District of New Mexico         1625 N. French Dr., Hobbs, NM 88240       Energy Minerals and Natural Resources         Distri       * ent         1301       REGISTERED         Distri       * ant         1000       * ant         Distri       * ant         1000       * ant         Distri       * ant         1200 S. St. Francis Dr., Santa Fe, NM 87505       * 87505         Pit, Closed-Loop System, Below-Grade         Proposed Alternative Method Permit or Closur         Type of action:       * Permit of a pit, closed-loop system, below-grade tat         Closure of a pit, closed-loop system, below-grade tat	Form C-144 July 21, 2008 For temporary pits, closed-loop sytems, and below-grade tanks, submit to the appropriate NMOCD District Office. For permanent pits and exceptions submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office. E Tank, or Plan Application nk, or proposed alternative method ank, or proposed alternative method
Modification to an existing permit Closure plan only submitted for an existing permitt below-grade tank, or proposed alternative method Instructions: Please submit one application (Form C-144) per individual pit, closed-loop Please be advised that approval of this request does not relieve the operator of liability should operations re environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable g	ed or non-permitted pit, closed-loop system, <b>b</b> system, below-grade tank or alternative request sult in pollution of surface water, ground water or the povernmental authority's rules, regulations or ordinances.
Operator: Burlington Resources Oil & Gas Company, LP         Address:       PO Box 4289, Farmington, NM 87499         Facility or well name:       HARDIE E 2C         API Number:       3004530905       OCD Permit Number         U/L or Qtr/Qtr:       J       Section:       9       Township:       28N       Range:       8         Center of Proposed Design:       Latitude:       36.67353°N       Longitude:	OGRID#: 14538 
Surface Owner:       X       Federal       State       Private       Iffibal Iffust of Indian         2       Pit:       Subsection F or G of 19.15.17.11 NMAC         Temporary:       Drilling       Workover         Permanent       Emergency       Cavitation       P&A         Lined       Unlined       Liner type:       Thickness       mil       LLDPE         String-Reinforced       Liner Seams:       Welded       Factory       Other       Volume:	HDPE PVC Other
3       Closed-loop System:       Subsection H of 19.15.17.11 NMAC         Type of Operation:       P&A       Drilling a new well       Workover or Drilling (Applies to notice of intent)         1       Drying Pad       Above Ground Steel Tanks       Haul-off Bins       Other         1       Lined       Unlined       Liner type:       Thickness       mil       LLDPE       H         Liner Seams:       Welded       Factory       Other	activities which require prior approval of a permit or
4       X       Below-grade tank:       Subsection I of 19.15.17.11 NMAC         Volume:       120       bbl       Type of fluid:       Produced Water         Tank Construction material:       Metal         Secondary containment with leak detection       X Visible sidewalls, liner, 6-inch lift and autor         Visible sidewalls and liner       Visible sidewalls only       Other         Liner Type:       Thickness       mil       HDPE       PVC       X Other	matic overflow shut-off
5       Alternative Method:         Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Enviror         Form C-144       Oil Conservation Division	amental Bureau office for consideration of approval. Page 1 of 5

6 Section D. of 19.15.17.11 NMAC (Applies to permanent pit, temporary pits, and below-grade tanks).											
Chain link, six feet in height, two strands of barbed wire at top (Required if located within 1000 feet of a permanent revidence, which invitibility or downly											
Four foot height, four strands of barbed wire evenly spaced between one and four feet											
X Alternate. Please specify 4 <sup>th</sup> hog wire fencing topped with two strands barbed wire.											
7											
Netting: Subsection E of 19:15.17.11 NMAC (Applies to permanent pits and permanent open top tanks)											
X Screen Other											
Monthly inspections (If netting or screening is not physically feasible)											
8											
Signs: Subsection C of 19.15,17.11 NMAC											
12" X 24", 2" lettering, providing Operator's name, site focation, and emergency telephone numbers											
9 Administrative Approvals and Exceptions:											
Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.											
Please check a box if one or more of the following is requested, if not leave blank:											
X Administrative approval(s): Requests must be submitted to the appropriate division district of the Santa Fe Environmental Bureau office for consideration of approval. (Fencing/BGT Liner)											
Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.											
10	1										
Stang Criteria (regarding permitting): 19.15.17.10 NMAC Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria may require administrative approval from the approximate district office or may be envidenced on acceptable must be submitted to the Seate Fe Environmental Bacenet Office for											
depropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau Office for consideration of approval. Applicant must attach justification for request. Please refer to 19.15.17.10 NMAC for guidance. Siting criteria does not apply to drying pads or above grade-tanks associated with a closed-loop system.											
Ground water is less than 50 feet below the bottom of the temporary pit, permanent pit, or below-grade tank. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	Yes	X No.									
<ul> <li>Within 300 feet of a continuously flowing watercourse, or 200 feet of any other watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).</li> <li>Topographic map; Visual inspection (certification) of the proposed site</li> </ul>	Yes	XNo									
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.	Yes	ΧΝυ									
(Applies to temporary, emergency, or cavitation pits and below-grade tanks)	<b>NA</b>										
- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image											
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.	Yes	No									
(Applied to permanent pits)	XNA										
- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image		<b>—</b>									
within 500 norizonal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.	Yes	X No.									
- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site.	<b></b>										
within incorporated municipal boundaries or within a defined municipal Iresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended - Written confirmation or verification from the municipality: Written approval obtained from the municipality	Yes	XNo									
Within 500 feet of a wetland. US Fish and Wildlife Wetland Identification map: Topographic map: Visual inspection (certification) of the proposed site	Yes	XNo									
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD - Mining and Mineral Division	Yes	XNo									
Within an unstable area.	□ Yes	X No									
- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map											
Within a 100-year floodplain - FEMA map	Yes	XNo									

