

NM1-60

**Permit
Application**

1/1/15

January 01, 2015

Mr. Jim Griswold-Environmental Bureau Chief
Gabriel Wade – OCD Attorney
1220 S. St. Francis
Santa Fe, NM 87505

Reference: C-137 Application for TRT Inc.

Subject: Minutes of Meeting

Dear Jim and Gabe:

On behalf of TRT Inc., please find attached a final C-137 application form and additional information to amend the previously submitted draft application as discussed during our meeting held on Wednesday December 31, 2014.

OCD pointed out three basic Issues as listed below, and TRT has addressed each issue with a response and action that amends the original Draft Submittal.

Issue #1: The C-137 needs to be submitted without modifications and dated to finalize the final submittal date.

Response & Action: A revised and complete C-137 form is attached hereto pursuant to OCD recommendations.

Issue #2: 19.15.36.8.C (5) engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

Response & Action: TRT specifically addressed this issue in the draft permit application and provided a common sense rationale for not having a professional engineer (PE) review and approve.

During the meeting several different scenarios were discussed, one being, the majority of all tank batteries are not required to have such approval, nor any above ground tanks, trucks, and trailers in the oilfield, including most best management practices, such as surface secondary containment liners.

This facility basically mirrors such operations, and the fact the original intent of the rule were for very large integrated waste disposal systems such a large pits, ponds, and landfills that requires a very specific engineering design to prevent premature failure.

TRT hereby request this requirement be waived pursuant to 19.15.36.19 (Exceptions and Waivers) and feels the pre-designed and proven operational re-cycling units and the API designed tanks and ANSI/ASME stamped piping provides an adequate alternative.

Issue #3: The OCD staff requested clarification concerning 19.15.36.8.C.15. **(b) Laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;**

The TRT Inc application stated this was **“Not Available.”**

TRT Inc had pointed out in 19.15.36.8.C.15 (c) *depth to, formation name, type and thickness of the shallowest fresh water aquifer; That this was “Non-Applicable”,* according to available records there are no active shallow fresh water aquifers located less than 50 feet below the surface that could be used in a beneficial manner, notwithstanding there could be some very limited interstitial water found on an intermittent time basis, depending upon recent rainfalls.

The Application also provided information pertaining to past OCD findings:

“There are no identified (designated by NMOSE) shallow fresh water aquifers under the site area that is potable or have been put to beneficial use. OCD established this finding in the Order R-3221 exception for this area. Referring to the potentiometric map show above, the only beneficial water identified is located in the Triassic Formation at a depth of greater than 300 feet below surface”.

In addition, TRT Inc. has committed to “Best Management Practices” (BMP’s) by installing a secondary liner under the entire facility.

While the agency acknowledged the findings, it needed a reason or exception or request for waiver as to why this was not supplied.

Response & Action: TRT hereby request this requirement be waived pursuant to 19.15.36.19 (Exceptions and Waivers) and feels the supplied hydrogeology background of the site and the past OCD rulings concerning water in this area provides the agency with sufficient information to allow an exception to this requirement plus the fact BMP’s are planned on being used.

Other issues brought to light during the meeting, but not necessarily requiring any action or response, was the issue of the definition of produce water, as defined by the New Mexico Statutes and subsequent rules and regulations.

TRT Inc’s permit application clearly mentions the re-cycling of regulated produced water and TRT Inc. hereby agrees with OCD’s broad interpretation of produced water. TRT Inc hereby agrees with only re-cycling produced water as regulated by the agency, unless otherwise specifically approved by the agency on a case-by-case basis, or by general authority allowed by other OCD rules and regulations, such as the current “Produced Water Rule” 19.15.34 NMAC, or subsequent rules pertaining to “Produced Water”.

In addition, TRT Inc understands it is not allowed to “TREAT” hazardous waste as defined by the EPA RCRA CFR Parts 260-282.

We are requesting that the Oil Conservation Division (OCD) accept the C-137 as a final application in order that an Administrative Completeness Approval pursuant to the Surface Waste Management rules and regulations can be issued as soon as possible.

Sincerely,



Wayne Price-Price LLC
312 Encantado Rd CT NE
Rio Rancho, NM 87124
wayneprice77@earthlink.net
505-715-2809

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

For State Use Only:

Form C-137
Revised August 1, 2011

Submit 1 Copy to Santa Fe Office

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

A meeting should be scheduled with the Division's Santa Fe office Environmental Bureau prior to pursuing an application for a surface waste management facility in order to determine if the proposed location is capable of satisfying the siting requirements of Subsections A and B of 19.15.36.13 NMAC for consideration of an application submittal.

1. Application: New Modification Renewal
2. Type: Evaporation Injection Treating Plant Landfill Landfarm Other
3. Facility Status: Commercial Centralized
4. Operator: Triple R Two Inc. (TRT)
Address: 1927 Talbott Guymon, OK 73942 Site Address: US HWY 62-180 27 East Carlsbad, NM
Contact Person: Ray Reid-President & General Manager Phone: Office: 580-338-4505 Cell: 580-461-1955
5. Location: SE /4 NW /4 Section 27 Township 20S Range R32E
6. Is this an existing facility? Yes No If yes, provide permit number NA
7. Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. Specify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the facility. See Attached
8. Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter. See Attached
9. Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter. See Attached
10. Attach 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. See Attached
11. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments. See Attached
12. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC. See Attached
13. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC. See Attached
14. Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that apply to surface waste management facilities. See Attached

15. Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).

See Attached

16. Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act). See Attached

17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC. See Attached

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options. See Attached

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC See Attached

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment. See Attached

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC. See Attached

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site; See Attached

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site; See Attached

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer; See Attached

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer; See Attached

(e) geologic cross-sections; See Attached

(f) potentiometric maps for the shallowest fresh water aquifer; and

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed. See Attached

23. In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing. See Attached

24. The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders Acknowledge.

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name: Wayne Price-Price LLC

Title: Agent/Consultant for TRT INC.

Signature: 

Date: January 1, 2015

E-mail Address: Wayneprice77@earthlink.net

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
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- 1 Application: New Modification Renewal
- 2 Type: Evaporation Injection Treating Plant Landfill Landfarm **Water Re-Cycling**
- 3 Facility Status: Commercial Centralized
- 4 Operator: Triple R Two Inc. (TRT)
- Address: 1927 Talbott Guymon, OK 73942 Site Address: US HWY 62-180 27 East Carlsbad, NM
- Contact Person: Ray Reid-President & General Manager Phone: Office: 580-338-4505 Cell: 580-461-1955
- 5 Location: SE /4 NW /4 Section 27 Township 20S Range R32E
- 6 Is this an existing facility? Yes No If yes, provide permit number NA

Line Items 7-24 **See Attachment Section Below:**

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name: Wayne Price-Price LLC

Title: Agent/Consultant

Signature:



Date: November 28, 2014

E-mail Address: Wayneprice77@earthlink.net

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

Attachments: Line Items 7-23

7. *Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. Specify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the facility.*

CEO: Ray Reid (25%)

1927 Talbott Guymon, OK 73942

Secretary: Janet Reid (25%)

1927 Talbott Guymon, OK 73942

Working Interest Partners:

Jeffrey Reid (25%)

1927 Talbott Guymon, OK 73942

Mark Pacheco (25%)

P.O. box 70, San Luis, Colorado, 81152 phone: 202 830 5491

8. *Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter.*

Please find enclosed below an annotated 2007 cutout from the Hobbs USGS Topo map produced by the US BLM. The map depicts the site location as being more or less in the SE/4-NW/4 of Section 27-Township 20S-Range 32E, located directly on the south side of US Highway 62-180, and lies approximately halfway between Hobbs, NM and Carlsbad, NM in Lea County, NM.

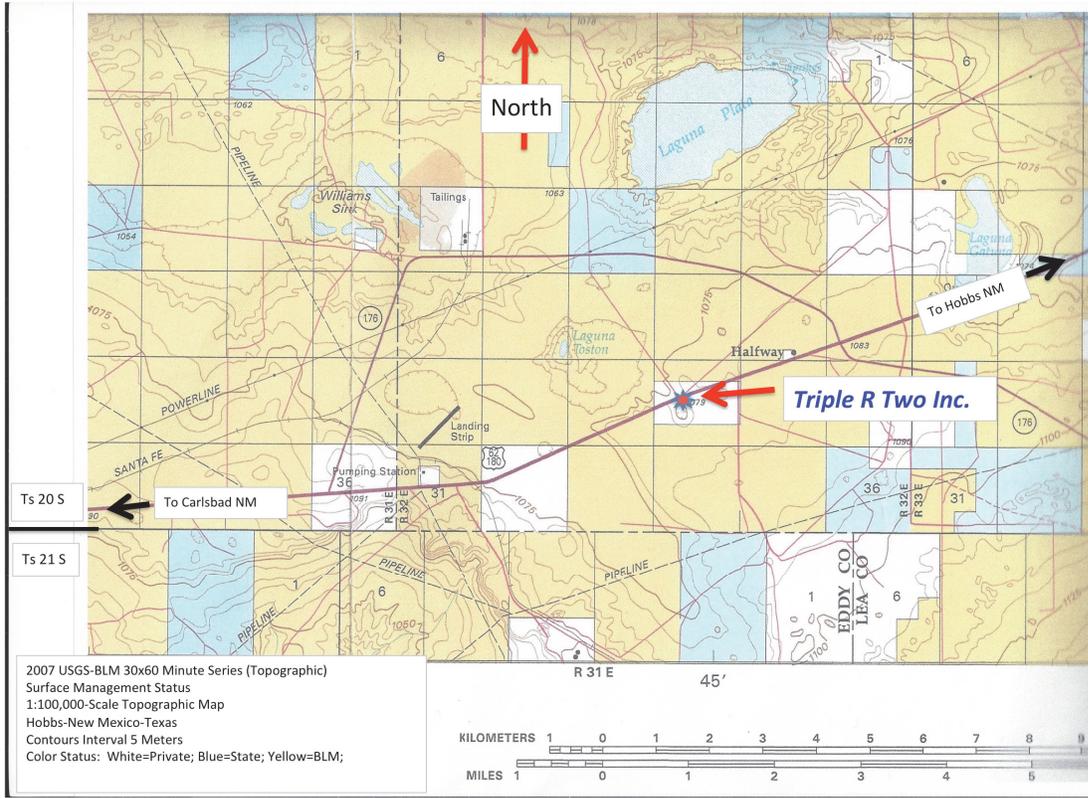
There are no perennial watercourses in the area, nor any in all of Lea County, NM. The map shows a number of natural salt playas located mostly to the northwest, north and northeast of the site. In addition, a depressed area is noted just south of the site located on adjacent private property of R-360, a commercial waste disposal facility permitted by the NMOCD that has unlined produced water pits and large contaminated soil piles.

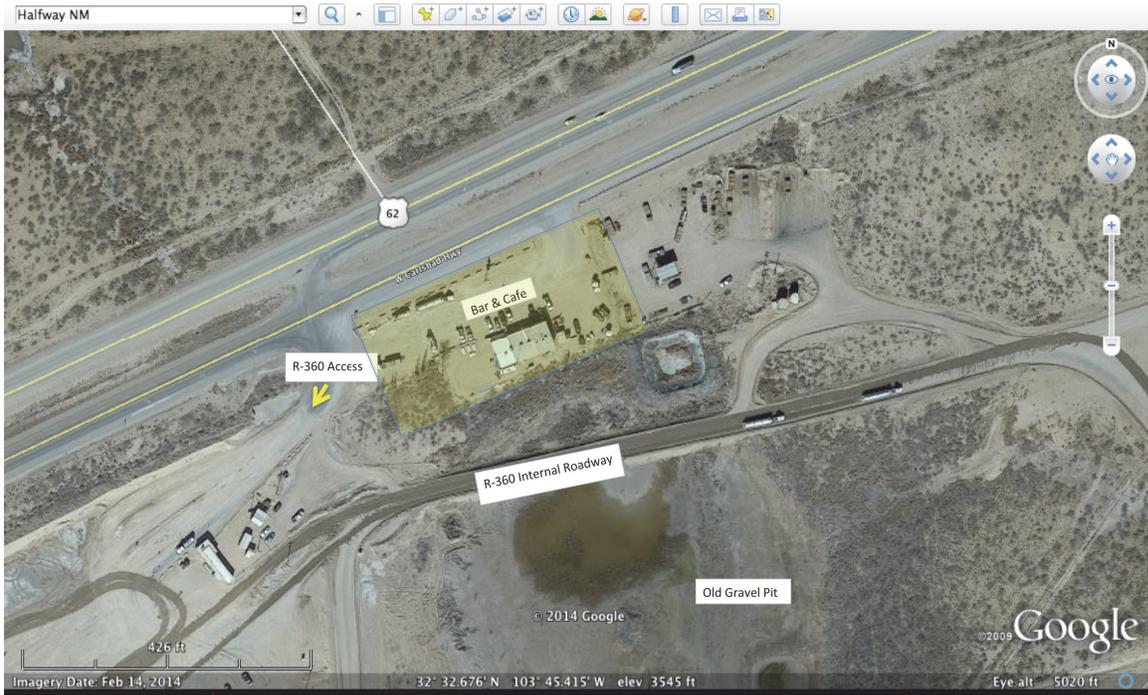
The Topo Map reveals the site is relative flat on the east side of the highway, with a more defined dip commencing on the west side of US 62-180 towards the Laguna Toston Salt Playa Lake. Laguna Toston has been used as a brine water sales operation, pumping water from the lake area. Past practices of the local potash mines have used this lake as a discharge of process wastewater.

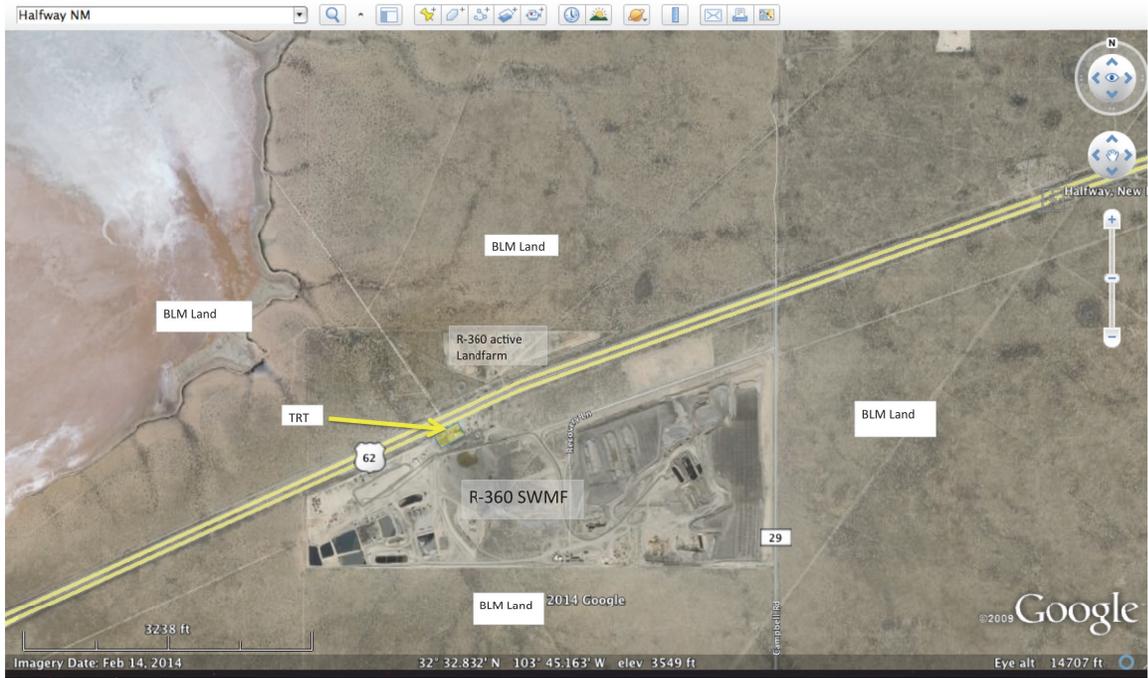
The map does not show or reflect any fresh water sources, including wells and springs. It should be noted, as observed by Wayne Price-Price LLC, all of these salt playas have at times intermittent salt-water seeps around the edges on the rim of these lakes.

There are no inhabited residences or public buildings near the site, other than the local commercial business buildings of both the Half-Way Bar & Restaurant operations and R-360 operations. TRT has a working lease agreement with the Bar & Restaurant owner, and TRT has plans to raze two-thirds of the facility to make room for TRT's operations. The owner had indicated a small portion of the building will be maintained as an office.

Please find enclosed below two aerial plat photos showing the Half-Way Bar and Restaurant operations and the general plat area of the R-360 operations.







9. *Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter.*

Sited Land Owner:

**Mike and Lorena Burton
520 Russell
Carlsbad, NM 88220**

Adjacent Land Owners within One Mile:

**Carlsbad Field Office
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220**

**R360 Environmental Solutions
3 Waterway Square Place Suite 110
The Woodlands, TX 77380**

10. *Attach 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.*

description of the surface waste management facility with a diagram;

Triple R Two Incorporated (TRT) intends to install and operate an oilfield water treatment process that will recycle, reclaim and reuse certain and approved oilfield waters. TRT's project will utilize the proprietary patent pending "Water Re-use" technologies of Mobil H2O Services along with standard API tanks commonly used in SWD tank battery operations.

The process will remove oil, organics, heavy metals, and suspended-dissolved solids from approved oilfield produced waters. The system will generate different qualities of water ranging from fresh to clear water brine depending upon the customers' specifications and requirements.

Please find enclosed below a generic process summary (Exhibit A), different stages of filtration (Exhibit B), and a general process schematic (Exhibit D). Process may vary depending upon quality of product needed.

Exhibit A (Summary)

Proposed Filtration flow summary (<http://www.mobileh2oservices.com/>)

Water will be transported by water trucks and stored in mobile tanks allowing the entire system to be utilized at multiple locations.

