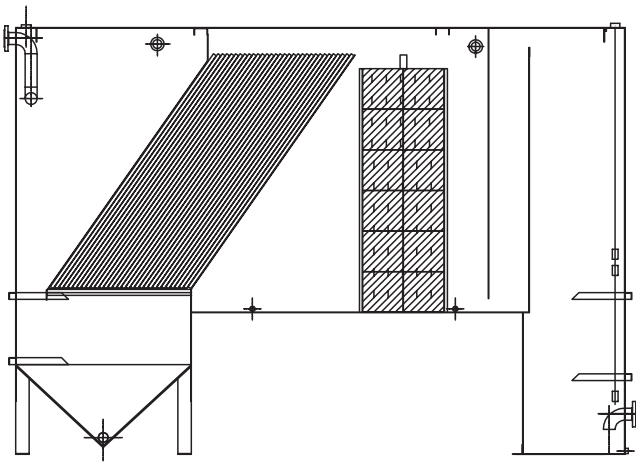
LEFT SIDE VIEW ELEVATION RIGHT SIDE VIEW

SPECIFICATIONS FOR SMALLER UNITS (SINGLE-HOPPER)

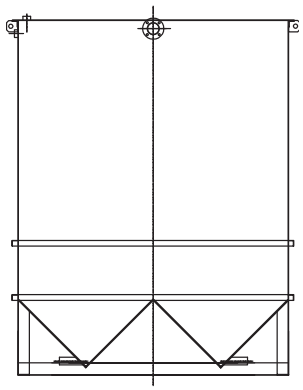
*Dimensions are approximate and may vary depending on your application.

Model	BPD (BARRELS PER DAY)	Inlet Outlet Dia.	Width	Height	Length	Clarifier Projected Plate (FT^2)	Separator Coalescing Media (FT^3)	Flow Rate (GPM)	Sludge Volume (GAL)	Capacity (GAL)
HQI-CS-10	342	2"	2' 4"	4' 10"	7' 0"	40	4	10	27	300
HQI-CS-20	685	2"	3' 4"	5' 10"	8' 0"	80	6	20	32	652
HQI-CS-30	1,028	2"	3' 4"	5' 10"	9' 2"	120	12	30	45	645
HQI-CS-50	1,714	3"	4' 4"	5' 10"	9' 8"	200	24	50	85	968
HQI-CS-75	2,571	3"	4' 4"	7' 10"	10' 6"	300	24	75	85	1,766
HQI-CS-100	3,428	4"	5' 4"	7' 10"	11' 0"	400	30	100	107	1,931
HQI-CS-150	5,142	6"	6' 6"	8' 4"	12' 0"	600	64	150	300	3,483

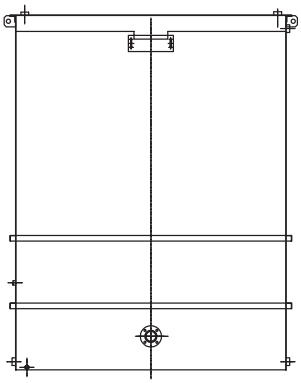
Oil Removal of 20 Micron Based on Flow Rates
Clarifier Projected Plate based on .25 gpm per sq. ft.
Design Temperature 40° F (5° C)



ELEVATION



LEFT SIDE VIEW



RIGHT SIDE VIEW

SPECIFICATIONS FOR LARGER UNITS (DOUBLE-HOPPER)

*Dimensions are approximate and may vary depending on your application.

Model	BPD (BARRELS PER DAY)	Inlet Outlet Dia.	Width (FT)	Height (FT)	Length (FT)	Clarifier Projected Plate (FT^2)	Separator Coalescing Media (FT^3)	Flow Rate (GPM)	Sludge Volume (GAL)	Capacity (GAL)
HQI-CS-200	6,857	6"	7' 6"	9' 6"	14' 0"	800	80	200	300	5,496
HQI-CS-250	8,571	8"	8' 6"	10' 6"	15' 0"	1,000	96	250	350	6,986
HQI-CS-300	10,285	8"	8' 6"	10' 6"	16' 0"	1,200	120	300	400	6,846
HQI-CS-350	12,000	8"	8' 6"	10' 6"	18' 0"	1,400	144	350	425	7,633
HQI-CS-400	13,714	8"	8' 6"	10' 6"	19' 0"	1,600	150	400	500	8,138
HQI-CS-450	15,428	8"	8' 6"	10' 6"	20' 0"	1,800	168	450	525	8,612
HQI-CS-500	17,142	8"	8' 6"	10' 6"	21' 4"	2,000	210	500	550	9,220
HQI-CS-550	18,857	8"	8' 6"	10' 6"	22' 6"	2,200	210	550	675	9,765
HQI-CS-600	20,570	10"	9' 6"	10' 6"	22' 0"	2,400	252	600	700	12,285
HQI-CS-700	24,000	10"	10' 6"	11' 6"	25' 0"	2,800	280	700	750	15,440
HQI-CS-800	27,428	10"	10' 6"	11' 6"	26' 0"	3,200	315	800	775	16,077
HQI-CS-900	30,850	12"	10' 6"	11' 6"	27' 0"	3,600	350	900	800	16,717

Oil Removal of 30 Micron Based on Flow Rates
Clarifier Projected Plate based on .25 gpm per sq. ft.
Design Temperature 40° F (5° C)

HYDRO QUIP

Whether an off-the-shelf unit or customized equipment, we'll help you determine the best solution for your application and site-specific needs.

TEL: 508-399-5771
FAX: 508-399-5352
108 Pond St, Seekonk, MA 02703
hqisales@hydroquipinc.com
www.hydroquipinc.com

ELLIS CORPORATION
Since 1898

SECTION 11XXX

DISSOLVED AIR FLOTATION (DAF) CLARIFIER SPECIFICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnish complete, tested and operating, the equipment as shown on the Drawings and as specified herein.

B. Work Included in This Section:
   1. Dissolved Air Flotation with selected options.

1.02 SUBMITTALS

A. Shop Drawings: Upon agreement to terms, and receipt of a purchase order, Ellis Corporation will submit 2 sets of shop drawings (approval drawings) of the DAF clarifier and included options. Shop drawings to be reviewed by the ENGINEER (Or agent). Requests for modifications to the shop drawings will be addressed by Ellis Corporation and revised shop drawings will be resubmitted to the ENGINEER until satisfactory to the ENGINEER. Approved drawings will be signed and returned to Ellis Corporation.

B. Manuals: Ellis will furnish 2 sets of operation and maintenance manuals prior to or with delivery of the DAF separator.

1.03 QUALITY ASSURANCE

A. All equipment furnished under this section shall be tested prior to delivery. All welded joints shall be double welded and leak tested. All electrical components shall be shop tested for proper operation, rotation, and response.

1.04 WARRANTY

A. Ellis Corporation warrants the equipment manufactured by it to be free from defects in material and workmanship for a period of 1 (one) year from the date of shipment, provided the machine is operated normally and at its rated capacity. Modifications to the equipment or the use of repair parts not approved by the company will subject the warranty to cancellation.

1.05 The Dissolved Air Flotation System shall be designed, manufactured and warranted by Ellis Corporation, Industrial Water Division, Itasca, Ill.

Water Pollution Control Systems
1400 West Bryn Mawr Avenue, Itasca, Illinois 60143 · 630-250-9222 · Fax 630-250-9241 · www.elliscorp.com/water

PART 2 - PRODUCTS

2.01 DISSOLVED AIR FLOTATION CLARIFIER

The Dissolved Air Flotation Clarifier is specifically designed to remove fats, oils, greases (FOG) and other suspended solids from a wastewater flow. Equipment is completely assembled and ready for installation on a concrete pad. Typical removal rates (with proper chemical treatment) are 95% and greater for both FOG's and suspended solids.

A. Separation Chamber
The separation chamber provides an excellent medium for solids flotation. Strategically placed baffles force float to the top of the unit, while driving sludge to the bottom and allowing clean water to carry through. The design allows for minimal velocities in the float region and the large float area in a compact design.

B. Skimmer Assembly
The all stainless steel surface skimmers are designed to skim the topmost portion of the accumulated float. The design of the skimmer is of the Ferris wheel type with the end of the skimming blade always pointing downward. The blade is mounted in a pivot to allow the skimmer to rotate during the skim and return cycle. This will prevent solids from accumulating on the blade surface. Skimmer driven by a variable speed drive.

C. Float Chamber
The float chamber is designed to isolate the solids from the waste stream and to provide storage capacity. The bottom of this chamber has sloped sides to form a "V" bottom to permit near complete pump out of the accumulated solids. The chamber also has provisions for sludge removal.

D. Solids chamber and auger
The lower portion of the solids chamber has sloped sides to form a "V" bottom chamber extending the length of the solids chamber. The "V" bottom chamber is equipped with a slowly rotating ribbon type screw auger to convey heavy gritty solids to a sludge discharge nozzle.

E. Effluent Chamber
An effluent chamber is provided to isolate clean water from the waste stream. Water flows into the effluent chamber via an adjustable weir. Positioning the 304 stainless steel adjustable weir sets the water level. This chamber has a discharge nozzle and provisions for recycle flow.

F. Dissolved Air Flotation pump
The dissolved air flotation pump is provided to dissolve the air into the water. An air control system is provided to meter air into the pump at specified rates. Air bubbles of roughly 30 micron will result through proper operation of the pump. Cast iron casing with 316 SS shaft and flooded suction.

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1400 West Bryn Mawr Avenue, Itasca, Illinois 60143 · 630-250-9222 · Fax 630-250-9241 · www.elliscorp.com/water

G. Materials of Construction
Tank is fabricated of heavy duty A-36 Carbon Steel Plate or 304 SS. Joints are double welded and leak tested. Exterior Structural members are constructed of A-36 carbon steel.

H. Finish – Stainless steel does not receive coatings
Interior: Surface prepared to SSPC-SP-10, near white metal blast and coated with multiple coats of coal tar epoxy, 14-16 dmt.

Exterior: Surfaces prepared to SSPC-SP-6, commercial blast and coated with a chromate free primer, rust color, 4 dmt. Top coat polyurethane enamel, 2 dmt. Finish color safety blue.

2.02 SLUDGE PUMPOUT SYSTEM – THIS IS OPTION "A"

A. An electrically operated progressive cavity positive displacement pump with intermittent timer. Automatic operation with manual override. System installed with PVC piping.

2.03 CHEMICAL PUMPS

A. Chemical pumps are supplied to inject chemicals into a preceding chemical mix tank to the DAF. The pumps are rated for 10 gph.

2.04 CONTROL PANEL

A. NEMA-4 Control panel with indicator light(s), switch(es), timer(s), motor starter(s), alarm light(s), alarm(s) with silence switch. Panel to control all components furnished by Ellis Corporation.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Equipment will be delivered to project site (terms as per contract). Installation Contractor is responsible for preparation of concrete pad (or other approved surface) and all anchor bolts. Holes for anchor bolts are as per shop drawings.

3.02 START-UP ASSISTANCE

A. Ellis Corporation will assist in the start-up of the system and instruction in the proper use of the equipment if required.

END OF SECTION

Water Pollution Control Systems
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APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.C

INSPECTION FORM (TYPICAL)

ATTACHMENT II.1.C
Inspection Form (Typical)
Sundance West

Date: _____ **Print Name:** _____

Others: _____ **Signature:** _____

Inspection will be in accordance with NMOCD operational conditions.

Item	Satisfactory	Action Required
Entrance Sign		
Berms and outside pond levees		
Tank Labels		
Sumps		
Pond levels three-foot free board		
Free oil on Pits-Ponds		
Pit and Pond condition		
Pit and Pond marker numbers		
Treatment Plant inspection		
Solid waste disposal area inspection		
Blowing trash		
Fences and Gates		
Leak detection sumps - Landfill - Liquid present?		(Monthly analysis required if yes)
Leak detection sumps - Evaporation Ponds - Liquid present?		(Monthly analysis required if yes)
Leak detection sumps - Jet Out Pit - Liquid present?		(Monthly analysis required if yes)
Leak detection sumps - Stab. & Solid. - Liquid present?		(Monthly analysis required if yes)
Landfill Leachate Sump		
Groundwater Monitoring		
Pond Sludge Depth		

***Comments & Repairs:** _____

H_2S

READINGS ARE TO BE TAKEN 4 FT DOWNWIND FROM EVAPORATION PONDS

Evaporation Pond (readings in ppm):

POND
1
2
3
4
5
6
7
8
9
10
11
12

*In the event that a reading of 10 ppm is registered at the Facility, personnel will evacuate the area and operator will monitor H_2S levels at the downwind of the Pond. If H_2S levels reach 20 ppm, the Facility will be closed and notification will be given to the following:

Sundance West Office	575-394-2511	NMOCD Hobbs	575-393-6161
New Mexico State Police	575-392-5580	NMOCD Santa Fe	505-476-3440
Lea County Sheriff	575-397-3611		

Receipt & Approval

Name: _____

Date: _____

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.D

POND INTEGRITY/LEAK DETECTION INSPECTION FORM (TYPICAL)

ATTACHMENT II.1.D
Pond Integrity/Leak Detection Inspection Checklist (Typical)
Sundance West

Date: _____ **Inspector(s):** _____

Time: _____ _____

_____

Weather:

Temperature _____ deg. F Precipitation (last 24 hours) _____ inches

Skies _____

Wind Speed _____ mph

Wind Direction _____ *(direction blowing from)*

NOTES:
"X" indicates that a Deficiency has been noted. "P" indicates that a Photograph has been taken. "S" indicates that a Sample has been collected. Complete descriptions of Deficiencies, Photographs, and Samples are provided on attached pages. Items are referenced by Location.

POND CONDITION

Location	Item			
	Erosion	Vegetation Established	Vectors	Sample

LEAK DETECTION SYSTEM

Riser #	Deficiency	
	Depth of H_2O	Structural Defect

NOTES: _____

_____

_____

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.E

POTENTIAL GEOMEMBRANE LINER LEAKAGE

Attachment II.1.E
Potential Geomembrane Liner Leakage
Sundance West

Title: Leakage Through Liners Constructed with Geomembranes - Part 1. Geomembrane Liners

Written by: J.P. Giroud and R. Bonaparte
Published in: Geotextiles and Geomembranes **Volume:** 8 **Issue:** 2 **Pages:** 27 to 67
Phone: +31 20-485-3757 ~ **Web Site:** http://www.elsevier.com

How impermeable are 'impermeable liners'? All liners leak, including geomembranes, but how much? What are the mechanisms of leakage through liners constructed with geomembranes? To answer these questions, a detailed review of leakage mechanisms, published and unpublished data, and analytical studies has been carried out with the goal of providing practical design recommendations. In particular, it appears that a composite liner (i.e. geomembrane on low-permeability soil) is more effective in reducing the rate of leakage through the liner than either a geomembrane alone or a soil liner (low-permeability soil layer) alone. However, the paper shows that the effectiveness of composite liners depends on the quality of the contact between the geomembrane and the underlying low-permeability soil layer.

