FORM 15 Rev 6/99

01630594

State of Colorado
Oil and Gas Conservation Commission

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

FOR OGCC USE ONLY

EARTHEN PIT REPORT/PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days, is required for pits. Submit required attachments and forms.

Complete the Attachment Checklist

	Oper	OGCC
Detailed Site Plan	✓	
Topo Map w/ Pit Location	✓	
Water Analysis (Form 25)		
Source Wells (Form 26)		
Pit Design/Plan & Cross Sect	✓	
Design Calculations	✓	
Sensitive Area Determ.	✓	
Mud Program		
Form 2A		

FORM SUBMITTED FOR:

☐ Pit Report ☑ Pit Permit

OGCC Operator Number: 19160
Name of Operator: ConocoPhillips Company
Address: 743 Horizon Ct., Ste. 101
City: Grand Junction State: CO Zip: 81506

Contact Name and Telephone:
Justin B. Lovato
No: 970-263-3123
Fax: 970-263-3124

API Number (of associated well): 05-045-14979 OGCC Facility ID (of other associated facility): CP01B-16 B-16 59 NPR
Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): NWNE, Sec 16, TWP 5S, RNG 96W, UTE 6th P.M.
Latitude: 39.62088 Longitude: -108.17224 County: Garfield

Pit Use: ☑ Production ☐ Drilling (Attach mud program) ☐ Special Purpose (Describe Use): _____
Pit Type: ☑ Lined ☐ Unlined Surface Discharge Permit: ☐ Yes ☑ No
Offsite disposal of pit contents: ☐ Injection ☐ Commercial Pit/Facility Name: B16 Pit/Facility No: B16
Attach Form 26 to identify Source Wells and Form 25 to provide Produced Water Analysis results.

Existing Site Conditions

Is the location in a "Sensitive Area?" ☐ Yes ☑ No **Attach data used for determination.**
Distance (in feet) to nearest surface water: 3824 ground water: > 20 water wells: > 2640 feet

LAND USE (or attach copy of Form 2A if previously submitted for associated well) Select one which best describes land use:

Crop Land: ☐ Irrigated ☐ Dry Land ☐ Improved Pasture ☐ Hay Meadow ☐ CRP
Non-Crop Land: ☑ Rangeland ☐ Timber ☐ Recreational ☐ Other (describe): _____
Subdivided: ☐ Industrial ☐ Commercial ☐ Residential

SOILS (or attach copy of Form 2A if previously submitted for associated well)

Soil map units form USNRCS survey: Sheet No: N/A (WSS) Soil Complex/Series No: 55, 56
Soils Series Name: Parachute-Irigul Complex, 5-30 percent slopes Horizon thickness (in inches): A: 10 ; B: 25 ; C: 29
Soils Series Name: Parachute-Irigul-Rhone Association, 25-50 percent slopes Horizon thickness (in inches): A: 13 ; B: 29 ; C: 35
Attach detailed site plan and topo map with pit location.

Pit Design and Construction

Size of pit (feet): Length: 240 Width: 100 Depth: 15
Calculated pit volume (bbls): 27,000 Daily inflow rate (bbls/day): Variable
Daily disposal rates (attach calculations): Evaporation: Minimal bbls/day Percolation: N/A bbls/day
Type of liner material: Reinforced Polyethylene Thickness: 36 mil top layer / 24 mil bottom layer
Attach description of proposed design and construction (include sketches and calculations).
Method of treatment of produced water prior to discharge into pit (separator, heater treater, other): Separator
Is pit fenced? ☐ Yes ☑ No Is pit netted? ☑ Yes ☐ No

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

Print Name: Justin B. Lovato Signed: _____
Title: Regulatory Specialist Date: October 7, 2008

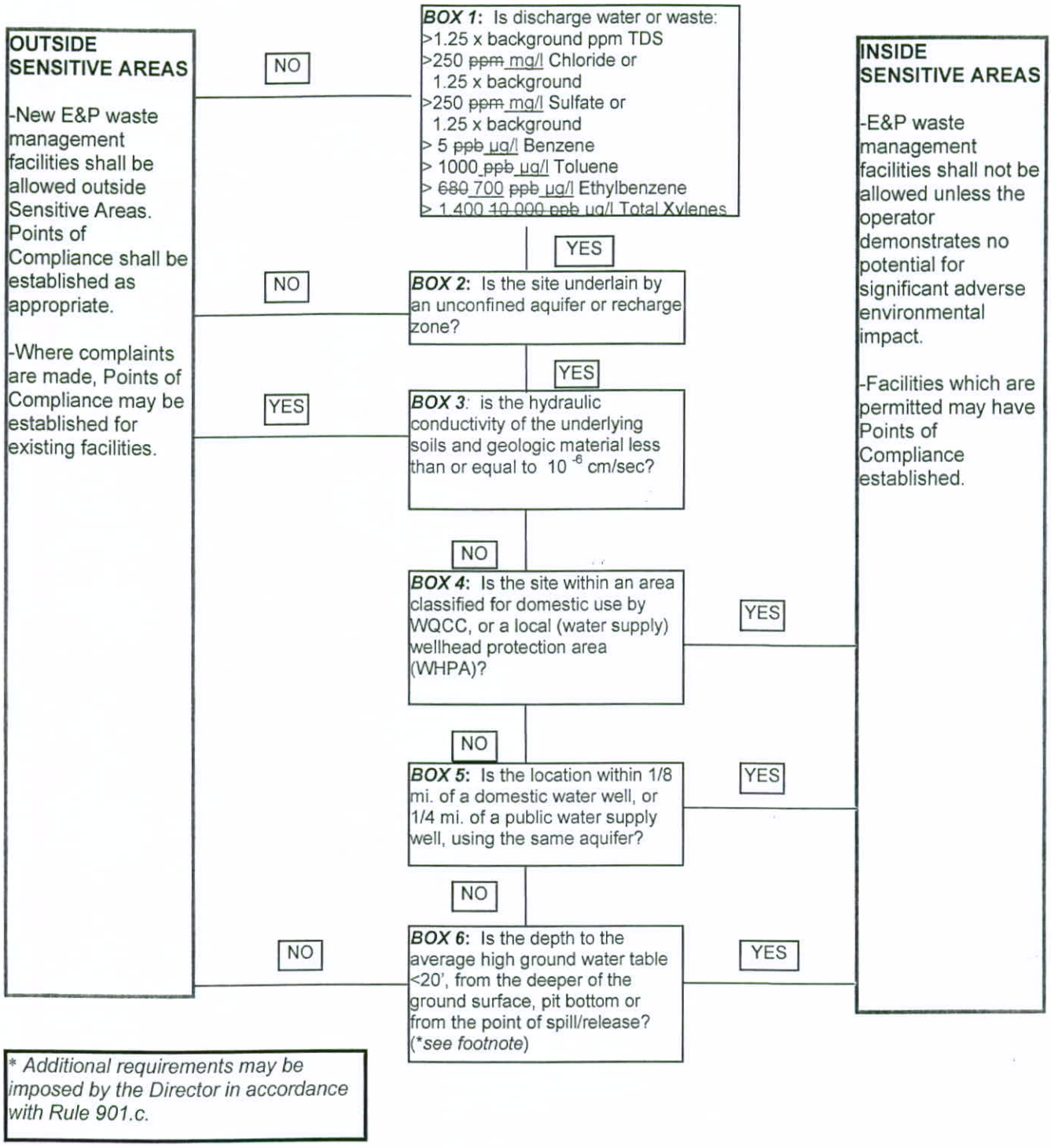
OGCC Approved: Thomas Canfield Title: EPS - NW Area Date: 11/13/09

CONDITIONS OF APPROVAL, IF ANY:

FACILITY NUMBER: 414394

JAK

Figure 901-1
SENSITIVE AREA DETERMINATION
Decision Tree



** Additional requirements may be imposed by the Director in accordance with Rule 901.c.*

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

August 4, 2008

Mr. John Heap
Colorado Lining Intl.
1062 Singing Hills Rd.
Parker, CO 80138-4653
(303) 841-2022
jheap@coloradolining.com

Re: Results of Compression Loading Testing (TRI Log 2308-47-03)

Dear Mr. Heap,

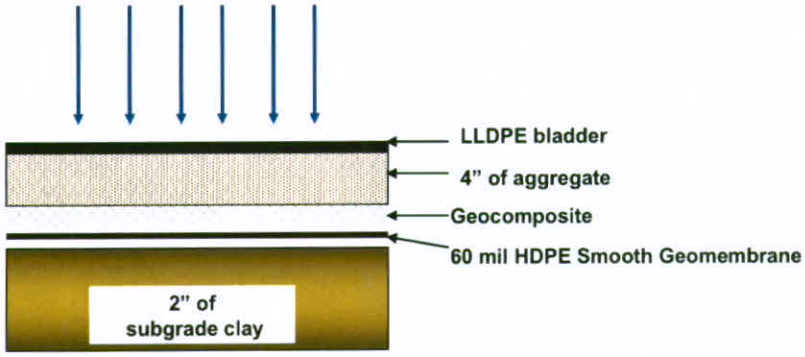
TRI/Environmental, Inc. (TRI) is pleased to present this final report for the requested compression testing in support of the Roan Plateau shale project. The testing was performed to determine the out-of-plane deformation resistance of a 60 mil HDPE smooth geomembrane and a 36 mil RPE geomembrane to compressive loading within a liner system. All sample materials and testing activities were managed under TRI log number E2308-47-03.

Technical Approach

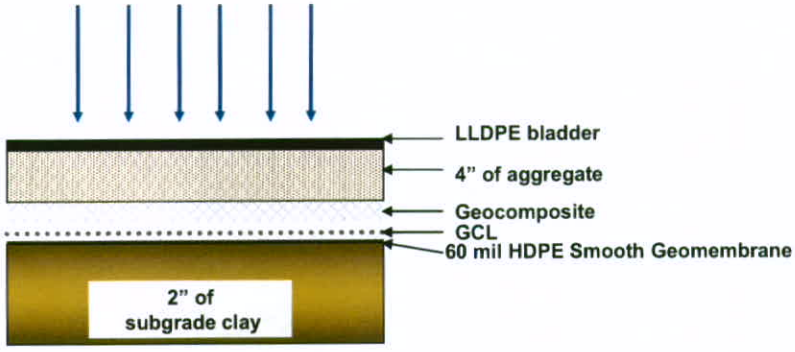
The compression testing was performed in general accordance with ASTM D 5514, *Test Method for Large Scale Hydrostatic Puncture Testing of Geosynthetics*. The test vessel measured 30" in diameter facilitating a 24" diameter test area. The test vessel is composed of a top and bottom half with an intermediate center section measuring 4" in height. The bottom of the test vessel was filled with a compacted clay liner substrate, which the geomembranes were placed over. Four different liner configurations were evaluated. Test configurations are depicted in the test configuration section. Each liner configuration was separated from the loading system via a 40 mil LLDPE geomembrane bladder.

After securing the top test chamber, air was introduced above the bladder to provide normal compressive stress through the bladder and onto the liner system. A normal compressive stress was applied at 1 psi per minute until a static load of 20.8 psi was achieved. This load was allowed to remain static for 1 hour.

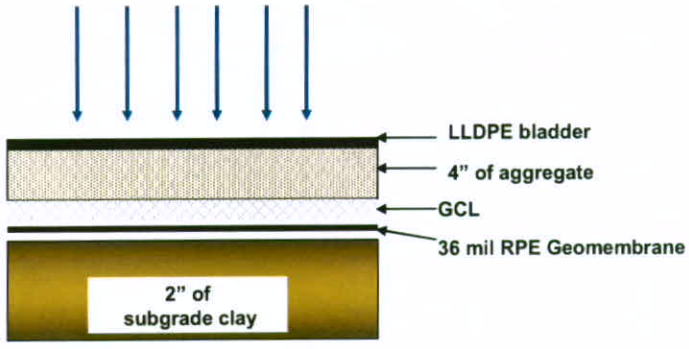
Test Configurations:



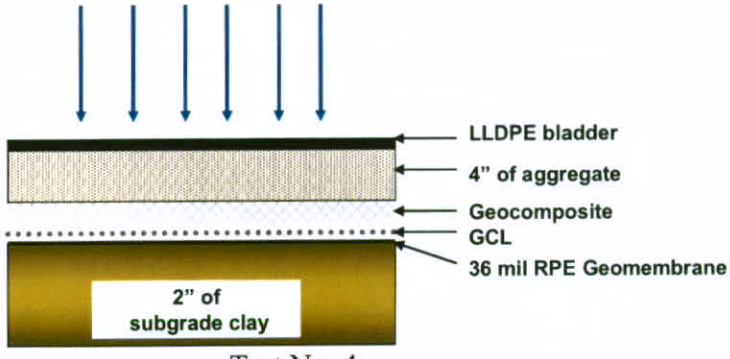
Test No. 1



Test No. 2



Test No. 3



Test No. 4

Post Test Inspection: After dismantling, the 60 mil smooth and 36 mil RPE geomembranes were inspected for out-of-plane deformations, punctures, and abrasions. Pictures showing equipment, system layers and post test exposure are also included. No visible punctures of the geomembrane were found.