1. The first step of the process will be for the water to pass thru a weir type skimmer system that will remove oil residuals that will be captured in specific barrels for resale.
2. The second step of the process allows the produced water will then enter into the filtration unit. The general dimensions of the unit are 8'6" x 53" with all equipment residing on a multi axle trailer. Secondary containment that consists of a fiber base mat and 18" h x 12' w x 53' L Polypropylene mobile containment will be placed on the ground and then the filtration unit backed into the containment area.
 - 2.1. Stage one involves electrolysis, which promotes the binding of dissolved solids and coagulation of suspended solids enhancing our filtration.
 - 2.2. Stage two allows the water to water to pass through a dissolved air flotation tank. This increases the oxygen level within the water promoting solids binding for filtration at later stages.
 - 2.3. Stage three consists of two media tanks that are typically filled with sand acting as a filter with water entering from the top then settling thru the sand and exiting the bottom.
 - 2.4. Stage four consists of the water entering into membrane type ultrafiltration modules that are designed to remove suspended and dissolved solids down to .8 micron in size.
 - 2.5. Stage five consists of the water entering into a membrane based reverse osmosis modules that produce a filtrate finished water and a permeate reject water that is unable to pass thru the membrane.
 - 2.6. The rejected water along with any backwash process waters/solids will be pumped into a tanker and returned to the SWD (salt water disposal) site and handled under current guidelines for disposal.
3. See the photo below for an actual Mobile H2O system. The system is placed and operated from a 53-foot trailer and capable of being powered by using its own generator. The Mobile H2O system is rated to produce 300 gallons per minute of freshwater depending on the quality of the untreated raw water.





Exhibit B

Mobile H₂O Services

Mobile H₂O Services

Solving water challenges one gallon at a time

Seven Stage Mobile filtration unit

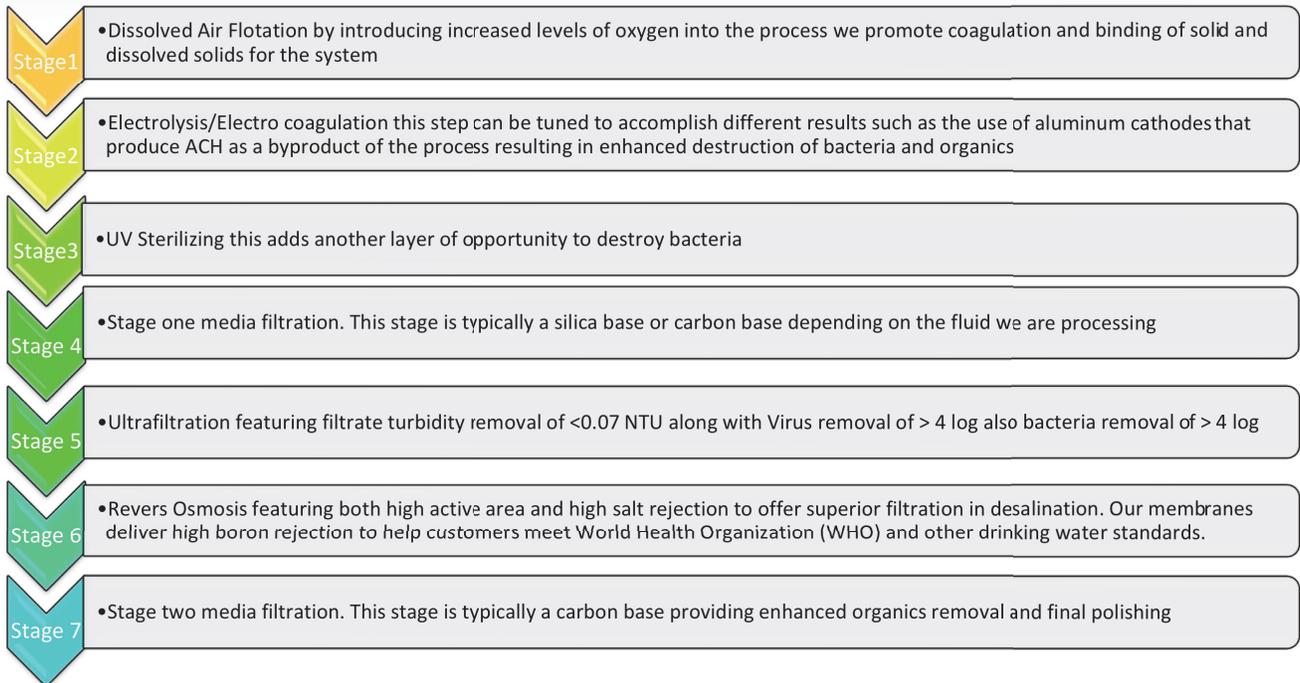
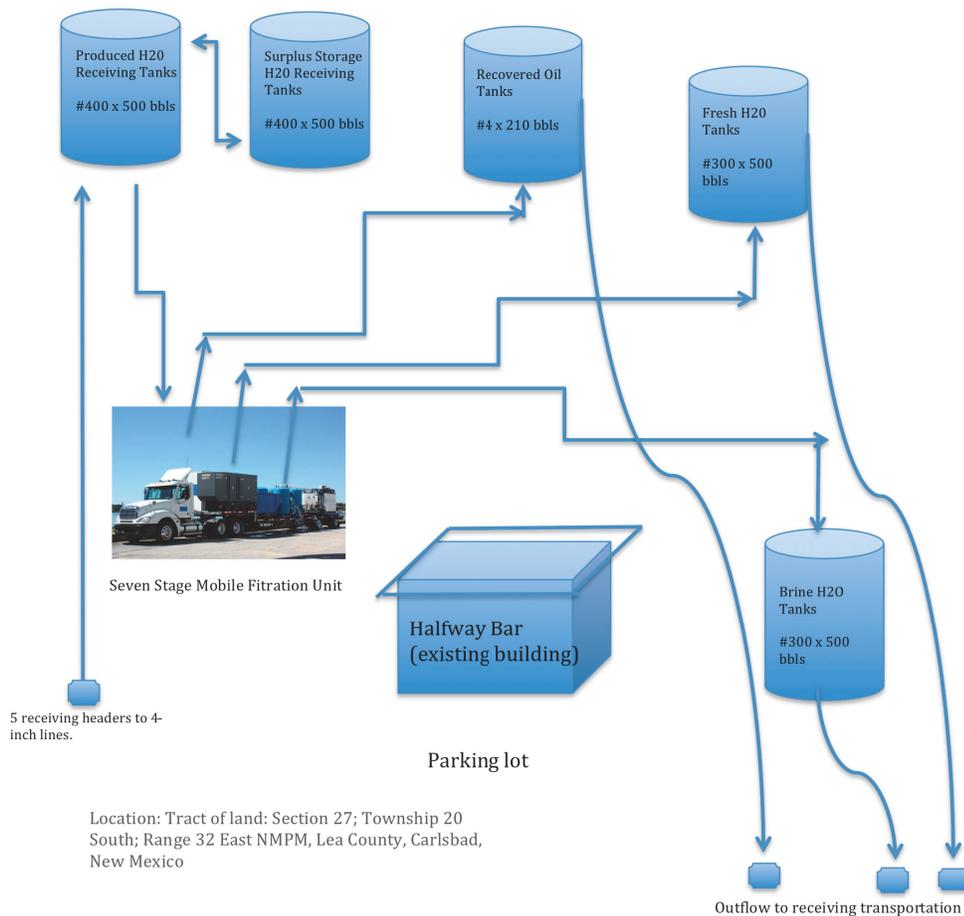


Exhibit D (Schematic)



10 Cont: 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.

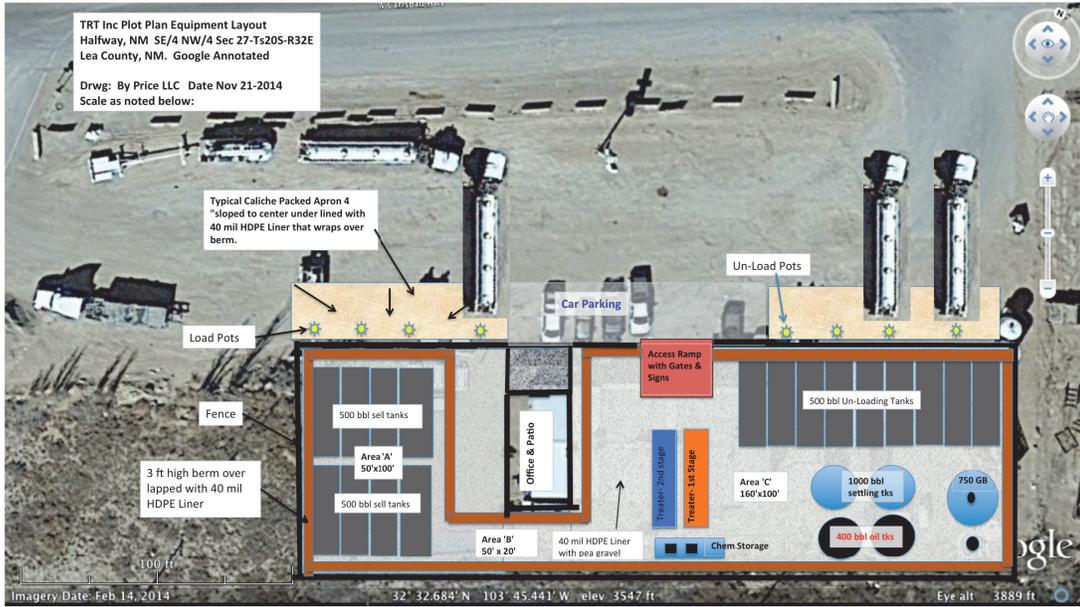
Please find enclosed below in Line 11, a certified survey, plat that includes the general layout, elevations and drainage features.

11. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

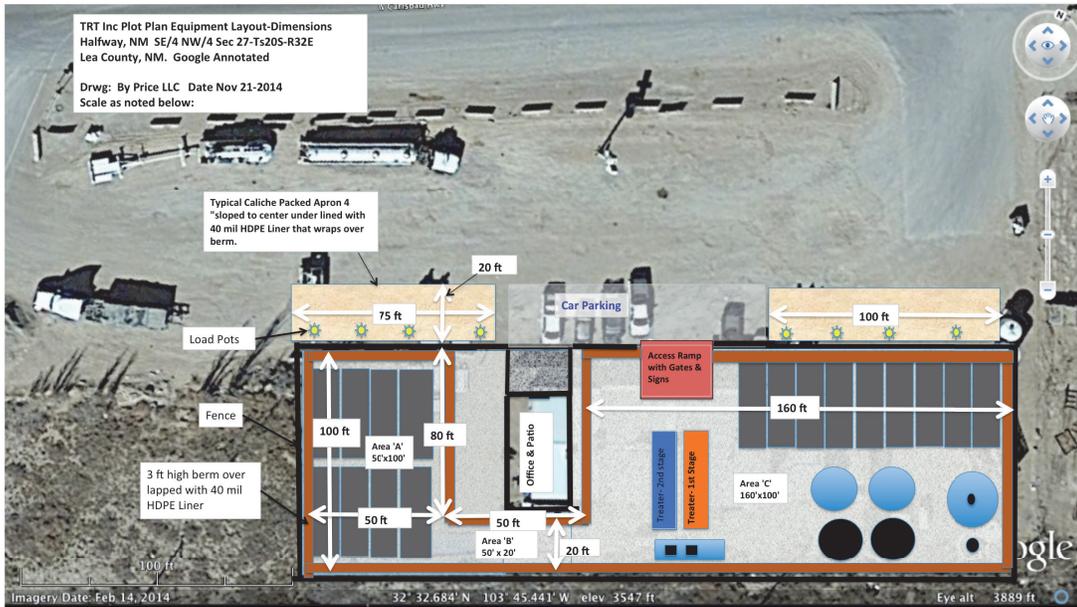
Please find attached below a **“Certified Survey”** describing the legal description, the **“TRT Inc Plot Plan Equipment Layout”** showing the general proposed equipment layout for all tanks, fences, gates, liner, berms, chemical storage areas, loading areas, drainage paths, and other significant features.

Also included is a **“Site Dimension Drawing”** reflecting the general size and shape of the proposed facility including calculated volumes and a **“Layout Detail Drawing”** reflecting general construction details and specifications required of the contractor.

This proprietary water treating process does not require a profession engineer to set-up or operate, and TRT has no plans for a permanent surface impoundment or waste disposal facility. The system generally will consist of a series of standard API tanks normally used throughout the oilfield.

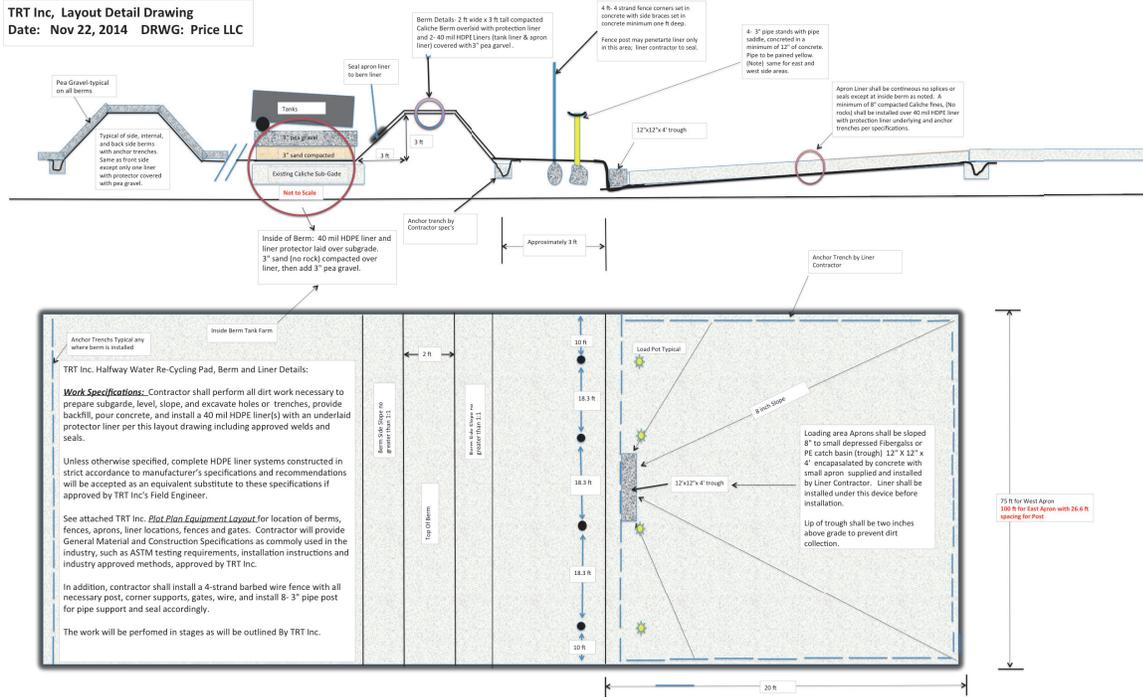


Area 'A' = 50' x 100' = 5000 ft² Vol= 50x100x3x7.46/42= 2664 bbl's Area 'B' = 50' x 20' = 1000 ft² Vol=50x20x3x7.46/42= 533 bbl's Area 'C' = 160x100 = 16,000 ft² Area 'C'
 Vol=160x100x3x7.46/42= 8526 bbl's **Total estimated 3 ft berm holding capacity inside Berm = 11,723 bbl's** The 3 ft high volume displacement of all tanks and equipment reduces the
 holding capacity by about 4000 bbls, thus the net holding capacity of the berm = 11,723-4000 bbls = 7,723 bbls. Note: The largest set of inter-connected tanks = 4500 bbl's x 1.33 = 5985 bbl's
 so the net reserve capacity equals approximately (7723-5985) = 1738 bbls.



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 5985 bbl's so the net reserve capacity equals approximately (7723-5985) = 1738 bbls.

TRT Inc, Layout Detail Drawing
 Date: Nov 22, 2014 DRWG: Price LLC



12. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC.-See Below which addresses applicable rule items:

13.D: C-133's- TRT will require all transporters to have a valid C-133 for predominantly liquids.

13.F: Waste and Product Acceptance- TRT will not allow or accept any non-oilfield or hazardous waste, unless specifically approved by OCD.

TRT will routinely accept exempt oilfield wastewaters, products or by-products of exempted oilfield waste, such as, but not limited to, produced water, oily produced water, high TSS/TDS produced water, off-spec crude oils and oil-water emulsions, certain BS&W contained in waters, contaminated fresh waters generated from oil and gas operations such as leaks and spills, de-water from drill cuttings, water from frac flow back tanks and pits, water from drilling pits, storage pits, tanks, vessels, trucks, frac flow-back water, well testing water, well flow-back water, well fluids circulated out of hole, and;

including non-exempt non-hazardous waters from upstream and downstream oilfield operations, including gas plants, compressor stations, drip pots, sumps, below-grade tanks, pipelines, pipeline hydro-test waters, refineries, and off-spec brine waters.

TRT does not anticipate any issues with “NORM” Naturally Occurring Radioactive Material in any incoming waste or product. TRT will test for “NORMS” on a routine basis for all products leaving the site until OCD accepts verification TRT has sufficient process knowledge.

TRT may use certain OCD regulated, and non-regulated fresh and non-protectable water, non-potable water, high TDS waters found in certain aquifers and wells permitted pursuant to the office of the State Engineer, for co-mingling, blending, mixing, processing, and treatment of oilfield waters.

TRT’s water treatment and recycling process generally considers the above mentioned incoming waste as products, as long as a majority (greater than 70%) of the incoming material is converted into a sellable, tradable or product of value that can be reused beneficially in the oil and gas industry.

All recycled or reclaimed water will be use exclusively in both upstream and downstream oil and gas operations. The final disposition of the water will be at the sole discretion of the end user.

TRT will not provide any treated water to a Non-Oilfield application unless specifically approved by OCD by obtaining a minor modification of the permit.

f.1&.2-C-138’s: Non-Applicable since all waste received will be in liquid form and utilizing the C-133 process. **TRT WILL NOT ACCEPT SOLIDS SUCH AS OILY SLUDGE, TANK BOTTOMS, CEMENT, SOLID MATERIALS IN GENERAL.**

Waste Streams. The following are anticipated waste streams:

1. **BS&W from off-spec treatment.**
2. **Tank Bottoms consisting of oily sludge and BS&W from primary treating tanks, i.e. Gun Barrel.**
3. **Filters, domestic trash, and miscellaneous oilfield trash.**

Waste Disposal: TRT will dispose of all waste into an approved OCD facility utilizing the C-133 (Liquids) and C-138 (Solids) form process. **Special Note:** The majority of all waste will be from RCRA exempted oilfield operations and TRT plans on utilizing the allowed RCRA mixture rule to claim an exemption for all waste generated on-site.

13. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC.- See Below which addresses applicable rule items including some operational requirements.

G. The operator of a commercial facility shall maintain records reflecting the generator, the location of origin, the location of disposal within the commercial facility, the volume and type of oil field waste, the date of disposal and the hauling company for each load or category of oil field waste accepted at the commercial facility. The operator shall maintain such records for a period of not less than five years after the commercial facility’s closure, subject to division inspection.

