	State of New Mexico	Form C-144 July 21, 2008
REGISTE	RED artment For temporar ation Division tanks, submit	y pits, closed-loop sytems, and below-grade to the appropriate NMOCD District Office.
District IV	St. Francis Dr. Santa Fe, NM 87505 For permanent Environmenta	at pits and exceptions submit to the Santa Fe Bureau office and provide a copy to the
220 S. St. Francis Dr., Santa Fe, NM 87505		
Dropos	Pit, Closed-Loop System, Below-Grade Tank, o	<u>r</u>
riopose		prication
Type of action:	X Permit of a pit, closed-loop system, below-grade tank, or propo	sed alternative method
	Modification to an existing permit	osed alternative method
	Closure plan only submitted for an existing permitted or non-p below-grade tank, or proposed alternative method	ermitted pit, closed-loop system,
Instructions: Please submit one ag	oplication (Form C-144) per individual pit, closed-loop system, be	low-grade tank or alternative request
Please be advised that approval of	this request does not relieve the operator of liability should operations result in pollution	of surface water, ground water or the
environment. Nor does approval relie	we the operator of its responsibility to comply with any other applicable governmental au	thority's rules, regulations or ordinances.
Operator: Burlington Resources Oil	& Gas Company, LP OGRID#:	14538
ddress: PO Box 4289, Farmington	n, NM 87499	
acility or well name: LIVELY 18		
API Number: 3	OCD Permit Number:	
J/L or Qtr/Qtr: M Section	n: <u>1</u> Township: <u>26N</u> Range: <u>8W</u> Cou	nty: San Juan
Center of Proposed Design: Latitude:	: <u>36.51024°N</u> Longitude: <u>-107.6388</u>	9°W NAD: X 1927 1983
urface Owner: Federal	State X Private IIIbai Irust or Indian Allotment	
1 I Pit Subsection For Got 191517	11 NMAC	
Prt: Subsection F or G of 19.15.17 Temporary: Drilling Work Permanent Emergency Ca Lined Unlined Lin String-Reinforced Liner Seams: Welded Fat Closed-loop System: Subsection Type of Operation: P&A P Drying Pad Above Group D	.11 NMAC over avitation P&A her type: Thickness mil LLDPE HDPE P ctory Other Volume: bbl Diment con H of 19.15.17.11 NMAC Drilling a new well Workover or Drilling (Applies to activities which notice of intent) ad Steel Tanks Haul-off Bins Other	C Other
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7 Netting: Subsection E of 19.15.17.11 NMAC (Applies to permanent pits and permanent open top tanks) X Screen Netting 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 location, and emergency telephone numbers X Signed in compliance with 19.15.3.103 NMAC								
 <u>Administrative Approvals and Exceptions:</u> Justifications and/or demonstrations of equivalency are required. Please refer to 19,15,17 NMAC for guidance. <i>Please check a box if one or more of the following is requested, if not leave blank:</i> 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 <u>Siting Criteria (regarding permitting)</u> : 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 appropriate 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 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). Topographic map; Visual inspection (certification) of the proposed site 	Yes Yes	X No X No						
 Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. (Applies to temporary, emergency, or cavitation pits and below-grade tanks) Visual inspection (certification) of the proposed site; Aerial photo; Satellite image 	□Yes □NA	XNo						
 Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. (Applied to permanent pits) Visual inspection (certification) of the proposed site; Aerial photo; Satellite image Within 500 horizonal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering 	Yes XNA							
 purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site. Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal artification. 								
 adopted pursuant to NMSA 1978, Section 3-27-3, as amended Written confirmation or verification from the municipality; Written approval obtained from the municipality Within 500 feet of a wetland. US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site Within the area overlying a subsurface mine. Written confirmation or verification or map from the NM EMNRD - Mining and Mineral Division 	Yes Yes	X No X No						
 Within an unstable area. 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	X No X No						

