



# **Black Hills Plateau Production**

*A Black Hills Corporation Enterprise*

## **Whittaker Flats D17-998 Location Water Storage Management Plan**



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**November 2015**

**Rev. 0**

**Prepared by:**



**HRL COMPLIANCE SOLUTIONS, INC.**  
Environmental Consultants

**2385 F ½ RD  
Grand Junction, CO 81505**



## **1.0 INTRODUCTION**

This plan is written to contain general information for Black Hills Plateau Production (Black Hills) water release management practices, as well as specific information should an accidental or unintentional release occur of the 40,000 barrels of treated water to be managed at the Whittaker Flats D7-998 site. Site specific information i.e. Best Management Practices (BMPs) implementation, potential pollution sources, etc. found throughout the text of this document are also referenced in Appendix A (site map) and Appendix B (BMP installation details). The Sundry Notice approved October 20, 2015, referenced as document # 400937158, outlines Colorado Oil and Gas Conservation Commission's (COGCC) Conditions of Approval (COAs) as well as comments to the COAs is referenced throughout the document and attached as Appendix C (Sundry Notice).

## **2.0 STORAGE TANK**

The 40,000 barrel Modular Large Volume Tank (MLVT) comprises of a rigid steel framework with an internal synthetic liner secured to the framework. The tank will be utilized as a temporary holding tank before the water can be transported to a permeant holding facility or properly disposed of. The tank will be installed on the Whittaker Flats D17-998 location (see Appendix A) and placed inside secondary containment. The secondary containment comprises of removable jersey barriers, or muscle walls, and earthen berms measuring four (4) feet in height and 280-300 feet in diameter which serves as the containment equivalent to 110% of the tank's maximum capacity. A synthetic liner is utilized inside the bermed secondary containment to inhibit infiltration into the pad surface.

## **3.0 WATER TREATMENT**

Black Hills has installed a filtration system which utilizes two (2) separators, one (1) low pressure P-tank followed by two (2) filter pods to treat the water. The filtration system collects water from each wellhead and treats the water before it is stored in the 40,000 barrel tank.

## **4.0 BMPs**

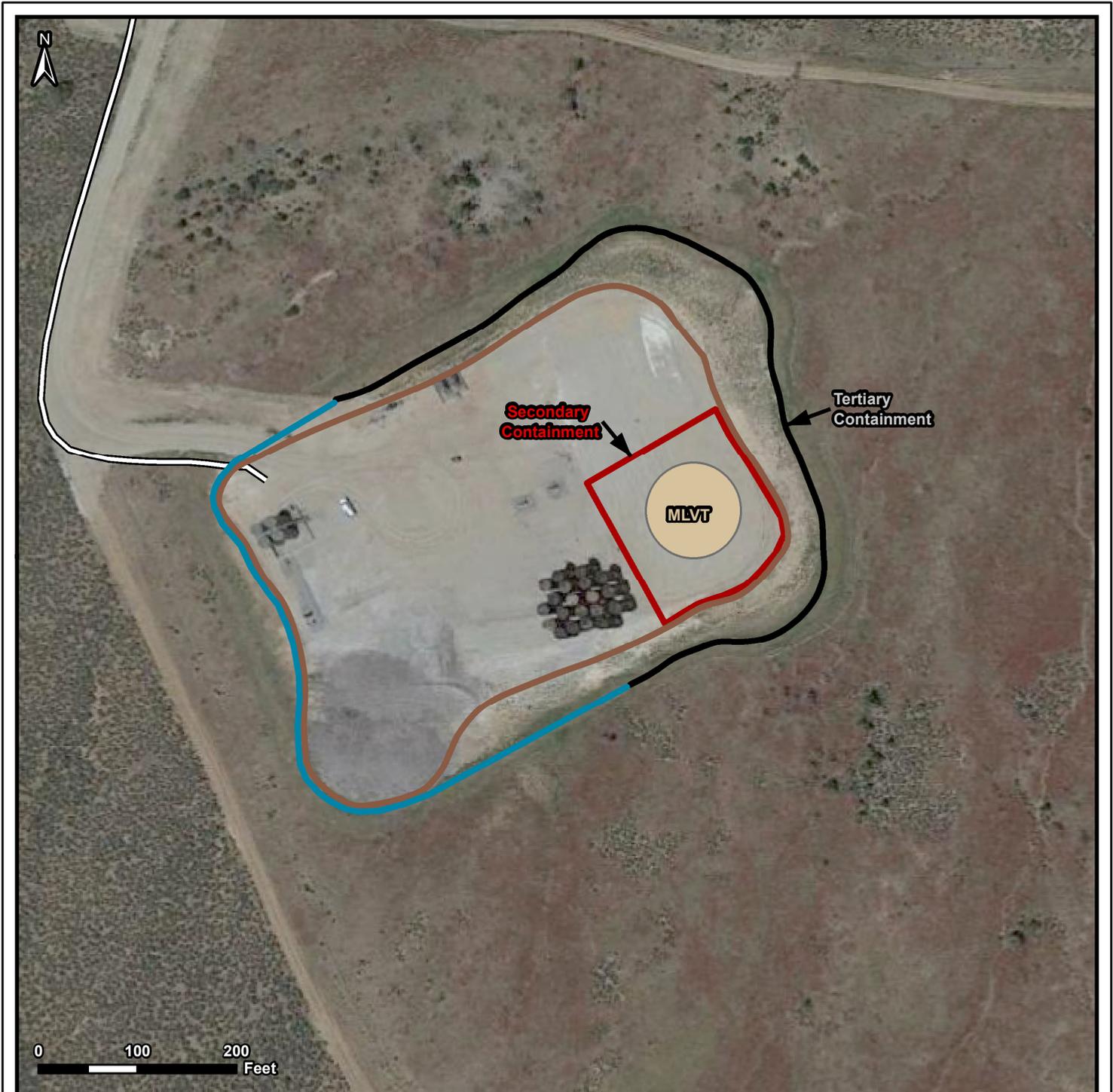
Best Management Practices to be implemented during drilling activities are summarized below. Installation details for the BMPs are identified in Appendix B.