Attached are forms to be used to log Incoming-Outgoing waters. All records shall be maintained on-site for a period of five years.

	A	B	C	D	E	F	G	H	I	J	K
1											
2	TRT Inc. Incoming Water Log										
3											
4											
5	<p><i>19.15.36 NMAC 13.G. The operator of a commercial facility shall maintain records reflecting the generator, the location of origin, the location of disposal within the commercial facility, the volume and type of oil field waste, the date of disposal and the hauling company for each load or category of oil field waste accepted at the commercial facility. The operator shall maintain such records for a period of not less than five years after the commercial facility's closure, subject to division inspection.</i></p>										
6											
7											
8											
9		Date	Time	Trucking Company	Valid C-133	Generator or Company	Lease or Location	Volume in BBls	Catorgory	Product status	
10											
11	Example	10-Dec-14	8:00 AM	Key Energy	C133-507	Chevron	Chev Tobac smith lease	90	produce water	exempt	
12											
13											
14											
15											
16											
17											
18											

	A	B	C	D	E	F	G	H	I	J	K
1	TRT Inc. OutGoing Water Log										
2											
3											
4											
5	19.15.36 NMAC 13.G. The operator of a commercial facility shall maintain records reflecting the generator, the location of origin, the location of disposal within the commercial facility, the volume and type of oil field waste, the date of disposal and the hauling company for each load or category of oil field waste accepted at the commercial facility. The operator shall maintain such records for a period of not less than five years after the commercial facility's closure, subject to division inspection.										
6											
7											
8											
9		Date	Time	Trucking Company	Valid C-133	Generator or Company	Lease or Location	Volume in BBls	Intended use	Product status	
10	Example	10-Dec-14	8:00 AM	Key Energy	C133-507	Chevron	Chev Tobac smith lease	90	Frac Water	exempt	
11											
12											
13											
14											
15											
16											
17											

H. Disposal at a commercial facility shall occur only when an attendant is on duty unless loads can be monitored or otherwise isolated for inspection before disposal. The surface waste management facility shall be secured to prevent unauthorized disposal.

TRT will initially have an operator on-site for accepting incoming and loading outgoing waters and to operate the treating process. Once system has been up and running and proven, plans are to have an un-attended unload-load process in place and TRT will seek OCD approval on the process to be used.

I. To protect migratory birds, tanks exceeding eight feet in diameter, and exposed pits and ponds shall be screened, netted or covered. Upon the operator's written application, the division may grant an exception to screening, netting or covering upon the operator's showing that an alternative method will protect migratory birds or that the surface waste management facility is not hazardous to migratory birds.

Non-Applicable since all tanks will be closed systems, and no pits are anticipated.

Surface waste management facilities shall be fenced in a manner approved by the division.

Agree and listed in Line Item 20 below, Best Management Practices

J. Surface waste management facilities shall have a sign, readable from a distance of 50 feet and containing the operator's name; surface waste management facility permit or order number; surface waste management facility location by unit letter, section, township and range; and emergency telephone numbers.

Agree and listed in Line 20 below, Best Management Practices.

K. The operators shall comply with the spill reporting and corrective action provisions of 19.15.30 NMAC or 19.15.29 NMAC.

TRT Acknowledges and agrees with spill reporting and corrective actions per 19.15.30 NMAC or 19.15.29 NMAC. Enclosed is a copy of OCD's spill reporting 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? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input type="checkbox"/> 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:		<u>OIL CONSERVATION DIVISION</u>
Printed Name:		Approved by Environmental Specialist:
Title:	Approval Date:	Expiration Date:
E-mail Address:	Conditions of Approval:	Attached <input type="checkbox"/>
Date:	Phone:	

* Attach Additional Sheets If Necessary

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; **TRT does not plan on having any designated sumps.**

(2) semi-annual inspection and sampling of monitoring wells as required, with analyses of ground water furnished to the division; and maintenance of records of inspection dates, the inspector and ground water monitoring wells' status; and

Currently there are no Monitor Wells on site.

(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.

Attached is a weekly site operational, maintenance and safety inspection sheet to be used and maintained for a minimum of five years. TRT will conduct a weekly safety meeting and note any issues on this log.

	A	B	C	D	E
1					
2					
3					
4			TRT Site Weekly Inspection LOG		
5					
6					
7					
8					
9	Date		Check Off if OK or NA		Comments-Log Issues or work performed to correct
10					
11		Berms and Liner Intact			
12		Load-Unload lines Catch Basins Empty			
13		All Valves in good working order			
14		Vents and Thief Hatches Working Properly			
15		Lightning Protection in Place			
16		Ground wires properly connected			
17		Level Controls Working			
18		Treating System			
19		Emergency Shutdown & Procedures Working including Alarms			
20					
21					
22					
23		Windsock			
24		Signs			
25		H2S Monitors working			
26		Emergency Plan Posted, Readable and Up to Date			
27		Personal Hand Signals in Place			
28		Communication Systems Working			
29		Weekly Safety Meeting Conducted-Note any issues			
30					
31		Any reported Leaks and Spills >5 bbls			
32		Spills > 5 bbls was it reported to OCD & C-141 filed			
33		Water & Oil from normal operations removed and cleaned-up			
34		Any Nuisance Odor Complaints			
35		Rainwater Collection Removed and Recycled			
36					
37					
38		Emergency Response Plan Activated			
39					
40		Any waste generated on site this week?			
41					
42					
43					
44		Note: This report will be filed and saved for 5 years			
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					

14. *Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that apply to surface waste management facilities.*

Using the Gifford-Pascal equation provided in the rule for 100 ppm ($X=1.589*Q*C^{.6258}$) Radius of Exposure (ROE) and a 500 ppm ($X=.4546*Q*C^{.6258}$) ROE, using a worst case volume of 15,000 cubic feet/day determined by estimating fifteen 250 barrel volume turnarounds of the gun barrel tank, equates to a Radius of Exposure (ROE) of approximately 4.7 ft and 2.2 ft respectfully using a worst-case headspace of 500 ppm.

The site will not have a potentially hazardous volume (PHV) as defined by the rule, therefore, TRT will be exempted from supplying a H2S contingency plan pursuant to the rule.

TRT's previous process knowledge in similar systems, have experienced 100 ppm to 300 ppm. In an over abundance of precaution, TRT will use 300+ ppm for initially permitting purposes.

TRT will perform the regulatory threshold testing and re-calculation for PHV's of the worst-case tank (i.e. Gun Barrel) within 90 days after start-up, and provide the results to the agency. TRT will also sample once a year to determine the H2S requirements and submit the results to the agency.

TRT will install OCD approved H2S signs and markers at all entrance points, and load-unload areas. In addition all tanks or vessels that equal or exceed 300 ppm will have signs and restricted access. The site will have one windsock visible from the entire site. TRT will also fence the area with a standard 4 string bared wire with signs on all four sides, with locking gates.

All site personnel, will have been certified and received a minimum of 8 hours of training per year on H2S awareness, hazards, detection, personal protection and contingency procedures. Records shall be maintained for five years.

At least one TRT employee will have been certified to use H2S protective equipment including SCBA's or other equipment to safely handle any emergency situation. All employees will wear personal H2S monitors to detect a minimum of 10 ppm of H2S.

15. *Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).*

TRT has read and understands Subsection D of 19.15.36.18 CLOSURE AND POST CLOSURE: This section does not specifically address other surface waste management facilities such as a water recycling, reclaiming, and Treating facility. TRT will remove all tanks, equipment, liners, berms, piping, and electrical. The site will be razed and leveled to existing original contours. Depending upon the landowner, TRT may and may not re-vegetate this site, as it will most likely remain a commercial entity.

TRT proposes to sample under the liner at the lowest elevation where standing fluids may have accumulated. TRT will utilize the current pit rule closure standards or another approved method as agreed upon with the agency at time of closure. If it has been determined there was a release in exceedence of the agreed standards, then TRT will submit a C-141 release report and seek approval for an approved remediation method.

Please find enclosed a Third Party Closure Request for the Facility for a Worst Case Cost Estimate of \$89,151.00.

TRT would like to propose an approved financial assurance method starting off at \$50,000 and escalating by 7.8 % per year until the maximum amount is met in 10 yea

	A	B	C	D	E	F	G	H	I	J	K	L	M
2													
3				Price LLC									
4				312 Encantado Rd CT NE									
5				Rio Rancho, NM 87124									
6				505-715-2809									
7				wayneprice77@earthlink.net									
8													
9													
10													
11				Enclosed is a third party estimate for closing the TRT proposed facility.									
12													
13				Description		Gandy Corp.	unit hours	Tanks/Vol		Unit Cost			
14				1 Hook-up and remove 15 wheeled Frac tanks		Tractor	2	15		\$150		\$4,500	
15				2 Waste disposal-Liquid Trucking		Trailer	0.5	150		\$110		\$8,250	
16				3 Waste Liquid Disposl (15,000 bbl's)			\$1	15000		1.5		\$22,500	
17				4 Solid Waste Disposl (150 bbls) = .2 yards			1	30		28		\$840	
18				5 Solid Waste Trucking		Trucks	8	2		175		\$2,800	
19				6 Remove and dispose of liner			1	1		1		\$1	
20				7 Remove Gun Barrell and Oil Tanks			24	3		175		\$12,600	
21				8 Level and compact site		Dozer	16	1		235		\$3,760	
22				9 Remove Elect		Dixie	24	1		300		\$7,200	
23				10 Sampling sample cost		Trace	1	1		1		\$5,000	
24				11 Third party contractor		Price LLC	24	1		175		\$5,000	
25													
26												\$72,451	
27												\$10,868	Overhead 15%
28												\$5,832	Taxes 7%
29												\$89,151	Total
30													

16 Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act).

Attached is an Emergency and Contingency Plan for the facility, which will be posted on the entrance signs and gates, provided to the Agency and local emergency agencies including fire departments responsible for the site. Included is an area road map, site plot plan showing location of emergency equipment and ingress-egress evacuation routes and copies of MSDS for on-site chemicals.

TRT will copy OCD within five working days of any amendments, will conduct annual on-site training concerning general operations, permit conditions, emergency response actions, sampling, waste characterization and proper paper work, forms, manifest etc. Records will be maintained for five years.

The attached plan addresses common sense simple and concise actions to be taken, provides communication numbers to agencies, list the company emergency coordinators, provides a list of equipment, provides ingress-egress routes, training will include signals, alarms etc, provides MSDS of all expected harmful contaminates, provides locations of plans, on-site personnel activation criteria, differentia between or characterization of major and minor releases, addresses safe emergency stoppage, clean-up actions, and safe handling of waste.

TRT Inc. Half-Way Site Emergency Response & Contingency Plan

Site Address: US HWY 62-180
32 miles West of Hobbs, NM west side of
Lea County, NM. Halfway Between Hobbs and
Carlsbad New Mexico South Side of Highway in
Front of R-360 Oilfield Disposal Facility
See Map Attached-page 2

Emergency Coordinators:

Dale Johnson –Site Supervisor
E-mail: Dalej@mobileh2oservices.com
Shop: 850-484-5444
Cell: 850-549-6631

Ray Reid-Off-Site Contact
Email: rayreid@ptsi.net
Home: 580-338-4505
Cell: 580-461-1955 Other On-Site

Other On-Site Coordinators:

Name: _____
E-Mail: _____
Home: _____
Cell: _____

Emergency Contacts: 911

Lea County Sherriff Dep: 575-397-9265
Eddy County Sherriff Dep: 575-616-7155
NM State Police: 575-622-7200
NM Oil Conservation Division:
Hobbs Office: 575-393-6161
Artesia Office: 575-748-1283
Santa Fe Office: 505-476-3440
Jim Griswold- 505-660-1067

Plan Posting Locations:

1. Outside of Fence Area on Main Sign Entrance Points.
2. Inside of Fence Area at Main Control Point.

Plan Activation Criteria:

Uncontrolled Fire, Explosion, Deadly Gases (H2S >20 ppm at fence line), Chlorine Dioxide (>.3 ppm Odor at fence line) or any Major Liquid Releases or any Personnel Injury:

Immediately Evacuate Area and Call 911 or Other Emergency Contacts. Notify Emergency Coordinators, Call for any assistance needed such as safety gear, response equipment, additional personnel and perform shutdowns of all processes if can be done safely. Call OCD when time allows.

On-site Emergency Coordinators will interact with County and State Emergency response teams and provide site hazard information as required by law.

Controllable Releases that do not impose a significant threat to Human Health or the Environment:

On-site personnel with Contractor assistance, if necessary, will shut down certain processes in an orderly fashion, activate valves, pumps etc. to stop release. Perform corrective actions as necessary, and report to the Company Emergency Coordinators. Call OCD when time allows.

Working Equipment & Devices Maintained On-Site:

See plot plan attached (page 3) for safety equipment locations and evacuation routes, Fire Extinguishers, SCBA or other breathing apparatus, H2S Monitors, secondary containment devices, communication equipment, signs, flags, Lock-out devices and tags, and any other requirements per Federal, State or Local laws. **MSDS's (attached)¹**,

Waste Re-Cycling or Disposal:

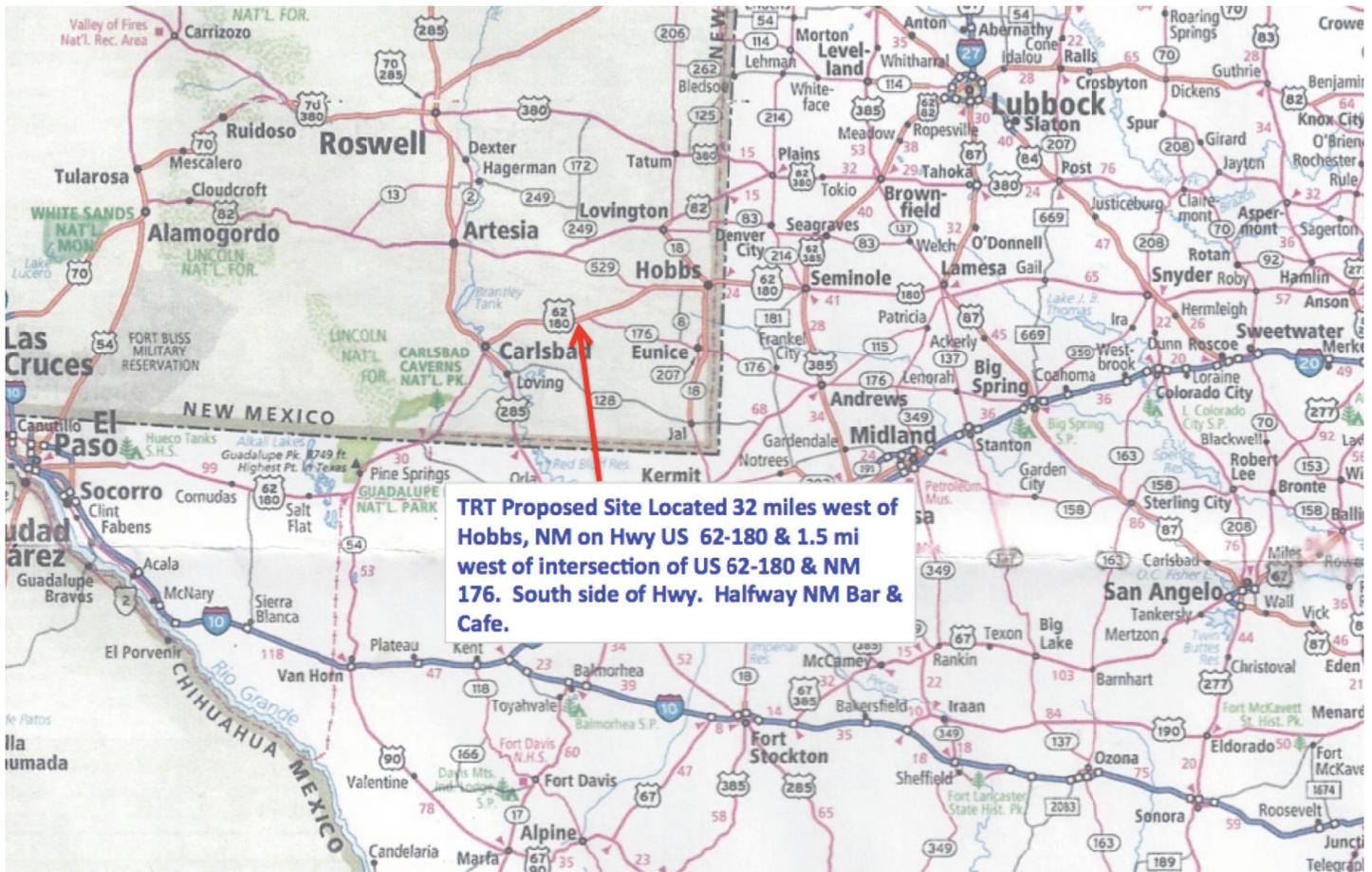
All flammable or combustible liquids shall be handled and recovered using common oilfield safe handling practices. Trucks shall be grounded, no plastic buckets, heat sources set at a minimum distance, fire retardant approved hard hats and clothing used, spark resistant tools etc. All waste disposed of off-site shall be tested or process knowledge used before disposal with approved paper work, forms or manifest.

Emergency Coordinator may amend plans or actions to improve safety for human health and the environment.

Plan Amendment and Training:

Any plan amendment shall be submitted to OCD within 5 working days. Annual Training shall be conducted which includes, emergency procedures, permit conditions, general operations, waste characterization, site hazardous and record retention.

¹ MSDS: Produce Water, Hydrogen Sulfide (H2S), Crude Oil, Sodium Chlorite, Sodium Bisulfate Monohydrate, Chlorine Dioxide.



17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC.

M. Each operator shall have a plan to control run-on water onto the site and run-off water from the site, such that:
 (1) the run-on and run-off control system shall prevent flow onto the surface waste management facility's active portion during the peak discharge from a 25-year storm; and

The facility will be constructed on the existing pad that presently contains the Bar & Restaurant area, which is approximately one foot higher than the immediate surrounding area. During the last major rain events (100-year storm) this area did not flood. The highway is constructed with a water run-off ditch, which allows rainwater to flow away from the site.

The process area will be contained within a three-foot high berm, that will in effect be four feet higher than the immediate surrounding area.

(2) run-off from the surface waste management facility's active portion shall not be allowed to discharge a pollutant to the waters of the state or United States that violates state water quality standards.

The approximate dimensions, area and volume inside of the berm process areas are shown on the "Plot Plan Equipment Layout" drawing above.