Test No.	Observations
1	**No measurable deformations, no punctures or notable marks**
2	**No measurable deformations, no punctures or notable marks**
3	**Three barely visible deformations noted, no punctures or notable marks**
4	**No measurable deformations, no punctures or notable marks**

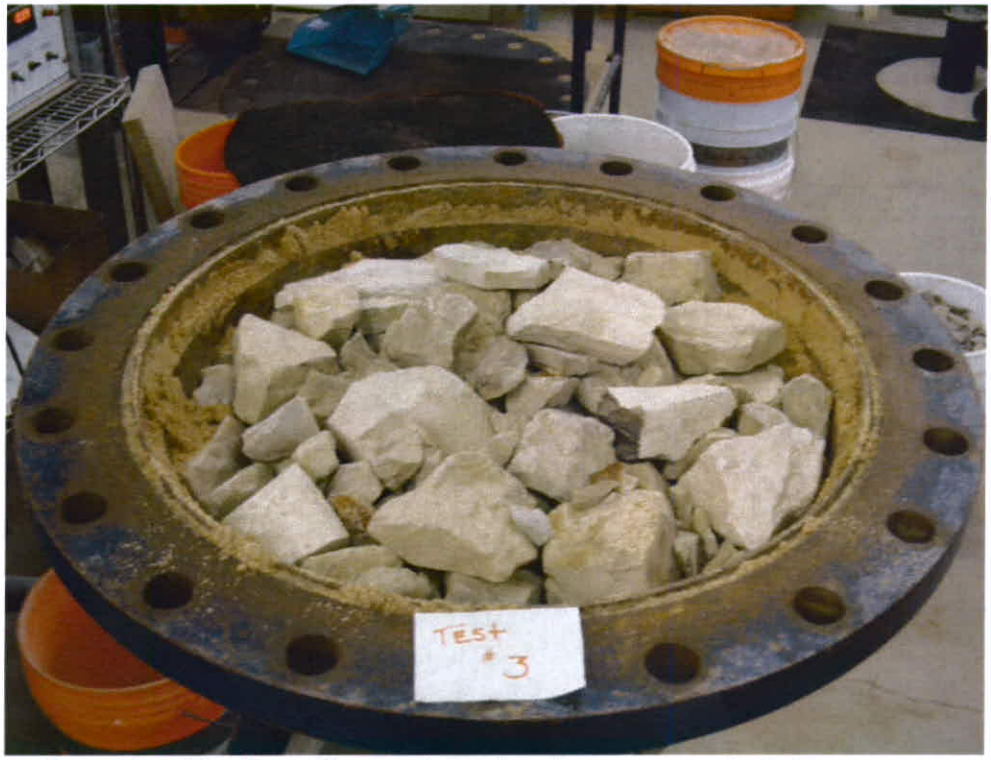
Conclusion

TRI trusts that this report sufficiently documents the testing described herein. TRI is pleased to be of service to Colorado Lining. Please contact me if you have any questions or require any additional information.

Sincerely,

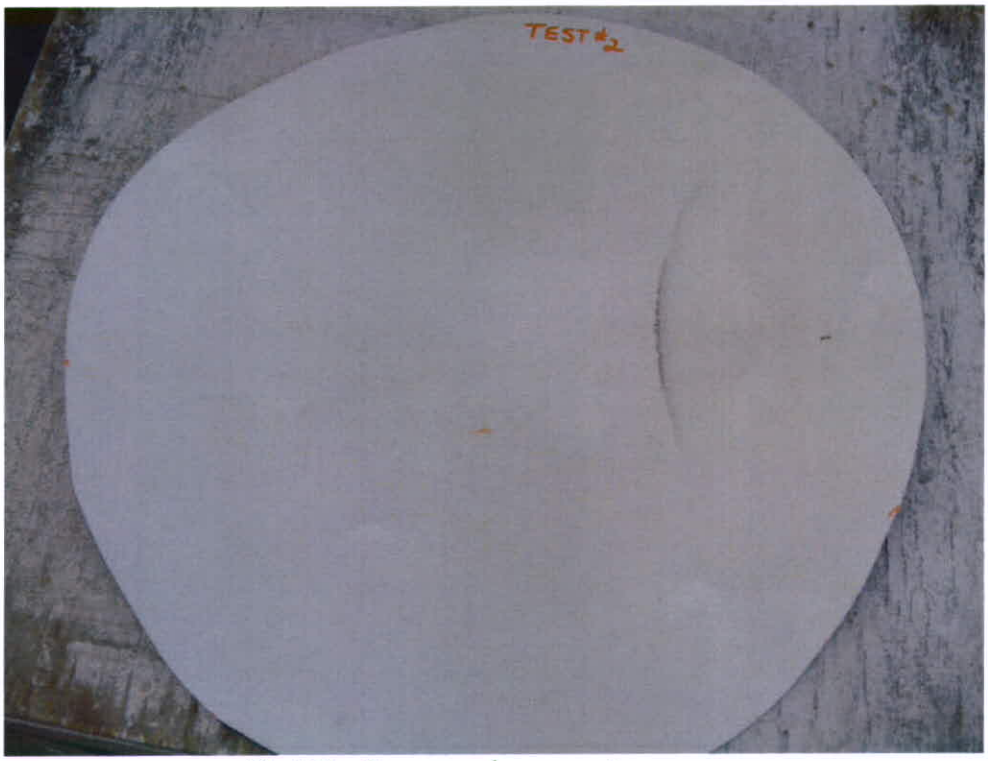
John M. Allen
Director
Geosynthetics Services
www.GeosyntheticTesting.com

Test Cell



Example of the Roan Plateau shale placed over geosynthetic liner system

Test No. 1 geomembrane post exposure



Test No. 2 geomembrane post exposure

Test No. 3 geomembrane post exposure

Test No. 4 geomembrane post exposure

SAMUEL ENGINEERING, INC
ConocoPhillips
B-16 Produced Water Pit
Pit Liner Hydrostatic Test

Reading	Date And Actual Time	Weather Conditions	Precipitation Since Last Reading	Gauge Reading	Evaporation Pan Reading	Water In Leak Detection System	Pass/Fail
Initial	9:30 AM 10/22	Snowing 14°	N/A	25'-0"	4"	None	Pass
Comments	Measurements taken w/ tape at incline. Measured from middle of pit						
12 Hour	5:30 PM 10/22	Sunny 44°	None	25'-0"	4"	None	Pass
Comments							
24 Hour	6:15 AM 10/23	Clear 9°	None	25'-0"	4"	None	Pass
Comments							
36 Hour	4:42 PM 10/23	Sunny 41°	None	25'-0"	4"	None	Pass
Comments							
48 Hour	6:55 PM 10/24	Clear 21°	None	25'-0"	4"	None	Pass
Comments							
60 Hour	4:55 PM 10/24	Sunny 50°	None	25'-0"	4"	None	Pass
Comments							
72 Hour (End)	6:21 AM 10/25	Clear 30°	None	25'-0"	4"	None	Pass
Comments							

Test Performed by: [signature] Signature — Jim McKenzy, Print Name

~~Contractor~~ C.O.P.: [signature] Signature — Gary Gierhart, Print Name

B16 Topographic Map

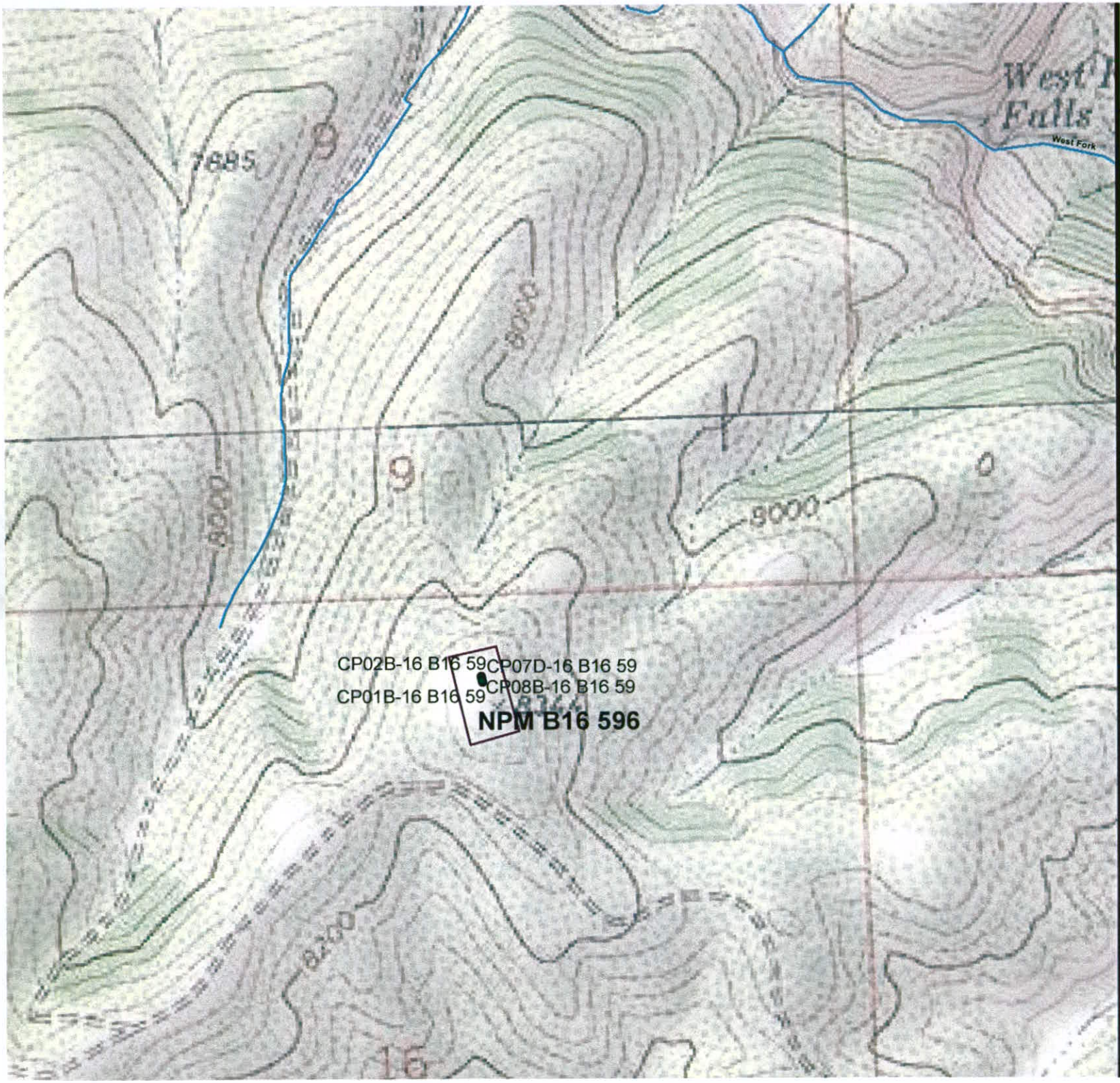
ConocoPhillips

Revision Date: 10/6/08

Surface Landowner

- Bureau of Land Management
- State
- Private
- Other Federal

Comments:



N
W E
S

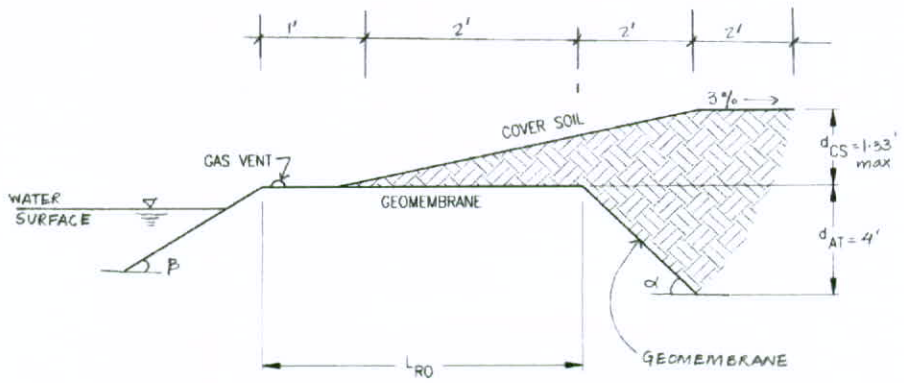
HRL COMPLIANCE SOLUTIONS, INC.
Environmental Consulting

0 370 740 1,480 Feet

0 0.025 0.05 0.1 0.15 0.2 Miles

Runout Length and Anchor Trench Design using GEOMEMBRANE

Designed: N. Das
10/6/2008



ANCHOR TRENCH DESIGN FOR B-16 : NOT TO SCALE

36 mil RPE

Runout distance	L_{RO}	3	ft
Depth of the anchor trench	d_{AT}	4.0	ft
Unit weight of cover soil (Shale)	γ_S	135	pcf
Thickness of soil cover	d_{cs}	0.60	ft
Friction Angle between Geomembrane and underlying soil	δ_c	25	degrees
Friction Angle between Geomembrane and the backfill	δ_F	N/A	degrees
Bottom Angle of the V Shaped Anchor Trench	α	45	degrees
Side Slope Angle	β	26.6	degrees
Ultimate Tensile Strength of 36 mil RPE	T_{ult}	840	plf
	$\sin \beta$	0.448	
	$\cos \beta$	0.894	
	$\tan \delta_c$	0.466	
	$\cos \alpha$	0.707	
Resistant Capacity of 36 mil RPE	T_{AT}	841	plf

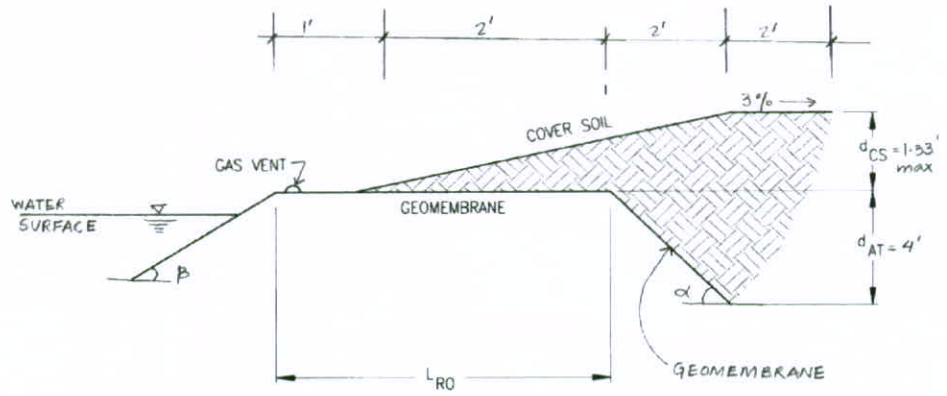
Note:

If $T_{ult} < T_{AT}$, The Geomembrane will fail if sufficient tensile stresses are mobilized.

If $T_{ult} > T_{AT}$, The Geomembrane will pull out if sufficient tensile stresses are mobilized.

If $T_{ult} = T_{AT}$, indicates a balanced design.

Runout Length and Anchor Trench Design using GEOMEMBRANE	Designed: N. Das 10/6/2008



ANCHOR TRENCH DESIGN FOR B-16 : NOT TO SCALE

24 mil RPE

Runout distance	L_{RO}	3	ft
Depth of the anchor trench	d_{AT}	4.0	ft
Unit weight of cover soil	γ_S	135	pcf
Thickness of soil cover	d_{cs}	0.60	ft
Friction Angle between Geomembrane and underlying soil	δ_c	25	degrees
Friction Angle between Geomembrane and the backfill	δ_F	N/A	degrees
Bottom Angle of the V Shaped Anchor Trench	α	45	degrees
Side Slope Angle	β	26.5	degrees
Ultimate Tensile Strength of 24 mil RPE	T_{ult}	750	plf
	$\sin \beta$	0.446	
	$\cos \beta$	0.895	
	$\tan \delta_c$	0.466	
	$\cos \alpha$	0.707	
Resistant Capacity of 24 mil RPE	T_{AT}	839	plf

Note:

If $T_{ult} < T_{AT}$, The Geomembrane will fail if sufficient tensile stresses are mobilized.