### **Earthen Berm**

An earthen berm surrounding the perimeter of the well pad will act as a tertiary containment to contain any leakage or release outside of secondary containment. The berm is illustrated in Appendix A, site map.

## **APPENDIX A**

### **Site Map**



**NOTES / COMMENTS:**

DISCLAIMER: This representation and the Geographic Information System (GIS) used to create it are designed as a source of reference and not intended to replace official records and/or legal surveys. HCSI assumes no responsibility for any risks, dangers, or liabilities that may result from its use and makes no guarantee as to the quality or accuracy of the underlying data.



**Water Storage  
Management Plan Map**  
Whittaker Flats D17-998  
39.276845 -108.359407  
Section 17, Township 9 South, Range 98 West

Mapped Features		Transportation
Secondary Containment	Cut Slope	Access Road
40,000 Barrels Storage Tank	Tertiary Containment	
Primary Berm		



**HRL COMPLIANCE SOLUTIONS, INC.**  
Environmental Consultants

Author: E. Fought
Revision: 0
Date: 11/24/2015

## **APPENDIX B**

### **BMP Installation Details**

## Berms - Preferred



### **Description and Purpose:**

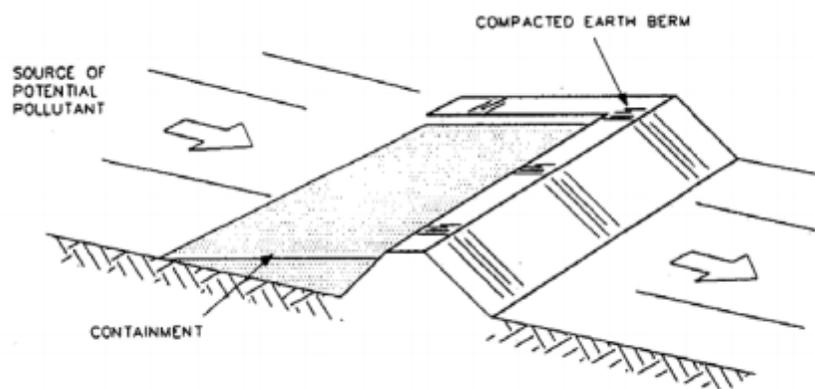
Earthen berms are used to intercept and divert runoff to a desired location such as a sediment trap or a slope drain. Berms can be used in conjunction with a diversion channel to convey runoff or run-on. Berms are commonly used along the top edges of cuts and fills to protect the embankment. Berms also contain and divert water from disturbed areas in order to control storm water and sediment leaving the site. Berms to intercept and divert runoff should not be used where the drainage area exceeds 10 acres.

### **Installation:**

Berms and diversions should be constructed of compacted soil and have uninterrupted positive grade to a stabilized area, such as a sediment trap. Wheel rolling, tracking, and bucket tamping are not adequate for compacting. The minimum height of a berm depends on expected water volume, the height is typically between 8-24 inches. The diversion channel should be constructed to allow 6 inches of freeboard and be clear of debris that would compromise the function of the structure.