Temporary Pits, Emergency Pits and Below-grade Tanks Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC
Instructions: Each of the following items must be different to the application. Please indicate, by a check mark in the box, that the documents are attached;
Mydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) or Subsection B or 19.15.17.9 NMAC.
Tychogeologic Data (Templorary and Energency Pusy - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9
N String Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC.
[X] Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
[X] Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
Previously Approved Design (attach copy of design) API or Permit
12       12 <b>Closed-loop Systems Permit Application Attachment Checklist:</b> Subsection B of 19.15.17.9 NMAC         Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.         Closed of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.         Closed of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.         Closed of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.         Closed of the following items must be attached to the application. Please indicate, by a check mark in the box.         Closed of the following items must be attached.         Closed of the following items m
Siting Criteria Compliance Demonstrations (only for on-site closure) - based upon the appropriate requirements of 19.15.17.10 NMAC
Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
Previously Approved Design (attach copy of design) API
Previously Approved Operating and Maintenance Plan API
Permanent Pits Permit Application Checklist: Subsection B of 19.15.17.9 NMAC
Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.
Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
Climatological Factors Assessment
Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
Dike Protection and Structural Integrity Design: based upon the appropriate requirements of 19.15.17.11 NMAC
Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
Quality Control/Quality Assurance Construction and Installation Plan
Freeboard and Overtonning Drevention Dian based upon the appropriate requirements of 19.15.17.11 NMAC
Nuisance or Hazardous Odors, including H2S. Prevention Plan
Emergency Response Plan
Oil Field Waste Stream Characterization
Monitoring and Inspection Plan
Erosion Control Plan
Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
Proposed Closure: 19.15.17.13 NMAC
Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.
Type: Drilling Workover Emergency Cavitation P&A Permanent Pit XBelow-grade Tank Closed-loop System
Proposed Closure Method: X Waste Excavation and Removal (Below-Grade Tank)
Waste Removal (Closed-loop systems only)
On-site Closure Method (only for temporary pits and closed-loop systems)
In-place Burial On-site Trench
Alternative Closure Method (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)
15
Waste Excavation and Removal Closure Plan Checklist: (19.15.17.13 NMAC) Instructions: Each of the following items must be attached to the closure plan.
Please indicate, by a check mark in the box, that the documents are attached.
X Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
X Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC
X Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)
X Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
X Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC
X Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16 <u>Waste Removal Closure For Closed-loop Systems That Utilize Ab</u> Instructions: Please identify the facility or facilities for the disposal of are required.	ove Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC) Cliquids, drilling fluids and drill cuttings. Use attachment if more than two	) facilities
Disposal Facility Name:	Disposal Facility Permit #	
Disposal Facility Name:	Disposal Facility Permit #	
Will any of the proposed closed-loop system operations and asso Yes (If yes, please provide the information	ciated activities occur on or in areas that will not be used for future No	service and operations?
Required for impacted areas which will not be used for future service     Soil Backfill and Cover Design Specification - based upo     Re-vegetation Plan - based upon the appropriate requirer     Site Reclamation Plan - based upon the appropriate requirer	and operations: on the appropriate requirements of Subsection H of 19.15.17.13 NM/ nents of Subsection I of 19.15.17.13 NMAC irements of Subsection G of 19.15.17.13 NMAC	AC
17 <u>Siting Criteria (Regarding on-site closure methods only:</u> 19. Instructions: Each siting criteria requires a demonstration of compliance in t certain siting criteria may require administrative approval from the appropri for consideration of approval. Justifications and/or demonstrations of equiva	15.17.10 NMAC he closure plan. Recommendations of acceptable source material are provided be are district office or may be considered an exception which must be submitted to th dency are required. Please refer to 19.15.17.10 NMAC for guidance.	low Requests regarding changes to te Santa Fe Environmental Bureau office
Ground water is less than 50 feet below the bottom of the buried	waste.	Yes No
<ul> <li>NM Office of the State Engineer - iWATERS database search; I</li> </ul>	JSGS: Data obtained from nearby wells	□N/A
Ground water is between 50 and 100 feet below the bottom of th	e buried waste	Yes No
- NM Office of the State Engineer - iWATERS database search; U	SGS; Data obtained from nearby wells	
Ground water is more than 100 feet below the bottom of the buri	ied waste.	
- NM Office of the State Engineer - iWATERS database search; U	SGS: Data obtained from nearby wells	
Within 300 feet of a continuously flowing watercourse, or 200 feet of a (measured from the ordinary high-water mark).	ny other significant watercourse or lakebed, sinkhole, or playa lake	Yes No
- Topographic map: Visual inspection (certification) of the propose	ed site	
Within 300 feet from a permanent residence, school, hospital, institutio - Visual inspection (certification) of the proposed site: Aerial photo	n, or church in existence at the time of initial application. ; satellite image	Yes No
Within 500 horizontal feet of a private, domestic fresh water well or sp purposes, or within 1000 horizontal fee of any other fresh water well or - NM Office of the State Engineer - iWATERS database; Visual ins	ring that less than five households use for domestic or stock watering spring, in existence at the time of the initial application, spection (certification) of the proposed site	Yes No
Within incorporated municipal boundaries or within a defined municipal pursuant to NMSA 1978, Section 3-27-3, as amended. Written confirmation or verification from the municipality: Written	al fresh water well field covered under a municipal ordinance adopted	Yes No
Within 500 feet of a wetland US Fish and Wildlife Wetland Identification map; Topographic m	nap: Visual inspection (certification) of the proposed site	Yes No
Within the area overlying a subsurface mine.		
- Written confiramtion or verification or map from the NM EMNRI	D-Mining and Mineral Division	
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Topographic man	f Geology & Mineral Resources; USGS; NM Geological Society;	Yes No
Within a 100-year floodplain. - FEMA map		Yes No
18 On-Site Closure Plan Checklist: (19.15.17.13 NMAC) Instruction by a check mark in the box, that the documents are attached.	ctions: Each of the following items must bee attached to the closur	re plan. Please indicate,
Siting Criteria Compliance Demonstrations - based upon t	he appropriate requirements of 19.15.17.10 NMAC	
Proof of Surface Owner Notice - based upon the appropria	te requirements of Subsection F of 19.15.17.13 NMAC	
Construction/Design Plan of Burial Trench (if applicable)	based upon the appropriate requirements of 19.15.17.11 NMAC	
Construction/Design Plan of Temporary Pit (for in place b	urial of a drying pad) - based upon the appropriate requirements of 1	9.15.17.11 NMAC
Protocols and Procedures - based upon the appropriate req	uirements of 19.15.17.13 NMAC	
Confirmation Sampling Plan (if applicable) - based upon the	ne appropriate requirements of Subsection F of 19.15.17.13 NMAC	
Waste Material Sampling Plan - based upon the appropriat	e requirements of Subsection F of 19.15.17.13 NMAC	
Disposal Facility Name and Permit Number (for liquids, du	rilling fluids and drill cuttings or in case on-site closure standards car	nnot be achieved)
Soil Cover Design - based upon the appropriate requirement	nts of Subsection H of 19.15.17.13 NMAC	
Site Reclamation Plan - based upon the appropriate requirement	ints of Subsection Lot 19.15.17.13 NMAC	