Table 1
Calculated Leakage Rates Due to Pinholes and Holes in a Geomembrane

	Water depth on top of the geomembrane, h_w					
	Defect Diameter	0.003 m (0.01 ft)	0.03 m (0.1 ft)	0.3 m (1 ft)	3 m (10 ft)	30 m (100 ft)
Pinholes	0.1 mm (0.004 in)	0.006 (0.0015)	0.06 (0.015)	0.6 (0.15)	6 (1.5)	60 (15)
	0.3 mm (0.012 in)	0.5 (0.1)	5 (1)	50 (13)	500 (130)	5000 (1 300)
Holes [a]	2 mm (0.08 in)	40 (10)	130 (30)	400 (100)	1300 (300)	4000 (1 000)
	11.3 mm (0.445 in)	1 300 (300)	4 000 (1 000)	13 000 (3 000)	40 000 (10 000)	130 000 (30 000)
	Values of leakage rate in liters/day (gallons/day)					

Table 2
Calculated Unitized Leakage Rates Due to Permeation of Water Through an HDPE Geomembrane

	Water depth on top of the geomembrane, h_w					
	0 m (0 ft)	*0.003 m (0.01 ft)*	*0.03 m (0.1 ft)*	*0.3 m (1 ft)*	*3 m (10 ft)*	*>10 m (>30 ft)*
Coefficient of migration, m_g(m^2/s)	0	$9x10^{-20}$	$9x10^{-18}$	$9x10^{-16}$	$9x10^{-14}$	$3x10^{-13}$
Unitized leakage rate, q_q	0	$9x10^{-17}$	$9x10^{-15}$	$9x10^{-13}$	$9x10^{-11}$	$3x10^{-10}$
(m/s)	0	$8x10^{-5}$	0.008	0.8	80	260
(lphd)	0	$8x10^{-6}$	0.0008	0.08	8	28
(gpad)						

Notes: These values of utilized leakage rates were calculated using eqn (5) and assuming a geomembrane thickness of 1 mm (40 mils). The coefficients of migration used to calculate the unitized leakage rates in this table were obtained from eqns (19) and (20), with $C_1 = 1x10^{-22}$ m^4 $kg^{-2}s^3$, $n = 2$, and $m_{gmax} = 3x10^{-13}$ m^2/s.

The water depths used here correspond to the typical values defined in Section1.3.6. (To use eqn (19), it is necessary to know the pressure difference, Δp. According to eqn (1), water depths, h_w, are approximately equal to hydraulic head differences, Δh, which are related by eqn (12) to pressure differences, Δp.)

- data used in calculations

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.F

PAINT FILTER TEST PROTOCOL

USEPA METHOD 9095B

METHOD 9095B

PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25 ^{o}C.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

5.0 REAGENTS

5.1 None.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

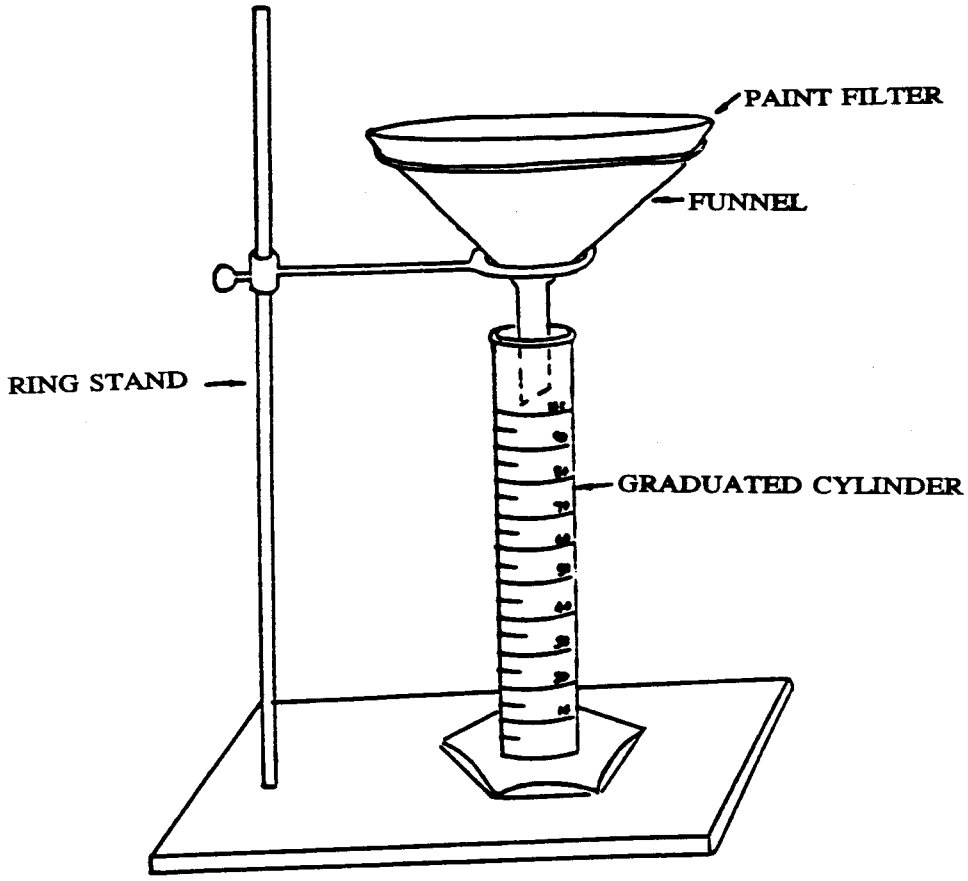
9.0 METHOD PERFORMANCE

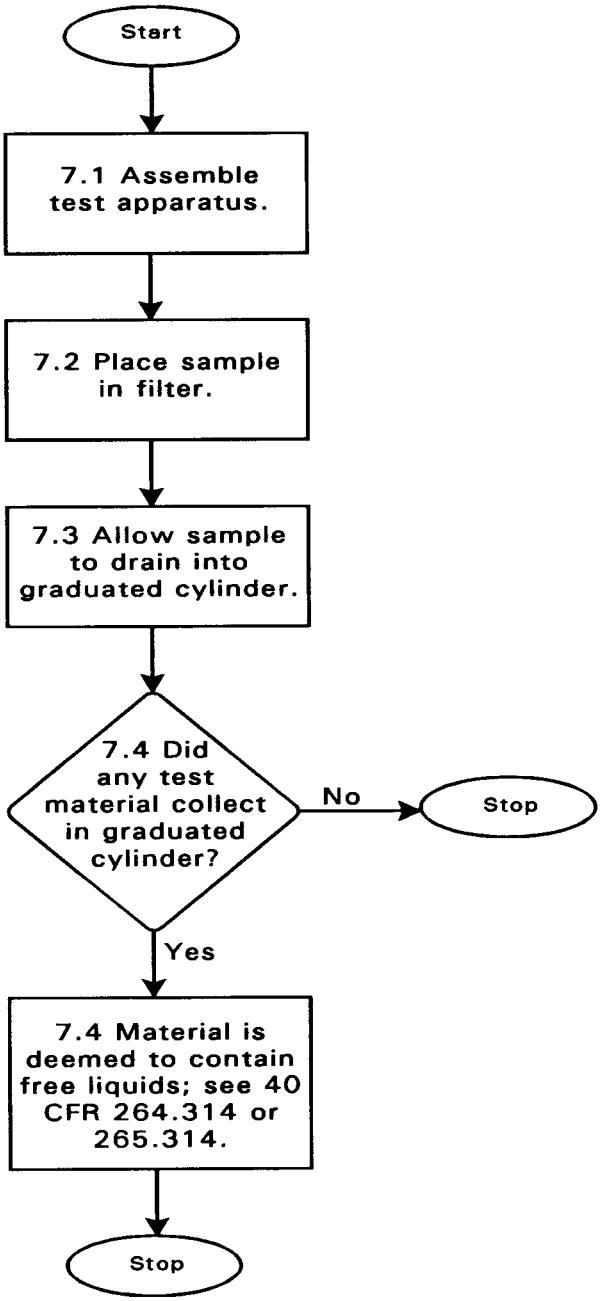
9.1 No data provided.

10.0 REFERENCES

10.1 None provided.

FIGURE 1
PAINT FILTER TEST APPARATUS




Start
7.1 Assemble test apparatus.
7.2 Place sample in filter.
7.3 Allow sample to drain into graduated cylinder.
7.4 Did any test material collect in graduated cylinder?
No
Stop
Yes
7.4 Material is deemed to contain free liquids; see 40 CFR 264.314 or 265.314.
Stop

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.G

INTERMEDIATE COVER INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.G

INTERMEDIATE COVER INSPECTION AND MAINTENANCE PLAN

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

In accordance with 19.15.36.14(7)(a-c) NMAC landfills are required to provide intermediate cover for areas that will not receive additional oil field waste for one month or more. In addition to being approved by the Oil Conservation Division, intermediate cover must be stabilized with vegetation, and inspected and maintained to prevent erosion and manage infiltration or leachate during the oil field waste deposition process. Sundance West, Inc. is requesting deviation from the vegetation requirement. Sundance West proposes to maintain, as best possible, natural vegetation on the intermediate cover, but does not plan to seed intermediate cover. This Intermediate Cover Inspection and Maintenance Plan (the Plan) provides a protocol for regular monitoring and maintenance of intermediate cover at the Sundance West Surface Waste Management Facility Landfill.

2.0 INTERMEDIATE COVER

At Sundance West, intermediate landfill cover is proposed to consist of a soil cover a minimum of 6-inches thick. Intermediate cover will be placed over areas of the landfill that will not receive further oil field waste for one month or more, but have not reached final grades. Intermediate cover is graded to promote positive drainage and limit erosion and infiltration. The intermediate cover will be inspected and maintained until additional waste placement has been conducted or final cover is constructed. If additional waste placement is to occur, the upper layer of intermediate cover may be removed prior to additional waste placement. Inactive areas with intermediate cover will be stabilized via the routine inspection and maintenance program described below:

2.1 Intermediate Cover Inspection Program

Areas of the Sundance West Landfill that have intermediate cover installed will be inspected at a minimum of once per month and also after significant ($\geq$ 0.5 inches) rain events. Inspections will be recorded on a form similar to that provided as **Figure II.1.G.1** (Intermediate Cover Inspection Form). The form will be used to record intermediate cover observations, and photo-documentation will supplement the record as necessary. The Intermediate Cover Inspection Forms will be maintained as part of the Facility Operating Record, and will elaborate on the following items, as applicable:

- Evidence of leachate
- Unusual odors

- Exposed waste
- Cracks greater than one inch in width and six inches in depth
- Surface water ponding
- Eroded or scoured soils
- Dead or stressed vegetation (if applicable)
- Vegetation growing taproots in areas not designated to accommodate them
- Vectors, such as flies and rodents
- Recordkeeping and reporting

Deficiencies identified during site inspections will be corrected within 30 days. Upon completion of the corrective action, appropriate documentation will be made on the Intermediate Cover Inspection Form and placed in the Facility Operating Record.

2.2 Intermediate Cover Maintenance Program

It is expected that routine site maintenance will be necessary to maintain intermediate cover. Intermediate cover is expected to require periodic maintenance such as soil enhancement/repair, and attention to naturally established vegetative cover.

2.2.2 Soil Repair

Intermediate cover repairs may be necessary due to ponding, surface water erosion or wind erosion. Ponding can result from differential settlement of the landfill contents, and erosion can be caused by runoff in areas without established vegetation or by repeated wind gusts. Areas where impacts are evident will be promptly repaired to maintain the integrity of the cover. Recently filled and covered areas will require the most maintenance since differential settlement decreases rapidly with time, and erosion is minimized as vegetation is established. Soil for repairs will be obtained from on-site sources. Repairs will be made on an as-needed basis.

2.2.3 Vegetation

Intermediate cover will not be seeded for vegetative growth; however, Sundance West will routinely attempt to maintain any naturally-established vegetative cover. Routine care includes, but is not limited to, the removal of undesirable plant species (e.g., taproots) and maintenance of native plant species as appropriate.

FIGURE II.1.G.1
Intermediate Cover Inspection Form
Sundance West

Date: _____ **Page** _____ of _____

Inspector(s): **Weather:** Temperature: _____ °F

_____ Skies: _____

_____ Precipitation: _____ inches (last 24 hours)

Intermediate Cover										
Location	**Odor**	**Leachate Seep**	**Exposed Waste**	**Cracks**	**Ponding**	**Erosion**	**Vegetation**		**Vectors**	**Sample**
							Stress	**Taproots**		

"X" indicates that a Deficiency has been noted. "P" indicates that a Photograph has been taken. "S" indicates that a Sample has been collected. Complete descriptions of Deficiencies, Photographs, and Samples are provided on attached pages. Items are referenced by Location.

Field Notes: _____

Corrective Action Required: _____

Corrective Action Completed: _____ _____
Signature Date

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
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1.0 INTRODUCTION

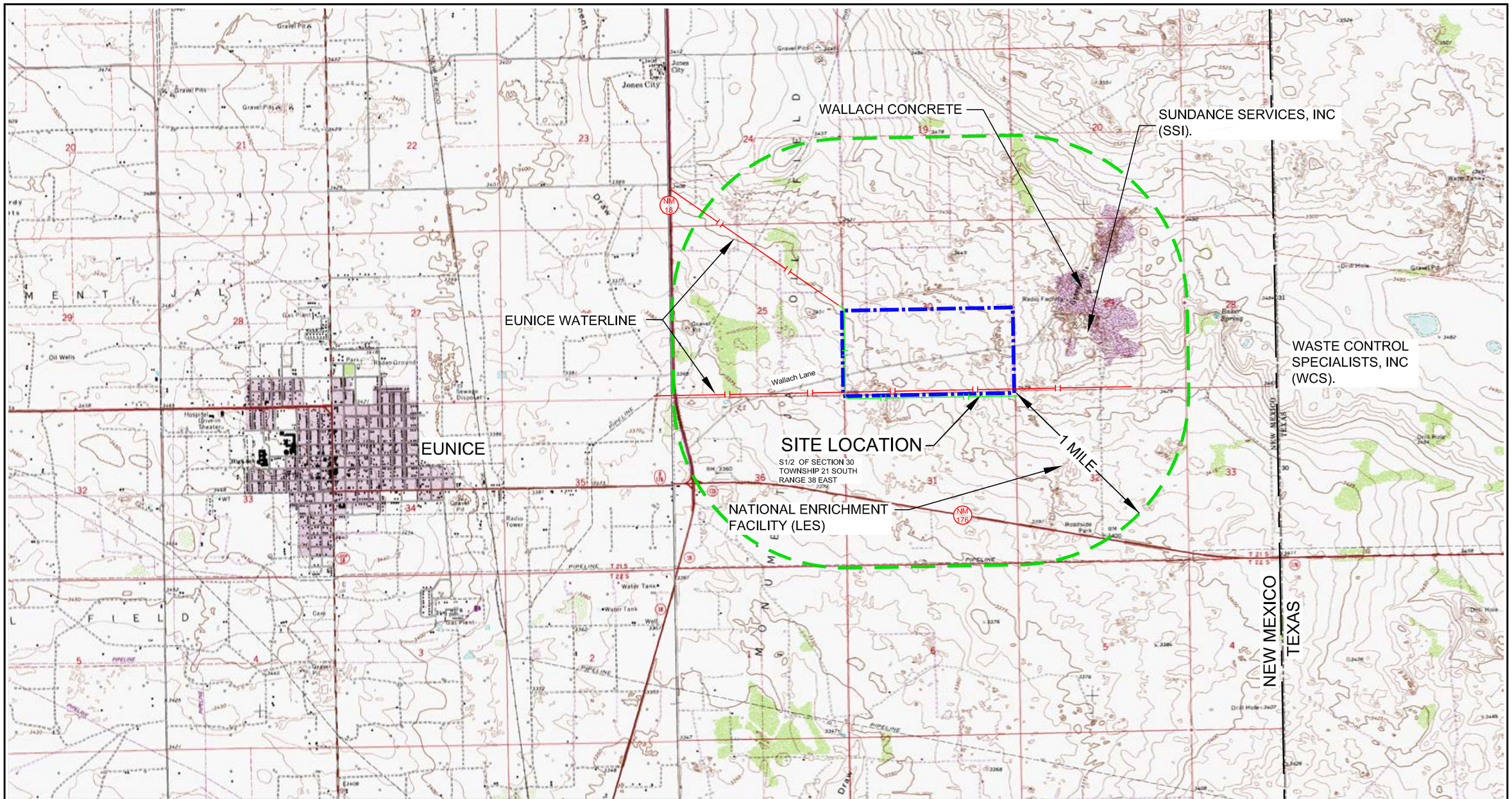
Sundance West is a proposed commercial Surface Waste Management Facility for oilfield waste processing and disposal services. The proposed Sundance West Facility is subject to regulation under the New Mexico Oil and Gas Rules, specifically 19.15.36 NMAC, administered by the Oil Conservation Division (OCD). The Facility is designed in compliance with 19.15.36 NMAC, and will be constructed and operated in compliance with a Surface Waste Management Facility Permit issued by the OCD. The Facility is owned by, and will be constructed and operated by, Sundance West, Inc.