If $T_{ult} > T_{AT}$, The Geomembrane will pull out if sufficient tensile stresses are mobilized.

If $T_{ult} = T_{AT}$, a balanced design results.

55—Parachute-Irigul complex, 5 to 30 percent slopes

Map Unit Setting

- *Elevation:* 7,600 to 8,800 feet
- *Mean annual precipitation:* 18 to 22 inches
- *Mean annual air temperature:* 36 to 40 degrees F
- *Frost-free period:* 65 to 90 days

Map Unit Composition

- *Parachute and similar soils:* 60 percent
- *Irigul and similar soils:* 30 percent

Description of Parachute

Setting

- *Landform:* Mountains
- *Landform position (two-dimensional):* Shoulder, summit
- *Landform position (three-dimensional):* Mountaintop
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Parent material:* Residuum weathered from shale and siltstone and/or residuum weathered from sandstone and shale

Properties and qualities

- *Slope:* 5 to 30 percent
- *Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
- *Drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water capacity:* Low (about 4.0 inches)

Interpretive groups

- *Land capability (nonirrigated):* 6e
- *Ecological site:* Mountain Loam (R048AY228CO)

Typical profile

- *0 to 10 inches:* Loam
- *10 to 25 inches:* Very channery loam, extremely channery loam
- *25 to 29 inches:* Unweathered bedrock

Description of Irigul

Setting

- *Landform:* Hills
- *Landform position (two-dimensional):* Backslope, shoulder, toeslope, summit, footslope
- *Landform position (three-dimensional):* Crest
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Parent material:* Residuum weathered from sandstone and shale

Properties and qualities

- *Slope:* 5 to 30 percent
- *Depth to restrictive feature:* 5 to 20 inches to lithic bedrock
- *Drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water capacity:* Very low (about 1.3 inches)

Interpretive groups

- *Land capability (nonirrigated):* 7e
- *Ecological site:* Loamy Slopes (R048AY303CO)

Typical profile

- *0 to 6 inches:* Channery loam
- *6 to 13 inches:* Very channery loam
- *13 to 17 inches:* Unweathered bedrock

56—Parachute-Irigul-Rhone association, 25 to 50 percent slopes

Map Unit Setting

- *Elevation:* 7,600 to 8,800 feet
- *Mean annual precipitation:* 18 to 22 inches
- *Mean annual air temperature:* 36 to 40 degrees F
- *Frost-free period:* 65 to 80 days

Map Unit Composition

- *Parachute and similar soils:* 35 percent
- *Irigul and similar soils:* 30 percent
- *Rhone and similar soils:* 20 percent

Description of Parachute

Setting

- *Landform:* Mountains
- *Landform position (two-dimensional):* Summit, shoulder
- *Landform position (three-dimensional):* Mountaintop
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Parent material:* Colluvium derived from sandstone and shale and/or residuum weathered from siltstone

Properties and qualities

- *Slope:* 25 to 50 percent
- *Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
- *Drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water capacity:* Low (about 4.0 inches)

Interpretive groups

- *Land capability (nonirrigated):* 7e
- *Ecological site:* Brushy Loam (R048AY238CO)

Typical profile

- *0 to 10 inches:* Loam
- *10 to 25 inches:* Very channery loam, extremely channery loam
- *25 to 29 inches:* Unweathered bedrock

Description of Irigul

Setting

- *Landform:* Hills
- *Landform position (two-dimensional):* Toeslope, summit, footslope, backslope, shoulder
- *Landform position (three-dimensional):* Crest
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Parent material:* Residuum weathered from sandstone and shale

Properties and qualities

- *Slope:* 25 to 50 percent
- *Depth to restrictive feature:* 5 to 20 inches to lithic bedrock
- *Drainage class:* Well drained
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water capacity:* Very low (about 1.3 inches)

Interpretive groups

- *Land capability (nonirrigated):* 7e
- *Ecological site:* Loamy Slopes (R048AY303CO)

Typical profile

- *0 to 6 inches:* Channery loam
- *6 to 13 inches:* Very channery loam
- *13 to 17 inches:* Unweathered bedrock

Description of Rhone

Setting

- *Landform:* Hills, mountains
- *Landform position (two-dimensional):* Backslope, shoulder, summit, footslope
- *Landform position (three-dimensional):* Mountainflank, side slope
- *Down-slope shape:* Concave
- *Across-slope shape:* Concave
- *Parent material:* Colluvium derived from sandstone and shale and/or residuum weathered from sandstone and shale

Properties and qualities

- *Slope:* 25 to 50 percent
- *Depth to restrictive feature:* 40 to 60 inches to paralithic bedrock
- *Drainage class:* Well drained

- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Available water capacity:* Moderate (about 7.5 inches)

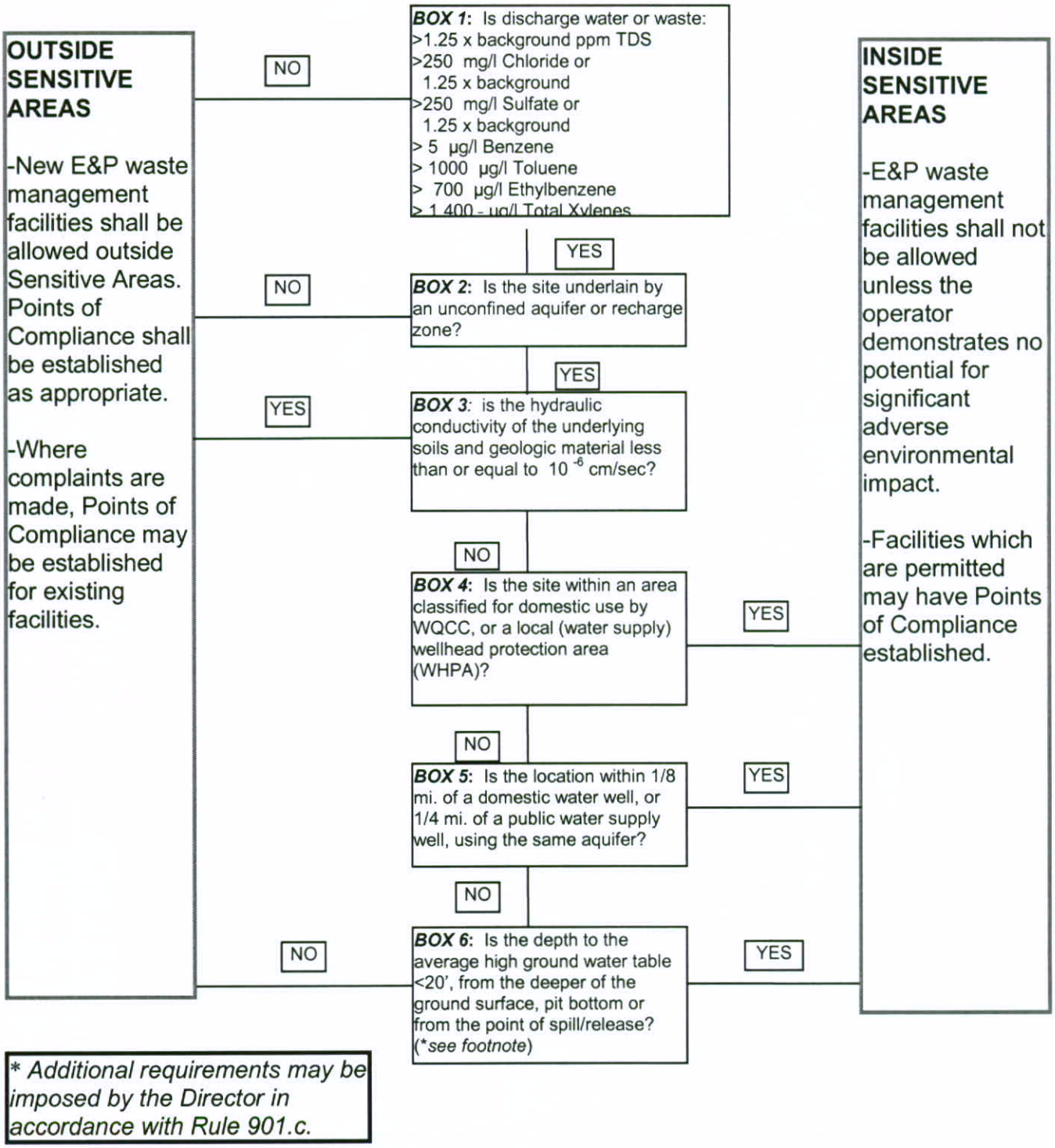
Interpretive groups

- *Land capability (nonirrigated):* 7e
- *Ecological site:* Brushy Loam (R048AY238CO)

Typical profile

- *0 to 10 inches:* Loam
- *10 to 39 inches:* Channery loam
- *39 to 55 inches:* Very channery loam
- *55 to 59 inches:* Unweathered bedrock

Figure 901-1
SENSITIVE AREA DETERMINATION
Decision Tree



** Additional requirements may be imposed by the Director in accordance with Rule 901.c.*

APPENDIX PART II

SENSITIVE AREA INDENTIFICIATON GUIDANCE DOCUMENT

A. PURPOSE OF THE GUIDANCE DOCUMENT

The Sensitive Area Identification Guidance Document specifically applies to the determination of areas in which unlined earthen produced water pits installed for use by oil and gas operations may be restricted.

This guidance document was developed to provide direction to both operators and COGCC staff for determination of Sensitive Areas (SAs). This document supports the implementation of the 900 Series of COGCC Rules, which establish the permitting, construction, operating and closure requirements for all pits used in oil and gas operations.

This document was prepared with the assistance of our stakeholders, including the oil and gas industry and the Water Quality Control Division (WQCD). This document may be revised periodically, when additional facts and data indicate a change is needed. Each document revision will be presented to the COGCC Commissioners for adoption by order of the Commission after a public hearing.

B. METHOD OF IDENTIFICATION OF SENSITIVE AREAS

Identification criteria were chosen to ensure the protection of ground water in accordance with WQCC standards and classifications, relative to oil and gas operations. After much discussion, the initial list of criteria was narrowed to the factors which would result in the most accurate identification of SAs using reasonable sources of available information. These identification criteria include:

- quality of the produced water,
- presence of unconfined aquifers or recharge areas,
- hydraulic conductivity of soils and geologic material under pit,
- presence of a WQCC classified area or wellhead protection area,
- proximity to public or domestic water supply wells,
- depth and quality of ground water.

The decision tree method was employed for easy use by operators. The operator may determine whether a location is in a SA by answering the questions posed in the following decision tree. The operator will make a SA determination for each existing and new pit only once.

Various sources of information available for answering the questions are noted. If vital information or data are incomplete or missing, then it is the responsibility of the operator to provide the minimum information necessary. The operator may also provide field observations and data to fulfill determination requirements.

When a discrepancy or question regarding the sensitivity of an area arises, the COGCC staff should be consulted. The COGCC will make the final determination in any dispute over whether a location is in a SA.

C. THE DECISION TREE

The decision tree consists of a series of technical questions. Explanations of these questions follow:

Box 1: Does the produced water to be placed in pit meet WQCC standards for ground water for the following contaminants of concern?

< Total Dissolved Solids (TDS) at 1.25 x background
< 250 ppm Chloride or background, whichever is higher
< 250 ppm Sulfate or background, whichever is higher
< 5 ppb Benzene
< 1,000 ppb Toluene
< 680 ppb Ethylbenzene
< 10,000 ppb Xylenes

YES - Produced water quality is below action levels stated in WQCC ground water standards. The risk to ground water resources posed by placing this produced water into unlined pits is considered insignificant and will be allowed.

NO - Contaminants of concern are present in the produced water at concentrations above the ground water standards. The risk to ground water posed by placing this produced water into unlined pits may be significant. Continue with decision tree.

The levels noted above are derived from ground water standards established by the WQCC. Their use in Box 1 does not imply that produced water must meet these standards in all pit situations.

Data References: These data must be obtained from testing the produced water. For a proposed new pit, the concentrations may be estimated from produced water quality data from wells in a common producing area.

Box 2: Is the pit location underlain by an unconfined aquifer or recharge zone?

An unconfined aquifer may occur in bedrock or in unconsolidated deposits, primarily alluvium adjacent to the Platte or other rivers. This does not include a small isolated occurrence of ground water that is not in communication with other hydrologic units. Wetlands should also be considered as they are likely to be in communication with shallow ground water and surface water.

YES - The location is in a SA and produced water placed into an unlined earthen pit here has a high potential to adversely impact ground water. Continue with decision tree.

NO - The location is not in a SA, and produced water placed in an unlined earthen pit here would have a low potential to adversely impact ground water.

References: USGS Hydrologic and Geologic Maps, NRCS (SCS) maps, wetland designation maps and field designations by the Army Corps of Engineers, and State Engineer's records.

Box 3: Is the hydraulic conductivity of the underlying soils and geologic material between the pit bottom and the aquifer less than or equal to 10^{-6} cm/sec?

Where the permeability of the soil and geologic material is high, produced water percolating from the pit may move easily to lower zones. As an example, sandy soil would allow a high rate of percolation of produced water from an unlined pit.

YES - The potential for adversely impacting ground water is high. Continue with decision tree.

NO - The ground water should be protected by the existing soils acting as a barrier to percolation of produced water. The location is not in a SA.

References: NRCS (SCS) Soil Surveys (for soil characterizations to about 5' below surface).

Box 4A: Is the **existing** pit location within a specified area for which the WQCC has classified the ground water or within a wellhead protection area (WHPA) as of 7/1/95? OR

Box 4B: Is the **new** pit location within a specified area for which the WQCC has classified the ground water or within a wellhead protection area (WHPA) at the date of construction?

The ground water in specified areas must be protected because it is used as a drinking water or other public water supply. Local entities may also designate areas for protection for similar reasons.