19		······································
Operator Application Certification:		
I hereby certify that the information submitted with this application is true, accurate	ate and complete to the best of m	y knowledge and belief.
Name (Print):	Title: R	egulatory Technician
Signature:	Date:	12/22/2008
c-mail address: crystal. a foya @ conocophillips.com	Telephone:	505-326-9837
		565 526 7657
20	<u> </u>	
OCD Approval: Permit Application (including closure plan)	Closure Plan (only)	CD Conditions (see attachment)
OCD Benzecentative Signatures		
OCD Representative Signature:		Approval Date:
Title:	OCD Permit Num	her:
21		
Closure Report (required within 60 days of closure completion): Subsec	tion K of 19.15.17.13 NMAC	
Instructions: Operators are required to obtain an approved closure plan prior to	implementing any closure activit	ies and submitting the closure report. The closure
report is required to be submitted to the division within 60 days of the completion approved closure plan has been obtained and the closure activities have been con	of the closure activities. Please	do not complete this section of the form until an
		atten Data
		etion Date:
22		
Closure Method:		
Waste Excavation and Removal On-site Closure Method	Alternative Closure Method	Waste Removal (Closed-loop systems only)
If different from approved plan, please explain.		
23		
Closure Report Regarding Waste Removal Closure For Closed-loop Systems	That Utilize Above Ground Ste	el Tanks or Haul-off Bins Only:
Instructions: Please identify the facility or facilities for where the liquids, drillin	ng fluids and drill cuttings were	disposed. Use attachment if more than two facilities
were utilized.		
Disposal Facility Name:	Disposal Facility Permit N	umber:
Disposal Facility Name:	Disposal Facility Permit N	umber:
Were the closed-loop system operations and associated activities performed on	or in areas that will not be used	for future service and opeartions?
Required for impacted areas which will not be used for future service and open Site Reclamation (Photo Documentation)	ations:	
Soil Backfilling and Cover Installation		
Re-vegetation Application Rates and Seeding Technique		
24 Closure Report Attachment Checklist: Instructions: Each of the follow	ing items must be attached to th	a desure mont. Disco indicate here the transition
the box, that the documents are attached.	ing items musi be anachea io ir	ie closure report. rieuse indicale, by a check mark in
Proof of Closure Notice (surface owner and division)		
Proof of Deed Notice (required for on-site closure)		
Plot Plan (for on-site closures and temporary pits)		
Confirmation Sampling Analytical Results (if applicable)		
Waste Material Sampling Analytical Results (if applicable)		
Disposal Facility Name and Permit Number		
Soil Backfilling and Cover Installation		
Re-vegetation Application Rates and Seeding Technique		
Site Reclamation (Photo Documentation)		
On-site Closure Location: Latitude:	Longitude:	NAD 1927 1983
Operator Closure Certification:		
Thereby certify that the information and attachments submitted with this closure re	eport is ture, accurate and comm	lete to the best of my knowledge and belief. I also certify that
the closure complies with all applicable closure requirements and conditions speci	ified in the approved closure pla	n.
Name (Drint).	The later	
	1 IIIe:	
Signature:	Date:	
e-mail address:	Telephone:	····