1.1 Site Location

The Sundance West site is located approximately 3 miles east of Eunice, 18 miles south of Hobbs, and approximately 1.5 miles west of the Texas/New Mexico state line in unincorporated Lea County, New Mexico (NM). The Sundance West site is comprised of a 320-acre ± tract of land located in the South ½ of Section 30, Township 21 South, Range 38 East, Lea County, NM. Site access will be provided via NM 18 and Wallach Lane. A Site Location Map is provided as **Figure II.2.1**.

1.2 Facility Description

The Sundance West Facility is a proposed new commercial Surface Waste Management Facility that will include two main components; a liquid oil field waste Processing Area (80 acres ±), and an oil field waste Landfill (180 acres ±). Oil field wastes are anticipated to be delivered to the Sundance West Facility from oil and gas exploration and production operations in southeastern NM and west Texas. The Site Development Plan provided in the **Permit Plans** (**Volume III.1**) identifies the locations of the Processing Area and Landfill facilities.



Based on Eunice NE, TX.- NM (1969) Photorevised (1979);
Eunice, NM (1969) Photorevised (1978);
Quadrangles, USGS 7.5' SERIES (1:24,000 Scale)

NOTE:

NO STREAMS, SPRINGS OR WATER COURSES WITHIN 1/2 MILE OF SITE

NORTH

0 1500' 3000'

SITE LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/22/2016	CAD: DWG NAME.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE II.2.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE LOC REVISED 11 x17.dwg
Date/Time:Aug. 09, 2016-12:37:03 ; LAYOUT: B (LS)

2.0 PURPOSE

This Oil Field Waste Management Plan (the Plan) addresses the requirements of 19.15.36.13, 14, 15, and 17 NMAC, and establishes an internal control program that will be followed by Sundance West to ensure that oil field wastes receive attention commensurate with the associated risk. The purpose of this Plan is to provide waste identification, tracking and screening mechanism for OCD waste that may require special handling to meet regulatory requirements and/or to protect employee health and safety. The oil field wastes discussed in this Plan will be limited to those materials that have met specific disposal requirements as described in Sections 13, 14, 15, and 17 of 19.15.36 NMAC; and 19.15.35.8 NMAC.

3.0 OIL FIELD WASTE ACCEPTANCE PROGRAM

A decision to approve or disapprove incoming oil field waste for management at the Sundance West Facility will be clearly documented for each load received at the Facility, as delineated on **Table II.2.1**. Disposal operations at Sundance West will only be conducted when an attendant is on duty. Sundance West plans to conduct Facility operations 24 hours a day, 7 days a week. The Facility will be secured with barbed wire fencing, and locking gates to prevent any unauthorized access or disposal when an attendant is not on duty. The temporary parking areas will be inspected for leakage, and vehicles will be required to have any valves or access ports secured and locked to prevent spillage or tampering. At a minimum, the following Waste Acceptance Protocol (**Table II.2.1**) requirements must be met prior to managing oil field waste at Sundance West:

3.1 Prohibited Wastes

Non-exempt hazardous waste and non-exempt Naturally Occurring Radioactive Material (NORM) wastes which are subject to other Federal or State regulations are prohibited at Sundance West. Generators/haulers with these wastes will be referred to a United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCRA) permitted facility (i.e., WCS, Andrews County, TX).

TABLE II.2.1
Waste Acceptance Protocol
Sundance West

The Facility will notify the customer of necessary conditions/limitations that apply to managing the waste, and the customer will be required to comply with the conditions/limitations.

The customer must provide OCD Form C-138, *Request for Approval to Accept Solid Waste* (**Attachment II.2.A**) to the Facility that issues the following certification that the waste is exempt oil field waste.

I do hereby certify that, according to the Resource Conservation and Recovery Act (RCRA) and Environmental Protection Agency's July, 1988, regulatory determination, any and all waste delivered to Sundance West from the above locations is: EXEMPT oilfield waste. This waste is in compliance with Regulated Levels of Naturally Occurring Radioactive Material (NORM) pursuant to 20 NMAC 3.1 Subpart 1403.C and D.

Should the generator or their authorized representative fail to sign the OCD Form C-138, the load of oil field waste will be rejected.

1. For Exempt Liquid Wastes:

Commercial or industrial customers will also be required to provide a valid *Authorization to Move Produced Water*, OCD Form C-133 (**Attachment II.1.B**). After authenticating the OCD Form C-133, Sundance West will verify that the customer is an authorized hauler by checking it against the OCD monthly updated list located at http://www.emnrd.state.nm.us/ocd/Statistics.htm. Sundance West will pursue the following protocol in managing the OCD Form C-133:

a) Monthly, the General Manager will provide the Facility personnel an updated list.
b) The OCD Form C-133 list will be maintained onsite in the Sundance West administrative files.
c) Prior to accepting any material, Facility personnel will ensure that the hauling company has a valid OCD Form C-133 approval.
d) If a valid OCD Form C-133 is not on file, the hauler will not be allowed to unload the liquid waste.
e) The General Manager or other appropriate Sundance West management personnel will be contacted if assistance is needed.

2. For Solid Waste:

In addition to providing OCD Form C-138, solid waste receipts will be subject to confirmation that the materials pass the Paint Filter Test (EPA 9095B). The protocol for this test is included as **Attachment II.2.C.**

3. For Materials Delivered to be Stabilized and Solidified:

These materials will be stabilized and solidified utilizing the procedures outlined in **Volume II, Section 1** and confirmed that the materials pass the Paint Filter Test prior to transporting them to the landfill for disposal.

3.2 Oil Field Waste Inspection and Management

Once the required paperwork has been reviewed and verified, each load will be inspected to ensure compliance with 19.15.36.13.F NMAC. Inspections consist of:

1. **Examination of Fluid from Load**
   a) Loads will be checked prior to acceptance to check for the presence of non-permitted materials (e.g., compressor oil) and to determine the solid content of the load (i.e., is the load "clean" or "dirty") for the purposes of proper handling.
   b) Every truck will stop at an inspection landing (similar to the one shown in **Figure II.2.2**) for evaluation by site personnel.
   c) Facility personnel will not step onto the truck until the driver has placed the truck in park with the brake applied, opened the door, and has his/her legs outside the cab. This is to ensure the truck does not move while Facility personnel are on the truck.
   d) Facility personnel will wear neoprene or other heavy duty non-permeable gloves.
   e) The cap on the tank will be opened and a metal rod will be inserted to the bottom of the tank.
   f) Care will be exercised because hydrogen sulfide (H_2S) may be present when the cap is opened. If there is any indication that H_2S may be present, the H_2S safety procedures will be followed (**Volume II.3**).
   g) Based on whether the rod contacts the metal bottom of the tank, or is slowed by sludge/solid material, Facility personnel will be able to gauge if the load may potentially be laden with sediment.
   h) The metal rod will be pulled out from the tank and the fluid on the rod examined for the presence of oils or other non-exempt materials.
   i) Odor can also be an indication if the load contains fluids that are non-exempt. Non-exempt waste with potential odors include:
      a. Septic conditions
      b. Caustic or acid cleaners
      c. Methanol, unused
      d. Pesticide and herbicide wastes
      e. Solvents, spent (including waste solvents)

      Non-compliant wastes are not accepted and will be rejected and returned to the Hauler/Generator.

2. **Presence of H_2S**

Sundance West will monitor for H_2S on a continual basis on each oil field delivery waste vehicle arriving at the site. Monitoring for H_2S will be completed as follows:

   a) The battery and calibration date on the monitor will be checked to ensure both are current.

INSPECTION LANDING EXAMPLE

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 01/06/2015	CAD: INSPECT.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.2.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\PERMIT FIGURES\INSPECT.dwg
Date/Time:Jan. 06, 2015-10:54:07

b) Sundance West personnel will position themselves upwind as far away from the cap opening on the tank as possible, in order to minimize the potential for exposure. Safety is the most important consideration when checking for H_2S.
c) Sundance West personnel will use the H_2S monitor to determine the potential presence and concentration of H_2S (for specific operational instructions, refer to specific owner's manual for the monitoring instrument).
d) The tube wand will be used to acquire a sample, and the H_2S reading and related notes will be recorded on the Sundance West Disposal Log (**Attachment II.3.D**).

In the event of an H_2S detection of 10 ppm or greater, the following procedures will also be implemented by Sundance West personnel:

a) Notification of the presence of H_2S will be provided to both the driver (hauler) and the generator.
b) The generator will be provided the option of allowing Sundance West to treat the load on-site. Should the generator decline treatment, the load will be rejected and directed to leave the Sundance West Facility.
c) If the generator requests treatment, Sundance West personnel will add calcium hypochlorite ($Ca(ClO)_2$) to the load at the levels corresponding to **Table II.3.6.**
d) Once the $Ca(ClO)_2$ has been added, the load will be "rolled" [i.e., trucks will use their air pumps to "roll" air through the tank to allow for mixing of the contents and the added $Ca(ClO)_2$] to assist the chemical reaction. After approximately 20 minutes, the load will be re-sampled for the presence of H_2S. Treatment will continue until the H_2S reading is below 1 ppm. Once the H_2S measurement reads below 1 ppm, the load will be directed to the receiving area for processing.
e) Treatment information and the final H_2S measurement will be recorded on the Sundance West Disposal Log (**Attachment II.2.D**).
f) Sundance West personnel will contact the Generator's Plant Manager or General Manager if assistance is needed.

3. Presence of Non-Exempt fluids

a) In the event compressor oil or other non-exempt fluids are detected, a sample of the fluid will be collected in a sample container.
b) The date, generating company, hauler, and location will be noted on the container.
c) The hauler will be prevented from unloading at the Facility.
d) The Facility will contact the Generator's Plant Manager or General Manager if assistance is needed.
e) Samples will be maintained at the Facility for two weeks for inspection by the Generator's personnel and OCD, as necessary.

4. Presence of High Solids Content

a) In the event high solid/sludge content is suspected, a sample of the material will be collected in a sample container.
b) The date, company, hauler, and location will be noted on the container.

c) If the load cannot be accepted through the Produced Water Tanks due to high solids content, the hauler will contact the Generator for permission to be charged for the cost of discharging through the Jet Out Pit or Stabilization and Solidification Area.
d) If the load cannot be accepted the hauler will contact the production company to inform them that the load has been rejected, and the hauler will be prevented from unloading at the Facility.
e) The Facility will contact the Generator's Plant Manager or General Manager if assistance is needed.
f) Samples will be maintained at the Facility for two weeks for inspection by the Generator's personnel.

5. Unloading

a) Sundance West anticipates a maximum of 8 unloading stations for Produced Water Receiving, and a maximum of 6 Jet Out Pit Bays.
b) To minimize the chance for conflicts between trucks, only 14 trucks will be allowed past the inspection platform(s) at any one time once the Facility is fully operational. Prior to ultimate development, the number of trucks allowed past the inspection platform(s) will be limited to the total number of Produced Waters Receiving stations and Jet Out Pit Bays that are available for use.
c) Trucks will pull up to the load-out station or back into the Jet Out Pit Bays as instructed by Facility personnel.
d) Drivers will connect their grounding straps to the grounding stakes at their specific Load-Out Point.
e) Trucks will off-load materials to the Jet Out Pit as appropriate.
f) Trucks will exit the Facility as instructed.
g) Failure of drivers to follow these procedures will be brought to the attention of Facility management for proper resolution with the hauling company.

3.3 Recordkeeping

Upon receipt of oil field waste, Facility employees will record the following into the Facility Disposal Log Book or similar (**Attachment II.2.D**).

- Generator
- Origin
- Date received
- Quantity
- Transporter
- Disposal location

Logbooks will be maintained for a minimum of 5 years after operations at the Facility have ceased. At the end of each month, the Sundance West General Manager will compile

information to be submitted electronically to OCD on the OCD Form C-115, *Operator's Monthly Report* (**Attachment II.2.E)**.

4.0 TRAINING

Facility employees will be trained and updated in the identification of oil field waste on at least an annual basis. Spotters and/or equipment operators will be present at the Facility when oil field waste is unloaded in order to check for unauthorized waste. In addition to the routine customer screening process, new customer oil field waste deliveries will receive focused supervision and scrutiny.

At a minimum, inspection personnel will be trained to identify suspicious wastes based on visual (and olfactory) characteristics in addition to the waste screening procedures outlined in Section 2.2 of this Plan. Specific items that will be on the training agenda include:

- Hazardous placarding or markings
- Proper form identification and use
- H_2S screening
- Non-exempt liquids recognition
- "Chemical" odors
- Excessive solids recognition
- Employee safety and personal protective equipment (PPE) use
- Site-generated waste handling and disposal

Whenever a suspicious waste is identified, Facility inspection personnel will follow specific procedures that may include:

- Identifying the unacceptable waste by characteristic, estimated quantity, transport vehicle, and the names and addresses of those associated with the waste load
- Questioning the driver of the vehicle
- Reviewing existing generator paperwork
- Contacting the possible source (i.e., generator) and questioning the originator of waste pursuant to the regulations.
- Denying access to the vehicle
- Calling the Division and/or Hazardous Waste Bureau, as applicable
- Using protective equipment
- Calling an emergency response agency, if required
- Contacting laboratory support, if necessary
- Document load refusal on C-138 (**Attachment II.2.A**)

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.A

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

OCD FORM C-138

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-138
Revised August 1, 2011

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. Generator Name and Address:

2. Originating Site:

3. Location of Material (Street Address, City, State or ULSTR):

4. Source and Description of Waste:

Estimated Volume _____ yd^3 / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd^3 / bbls

5. GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS

I, _____, representative or authorized agent for _____ do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency* ☐ *Monthly* ☐ *Weekly* ☐ *Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. Transporter:

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #:

Address of Facility:

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☐ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: _____ TITLE: _____ DATE: _____

SIGNATURE: _____ TELEPHONE NO.: _____

Surface Waste Management Facility Authorized Agent

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.B

AUTHORIZATION TO MOVE PRODUCED WATER

OCD FORM C-133

Submit a single copy to
Santa Fe Office

State of New Mexico
Energy Minerals and Natural Resources

Form C-133
Revised August 1, 2013

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

AUTHORIZATION TO MOVE PRODUCED WATER

Transporter Name:_____

Business (Physical) Address in New Mexico:

_____

_____

Contact Mailing Address (If different):

_____

_____

Business Phone: _____
Business Fax: _____

Contact Phone: _____
Contact Fax: _____

1. Attach a copy of the applicant's New Mexico Public Regulation Commission (PRC) Warrant for Transportation Services.

2. Identify the form of the applicant's business entity: (Example: corporation, limited liability company [LLC], limited partnership, limited liability partnership, partnership, sole proprietor): _____

A. If the applicant is a corporation or LLC, provide the Secretary of State corporation number:
_____

B. If the applicant is a limited partnership or limited liability partnership, provide the Secretary of State file number: _____

C. If the applicant is any other form of partnership, identify all partners:
_____

D. If the applicant is a sole proprietor, provide the name of the sole proprietor:
_____

(Note: If the form of your business entity changes, the name of your business changes, or the business address changes, you must re-apply for authorization.)

It is the responsibility of each holder of an approved Form C-133 to comply with 19.15.34 NMAC and familiarize its personnel with that rule's requirements. Failure to move or dispose of produced water in accordance with 19.15.34 NMAC may be cause for cancellation of the Form C-133.