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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 attached to the application. Please indicate, by a check mark in the hoy, that the documents are attached
X Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19,15,17.9
X Siting 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
X 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 Closed-loop Systems Permit Application Attachment 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. Ceologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9 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 10 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)
Previously Approved Operating and Maintenance Plan API
Permanent Pits Permit Application Checklist: Subsection B of 1915 179 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 (I) 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
Liner Specifications and Compatibility Assessments based and the set of 19.15.17.11 NMAC
Ouality Control/Quality Assurance Construction and Installation Plan
Operating and Maintenance Plan - based upon the appropriate requirements of 19 15 17 12 NMAC
Freeboard and Overtopping Prevention Plan - 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
Closure Plan
Costure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
14 Proposed Clesures 10.15.17.13 NDAAC
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 X Below-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 Excuvation and Removal Closure Plan Checklist: (19.15.17.13 NMAC) Instructions: Each of the following items must be attached to the closure plan.
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 10.15.17.13 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 1 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</u> Instructions: Please identify the facility or facilities for the dispose are required.	Above Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC d of liquids, drilling fluids and drill cuttings. Use attachment if more than tw	.): vo facilities
Disposal Facility Name:	Disposal Facility Permit #-	
Disposal Facility Name:	Disposal Facility Permit #-	
Will any of the proposed closed-loop system operations and a Yes (If yes, please provide the information	associated activities occur on or in areas that will not be used for futur No	e service and operations?
Required for impacted areas which will not be used for future serve Soil Backfill and Cover Design Specification - based u Re-vegetation Plan - based upon the appropriate requi Site Reclamation Plan - based upon the appropriate re		IAC
17 <u>Siting Criteria (Regarding on-site closure methods only:</u> Instructions: Each siting criteria requires a demonstration of compliance certain sating criteria may require administrative approval from the appro- for consideration of approval. Justifications and/or demonstrations of equ	19.15.17.10 NMAC in the closure plan. Recommendations of acceptable source inaterial are provided b opriate district office or may be considered an exception which must be submitted to t uivalency are required. Please refer to 19.15.17.10 NMAC for guidance.	elow, Requests regarding changes to the Santa Fe Environmental Bureau office
Ground water is less than 50 feet below the bottom of the bur NM Office of the State Engineer - iWATERS database search	ied waste. h: USGS: Data obtained from nearby wells	Yes No
Ground water is between 50 and 100 feet below the bottom of	f the buried waste	
- NM Office of the State Engineer - iWATERS database search	i; USGS: Data obtained from nearby wells	
Ground water is more than 100 feet below the bottom of the h	nuried waste	
- NM Office of the State Engineer - iWATERS database search	i: USGS: Data obtained from nearby wells	
Within 300 feet of a continuously flowing watercourse, or 200 feet o (measured from the ordinary high-water mark).	of any other significant watercourse or lakebed, sinkhole, or playa lake	Yes No
- Topographic map: Visual inspection (certification) of the prop	posed site	
Within 300 feet from a permanent residence, school, hospital, institu	ation, or church in existence at the time of initial application	
· Visual inspection (certification) of the proposed site; Aerial pho-	oto: satellite image	
Within 500 horizontal feet of a private, domestic fresh water well or purposes, or within 1000 horizontal fee of any other fresh water well - NM Office of the State Engineer - iWATERS database; Visual	spring that less than five households use for domestic or stock watering I or spring, in existence at the time of the initial application. inspection (certification) of the proposed site	Yes No
Within incorporated municipal boundaries or within a defined munic pursuant to NMSA 1978, Section 3-27-3, as amended. Written confirmation or verification from the municipality. Wr	cipal fresh water well field covered under a municipal ordinance adopted	Yes No
Within 500 feet of a wetland	nen approval ostanea non die nonicipality	
 US Fish and Wildlife Wetland Identification map: Topographic 	e map: Visual inspection (certification) of the proposed site	
Within the area overlying a subsurface mine.		Yes No
 Written confirmation or verification or map from the NM EMN Within an unstable area 	RD-Mining and Mineral Division	
Engineering measures incorporated into the design: NM Bureau	of Geology & Mineral Business LICCE, MM Contact and	Yes No
Topographic map	To Geology & Mineral Resources: USGS; NM Geological Society;	
Within a 100-year floodplain. - FEMA map		Yes No
18 On-Site Closure Plan Checklist: (19.15.17.13 NMAC) Instr by a check mark in the box, that the documents are attached.	ructions: Each of the following items must bee attached to the closur	re plan. Please indicate,
Siting Criteria Compliance Demonstrations - based upor	n the appropriate requirements of 19.15.17.10 NMAC	
Proof of Surface Owner Notice - based upon the appropriate of Surface Owner Notice - based upon the appropriate of the state of the sta	riate requirements of Subsection F of 19.15.17.13 NMAC	
Construction/Design Plan of Burial Trench (if applicable	e) based upon the appropriate requirements of 19.15.17.11 NMAC	
Construction/Design Plan of Temporary Pit (for in place Protocols and Procedures - based upon the appropriate re	burial of a drying pad) - based upon the appropriate requirements of 19 equirements of 19.15.17.13 NMAC	9.15.17.11 NMAC
Confirmation Sampling Plan (if applicable) - based upon	the appropriate requirements of Subsection F of 19.15.17.13 NMAC	
Waste Material Sampling Plan - based upon the appropri	iate requirements of Subsection F of 19.15.17.13 NMAC	
Disposal Facility Name and Permit Number (for liquids,	drilling fluids and drill cuttings or in case on-site closure standards car	not be achieved)
Soil Cover Design - based upon the appropriate requirem	nents of Subsection H of 19 15 17 13 NMAC	and the works were the

Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC Re-vegetation Plan - based upon the appropriate requirements of Subsection 1 of 19.15.17.13 NMAC

Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

	ormation submitted with this application	is true, accurate and complete to the	best of my knowledge and belief.
Name (Print):	Crystal Tafoya	Title:	Regulatory Technician
Signature:	Criptal Jafaya	Date:	12/22/2008
e-mail address:	rriestal adovaistionou ophillips.o.	Telephone:	505-326-9837
)			
CD Approval:	ermit Application (including closure p	olan) 🔲 Closure Plan (only)	OCD Conditions (see attachment)
CD Representative Sig	gnature:		Approval Date:
itle:		OCD Pert	nit Number:
 I			
losure Report (require	d within 60 days of closure comple	tion): Subsection K of 19.15.17.13 NMAG	
port is required to be subi	nitted to the division within 60 days of th	pean prior to implementing any closi ie completion of the closure activitie	ire activities and submitting the closure report. The closure s. Please do not complete this section of the form until an
pproved closure plan has l	een obtained and the closure activities h	uwe been completed.	
		Closure	e Completion Date:
Osure Method:			
If different from an		Method Alternative Closure	Method Waste Removal (Closed-loop systems only)
	roved plan, please explain.		
sure Report Regarding	Waste Removal Closure For Closed-Io	on Systems That Litilize Above C-	ound Steel Tools on Hard of Plan O. J
tructions: Please identify	the facility or facilities for where the li	iquids, drilling fluids and drill cutti	ngs were disposed. Use attachment if more than two facilities
re utilized.			
Disposal Facility Name:		Disposal Facility	Permit Number:
Were the closed-loop sys	tem operations and associated activities	Disposal Facility	Permit Number:
Yes (If yes, please de	monstrate compliane to the items below	v) \square No	be used for ruture service and opeartions?
Required for impacted ar	eas which will not be used for future serv	vice and operations:	
Required for impacted ar Site Reclamation (Pt	eas which will not be used for future serviolo Documentation)	vice and operations:	
Required for impacted ar Site Reclamation (Pt Soil Backfilling and	eas which will not be used for future servitoto Documentation) Cover Installation	vice and operations:	
Required for impacted ar Site Reclamation (Pt Soil Backfilling and Re-vegetation Applic	eas which will not be used for future serv toto Documentation) Cover Installation ration Rates and Seeding Technique	vice and operations:	
Required for impacted ar Site Reclamation (Pf Soil Backfilling and Re-vegetation Applic	eas which will not be used for future service of the operation of the oper	vice and operations:	
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Town	ship: 26	N F	Rang	e: 0	8W	Sectio	ns:						
NAD27	X:		Y:			– Zone	e: [Sear	ch Radiu	s:		
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Owner Name: (First	st)			- (Last)			- C	Non-I	Domestic	⊂ Dom	estic 6	All
POD / Surface	e Data Ro	eport	SH A		Av	g Depth to	Water	Report		Wat	er Column	Report	
			Clear	Forr	n	IWATI	ERS Mei	nu	Help	1			
				W	ATE	R COLUMN	REPOR	T 08/	20/20	008			
(0	marter	s are	1=1	NW 2	=NE	3=SW 4=	SE)						
(0	uarter	s are	bi	gges	t to	smalle	st)			Depth	Depth	Water	(in
POD Number	Tws	Rng	Sec	qq	a d	Zone	x		Y	Well	Water	Column	
SJ 02405	26N	08W	01	3 4	3					180	100	80	
SJ 02411	26N	08W	01	4 4	1					6000			
SJ 02407	26N	08W	01	4 4	. 1					2200			
Record Count: 3													