Township: 28N	Range: 09W Sections:	
NAD27 X:	Y: Zone: Se	arch Radius:
County: Basin	Number:	Suffix:
Owner Name: (First)	(Last)	1-Domestic O Domestic O All
POD / Surface Data Report	Avg Depth to Water Report	Water Column Report
	Clear Form iWATERS Menu He	ID

	(quarter (quarter	s ar	e 1=) e big	WW gge	2:	=NE t to	3=SW 4=SI smalles	E) t)		Depth	Depth	Water	(in
POD Number	Tws	Rng	Sec	q	ġ	g	Zone	x	Y	Well	Water	Column	
SJ 03746 POD1	28N	09W	20	1	2	3				190	40	150	
SJ 00018	28N	09W	20	3	1	4				135	71	64	
SJ 02800	28N	09W	24	4	2	3				200			

Record Count: 3

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### New Mexico Office of the State Engineer POD Reports and Downloads

-
Township: 28N Range: 08W Sections:
NAD27 X: Y: Zone: Search Radius:
County: Basin: Number: Suffix:
Owner Name: (First) (Last) CNon-Domestic CDomestic All
POD / Surface Data Report Avg Depth to Water Report Water Column Report
Clear Form iWATERS Menu Help

### WATER COLUMN REPORT 08/21/2008

( gr ( gr	larter Larter	s are	e 1=1 e big	NW 999	2= est	=NE to	3=SW 4=S smalles	E) t)		Depth	Depth	Water	(in
POD Number	Tws	Rng	Sec	P	P	P	Zone	x	Y	Well	Water	Column	
SJ 02283	28N	08W	14	4	2	1				540	480	60	
SJ 00209	28N	08W	17	3	2	1				15			
SJ 00209 -AMENDED-	5 2'8N	08W	17	4	1	1				15			
SJ 00209 S	28N	08W	17	4	1	1				15		15	
SJ 00163 S	28N	W80	18	4	4	2				1450	800	650	

Record Count: 5





# Mines, Mills and Quarries Web Map

HARDIE E 2C Unit Letter: J, Section: 09, Town: 028N, Range: 008W







## HARDIE E 2C

### Site Specific Hydrogeology

A visual site inspection confirming the information contained herein was performed on the well 'HARDIE E 2C', which is located at 36.67353 degrees North latitude and 107.68237 degrees West longitude. This location is located on the Cutter Canyon 7.5' USGS topographic quadrangle. This location is in section 9 of Township 28 North Range 8 West of the Public Land Survey System (New Mexico Principal Meridian). This location is located in San Juan County, New Mexico. The nearest town is Turley, located 7.6 miles to the northwest. The nearest large town (population greater than 10,000) is Farmington, located 29.3 miles to the west (National Atlas). The nearest highway is US Highway 64, located 3.8 miles to the north. The location is on BLM land and is 3,118 feet from the edge of the parcel as notated in the BLM land status layer updated January 2008. This location is in the Blanco Canyon. New Mexico, Sub-basin. This location is located 1946 meters or 6382 feet above sea level and receives 12 inches of rain each year. The vegetation at this location is classified as Colorado Plateau Pinon-Juniper Woodland as per the Southwest Regional Gap Analysis Program.

The estimated depth to ground water at this point is 602 feet. This estimation is based on the data published on the New Mexico Engineer's iWaters Database website and water depth data from ConocoPhillips' cathodic wells. Groundwater data available from the NM State Engineer's iWaters Database for wells near the proposed site are attached. The nearest stream is 1,252 feet to the northeast and is classified by the USGS as an intermittent stream. The nearest perennial stream is 3,309 feet to the west. The nearest water body is 2,725 feet to the east. It is classified by the USGS as an intermittent lake and is 0.1 acres in size. The nearest spring is 6,003 feet to the south. All stream, river, water body and spring information was determined as per the USGS Hydrographic Dataset (High Resolution), downloaded 3/2008. The nearest water well is 5,000 feet to the northeast. The nearest wetland is a 2.9 acre Ravine located 3,432 feet to the west. The slope at this location is 1 degree to the northwest as calculated from USGS 30M National Elevation Dataset. This information is also discerned from the aerial and topographic map included. The surface geology at this location is SAN JOSE FORMATION--Siltstone, shale, and sandstone with a Sandstone dominated formations of all ages substrate. The soil at this location is 'Travessilla-Weska-Rock outcrop complex, moderately steep' and is well drained and not hydric with severe erosion potential as taken from the NRCS SSURGO map unit, downloaded January 2008. The nearest underground mine is 22.3 miles to the northeast as indicated on the Mines, Mills and Quarries Map of New Mexico provided.