"I hereby certify that the information above is true and complete to the best of my knowledge and belief." (Application must be signed by person who is authorized to obligate the company applying for the permit)

Signature:_____ Date:_____

Printed Name:_____ Title:_____

E-mail Address:_____

(This space for State use)

Approved by:_____ Title:_____

Date:_____

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.C

PAINT FILTER TEST PROTOCOL

USEPA METHOD 9095B

METHOD 9095B

PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25 ^{o}C.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

5.0 REAGENTS

5.1 None.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

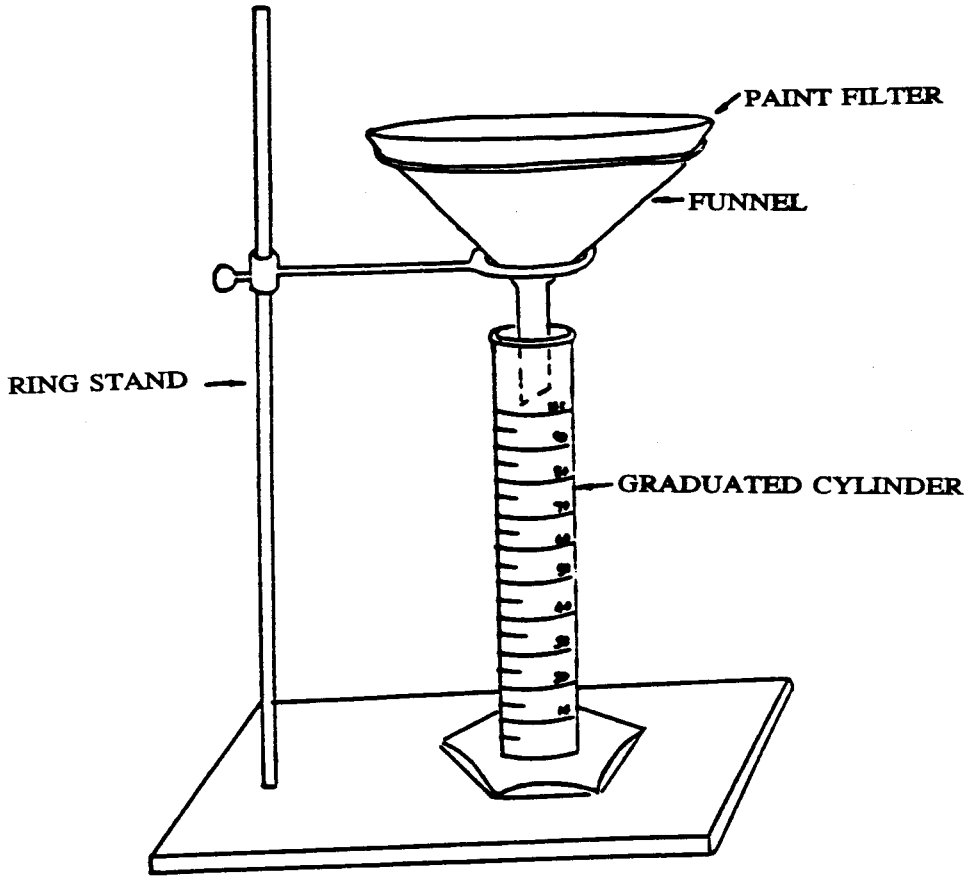
9.0 METHOD PERFORMANCE

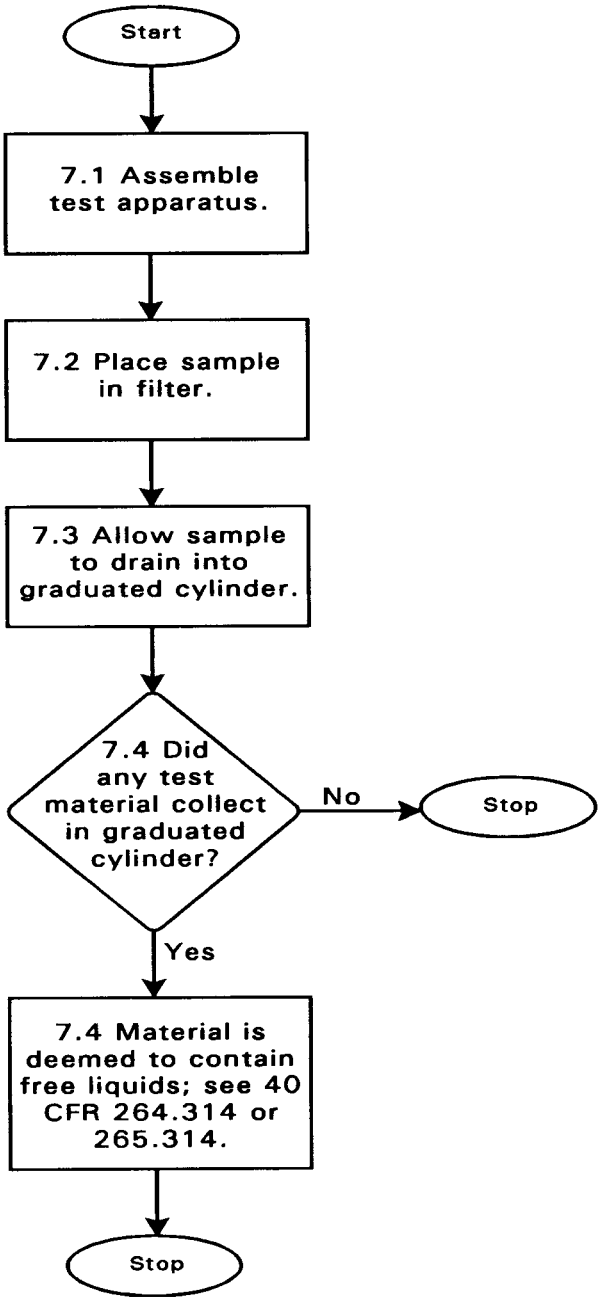
9.1 No data provided.

10.0 REFERENCES

10.1 None provided.

FIGURE 1
PAINT FILTER TEST APPARATUS




Start
7.1 Assemble test apparatus.
7.2 Place sample in filter.
7.3 Allow sample to drain into graduated cylinder.
7.4 Did any test material collect in graduated cylinder?
No
Stop
Yes
7.4 Material is deemed to contain free liquids; see 40 CFR 264.314 or 265.314.
Stop

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.D

DISPOSAL LOG (TYPICAL)

ATTACHMENT II.2.D
Disposal Log (Typical)
Sundance West

Lea County, NM
NMOCD #_____

Date: _____ **Page _____ of _____**

Generator	Origin	Hauler	Soil (yards)	Mud (bbls)	Fluids (bbls)	Bottoms (bbls)	Cuttings (yards)	Washout	Sulfur (tons or bbls)	Trash (sales)	Disposal Location
		Totals:									

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.E

OPERATOR'S MONTHLY REPORT

OCD FORM C-115

District I
1625 North French, Hobbs, NM 88241

District II
1301 West Grand Avenue, Artesia, NM 88210

District III
1000 Rio Brazos, Aztec, NM 84710

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South Saint Francis Drive
Santa Fe, NM 87505

OPERATOR'S MONTHLY REPORT

Form C-115 First Page
Revised January 22, 2004
Instruction on Reverse Side
1 ☐ Amended Report

2 Operator	3 OGRID:	4 Month/Year
5 Address:		6 Page 1 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER						
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 CODE 1	9 Volume	10 Pressure	11 CODE 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 CODE 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 CODE 4	23 Oil on hand at end of month

I hereby certify that the information contained in this report is true and complete to the best of my knowledge.
24

Signature	Printed Name & Title	E-mail Address	Date	Phone Number

2 Operator	3 OGRID	4 Month/Year	6 Page 2 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 C O D E 1	9 Volume	10 Pressure	11 C O D E 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 C O D E 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 C O D E 4	23 Oil on hand at end of month

2 Operator	3 OGRID	4 Month/Year	6 Page 3 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 CODE 1	9 Volume	10 Pressure	11 CODE 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 CODE 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 CODE 4	23 Oil on hand at end of month

2 Operator	3 OGRID	4 Month/Year	6 Page 4 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 CODE 1	9 Volume	10 Pressure	11 CODE 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 CODE 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 CODE 4	23 Oil on hand at end of month

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

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SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

1.0 INTRODUCTION

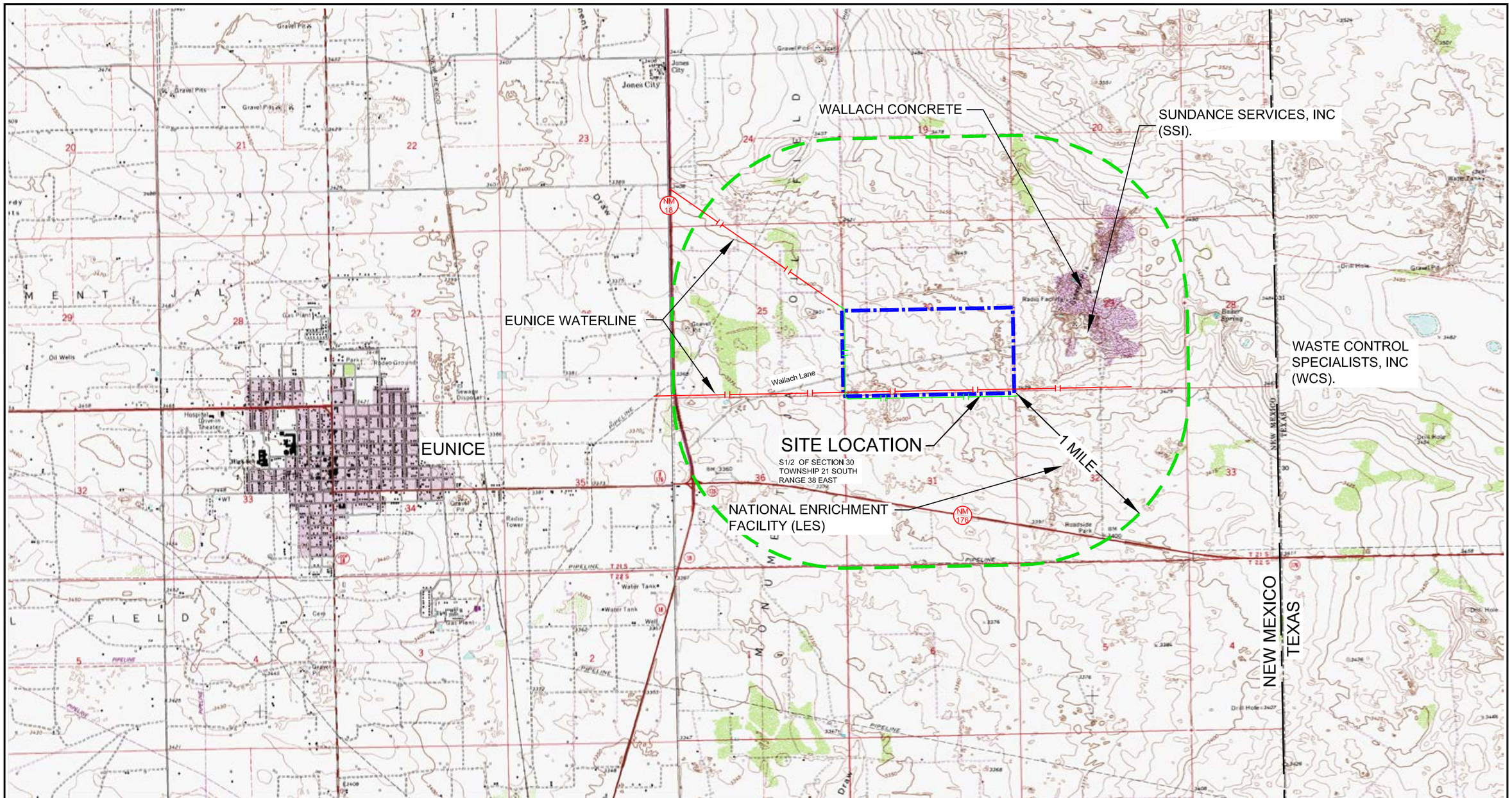
Sundance West is a proposed commercial Surface Waste Management Facility for oil field waste processing and disposal services. The proposed Sundance West Facility is subject to regulation under the New Mexico Oil and Gas Rules, specifically 19.15.36 NMAC, administered by the Oil Conservation Division (OCD). The Facility is designed in compliance with 19.15.36 NMAC, and will be constructed and operated in compliance with a Surface Waste Management Facility Permit issued by the OCD. The Facility is owned by, and will be constructed and operated by, Sundance West, Inc.

1.1 Site Location

The Sundance West site is located approximately 3 miles east of Eunice, 18 miles south of Hobbs, and approximately 1.5 miles west of the Texas/New Mexico state line in unincorporated Lea County, New Mexico (NM). The Sundance West site is comprised of a 320-acre ± tract of land located in the South ½ of Section 30, Township 21 South, Range 38 East, Lea County, NM. Site access will be provided via NM 18 and Wallach Lane. A Site Location Map is provided as **Figure II.3.1**.

1.2 Facility Description

The Sundance West Facility is a proposed new commercial Surface Waste Management Facility that will comprise a 320-acre ± tract of land that will include two main components, a liquid oil field waste Processing Area (80 acres ±), and an oil field waste Landfill (180 acres ±). Oil field wastes are anticipated to be delivered to the Sundance West Facility from oil and gas exploration and production operations in southeastern NM and west Texas. The Site Plan provided as **Figure II.3.2** identifies the locations of the Processing Area and Landfill facilities. The proposed facilities are detailed in **Table II.3.1**, and are planned to be developed in four primary phases.



Based on Eunice NE, TX.- NM (1969) Photorevised (1979);
Eunice, NM (1969) Photorevised (1978);
Quadrangles, USGS 7.5' SERIES (1:24,000 Scale)

NOTE:

NO STREAMS, SPRINGS OR WATER COURSES WITHIN 1/2 MILE OF SITE

NORTH

0 1500' 3000'

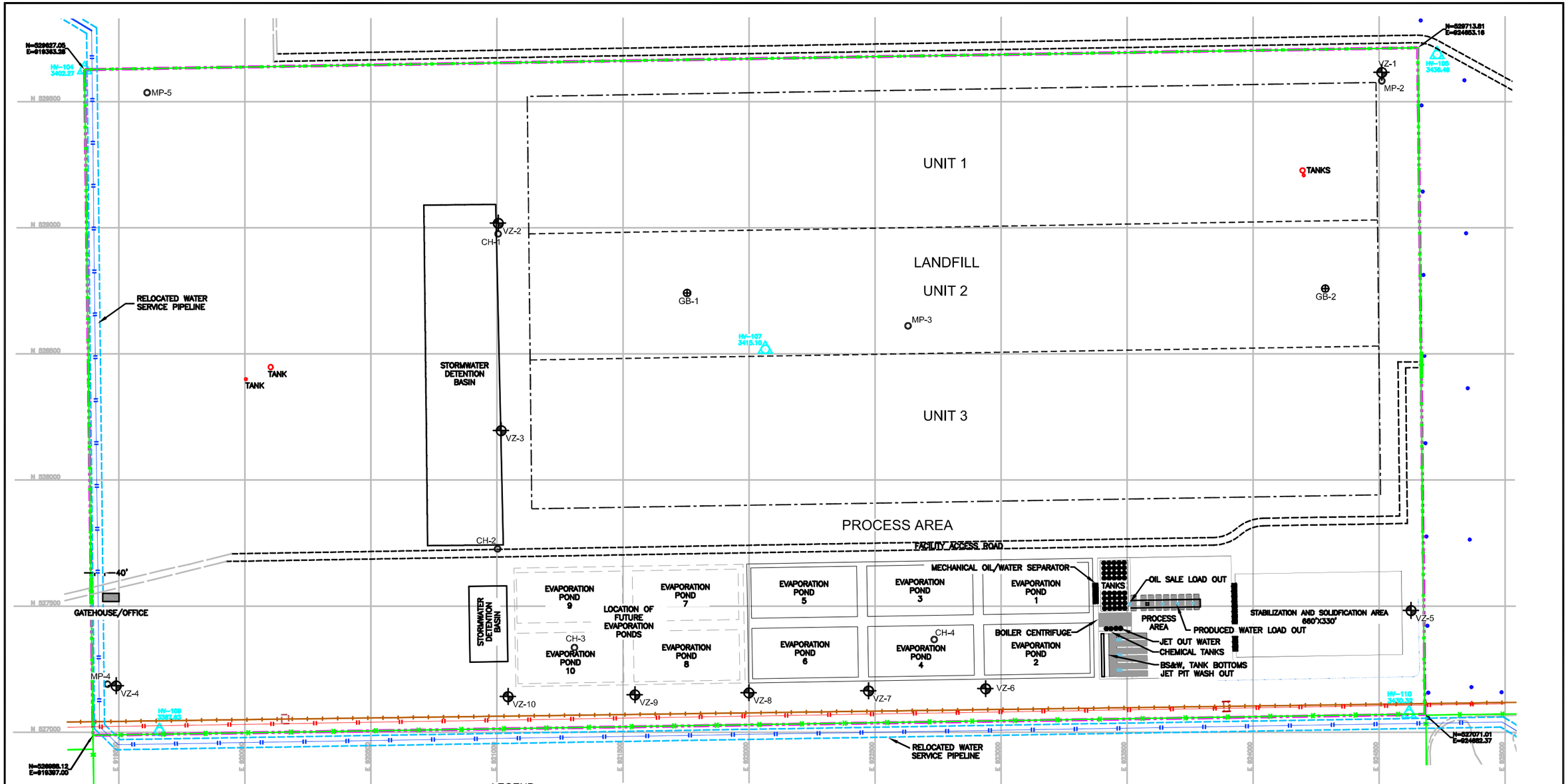
SITE LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/22/2016	CAD: DWG NAME.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE II.3.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE LOC REVISED 11 x17.dwg
Date/Time:Aug. 09, 2016-12:21:12 ; LAYOUT: B (LS)