YES - The potential for adversely impacting ground water used as a public water supply exists. This location is in a SA.

NO - An unlined pit is not likely to adversely impact a public water supply. Continue with decision tree.

References: See WQCC regulations, which includes maps of specified areas. WHPA information may be obtained from local governments.

Box 5: Is the pit location within:
660' (1/8 mi.) of a domestic water well, OR
1320' (1/4 mi.) of a public water supply well, and completed in the same aquifer that may be adversely impacted from an unlined earthen pit?

YES - The potential for adversely impacting ground water used by the public exists. The location is in a SA.

NO - An unlined pit has a low potential for adversely impacting ground water used by the public. Continue with decision tree.

References: Colorado State Engineer's database, landowners, and local water well drillers.

Box 6: Is the depth from the pit bottom to the ground water table less than 20', estimated to be the average high ground water level, including influence of irrigation? The average high should be the level of the ground water table during spring runoff or crop irrigation (whichever is higher).

YES - The potential for adversely impacting the ground water is high. This location is in a SA.

NO - An unlined pit has a low potential for adversely impacting ground water, so the location is not in a SA.

References: USGS Hydrologic and Geologic maps and Water Supply studies, landowners, local water well drillers, NCRS (SCS), and agriculture organizations such as the CSU Extension Service.

D. DECISION TREE RESULTS

1. IF THE LOCATION **IS NOT** IN A SENSITIVE AREA:

Unlined earthen pits (and buried concrete sumps or other non-leakproof vessels) are an acceptable method for handling produced water. A pit permit must be obtained in accordance with COGCC Rule 903. Points of Compliance may be included as permit conditions.

2. IF THE LOCATION **IS** IN A SENSITIVE AREA:

Unlined earthen pits ARE NOT an acceptable method for disposing of produced water. Equipment such as aboveground tanks, below-grade leakproof tanks or vessels (such as FRP or lined/coated steel), or adequate lining in an earthen pit may be used. Other methods of produced water disposal may be used such as evaporation, injection into a permitted UIC Class II well or surface discharge in accordance with WQCD Colorado Discharge Permit System (CDPS).

An operator may provide data that demonstrates that the proposed unlined pit will not impact ground water. An operator may also provide information that demonstrates the existing ground water is not currently nor likely to be used by the public. The COGCC will evaluate the proposal and supporting data, and may allow an unlined pit, where the placement of produced water into an unlined pit will not adversely impact ground water resources.

The operator may choose to perform analyses to determine the quality of the existing ground water that may be impacted. Should the produced water quality analyses show it to be of better quality than the existing ground water, the unlined pit may be authorized. This concept is further explained on attached Produced Water Quality Decision Tree.

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PERFORMANCE SPECIFICATION

SPECIFICATION 02517

EARTHWORK AND LEAK DETECTION WELL

FOR

ConocoPhillips

B16 Produced Water Pit Geosynthetic Lining System
SE Project 8053-01

Orig./Lead Eng.:		Date	
Project Engineer Approval:		Date	10-09-08
Project Manager Approval:		Date	10-09-08
Client Approval:		Date	

Rev. No.	By	Revisions	Approval	Date
0	TP	ISSUED FOR CONSTRUCTION		
1	TP	REVISED / ISSUED FOR CONSTRUCTION		

1.0 GENERAL

A. Related specifications: 02530 GEOSYNTHETICS INSTALLATION.

B. These technical specifications establish the quality of materials and workmanship and define how quality is measured for earthwork, hard material subgrade, and leak detection wells. They apply to lined containment pond areas. It also establishes the quality of materials and workmanship for furnishing, delivering, installing and constructing hard material subgrade and standard leak detection wells for double-lined systems.

C. The word "Owner," as used here shall mean ConocoPhillips.

2.0 ABBREVIATIONS

A. The abbreviation below shall mean:

AASHTO..... American Association of State Highway and Transportation Officials

ASTM..... American Society for Testing Materials

3.0 CODES AND STANDARDS

A. Unless otherwise specified or shown on drawings, the following codes and standards shall apply to the extent indicated herein:

ASTM D422..... Standard Method of Test for Particle-Size/Analysis of Soils

ASTM D2487.... Standard Test Methods for Classification of Soils for Engineering Purposes

ASTM D2488.... Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

ASTM D3740.... Evaluation of Agencies engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Designing Construction

4.0 MATERIALS

A. Hard materials will be encountered in 100 percent of the excavation from the existing surface.

B. Material for subgrade will consist of the naturally occurring shale rock, shaped to the lines and grades on the Design Drawings. The naturally occurring shale rock

shall be broken into pieces with excavation equipment. The side slopes and bottom of the excavation shall be shaped with aggregate less than 2 inches in diameter in a manner that is smooth and does not allow for protrusion of rocks from the planar surface of the side slopes and the bottom of the pit.

C. Drill cuttings mixed with fly ash and wood chips or drill cuttings alone may be used to provide a smooth finish to the subgrade for placement of the geosynthetic liner materials including geocomposites. Such cuttings must have passed the testing required by COGCC in Table 910-1.

D. Materials will consist of the geocomposites and geomembranes used in the pond liner system. The leak detection well shall consist of 8-in diameter HDPE pipe perforated at the bottom end as shown on the design drawings. The 8-in HDPE shall be sealed from the primary liner with a pipe boot. An 8-in cap will be provided above grade as shown on the design drawings. Refer to 02530 GEOSYNTHETICS INSTALLATION for more information on geocomposites and geomembranes.

E. A minimum 4-ft x 4-ft x 16-in deep sump pit filled with gravel and wrapped with 8-oz non-woven geotextile fabric shall be placed at the low point of the pond and at the bottom end of the leak detection well. Refer to 02530 GEOSYNTHETICS INSTALLATION for more information on geotextile.

F. Class 2 Backfill is defined as all soils and rock excavated at the site with a diameter of less than 2 inch maximum dimension. Suitable equipment or approved procedures shall be provided to ensure the maximum dimension is not exceeded.

5.0 QUALITY ASSURANCE

A. Quality assurance during preparation of hard material subgrade shall be performed by an agent of the sealing engineer. Inspections during filed construction shall be visual and the subgrade shall be approved by the certifying engineer prior to placement of the liner system.

B. The owner shall engage a third party independent Engineering firm for quality control.

C. Inspections during filed construction shall be visual and the subgrade shall be approved by the certifying engineer prior to placement of the leak detection well and related liners. The leak detection well shall be approved by the certifying engineer prior to backfill of the well.

6.0 PROJECT SITE CONDITIONS

A. Data on indicated subsurface conditions are made available for the convenience of the earthwork contractor and are not intended as representations or warranties of continuity of such conditions.

B. Protect existing benchmarks and monuments and other reference points; if disturbed or destroyed, replace as directed by Owner.

C. Erect and maintain such safeguards as required by construction operations, codes or existing conditions, for the safety of persons or property and to protect the same from damage, injury or loss.

D. Provide for diversion of surface drainage during the period of earthwork, keeping excavations free of water during entire process of work, regardless of cause, source or nature of the water.

7.0 SURVEY

A. The Owner will establish the control point(s) to be utilized by the Contractor. The Contractor shall be responsible for all construction surveying to control the work.

B. Cross-sections of the original surface and the as-built condition will be taken as directed.

C. Prior to installation of any geosynthetic liners, Contractor shall verify with grading level that the pit side slopes are 2:1 maximum, the bottom of the pit slopes as designed for the leak detection system, and the pit depth and general layout is per the design drawings.

D. All survey work will be subject to checking by the Owner or Owner's representative.

8.0 CLEARING AND GRUBBING

A. Existing pit will be drained and the existing liner system removed prior to construction.

B. Existing fencing will be removed prior to the start of work to allow for proper re-shaping of the existing pit.

C. Fluids, solids, and existing liners removed from the existing pit shall be disposed of at the waste locations identified and approved by Owner.

D. Clearing and grubbing shall be performed as required.

E. Clearing will consist of the removal and disposal of all brush, grass, rubbish, and other obstructions resting on the surface of the original ground. Unless otherwise indicated, clearing shall be performed within the limits of and ten feet outside of the pits.

9.0 DUST PALLIATIVE

A. Apply water or chemical for the control of airborne dust originating as a result of earthwork operations in accordance with applicable ordinances and regulations. Chemicals if utilized are to be approved in advance of use by field.

10.0 EXCAVATION

A. Classification of all excavated materials shall be included in the following:

1. Common and Rippable Excavation shall consist of all materials that can be excavated without blasting. Rippable excavation shall consist of all materials that can be effectively loosened or broken down by ripping in a single pass with a late model tractor-mounted hydraulic ripper equipped with one digging point of standard manufacturer's design adequately sized for use with and propelled by a crawler-type tractor rated equal to or better than a D-9 Caterpillar flywheel horsepower, operating in low gear. Additionally, all boulders or detached pieces of solid rock less than 2 cubic yards in volume will be classified as Common and Rippable Excavation.

2. Rock Excavation - For the purpose of classification of excavation, rock is defined as sound and solid masses, layers, or ledges of mineral matter in place and of such hardness and texture that it cannot be effectively loosened or broken down by a hydraulic ripper specified above. Testing to determine compliance with this classification shall be made when requested. All boulders or detached masses of solid rock larger than 2 cubic yards in volume will be classified as rock.

B. Suitable excavated materials conforming to the requirements of Section 4.0 shall be utilized in backfills. Unsuitable material within the limits of excavation shall be removed and disposed of as waste. Unsuitable material is defined as material that is greater than 2 inches in diameter, organic materials and debris of any kind, or any material that is protruding from the planar surface of the bottom of the pit, side slopes of the pit, and within the anchor trench. Unsuitable or excess excavated material shall be disposed of at Owner's designated waste locations.

C. The method of excavation shall not weaken surrounding areas or damage structures or parts thereof that are completed or under construction. Existing structures and utilities adjacent to excavations shall be protected and supported to

prevent displacement.

D. Excavations shall conform within the tolerances specified to the lines, grades, sections and elevations shown on Design Drawings.

E. Except as otherwise shown, grading tolerances shall be zero to minus 4 inches for horizontal and sloped planes of excavation in earth and zero to minus 6 inches for horizontal and sloped planes excavation in rock.

F. Over-excavated areas within the pit area shall be restored with properly compacted drill cuttings to the elevations shown on Design Drawings. Compaction equipment shall be suitable for the size and depth of the holes being filled.

G. If any areas outside of the pit area are over-excavated in rock, the over-excavation shall be restored by backfilling spaces under and adjacent to footings, foundations or other bearing portions of structures with concrete having a 28-day compressive strength of 2000 psi. Restoration of over-excavated areas in rock and soil shall provide uniform bearing values at least equivalent to that previously given by the excavation prior to the over-excavation.

H. Areas being excavated and areas to be backfilled shall be maintained in a clean condition free from debris.

I. Compaction shall be "Ordinary compaction" without field testing but shall require close observation to ensure that the materials are being densified and that no soft or loose spots remain. Loose lifts shall be no more than six inches in thickness prior to compaction. Care must be taken to ensure that tracks compact evenly and do not 'bridge' between hard points leaving uncompacted material between. Tracked equipment exerts fairly low ground pressures but may be suitable for this project if closely observed. For reference the following equipment exerts pressure on the soil.

i. D8 Tractor with standard track and dozer Ground pressure is 1884 pounds per square foot (13.1 psi).

ii. 345 D Hydraulic excavator with 36" track Ground pressure is 1163 pounds per square foot (8.1 psi).

11.0 PIPE TRENCH EXCAVATION

A. The pipeline route for the leak detection system shall be excavated so that the pipe rests in a trapezoidal trench, as indicated on the Design Drawings. The bottom and sides of the trench shall be finished as smooth as the pit subgrade with similar surface treatment. The 8 oz non-woven textile liner shall wrap around the outside

of the gravel sump. The bottom geocomposite cushion and 24 mil RPE liners shall deform into the trench beneath the 8 oz non-woven textile liner. The geocomposite conduction liner shall continue over the top of the pit until the reaching the pipe and shall also be positioned underneath the pipe, as indicated on the Design Drawings. Ensure that the primary geomembrane liner is not significantly deformed over the pipe. Backfill around the pipe with clean drill cuttings.

B. The leak detection sump shall be excavated so as to provide the cover, bedding depth and minimum width of 4 feet as shown on the drawings.

C. The bottom of the pit shall be graded to drain to the leak detection system sump as indicated on the Design Drawings.

D. The method of excavation shall not weaken surrounding areas or damage structures or parts thereof that are completed or under construction.

E. All excavation shall conform within the tolerances specified to the lines, grades, sections and elevations shown on drawings and shall be shaped on the bottom to the bedding details shown to provide uniform bearing and support of each pipe section for the entire length.

F. In all excavation requiring blasting, care shall be taken to minimize overbreak. Material outside the authorized cross section, which has been shattered or loosened by blasting, shall be removed.

G. Precautions shall be taken so as not to excavate below the depths indicated on the drawings. Where excessive or unauthorized excavation occurs, backfill the depth to the proper grade with compacted sand and or pea gravel or other suitable material.

H. Except as otherwise shown, grading tolerances shall be plus zero to minus 4 inches for rippable rock excavation.

I. Remove excavated material not required or suitable for backfill from the excavation area and dispose of it at an onsite, designated location.

12.0 PIT SURFACE TREATMENT

A. Benching of Sloped Surfaces

Pit side slopes will be no steeper than 2 to 1 (horizontal to vertical) as indicated on Design Drawings. Tolerance for side slopes will be 2 inches in a 4 foot length of straight edge provided the transitions are smooth curves.

B. Surface Preparation:

Existing rippable hard material on the exposed surface of the pit bottom and side slopes shall be reduced in size to a maximum of 2 inches in diameter. Ensure that there are no rock protrusions above the planar surface of the pit bottom, side walls, and anchor trench. Reduction of this rock shall be done with the most appropriate means and methods available, such as tracking over the rock with the dozer, the use of ripper attachments on excavators, and/or the use of compaction equipment. Large or very hard materials which are resistant to crushing with available equipment may require removal or reduction with special equipment.

C. Filling Holes, Depressions and Cavities

Depressions and other cavities shall be filled in with clean drill cutting to the elevations of the pit bottom and side slopes indicated on the Design Drawings. Crushed rock less than 2 inches in diameter may also be used to fill in holes, depressions, and cavities. Compaction equipment shall be suitable for the size and depth of the holes being filled.