### Regional Hydrogeological context:

The San Jose Formation of Eocene age occurs in New Mexico and Colorado, and its outcrop forms the land surface over much of the eastern half of the central basin. It overlies the Nacimiento Formation in the area generally south of the Colorado-New Mexico State line and overlies the Animas Formation in the area generally north of the State line. The San Jose Formation was deposited in various fluvial-type environments. In general, the unit consists of an interbedded sequence of sandstone, siltstone, and variegated shale. Thickness of the San Jose Formation generally increases from west to east (200 feet in the west and south to almost 2,700 feet in the center of the structural basin). Ground water is associated with alluvial and fluvial sandstone aquifers. Thus, the occurrence of ground water is mainly controlled by the distribution of sandstone in the formation. The distribution of such sandstone is the result of original depositional extent plus any post-depositional modifications, namely erosion and structural deformation. Transmissivity data for San Jose Formation are minimal. Values of 40 and 120 feet squared per day were determined from two aquifer tests (Stone et al. 1983, table 5). The reported or measured discharge from 46 water wells completed in San Jose Formation ranges from 0.15 to 61 gallons per minute and the median is 5 gallons per minute. Most of the wells provide water for livestock and domestic use. The San Jose Formation is a very suitable unit for recharge from precipitation because soils that form on the unit are sandy and highly permeable and therefore readily adsorb precipitation. However, low annual precipitation, relatively high transpiration and evaporation rates, and deep dissection of the San Jose Formation by the San Juan River and its tributaries all tend to reduce the effective recharge to the unit.

Stone et al., 1983, Hydrogeology and Water Resources of the San Juan Basin, New Mexico: Socorro, New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6, 70 p.

# Burlington Resources Oil & Gas Company, LP San Juan Basin Below Grade Tank Design and Construction

In accordance with NMAC 19.15.17 the following information describes the design and construction of below grade tanks on Burlington Resources Oil & Gas Company, LP (BR) locations. This is BR's standard procedure for all below grade tanks (BGT). A separate plan will be submitted for any BGT which does not conform to this plan.

### General Plan:

- 1. BR will design and construct a properly sized and approved BGT which will contain liquids and should prevent contamination of fresh water to protect the public health and environment.
- 2. BR signage will comply with 19.15.3.103 NMAC when BR is the operator. If BR is not the operator it will comply with 19.15.17.11NMAC. BR includes Emergency Contact information on all signage.
- 3. BR has approval to use alternative fencing that provides better protection. BR constructs fencing around the BGT using 4 foot hog wire fencing topped with two strands of barbed wire, or with a pipe top rail. A six foot chain link fence topped with three strands of barbed wire will be use if the well location is within 1000 feet of permanent residence, school, hospital, institution or church. BR ensures that all gates associated with the fence are closed and locked when responsible
- 4. BR will construct a screened, expanded metal covering, on the top of the BGT.
- 5. BR shall ensure that a below-grade tank is constructed of materials resistant to the below-grade tank's particular contents and resistant to damage from sunlight as shown on design drawing and specification sheet.
- 6. The BR below-grade tank system shall have a properly constructed foundation consisting of a level base free of rocks, debris, sharp edges or irregularities to prevent punctures, cracks or indentations of the liner or tank bottom as shown on design drawing.
- 7. BR shall operate and install the below-grade tank to prevent the collection of surface water run-on. BR has built in shut off devices that do not allow a below-grade tank to overflow. BR constructs berms and corrugated retaining walls at least 6" above ground to keep from surface water run-on entering the below grade tank as shown on the design plan.
- 8. BR will construct and use a below-grade tank that does not have double walls. The below-grade tank's side walls will be open for visual inspection for leaks, the below-grade tank's bottom is elevated a minimum of six inches above the underlying ground surface and the below-grade tank is underlain with a geomembrane liner to divert leaked liquid to a location that can be visually inspected.

- 9. BR has equipped the below-grade tanks with the ability to detect high level in the tank and provide alarm notification and shutdown process streams into the tank. Once high level is detected RTU logic closes the inlet separator sales valve and does not permit vent valve to open. This shutdown of the sales valve and gagging of the vent valves prevents any hydrocarbon process streams from entering the pit tank once a high level is detected. Furthermore, an electronic page is sent to the BR MSO for that well site and to the designated contract "Water-Hauling" Company indicating a high level and that action must be taken to address this alarm. The environmental drain line from BR's compressor skid under normal operating conditions is in the open position. The environmental drain line is in place to capture any collected rain water or spilled lubricants from our compressor skids. The swab drain line is a manually operated drain and by normal operating procedures is in the closed position. The tank drain line is also a manually operated drain and during normal operations it is in the closed position.
- 10. The geomembrane liner consists of a 45-mil flexible LLDPE material manufactured by Raven Industries as J45BB. This product is a four layer reinforced laminated containing no adhesives. The outer layers consist of a high strength polyethylene film manufactured using virgin grade resins and stabilizers for UV resistance in exposed applications. The J45BB is reinforced with 1300 denier (minimum) tri-directional scrim reinforcement. It exceeds ASTMD3083 standard by 10%. J45BB has a warranty for 20 years from Raven Industries and is attached. It is typically used in Brine Pond, Oilfield Pit liner and other industrial applications. The manufacture specific sheet is attached and the design attached displays the proper installation of the liner.
- 11. The general specification for design and construction are attached in the BR document.