NOTE

AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES, 5115 COPPER NE, ALBUQUERQUE, NM 87108
DATE OF PHOTOGRAPHY: 10-01-08

LEGEND

- FACILITY BOUNDARY
- LIMIT OF WASTE BOUNDARY
- UNIT BOUNDARY
- FENCE (EXISTING)
- PROPOSED 4-STRAND BARBED WIRE FENCING
- NEW UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- RAILROAD TRACK
- RELOCATED WATER SERVICE PIPELINE
- EXISTING EUNICE WATERLINE
- PIPELINE EASEMENT
- LOCKING GATE
- GB-1 GEOTECHNICAL BOREHOLE
- MP-2 SOIL BORING
- CH-3 COREHOLE BORING
- VZ-1 VADOSE ZONE MONITORING WELL
- POWER POLE
- STORAGE TANK
- EXISTING BOX CULVERT
- HV-109 3387.63 SURVEY CONTROL POINT
- N 527500 / E 922000 SITE GRID

NORTH

0 200' 400'

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE DEV.dwg
Date/Time:Jul, 19, 2016-05:14:34

SITE PLAN

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/18/2016	CAD: SITE DEV.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.2
APPROVED BY: IKG	gel@gordonenvironmental.com	

TABLE II.3.1
Proposed Facilities[1]
Sundance West

Description	No.
Oil field waste disposal landfill	1
Produced water load-out points	8
Produced water tanks	45
Mechanical oil/water separation unit	4
Evaporation ponds	10
Stabilization and Solidification Area	1
Oil treatment plant	1
Crude oil receiving tanks	3
Oil sales tanks	2
Customer jet wash	1 (6 bays)

Note:
[1]Subject to change. The proposed facilities are based on projected waste types and volumes; therefore this list may be modified in response to changes in waste streams, technology, etc.

1.3 Purpose

The purpose of this Hydrogen Sulfide (H_2S) Prevention and Contingency Plan (the Plan) is to enhance awareness and establish measures to protect employees from occupational exposure to H_2S while allowing them to perform their assigned duties. The Plan is also designed to protect customers and visitors to the Sundance West Facility, as well as the general public and nearby land users.

This Plan prescribes measures for:

- Providing routine H_2S monitoring of incoming wastes.
- Installation of monitoring points at the Facility evaporation ponds.
- Routine perimeter monitoring, and the potential for permanent monitoring stations.
- Regular monitoring in and around incoming oil field waste transportation vehicles.
- Augmenting the monitoring procedures in the event that H_2S is detected in excess of 10 parts per million (ppm).

Sundance West will invite the local emergency response authorities identified in **Table II.3.2** to the site for a briefing on this Plan. During this briefing, Sundance West will discuss notification, emergency response procedures, and evacuation plans. The H_2S monitoring program will be implemented during the active life of the Facility.

TABLE II.3.2
Emergency Response Agencies and Contacts
Sundance West

Agency/Organization	Emergency Number
1. Fire	
Eunice Fire Department	911 or (575) 394-2112
2. Police	
Lea County Sheriff's Department	911 or (575) 396-3611
New Mexico State Police	911 or (575) 392-5580
3. Medical/Ambulance	
Eunice EMS	911 or (575) 394-2112
Lea Regional Medical Center 5419 N. Lovington Highway Hobbs, NM 88240	(575) 492-5000
4. Emergency Response Firm	
Phoenix Environmental, LLC. 2113 N French Drive Hobbs, NM 88240	(575) 391-9685
5. OCD Emergency Response Contacts	
Oil Conservation Division 1625 N. French Drive Hobbs, NM 88240	(575) 393-6161
Mobile Phone	(575) 370-3180
Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505	(505) 476-3440
6. State Emergency Response Contacts	
Environmental Emergency 24 hr. (NMED)	(505) 827-9329
New Mexico Environment Department Solid Waste Bureau, Santa Fe	(505) 827-0197
7. Local Emergency Response Contacts	
Lea County Emergency Management	(575) 391-2983
8. Federal Emergency Response Contacts	
National Emergency Response Center (U.S. Coast Guard)	(800) 424-8802
Region VI Emergency Response Hotline (USEPA)	(214) 665-2200

1.4 Hydrogen Sulfide Characteristics

H_2S is a colorless and flammable gas with a distinct odor. Being heavier than air, H_2S tends to accumulate at the floor of poorly ventilated spaces. It is found in petroleum and natural gas and is sometimes present in groundwater. The odor of hydrogen sulfide gas can be perceived at levels as low as 10 parts per billion (ppb). At levels of 50-100 ppm, it may cause the human sense of smell to fail. Limited exposure to low concentrations of H_2S can result in eye irritation, sore throat, coughing, shortness of breath, and fluid in the lungs. These symptoms usually recede in a few weeks in the absence of continued exposure. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Exposure to high concentrations of H_2S can lead to eye damage, loss of sense of smell, pulmonary edema (swelling and/or fluid accumulation in the lungs), loss of breathing and death. General risks associated with H_2S contact are summarized on **Table II.3.3**, and more detailed chemical hazard information for H_2S is provided on the material safety data sheet (MSDS) furnished in **Attachment II.3.A**.

TABLE II.3.3
H_2S Exposure Health Risk
Sundance West

H_2S EXPOSURE LEVEL[1]	HEALTH RISK
Low (0-10 ppm)	Eye, nose, and throat irritation; coughing, shortness of breath, fluid in the lungs
Moderate (10-50 ppm)	Headache, dizziness, nausea and vomiting, coughing and breathing difficulty, loss of sense of smell
High (50-200 ppm)[2]	Severe respiratory tract irritation, loss of sense of smell, eye damage, shock, convulsions, coma, pulmonary edema (swelling and/or fluid accumulation in the lungs), death

[1]*General data obtained from www.safetydirectory.com*
[2]*NIOSH Immediate Danger to Life or Health (IDLH) is 100 ppm*

The oil field waste types, and engineering design and operating procedures specific to the Sundance West Facility, will mitigate against the potential release of H_2S in to the environment. The measures deployed by Sundance West that minimize the potential generation of releases include:

- Screening of existing and new deliveries
- Load inspections for the presence of H_2S as outlined in the Oil Field Waste Management Plan (**Volume II.2**)
- Onsite H_2S treatment of incoming loads to ensure that the acceptance criteria of no measurable H_2S (< 1 ppm) is met

- Constant evaporation pond testing
- Employee training

The cornerstone of this Plan consists of routine H_2S monitoring conducted for the Facility evaporation ponds and incoming waste streams to ensure that the regulatory limits for H_2S are not exceeded. The monitoring is intended to confirm that the H_2S concentration being accepted at the Facility is less than 1 ppm. This approach to monitoring and treatment has proven effective in reducing H_2S concentrations and successful in eliminating the need for H_2S Contingency Plan implementation as described in 19.15.11.9 NMAC (i.e., to address H_2S > 100 ppm). In addition, this Plan follows American Petroleum Institute (API) Recommended Practice 55 (RP-55), paragraph 7.6 to address H_2S >30 ppm (**Table II.3.4**).

1.5 Regulatory Requirements: 19.15.36 NMAC and 19.15.11 NMAC

The Rules for Surface Waste Management Facilities (19.15.36 NMAC) address the monitoring and management of H_2S in 19.15.36.8.C.(8):

> *19.15.36.8 SURFACE WASTE MANAGEMENT FACILITY PERMITS AND APPLICATION REQUIREMENTS*
>
> *C. Application requirements for new facilities, major modifications and permit renewals. An applicant or operator shall file an application, form C-137, for a permit for a new surface waste management facility, to modify an existing surface waste management facility or for permit renewal with the environmental bureau in the division's Santa Fe office. The application shall include:*
>
> *(8) a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.11 NMAC that apply to surface waste management facilities;*

Additionally, this H_2S monitoring program is intended to demonstrate compliance with 19.15.36.8.C.(8) NMAC (Surface Waste Management), and the requirements of 19.15.11 NMAC (Hydrogen Sulfide Gas), as well as, other permit conditions that may apply to this Facility. Should monitoring results identify unexpected concentrations of H_2S in excess of 30 ppm (RP-55 limit) in a public area, the requirements of 19.15.11.8.C NMAC will be implemented and this Plan, developed specifically to be responsive to 19.15.11.9 NMAC, will be implemented as required with proper notification. The RP-55 limit of 30 ppm will result in a radius of exposure (ROE) of 250 ft from the point of release (assuming a release rate of 100 SCFH on Figure C-2 of RP-55). This ROE is depicted on **Figure II.3.2**, and there are no "public areas" within this ROE.

TABLE II.3.4
API Recommended Practice 55
Sundance West

7.6 IMMEDIATE ACTION PLAN

Each contingency plan should contain a condensed "Immediate Action Plan" to be followed by designated personnel any time they receive notice of a potentially hazardous hydrogen sulfide or sulfur dioxide discharge. For the protection of personnel (including the general public) and abatement of the discharge, this "Immediate Action Plan" should include, but not be limited to, the following provisions:

a. Alert and account for facility personnel.
   1. Move away from the hydrogen sulfide or sulfur dioxide source and get out of the affected area.
   2. Don proper personal breathing equipment.
   3. Alert other affected personnel.
   4. Assist personnel in distress.
   5. Proceed to the designated emergency assembly area.
   6. Account for on-site personnel.

b. Take immediate measures to control the present or potential hydrogen sulfide or sulfur dioxide discharge and to eliminate possible ignition sources. Emergency shutdown procedures should be initiated as deemed necessary to correct or control the specific situation. When the required action cannot be accomplished in time to prevent exposing operating personnel or the public to hazardous concentrations of hydrogen sulfide or sulfur dioxide, proceed to the following steps, as appropriate for the site specific conditions.

c. Alert the public (directly or through appropriate government agencies) that may be subjected to an atmosphere exposure exceeding 30 ppm[21] of hydrogen sulfide or 10[21] ppm of sulfur dioxide.

d. Initiate evacuation operations.

e. Contact the first available designated supervisor on the call list (refer to Par. 7.4.a). Notify the supervisor of circumstances and whether or not immediate assistance is needed. The supervisor should notify (or arrange for notification of) other supervisors and other appropriate personnel (including public officials) on the call list.

f. Make recommendations to public officials regarding blocking unauthorized access to the unsafe area and assist as appropriate.

g. Make recommendations to public officials regarding evacuating the public and assist as appropriate.

h. Notify, as required, state and local officials and the National Response Center to comply with release reporting requirements (i.e., 40 *Code* of *Federal Regulations Parts 302* and 355) (refer to Par. 4.4).

i. Monitor the ambient air in the area of exposure (after following abatement measures) to determine when it is safe for re-entry.

[2l]Emergency Response Planning Guide Level 2 (ERPG-2), refer to Reference 27. ERPG-2 is defined as the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

Note: This sequence (Par. 7.6) should be altered to fit the prevailing situation. Certain actions, especially those dealing with the public, should be coordinated with public officials.

This Table is extracted from the American Petroleum Institute (API) Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, Recommended Practice 55, Second Edition, February 15, 1995

2.0 EMERGENCY COORDINATORS

Sundance West has designated individual specialists with the responsibility and authority to implement response measures in the event of an emergency which threatens freshwater, public health, safety or the environment per 19.15.36.13.N.(3) NMAC. The Primary, Alternate, and on-site Emergency Coordinators (ECs; **Table II.3.5**) will be thoroughly familiar with all aspects of this Plan; operations and activities at the Facility; location and characteristics of waste to be managed; the repository of all records within the Facility; and the Facility layout. **Table II.3.5** provides a list of names, designations, titles, and phone numbers for each EC, who will be formally identified to OCD prior to commencing Facility operations.

TABLE II.3.5
List of Emergency Coordinators*
Sundance West

Primary Emergency Coordinator

Name:	Joe Carrillo	Work Phone:	(575) 394-2511
Title:	Corporate Plant Manager	Mobile Phone:	(575) 390-0342
Address:	605 Ave J	Home Phone:	NA
	Eunice, NM 88231		

Alternate Emergency Coordinator

Name:	TBD	Work Phone:	TBD
Title:	TBD	Mobile Phone:	TBD
Address:	TBD	Home Phone:	TBD
	TBD		

Onsite Emergency Coordinator

Name:	TBD	Work Phone:	TBD
Title:	TBD	Mobile Phone:	TBD
Address:	TBD	Home Phone:	TBD
	TBD		

**Or as designated by Sundance West.*

The ECs are responsible for coordinating emergency response measures and have the authority to commit the resources required for implementation of this Plan. A designated EC will be available to respond to emergencies 24 hours a day, 7 days a week. The Sundance West employee who identifies an emergency situation will contact an EC directly; or via phone or radio. Contact will be attempted with each EC (Primary, Alternate, and the On-site) until communication is achieved (**Table II.3.5**). Upon arrival at the scene of an emergency, the first EC to arrive will assume responsibility for initiating response measures. If more than one EC responds, authority is assigned to the highest-ranking EC.

In the rare case that an EC cannot be contacted in an emergency, the Sundance West employee who identifies the emergency will make every effort to follow the emergency procedures outlined in this Plan until an EC or emergency authority (local, state, or federal; **Table II.3.2**) arrives to assist or take charge. The term "EC" as used throughout this Plan to references the responsible Emergency Coordinator at the scene of an emergency regardless of whether that EC is the Primary, Alternate, On-site EC, or EC designee. This Plan will be amended as described in Section 8.0 if the list of ECs changes, with updates submitted in a timely manner to OCD and filed on-site.