The total estimated 3 ft high berm-holding capacity; inside the berm area equals approximately 11,723 bbl. The 3 ft high volume displacement of all tanks and equipment reduces the holding capacity by about 4000 bbls, thus the net holding capacity of the berm equals (11,723-4000) = 7,723 bbls.

Using an estimated maximum holding volume of the largest set of inter-connected tanks inside of the berm, which is 4,500 barrels, and adding an additional 900 barrels for a 2-inch rainfall event would equal 5400 barrels.

Adding a diversity factor of 133%, equals approximately 7182 bbls. Therefore, the net reserve capacity equals approximately (7723-7182) = 541 bbls. It is important to point out that not all tanks and vessels will be interconnected where the total fluid volumes would be released.

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options.

Non-Applicable

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC.

Non-Applicable

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment.

TRT will use best management practices (BMP) in the following manner:

- 1. The entire facility will have a minimum of a 40 mil HDPE liner (i.e. secondary containment) under all process tanks and load-unload areas of the facility. The liner will be installed per the manufacture's recommended specifications using a certified installer.**
- 2. The site process area will be bermed and constructed to hold a total volumetric capacity of 1.33 of all interconnected tanks, vessels, etc. The berm will be covered with the liner and appropriate anchor trench installed.**
- 3. All load-unload lines will have isolation valves and hose connections contained inside of a mounted catch devices for deminimus leaks and drips.**
- 4. All tanks, vessels, piping systems will have adequate isolation, by-pass valves, level and metering devices where required in the process. Some devices will be automated while others will be manual control.**
- 5. All tanks or vessels will be installed aboveground; no pits or large sumps will be utilized in the process.**
- 6. Any vessel that has the capability of containing hazardous vapor pressures of one psig or above atmospheric pressure in the headspace above the liquid line, will be installed with pressure-vacuum devices, thief hatches and man-ways all per API specifications.**
- 7. All Electrical, grounding and lightning protection systems will be per the National Electrical Code (NEC). The system will have an emergency kill switch located outside of the berm area.**
- 8. All piping will be per API normal oilfield specifications and standard practices. No low pressure PVC pipe will be utilized and all hoses will be standard oilfield API approved for the service intended.**
- 9. All load-unload lines will have grounding connections.**
- 10. H2S monitoring and control will be pursuant to line item #14 above.**
- 11. TRT will record daily volumes of all water received and sold.**
- 12. TRT will install Company and Hazard signs per OCD requirements.**

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

A(5). No other surface waste management facility shall be located where ground water is less than 50 feet below the lowest elevation at which the operator will place oil field waste.

This area is covered under an existing exception to the original R-3221 order allowing unlined pits. The exception was based on the fact that no protectable water is encountered under the site and there are no beneficial public or domestic water wells within one mile of the site that has been identified.

The Original Order R-9166 and Case # 9882 for the CRI (now R-360) facility was approved based on these facts.

TRT will have primary and secondary containment devices to prevent any product or waste from reaching the ground.

B. No surface waste management facility shall be located:

(1) within 200 feet of a watercourse, lakebed, sinkhole or playa lake;

On site inspection by Wayne Price-Price LLC consultant for TRT, hereby certifies and confirmed the site is greater than 200 feet from any watercourse, lakebed, sinkhole, or playa lake. Please see the Item 8 above referencing the topo map and aerial photos.

(2) within an existing wellhead protection area or 100-year floodplain;

This area is located in the western part of the Lea County in the Capitan Domestics underground water basin as defined by the NM Office of State Engineers (NMOSE). Geographically it is defined where the Querecho Plains of SENM merge into the alluvium Laguna Valley.

The NMOSE waters data base did not reveal any records of permitted water wells located in Sections 21,22,23,26,27,28,33,34 or 35 in Township 20S-Range 32E. Copy of record is enclosed below.



New Mexico Office of the State Engineer Water Column/Average Depth to Water

No records found.

PLSS Search:

Section(s): 21, 22, 23, 26, 27, 28, 33, 34, 35
Township: 20S
Range: 32E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

10/31/14 10:06 AM

Page 1 of 1

WATER COLUMN/ AVERAGE
DEPTH TO WATER

(2) cont: within an existing wellhead protection area or 100-year floodplain:

The FEMA Floodplain designated area is identified as #35015C0875D (Attached for Reference) and currently no map is printed for this area. September of this year Hurricane Idile caused heavy flooding in all of SE New Mexico and parts of West Texas.

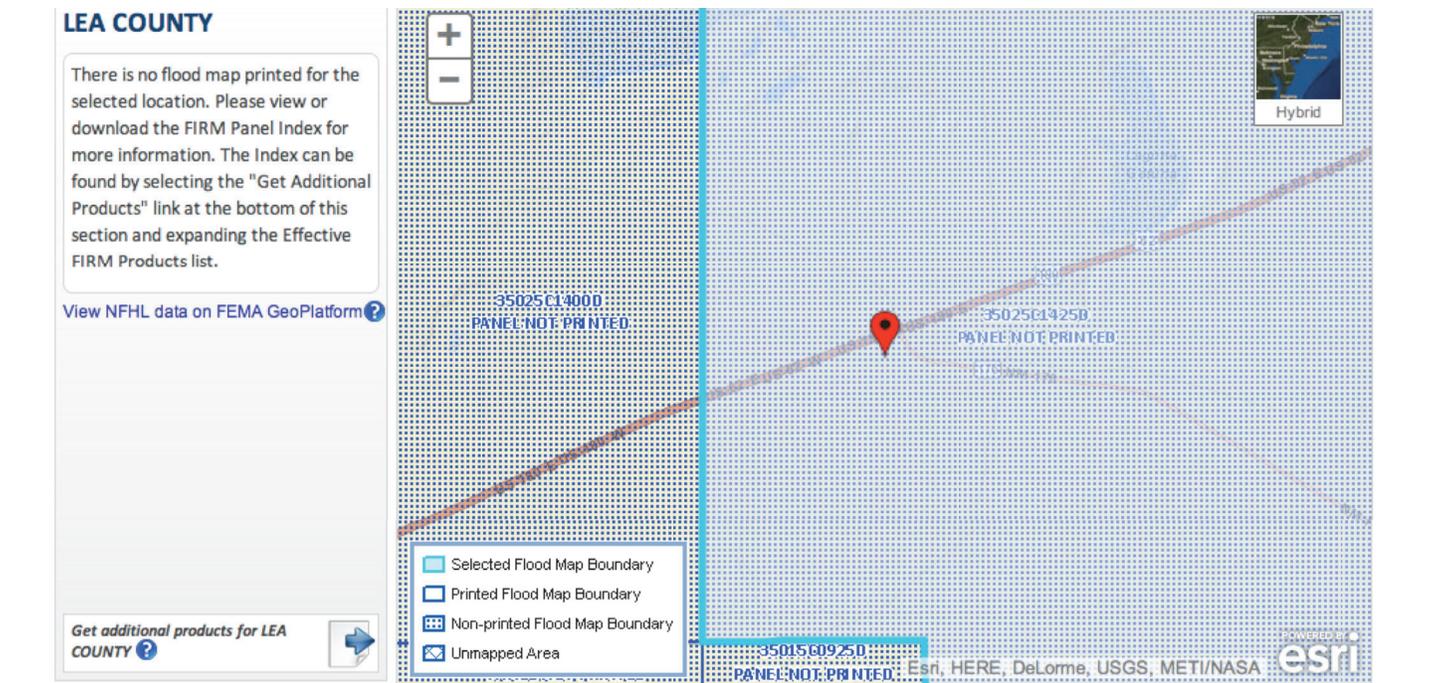
Some rainfalls in the immediate area were reported as 1-2 inches per hour and some locations in the immediate area had 10-20 inches of rainfall within a one-week period, exceeding a 100-year storm event.

The proposed location is approximately one to two feet above the surrounding area with good drainage off of the site. R-360 an OCD permitted Surface Waste Management Facility had some limited flooding directly behind the proposed site. Flood waters approached the TRT proposed back property line and briefly covered this area with about one foot of water.

This area is approximately 3-5 feet below the existing Bar and Café site with defined drainage paths to the west and north toward the Laguna Toston lake which is approximately 50 feet below the elevation of the Bar & Café and proposed site.

In an over abundance of precaution, TRT and the current landowner indicated they are going to fill in the back property to existing grade. In addition, a three-foot berm will be build on top of this area.

This area to be filled in is part of a man-made past gravel operation and constructed cow tank installed by the previous rancher in the area. Photos of the area are attached for reference.



Photos Below:



Halfway Bar & Café Looking South



Looking East



Bar Drive Way looking SE
Background show R-360 Waste



Behind Bar looking west-Gravel Pit
full of rainwater.



Looking west down property Line
and DOT ROW on the right.



Highway stormwater drain west of
bar-water drains to Laguna Toston
area.

(3) within, or within 500 feet of, a wetland;

There are no historical or designated wetlands within 500 feet.

(4) within the area overlying a subsurface mine;

This area is in proximity to several major Potash mines. These mines range in depth from surface to 2500 ft deep. No major collapse features have been recorded due to mine activity. There are natural collapse features throughout the area.

(5) within 500 feet from the nearest permanent residence, school, hospital, institution or church in existence at the time of initial application; or

There are no know permanent residence, school, hospital or church within 500 feet of the site. There are buildings associated with the R-360 facility and the proposed site currently has an active business that will be shut down.

(6) within an unstable area, unless the operator demonstrates that engineering measures have been incorporated into the surface waste management facility design to ensure that the surface waste management facility's integrity will not be compromised.

The site is currently not located in, or on any unstable area, as there is continuous car and truck traffic over the years.

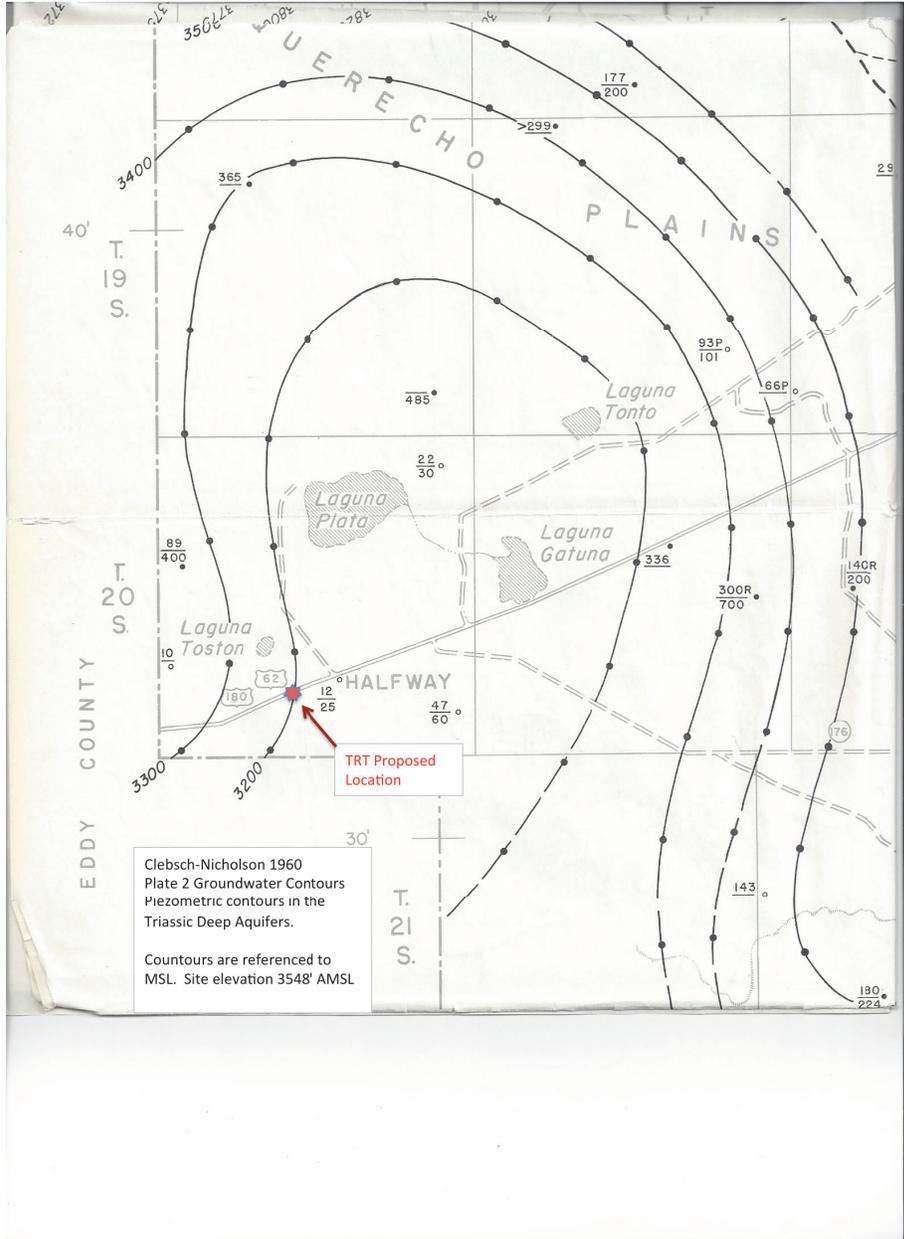
C. No surface waste management facility shall exceed 500 acres.

The proposed site is less than 500 acres. See site survey in line item 10 above.

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;

There are no streams, springs or other watercourses or water wells within one mile of the site, notwithstanding some brine water seeps found inside of the named salt plays within the area. Public domain water maps do not show shallow contours in this area. There is one shallow domestic well shown, located about 1.5 miles to the northeast of the site, which was probably the "Old Half-Way Bar" Reference: Plate 2. Geologic Maps of Southern Lea County, New Mexico, Clebsch-Nicholson Jr. 1960. Cut-out of area enclosed below.



Clebsch-Nicholson 1960
 Plate 2 Groundwater Contours
 Piezometric contours in the
 Triassic Deep Aquifers.

Contours are referenced to
 MSL. Site elevation 3548' AMSL

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;

Not Available-

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;

Non-Applicable, according to available records there are no active shallow fresh water aquifers located less than 50 feet below the surface that could be used in a beneficial manner, notwithstanding there could be some very limited interstitial water found on an intermittent time basis, depending upon recent rainfalls.

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;

Triassic redbeds, comprised of the Chinle Shale, Santa Rosa sandstone, and the Dewey Lake formation, underlies both Laguna Toston and the proposed water disposal site; Shales within the Triassic redbeds underlying the proposed waste disposal site and Laguna Toston are virtually impermeable and therefore prevent vertical seepage of the waters from the site and Laguna Toston into sand stringers within the redbeds which may contain fresh water;

Reference: CASE NO. 9882
Order No. R-9166
Page -3-

(e) geologic cross-sections;

Not Constructed. See lithologic description above.

(f) potentiometric maps for the shallowest fresh water aquifer; and

There are no identified (designated by NMOSE) shallow fresh water aquifers under the site area that is potable or have been put to beneficial use. OCD established this finding in the Order R-3221 exception for this area. Referring to the potentiometric map show above, the only beneficial water identified is located in the Triassic Formation at a depth of greater than 300 feet below surface.

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed.

This is Non-Applicable to TRT's process as no contaminated soils will be placed on the ground surface. TRT will place tanks over a liner as mentioned above. The installation of the liner will ensure proper compaction to a minimum of 90% compaction using standard civil engineering practices.

23. *In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing.*

Non-Applicable

24. *The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders.*

TRT hereby commits to designing, operating, and maintaining the facility in order that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders.

Appendix A-MSDS

Safety Data Sheet: Produced Water

1. Identification

Product Name: Produced Water

MSDS Number: A0133.sds

Synonyms: Formation Water, Salt Water, H₂O, Oily Water; Sweet and Sour

Product Use: Water extracted from natural gas well production, process stream, waste

EP Energy

1001 Louisiana Street
Houston, Texas 77002

Information: (713) 997-1000 or 855-269-0826
CHEMTREC: (800) 424-9300

2. Hazard(s) Identification

Note: This product has not been tested by EP Energy to determine its specific health hazards. Therefore, the information provided in this section includes health hazard information on the product components.

Potential Health Effects from Overexposure:

Acute Effects:

Eyes: Eye contact with vapors may cause eye irritation. Eye contact with liquid may cause irritation, and pain. Eye contact with H₂S gas may cause painful irritation and may be indicative of exposure above applicable H₂S standards.

Skin: Harmful if absorbed through skin. Skin contact may cause skin irritation and redness. Repeated or prolonged skin contact may cause dermatitis.

Inhalation: May contain high concentration of H₂S, from which respiratory paralysis and death may occur. Breathing the mist and vapors may be irritating to the respiratory tract. H₂S is irritating and highly toxic if inhaled. H₂S is a mucous membrane and respiratory tract irritant. High concentrations of H₂S, even briefly, may cause dizziness, drowsiness, tremors, pulmonary edema, and death. H₂S acts as a chemical asphyxiant by paralyzing the respiratory center. Lower concentrations of H₂S will produce symptoms such as headache, dizziness, excitement, staggering gait, diarrhea and dysuria. H₂S is fibrogenic to the lungs following acute exposures complicated by bronchitis obliterans.

Ingestion: Ingestion may cause irritation of the digestive tract that may result in nausea, vomiting and diarrhea. In addition, signs and symptoms of H₂S toxicity may be present.

Chronic Effects:

Cancer hazard. Contains chemicals which may have reproductive toxicity, teratogenic or mutagenic effects. Due to presence of benzene, long-term exposure may increase the risk of anemia, leukemia and nervous system damage. Liver or kidney injury may occur. May cause central nervous system disorders and/or damage. Frequent or prolonged contact may lead to dermatitis. Gastrointestinal and vascular effects and death may occur at high concentrations.

Additional Medical and Toxicological Information:

Natural gas condensate and some of its fractions, which can contaminate produced water, have been shown to cause skin irritation, damage and even cancers when applied directly and repeatedly to the skin. When laboratory animals inhale oil vapors at high concentration or ingest in repeated doses, various tumors have developed. H₂S exposure may aggravate pre-existing lung ailments, gastrointestinal, cardiovascular and nervous disorders.

3. Composition/Information

Note: Composition will vary with geographic location, geologic formation, temperature and pressure.

Components	CAS No.	Wt% ⁽¹⁾
Water	Mixture	>68
Mineral Variety ⁽²⁾	Varies	<32
Gas Condensate	8002-05-9	<1
Benzene	71-43-2	<1
Hydrogen Sulfide	7783-06-4	Varies

⁽¹⁾Normal composition ranges are shown. Exceptions may occur depending upon the source of the produced water.