### PROPERTIES TEST METHOD J30BB J36BE **J45BB** Min. Roll Typical Roll Min. Roll **Typical Roll** Min. Roll Typical Roll Averages Averages Averages Averages Averages Averages Appearance Black/Black Black/Black Black/Black Thickness **ASTM D 5199** 27 mil 30 mil 32 mil 36 mil 40 mil 45 mil Weight Lbs Per MSF 126 lbs 140 lbs ASTM D 5261 151 lbs 168 lbs (oz/yd²) 189 lbs 210 lbs (18.14)(20.16)(21.74)(24.19)(27.21)(30.24)Construction \*\*Extrusion laminated with encapsulated tri-directional scrim reinforcement **Ply Adhesion ASTM D 413** 16 lbs 20 lbs 19 lbs 24 lbs 25 lbs 31 lbs 88 lbf MD 1" Tensile Strength 110 lbf MD 90 lbf MD ASTM D 7003 113 Ibf MD 110 lbf MD 138 lbf MD 63 lbf DD 79 lbf DD 70 lbf DD 87 lbf DD 84 lbf DD 105 lbf DD 1" Tensile Elongation @ 550 MD 750 MD 550 MD **ASTM D 7003** Break % (Film Break) 750 MD 550 MD 750 MD 550 DD 750 DD 550 DD 750 DD 550 DD 750 DD 1" Tensile Elongation @ 20 MD 33 MD ASTM D 7003 20 MD 30 MD Peak % (Scrim Break) 20 MD 36 MD 20 DD 33 DD 20 DD 31DD 20 DD 36 DD Tongue Tear Strength 75 lbf MD 97 lbf MD 75 lbf MD **ASTM D 5884** 104 lbf MD 100 lbf MD 117 lbf MD 75 lbf DD 90 lbf DD 75 lbf DD 92 lbf DD 100 lbf DD 118 lbf DD Grab Tensile 180 lbf MD 218 lbf MD 180 Ibf MD ASTM D 7004 222 lbf MD 220 lbf MD 257 lbf MD 180 lbf DD 210 lbf DD 180 lbf DD 223 lbf DD 220 lbf DD 258 lbf DD Trapezoid Tear 120 lbf MD 146 lbf MD **ASTM D 4533** 130 lbf MD 189 lbf MD 160 lbf MD 193 lbf MD 120 (bf DD 141 lbf DD 130 lbf DD 172 lbf DD 160 lbf DD 191 lbf DD \* Dimensional Stability ASTM D 1204 <1 <0.5 <1 <0.5 <1 <0.5 Puncture Resistance **ASTM D 4833** 50 lbf 64 lbf

MD = Machine Direction DD = Diagonal Directions

Maximum Use Temperature

Minimum Use Temperature

Note: Minimum Roll Averages are set to take into account product variability in addition to testing variability between laboratories.

65 lbf

180° F

-70° F

83 lbf

180° F

-70° F

\*Dimensional Stability Maximum Value

180° F

-70° F

\*\*DURA-SKRIM J30BB, J36BB & J45BB are a four layer reinforced laminate containing no adhesives. The outer layers consist of a high strength polyethylene film manufactured using virgin grade resins and stabilizers for UV resistance in exposed applications. DURA-SKRIM J30BB, J36BB & J45BB are reinforced with a 1300 denier (minimum) tri-directional scrim reinforcement.

Note: RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO: no guarantee of satisfactory results from reliance upon contained information or recommendations and



PLANT LOCATION

180° F

-70° F

Sioux Falls, South Dakota

# SALES OFFICE

80 lbf

180° F

-70° F

99 lbf

180° F

-70° F

P.O. Box 5107 Sioux Falls, SD 57117-5107 (605) 335-0174 (605) 331-0333 FAX 800-635-3456

# RAVEN INDUSTRIES INC. EXPOSED GEOMEMBRANE LIMITED WARRANTY

Raven Industries Inc. warrants Dura-Skrim J30BB, J36BB, and J45BB to be free from manufacturing defects and to be able to withstand normal exposure to sunlight for a period of 20 years from the date of sale for normal use in approved applications in the U.S and Canada, excluding Hawaii. This warranty is effective for products sold and shipped from January 1, 2008 to December 31, 2008.

This Limited Warranty does not include damages or defects in the Raven geomembrane resulting from acts of God, casualty or catastrophe including but not limited to: earthquakes, floods, piercing hail, or tornadoes. The term "normal use" as used herein does not include, among other things improper handling during transportation, unloading, storage or installation, the exposure of Raven geomembranes to harmful chemicals, atypical atmospheric conditions, abuse of Raven geomembranes by machinery, equipment or people; improper site preparation or covering materials, excessive pressures or stresses from any source or improper application or installation. Raven geomembrane material warranty is intended for commercial use only and is not in effect for the consumer as defined in the Magnuson Moss Warranty or any similar federal, state, or local statues. The parties expressly agree that the sale hereunder is for commercial or industrial use only.

Should defects or premature loss of use within the scope of the above Limited Warranty occur, Raven Industries Inc. will, at its option, repair or replace the Raven geomembrane on a pro-rata basis at the then current price in such manner as to charge the Purchaser/User only for that portion of the warranted life which has elapsed since purchase of the material. Raven Industries Inc. will have the right to inspect and determine the cause of any alleged defect in the Raven geomembrane and to take appropriate steps to repair or replace the Raven geomembrane if a defect exists which is covered under this warranty. This Limited Warranty extends only to Raven's geomembrane, and does not extend to the installation service of third parties nor does it extend to materials furnished or installed by others in connection with the intended use of the Raven geomembranes.