13.0 ANCHOR TRENCHES

A. Geosynthetic runout and anchor trench shall be constructed to the dimensions as indicted on Design Drawings. The subgrade surface of the anchor trench runout shall be of the same material as the side slope of the pit and will be smooth for placement of the liner system. Subgrade will be approved by the onsite engineer prior to placement of geosynthetics.

B. Class 2 Backfill as defined in Section 4.0 shall be used to backfill over the geosynthetic runout and in the anchor trench. Class 2 Backfill shall be used on top of the geosynthetic runout to a minimum depth of 12 inches and will match existing depth and grade as indicated on Design Drawings.

C. Backfill within anchor trench and over geosynthetic runout shall be placed in 6-inch lifts and wheel or bucket compacted with onsite equipment. Tolerance for final grade over runout and anchor trench shall be minus zero to plus 2 inches. Compaction efforts will be observed and approved by the onsite engineer to ensure sufficient compaction in required lifts.

14.0 STOCKPILING

A. As part of earthwork operations, stockpiling of excavated or borrowed material may be required.

B. Different classes of material shall be stockpiled separately if required by Owner.

C. Stockpiles and waste material shall be placed in such a manner to provide natural drainage and a stable embankment as approved by Owner.

D. Stockpiles shall be constructed with maximum height not exceeding 40 feet.

E. Location of stockpiles to be determined by Owner.

15.0 RESHAPING AND GRADING EXISTING IMPROVEMENTS

A. Prior to commencing finish grading, existing improvements shall be checked for their compliance with rough grading requirements shown on design drawings and restored to original lines, grade and cross section if required.

B. Clean and reshape previously constructed ditches of sedimentation and debris to original lines, grade and cross section.

C. Clean all previously constructed culverts of sedimentation and debris.

16.0 FINISH GRADING TOLERANCES

A. The finish grade tolerance for the rippable rock shall be plus zero and minus 4 inches to the lines and grades as indicated on the Design Drawings.

B. Areas not within the allowable tolerances shall be corrected by breaking, scarifying, placing additional material, remixing, and reshaping to the specifications herein.

17.0 CLEANUP

A. Leave area in a clean and neat condition. Grade all disturbed surfaces to prevent standing surface water.

END OF SECTION 02515

ATTACHMENT 1

GEOSYTHETIC COMPRESSION LOADING TEST RESULTS

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PERFORMANCE SPECIFICATION

SPECIFICATION 02530

GEOSYNTHETICS INSTALLATION

FOR

ConocoPhillips

B16 Produced Water Pit Geosynthetic Lining System
SE Project 8053-01

Orig./Lead Eng.: _____ Date _____

Project Engineer Approval: _____ Date 10-09-08

Project Manager Approval: _____ Date 10-09-08

Client Approval: _____ Date _____

Rev. No.	By	Revisions	Approval	Date
0	TP	ISSUED FOR CONSTRUCTION		

1.0 GENERAL

A. This specification establishes the quality of materials and workmanship and defines how quality is measured for geosynthetic materials to be manufactured and installed for the B-16 Drill Pad at the Roan Plateau, Garfield County CO.

B. The word "Owner", as used here, shall mean Conoco Phillips.

C. Measurement shall be made of the total surface area in square feet covered by the geosynthetic. Final quantities will be based on as-built conditions. Allowance will be made for geosynthetic in anchor and drainage trenches; however, no allowance will be made for waste, overlap, repairs, or materials used for the convenience of the Contractor.

2.0 ABBREVIATIONS

ASTM.....	American Society for Testing Materials
HDPE	High Density Polyethylene
LLDPE	Linear Low Density Polyethylene
RPE	Reinforced Polyethylene
LDS	Leak Detection System

3.0 CODES AND STANDARDS

ASTM D751 (2006)	Standard Test Methods for Coated Fabrics
ASTM D413 98(2007)	Standard Test Methods for Rubber Property—Adhesion to Flexible Substrate
ASTM D 1004 (2007)	Initial Tear Resistance of Plastic Film and Sheeting
ASTM D 1203 (1994; R 2003)	Volatile Loss from Plastics Using Activated Carbon Methods
ASTM D 1204 (2007)	Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
ASTM D 1505 (2003)	Density of Plastics by the Density-Gradient Technique
ASTM D 1603 (2006)	Carbon Black Content in Olefin Plastics

ASTM D 1790 (2002)	Brittleness Temperature of Plastic Sheeting by Impact
ASTM D 3895 (2007)	Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 4218 (1996; R 2001)	Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
ASTM D 4354 (1999; R 2004)	Sampling of Geosynthetics for Testing
ASTM D 4355 (2007)	Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D 4491 (1999a; R 2004e1)	Water Permeability of Geotextiles by Permittivity
ASTM D 4533 (2004)	Trapezoid Tearing Strength of Geotextiles
ASTM D 4595 (2005)	Tensile Properties of Geotextiles by the Wide-Width Strip Method
ASTM D 4632 (1991; R 2003)	Grab Breaking Load and Elongation of Geotextiles
ASTM D 4716 (2004)	Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
ASTM D 4751 (2004)	Determining Apparent Opening Size of a Geotextile
ASTM D 4759 (2002)	Determining the Specification Conformance of Geosynthetics
ASTM D 4833 (2000e1)	Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873 (2002)	Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D 5035 (2006)	Breaking Force and Elongation of Textile Fabrics (Strip Method)
ASTM D 5199 (2001; R 2006)	Measuring Nominal Thickness of Geosynthetics
ASTM D 5261 (1992; R 2003)	Measuring Mass Per Unit Area of Geotextiles

ASTM D 5262 (2007)	Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
ASTM D 5321 (2002)	Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D 5397 (2007)	Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D 5596 (2003)	Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D 5721 (1995; R 2002)	Air-Oven Aging of Polyolefin Geomembranes
ASTM D 5885 (2006)	Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
ASTM D 5994 (1998; R 2003)	Measuring Core Thickness of Textured Geomembrane
ASTM D 6497 (2002)	Mechanical Attachment of Geomembrane to Penetrations or Structures
ASTM D 792 (2000)	Density and Specific Gravity (Relative Density) of Plastics by Displacement
GSI GRI GC7 (1997)	Determination of Adhesion and Bond Strength of Geocomposites
GSI GRI GM7 (1995)	Accelerated Curing of Geomembrane Test Strip Seams Made by Chemical Fusion Methods
GSI GRI GM9 (1995)	Cold Weather Seaming of Geomembranes
GSI GRI GM11 (1997)	Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device

4.0 SUBMITTALS

A. Shop Drawings

1. Geomembrane panel layout and penetration detail drawings.

B. As-Built Drawings

1. Final as-built drawings of geomembrane installation.

C. Product Data

1. Tests, Inspections, and Verifications – Manufacturer's and fabricator's QC manuals.

2. Field Seaming – Installer's QC manual.

3. Qualifications

   a. Manufacturer's, and fabricator's qualification statements, including resumes of key personnel involved in the project.

   b. Installer's, QC inspector's, and QC laboratory's qualification statements including resumes of key personnel involved in the project.

   c. The submittal from the QC laboratory shall include verification that the laboratory is accredited via the Geosynthetic Accreditation Institute's Laboratory Accreditation Program (GAI-LAP) for the tests the QC laboratory will be required to perform.

4. Samples – Geomembrane QA and QC samples.

5. Test Reports

   a. Materials – Manufacturer's certified raw and sheet material test reports and a copy of the QC certificates.

   b. Surface Preparation – Certification from the QC inspector and installer of the acceptability of the surface on which the geomembrane is to be placed, immediately prior to geomembrane placement.

   c. Non-Destructive Field Seam Continuity Testing – QC inspector certified test results on all field seams.

   d. Destructive Field Seam Testing – Installer and certified QC laboratory test results on all destructively tested field seams.

   e. Destructive Seam Test Repairs – QC inspector certified test results on all repaired seams.

   f. Interface Friction Testing - Certified laboratory interface friction test results including description of equipment and test method.

   g. Tests – Certified QC test results.

5.0 QUALIFICATIONS

A. Manufacturer – Manufacturer shall have produced the proposed geomembrane sheets for at least 5 completed projects and a minimum total area of 10 million square feet.

B. Fabricator – The fabricator is responsible for seaming geomembrane sheets into panels. Fabricator shall have fabricated the proposed geomembrane panels for at least 5 completed projects and a total area of 2 million square feet.

C. Installer – The installer is responsible for field handling, deploying, seaming, anchoring, and field Quality Control (QC) testing of the geomembrane. The installer shall have installed the proposed geomembrane material for at least 5 completed projects, for a minimum total area of 2 million square feet. At least one seamer shall have experience seaming a minimum of 500,000 square feet of the proposed geomembrane using the same type of seaming equipment and geomembrane thickness specified for this project.

D. QC Technician – The QC inspector is the person or corporation hired by the Owner, who is responsible for monitoring and documenting activities related to the QC of the geomembrane from manufacturing through installation. The QC inspector shall have provided QC inspection during installation of the proposed geomembrane material for at least 5 completed projects having a total minimum area of 2 million square feet.

E. QC Laboratory – The QC laboratory shall have provided QC and/or Quality Assurance (QA) testing of the proposed geomembrane and geomembrane seams for at least five completed projects having a total minimum area of 2 million square feet. The QC laboratory shall be accredited via the Geosynthetic Accreditation Institute's Laboratory Accreditation Program (GAI-LAP) for the tests the QC laboratory will be required to perform.

6.0 MATERIALS

A. Geocomposite

1. Geocomposite Manufacturer's Quality Control

a. The geocomposite material to be used for lining the pond shall be a double sided geotextile-geonet geocomposite. The bottom geocomposite layer is to act as cushion and gas vent and the top one as a leak detection layer.

b. The polymer used to manufacture the geonet core of the geocomposite shall be polyethylene which is clean and free of any foreign contaminants.

c. Regrind material, which consists of edge trimmings and other scraps, may be used to manufacture the geonet; however, post consumer recycled material shall not be used.

d. The drainage core of the geocomposite shall be manufactured by extruding three sets of polyethylene strands to form a triaxial void maintaining structure consisting of a thick vertical rib with diagonally placed top and bottom ribs. The geonet shall meet the property requirements listed in Table 1.

e. The geotextile of the geocomposite shall be high UV resistant, continuous filament which is a needle punched, nonwoven polypropylene geotextile. The strength retained after 500 hours of UV exposure shall be at least 95% per ASTM G154. The filter and cushioning properties of the geotextile shall meet the property requirements listed in Tables 2 and 3.

2. Geonet Material Properties.

The Geonet Layer shall conform to the following material properties:

Table 1: Required Geocomposite Material Properties

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE ROLL VALUE[d]		
Geocomposite			**6 oz/yd²**	**8 oz/yd²**	**10 oz/yd²**
Product Code			F420600605	F420800805	F421001005
Transmissivity[a], gal/min/ft (m²/sec)	ASTM D 4716-00	1/540,000 ft²	0.48 (1 x 10^{-4})	0.48 (1 x 10^{-4})	0.43 (9 x 10^{-5})
Ply Adhesion, lb/in (g/cm)	GRI GC-7	1/50,000 ft²	1.0 (178)	1.0 (178)	1.0 (178)
Roll Width, ft (m)			14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
Roll Length, ft (m)			230 (70.1)	200 (60.9)	190 (58.0)
Roll Area, ft² (m²)			3,335 (310)	2,900 (269)	2,755 (256)
Geonet core[b]					
Transmissivity,[a] gal/min/ft (m²/sec)	ASTM D 4716-00		9.66 (2 x 10^{-3})	9.66 (2 x 10^{-3})	9.66 (2 x 10^{-3})
Thickness, mil (mm)	ASTM D 5199	1/50,000 ft²	200 (5)	200 (5)	200 (5)
Density, g/cm³	ASTM D 1505	1/50,000 ft²	0.94	0.94	0.94
Tensile Strength (MD), lb/in (N/mm)	ASTM D 5035	1/50,000 ft²	45 (7.9)	45 (7.9)	45 (7.9)
Carbon Black Content, %	ASTM D 1603	1/50,000 ft²	2.0	2.0	2.0
Geotextile (prior to lamination)[b,c]					
Mass per Unit Area, oz/yd² (g/m²)	ASTM D 5261	1/90,000 ft²	6 (200)	8 (270)	10 (335)
Grab Tensile, lb (N)	ASTM D 4632	1/90,000 ft²	170 (755)	220 (975)	260 (1,155)
Puncture Strength, lb (N)	ASTM D 4833	1/90,000 ft²	90 (395)	120 (525)	165 (725)
AOS, US sieve (mm)	ASTM D 4751	1/540,000 ft²	70 (0.212)	80 (0.180)	100 (0.150)
Permittivity, (sec⁻¹)	ASTM D 4491	1/540,000 ft²	1.5	1.5	1.2
Flow Rate, gpm/ft² (lpm/m²)	ASTM D 4491	1/540,000 ft²	110 (4,480)	110 (4,480)	85 (3,460)
UV Resistance, % retained	ASTM D 4355 (after 500 hours)	once per formulation	70	70	70

NOTES:

- [a] Gradient of 0.1, normal load of 10,000 psf, water at 70 degrees F between steel plates for 15 minutes..
- [b] Component properties prior to lamination.
- [c] Several geotextiles are available and and may be supplied bu GSE or other approved equivalent.
- [d] These are MARV values that are based on the cumulative results of specimens tested and determined by GSE. AOS in mm is maximum average roll value.

Table 2: Required Filter Geotextile Properties

Property	Test method	Units	Value
Color	Black		
Serviceability Class	Class 1		
AOS (MARV)	ASTM D 4751	US Sieve (mm)	80 (.18)
Permittivity (MARV)	ASTM D4491	sec^{-1}	0.5
Grab Tensile Strength (MARV)	ASTM D4632	lbs	202
Trapezoidal Tear (MARV)	ASTM D4533	lbs	79
Puncture Strength (MARV)	ASTM D4833	lbs	79
CBR Puncture Strength (MARV)	ASTM D6241	lbs	449
UV Resistance @ 500 Hours (MIN)	ASTM G154	%	95

Table 3: Required Friction Geotextile Properties

Property	Test method	Units	Value
Color	Black		
Serviceability Class	Class 1		
Grab Tensile Strength (MARV)	ASTM D4632	lbs	202
Trapezoidal Tear (MARV)	ASTM D4533	lbs	79
Puncture Strength (MARV)	ASTM D4833	lbs	79
CBR Puncture Strength (MARV)	ASTM D6241	lbs	449
UV Resistance @ 500 Hours (MIN)	ASTM G154	%	95

NOTES

- These values are typical data and are not intended as limiting specifications.
- All cut edges where the scrim is exposed must be sealed using PE welding rod.