New Mexico Office of the State Engineer

Page	1	of	1
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New Mexico Office of the State Engineer POD Reports and Downloads
Township: 26N Range: 07W 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 WATERS Menu Help

WATER COLUMN REPORT 08/20/2008

	(quarter (quarter	arters are 1=NW 2=NE 3=SW 4=SE) arters are biggest to smallest)									Depth	Water	(in
POD Number	Tws	Rng	Sec	q	đ	a	Zone	x	Y	Well	Water	Column	
SJ 02409	26N	07W	01	1	2	2				700	400	300	
SJ 02402	26N	07W	05	3	3	2				36	18	18	
SJ 00071	26N	07W	15	4	1	2				365	26	339	
SJ 00070	26N	07W	15	4	2	3				335	22	313	
SJ 02406	26N	07W	30	3	2	1				280	180	100	

Record Count: 5

, New Mexico Office of the State Engineer

New Mexico Office of the State Engineer POD Reports and Downloads										
Township: 27N Range: 07W 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 08/20/2008

	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are biggest to smallest)									Depth	Depth	Water	(in
POD Number	Tws	Rng	Sec	q	g	g	Zone	х	Y	Well	Water	Column	
RG 81025	27N	07W	35	4	3	3				560	465	95	
SJ 00195	27N	07W	15	2						1633	500	1133	
SJ 02314	27N	07W	17	3	3					355	320	35	
SJ 02408	27N	07W	21	2	1	3				400	300	100	
SJ 03274	27N	07W	35	3	4	4				450			
SJ 02404	27N	07W	35	4	3	3				550	250	300	

Record Count: 6

		New Mexico Of POD Rep	ffice of the Sta orts and Down	<i>te Engi</i> i nloads	neer				
	Township: 27N	Range: 08W	Sections:				Ţ		
NA	D27 X:	Y:	Zone:	•	Searc	h Radiu	s:		
County:	Basi	n:		Numt	ber:		Suffix:		
Owner Name:	(First)	(Last)			Non-D	omestic	۲ Dom	estic @	All
POD /	Surface Data Repo	rt Avg	Depth to Water	Report		Wat	er Column	Report	
		Clear Form	iWATERS Me	enu	Help				
		WATER	COLUMN REPO	RT 08/2	20/200	0.8			
	(quarters a (quarters a	re 1=NW 2=NE 3 re biggest to	S=SW 4=SE) smallest)			Depth	Depth	Water	(in
POD Number SJ 02410	Tws Rn 27N 08	g Sec q q q W 36 1 3 2	Zone X		Y	Well 2200	Water	Column	
Record Count:	1								





8/08

Mines, Mills and Quarries Web Map

LIVELY 18 Unit Letter: M, Section: 01, Town: 026N, Range: 008W







LIVELY 18

Site Specific Hydrogeology

A visual site inspection confirming the information contained herein was performed on the well 'LIVELY 18', which is located at 36.51024 degrees North latitude and 107.63889 degrees West longitude. This location is located on the Fresno Canyon 7.5' USGS topographic quadrangle. This location is in section 1 of Township 26 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 Nageezi, located 17.8 miles to the south. The nearest large town (population greater than 10,000) is Farmington, located 35.1 miles to the northwest (National Atlas). The nearest highway is State Highway 403, located 11.7 miles to the southeast. The location is on BLM land and is 196 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 1866 meters or 6120 feet above sea level and receives 10.5 inches of rain each year. The vegetation at this location is classified as Inter-Mountain Basins Semi-Desert Shrub Steppe as per the Southwest Regional Gap Analysis Program.