Any claim for any alleged breach of this warranty must be made in writing, by certified mail, to the General Manager of Engineered Films Division of Raven Industries Inc. within ten (10) days of becoming aware of the alleged defect. Should the required notice not be given, the defect and all warranties are waived by the Purchaser, and Purchaser shall not have any rights under this warranty. Raven Industries Inc. shall not be obligated to perform repairs or replacements under this warranty unless and until the area to be repaired or replaced is clean, dry, and unencumbered. This includes, but is not limited to, the area made available for repair and/or replacement of Raven geomembrane to be free from all water, dirt, sludge, residuals and liquids of any kind. If after inspection it is determined that there is no claim under this Limited Warranty, Purchaser shall reimburse Raven Industries Inc. for its costs

In the event the exclusive remedy provided herein fails in its essential purpose, and in that event only, the Purchaser shall be entitled to a return of the purchase price for so much of the material as Raven Industries Inc. determines to have violated the warranty provided herein. Raven Industries Inc. shall not be liable for direct, indirect, special, consequential or incidental damages resulting from a breach of this warranty including, but not limited to, damages for loss of production, lost profits, personal injury or property damage. Raven Industries Inc. shall not be obligated to reimburse Purchaser for any repairs, replacement, modifications or alterations made by Purchaser unless Raven Industries Inc. specifically authorized, in writing, said repairs, replacements, modifications or alteration in advance of them having been made. Raven Industry's liability under this warranty shall in no event exceed the replacement cost of the material sold to the Purchaser for the particular installation in which it failed.

Raven Industries Inc. neither assumes nor authorizes any person other than the undersigned of Raven Industries Inc. to assume for it any other or additional liability in connection with the Raven geomembrane made on the basis of the Limited Warranty. The Limited Warranty on the Raven geomembrane herein is given in lieu of all other possible material warranties, either expressed or implied, and by accepting delivery of the material; Purchaser waives all other possible warranties, except those specifically given. This Limited Warranty may only be modified by written document mutually executed by Owner and Raven Industries Inc.

Limited Warranty is extended to the purchaser/owner and is non-transferable and non-assignable; i.e., there are no third-party beneficiaries to this warranty.

Purchaser acknowledges by acceptance that the Limited Warranty given herein is accepted in preference to any and other possible materials warranties.

THIS LIMITED WARRANTY SHALL BE GOVERNED BY SOUTH DAKOTA LAW AND VENUE FOR ALL LEGAL PROCEEDINGS IN CONNECTION WITH THIS LIMITED WARRANTY SHALL BE IN MINNEHAHA COUNTY, SOUTH DAKOTA. RAVEN INDUSTRIES INC. MAKES NO WARRANTY OF ANY KIND OTHER THAN THAT GIVEN ABOVE AND HEREBY DISCLAIMS ALL WARRANTIES, BOTH EXPRESSED OR IMPLIED, OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THIS IS THE ONLY WARRANTY THAT APPLIES TO THE MATERIALS REFERRED TO HEREIN AND RAVEN INDUSTRIES INC. DISCLAIMS ANY LIABILITY FOR ANY WARRANTIES GIVEN BY ANY OTHER PERSON OR ENTITY, EITHER WRITTEN OR ORAL.

RAVEN INDUSTRIES' WARRANTY BECOMES AN OBLIGATION OF RAVEN INDUSTRIES INC. TO PERFORM UNDER THE WARRANTY ONLY UPON RECEIPT OF FINAL PAYMENT AND EXECUTION BY A DULY AUTHORIZED OFFICER OF RAVEN INDUSTRIES INC.

# Burlington Resources Oil & Gas Company, LP San Juan Basin Below Grade Tank Maintenance and Operating Plan .

In accordance with Rule 19.15.17 the following information describes the operation and maintenance of Below Grade Tank (BGT) on Burlington Resources Oil & Gas Company, LP (BR) locations. This is BR's standard procedure for all BGT. A separate plan will be submitted for any BGT which does not conform to this plan.

### General Plan:

- BR will operate and maintain a BGT to contain liquids and solids and maintain the integrity of the liner, liner system and secondary containment system to prevent contamination of fresh water and protect public health and environment. BR will accomplish this by performing an inspection on a monthly basis, installing cathodic protection, and automatic overflow shutoff devices as seen on the design plan.
- 2. BR will not discharge into or store any hazardous waste in the BGT.
- 3. BR shall operate and install the below-grade tank to prevent the collection of surface water run-on. BR has built in shut off devices that do not allow a below-grade tank to overflow. BR constructs berms and corrugated retaining walls at least 6" above ground to keep from surface water run-on entering the below grade tank as shown on the design plan.
- 4. As per 19.17.15.12 Subsection D, Paragraph 3, BR will inspect the below-grade tank at least monthly reviewing several items which include 1) containment berms adequate and no oil present, 2) tanks had no visible leaks or sign of corrosion, 3) tank valves, flanges, and hatches had no visible leaks and 4) no evidence of significant spillage of produced liquids. In addition, BR's multi-skilled operators (MSOs) are required to visit each well location once per week. If detected on either inspection, BR shall remove any visible or measurable layer of oil from the fluid surface of a below-grade tank in an effort to prevent significant accumulation of oil overtime. The written record of the monthly inspections will include the items listed above and will be maintained for five years.
- 5. BR shall require and maintain a 10" adequate freeboard to prevent overtopping of the below-grade tank.
- 6. If the below grade tank develops a leak, or if any penetration of the pit liner or below grade tank, occurs below the liquid's surface, then BR shall remove all liquid above the damage or leak line within 48 hours. BR shall notify the appropriate district office. BR shall repair or replace the pit liner or below grade tank, within 48 hours of discovery. If the below grade tank or pit liner does not demonstrate integrity, BR shall promptly remove and install a below grade tank or pit liner that complies with Subsection I of 19.15.17.11 NMAC. BR shall notify the appropriate district office of a discovery of leaks less than 25 barrels as required pursuant to Subsection B of 19.15.3.116 NMAC shall be reported within twenty-four (24) hours of discovery of leaks greater than 25 barrels. In addition, immediate verbal notification pursuant to Subsection B, Paragraph (1), and Subparagraph (d) of 19.15.3.116 NMAC shall be reported to the division's Environmental Bureau Chief.