Table 4: Required Friction Geotextile Properties

PROPERTIES	TEST METHOD	J30BB		J36BB		J45BB	
		Min. Roll Averages	Typical Roll Averages	Min. Roll Averages	Typical Roll Averages	Min. Roll Averages	Typical Roll 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 (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 (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
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 105 lbf DD
1" Tensile Elongation @ Break % (Film Break)	ASTM D 7003	550 MD 550 DD	750 MD 750 DD	550 MD 550 DD	750 MD 750 DD	550 MD 550 DD	750 MD 750 DD
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 20 DD	36 MD 36 DD
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 172 lbf DD	160 lbf MD 160 lbf DD	193 lbf MD 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	65 lbf	83 lbf	80 lbf	99 lbf
Maximum Use Temperature		180° F	180° F	180° F	180° F	180° F	180° F
Minimum Use Temperature		-70° F	-70° F	-70° F	-70° F	-70° F	-70° F

Note: Minimum Roll Averages are set to take into account product variability in addition to testing variability between laboratories.
MD stands for machine Direction and DD for Diagonal Direction.

B. Geomembranes (24 mil Primary and 36 mil Secondary RPE)

1. Geosynthetics Manufacturer's Quality Control

a. The geomembrane liner shall be a four layer reinforced laminate containing no adhesives.

b. The outer layers of the RPE shall consist of a high strength polyethylene film and shall be resistant to ultraviolet rays in exposed applications.

c. The manufacturer of the liner shall take random samples of the liner material from each fabricated roll during manufacturing. Samples shall be tested by methods specified within this Section, or applicable ASTM standards, for thickness, strength, tear resistance, low temperature impact density and dimensional stability. Each roll of material shall be clearly identified and correlated to the test results provided.

d. The geomembrane manufacturer shall confirm in writing, that the geosynthetics to be furnished will be free of defects in materials and workmanship at the time of sale, and against deterioration due to the effects of ozone, ultraviolet or other normal weathering on a pro-rata basis. The geomembrane manufacturer shall furnish a sample warranty during the submittal process for review and approval prior to shipment. In addition, the manufacturer shall provide a minimum warranty against material failure of 15 years in case of the 24 mil RPE and for a minimum of 20 years for the 36 mil RPE.

2. RPE Material Properties

The material provided as Reinforced Polyethylene (RPE) liner shall conform to the following standards or approved equivalent:

7.0 INSTALLATION

A. Geocomposite

1. Prior to deployment of the geocomposite, the geosynthetics contractor shall inspect, certify, and accept, the subgrade on which the liner is to be placed to ensure conformance with the specifications. Surfaces not in compliance with the specifications shall be rectified by the earthwork Contractor.

2. The geocomposite layer shall be handled in such a manner as to ensure that it is not damaged in any way. On slopes, the material shall be anchored in the anchor trench and then rolled down the slope in such a manner as to continually keep the material under tension.

3. In the presence of wind, the leading edge of the material shall be weighted with sandbags or ballasts until the final cover is placed.

4. Care shall be taken to assure that any underlying layers are not damaged during placement. Low ground pressure machines such as ATVs are recommended to facilitate deployment over the geosynthetic layers. Low ground pressure machines shall be used when carrying a driver weighing approximately 150 lbs.

5. The bottom geocomposite layer is to act as cushion and gas vent and the top one as a leak detection layer. The bottom layer is to be placed along the slope of the bottom of the pit so it conforms to the shape of the pit bottom or as directed by the field engineer.

B. Geomembrane (Primary and Secondary RPE)

1. Prior to deployment of geomembrane, the geosynthetics contractor shall inspect, certify and accept, all surfaces on which the liner is to be placed to ensure conformance with the specifications. Surfaces not in compliance with the specifications shall be rectified by the geosynthetics contractor.

2. The amount of geomembrane liner deployed without final quality control and final repairs being completed shall not exceed 100,000 square feet. In addition, no seams shall be left unwelded and no openings in the liner shall be left at the end of a shift unless approved by the field engineer. The liner shall be placed over the prepared surface using methods and procedures that ensure a minimum of handling. The geosynthetics contractor shall provide adequate temporary anchoring devices to prevent damage due to wind.

3. Handling and storage of liner material shall be in accordance with the manufacturer`s printed instructions. All persons walking or working on the geomembrane shall wear soft-sole shoes.

4. The liner shall be installed in a relaxed condition and shall be free of tension or stress upon completion of the installation. All necessary precautions, including provisions for installing extra material, shall be taken to avoid trampolining of liner which will remain exposed (i.e., pad, pond corners and solution channels).

5. Horizontal field seams on slopes should be kept to a minimum. Seams shall be made by lapping the uphill material over the downhill material with sufficient overlap. A minimum of five feet is to be allowed from the toe of the slope to any horizontal seam on flat areas.

6. Installation shall be performed under the direction of a superintendent who has installed a minimum of 10,000,000 square feet of HDPE or LLDPE flexible lining material. The superintendent shall be provided by the geosynthetics contractor and shall be in charge of the installation.

7. Extreme care shall be taken by the geosynthetics contractor in the preparation of the areas to be welded. The area to be welded shall be cleaned and prepared according to approved procedures, and all sheeting shall be welded together by thermal methods.

8.0 FIELD SEAM INSPECTION AND TESTING

A. Geocomposite

1. Each component of the geocomposite (geotextile(s) and geonet) shall be secured or seamed to the like component at overlaps.

2. Adjacent edges of geonet along the length of the geocomposite, shall be overlapped 2-3 inches or as approved by the Engineer based on the site specific conditions, placed with the edges of each geonet butted against each other. These overlaps shall be joined by tying the geonet cores together with white or yellow cable ties or plastic fasteners. These ties shall be spaced at a maximum of every 10 feet along the roll length.

B. Geomembrane (Primary and Secondary RPE)

1. A maximum effort shall be made to install a perfect liner. This means that all seams completed in the field patches, and extrusions shall be inspected, tested, and recorded.

2. The welding equipment used shall be capable of continuously monitoring and controlling the temperatures in the zone of contact where the machine is actually fusing the lining material in order to ensure that the integrity of the weld is not affected by changes in weather conditions.

3. No "fish mouth" shall be allowed within the seam area. Where "fish mouths" occur, the material shall be cut, overlapped, and extrusion welded. Welds on completion of the work shall be tightly bonded. Any membrane area showing distress due to excessive scuffing or puncture from any cause shall be replaced or repaired.

4. The geosynthetics contractor shall take into account that rapid weather changes are very possible, resulting in delays in construction of field seams. Joining of panels and repairs will only be permitted under weather conditions allowing such work within the warranty limits imposed by the manufacturer.

5. A quality-control technician shall inspect each seam, marking his initials and the date inspected at the end of each panel. Any area showing a defect shall be marked and repaired in accordance with approved repair procedures.

6. The field installation testing program shall consist of periodic visual observations, continuity, and strength tests. These inspections and tests are to be made routinely and are automatic regardless of other types of testing required. The program shall include:

a. Visual Observations

- To perform visual check field seams for squeeze out, footprint, melt and overlap.
- Machines to be checked for cleanliness.
- Any area of the seam or panel showing a defect shall be marked and repaired in accordance with the applicable repair procedures.

b. Non Destructive Testing

A 48 inch (1.2 m) sample should be taken from each factory seam welding unit used in this work at the beginning of every work shift an every four hours of production thereafter. Samples shall be nondestructive, not requiring patching of fabricated panels. Test specimens shall be cut at quarter points from each 48 inch seam sample (a total of three places) and tested for seam strength and peel adhesion. The shear seam strength shall be tested in accordance with ASTM D751 modified method and peel adhesion will be tested in accordance with ASTM D413, Machine Method, Type A. A log shall be maintained showing the date, time, panel number and test results. Failure of the material and/or seams to meet all the requirements of these specifications may be cause for rejection of the RPE material and/or seams as appropriate. The fabricator shall provide the test results to the owner or engineer upon request. The results of the leak test shall be marked at the location and shall be recorded by the geosynthetics contractor. If the test fails, the location of the leak shall be found and repaired or the entire seam shall be repaired and retested.

c. Strength Testing

1. For trial welds, the following procedure is to be used:

- Trial welds shall be completed under the same conditions and using the same materials, pre-seaming, and seaming techniques as used to fabricate field seams. The trial weld samples shall be a minimum of 3 feet long by 1 foot wide, marked with the date, technician's name, ambient temperature, and welding machine number and temperature. Coupons from the test weld shall be tested for peel and bonded seam strength using a calibrated tensiometer, as well as thickness, in accordance either the applicable ASTM or NSF 54 standards as appropriate. If failing results occur, the welding machine shall be repaired or replaced and retested.

- The minimum frequency for obtaining trial weld samples from each of the welding machines in operation is the following:
    - Prior to the beginning of seaming operations.
    - After every four hours of seaming operations.
    - After repairs have been made to seaming equipment.
    - By each technician using the seaming equipment.
    - As required by the Owner.

d. Destructive Testing

1. For destructive testing of field seams the following procedure is to be used:

- Destructive samples may be obtained from field seams or repaired areas by cutting perpendicular to the seams. The sample should be approximately 2 feet long by 1 foot wide. This sample shall be cut into two samples of 1 foot by 1 foot and labeled with the welder's identification, date, and location. One of the samples will be retained by the Owner and one of the samples will be tested by the Geosynthetics Contractor, using a calibrated tensiometer, in accordance with the applicable ASTM or NSF 54 standards as appropriate.

- The frequency for obtaining destructive test samples shall not be less than one sample per 750 feet of field seam. Coupons from the destructive sample shall be tested for peel and bonded strength as well as thickness, in accordance with the applicable ASTM standards. If one or more of the coupons fails, the sample will be considered a failure. As far a practicable, samples should be taken from above the water level in the pond or from the anchor trench to minimize repair within the water bearing surface.

- In the event of a failing test result, additional samples, on either side of the failure, shall be tested to isolate the portion of the seam which needs to be repaired, and the failed portion of the weld shall be "capped". Alternatively, the entire seam can be rewelded and retested.

END OF SECTION 02530

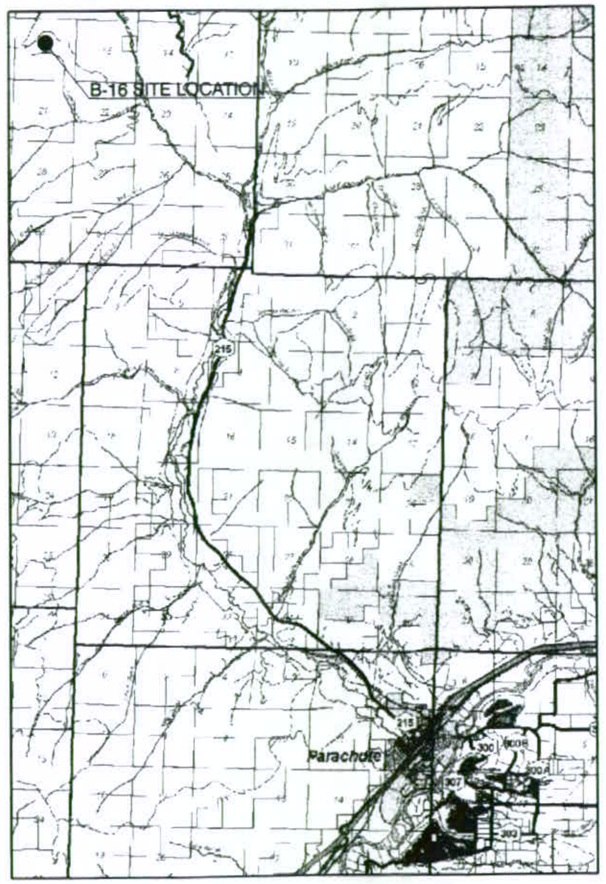
ConocoPhillips
B-16 PRODUCED WATER PIT RE-DESIGN
CIVIL CONSTRUCTION PLANS

A PORTION OF
SECTION 16, T5S, R96W, 6TH P.M., NW 1/4 NE 1/4

GENERAL SPECIFICATION NOTES:

1. THE CONTRACTOR SHALL HAVE AT LEAST ONE (1) SIGNED COPY OF THE PLANS & SPECIFICATIONS ON THE JOB SITE AT ALL TIMES.
2. THE COORDINATE SYSTEM AND THE TOPOGRAPHY SHOWN ON PLANS ARE PER "UINTAH ENGINEERING AND LAND SURVEYING." SURVEY OF JANUARY 17, 2008.
3. ALL ELEVATIONS AND SLOPES SHOWN ON THE SAMUEL ENGINEERING INC. PLANS ARE TO TOP OF FINISHED GRADE (F.G. OR P.G.) AT THE SURFACE COURSE. ALL CUT SLOPES ARE 3:2 AND ALL FILL SLOPES ARE 2:1 UNLESS NOTED OTHERWISE.
4. THE CONTRACTOR SHALL NOTIFY THE "UTILITY NOTIFICATION CENTER OF COLORADO," AT 811, 1-800-922-1897 OR WWW.UNCC2.ORG. FOR CURRENT UTILITY LOCATION INFORMATION AT LEAST 72 HOURS PRIOR TO BEGINNING ANY EXCAVATION.
5. DURING THE CONSTRUCTION THE CONTRACTOR SHALL MAINTAIN A DUST CONTROL PROGRAM WHICH SHALL INCLUDE WATERING OF ALL DISTURBED AREAS.
6. ALL STORM SEWER (STS) PIPE AND FITTINGS SHALL BE CORRUGATED METAL PIPE (CMP), GALVANIZED, AND OF 26 GAGE STEEL.
7. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AND PROVIDE THE REQUIRED EROSION CONTROL MEASURES AT THE PROJECT SITE AT ALL TIMES.
8. EXCAVATION SHALL BE AS NEARLY VERTICAL AS POSSIBLE. SHEET AND SHORE IF SOIL CONDITIONS REQUIRE
9. NO CONCRETE SHALL BE PLACED UNTIL THE SUBGRADE IS INSPECTED BY THE ENGINEER.
10. ALL BURIED STRUCTURES, PIPES AND ALL APPROVED MATERIAL SUBSTITUTIONS SHALL BE CAPABLE OF A MINIMUM OF HS-20-44 LOADING.
11. IF OBSTRUCTION SUCH AS INLETS, UTILITY POLES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED THE LOCATIONS OF WATER OR SEWER ROUTES MAY BE ADJUSTED UPON APPROVAL OF THE ENGINEER.
12. VERTICAL CLEARANCE BETWEEN WATER LINES AND ALL OTHER EXISTING OR PROPOSED SANITARY OR STORM SEWERS, GAS, TELEPHONE, TV AND ANY OTHER LINES SHALL BE 18."
13. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI
14. NO DISTURBANCE OF EXISTING CONDITIONS SHALL OCCUR WITHIN 15 FEET OF PROPERTY BOUNDARY

CIVIL SHEET INDEX:



LOCATION MAP
N.T.S.