⁽²⁾Actual composition is unknown, but may contain Sodium Chloride (CAS No. 7647-14-5), Potassium Chloride (CAS No. 7447-40-7) and/or

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Calcium Chloride (CAS No. 10043-52-4)

4. First-Aid Measures

- Eye Contact: Immediately flush eyes immediately with water for at least 15 minutes, occasionally lifting the eyelids. If pain or redness persists, seek medical attention. If eye is exposed to hot liquid, cover eyes with cloth and seek immediate medical attention.
- Skin Contact: First aid is not normally required; however, it is good practice to wash any chemical from the skin. In case of hot liquid exposure, do not remove clothing or treat, wash only unburned area and seek immediate medical attention.
- Inhalation: If respiratory symptoms develop, move victim to fresh air. Seek immediate medical attention if symptoms persist. If breathing has stopped and airway is clear, provide artificial respiration. Do not use mouth-to-mouth method if victim ingested the substance. Provide artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult, if qualified. Seek immediate medical attention.
- Ingestion: DO NOT INDUCE VOMITING. If spontaneous vomiting occurs, place on the left side with head down to prevent aspiration of liquid into the lungs. Give 1-2 glasses of water if patient is alert and able to swallow. Have exposed individual rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Do not leave victim unattended. Monitor for breathing difficulties. Seek immediate medical attention.

Medical Providers: Medical providers are urged to contact a Regional Poison Center at 800-222-1222.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents.

At high concentrations, H₂S may produce pulmonary edema, respiratory depression, and/or respiratory paralysis.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

5. Fire-Fighting Measures

Flammable Properties:

Flash Point: Varies widely depending on hydrocarbon content
 Flammable Limits in Air, % by Volume:
 Lower (LFL): 4.0 % Upper(UFL): 46.0 %
 Auto-ignition Temperature: Not available



NFPA Ratings: Health: 1 Flammability: 2 Reactivity: 0

General Fire Hazards:

Flammable. Fire is associated with natural gas condensate floating on the surface of the produced water. May be ignited by heat, sparks or flames or other sources of ignition. Vapors may reach an ignition source, and flashback. Runoff to sewer may create fire or explosion hazard downstream from the source. Gases may form explosive mixtures with air. BLEVE'S (Boiling Liquid Expanding Vapor Explosions) can occur when a liquid in a pressurized container is heated to temperatures beyond its boiling point. This can lead to failure of the container and damage to the surrounding area. May react with strong oxidizing materials and a wide variety of chemicals.

Hazardous combustion/decomposition products may include carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides and sulfur oxides. Hydrogen sulfide may be present. Downwind personnel must be evacuated.

Extinguishing Media:

Suitable extinguishing media: dry chemical, foam, carbon dioxide or water spray. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unsuitable extinguishing media: Do not use a solid water stream. Water and foam should not be used together on the same surface as water destroys the foam. Water should be used as a spray to keep surrounding areas cool.

Fire Fighting Instructions:

Move containers from fire area if you can do it without risk. Use a smothering technique for extinguishing fire. Do not use a forced- water stream as this will scatter the fire. Use a water spray to cool fire-exposed containers and surrounding areas until well after fire is out. Do not direct water at source of leak or safety devices as icing may occur. Dike fire-control water for later disposal; do not scatter the material. Firefighters should wear self-contained breathing apparatus and full protective clothing. Refer to Section 8 for appropriate PPE selection.

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Precautions for Fire Involving Tanks or Car/Trailer Loads: ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. If unmanned hose holders or monitor nozzles cannot be used, withdraw from area and let fire burn.

6. Accidental Release Measures

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before re-entering.

Stop gas flow. Eliminate sources of heat or ignition, including internal combustion engines and power tools. If indoors, ventilate the affected area. Evacuate building and all affected areas, downwind areas first. For a large spill, consider a downwind evacuation of at least 300 meters. Isolate area until gas has dispersed

Prevent spreading of vapors through sewers, ventilation systems and confined areas. Protect surface and groundwater sources from contamination. If the facility has an oil or hazardous substance contingency plan, activate its procedures. For emergency information and procedures to follow in the case of an accidental release, call the Emergency Telephone Number(s) listed in Section 1. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Use clean, non-sparking tools to collect absorbed materials.

Dike far ahead of liquid spill for later disposal. Never discharge releases directly into sewers or surface waters. Water spray may reduce vapor; but may not prevent ignition in closed spaces. A vapor suppressing foam may be used to reduce vapors. Provide sufficient ventilation in the affected area(s) and wear appropriate personal protective equipment as indicated in Section 8 when handling spill material. Wear self-contained breathing apparatus if conditions warrant.

Note: Large releases may require the notification of local emergency response agencies. Advise authorities and the National Response Center (800-424-8802) if the release is to navigable waters. Clean up according to all applicable regulations.

7. Handling and Storage

Handle in accordance with good industrial hygiene and safety practices. These practices include, but are not limited to, avoiding unnecessary exposure and prompt removal of material from eyes, skin, and clothing. If needed, take first aid actions as indicated in Section 4.

Handling: Handle as a flammable liquid. Keep away from heat, sparks and open flame. No smoking. Use only with adequate ventilation. May release or contain dangerous levels of H₂S. Use only with adequate ventilation. Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8. Vent slowly to the atmosphere when opening. Avoid all contact with skin and eyes. Avoid breathing product dust or vapors. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Non-sparking tools should be used. Bond and ground containers before product transfer. Review all operations which have the potential of generating and accumulating electrostatic charge and/or flammable atmosphere including tank and container filling, cleaning, sampling gauging, switch loading, mixing, agitation and vacuum truck operations. Use appropriate mitigating procedures. Do not enter confined spaces without following proper entry procedures. Remove contaminated clothing immediately. Wash with soap and water after working with this product.

Scales, deposits and sludge from equipment associated with this product may have accumulation of Naturally Occurring Radioactive Materials (NORM). Equipment should be assessed for external gamma radiation.

Storage: Keep away from flame, sparks, excessive temperatures and open flame. No smoking. Maintain vessels closed and clearly labeled. Empty vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose these vessels to sources of ignition. This material may contain or release H₂S. In a tank or other closed container, the vapor space above this material may accumulate hazardous concentrations of H₂S. Do not enter confined spaces without following proper entry procedures. Use appropriate containment to avoid environmental contamination.

Incompatibilities: Keep away from strong oxidizers, ignition sources and heat.

8. Exposure Controls/Personal Protection

Components	CAS No.	Wt% ⁽¹⁾	Occupational Exposure Limits			Units
			OSHA ⁽¹⁾	ACGIH ⁽¹⁾	NIOSH ⁽²⁾	
Petroleum distillates, naphtha	8002-05-9	<1	500 ppm	N/A	350 mg/m ³	---
Benzene	71-43-2	<1	1 5 ^{STEL}	0.5 ⁽³⁾ 2.5 ^{STEL}	0.1 1 ^{STEL}	ppm
Hydrogen Sulfide	7783-06-4	<1	20 ^{Ceiling}	15 ^{STEL}	10 ^{Ceiling}	ppm

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- ⁽¹⁾8-hour TWA unless otherwise specified.
⁽²⁾10-hour TWA unless otherwise specified.
⁽³⁾ ACGIH has established a Biological Exposure Index (BEI) for this substance.
 N/A: Not Applicable
 STEL: 15-minute Short Term Exposure Limit
 Ceiling: Concentration not to be exceeded at any time

8. Exposure Controls/Personal Protection (cont'd)

- Eye Protection:** Safety glasses are required standard PPE. Chemical goggles or face shield should be worn when handling product if the possibility of spray exists.
- Skin Protection:** Fire Resistant Clothing (FRC) is required standard PPE. Wash contaminated clothing prior to reuse. If gloves are required for job operations involving this product, wear nitrile rubber or polyvinyl alcohol (PVA) gloves. Wash with soap and water before eating, drinking or smoking. Wash contaminated clothing before reuse.
- Inhalation:** Respiratory protection is not required for normal use. A NIOSH-approved respirator must be worn where controls do not maintain airborne concentrations below occupational exposure limits. Positive-pressure, full-face, self-contained breathing apparatus (SCBA) should be available for emergency use. HYDROGEN SULFIDE MAY BE PRESENT OR RELEASED. NIOSH-approved respiratory protection should be used when handling crude of high or unknown hydrogen sulfide content and to reduce airborne concentrations to allowable occupational exposure levels.
- Engineering Controls:** Work in well ventilated areas. Use non-sparking tools where liquids or vapors from the condensate contamination may be generated at flammable concentrations. Provide adequate general and local exhaust ventilation to maintain airborne concentrations below applicable occupational exposure limits and prevent formation of oxygen deficient atmospheres, when necessary.

9. Physical and chemical properties

Values given are typical of similar products. There are no test results for this mixture.

Appearance:	Clear or opaque liquid	% Volatile by Volume:	Negligible
Odor:	Slightly hydrocarbon/rotten eggs	Viscosity:	Not available
Boiling Point:	Varies widely depending on hydrocarbon content	Melting Point:	Not available
Freezing Point:	< 32 °F	Vapor Density (Air = 1):	> 1
Vapor Pressure:	Not available	pH:	Not available
Solubility in H₂O:	Not available	Evaporation Rate:	Not available
Specific Gravity @ 68 °F & 1 atm:	> 1	Molecular Wt.:	Not available

10. Stability and Reactivity

- Stability:** Stable under normal conditions of use and normal temperature conditions.
Hazardous Polymerization: Will not occur.
Conditions to Avoid/Incompatibilities: Strong oxidizing agents, strong reducing agents, chlorine, fluorine, bromine and metal catalysts, heat, sparks, flame and build-up of static electricity.
Hazardous Decomposition Products: Not anticipated under normal conditions of use. Combustion of H₂S creates sulfur dioxide.

11. Toxicological Information

Toxicological data does not exist for this mixture. Not expected to be irritating, not expected to be a skin sensitizer and not expected to cause organ effects. May cause cancer.

BENZENE: This product contains benzene, which can cause degeneration in blood forming bone marrow leading to anemia which may further degrade to leukemia, a type of cancer. Acute benzene poisoning causes central nervous system depression. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia. Mutagenic and clastogenic in mammalian and non-mammalian test systems. Reproductive or developmental toxicant only at doses that are maternally toxic, based on tests with animals.

HYDROGEN SULFIDE: This product may contain or release hydrogen sulfide, which may be fatal if inhaled. Greater than 15-20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50-500 ppm can cause headache, nausea, dizziness, loss of reasoning and balance, difficulty breathing, fluid in the lungs and possible loss of consciousness. Greater than 500 ppm can cause rapid or immediate unconsciousness due to respiratory paralysis and death by suffocation unless removed from exposure and successfully resuscitated. Inhalation of a single breath at a concentration of 1000 ppm (0.1%) can cause immediate unconsciousness and death. Hydrogen sulfide is corrosive when moist. Skin contact may cause burns. There is a rapid loss of sense of smell on exposure to gas concentrations above 50 ppm. At high concentrations, individuals may not even recognize the odor before becoming unconscious.

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Carcinogenicity:

Component (CAS No.)	ACGIH ⁽¹⁾	IARC Monographs ⁽²⁾	US NTP	OSHA Regulated
Benzene (71-43-2)	A1	1	Yes	Yes

⁽¹⁾ACGIH Carcinogens: A1 = Confirmed human carcinogen, A2 = Suspected human carcinogen, A3 = Confirmed animal carcinogen with unknown relevance to humans, A4 = Not classifiable as a human carcinogen, A5 = Not suspected as a human carcinogen

⁽²⁾IARC Monographs: 1 = Carcinogenic to humans, 2A = Probably carcinogenic to humans, 2B = Possibly carcinogenic to humans, 3 = Not classifiable as to carcinogenicity to humans, 4 = Probably not carcinogenic to humans

12. Ecological Information

Keep out of sewers, drainage areas, and waterways.

Report spills and releases, as applicable, under Federal and State regulations. May be hazardous to waterways/wildlife.

13. Disposal Information

Do not dispose of waste into sewer. Do not allow this material to drain into sewers/water supplies. If discarded, this material may meet the criteria of being an "ignitable" waste. If hydrogen sulfide and/or benzene are present in the waste, the waste may be considered a hazardous U-listed waste. Under RCRA, it is the responsibility of the user to determine, at the time of disposal, if the material meets federal, state, or local criteria to be defined as a hazardous waste.

14. Transport Information

Proper Shipping Name: Flammable Liquid, n.o.s

UN/Identification No: UN 1993

Hazard Class: 3

Packing Group: II

ERG#: 128

15. Regulatory Information

Section 302 EPCRA Extremely Hazardous Substances (EHS):

Product Component	CAS No.	Wt%	RQ, lb	TPQ, lb
None				

Section 304 CERCLA Hazardous Substances:

Product Component	CAS No.	Wt%	RQ, lb
Benzene	71-43-2	<1	10
Hydrogen Sulfide	7783-06-4	<1	100

Section 311/312 Hazard Categorization:

Acute:	Chronic:	Fire:	Pressure:	Reactive:
Yes	Yes	Yes	Yes	No

Section 313 EPCRA Toxic Substances:

Ingredient	CAS No.	Wt. %
Benzene	71-43-2	<1
Hydrogen Sulfide	7783-06-4	<1

EPA TSCA

All components are either on the U.S. EPA TSCA Inventory List, or are not regulated under TSCA.

Key RQ = Reportable Quantity
TPQ = Threshold Planning Quantity of EHS

CALIFORNIA PROPOSITION 65 WARNING

Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm may be found in crude oil and petroleum

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products. Although it is possible to sufficiently refine a crude oil or its end products to remove the potential for cancer, we are advising that one or more of the listed chemicals may be present in some detectable quantities. Read and follow directions and use care when handling crude oil and petroleum products.

16. Other Information

Last Revision: 08/01/2012, Date Prepared: 03/07/2006

THIS INFORMATION RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF THIS COMPANY'S KNOWLEDGE AND BELIEVED ACCURATE AND RELIABLE AS OF THE DATE INDICATED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO THE ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY THEMSELVES AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR THEIR OWN PARTICULAR USE.

KEY/LEGEND

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous Goods by Road
CAA - Clean Air Act
CAS - Chemical Abstracts Service Registry Number
CDG - Carriage of Dangerous Goods By Road and Rail Manual
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
CNS - Central Nervous System
EINECS - European Inventory of Existing Chemical Substances Registry Number
ERG - Emergency Response Guidebook
EPCRA - Emergency Planning and Community Right-to-Know Act
GHS - Globally Harmonized System of Classification and Labeling of Chemicals
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
ICAO - International Civil Aviation Organization
IMDG - International Maritime Dangerous Goods Code
IMO - International Maritime Organization
MSDS - Material Safety Data Sheet
N/E - Not Established
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - Permissible Exposure Limit
PPE - Personal Protective Equipment
RCRA - Resource Conservation and Recovery Act
RID - Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ - Reportable Quantities
SARA - Superfund Amendments and Reauthorization Act of 1986
SDS - Safety Data Sheet
TCC - Tag Closed Cup
TDG - Transportation of Dangerous Goods
TLV - Threshold Limit Value
TSCA - Toxic Substance Control Act
UN/NA - United Nations / North American Number
UNECE - United Nations Economic Commission for Europe
US DOT - United States Department of Transportation
US EPA - United States Environmental Protection Agency
Vol. - Volume
WHMIS - Workplace Hazardous Materials Information System

This is the end of MSDS A0133.sds

MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT IDENTIFICATION

PRODUCT NAME: Hydrogen Sulfide
CHEMICAL NAME: Sulfides **FORMULA:**
H₂S
SYNONYMS: Sulfuretted Hydrogen; Hydrogen Sulphide;
Hydrosulfuric Acid; Sulfur Hydride; Sewer Gas; Sour Gas

MANUFACTURER: Air Products and Chemicals, Inc.
ADDRESS: 7201 Hamilton Boulevard
Allentown, PA 18195-1501

PRODUCT INFORMATION: (800) 752-1597

MSDS NUMBER: 1010 **REVISION:** 5
REVIEW DATE: October 1998 **REVISION DATE:** October 1998

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hydrogen Sulfide is sold as pure product (> 99%).

CAS NUMBER: 7783-06-4

EXPOSURE LIMITS:

OSHA: PEL = 20 ppm (Ceiling) **ACGIH:** TWA = 10 ppm
(10 minutes)

NIOSH: REL = 10 ppm Ceiling

STEL = 15 ppm

IDLH = 100 ppm

SECTION 3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Hydrogen Sulfide is a toxic, flammable, colorless, liquefied gas. Hydrogen Sulfide has a distinct "rotten-egg" smell. The odor cannot be relied on as an adequate warning of the presence of Hydrogen Sulfide because at high concentrations olfactory fatigue occurs. Inhalation of high concentrations of this gas can result in unconsciousness, coma, and death. Direct contact with liquid Hydrogen Sulfide can cause frostbite. Hydrogen Sulfide poses an immediate fire hazard when mixed with air. The gas is heavier than air, and may spread long distances. Distant ignition and flashback are possible. Flame or high temperature impinging on a localized area of a cylinder of Hydrogen Sulfide can cause the cylinder to explode without activating the cylinder's relief devices. Provide adequate fire protection during emergency response situations. Contact with the liquid (or, contact with rapidly expanding gases) may cause frostbite.

EMERGENCY TELEPHONE NUMBERS

(800) 523-9374
(610) 481-7711

Continental U.S., Canada, and Puerto Rico
Other locations

ACUTE POTENTIAL HEALTH EFFECTS:

ROUTES OF EXPOSURE:

EYE CONTACT: Inflammation and irritation of the eyes can occur at very low airborne concentration (less than 10 ppm). Exposure over several hours may result in "gas eyes" or "sore eyes" with symptoms of scratchiness, irritation, tearing and burning. Above 50 ppm, there is an intense tearing, blurring of vision, and pain when looking at light. Exposed individuals may see rings around bright lights. Most symptoms disappear when exposure ceases. However, in serious cases, the eye can be permanently damaged. In addition to irritation, contact of the eyes with the liquid can cause frostbite.

INGESTION: Ingestion of Hydrogen Sulfide is not a likely route of industrial exposure.

INHALATION: Inhalation of high concentrations of Hydrogen Sulfide can cause dizziness, headache, and nausea. Exposure to higher concentrations can result in respiratory arrest, coma, or unconsciousness. Exposure for more than 30 minutes at concentrations of greater than 600 ppm have been fatal. Continuous inhalation of low concentrations may cause olfactory fatigue, so that the odor is no longer an effective warning of the presence of Hydrogen Sulfide. Severe exposures which do not result in death may cause long-term symptoms such as memory loss, paralysis of facial muscles, or nerve tissue damage.