The estimated depth to ground water at this point is 57 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 247 feet to the south and is classified by the USGS as an intermittent stream. The nearest perennial stream is 3,640 feet to the west. The nearest water body is 3,637 feet to the west. It is classified by the USGS as an intermittent lake and is 1.2 acres in size. The nearest spring is 17,537 feet to the east. 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 555 feet to the southeast. The nearest wetland is a 1.4 acre Other located 3,622 feet to the west. The slope at this location is 3 degrees to the east 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 NACIMIENTO FORMATION--Shale and sandstone with a Shale dominated formations of all ages substrate. The soil at this location is 'Blancot-Notal association, gently sloping' and is well drained and not hydric with moderate erosion potential as taken from the NRCS SSURGO map unit. downloaded January 2008. The nearest underground mine is 25.4 miles to the southwest as indicated on the Mines, Mills and Quarries Map of New Mexico provided.

Regional Geological context:

The Nacimiento Formation is of Paleocene age (Baltz, 1967, p. 35). It crops out in a broad band inside the southern and western margins of the central basin and in a narrow band along the west face of the Nacimiento Uplift. The Nacimiento is a nonresistant unit and typically erodes to low, rounded hills or forms badland topography.

The Nacimiento Formation occurs in approximately only the southern two-thirds of the San Juan Basin where it conformably overlies and intertongues with the Ojo Alamo Sandstone (Fassett, 1974, p. 229). The Nacimiento Formation grades laterally into the main part of the Animas Formation (Fassett and Hinds, 1971, p. 34); thus, in this area, the two formations occupy the same stratigraphic interval.

Strata of the Nacimiento Formation were deposited in lakebeds in the central basin area with lesser deposition in stream channels (Brimhall, 1973, p. 201). In general, the Nacimiento consists of drab, interbedded black and gray shale with discontinuous, white, medium- to very coarse grained arkosic sandstone (Stone e al., 1983, p.30). Stone et al. indicated that the formation may contain more sandstone than commonly reported because some investigators assume the slope-forming strata in the unit area shales, whereas in many places the strata actually are poorly consolidated sandstones.

Total thickness of the Nacimiento Formation ranges from about 500 to 1,300 feet. The unit generally thickens from the basin margins toward the basin center (Steven et al., 1974). The sandstone deposits within the Nacimiento Formation are much thinner than the total thickness of the formation because their environment of deposition was localized stream channels (Brimhall, 1973, p. 201). The thickness of the combined San Jose, Animas, and Nacimiento Formations ranges from 500 to more than 3.500 feet.

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Hydraulic Properties:

Reported well yields for 53 wells completed in either the Animas or Nacimiento Formations range from 2 to 90 gallons per minute and the median yield is 7.5 gallons per minute. The primary use of water from Nacimiento and Animas Formations is domestic and livestock supplies. There are no known aquifer tests for the Animas or Nacimiento Formations, but specific capacities reported for six wells range from 0.24 to 2.30 gallons per minute per foot of drawdown (Levings et al., 1990).

The Animas and Nacimiento Formations are in many ways hydrologically similar to the San Jose Formation because sands in both units produce approximately the same quantities of water. However, the greater percentage of fine materials in the Animas and Nacimiento Formations may restrict downward vertical leakage to the Ojo Alamo Sandstone or Kirtland Shale. The poorly cemented fine material is highly erodible, forms a badland terrain, and supports only spotty vegetation. These conditions are more conductive to runoff than retention of precipitation.

References:

Baltz, E.H., 1967, Stratigraphy and regional tectonic implications of part of Upper Cretaceous rocks, eastcentral San Juan Basin, New Mexico: USGS Professional Paper 552, 101 p.

Brimhall, R.M., 1973, Ground-water hydrology of Tertiary rocks of the San Juan Basin, New Mexico, in Fassett, J.E., ed., Cretaceous and Tertiary rocks of the Southern Colorado Plateau: Four Corners Geological Society Memoir, p. 197-207.

Fassett, J.E., 1974, Cretaceous and Tertiary rocks of the eastern San Juan Basin, New Mexico and Colorado, in Guidebook of Ghost Ranch, central-northern New Mexico: New Mexico Geological Society, 25th Field Conference, p. 225-230.