ABBREVIATIONS:

BOP........ BOTTOM OF POND
BOT........ BOTTOM OF TRENCH
DIA........ DIAMETER
PROP....... PROPOSED
DTL........ DETAIL
EG......... EXISTING GRADE
ELV........ ELEVATION
EXIST...... EXISTING FEATURE
FG......... FINISHED GRADE
FL......... FLOWLINE
GCL........ GEOSYNTHETIC CLAY LAYER
GDL........ GEOSYNTHETIC DRAINAGE LAYER
HDPE....... HIGH DENSITY POLYETHYLENE
HP......... HIGH POINT
IE......... INVERT ELEVATION
LF......... LINEAL FEET
LP......... LOW POINT
PROP....... PROPOSED
PT......... POINT OF TANGENCY
PG......... PROFILE GRADE
PL......... PROPERTY LINE
R.......... RADIUS
REF........ REFERENCE INFORMATION
RPE........ RIENFORCED POLYETHYLENE
SHT........ SHEET
TOP........ TOP OF PIT
TYP........ TYPICAL FEATURE OR DESCRIPTION
WS......... WATER SURFACE

LEGEND:

EXIST. CONTOUR LINE
PROP. CONTOUR LINE
PROPOSED FENCE LINE
PROP. ELEVATION
DIVERSION DITCH
EXIST. WELLS

REFERENCE DRAWINGS	
DWG NO.	DESCRIPTION

REVISIONS			
NO.	DESCRIPTION	DATE	BY
0	ISSUED FOR CONSTRUCTION	10/06/08	MAS

COLORADO REGISTERED PROFESSIONAL ENGINEER 39396 10-07-08

SCALE	N.T.S.	DATE
DESIGNED	M. SKELSKEY	10/06/08
DRAWN	E. TRUJILLO	10/06/08
CHECKED		
APPROVED		
APPROVED		

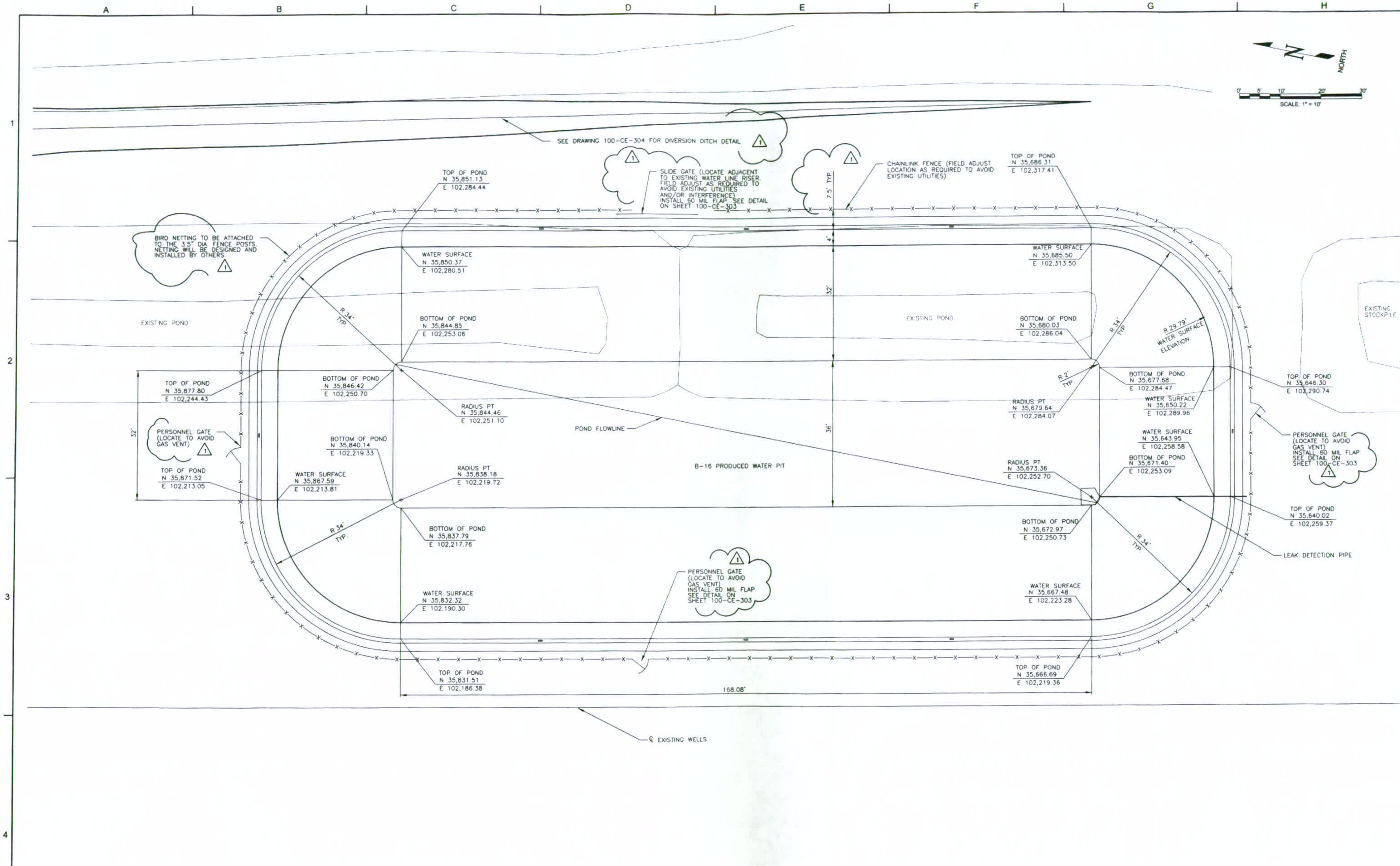
CLIENT ConocoPhillips
LOCATION Parachute, CO

ConocoPhillips

Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE
B-16 PRODUCED WATER PIT RE-DESIGN
COVER SHEET W/DRAWING INDEX, NOTES & LEGEND

PROJECT NO. 8053
DRAWING NUMBER 100-CE-001
REV 0



DWG NO	DESCRIPTION
REFERENCE DRAWINGS	

NO.	DESCRIPTION	DATE	BY
1	REVISED / ISSUED FOR CONSTRUCTION ADDED GATES AND DIVERSION DITCH	10/06/08	MAS
0	ISSUED FOR CONSTRUCTION	09/29/08	MCL
REVISIONS			

COLORADO REGISTERED PROFESSIONAL ENGINEER 39396 10-07-08

		DATE
SCALE	1"-10'	
DESIGNED	M. LAMBERT	9/24/08
DRAWN	E. TRUJILLO	9/24/08
CHECKED	M. SKELSKEY	10/06/08
APPROVED		
APPROVED		

CLIENT: ConocoPhillips
LOCATION: Parachute, CO

ConocoPhillips

SE Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE: B-16 PRODUCED WATER PIT RE-DESIGN HORIZONTAL CONTROL PLAN

PROJECT NO. **8053**

DRAWING NUMBER: 100-CE-102 REV 1

I:\Civil\Drawings\100-CE-102.dgn 10/8/2008 4:21:51 PM

NORTH

0' 5' 10' 20' 30'
SCALE: 1" = 10'

SEE DRAWING 100-CE-304 FOR DIVERSION DITCH DETAIL

TOP 8336.60
WS 8334.60

8335
8330
8325
8320

BOP 8320.60

FL 8319.27

B16 PRODUCED WATER PIT

BOP 8317.94
LP/FL 8317.94

A 302

B 302

℄ EXISTING WELLS

REFERENCE DRAWINGS

NO.	DESCRIPTION	DATE	BY
1	REVISED ISSUED FOR CONSTRUCTION		
0	ISSUED FOR CONSTRUCTION	09/29/08	MCL

REVISIONS

COLORADO REGISTERED PROFESSIONAL ENGINEER 39396 10-07-08

SCALE:	1"-10'	DATE
DESIGNED:	M. LAMBERT	9/24/08
DRAWN:	E. TRUJILLO	9/24/08
CHECKED:	M. SKELSKEY	10/06/08
APPROVED:		
APPROVED:		

CLIENT: ConocoPhillips
LOCATION: Parachute, CO

ConocoPhillips

Samuel Engineering, Inc.
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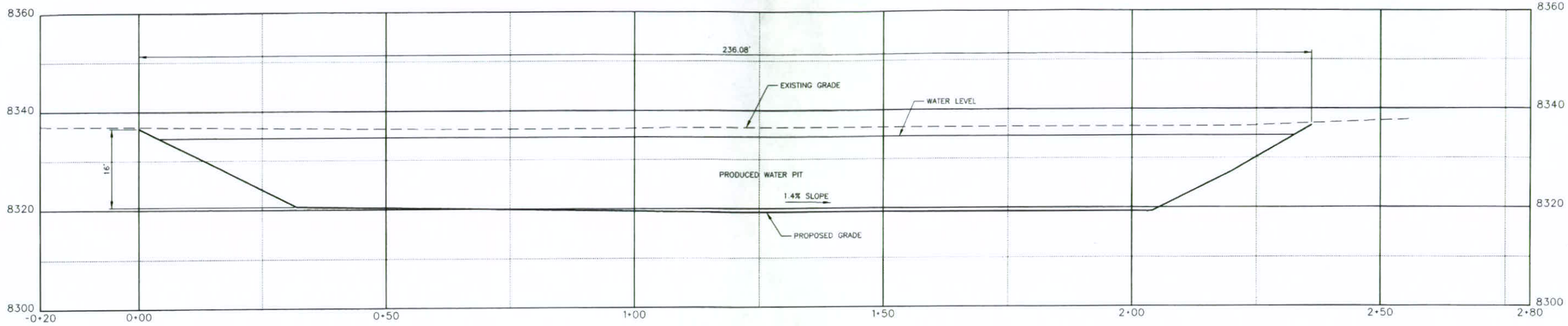
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE

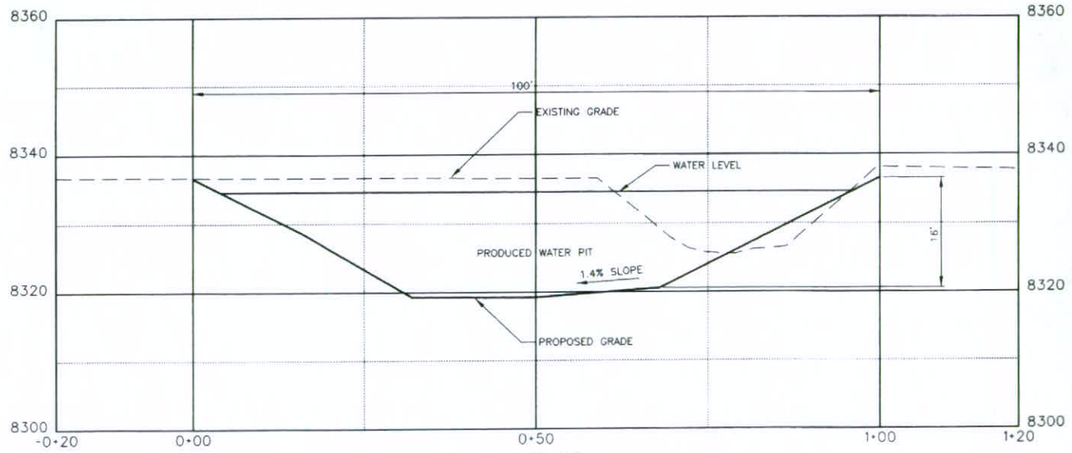
B-16 PRODUCED WATER PIT RE-DESIGN
GRADING PLAN

PROJECT NO.
8053

DRAWING NUMBER
100-CE-301
REV. 1



SECTION "A-A"



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DWG NO.	DESCRIPTION
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NO.	DESCRIPTION	DATE	BY
REVISIONS			

NO.	DESCRIPTION	DATE	BY
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REVISIONS			

COLORADO REGISTERED MARK A. SAMUEL 39396 PROFESSIONAL ENGINEER 9-07-08

SCALE	1"=10'	DATE
DESIGNED	M. LAMBERT	9/29/08
DRAWN	E. TRUJILLO	9/29/08
CHECKED		
APPROVED		
APPROVED		

CLIENT ConocoPhillips

ConocoPhillips

LOCATION Parachute, CO

Samuel Engineering, Inc.
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Phone: 303.714.4840
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TITLE

B-16 PRODUCED WATER PIT RE-DESIGN
SECTIONS AND DETAILS, SHEET 1 OF 2

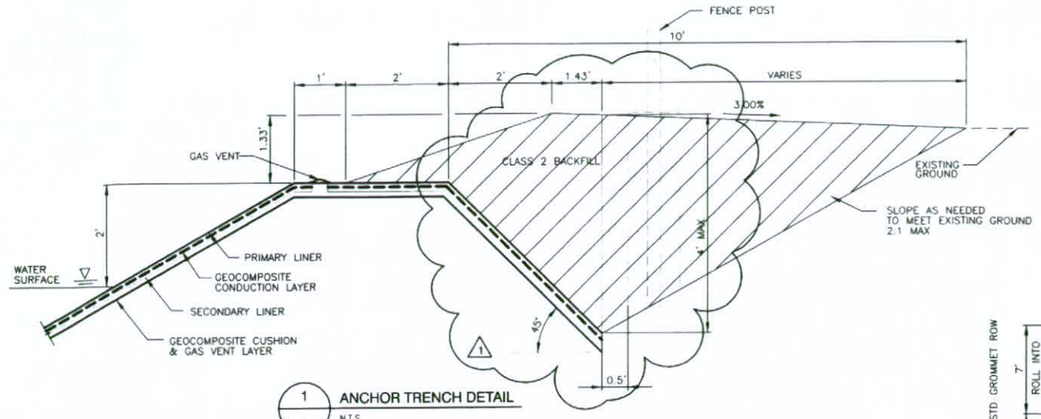
PROJECT NO.