### **Maintenance:**

Inspection and maintenance should be provided periodically and after rain or snowfall events that cause significant runoff. Berms should be inspected for breaches, erosion, tunneling or by-passing the structure. Sediment buildup against the berm or in the channel should be removed if the sediment is impacting the function of the structure. Riprap or turf reinforcement can be used to limit erosion in the diversion channels if water velocities are causing erosion.



**APPENDIX C**

**Sundry Notice**

**State of Colorado**  
**Oil and Gas Conservation Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



DE	ET	OE	ES
Document Number: <b>400937158</b>			
Date Received: <b>11/14/2015</b>			

**SUNDRY NOTICE**

Submit a signed original. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full in Comments or provide as an attachment. Identify Well by API Number; identify Oil and Gas Location by Location ID Number; identify other Facility by Facility ID Number.

OGCC Operator Number: 10150 Contact Name Ningning Li  
 Name of Operator: BLACK HILLS PLATEAU PRODUCTION LLC Phone: (303) 726-0949  
 Address: 1515 WYNKOOP ST STE 500 Fax: (303) 566-3344  
 City: DENVER State: CO Zip: 80202 Email: Ningning.Li@blackhillscorp.com

Complete the Attachment  
Checklist

OP OGCC

API Number : 05- 077 00 OGCC Facility ID Number: 429734  
 Well/Facility Name: WHF Well/Facility Number: D17 998  
 Location QtrQtr: NWNW Section: 17 Township: 9S Range: 98W Meridian: 6  
 County: MESA Field Name: \_\_\_\_\_  
 Federal, Indian or State Lease Number: \_\_\_\_\_

Survey Plat		
Directional Survey		
Srfc Eqpmt Diagram		
Technical Info Page		
Other		

**CHANGE OF LOCATION OR AS BUILT GPS REPORT**

- Change of Location \*       As-Built GPS Location Report       As-Built GPS Location Report with Survey

\* Well location change requires new plat. A substantive surface location change may require new Form 2A.

**SURFACE LOCATION GPS DATA** Data must be provided for Change of Surface Location and As Built Reports.

Latitude \_\_\_\_\_ PDOP Reading \_\_\_\_\_ Date of Measurement \_\_\_\_\_  
 Longitude \_\_\_\_\_ GPS Instrument Operator's Name \_\_\_\_\_

**LOCATION CHANGE (all measurements in Feet)**

Well will be: \_\_\_\_\_ (Vertical, Directional, Horizontal)

Change of **Surface** Footage **From** Exterior Section Lines:

Change of **Surface** Footage **To** Exterior Section Lines:

Current **Surface** Location **From** QtrQtr NWNW Sec 17

New **Surface** Location **To** QtrQtr \_\_\_\_\_ Sec \_\_\_\_\_

Change of **Top of Productive Zone** Footage **From** Exterior Section Lines:

Change of **Top of Productive Zone** Footage **To** Exterior Section Lines:

Current **Top of Productive Zone** Location **From** Sec \_\_\_\_\_

New **Top of Productive Zone** Location **To** Sec \_\_\_\_\_

Change of **Bottomhole** Footage **From** Exterior Section Lines:

Change of **Bottomhole** Footage **To** Exterior Section Lines:

Current **Bottomhole** Location Sec \_\_\_\_\_ Twp \_\_\_\_\_

New **Bottomhole** Location Sec \_\_\_\_\_ Twp \_\_\_\_\_

Is location in High Density Area? \_\_\_\_\_

Distance, in feet, to nearest building \_\_\_\_\_, public road: \_\_\_\_\_, above ground utility: \_\_\_\_\_, railroad: \_\_\_\_\_,

property line: \_\_\_\_\_, lease line: \_\_\_\_\_, well in same formation: \_\_\_\_\_

Ground Elevation \_\_\_\_\_ feet Surface owner consultation date \_\_\_\_\_

FNL/FSL		FEL/FWL	
<u>984</u>	<u>FNL</u>	<u>801</u>	<u>FWL</u>
_____	_____	_____	_____
Twp <u>9S</u>	Range <u>98W</u>	Meridian <u>6</u>	
Twp _____	Range _____	Meridian _____	
_____	_____	_____	_____
_____	_____	_____	_____
Twp _____	Range _____		
Twp _____	Range _____		
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

\*\*

\*\*

\*\* attach deviated drilling plan

OTHER CHANGES

**REMOVE FROM SURFACE BOND** Signed surface use agreement is a required attachment

**CHANGE OF WELL, FACILITY OR OIL & GAS LOCATION NAME OR NUMBER**

From: Name WHF Number D17 998 Effective Date: \_\_\_\_\_

To: Name \_\_\_\_\_ Number \_\_\_\_\_

**ABANDON PERMIT: Permit can only be abandoned if the permitted operation has NOT been conducted. Field inspection will be conducted to verify site status.**

WELL: Abandon Application for Permit-to-Drill (Form2) – Well API Number \_\_\_\_\_ has not been drilled.