SKIN CONTACT: The gas may be irritating to the skin. Direct contact with liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

POTENTIAL HEALTH EFFECTS OF REPEATED EXPOSURE:

ROUTE OF ENTRY: Inhalation, skin contact

TARGET ORGANS: Respiratory system, skin, central nervous system.

SYMPTOMS: The most significant symptoms of chronic, low level exposure are related to the central nervous system, with potential nerve tissue damage. Repeated low level skin exposure may cause dermatitis.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Acute or chronic respiratory conditions or eye disorders may be aggravated by over-exposure to Hydrogen Sulfide.

CARCINOGENICITY: Hydrogen Sulfide is not found on the FEDERAL OSHA Z LIST, NTP, CAL/OSHA, or IARC Carcinogenicity lists.

SECTION 4. FIRST AID MEASURES

EYE CONTACT: If liquid is splashed into eyes, or if irritation of the eye develops after exposure to Hydrogen Sulfide, open victim's eyes while under gentle, lukewarm, running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention from an ophthalmologist.

INGESTION: Ingestion is an unlikely route of exposure for Hydrogen Sulfide.

INHALATION: Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.

SKIN CONTACT: If liquid is spilled on skin, or if irritation of the skin develops after exposure to liquid or gas, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention. In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

NOTES TO PHYSICIANS: Administer oxygen, if necessary and treat symptoms. Be observant for initial signs of pulmonary edema.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT:
Flammable gas

AUTOIGNITION:
500 °F (260 °C)

FLAMMABLE RANGE:
(LEL): 4.0% (UEL): 44.0%

EXTINGUISHING MEDIA: Extinguish Hydrogen Sulfide fires by shutting-off the source of the gas. Use water spray to cool fire-exposed containers, structures, and equipment. Other appropriate extinguishing media are dry chemical, foam, and carbon dioxide.

SPECIAL FIRE-FIGHTING PROCEDURES: Evacuate all personnel from area. If possible without risk, shut off source of gas, then fight fire according to types of materials burning. Extinguish fire only if gas flow can be stopped. This will avoid possible accumulation and reignition of a flammable gas mixture. Keep adjacent cylinders cool by spraying with large amounts of water until the fire burns itself out. For small releases, if it is not possible to stop the leak, and it does not endanger personnel, let the fire burn itself out. Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing

Apparatus and full protective equipment, including fire resistant clothing. Large fires should be fought from a distance with an unmanned hose holder or monitor nozzles. If this product is involved in a fire, fire run-off water should be contained to prevent possible environmental damage. If necessary, decontaminate fire-response equipment with soap and water solution.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a cylinder can build-up due to heat and it may rupture if pressure relief devices should fail to function. An extreme explosion hazard exists in areas in which the gas has been released but the material has not yet ignited.

HAZARDOUS COMBUSTION PRODUCTS: Oxides of sulfur

SECTION 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate immediate area. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. Shut off source of leak, if possible. Isolate any leaking cylinder. If leak is from container, pressure relief device or its valve, contact your supplier. If leak is in user's system, close cylinder valve, safely vent pressure and purge with inert gas before attempting repairs. Protection of all personnel and the area must be maintained. All responders must be adequately protected from exposure. Monitoring should be done for the levels of Hydrogen Sulfide. Colorimetric tubes are available to detect the presence of Hydrogen Sulfide. Levels of Hydrogen Sulfide should be below levels listed in Section 2 (Composition / Information on Ingredients) and the atmosphere must have at least 19.5% oxygen before personnel can be allowed in the area without Self-contained breathing apparatus. Combustible vapor levels must be below 0.4%, which is 10% of the LEL of Hydrogen Sulfide, prior to entry.

SECTION 7. HANDLING AND STORAGE

STORAGE: Store cylinders in a well-ventilated, secure area, protected from the weather. Cylinders should be stored up-right with valve outlet seals and valve protection caps in place. Storage should be away from heavily traveled areas and emergency exits. There should be no sources of ignition. All electrical equipment should be explosion-proof in the storage areas. Storage areas must meet National Electrical Codes for Class 1 hazardous areas. Flammable storage areas should be separated from oxygen and other oxidizers by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high, having a fire resistance rating of at least 1/2 hour. Post "No Smoking or Open Flames" signs in the storage and use areas. Do not allow storage temperature to exceed 125 °F (52 °C). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. Consideration should be taken to install leak detection and alarm equipment for storage areas.

HANDLING: Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure reducing regulator to safely discharge product from cylinder. Use a check valve to prevent reverse flow into cylinder. Never apply flame or localized heat directly to any part of the cylinder. Once cylinder has been connected to properly purged and inerted process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap-wrench to remove over-tight or rusted caps. All piped systems and associated equipment must be grounded. Electrical equipment should be non-sparking or explosion-proof.

SPECIAL PRECAUTIONS: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Hydrogen Sulfide could occur without any significant warning symptoms. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All work practices should minimize the release of Hydrogen Sulfide.

Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. (telephone 703-412-0900) pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers*. Local regulations may require specific equipment for storage and use.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

VENTILATION: Hydrogen Sulfide detectors should be installed in or near areas where Hydrogen Sulfide is being used or stored. If appropriate, install automatic monitoring equipment to detect the level of oxygen and the presence of potentially explosive air-gas mixtures. Because of the high hazard associated with Hydrogen Sulfide, stringent control measures such as a gas cabinet enclosure or isolation may be necessary. Provide natural or explosion-proof ventilation adequate to ensure Hydrogen Sulfide does not reach exposure limits listed in Section 2. (Composition / Information on Ingredients). Local exhaust ventilation is preferred, because it prevents gas dispersion into the work place by eliminating it at its source.

RESPIRATORY PROTECTION: Maintain exposure levels of Hydrogen Sulfide below the levels listed in Section 2 (Composition / Information on Ingredients). Use supplied air respiratory protection if Hydrogen Sulfide levels exceed exposure limits or during emergency response to a release of this product. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. The following NIOSH respiratory protection recommendations are for Hydrogen Sulfide. Up to 100 ppm - Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide; or gas mask with canister to protect against hydrogen sulfide; or SAR; or full-facepiece SCBA.

Emergency Use: Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA. Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA. The IDLH concentration for Hydrogen Sulfide is 100 ppm. High concentrations may be within the flammable range and must not be entered.

EYE PROTECTION: Safety glasses. Additionally, face-shields should be worn if there is a potential for contact with liquid Hydrogen Sulfide. Eye wash stations/safety showers should be near areas where Hydrogen Sulfide is used or stored.

SKIN PROTECTION: Work gloves are recommended when handling cylinders of Hydrogen Sulfide. Use thermally insulated gloves when working with containers of Liquid Hydrogen Sulfide. Wear chemically-resistant gloves when using this gas. Butyl rubber, chlorinated polyethylene, neoprene nitrile, and polyvinyl rubber are recommended. Use fire-resistant gloves and clothing in emergency situations. Use double gloves for spill response.

OTHER PROTECTIVE EQUIPMENT: Use body protection appropriate for task. Static-resistant clothing is recommended. Safety shoes are recommended when handling cylinders. Transfer of large quantities under pressure may require use of fire retardant and/or chemically impervious clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE, ODOR AND STATE: Colorless gas. The liquid is also colorless. The odor for both the liquid and gas is similar to that of "rotten eggs".

MOLECULAR WEIGHT: 34.08

BOILING POINT (1 atm): -76.4 °F (-60.2 °C)

SPECIFIC GRAVITY (also called vapor density) (air = 1): 1.189

SPECIFIC GRAVITY (of liquid) (At 59 °F (15 °C)): 0.79

FREEZING/MELTING POINT: -117.2 °F (-82.9 °C)

VAPOR PRESSURE (At 70 °F (21.1°C)): 248.9 psig

GAS DENSITY (At 68 °F (20 °C) and 1 atm): 0.088 lb/ft³

SOLUBILITY IN WATER (At 68 °F (20 °C)): 0.317 lb/gal

SECTION 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: Cylinders should not be exposed to temperatures in excess of 125 °F (52 °C).

INCOMPATIBILITY (Materials to Avoid): Hydrogen Sulfide is a strong reducing agent and is highly reactive. Hydrogen Sulfide is not compatible with the following materials: oxidizing agents, organic peroxides, alkaline materials, metals (i.e. copper, lead), and metal oxides. Hydrogen Sulfide is corrosive to most metals, because it reacts with these substances to form metal sulfides.

REACTIVITY:

- A) **HAZARDOUS DECOMPOSITION PRODUCTS:** Hydrogen and sulfur
 B) **HAZARDOUS POLYMERIZATION:** Will not occur

SECTION 11. TOXICOLOGICAL INFORMATION

LC₅₀, TCLO, or LCLo (Inhalation): Human LCLo: 600 ppm/30 minutes; Man LDLo: 5700 mg/kg (Central Nervous System Effects, Pulmonary System Effects); Human LCLo: 800 ppm/5 minutes; Rat LC₅₀: 444 ppm; Rat TCLO: 20 ppm (female 6-22 days post) (Reproductive Effects); Mammal LCLo: 800 ppm/5 minutes; Rat TCLO: 1200 mg/m³/2 hours/5 days-intermittent (Brain and Coverings-other degenerative changes; Biochemical - enzyme inhibition, induction, or change in blood or tissue levels - true cholinesterase); Rat TCLO: 100 ppm/8 hours/5 weeks-intermittent (Brain and Coverings - other degenerative changes; Lungs, Thorax, or Respiration - other changes; Biochemical - enzyme inhibition, induction, or change in blood or tissue levels - cytochrome oxidases (including oxidative phosphorylation)); Rat TCLO: 80 ppm/6 hours/90 days-intermittent (Brain and Coverings - changes in brain weight; Nutritional and Gross Metabolic - weight loss or decreased weight gain); Rat TCLO: 80 ppm/6 hours/90 days-intermittent (Nutritional and Gross Metabolic - weight loss or decreased weight gain; Related to Chronic Data - death); Mouse LC₅₀: 634 ppm/1 hour; Rabbit TCLO: 40 mg/m³/5 hours/30 weeks-intermittent (Sense Organs and Special Senses (Eye) - conjunctive irritation); Rat TCLO: 20 ppm: female 6-22 day(s) after conception; lactating female 21 day(s) post-birth (Reproductive - Effects on Newborn - physical).

LD₅₀, (Oral): No data currently available.

LD₅₀ (Dermal): No data currently available.

SKIN CORROSIVITY: Hydrogen Sulfide is irritating to the skin.

CARCINOGENICITY: Currently, Hydrogen Sulfide has not been found to be carcinogenic.

ADDITIONAL NOTES: None

SECTION 12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: Currently, the following aquatic toxicity data are available for Hydrogen Sulfide:

TLm (Asellussp) 96 hours = 0.111 mg/L

TLm (Cranfogyx sp) 96 hours = 1.07 mg/L

TLm (Gammarrus) 96 hours = 0.84 mg/L

LC₅₀ (fly inhalation) 960 minutes = 380 mg/m³

LC₅₀ (fly inhalation) 7 minutes = 1500 mg/m³

TLm (Lepomis macrochirus, bluegill sunfish) 96 hours = 0.0478 mg/L

TLm (*Lepomis macrochirus*, bluegill sunfish) 96 hours = 0.0448 mg/L at 21-22 °C

TLm (*Pimephales promelas*, fathead minnow) 96 hours = 0.0071-0.55 mg/L

TLm (*Salvelinus fontinalis*, brook trout) 96 hours = 0.0216-0.038 mg/L at 8-12.5 °C

MOBILITY: Hydrogen Sulfide will not be mobile in soil.

PERSISTENCE AND BIODEGRADABILITY: Persistence: Converts to elemental sulfur upon standing in water. Biodegradation: Microorganisms in soil and water are involved in oxidation-reduction reactions that oxidize hydrogen sulfide to elemental sulfur. Members of the genera Beggiatoa, Thioploca, and Thiotrix function in transition zones between aerobic and anaerobic conditions where both molecular oxygen and hydrogen sulfide are found. Also, some photosynthetic bacteria oxidize hydrogen sulfide to elemental sulfur. Members of the families Chlorobiaceae and Chromatiaceae (purple sulfur bacteria) are obligate aerobes and are phototropic, and are found in waters with high H₂S concentrations. The interactions of these organisms form part of the global sulfur cycle.

POTENTIAL TO BIOACCUMULATE: Hydrogen Sulfide does not have bioaccumulation or food chain contamination potential.

REMARKS: Hydrogen Sulfide is not a Class I or Class II ozone depleting chemical (40 CFR Part 82).

SECTION 13. DISPOSAL CONSIDERATIONS

UNUSED PRODUCT / EMPTY CONTAINER: Return container and unused product to supplier. Do not attempt to dispose of residual or unused quantities.

DISPOSAL INFORMATION: Shall be done in accordance with Federal, State and local regulations. Wastes containing this material may be classified by EPA as a hazardous waste by characteristic (such as Ignitability, Corrosivity, Toxicity, Reactivity). Waste streams must be characterized by the user to meet Federal, State and local requirements.

SECTION 14. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: Hydrogen Sulfide, liquefied
HAZARD CLASS NUMBER and DESCRIPTION: 2.3 (Poison Gas)
UN IDENTIFICATION NUMBER: UN1053
DOT SHIPPING LABEL(S) REQUIRED: Poison Gas, Flammable Gas
PLACARD (When required): Poison Gas
SPECIAL SHIPPING INFORMATION: Hydrogen Sulfide is poisonous by inhalation. Shipments must be properly described as inhalation hazards. ZONE B. Cylinders should be transported in a secure upright position in a well-ventilated truck. Never transport in passenger compartment of a vehicle. Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.
CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).
NAERG (NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK) #: 117

SECTION 15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

EPA - ENVIRONMENTAL PROTECTION AGENCY:

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (40 CFR Parts 117 and 302)

Reportable Quantity (RQ): 100 lbs (455 kg)

SARA TITLE III: Superfund Amendment and Reauthorization Act

SECTIONS 302/304: Emergency Planning and Notification (40 CFR Part 355)

Extremely Hazardous Substances: Hydrogen Sulfide is listed.

Threshold Planning Quantity (TPQ): 500 lbs (2275 kg)

Reportable Quantity (RQ): 100 lbs (455 kg)

SECTIONS 311/312: Hazardous Chemical Reporting (40 CFR Part 370)

IMMEDIATE HEALTH: Yes

PRESSURE: Yes

DELAYED HEALTH: No

REACTIVITY: No

FIRE: Yes

SECTION 313: Toxic Chemical Release Reporting (40 CFR 372)

Releases of Hydrogen Sulfide require reporting under Section 313.

CLEAN AIR ACT:

SECTION 112 (r): Risk Management Programs for Chemical Accidental Release (40 CFR Part 68)

Hydrogen Sulfide is listed as a regulated substance.

Threshold Planning Quantity (TPQ): 10,000 lbs (4,553 kg)

TSCA: Toxic Substances Control Act

Hydrogen Sulfide is listed on the TSCA Inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR Part 1910.119: Process Safety Management of Highly Hazardous Chemicals.

Hydrogen Sulfide is listed in Appendix A of this regulation as a highly hazardous substance.

Threshold Planning Quantity (TPQ): 1500 lbs (682 kg)

STATE REGULATIONS:

CALIFORNIA:

Proposition 65: Hydrogen Sulfide is not a listed substance which the State of California requires warning under this statute.

SECTION 16. OTHER INFORMATION

NFPA RATINGS:

HEALTH: = 4

FLAMMABILITY: = 4

REACTIVITY: = 0

SPECIAL: None

HMIS RATINGS:

HEALTH: = 4

FLAMMABILITY: = 4

REACTIVITY: = 0

BECKART ENVIRONMENTAL, INC.

6900 46TH STREET
KENOSHA, WI 53144

PHONE # (262) 656-7680

FAX # (262) 656-7699

Emergency phone number: CHEMTREC: 1-800-424-9300

DATE REVISED: 01/08/14

This MSDS complies with 29 CFR 1910.1200 (The Hazard Communication Standard)

I PRODUCT INFORMATION:

PRODUCT NAME: **Aqua-Dry Kits (50G, 100G, 500G) – Component B**

PRODUCT TYPE: Deodorizing delivery system (pouch) for the generation of chlorine dioxide.

II HAZARDOUS INGREDIENTS:

<u>INGREDIENT</u>	<u>CAS #:</u>	<u>CONCENTRATION (% by weight)</u>
Sodium Bisulfate Monohydrate	10034-88-5	78%

III PHYSICAL DATA:

FORM: dry powder in plastic bag enclosed in foil bag

pH Value: 2 approximately, 30g/l water

MELTING POINT: 137° F

% VOLITILE: Not determined

SOLUBILITY IN WATER: 67g/100g water

ODOR: odorless

VAPOR PRESSURE: Not determined

APPEARANCE: white powder

EVAPORATION RATE: NA

IV FIRE AND EXPLOSION DATA:

FLASH POINT: NA

FLAMMABLE NA

LEL: NA

UEL: NA

SPECIAL FIRE FIGHTING PROCEDURE: NIOSH certified gas mask with canister for chlorine, or self-contained breathing apparatus should be used. Wear protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: In case of fire, instant separation of two components by placing in safe room.

EXTINGUISHING MEDIA: Carbon Dioxide (CO₂), quenching foam, dry chemical powder, Do NOT use water.

V REACTIVITY DATA:

STABILITY: Stable at normal temperatures and pressure. Boiling point not applicable.

INCOMPATIBILITY (MATERIALS TO AVOID): Corrosive to steel, stainless steel, and many other materials. Avoid contact with strong bases.

DECOMPOSITION: Decomposition product: sulfur dioxide. Avoid contact with other combustible goods.

HAZARDOUS POLYMERIZATION: Will not occur

VI HEALTH HAZARD INFORMATION:

ROUTES OF EXPOSURE AND EFFECTS:

SKIN: May irritate and cause redness.

EYE: Contact causes redness, irritation, pain, blurred vision, tearing, corneal injury and burns.

INHALATION: Harmful if inhaled. Coughing, headaches, labored breathing, nausea, shortness of breath, pulmonary edema.

INGESTION: Can cause extreme irritation to the throat, mouth, stomach, and possible Ulceration.

PERMISSIBLE EXPOSURE LIMITS (Limits are for concentration in air, not aqueous solution.)

OSHA PEL-TWA	ACGIH TLV-TWA
0.1 ppm	0.1 ppm

CARCINOGENICITY: This product does not contain compounds known to cause cancer according to NTP, IARC, or OSHA

Acute oral LD ₅₀ : rats: 278mg/kg	ACGIH (ClO ₂ gas) 0.1ppm (TWA), 0.3ppm (STEL)
--	--

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Remove contaminated clothing. Wash exposed area with plenty of soap and water for at least 15 minutes.