# Burlington Resources Oil & Gas Company, LP San Juan Basin Below Grade Tank Closure Plan

In accordance with Rule 19.15.17.13 NMAC the following information describes the closure requirements of Below Grade Tanks (BGTs) on Burlington Resources Oil & Gas Company, LP locations hereinafter known as BR locations. This is BR's standard procedure for all BGTs. A separate plan will be submitted for any BGT which does not conform to this plan.

### General Requirements:

- BR shall close a below-grade tank within the time periods provided in Subsection A of 19.15.17.13 NMAC. This will include a) below-grade tanks that do not meet the requirements of Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC or is not included in Paragraph (5) of Subsection I o f19.15.17.11 NMAC within five years, if not retrofitted to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC; b) permitted below-grade tanks within 60 days of cessation of the below-grade tank's operation., or c) an earlier date that the division requires because of imminent danger to fresh water, public health or the environment. For any closure, BR will file the C144 Closure Report as required.
- 2. BR shall remove liquids and sludge from a below-grade tank prior to implementing a closure method and shall dispose of the liquids and sludge in a division-approved facility. The facilities to be used will be Basin Disposal (Permit #NM-01-005) and Envirotech Land Farm (Permit #NM-01-011). The liner after being cleaned well (Subsection D, Paragraph 1, Subparagraph (m) of 19.15.9.712 NMAC) will be disposed of at the San Juan County Regional Landfill located on CR 3100.
- 3. BR will receive prior approval to remove the below-grade tank and dispose of it in a division-approved facility or recycle, reuse, or reclaim it in a manner that the appropriate division district office approves. Documentation of how the below-grade tank was disposed of or recycled will be provided in the closure report.
- 4. If there is any on-site equipment associated with a below-grade tank, then BR shall remove the equipment, unless the equipment is required for some other purpose.
- 5. BR shall test the soils beneath the below-grade tank to determine whether a release has occurred. BR shall collect, at a minimum, a five point, composite sample; collect individual grab samples from any area that is wet, discolored or showing other evidence of a release; and analyze for BTEX, TPH and chlorides to demonstrate that the benzene concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 0.2 mg/kg; total BTEX concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 0.2 mg/kg; total BTEX concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 50 mg/kg; the TPH concentration, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 50 mg/kg; the TPH division approves, does not exceed 100 mg/kg; and the chloride concentration, as determined by EPA method that the division approves, does not exceed 250 mg/kg, or the background concentration, whichever is greater. BR shall notify the division of its results on form C-141.
- 6. If BR or the division determines that a release has occurred, then BR shall comply with 19.15.3.116 NMAC and 19.15.1.19 NMAC, as appropriate.

- 7. If the sampling program demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in Paragraph (4) of Subsection E of 19.15.17.13 NMAC, then BR shall backfill the excavation with compacted, non-waste containing, earthen material; construct a division-prescribed soil cover; recontour and re-vegetate the site.
- 8. Notice of Closure will be given prior to closure to the Aztec Division office between 72 hours and one week via email or verbally. The notification of closure will include the following:
  - i. Operator's name
  - ii. Location by Unit Letter, Section, Township, and Range. Well name and API number.
- 9. The surface owner shall be notified of BR's closing of the below-grade tank prior to closure as per the approved closure plan via certified mail, return receipt requested.
- 10. Re-contouring of location will match fit, shape, line, form and texture of the surrounding. Re-shaping will include drainage control, prevent ponding, and prevent erosion. Natural drainages will be unimpeded and water bars and/or silt traps will be place in areas where needed to prevent erosion on a large scale. Final re-contour shall have a uniform appearance with smooth surface, fitting the natural landscape.
- 11. BR shall seed the disturbed areas the first growing season after the operator closes the pit. Seeding will be accomplished via drilling on the contour whenever practical or by other division-approved methods. BLM stipulated seed mixes will used on federally jurisdicted lands and division-approved seed mixtures (administratively approved if required) will be utilized on all State or private lands. Vegetative cover will equal 70% of the native perennial vegetative cover (un-impacted) consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and maintain that cover through two successive growing seasons. If alternate seed mix is required by the state, private owner or tribe, it will be implemented with administrative approval if needed. BR will repeat seeding or planting will be continued until successful vegetative growth occurs.
- 12. A minimum of four feet of cover shall be achieved and the cover shall include one foot of suitable material to establish vegetation at the site, or the background thickness of topsoil, whichever is greater.
- 13. All closure activities will include proper documentation and be available for review upon request and will be submitted to OCD within 60 days of closure of the below-grade tank. Closure report will be filed on C-144 and incorporate the following:
  - Soil Backfilling and Cover Installation
  - Re-vegetation application rates and seeding techniques
  - Photo documentation of the site reclamation
  - Confirmation Sampling Results
  - Proof of closure notice