PIT: Abandon Earthen Pit Permit (Form 15) – COGCC Pit Facility ID Number \_\_\_\_\_ has not been constructed (Permitted and constructed pit requires closure per Rule 905)

CENTRALIZED E&P WASTE MANAGEMENT FACILITY: Abandon Centralized E&P Waste Management Facility Permit (Form 28) – Facility ID Number \_\_\_\_\_ has not been constructed (Constructed facility requires closure per Rule 908)

OIL & GAS LOCATION ID Number: \_\_\_\_\_

Abandon Oil & Gas Location Assessment (Form 2A) – Location has not been constructed and site will not be used in the future.

Keep Oil & Gas Location Assessment (Form 2A) active until expiration date. This site will be used in the future.

**Surface disturbance from Oil and Gas Operations must be reclaimed per Rule 1003 and Rule 1004.**

**REQUEST FOR CONFIDENTIAL STATUS**

**DIGITAL WELL LOG UPLOAD**

**DOCUMENTS SUBMITTED** Purpose of Submission: \_\_\_\_\_

RECLAMATION

**INTERIM RECLAMATION**

Interim Reclamation will commence approximately \_\_\_\_\_

Per Rule 1003.e.(3) operator shall submit Sundry Notice reporting interim reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

Interim reclamation complete, site ready for inspection.

Per Rule 1003.e(3) describe interim reclamation procedure in Comments below or provide as an attachment and attach required location photographs.

**Field inspection will be conducted to document Rule 1003.e. compliance**

**FINAL RECLAMATION**

Final Reclamation will commence approximately \_\_\_\_\_

Per Rule 1004.c.(4) operator shall submit Sundry Notice reporting final reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

Final reclamation complete, site ready for inspection. Per Rule 1004.c(4) describe final reclamation procedure in Comments below or provide as an attachment.

**Field inspection will be conducted to document Rule 1004.c. compliance**

Comments:

**ENGINEERING AND ENVIRONMENTAL WORK**

NOTICE OF CONTINUED TEMPORARILY ABANDONED STATUS

Indicate why the well is temporarily abandoned and describe future plans for utilization in the COMMENTS box below or provide as an attachment, as required by Rule 319.b.(3).

Date well temporarily abandoned \_\_\_\_\_ Has Production Equipment been removed from site? \_\_\_\_\_

Mechanical Integrity Test (MIT) required if shut in longer than 2 years. Date of last MIT \_\_\_\_\_

SPUD DATE: \_\_\_\_\_

**TECHNICAL ENGINEERING AND ENVIRONMENTAL WORK**

Details of work must be described in full in the COMMENTS below or provided as an attachment.

NOTICE OF INTENT Approximate Start Date 10/12/2015

REPORT OF WORK DONE Date Work Completed \_\_\_\_\_

- Intent to Recomplete (Form 2 also required)
- Request to Vent or Flare
- E&P Waste Mangement Plan
- Change Drilling Plan
- Repair Well
- Beneficial Reuse of E&P Waste
- Gross Interval Change
- Rule 502 variance requested. Must provide detailed info regarding request.
- Other \_\_\_\_\_
- Status Update/Change of Remediation Plans for Spills and Releases

**COMMENTS:**

Black Hills requests a variance to the COA stating that MLVT can only be used to store freshwater (Approved 8/11/2015). During Drillout of the WHF 7C-20, WHF 1C-19, and WHF 5C-20, Black Hills needs to flowback into MLVT on location to store flowback water temporarily so that it may be pumped via 3rd party pipeline to central facility. BLM COAs direct Black Hills to minimize truck traffic through area of environmental concern. Black Hills will keep fluid level below 60% (25,000 bbls) of the MLVT tank volume (43,000 bbls) in addition to Black Hills has erected secondary containment with a liner and muscle wall equivalent to 110% of the total MLVT volume. Note that the secondary containment will hold more than 180% of the 25,000 bbls. In addition Black Hills has tertiary containment with the entirety of the location being bermed.