3.0 MONITORING

3.1 Incoming loads

Sundance West will monitor for H_2S on a continual basis on every oil field delivery waste vehicle arriving at the site, as described in the Oil Field Waste Management Plan (**Volume II.2**). Monitoring results will be recorded on the OCD Form C-138 under "Source and Description of Waste" (**Attachment II.3.B**) and retained as part of the Facility Operating Record. Sundance West personnel will wear H_2S personal monitors under circumstances where H_2S may be present, including when they are testing or unloading materials that may contain H_2S. The monitors will issue a visual and audible signal at 10 ppm of H_2S in the ambient air that becomes more rapid at 20 ppm. In the event of an H_2S detection of 10 ppm or greater, the following procedures will be implemented:

- Notification of the presence of H_2S will be provided to both the driver (hauler) and the generator.
- The generator will be provided the option of allowing Sundance West to treat the load

on-site. Should the generator decline treatment, the load will be rejected and directed to leave the Sundance West Facility.

- If the generator requests treatment, Sundance West personnel will add calcium hypochlorite ($Ca(ClO)_2$) to the load at the levels corresponding to **Table II.3.6.**
- Once the $Ca(ClO)_2$ has been added, the load will be "rolled" (i.e., trucks will use their air pumps to "roll" air through the tank to allow for mixing of the contents and the added $Ca(ClO)_2$ to assist the chemical reaction. After approximately 20 minutes, the load will be re-sampled for the presence of H_2S. Treatment will continue until the H_2S reading is below 1 ppm. Once the H_2S measurement reads below 1 ppm, the load will be directed to the receiving area for processing.
- Treatment information and the final H_2S measurement will be recorded on the OCD Form C-138 under "Source and Description of Waste" (**Attachment II.3.B**).
- Sundance West personnel will contact the generator's Plant Manager or General Manager if assistance is needed.

3.2 Evaporation Pond Monitoring

3.2.1 Stationary Monitors

Evaporation ponds will be monitored for the presence of H_2S by recording at continuous monitors maintained along the outside perimeter of the pond area as shown on **Figure II.3.3**. These monitors will be wired directly to the office for remote observation. H_2S readings and wind speed/direction will be logged and recorded twice daily on the Sundance West Daily Air and Water Inspection Form (**Attachment II.3.C**). The EC will be notified, and will implement the procedures outlined below if H_2S readings are $\geq$ 10 ppm. If H_2S readings are $\geq$ 20 ppm, the employee will implement the procedures listed in **Table II.3.7**.

- A second reading will be taken on the downwind berm within one hour
- The dissolved oxygen and dissolved sulfide levels of the pond will be tested immediately and the need for immediate treatment determined
- Tests for H_2S levels will be made at the fenceline downwind from the area of concern

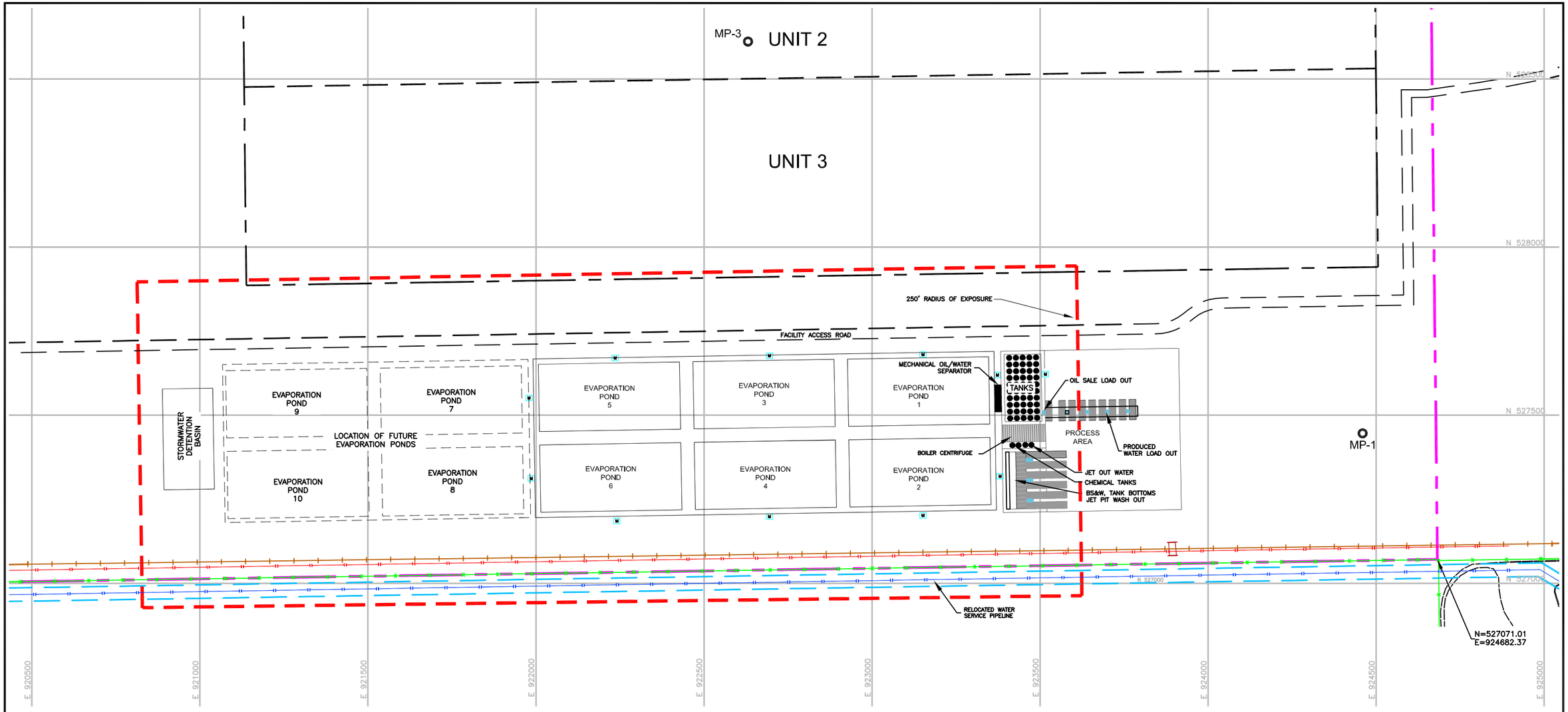
If two (2) consecutive H_2S readings of 10 ppm or greater are recorded:

- The EC will notify the Hobbs office of the OCD immediately (**Table II.3.2**)
- Sundance West will commence hourly monitoring on a 24-hour basis
- Sundance West will lower the pond level so that the mechanical evaporation system will circulate the entire pond
- Sundance West will obtain daily analysis of dissolved sulfides in the pond

TABLE II.3.6
H_2S Treatment for Vehicles [1]
Sundance West

H_2S PPM[2]	$Ca(ClO)_2$ "Coffee Cans" Required[3]
<50	1.0
50-100	1.5
100-150	2.0
150-200	2.5
200-250	3.0
250-300	3.5
300-350	4.0
350-400	4.5
400-450	5.0
450-500	5.5
500-550	6.0
550-600	6.5
600-650	7.0
650-700	7.5
700-750	8.0
750-800	8.5
800-850	9.0
850-900	9.5
900-950	10.0
950-1000	10.5

Notes:
[1]*Typical volume of truck is 80 bbl. One coffee can equals 34.5 oz of product.*
[2]*PPM = parts per million*
[3]*$Ca(ClO)_2$ = calcium hypochlorite*



LEGEND

- FACILITY BOUNDARY
- LIMIT OF WASTE BOUNDARY
- 250' RADIUS OF EXPOSURE
- FENCE
- NEW UNPAVED ROAD
- RAILROAD TRACK
- UNDERGROUND WATER SERVICE PIPELINE
- EXISTING EUNICE WATERLINE
- WATER SERVICE PIPELINE RIGHT-OF-WAY
- M — H_2S MONITORING LOCATION
- N 527500 / E 922000 — SITE GRID

NOTE

AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES
5115 COPPER NE, ALBUQUERQUE, NM 87108
DATE OF PHOTOGRAPHY: 10-01-08

NORTH

0 150' 300'

EVAPORATION PONDS STATIONARY MONITORING

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/18/2016	CAD: POND MONITOR.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE II.3.3
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\POND MONITOR 11 x17.dwg
Date/Time:Aug. 09, 2016-11:56:15 ; LAYOUT: B (LS)

TABLE II.3.7
Implementation, Assessment, and Notification Procedures for H_2S
Sundance West

1. **EVACUATE AREA AND NOTIFY THE ECs:** The employee who first becomes aware of the H_2S alarm will immediately evacuate the area, don protective personal breathing equipment and notify the Primary EC, and the Alternate EC and On-site EC if necessary. Notification will be made in person, via telephone, or via radio. The responding EC will assume full authority over the situation. Properly protected responders will then assist any affected personnel or customers.
2. **REMAIN UPWIND OF RELEASE:** Persons evacuated from the release area should remain away and upwind from the area of the release until an assessment of the conditions has been made.
3. **ASSESS THE AMOUNT OF RELEASE:** The EC will assess the source, severity, and extent of the alarm. Monitoring equipment will be operated by trained personnel.
4. **MONITOR DOWNWIND IF $H_2S \geq 10$ PPM**: In the event a reading of 10 ppm is registered, the area will be evacuated and Facility personnel will monitor the H_2S levels along the downwind boundary of the Facility.
5. **EVACUATE AND CLOSE THE FACILITY IF $H_2S \geq 20$ PPM AT DOWNWIND BOUNDARY:** If levels reach 20 ppm at the downwind boundary, the Facility will be evacuated and closed. Evacuation procedures are enumerated on the Site Evacuation Plan provided as **Figure II.3.4**. Additionally, Sundance West will notify all persons within one-half mile of the fence line. (No residents are currently within one-half mile.)
6. **NOTIFICATION OF AUTHORITIES:** Notification will be provided to the New Mexico State Police, Lea County Sheriff, Lea County Emergency Management, and OCD (**Table II.3.1**). In addition, medical authorities will be contacted if needed. Sundance West will also notify the Emergency Response Firm if necessary (**Table II.3.1**) to provide response personnel, equipment, and supplies to mitigate the source of an H_2S reading of $\geq$10 ppm.
7. **RECORDKEEPING:** Sundance West will log and report to the OCD all incidences where an H_2S reading of $\geq$10 ppm is registered at the ponds (also see Section 6.0). Records will be maintained for at least 5 years at the Sundance West administrative offices.

3.2.2 Dissolved Oxygen and pH Monitoring

Dissolved oxygen and pH levels are key indicators of the efficacy of treatment and removal of H_2S during the aeration process in the evaporation ponds. The chemical reaction of H_2S and oxygen to produce sulfate as an end product is dependent upon the level of both dissolved oxygen and pH. Daily tests will be conducted and records made for each pond. If the pH falls below 8.0, remedial steps will be taken immediately to raise the pH. Sundance West proposes

to use sodium hydroxide (caustic agent) to raise the pH to the optimal level of 8.2-9.0. Dissolved oxygen levels will be tested on a daily basis to ensure a residual of 0.5 ppm is maintained. The dissolved oxygen level will be taken at the beginning of each day (or at least once per 24-hour period), one foot off the bottom of each pond at various locations and recorded. If any tests show a dissolved residual oxygen level of less than 0.5 ppm, immediate steps will be under taken to oxygenate the pond and create a residual oxygen level within the pond of at least 0.5 ppm. Remedial measures may include addition of chemicals or increased aeration. The pH readings will be recorded daily on the Daily Air and Water Inspection Form (**Attachment II.3.C**).

4.0 IMPLEMENTATION, ASSESSMENT, AND NOTIFICATION

The following subsections present a series of procedures for implementation, assessment, and notification of appropriate authorities in the unlikely event that a H_2S emergency develops (19.15.11.9 NMAC).

4.1 Implementation

This H_2S Contingency Plan will be implemented when an imminent or actual emergency situation develops that represents a potential impact to fresh water, public health, safety or the environment. The circumstances that could require implementation of this Plan includes the release of H_2S gas.

Table II.3.7 lists the implementation, assessment, and notification procedures that will be followed in the event of an emergency. Assessment and notification are discussed further in Sections 4.2 and 4.3.

4.2 Assessment

In the event of a release, the EC will immediately identify the character, source, amount and extent of released materials, if possible; as well as assess the potential impact to fresh water, public health, safety or the environment. During an emergency, the EC may amend this Plan, as necessary, to protect fresh water, public health, safety or the environment (19.15.11.9.F NMAC). The EC will also assess the circumstances of an emergency situation and determine the responses required to:

- provide notifications to appropriate agencies and the general public
- implement appropriate response and recordkeeping procedures

The assessment provides the EC with critical data needed to determine whether an evacuation is necessary, whether emergency authorities should be contacted, and whether Sundance West should attempt to control the release with on-site personnel and equipment. **Table II.3.8** provides OCD descriptions of "major" and "minor" releases which are applicable for assessment purposes (19.15.29.7 – 11 NMAC). This section contains additional, detailed information regarding the Site Evacuation Plan, and Section 5.0 addresses control procedures.

4.2.1 Site Evacuation Plan

Based upon the type of waste materials and treatment received at Sundance West, the potential for a Facility evacuation is unlikely (19.15.11.9.B.(2)(a) NMAC). However, various circumstances could arise warranting a Facility evacuation. In an emergency situation, the EC is the individual responsible for determining when evacuation of the Facility is required. Imminent or actual dangers that constitute a situation that could require evacuation include:

- Detection of H_2S levels at ≥10 ppm (evacuate the immediate area and monitor downwind levels)
- Detection of H_2S levels at ≥20 ppm (evacuate and close the Facility)

When conditions warrant immediate evacuation (e.g., H_2S ≥20 ppm), on-site persons (e.g., Facility personnel, haulers, visitors, vendors, etc.) will be directed to proceed immediately to the Facility Gatehouse to evacuate through the main gates (**Figure II.3.4**), the primary evacuation route. Sundance West Personnel will exercise good judgment and common sense in using the primary evacuation route to exit the Facility, or selecting the most appropriate alternative evacuation route, if necessary. Assembly points and primary/secondary evacuation routes are provided on **Figure II.3.4.** Driving directions to the nearest hospital are included as **Figure II.3.5**, and **Table II.3.9** provides detailed procedures for evacuating the Facility.

TABLE II.3.8
Part 29: Release Notification
Sundance West

19.15.29.7 DEFINITIONS:

A. "Major release" means:

(1) an unauthorized release of a volume, excluding gases, in excess of 25 barrels;

(2) an unauthorized release of a volume that:

- **(a)** results in a fire;
- **(b)** will reach a watercourse;
- **(c)** may with reasonable probability endanger public health; or
- **(d)** results in substantial damage to property or the environment;

(3) an unauthorized release of gases in excess of 500 MCF; or

(4) a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

B. "Minor release" means an unauthorized release of a volume, greater than five barrels but not more than 25 barrels; or greater than 50 MCF but less than 500 MCF of gases.

19.15.29.8 RELEASE NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall notify the division of unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixture of the chemicals or contaminants, in accordance with the requirements of 19.15.29 NMAC.

B. The person operating or controlling either the release or the location of the release shall notify the division in accordance with 19.15.29 NMAC with respect to a release from a facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

19.15.29.9 REPORTING REQUIREMENTS: The person operating or controlling either the release or the location of the release shall provide notification of releases in 19.15.29.8 NMAC as follows.

A. The person shall report a major release by giving both immediate verbal notice and timely written notice pursuant to Subsections A and B of 19.15.29.10 NMAC.