EYE: Immediately flush with water for 15 minutes. Get medical attention.

INHALATION: Remove to fresh air. If irritation persists, seek medical attention.

INGESTION: If breathing is difficult, give oxygen. Do not induce vomiting, give large quantities of water. Seek medical attention.

VII HANDLING AND USE PRECAUTIONS:

SPILL/LEAK PROCEDURE: Isolate hazard area and deny entry to unnecessary or unprotect personnel. Keep combustibles away from spill. Ventilate area of spill or leak. Remove gas with a fine water spray. Stop leak if you can without risk. Wear a self-contained breathing apparatus. Contain spilled liquid with sand or earth. Place in a disposal container. Avoid runoff into storm sewers and ditches that lead to waterways. Never discharge directly into a lake, pond, stream, river, or other natural body of water. Avoid heat and sun rays.

WASTE DISPOSAL METHODS: Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine whether a substance should be classified as a hazardous waste at the time of disposal. This is due to the fact that product use, transformation, synthesis, mixtures, etc. may change the nature of the product. Dispose of waste in accordance with applicable federal, state, and local laws. Do not reuse original packaging, no partial use of product.

***HANDLING and STORAGE PRECAUTIONS:** Product is oxidizer and may cause irritation to exposed skin, and eyes. Avoid getting product on skin or in eyes. Proper protective clothing should be worn while handling product. Wash after handling and avoid breathing vapors. Store product in a cool dry place away from direct sunlight. Protect against humidity, keep away from alkalines, reducing agents, and combustible materials.

VIII INDUSTRIAL HYGIENE:

VENTILATION: Local exhaust is recommended. Use only in well ventilated areas.

RESPIRATOR: Use NIOSH approved respirator when exposure is great.

EYE PROTECTION: Chemical goggles.

GLOVES: Rubber or neoprene gloves.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Rubber splash apron, and rubber boots. Safety shower and eye wash station should be located nearby.

PERSONAL PROTECTION: Keep away from food and beverages. When touching clothing, immediately change clothing.

IX SPECIAL PRECAUTIONS:

None

X TOXICOLOGICAL INFORMATION:

Acute oral toxicity: RTECS #VZ1870000
LD/LC₅₀ = 193 mg/kg
Dermal toxicity: Causes burns
Irritant on Skin: Harmful if absorbed through skin

XI ECOLOGY INFORMATION:

Fish toxicity: No information found
Bacteria toxicity: No information found

XII SHIPPING INFORMATION:**DOT:**

PROPER SHIPPING NAME: Corrosive Solid, Acidic, Inorganic, N.O.S. (Contains Sodium Bisulfate Monohydrate)
HAZARD CLASS: 8
UN/NA #: UN 3260 / PG II
DOT LABELS: Corrosive Material Class 8
DOT PLACARDS: none required (package conforms to 49CFR 173.4)
STORAGE CONDITIONS: Keep containers closed
STORAGE CONDITIONS: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, well ventilated dry area. Store below 100° F. Avoid exposure to sunlight or ultraviolet light. Keep separated from incompatible substances. Protect against fire.

HMIS RATINGS: Health:	3	NFPA RATINGS: Health:	3
Flammability:	0	Flammability:	0
Reactivity:	0	Reactivity:	0

XIII PERSONAL PROTECTION & REGULATORY INFORMATION:

REACTIVITY HAZARD: yes	ACUTE HAZARD: yes
FIRE HAZARD: yes	CHRONIC HAZARD: yes
PRESSURE HAZARD: no	
CERCLA HAZARDOUS SUBSTANCE: Not regulated	

N/A = Not applicable

N/F = None found

N/E = Not established

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MATERIAL SAFETY DATA SHEET

This MSDS is supplied by Halox Technologies, Inc. as a service rather than as a supplier of chlorine dioxide. For emergency information contact your sodium chlorite supplier.

SECTION I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Chlorine dioxide

CHEMICAL FORMULA: ClO₂

CHEMICAL NAME: Chlorine dioxide

CHEMICAL FAMILY: Inorganic compound

Halox Technologies, Inc.
Bridgeport, CT 06610
www.haloxtech.com
MKT-TDS-0032

CHEMICAL TYPE: Chlorine dioxide gas absorbed
in water solution. Antimicrobial.

**EMERGENCY TELEPHONE NUMBER AND
TELEPHONE NUMBER FOR INFO: CON-
TACT YOUR SODIUM CHLORITE SUPPLIER.**

Date Prepared: 21 June 2004

Spsds: 15 April 2002

SECTION II. HAZARD INGREDIENTS/IDENTITY INFORMATION

CHEMICAL NAME	CAS NUMBER	PRODUCT ID NO.	WT. %
Chlorine dioxide	10049-04-4	NA 9191	0.054 (540 mg/l) ¹

This product is not considered hazardous by 29 CFR 1910.1200.

EXPOSURE LIMITS: Chlorine dioxide (Note: Limits are for concentration in air, not aqueous solution.)

OSHA PEL- TWA	OSHA PEL- STEL	NIOSH REL- TWA	NIOSH REL- STEL	ACGIH TLV- TWA	ACGIH TLV- STEL
0.1 ppm	0.3 ppm	0.1 ppm	0.3 ppm	0.1 ppm	0.3 ppm

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS**AQUEOUS SOLUTION**

APPEARANCE/ODOR: Pale yellow to yellow/chlorine-like.

VAPOR PRESSURE: ~5mm Hg at 25 °C (ClO₂)

BOILING POINT: Same as water.

MELTING POINT: Same as water.

EVAPORATION RATE: Not applicable

SPECIFIC GRAVITY: 1.0 at 0 °C

ODOR THRESHOLD: No data

CHLORINE DIOXIDE GAS

ODOR: Chlorine-like

BOILING POINT: 11 °C

SOLUBILITY IN WATER: 3.01 g/l at 25 °C and 34.5 mm Hg (partial pressure)

SPECIFIC GRAVITY: Not available.

MELTING POINT: -59 °C (as 100% ClO₂)

% VOLATILE: 100%

pH: 2.5 –3.5 (for Halox generated 540 ppm solution).

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Dilute chlorine dioxide solutions do not present a fire hazard.

EXTINGUISHING MEDIA: Water. Use water spray to reduce vapors.

UNSUITABLE EXTINGUISHING MEDIA: Dry chemical, CO₂, halon.

SPECIAL PROTECTIVE EQUIPMENT: Protect from respiratory exposure.

SPECIAL EXPOSURE HAZARDS: None.

FLASH POINT: Not applicable.

AUTOIGNITION: Not applicable.

UPPER/LOWER FLAMMABILITY LIMITS: None.

HAZARDOUS COMBUSTION: None

FIRE/EXPLOSION HAZARDS: None.

SENSITIVITY TO MECHANICAL/STATIC DISCHARGE: None known.

SECTION V. REACTIVITY DATA

STABILITY: Stable under ambient conditions. Avoid contact with direct sunlight and excessive heat.

HAZARDOUS REACTIONS: None known.

CONDITIONS TO AVOID: Avoid elevated temperatures to reduce/avoid evolution of ClO₂ gas.

INCOMPATIBILITY: Corrosive to steel, stainless steel, and many other materials. Avoid contact with reducing agents.

HAZARDOUS DECOMPOSITION: When chlorine dioxide gas is heated to decomposition, chlorine gas is produced. Chlorine gas creates hydrochloric acid when mixed with water or steam.

SECTION VI. HEALTH HAZARD DATA

ROUTES OF ENTRY: Inhalation, ingestion, skin and eye contact.

TARGET ORGANS: Eyes, skin, respiratory tract and mucous membranes.

ACUTE HEALTH EFFECTS

INGESTION: Not a normal route of exposure. Harmful if swallowed. Can cause irritation to mouth, esophagus, stomach, and mucous membranes.

SKIN CONTACT: Corrosive. May cause redness and irritation.

EYE CONTACT: Contact causes redness, irritation, pain, blurred vision, tearing, corneal injury and burns.

INHALATION: Harmful if inhaled. Coughing, headaches, labored breathing, nausea, shortness of breath, pulmonary edema.

CHRONIC HEALTH EFFECTS

May have effects on lungs, resulting in chronic bronchitis and permanent lung damage (with chronic exposure).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate existing skin and respiratory conditions.

EMERGENCY AND FIRST AID PROCEDURES

EYES: In case of contact, immediately flush with water for at least 15 to 20 minutes. Lift upper and lower lids and rinse well under them. Get immediate medical attention.

SKIN: Immediately rinse excess material off skin with large amounts of water; remove contaminated clothing and shoes; then wash with soap and water. If heavy contamination has occurred, then discard the clothing in a manner that limits further exposure. Otherwise, thoroughly clean contaminated clothing and shoes before reuse. Get medical attention.

INHALATION: Remove from exposure. If individual is not breathing, administer cardiopulmonary resuscitation (CPR) and get immediate medical attention. If individual is breathing, but with difficulty, get medical attention.

INGESTION: Do not induce vomiting. Do not give anything by mouth to an unconscious person. Get medical attention.

TOXICOLOGY INFORMATION

ACUTE ORAL TOXICITY: No information.

ACUTE DERMAL TOXICITY: No information.

INHALATION EFFECTS: Strong respiratory irritant.

IRRITATION TO SKIN: Irritant. Can give transient pain and redness.

IRRITATION TO EYES: Strong irritant.

SENSITIZATION DATA: No information.

REPRODUCTIVE TOXICITY: Chlorine dioxide did not cause birth defects in laboratory animals, even at exceptionally high exposure levels.

CARCINOGENICITY: This product does NOT contain compounds known to cause cancer according to NTP, IARC or OSHA.

MUTAGENICITY: Chlorine dioxide did test positive in a small fraction of mutagenesis assays conducted, however, in a two year mouse bioassay there was no clear evidence of carcinogenicity.

TERATOGENICITY: No information.

LD₅₀ (oral) rats: 292 mg/kg

LC_{LO} (inhalation) rats: 500 ppm/15 min. (Note: This refers to ppm in air NOT in solution)

IRRITATION (rabbit): Moderate irritant to eyes.

AQUATIC TOXICITY:

LC₅₀ (96 hrs) Fathead minnow, juvenile: 0.02 mg/l

LC₅₀ (96 hrs) Fathead minnow, adult: 0.17 mg/l

LC₅₀(96 hrs) Bluegill, young of the year: 0.15 mg/l

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

STORAGE: Store aqueous solution in a cool, dry environment in suitable storage containers. Solutions in pure water can be maintained for months in closed, UV protected containers.

LARGE SPILL: Isolate hazard area and deny entry to unnecessary or unprotected personnel. Keep combustibles away from spill. Ventilate area of spill or leak. Remove gas with a fine water spray. Stop leak if you can do it without risk. Wear a self-contained breathing apparatus. Contain spilled liquid with sand or earth. Place in a disposal container. Avoid runoff into storm sewers and ditches that lead to waterways. Never discharge directly into a lake, pond, stream, river, or other natural body of water.

SMALL SPILL: Rinse with large amounts of water..

HANDLING: Wear appropriate protective clothing. Avoid prolonged contact with skin and clothing. Avoid breathing vapors. Wash with soap and water after handling

RESPIRATORY PROTECTION: Use general room ventilation or local exhaust ventilation to keep airborne exposure below the PEL. If ventilation is not adequate, wear an approved respirator.

SKIN PROTECTION: Wear impervious gloves, boots and apron. .

EYE PROTECTION: Always wear safety glasses with side shields or a full face shield.

PERSONNEL PROTECTION: Air-purifying full-face respirator. Chemical-resistant gloves, safety glasses with side shields or chemical goggles. Eye wash facility and emergency shower should be in close proximity.

UNSUITABLE HANDLING/STORAGE MATERIALS: Avoid contact with oxidizable organic materials. Avoid concentrating the vapors as extremely highly concentrated vapors (10% (w/w) in air) may explosively decompose on shock, friction, concussion or materials.

TRANSPORTATION AND REGULATORY INFORMATION

Shipping chlorine dioxide is not allowed.

TRANSPORTATION DESCRIPTION

DOT/TDG: Not determined

UN ID NO.: Not applicable

IMDG/SFA: Not determined

PROPER SHIPPING NAME: Not applicable

AIR (ICAO/IATA-DGR): Not determined

REGULATORY INFORMATION

CANADA DSL: In compliance

US TSCA: In compliance

WHMIS CLASSIFICATION: Not determined

OSHA REGULATED: Non hazardous. Corrosive as defined in 29 CFR 1910.1200

HMIS RATING: Not rated

NFPA RATING: Not rated

SARA 302: Not subject to SARA Section 302

SARA 311/312: Not subject to SARA Section 311/312

SARA 313: Subject to SARA Section 313

CALIFORNIA PROPOSITION 65: Not subject to California Proposition 65

CERCLA REPORTABLE QUANTITIES: Not subject to CERCLA.

DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL: In accordance with municipal, provincial, state and federal regulations.

RCRA: D002.

ECOLOGICAL INFORMATION

BIODEGRADABILITY: No data.

OTHER INFORMATION: None.

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses, which infringe valid patents, or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

¹ 540 mg/l is the concentration obtained under ideal conditions at the Halox testing facility. This is based on multiple data points from non-consecutive days with all variables and parameters under scrupulous control.

MATERIAL SAFETY DATA SHEET

CRUDE OIL

MSDS No.
RS296
Version: 5
Rev. Date
05/13/2002

IMPORTANT: Read this MSDS before handling and disposing of this product and pass this information on to employees, customers, and users of this product.

1. PRODUCT and COMPANY IDENTIFICATION

Material Identity	Crude Oil		
Trade Name(s)	Oriente, Cano Limon, Line 63, Shell-Ventura, SJV Light, Rainbow, West Texas Inter-Cushing, Peace River-Canadian, Federated Crude-Canadian, Pembina Crude-Canadian, Forcados, Cabinda, Basrah Light, Basrah, Arab Medium, Elang Crude, Girassol		
Other Name(s)	Earth Oil, Petroleum Oil, Rock Oil, Zafiro		
Chemical Description	This material is a C1 to C50 hydrocarbon liquid which contains approximately .9 to 2.8 wt% sulfur compounds		
Manufacturer's Address	BP West Coast Products LLC Carson Business Unit 1801 E. Sepulveda Boulevard Carson, California 90749-6210	BP West Coast Products LLC Cherry Point Business Unit 4519 Grandview Road Blaine, Washington 98230	
Telephone Numbers	Emergency Health Information:	1 (800) 447-8735	
	Emergency Spill Information:	1 (800) 424-9300 CHEMTREC (USA)	
	Other Product Information:	1 (866) 4BP-MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com	

2. COMPONENTS and EXPOSURE LIMITS

<u>Component</u> ¹	<u>CAS No.</u>	<u>% Composition By Volume</u> ²		<u>ACGIH TLV</u>	<u>Exposure Limits OSHA PEL</u> ³	<u>Units</u>	<u>Type</u>
CRUDE OIL, PETROLEUM	8002-05-9	EQ	100	N/AP	N/AP		
which contains:							
BUTANE	106-97-8	AP	0.8 to 1	800	800	pm	TWA
HEXANE (N-HEXANE)	110-54-3	AP	0.3 to 1	50 skin	50	ppm	TWA
ISOPENTANE	78-78-4	AP	0.3 to 1.5	N/AP 600	750 600	ppm ppm	STEL TWA
PENTANE	109-66-0	AP	1.5 to 2.5	N/AP 600	750 600	ppm ppm	STEL TWA
Other applicable exposure guidelines:							
COAL TAR PITCH VOLATILES, AS BENZENE SOLUBLES ⁽⁴⁾	65996-93-2			0.2	0.2	mg/m3	TWA
OIL MIST, MINERAL	8012-95-1			10 5	N/AP 5	mg/m3 mg/m3	STEL TWA
STODDARD SOLVENT	8052-41-3			100	100	ppm	TWA

Stoddard Solvent exposure limits are listed as an exposure guideline for hydrocarbon vapors that may be similar to those derived from crude oil.

Since specific exposure standards or control limits have not been established for this material, the exposure limits shown here are suggested as minimum control guidelines.

¹ Carcinogen displayed after Component Name. Listed by ⁽¹⁾ NTP, ⁽²⁾ IARC, ⁽³⁾ OSHA, ⁽⁴⁾ Other

² See Abbreviations on last page

³ The OSHA exposure limits were changed in 1993 due to a federal court ruling. ARCO has chosen to list the 1989 OSHA exposure limits in this document as they are generally more stringent and therefore more protective than the current exposure limits. (Refer to 29 CFR 1910.1000).

3. HAZARD IDENTIFICATION

IMMEDIATE HAZARDS

DANGER

HIGHLY FLAMMABLE! OSHA/NFPA Class 1B flammable liquid. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME! CONTAINS PETROLEUM DISTILLATES! Avoid breathing vapors or mists. Use only with adequate ventilation. If swallowed, do not induce vomiting since aspiration into the lungs may cause chemical pneumonia. Obtain prompt medical attention.

May cause irritation or more serious skin disorders! May be harmful if inhaled! May cause irritation of the nose, throat, and lungs, headache, dizziness, drowsiness, loss of coordination, fatigue, nausea and labored breathing. May cause irregular heartbeats. Avoid prolonged or repeated liquid, mist, and vapor contact with eyes, skin, and respiratory tract.

Wash hands thoroughly after handling.

Sulfur compounds in this material may decompose to release hydrogen sulfide gas which may accumulate to potentially lethal concentrations in enclosed air spaces. Vapor concentrations of hydrogen sulfide above 50 ppm, or prolonged exposure at lower concentrations, may saturate human odor perceptions so that the smell of gas may not be apparent. **DO NOT DEPEND ON THE SENSE OF SMELL TO DETECT HYDROGEN SULFIDE!**

Long-term tests show that similar crude oils have produced skin tumors on laboratory animals.

Crude oils contain some polycyclic aromatic hydrocarbons which have been shown to be carcinogenic after prolonged or repeated skin contact in laboratory animals.

Routes of Exposure

Signs and Symptoms

Inhalation (Primary)

Vapors or mists from this material, at concentrations greater than the recommended exposure limits in Section 2, can cause irritation of the nose, throat, and lungs, headache, dizziness, drowsiness, loss of coordination, fatigue, nausea and labored breathing. Airborne concentrations above the recommended exposure limits are not anticipated during normal workplace activities due to the slow evaporation of this material at ambient temperatures.