Risk Mitigation (Spill Prevention) - Secondary containment which consists of a muscle wall and a liner able to contain up to 110% of the volume of the MLVT Tank. The Muscle wall is 4' tall and about 280-300' in diameter. Tertiary containment around the entire location with an Earthen Berm.

Duration of Operations- We have two wells on flowback almost finished with the fluid recovery process and 1 more well which should be drilled out and all fluid should be mostly recovered by December 15th. The MLVT will be dismantled and liners cleaned off location by January 1st.

MLVT Working Capacity and Schedule/Process of Fluid Removal - The MLVT full working capacity is 40,000 bbls of fluid. As a fail safe during flowback we keep at least 8 inches in the tank to keep the integrity of the liner but no more than 90 inches of flowback water (approximately 25,000 bbls). This means that during flowback operations we have over 160% of fluid containment in the secondary containment. Process will be the following: fill up MLVT to 25,000 bbls, pump fluid down the Summit 3rd Party line down to the Debeque central facility, then pig the line and switch back to gas sales down the Summit 3rd party line. From Sales to Sales, typically takes approximately 36 to 72 hrs.

MLVT Tank design and Prior History of BLM COAs - The design of the MLVT PE study is attached speaking to the engineering of the tank design. The BLM approval on the use of the MLVT tank for flowback storage is also attached. The BLM sundry was approved with the directive that Black Hills will reduce trucking across areas of environmental concern.

**H2S REPORTING**

Data Fields in this section are intended to document Sample and Location Data associated with the collection of a Gas Sample that is submitted for Laboratory Analysis.

Gas Analysis Report must be attached.

H2S Concentration: \_\_\_\_\_ in ppm (parts per million) Date of Measurement or Sample Collection \_\_\_\_\_

Description of Sample Point:

Absolute Open Flow Potential \_\_\_\_\_ in CFPD (cubic feet per day)

Description of Release Potential and Duration (If flow is not open to the atmosphere, identify the duration in which the container or pipeline would likely be opened for servicing operations.):

Distance to nearest occupied residence, school, church, park, school bus stop, place of business, or other areas where the public could reasonably be expected to frequent: \_\_\_\_\_

Distance to nearest Federal, State, County, or municipal road or highway owned and principally maintained for public use: \_\_\_\_\_

COMMENTS:

<b><u>Best Management Practices</u></b>	
<b><u>No BMP/COA Type</u></b>	<b><u>Description</u></b>

**Operator Comments:**

This sundry is being submitted to provide additional information.

I hereby certify all statements made in this form are, to the best of my knowledge, true, correct, and complete.

Signed: \_\_\_\_\_ Print Name: Jessica Donahue  
Title: Regulatory Technician Email: Jessica.Donahue@blackhillscorp.com Date: 11/14/2015

Based on the information provided herein, this Sundry Notice (Form 4) complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved:  Date: 11/20/2015

**CONDITIONS OF APPROVAL, IF ANY:**

**COA Type**

**Description**

	Per the COGCCs June 13, 2014 "Policy of The Use of Modular Large Volume Tanks in Colorado," provide a summary of daily inspections and records of repairs and/or maintenance that were performed regarding the MLVT at this Location by November 27, 2015.
	By November 27, 2015, provide subgrade compaction documentation.
	By November 27, 2015, provide secondary and tertiary containment documentation and verification.
	All E&P waste shall be removed from the MLVT by December 31, 2015.
	Per the COGCCs June 13, 2014 "Policy of The Use of Modular Large Volume Tanks in Colorado," provide a contingency plan/emergency plan by November 27, 2015

**General Comments**

<b><u>User Group</u></b>	<b><u>Comment</u></b>	<b><u>Comment Date</u></b>
Final Review	Conditions of approval verified with operator.	11/20/2015 4:23:10 PM
Final Review	Dates listed in operator comments are inferred to be December 15, 2015 and January 1st, 2016, although the years were not listed.	11/20/2015 4:22:08 PM
Engineer	PE Brandon Bummer lic. active in good standing exp. 10/31/2017. Design letter dated 2013.	11/16/2015 9:42:54 AM

Total: 3 comment(s)

**Attachment Check List**

<b><u>Att Doc Num</u></b>	<b><u>Name</u></b>
400937158	FORM 4 SUBMITTED
400937159	OTHER
400937160	BLM SUNDRY

Total Attach: 3 Files