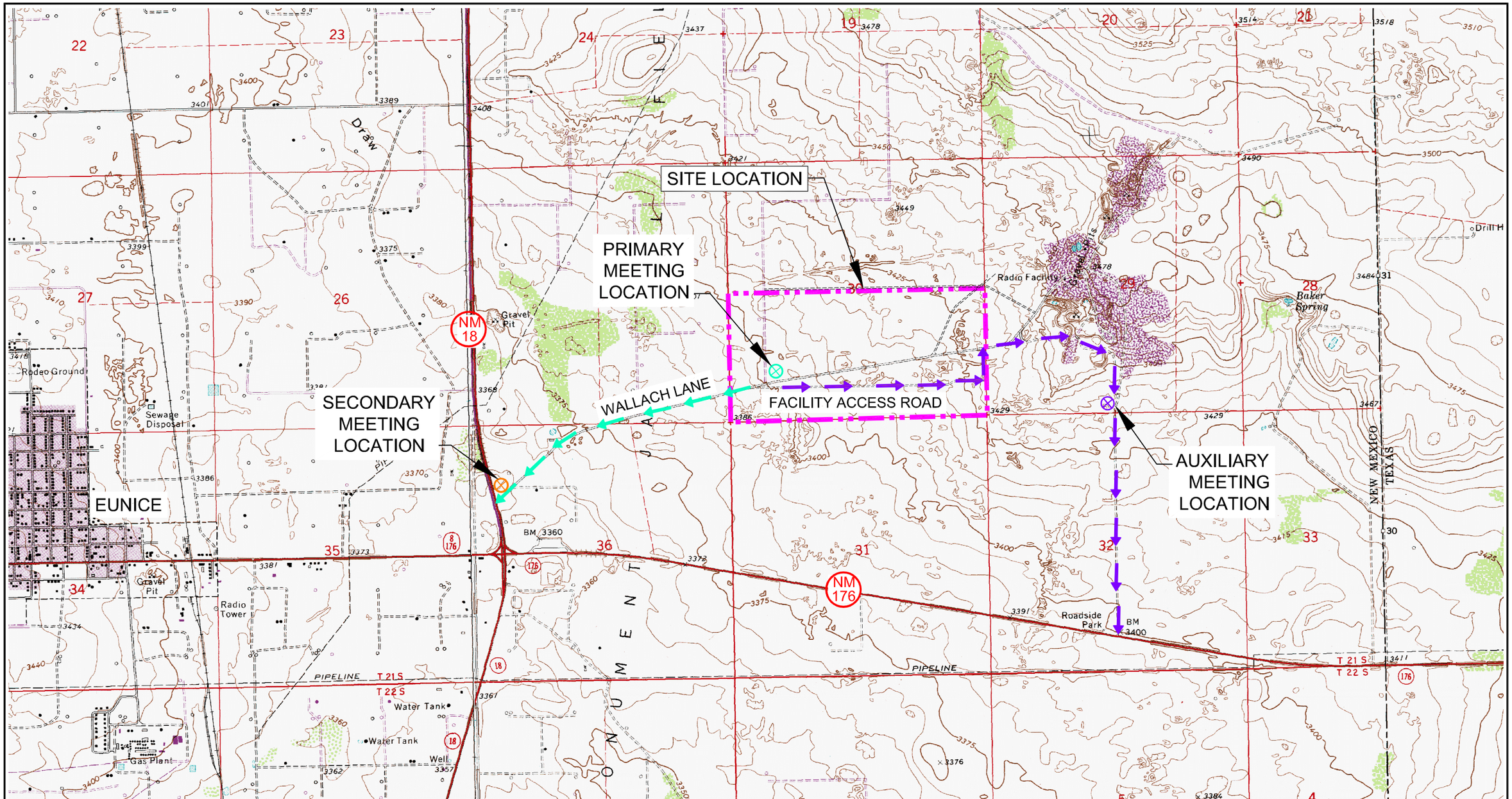
B. The person shall report a minor release by giving timely written notice pursuant to Subsection B of 19.15.29.10 NMAC.

19.15.29.10 CONTENTS OF NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall provide immediate verbal notification within 24 hours of discovery to the division district office for the area within which the release takes place. In addition, the person shall provide immediate verbal notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief. The notification shall provide the information required on form C-141.

B. The person operating or controlling either the release or the location of the release shall provide timely written notification within 15 days to the division district office for the area within which the release occurs by completing and filing form C-141. In addition, the person shall provide timely written notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide appropriate additions or corrections to the information contained in the prior verbal notification.

19.15.29.11 CORRECTIVE ACTION: The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.



MAP BASE:
EUNICE N. MEX. 1969, PHOTOREVISED 1979 AND EUNICE NE, TEX.-N. MEX. 1969, PHOTOREVISED 1979, 1:24000, USGS 7.5 MIN. SERIES TOPOGRAPHIC QUADRANGLES

LEGEND

- FACILITY BOUNDARY
- UNPAVED ROADS
- PRIMARY MEETING LOCATION
- PRIMARY EVACUATION ROUTE
- SECONDARY MEETING LOCATION
- AUXILIARY MEETING LOCATION
- AUXILIARY EVACUATION ROUTE

NORTH

0 1000' 2000'

SITE EVACUATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
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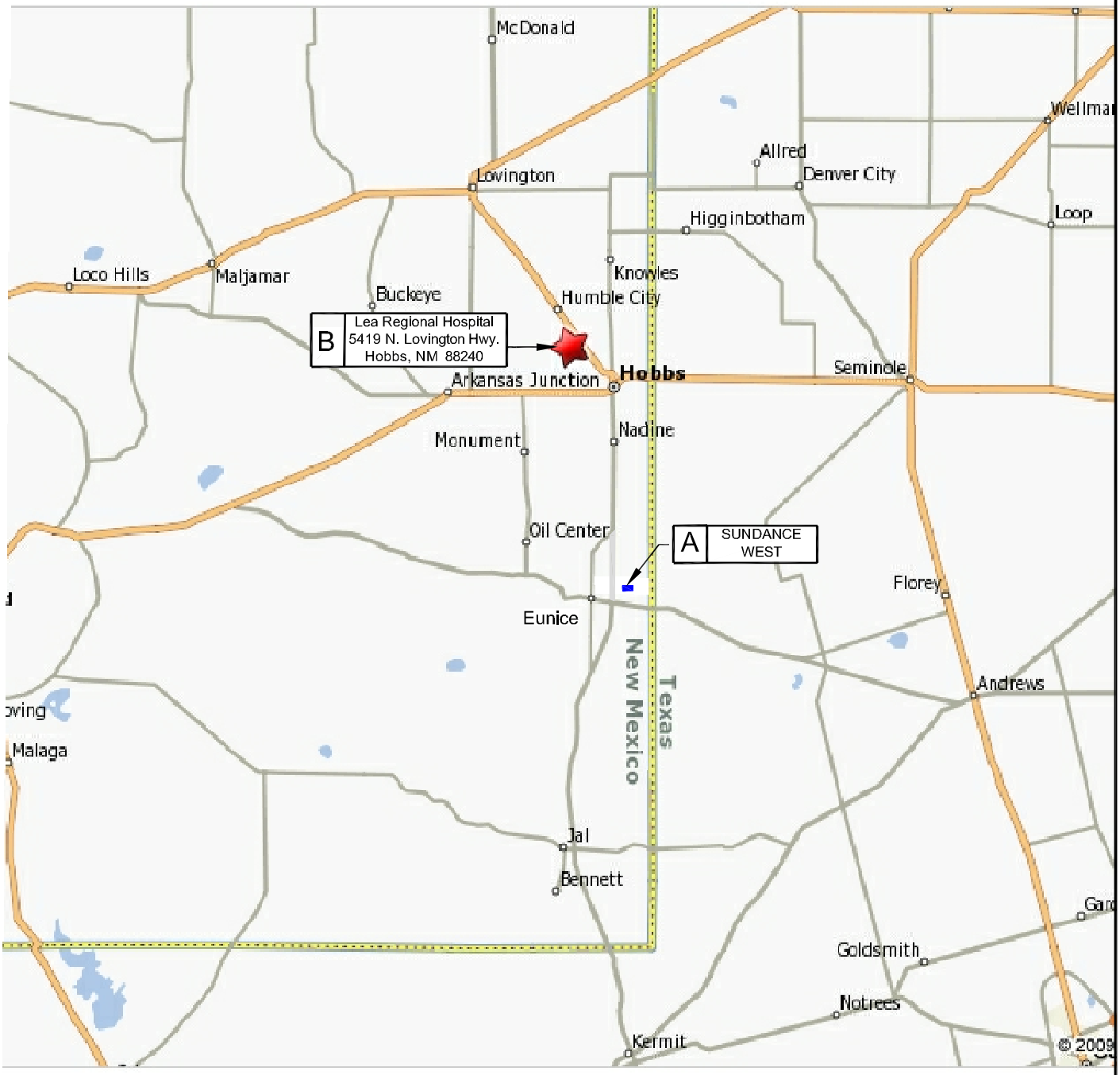
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/19/2016	CAD: SITE EVAC.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.4
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE EVACUATION.dwg
Date/Time:Jul, 19, 2016-10:02:31



A: Sundance West, Wallach Lane & NM-18, Eunice, NM 88231

1.	Start out going WEST on WALLACH LN toward NM-18N	0.0 mi
2.	Turn RIGHT on NM-18N	18.0 mi
3.	Turn LEFT onto E SANGER ST/CR-65	0.5 mi
4.	Turn SLIGHT RIGHT onto N TURNER ST	1.3 mi
5.	N TURNER ST becomes NM-18N	3.1 mi
6.	Turn LEFT onto GERRY ST	0.1 mi
7.	Arrive 5419 N LOVINGTON HWY	0.0 mi

B: Lea Regional Medical Center, 5419 N Lovington Hwy, Hobbs, NM 88240-9100

Note: A to B Travel Estimates: 35 minutes / 23.86 miles

Map downloaded from MAPQUEST, September 15, 2009

Drawing:P:\acad 2003\530.06.01\PERMIT FIGURES\HOSPITAL.dwg
Date/Time:Feb. 05, 2015-12:52:43

NORTH

NOT TO SCALE

HOSPITAL LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
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DATE: 02/05/2015	CAD: HOSPITAL.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.5
APPROVED BY: IKG	gei@gordonenvironmental.com	

TABLE II.3.9
Evacuation Procedures
Sundance West

When evacuation is required, the following procedures will be followed:

1. Facility personnel will be alerted directly or using the Facility telephone, cellular telephones, or radios.
2. Vehicles delivering waste will be diverted away from the location of the emergency and routed towards the Facility exit (**Figure II.3.2**).
3. All Facility operating equipment will be shut down.
4. Personnel will be directed to proceed to the Facility Gatehouse which will be the primary meeting locations (**Figure II.3.4**). The EC will identify missing persons at that time.
5. If the emergency involves the Facility Gatehouse or its immediate environs, the intersection of NM 18 and Wallach Lane will be the secondary assembly point and evacuation routes to this location will be utilized (as applicable).
6. If the emergency precludes access to both, the Facility Gatehouse and the intersection of NM 18 and Wallach Lane, personnel will evacuate the site via an auxiliary access gate at the east end of the facility.
7. Once assembled, personnel will stand by to afford assistance and coordinate further actions.

4.3 Notification of Authorities and General Public

This Section provides a series of procedures for implementation and notification of appropriate authorities in the event that a specific emergency develops (19.15.11.16 NMAC). Whenever there is an imminent or actual emergency, the EC will immediately contact on-site persons (Facility personnel, visitors, vendors, haulers, etc.) via on-site communication systems, as well as notify the appropriate state and local agencies (**Table II.3.2**), as necessary. OCD will be notified within 4 hours after the Contingency Plan has been activated.

Table II.3.2 provides a list of emergency response agencies and contacts that may need to be notified depending on the type and extent of an emergency situation. **Table II.3.2** will be posted as appropriate and near on-site telephones for easy access by Sundance West personnel. Fire, police, and medical authorities will be contacted, as necessary, in an emergency situation (**Table II.3.2**).

In the case of an H_2S emergency where H_2S is $\geq$10 ppm, notification will be provided to the New Mexico State Police, Lea County Sheriff, and OCD (also listed on **Table II.3.2**):

- OCD
  Hobbs, NM (575) 393-6161
  Mobile Phone (575) 370-3180
  Santa Fe, NM (505) 476-3440
- New Mexico State Police 911 or (575) 392-5580
- Lea County Sherriff's Dept. 911 or (575) 396-3611
- Lea County Emergency Management (575) 391-2983

Sundance West will also notify the Emergency Response Firm if necessary (**Table II.3.2**) to provide response personnel, equipment, and supplies to mitigate the source of an H_2S reading ≥10 ppm.

Table II.3.8 provides specific information regarding notification of OCD in the case of a release, which by definition includes breaks, leaks, spills, releases, fires or blowouts. In addition, **Table II.3.8** also provides OCD definitions for "major" and "minor" releases.

Additional State, Federal, and other local emergency contact numbers are provided and should be used as deemed appropriate to the situation (**Table II.3.2**). If the EC determines that the incident could threaten fresh water, human health, public safety or the environment beyond the limits of the Facility, the EC will notify the National Response Center and USEPA at the following phone numbers (also included on **Table II.3.2**):

- National Response Center - 24 Hr. Hotline: (800) 424-8802
- Region VI Emergency Response Hotline (USEPA): (214) 665-2200

The EC's notification to authorities will include the following information, as listed on the Incident Report Form (**Attachment II.3.D**):

- name and telephone number of person reporting the incident
- name and address of Facility
- time and type of incident (e.g., hazardous material release, fire)
- name and quantity of material(s) involved, to the extent known
- extent of injuries, if any
- possible hazards to human health or the environment
- other information requested by the response entity

5.0 EMERGENCY EQUIPMENT

The following sections describe emergency equipment at Sundance West that will be available for responding to emergency situations. An Emergency Response Equipment List describing the equipment, quantity, location, and uses is provided as **Table II.3.10**.

TABLE II.3.10
Emergency Response Equipment List[1]
Sundance West

Equipment Description	Quantity	Location	Use(s)
10 lb ABC rated fire extinguisher	2	Facility Gatehouse	Firefighting
10 lb ABC rated fire extinguisher	2	Trucks	Firefighting
10 lb ABC rated fire extinguisher	1	Heavy Equipment	Firefighting
20 lb ABC rated fire extinguisher	1	Crude Oil Recovery Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Centrifuge Building	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Sales Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Produced Water Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Diesel Storage Tank	Firefighting
Loader	1	Facility	Berm Repair
Oil Booms	4	NE Corner of Pond	Oil Containment
Self-contained Breathing Apparatus	1 per employee	Facility Gatehouse	Protective gear for employees
Pair leather gloves	1 per employee	Assigned to employee	Protective gear for employees
NOMEX Coveralls	7 per Employee	Assigned to Employee	Protective gear for employees
Pair safety glasses	1 per employee	All employee workstations	Protective gear for employees
Round-point wood handled shovels	2	Process Area Building	Contain spillage, putting out fires
First Aid Kit	1	Facility Gatehouse	First Aid
First Aid Kit	1 per vehicle	Facility Vehicles	First Aid
Eye Wash Station	1	Produced Water Receiving Tanks	First Aid
Portable 2-way radio	1 per employee	Base unit at Facility Gatehouse	Communications
Cell Phones	min. 3	Facility Manager Facility Operator Facility Operator	Communications
Office Phone	2	Facility Gatehouse	Communications
Mobile pressure washer	1	Mobile	Decontaminating equipment

Notes:
[1]Subject to change in response to waste receipts, regulatory requirements, technology, etc.

5.1 Internal Communications

Communications at Sundance West will be accomplished via cellular telephones, land lines, and two-way radios. These systems provide Facility personnel with immediate emergency notification capabilities, and the opportunity to receive instructions in the event of an emergency incident. Any mechanical difficulties with the communications equipment will be promptly repaired. Internal communication devices are also listed on **Table II.3.10.**

5.2 External Communications

The land-line telephones and cell phones located at Sundance West will have outside access in the event that notification of the local emergency response authorities is required (i.e., fire department, ambulance, etc.). Key Facility personnel including the ECs, Facility Manager, etc., will carry cellular telephones for contacting outside agencies. The cellular telephones also provide a backup means for contacting emergency authorities in the event they cannot be reached by conventional telephone lines. Emergency phone numbers will be posted in the Facility Gatehouse and provided to employees on laminated pocket cards. External communication devices are also listed on **Table II.3.10.**

5.3 Personnel Protection, First Aid, and Safety Equipment

Personal protective equipment (PPE) necessary for responding to a potential release of hazardous materials will be maintained in on-site buildings (Facility Gatehouse and the Produced Water Facility) and/or issued to each employee (**Table II.3.10**). These items include Tyvek suits, gloves, safety glasses, hearing protection, self-contained breathing apparatus (SCBA), etc.