Exposure to moderate airborne concentrations of hydrogen sulfide (less than 50 ppm) can result in irritation of the eyes, nose and throat, headache, dizziness, shortness of breath, nausea and nervousness. Exposure to hydrogen sulfide vapor above 200 ppm may cause irritation of mucous membranes, inflammation of the lungs, accumulation of fluid in the lungs, irregular heartbeats, unconsciousness with convulsions or impaired breathing with suffocation. Exposure to higher concentrations of hydrogen sulfide vapor (above 500 ppm) may cause rapid death.

Eye Contact

May cause slight eye irritation.

Skin Contact

Moderate skin irritation may occur upon short-term exposure.

Exposure to sunlight may increase the degree of skin irritation.

Absorption through the skin may occur and produce toxic effects (see Summary of Chronic Hazards).

Ingestion

May cause irritation of the mouth, throat and gastrointestinal tract leading to nausea, vomiting, diarrhea, and restlessness. May cause headache, dizziness, drowsiness, loss of coordination, fatigue, nausea and labored breathing.

ASPIRATION HAZARD: Aspiration into the lungs may cause chemical pneumonia. This material can enter the lungs during swallowing or vomiting and may cause lung inflammation and damage which in severe cases may be fatal.

Summary of Chronic Hazards and Special Health Effects

Personnel with preexisting central nervous system (CNS) disease, skin disorders, or chronic respiratory diseases should be evaluated by an appropriate health professional before exposure to this material.

Prolonged/repeated skin exposure, inhalation or ingestion of this material may result in adverse dermal or systemic effects. Avoid prolonged or repeated exposure. May be harmful if absorbed through the skin. Prolonged or repeated contact may create cancer risk, organ damage, and adversely affect reproduction, fetal development and fetal survival. Avoid all skin contact.

Neurotoxic effects have been associated with n-hexane, a component of this material. Avoid prolonged or repeated exposure.

See Section 11 for Additional Toxicological Information.

4. EMERGENCY and FIRST AID**Inhalation**

Immediately remove personnel to area of fresh air. For respiratory distress, give oxygen, rescue breathing, or administer CPR (cardiopulmonary resuscitation) if necessary. Obtain prompt medical attention.

Eye Contact

Flush eyes with clean, low-pressure water for at least 15 minutes, occasionally lifting the eyelids. If pain or redness persists after flushing, obtain medical attention.

Skin Contact

Immediately remove contaminated clothing. Wash affected skin thoroughly with soap and water. If irritation persists, obtain medical attention.

Ingestion

Do not induce vomiting since aspiration into the lungs may cause lipid pneumonia. Obtain prompt medical attention.

Emergency Medical Treatment Procedures

See above procedures. Personnel with pre-existing central nervous system disease, skin disorders, chronic respiratory diseases, or impaired liver or kidney function should avoid exposure to this product.

5. FIRE and EXPLOSION

Flash Point (Method)* Based on NFPA Petroleum, Crude AP 20°F to 90°F
Autoignition Temperature (Method)* N/DA
Flammable Limits (% Vol. in Air*) Lower AP 1 +
Upper AP 8 +

NFPA Hazard Rating:
Health: 2 = Moderate
Fire: 3 = High
Reactivity: 0 = Insignificant
Special:

* At Normal Atmospheric Temperature and Pressure

+ Based on NFPA 325

Fire and Explosion Hazards

HIGHLY FLAMMABLE! This material releases flammable vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, these vapors can burn in the open or explode in confined spaces.

Flammable vapors may travel long distances along the ground before reaching a point of ignition and flashing back.

Open top tanks involved in a fire have a potential for "boil-over" if water or water-in-oil emulsion is at the bottom of the tank. Boil-over may result in a large expulsion of burning oil from the tank, greatly increasing the fire area.

Extinguishing Media

Foam, Dry chemical, Carbon dioxide (CO₂)

Water and water fog can cool the fire but may not extinguish the fire.

Special Firefighting Procedures

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of combustion products and oxygen deficiencies. Cool tanks and containers exposed to fire with water. If firefighters cannot work upwind to the fire, respiratory protective equipment must be worn unless and until atmospheric monitoring indicates that such protection is not required. Improper use of water and extinguishing media containing water may cause frothing which can spread the fire over a larger area. Water fog or spray are of value for cooling tank shells and surfaces exposed to fire, but may not achieve extinguishment.

6. ACCIDENTAL RELEASE MEASURES

Precautions if Material is Spilled or Released Contain spill, evacuate non-essential personnel, and safely stop flow. On hard surfaces, spilled material may create a slipping hazard. Equip cleanup crews with proper protective equipment (as specified in Section 8) and advise of hazards. Clean up by recovering as much spilled or contaminated materials as possible and placing into closed containers. Consult with an environmental professional for the federal, state and local cleanup and reporting requirements for spills and releases.

7. HANDLING and STORAGE

Handling, Storage and Decontamination Procedures Store and transport in accordance with all applicable laws. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME! KEEP CONTAINERS CLOSED, PLAINLY LABELED AND OUT OF CLOSED VEHICLES! Containers should be able to withstand pressures expected from warming or cooling in storage. Ground all drums and transfer vessels when handling. Store in cool (80°F or below), well-ventilated location. All electrical equipment in storage and/or handling areas should be installed in accordance with applicable requirements of the National Electrical Code (NEC).

KEEP OUT OF REACH OF CHILDREN!

Empty containers retain some liquid and vapor residues, and hazard precautions must be observed when handling empty containers.

For determining National Electrical Code (NEC) Hazardous (Classified) location requirements for electrical installations, consider this material Class 1, Group D.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Where possible, use adequate ventilation to keep vapor and mist concentrations of this material below the Occupational Exposure Limits shown in Section 2. Electrical equipment should comply with National Electrical Code (NEC) standards (see Section 7).

Respiratory Where there is potential for exposure to hydrogen sulfide gas in excess of the permissible exposure limit, a NIOSH/MSHA-approved supplied-air respirator operated in positive pressure mode should be worn.

If hydrogen sulfide gas is not present in excess of permissible exposure limits, a NIOSH/MSHA-approved air-purifying respirator with an organic vapor cartridge may be permissible under certain circumstances where airborne concentrations of hydrocarbon vapor may exceed the exposure limits in Section 2. Where work conditions may generate airborne mists of the material, also use a high-efficiency particulate pre-filter. Consult a health and safety professional for guidance in respirator selection. Respirator use should comply with OSHA 29 CFR 910.134.

CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of the air-purifying respirator.

Eyes Eye protection should be worn. If there is potential for splashing or spraying, chemical protective goggles and/or a face shield should be worn. If contact lenses are worn, consult an eye specialist or a safety professional for additional precautions. Suitable eye wash water should be available in case of eye contact with this material.

Skin Avoid all skin contact with this material. If conditions of use present any potential for skin contact, clean and impervious clothing such as gloves, apron, boots, and facial protection should be worn. Neoprene, Nitrile, Butyl Rubber or Viton glove material is recommended. When working around equipment or processes which may create the potential for skin contact, full body coverage should be worn, which consist of impervious boots and oil-resistant coated Tyvek suit or other impervious jacket and pants.

Non-impervious clothing which accidentally becomes contaminated with this material should be removed promptly and not reworn until the clothing is washed thoroughly and the contamination is effectively removed. Discard soaked leather goods.

Other Hygienic and Work Practices

Use good personal hygiene practices. If skin contact should occur, material should be removed from the skin with a waterless hand cleaner, and the affected area should then be washed with a mild soap and water. Wash hands and other exposed areas thoroughly before eating, drinking, smoking or using toilet facilities.

9. PHYSICAL and CHEMICAL PROPERTIES

Boiling Point:	AP -54°F to 1100°F
Viscosity Units, Temp. (Method):	N/DA
Dry Point:	N/AP
Freezing Point:	N/DA
Vapor Pressure, Temp. (Method):	AP 1 to 2 at 100°F (REID-PSIA)
Volatile Characteristics:	Appreciable
Specific Gravity (H₂O = 1 @ 39.2°F):	AP 0.88
Vapor Sp. Gr. (Air = 1.0 @ 60°F - 90°F):	N/DA
Solubility in Water:	Negligible
PH:	N/AP
Appearance and Odor:	Thick light yellow to dark black colored liquid. Petroleum hydrocarbon odor.
Other Physical and Chemical Properties:	Total sulfur = approx. 1.1% - 2.8% Hydrogen sulfide content is less than 5 ppm dissolved in liquid Vanadium = approx. 210 ppm

10. STABILITY and REACTIVITY

Stability	Stable
Hazardous Polymerization	Not expected to occur.
Other Chemical Reactivity	N/AP

Conditions to Avoid	Heat, sparks, and open flame.
Materials to Avoid	Strong acids, alkalis, and oxidizers such as liquid chlorine and oxygen.
Hazardous or Decomposition Products	Burning or excessive heating may produce carbon monoxide and other harmful gases or vapors including oxides of sulfur and nitrogen.

11. TOXICOLOGICAL INFORMATION

Toxicological Information	The information found in this section is written for medical, toxicology, occupational health and safety professionals. This section provides technical information on the toxicity testing of this or similar materials or its components. If clarification of the technical content is needed, consult a professional in the areas of expertise listed above.
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Prolonged/Repeated Exposures	IARC has determined there is "limited evidence for the carcinogenicity in experimental animals of crude oil" and "inadequate evidence for the carcinogenicity in humans of crude oil." IARC concludes that "crude oil is not classifiable as to its carcinogenicity to humans (Group 3)." Crude oil administered orally to pregnant rats during gestation produced increased number of resorptions and decrease in fetal weight and length.
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Exposure to N-hexane at concentrations considerably higher than the current permissible exposure limit has reportedly been associated with peripheral neuropathy.

12. ECOLOGICAL INFORMATION

Not Available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Maximize recovery for reuse or recycling. Consult environmental professional to determine if state or federal regulations would classify spilled or contaminated materials as a hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Comply with all federal, state and local laws pertaining to waste management.

14. TRANSPORT INFORMATION

UN Proper Shipping Name	Petroleum crude oil
UN Hazard Class	3
UN Number	UN1267
UN Packing Group	PGI

15. REGULATORY INFORMATION

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA), TITLE III

Section 311/312 Hazard Categories:

Immediate (acute) health hazard
 Delayed (chronic) health hazard
 Fire hazard

No chemicals in this product exceed the threshold reporting level established by SARA Title III, Section 313 and 40 CFR 372.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are listed on the TSCA Inventory.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)

This material is covered by CERCLA's PETROLEUM EXEMPTION.

(Refer to 40 CFR 307.14)

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 - PROPOSITION 65

PROP 65 WARNING LABEL:

Chemicals known to the State to cause cancer, birth defects, or other reproductive harm are found in gasoline, crude oil, and many other petroleum products and their vapors, or result from their use. Read and follow label directions and use care when handling or using all petroleum products.

WARNING:

This product contains the following chemical(s) listed by the state of California as known to cause cancer or birth defects or other reproductive harm.

MINERAL OILS, UNTREATED ^(C)

Other Prop 65 chemicals will result under certain conditions from the use of this material. For example, burning fuels produces combustion products including carbon monoxide, a Prop 65 reproductive toxin.

^(C) = Carcinogen

16. OTHER INFORMATION

**General
Comments**

The information and conclusions herein reflect normal operating conditions and may be from sources other than direct test data on the mixture itself.

Abbreviations:	EQ = Equal	AP = Approximately	N/P = No Applicable Information Found
	LT = Less Than	UK = Unknown	N/AP = Not Applicable
	GT = Greater Than	TR = Trace	N/DA = No Data Available

Prepared by: Product Stewardship

Disclaimer of Liability

The information in this MSDS was obtained from sources which we believe are reliable. **HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.**

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. **FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.**

This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

BECKART ENVIRONMENTAL, INC.

6900 46TH STREET
KENOSHA, WI 53144

PHONE # (262) 656-7680

FAX # (262) 656-7699

Emergency phone number: CHEMTREC: 1-800-424-9300

DATE REVISED: 06/08/2012

This MSDS complies with 29 CFR 1910.1200 (The Hazard Communication Standard)

I PRODUCT INFORMATION:

PRODUCT NAME: Aqua-Dry Kits (50G, 100G, 500G) – Component A

PRODUCT TYPE: Deodorizing delivery system (pouch) for the generation of chlorine dioxide.

II HAZARDOUS INGREDIENTS:

<u>INGREDIENT</u>	<u>CAS #:</u>	<u>CONCENTRATION (% by weight)</u>
Sodium chlorite	7758-19-2	<45%

III PHYSICAL DATA:

FORM: dry powder in plastic bag enclosed in foil bag

pH Value: 10 approximately, 100g/l water

MELTING POINT: 356°F

% VOLITILE: Not determined

SOLUBILITY IN WATER: 250g/l water (20°C)

ODOR: Almost odorless

VAPOR PRESSURE: Not determined

APPEARANCE: white powder

EVAPORATION RATE: NA

OXIDIZING: 0

IV FIRE AND EXPLOSION DATA:

FLASH POINT: NA

FLAMMABLE NA

LEL: NA

UEL: NA

SPECIAL FIRE FIGHTING PROCEDURE: NIOSH certified gas mask with canister for chlorine, or self-contained breathing apparatus should be used.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Material is a strong oxidizer. Contact with combustibles may initiate combustion. Acid and heat may accelerate combustion, and decomposition products may include chlorine.

EXTINGUISHING MEDIA: Water and Foam (Do NOT use carbon dioxide).

V REACTIVITY DATA:

STABILITY: Stable at normal temperatures and pressure. Avoid contact with direct sunlight and excessive heat

INCOMPATIBILITY (MATERIALS TO AVOID): Corrosive to steel, stainless steel, and many other materials. Avoid contact with reducing agents, oxidizers, and acids.

DECOMPOSITION: Will produce chlorine dioxide gas with contact of acids. Thermal decomposition products include chlorine and oxides of sodium. Thermal critical point >180° C. Store in cool & dry storage room.

HAZARDOUS POLYMERIZATION: Will not occur

VI HEALTH HAZARD INFORMATION:

ROUTES OF EXPOSURE AND EFFECTS:

SKIN: May irritate and cause redness.

EYE: Contact causes redness, irritation, pain, blurred vision, tearing, corneal injury and burns.

INHALATION: Harmful if inhaled. Coughing, headaches, labored breathing, nausea, shortness of breath, pulmonary edema.

INGESTION: Can cause extreme irritation to the throat, mouth, stomach, and possible Ulceration.

PERMISSIBLE EXPOSURE LIMITS (Limits are for concentration in air, not aqueous solution.)

OSHA PEL-TWA ACGIH TLV-TWA

0.1 ppm 0.1 ppm

CARCINOGENICITY: This product does not contain compounds known to cause cancer according to NTP, IARC, or OSHA

ACGIH (ClO ₂ gas) 0.1ppm (TWA), 0.3ppm (STEL)
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EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Remove contaminated clothing. Wash exposed area with plenty of soap and water for at least 15 minutes.

EYE: Immediately flush with water for 15 minutes. Get medical attention.

INHALATION: Remove to fresh air. If irritation persists, seek medical attention.

INGESTION: If conscious drink large quantities of milk, or gelatin solution, or if this is not available drink a large quantity of water. Do not drink Vinegar or other acids. Do not induce vomiting. Seek medical attention.

VII HANDLING AND USE PRECAUTIONS:

SPILL/LEAK PROCEDURE: Isolate hazard area and deny entry to unnecessary or unprotect personnel. Keep combustibles away from spill. Ventilate area of spill or leak. Remove gas with a fine water spray. Stop leak if you can without risk. Wear a self-contained breathing apparatus. Contain spilled liquid with sand or earth. Place in a disposal container. Avoid runoff into storm sewers and ditches that lead to waterways. Never discharge directly into a lake, pond, stream, river, or other natural body of water.

WASTE DISPOSAL METHODS: Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine whether a substance should be classified as a hazardous waste at the time of disposal. This is due to the fact that product use, transformation, synthesis, mixtures, etc. may change the nature of the product. Dispose of waste in accordance with applicable federal, state, and local laws. Do not reuse original packaging, clean empty packaging with water.

*HANDLING and STORAGE PRECAUTIONS: Product is an oxidizer and may cause irritation to exposed skin, and eyes. Avoid getting product on skin or in eyes. Proper protective clothing should be worn while handling product. Wash after handling and avoid breathing vapors. Store product in a cool dry place away from direct sunlight. Keep product away from acids, reducing agents, and organic substances that may react with the product in storage.

VIII INDUSTRIAL HYGIENE:

VENTILATION: Local exhaust is recommended. Use only in well ventilated areas.

RESPIRATOR: Use NIOSH approved respirator when exposure is great.

EYE PROTECTION: Chemical goggles.

GLOVES: Wear PVC protective gloves.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Rubber splash apron, and rubber boots. Safety shower and eye wash station should be located nearby.

PERSONAL PROTECTION: Keep away from food and beverages. When touching clothing, immediately rinse with water.

IX SPECIAL PRECAUTIONS:

None

X TOXICOLOGICAL INFORMATION:Acute oral toxicity: LD₅₀ = 200 – 2000 mg/kg (in rats) (OECD 01)Dermal toxicity: LD₅₀ = 50 – 400 mg/kg (in rats) (OECD 402)

Irritant on Skin: Corrosive (Rabbit OECD 404)

XI ECOLOGICAL INFORMATION:Fish toxicity: LC₅₀ (96 h) = 100 – 2000 mg/L (Brachydanoio rerio, OECD 203)Bacteria toxicity: EC₅₀ = 100-800 mg/L (OECD209)XII SHIPPING INFORMATION:DOT:

PROPER SHIPPING NAME: Sodium Chlorite

HAZARD CLASS: 5.1

UN/NA #: UN 1496, PG II

DOT LABELS: Oxidizing

DOT PLACARDS: none required (package conforms to 49CFR 173.4)

STORAGE CONDITIONS: Keep containers closed

STORAGE CONDITIONS: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, well ventilated dry area. Store below 212 F (100 C). Avoid exposure to sunlight or ultraviolet light. Keep separated from incompatible substances. Protect against fire.

HMIS RATINGS: Health: 1
 Flammability: 0
 Reactivity: 0

NFPA RATINGS: Health: 1
 Flammability: 0
 Reactivity: 1

XIII PERSONAL PROTECTION & REGULATORY INFORMATION:

REACTIVITY HAZARD: yes

FIRE HAZARD: yes

PRESSURE HAZARD: no

CERCLA HAZARDOUS SUBSTANCE: Not regulated

ACUTE HAZARD: yes

CHRONIC HAZARD: yes

N/A = Not applicable

N/F = None found

N/E = Not established

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