Fassett, J.E., and Hinds, J.S., 1971, Geology and fuel resources of the Fruitland Formation and Kirtland Shale of the San Juan Basin, New Mexico and Colorado: USGS Professional Paper 676, 76 p. Levings, G.W., Craigg, S.d., Dam, W.L., Kernodle, J.M., and Thorn, C.R., 1990, Hydrogeology of the San Jose, Nacimiento, and Animas Formations in the San Juan structural basin, New Mexico, Colorado, Arizona, and Utah: USGS Hydrologic Investigations Atlas HA-720-A, 2 sheets.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H., and Padgett, E.T., 1983, Hydrogeology and water resources of San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6.

CAREAR STRATES AND A CONTRACT OF COMPLETE

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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 belowgrade 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.

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- 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		J30BB	for the state of t	3689				
		Min. Roll Averages	Typical Roll Averages	Min. Roll	Typical Ro	Min. Roll	Typical Roll	
Appearance		Black/Black		Averages	Averages Averages		Averages	
Thickness	ASTM D 5100	27 mil 00			Black/Black		Black/Black	
Weight I be Day MOR	101110 3133	27 mi	30 mil	32 mil	36 mil	40 mil	45 mil	
(oz/yd²)	ASTM D 5261	126 lbs (18.14)	140 lbs (20.16)	151 lbs (21.74)	168 lbs (24,19)	189 lbs (27,21)	210 lbs	
Construction		**Ex	trusion laminate	with encapsulated to direct				
Ply Adhesion	ASTM D 413	16 lbs 20 lbs				al scrim reinforcement		
86			20105	19 IDS	24 lbs	25 lbs	31 lbs	
1" Tensile Strength	ASTM D 7003	88 lbf MD 63 lbf DD	110 lbf MD 79 lbf DD	90 lbf MD 70 lbf DD	113 lbf MD 87 lbf DD	110 lbf MD 84 lbf DD	138 lbf MD	
1° Tensile Elongation @ Break % (Film Break)	ASTM D 7003	550 MD 550 DD	750 MD 750 DD	550 MD 550 DD	750 MD	550 MD	750 MD	
1° Tensile Elongation @ Peak % (Scrim Break)	ASTM D 7003	20 MD 20 DD	33 MD 33 DD	20 MD 20 DD	30 MD 31DD	20 MD	750 DD 36 MD	
Tongue Tear Strength	ASTM D 5884	75 lbf MD 75 lbf DD	97 lbf MD 90 lbf DD	75 lbf MD 75 lbf DD	104 lbf MD 92 lbf DD	100 lbf MD 100 lbf DD	117 lbf MD 118 lbf DD	
Grab Tensile	ASTM D 7004	180 lbf MD 180 lbf DD	218 lbf MD 210 lbf DD	180 lbf MD 180 lbf DD	222 lbf MD 223 lbf DD	220 lbf MD 220 lbf DD	257 lbf MD 258 lbf DD	
Trapezoid Tear	ASTM D 4533	120 lbf MD 120 lbf DD	146 lbf MD 141 lbf DD	130 lbf MD 130 lbf DD	189 lbf MD	160 lbf MD	193 lbf MD	
Dimensional Stability	ASTM D 1204	<1	<0.5			160 lbf DD	191 lbf DD	
Puncture Resistance	ASTM D 4922	FOUL	-0.5	<1	<0.5	<1	<0.5	
	AGTWID 4033	50 lbt	64 lbf	65 lbf	83 lbf	80 lbf	99 lbf	
distanti use remperature		180° F	180° F	180° F	180° F	180° F	180° E	
Minimum Use Temperature		-70° F	-70° F	-70° F	-70° F	-70° E	70% 5	
						-1V F 1	-/(I" E	

MD = Machine Direction

DD = Diagonal Directions

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

*Dimensional Stability Maximum Value

**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

Sioux Falls, South Dakota

SALES OFFICE

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

-70° F

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, at its 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 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 associated with the site inspection.

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 of 19.15.17.11 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.
- 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, nonwaste 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
 - 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 belowgrade 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 .