First aid and safety equipment will be maintained at strategic locations at Sundance West as shown on **Table II.3.10**. Safety equipment located at the Facility includes industrial first aid kits, fire extinguishers, an eye wash station, etc. An emergency shower will be located at the Produced Water Facility. First aid kits will be placed in the Facility Gatehouse and the Produced Water Facility. In addition, first aid kits will be maintained in all Facility vehicles, including heavy equipment. Prominent signs will be placed identifying the location of health and safety equipment, and emergency response items (e.g., fire extinguishers).

6.0 RECORDKEEPING

The EC will be responsible for ensuring that emergency response actions are fully documented. The Primary EC may complete the documentation requirements or delegate to another EC. The Incident Report Form (**Attachment II.3.D**) illustrates the information that will be recorded as a result of any emergency incident and related response action. This form will be signed by both the EC and the Facility Manager. Copies of the form filed for each incident will be retained for OCD review as part of the Facility Operating Record.

In addition, in the case of an unauthorized release at Sundance West, the OCD will be notified pursuant to 19.15.29 NMAC. As defined by OCD a "release" is any "*breaks, leaks, spills, releases, fires or blowouts involving crude oil, produced water, condensate, drilling fluids, completion fluids or other chemical or contaminant or mixture thereof, including oil field wastes and natural gases to the environment"* (19.15.2.7.R(4) NMAC). A major release (19.15.29 NMAC; **Table II.3.8**) includes an unauthorized release of any volume which may, with reasonable probability, endanger public health; or an unauthorized release of natural gases in excess of 500 thousand cubic feet (mcf); or a release of any volume which may with reasonable probability endanger public health or results in substantial damage to property or to the environment, cause detriment to water, or exceed the standards in 19.15.30 NMAC. A major release requires both immediate verbal notification (within 24 hours), as well as timely written notification to OCD (within 15 days) using OCD Form C-141 (*Release Notification and Corrective Action*). A minor release (**Table II.3.8**) is an unauthorized release of greater than 50 mcf but less than 500 mcf of natural gases. A minor release requires timely written notice. A copy of OCD Form C-141 is provided as **Attachment II.3.E**. Copies of the Form filed for each incident will be retained on-site as part of the Facility Operating Record.

7.0 COORDINATION AGREEMENTS

A copy of this Plan will be made available to the organizations identified in **Table II.3.2**. This Plan serves to familiarize each of the identified organizations with the operations of the Facility and types of emergencies and responses that may be required. Each agency will be encouraged to visit the Facility for purposes of assessing site operations, and providing input regarding emergency response procedures (19.15.11.9.B.(2)(e) NMAC).

8.0 PLAN AMENDMENT

The EC will be responsible for assuring that updates to or amendments of this Plan are conducted and recorded in the event of any of the following (19.15.11.9.F NMAC):

1. The Facility Permit is revised or modified with potential impacts on this Plan.
2. The OCD mandates it, including responses to regulatory updates.
3. The Plan fails in an emergency.
4. Modification to the Facility design, construction, operation, maintenance or other circumstances that changes the potential circumstance or locations for fires, explosion, or releases of hazardous oil field waste constituents; or related changes in the appropriate emergency response.
5. The list of ECs changes.
6. The list of emergency equipment changes significantly.

The updated Plan will be distributed to OCD and made available to the organizations identified in **Table II.3.1** with a cover letter highlighting any substantive changes. Proposed changes will be in compliance with 19.15.36 NMAC.

9.0 TRAINING

The EC or Facility training representative will ensure all new and existing employees are trained on the H_2S Prevention and Contingency Plan at least annually; or when significant changes to the Plan have been made, whichever is more frequent. Prior to any new employee commencing work, a training session separate from the standard annual training will be conducted to provide specific proficiency in H_2S safety and procedures. Training will include both classroom drills and field exercises simulating H_2S monitoring, potential releases, and evacuation procedures. Included in this training are H_2S hazards identification and detection, personal protection, and contingency procedures.

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.A

MATERIAL SAFETY DATA SHEET FOR H_2S

MATERIAL SAFETY DATA SHEET

Hydrogen Sulfide

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Hydrogen Sulfide
Synonyms:	H2S Sour Gas Sulfuretted Hydrogen Hepatic Gas Hydrosulfuric Acid Alliance - Hydrogen Sulfide - 1605 Ferndale - Hydrogen Sulfide - 1605 LAR - Acid Gas LAR - Sour Gas Santa Maria - Acid gas Santa Maria - Sour Gas Trainer - Hydrogen Sulfide - S173 Wood River - Hydrogen Sulfide - 100240
Intended Use:	Refinery by-product
Chemical Family:	Inorganic Gas

Responsible Party:	ConocoPhillips 600 N. Dairy Ashford Houston, Texas 77079-1175
MSDS Information:	800-762-0942 MSDS@conocophillips.com

Emergency Overview

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident Call CHEMTREC:
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: (800) 356-3219

Health Hazards/Precautionary Measures: Poisonous hydrogen sulfide gas. Harmful if inhaled. Causes severe eye irritation. Use with ventilation adequate to keep exposure below recommended limits, if any. Do not breathe gas. Avoid contact with eyes. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable gas. Can cause flash fire. Keep away from heat, sparks, flames, static electricity or other sources of ignition. Do not enter storage areas or confined space unless adequately ventilated.

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)

NFPA 704 Hazard Class:

Health:	4 (Extreme)
Flammability:	4 (Extreme)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Hydrogen Sulfide 7783-06-4	100	10 ppm TWA 14 mg/m^3 TWA 15 ppm STEL 21 mg/m^3 STEL	20 ppm CEIL 50 ppm 10 min. peak	100 ppm IDLH	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Severe eye irritant. Contact may cause stinging, watering, redness, swelling, and eye damage.

Skin: Skin contact is unlikely. No information available on skin absorption.

Inhalation (Breathing): Toxic. May be harmful if inhaled.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Signs and Symptoms: Effects of overexposure may include irritation of the eyes, nose, throat, and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats (arrhythmias), sudden collapse, respiratory failure, convulsions and death.

Cancer: There is no information available on the cancer hazard of this material.

Target Organs: No data available for this material.

Developmental: Inadequate data available for this material.

Other Comments: Hydrogen sulfide is a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include respiratory (asthma-like) disorders.

4. FIRST AID MEASURES

Eye: Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 20 minutes. Seek immediate medical attention.

Skin: First aid is not normally required. However, it is good practice to wash any chemical from the skin.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Notes to Physician: In high doses hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote; however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of H2S is confirmed and the patient does not respond rapidly to supportive care, the use of nitrites is an alternative treatment. For adults the dose is 10 ml of a 3% NaNO2 solution (0.5 gm NaNO2 in 15 mL water) I.V. over 2-4 minutes. Dosage should be adjusted in children or in presence of anemia. Follow blood pressure, methemoglobin levels, arterial blood gases, and electrolytes closely in serious cases.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
OSHA Flammability Class:	Flammable Gas
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Vapors are heavier than air and can accumulate in low areas. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire. Closed containers exposed to extreme heat can rupture due to pressure buildup.

Extinguishing Media: Dry chemical or carbon dioxide is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. If this cannot be done, allow fire to burn. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Stay away from ends of container.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate danger area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Water spray may be useful in minimizing or dispersing vapors (see Section 5).

Notify fire authorities and appropriate federal, state, and local agencies. If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Use good personal hygiene practices.

Storage: Keep container(s) tightly closed. In a tank, barge, or other closed container, the vapor space above materials that contain hydrogen sulfide (H2S) may result in concentrations immediately dangerous to life or health (IDLH). Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode in oxygen deficient environments (oxygen content <19.5%) or if exposure concentration is unknown or if conditions immediately dangerous to life or health (IDLH) exist.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: Not required based on the hazards of the material. However, it is considered good practice to wear gloves when handling chemicals.

Eye/Face: The use of a face shield and chemical goggles to safeguard against potential eye contact, irritation, or injury is recommended.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)
Odor Threshold:	0.0047 ppm
pH:	Not applicable
Vapor Pressure (mm Hg):	554.6 psia @ 100°F (38°C)
Vapor Density (air=1):	1.20
Boiling Point:	-60°F / -12°C
Melting/Freezing Point:	-86°F / -66°C
Solubility in Water:	Slight
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	1.2 (Gas)
Heat Value (BTU):	-6552 (BTU/lb)

Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	>1
Molecular Weight:	34.08
Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable gas.

Conditions to Avoid: Avoid high temperatures and all sources of ignition (see Sections 5 and 7). Toxic fumes can be released on heating.

Materials to Avoid (Incompatible Materials): Avoid contact with nitric acid, strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

No definitive information available on carcinogenicity, mutagenicity, target organ, or developmental toxicity.

Acute Data:

Hydrogen Sulfide - CAS: 7783-06-4
Dermal LD50 = Not Applicable
LC50 = 600 ppm, 30 min. (Human)
Oral LD50 = Not Applicable

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced or spilled to soil or water, would be a RCRA "listed" hazardous waste, as would any soils or waters contaminated by spills of the material. This material is listed as hydrogen sulfide (U135). Further, this material, once it becomes a waste, is subject to the land disposal restrictions at 40 CFR 268.40 and must be treated prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT

Note: This material normally remains in plant and does not enter the public transportation system. i.e. rail, highway, air or water.

IMDG

ICAO/IATA

	LTD. QTY.	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)
Acute Health: Yes
Chronic Health: No
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....100%

EPA (CERCLA) Reportable Quantity (in pounds):
Petroleum Exemption applies to this material.

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....500

California Proposition 65:
Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):
-- None Known --

Carcinogen Identification:
This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

TSCA:
All components are listed on the TSCA inventory.

International Regulations:

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Domestic Substances List: Listed
WHMIS Hazard Class:
B1 - Flammable Gases
D1A - Materials Causing Immediate and Serious Toxic Effects - Very Toxic Material
D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	13-Oct-2005
Previous Issue Date:	28-Dec-2000
Revised Sections or Basis for Revision:	Responsible party (Section 1) Added facility synonyms - SEE SECTION 1.
MSDS Code:	001909

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.B

REQUEST FOR APPROVAL TO ACCCEPT SOLID WASTE

OCD FORM C-138

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-138
Revised August 1, 2011

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. Generator Name and Address:

2. Originating Site:

3. Location of Material (Street Address, City, State or ULSTR):

4. Source and Description of Waste:

Estimated Volume _____ yd^3 / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd^3 / bbls

5. GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS

I, _____, representative or authorized agent for _____ do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency* ☐ *Monthly* ☐ *Weekly* ☐ *Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. Transporter:

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #:

Address of Facility:

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☐ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: _____ TITLE: _____ DATE: _____

SIGNATURE: _____ TELEPHONE NO.: _____

Surface Waste Management Facility Authorized Agent

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
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ATTACHMENT II.3.C

DAILY AIR AND WATER INSPECTION REPORT FORM H_2S MONITOR

(TYPICAL)

ATTACHMENT II.3.C
Daily Air and Water Inspection (Typical)
Sundance West

YEAR_____ MONTH_____ WEEK BEGINNING_____

AMBIENT AIR WIND SPEED/DIRECTION
A.AM READINGS, NOTE INTIALS AND TIME
B.PM READINGS, NOTE INTIALS AND TIME
SUMP LEVELS
A. POND AND SLAB CHECKED DAILY,NOTE INTIALS AND TIME
B. PUMP SUMP CHECKED AM & PM,NOTE INTIALS AND TIME
C. LOADING AREA SUMP CHECKED AM & PM, NOTE INTIALS AND TIME

LOADING SUMP EMPTIED
A. LOADING AREA SUMP EMPTIED AT 4 PM, NOTE INTIALS AND TIME
CONCRETE SLAB EMPTIED
A.SLAB EMPTIED AT 4 PM, NOTE INTIALS AND TIME

Date	Sun	Mon	Tues	Wed	Thu	Fri	Sat
Ambient Air H2S (AM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Ambient Air H2S (PM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Sump Levels							
AM Pond Sump (ft)							
AM Cement Slab (ft)							
AM Loading Area (ft)							
AM Pump House Sump (ft)							
Intials and Time							
PM Loading Area (ft)							
PM Pump House(ft)							
Intials and Time							
Loading Sump Emptied							
Intials and Time							
Concrete Slab Emptied							
Intials and Time							
Pond Conditions							
Pond Level							
Overflow Color							
Pond Color							
Water Temperature							
pH							
Dissolved Oxygen							
Total Chlorine							
Dissolved H2S/Sulfides							
Bleach/Chemical							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Manager Verification							
Intials and Time							

APPLICATION FOR PERMIT
SUNDANCE WEST

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ATTACHMENT II.3.D

INCIDENT REPORT FORM (TYPICAL)

INCIDENT REPORT FORM
Sundance West

Lea County, NM

Type of Incident and General Information

- ❑ Work Related Injury/Illness
- ❑ Property Damage
- ❑ Vehicular Accident
- ❑ Unsafe Act/Near Miss
- ❑ Vandalism/Criminal Activity
- ❑ Other _____ (i.e., spill, release, fire, explosion, hot load, etc.)

Employee Name: _____ Job Title: _____

Phone No: _____ Date of Incident: _____ Time of Incident: _____ AM/PM

Location of Incident: _____

Start of Shift:_____ Weather:_____

Date and Time Reported to Management: Date: _____ Time: _____ AM/PM

Reported to: _____ Title: _____ Reported by: _____

What was the injury category of incident at the time it was first reported to management?

[ ] N/A. Employee does not claim an injury associated with this incident
[ ] Notice Only of Injury, Declined Medical Treatment at this time
[ ] First Aid done on site, Declined Medical Treatment at this time
[ ] Medical Treatment. Transported by _____ to _____
[ ] Fatality, employee

THIS SECTION FILLED OUT BY EMPLOYEE

Employee's Description of Incident / Declaración del empleado de los hechos

Were you injured? *(Ud. se lastimó ?)* **Yes [ ] No [ ]**

Type of Injury: *(Tipo de lesión)* _____

Part of Body: _____ Left _____ Right _____
(Parte del cuerpo) *(Izq)* *(Der)*

Explain in your own words what happened. *(Explique en sus propias palabras lo que sucedió)*

_____

_____

_____

_____

_____

Employee Signature: (*Firma del empleado*) _____

Date: (*Fecha*) _____

INCIDENT REPORT FORM
Sundance West

TO BE FILLED OUT BY EMERGENCY COORDINATOR

Describe in order of occurrence the events leading to the incident and/or injury. Reconstruct the sequence of events that led to the incident. _____

_____

_____

_____

_____

Identify possible hazards to human health or the environment: _____

_____

_____

_____

_____

Identify name and quantity of material(s) involved: _____

_____

_____

_____

_____

CORRECTIVE ACTIONS. (Equipment, Practices, Environment, Retraining) Steps that have been, or will be taken to prevent recurrence: _____

_____

_____

_____

_____

Date Corrective Action Completed: _____

- I have been briefed on the corrective actions outlined above
- *Estoy consciente de las acciones correctivas mencionadas anteriormente en esta hoja*

_____
Employee's Signature

_____
Date

Report Reviewed and Concluded By:

_____
Emergency Coordinator's Signature

_____
Date

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.E

RELEASE NOTIFICATION AND CORRECTIVE ACTION

OCD FORM C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company	Contact
Address	Telephone No.
Facility Name	Facility Type

Surface Owner	Mineral Owner	API No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

Latitude_____ Longitude_____

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name:	Approved by Environmental Specialist:	
Title:	Approval Date:	Expiration Date:
E-mail Address:	Conditions of Approval:	Attached ☐
Date: Phone:		

* Attach Additional Sheets If Necessary