8053

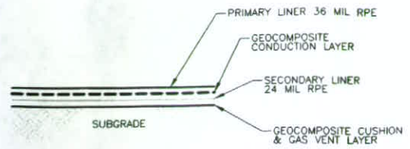
DRAWING NUMBER

100-CE-302

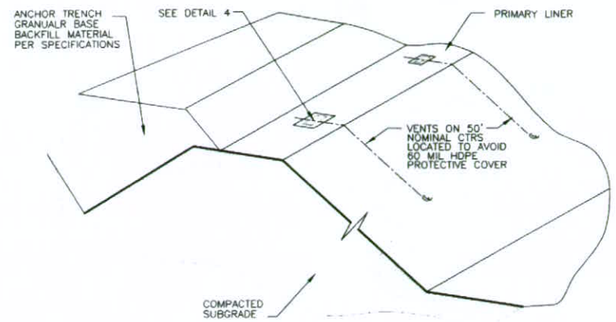
REV 0



1 ANCHOR TRENCH DETAIL
N.T.S.



2 TYPICAL POND LINING SYSTEM DETAIL
NTS



3 GAS VENT LOCATION DETAIL
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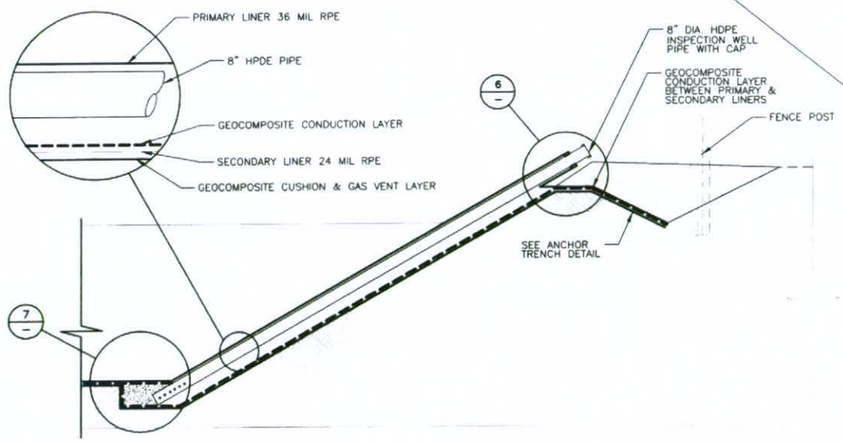
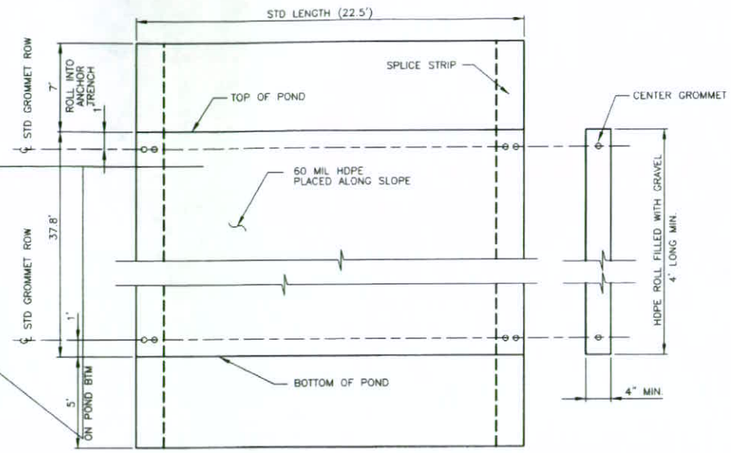
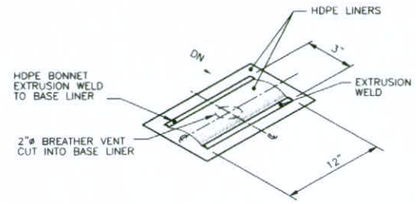




NOTE: 3 REQUIRED (LOCATE AS REQUIRED TO AVOID GAS VENT AND PROTECT POND DURING ACCESS)

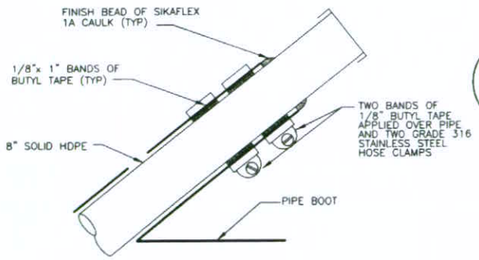
8 60 MIL FLAP (LINER PROTECTION)
N.T.S.



4 AIR/GAS VENT DETAIL
N.T.S.

5 LEAK DETECTION WELL DETAIL WITH PIPE RESTING ON SLOPE GRADE
N.T.S.

NOTE: POND BOTTOM TO BE SLOPED TOWARDS SUMP PIT. SEE GRADING PLAN FOR ELEVATIONS.



6 PIPE BOOT SEALING DETAIL
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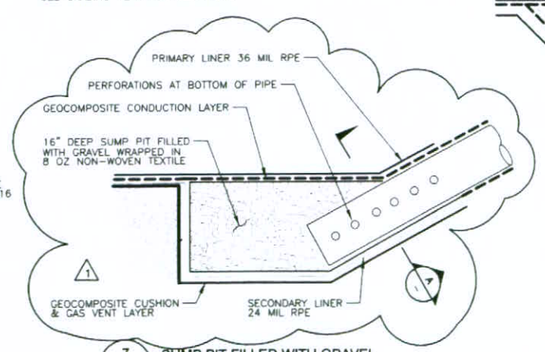

7 SUMP PIT FILLED WITH GRAVEL
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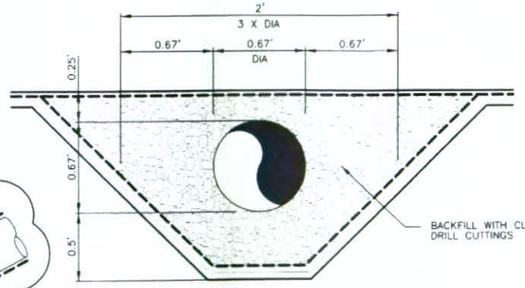

A SECTION
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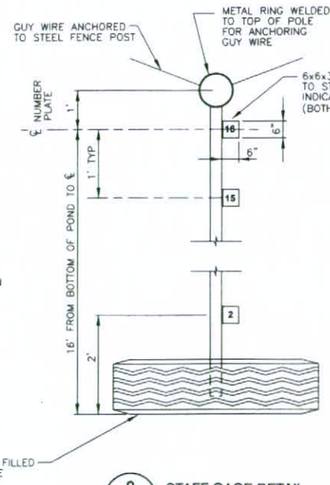
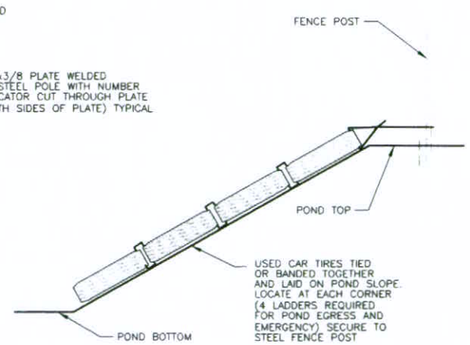


9 STAFF GAGE DETAIL
N.T.S.



10 TIRE LADDER
N.T.S.

NO	DESCRIPTION	DATE	BY
1	REVISED ISSUED FOR CONSTRUCTION	10/06/08	MAS
0	ISSUED FOR CONSTRUCTION	9/29/08	MCL

REVISIONS

REFERENCE DRAWINGS

COLORADO REGISTERED MARK A. SKELSKEY 39396 10-07-08 PROFESSIONAL ENGINEER

		DATE
SCALE	1"=1'	
DESIGNED	M. LAMBERT	09/28/08
DRAWN	E. TRUJILLO	09/28/08
CHECKED	M. SKELSKEY	10/06/08
APPROVED		
APPROVED		

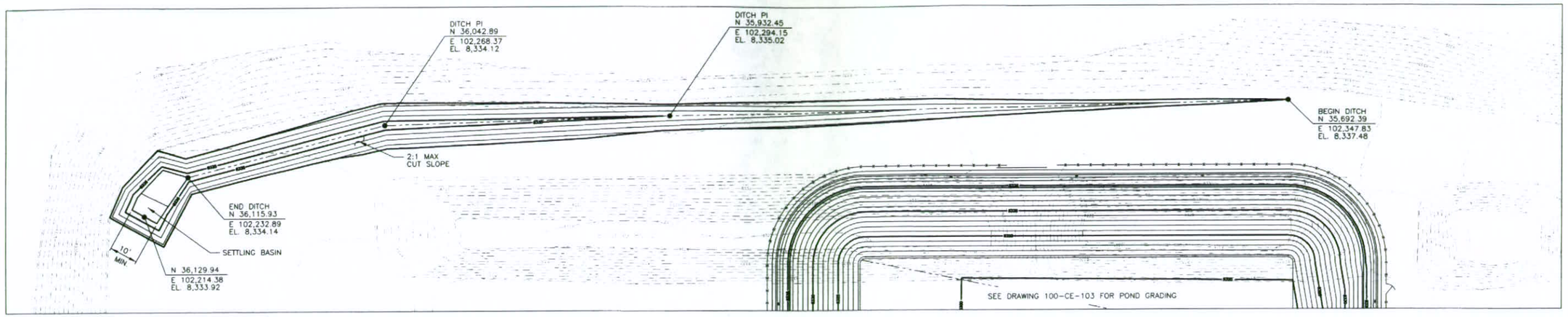
CLIENT ConocoPhillips
LOCATION Parachute, CO

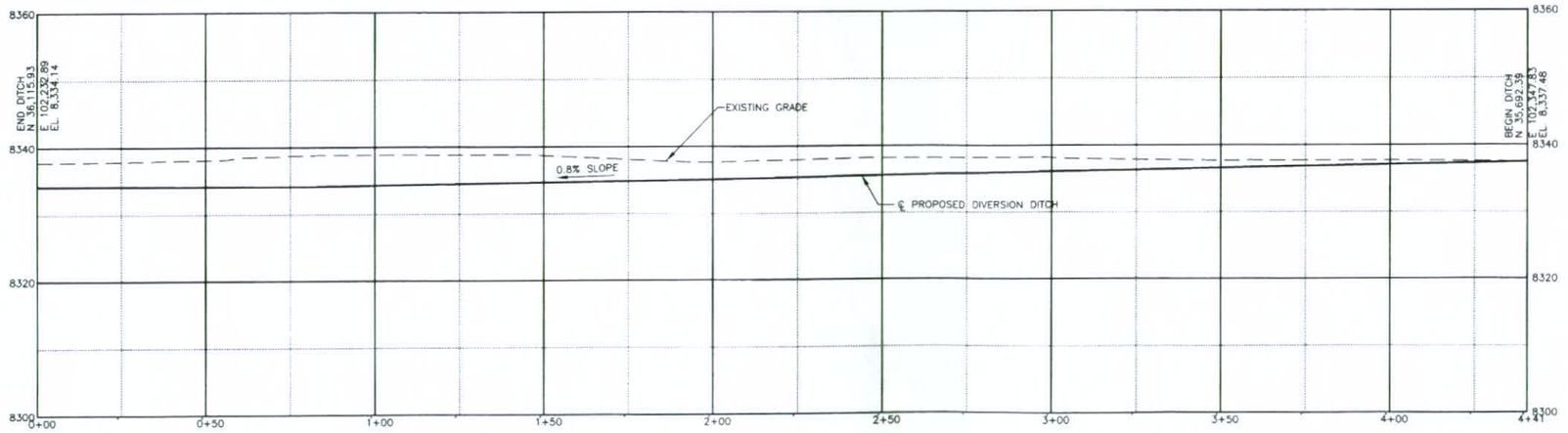
Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE: B-16 PRODUCED WATER PIT RE-DESIGN SECTIONS AND DETAILS

PROJECT NO. 8053

DRAWING NUMBER 100-CE-303 REV 1





DIVERSION DITCH PLAN

DIVERSION DITCH PROFILE

DWG NO.	DESCRIPTION

REFERENCE DRAWINGS

NO.	DESCRIPTION	DATE	BY	CLIENT	PROJECT MANAGER	PROJECT ENGINEER	CHECK

REVISIONS

NO.	DESCRIPTION	DATE	BY
0	ISSUED FOR CONSTRUCTION	10/06/08	MAS

REVISIONS

COLORADO REGISTERED PROFESSIONAL ENGINEER
MARK A. SKELSKEY
36396
10-07-08

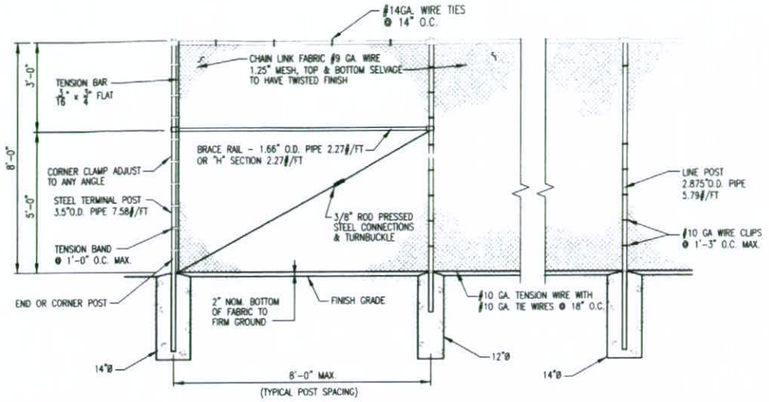
		DATE
SCALE	1"-20'	
DESIGNED	M. LAMBERT	10/02/08
DRAWN	E. CURTIS	10/03/08
CHECKED	M. SKELSKEY	10/06/08
APPROVED		
APPROVED		

CLIENT ConocoPhillips
LOCATION Parachute, CO

Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

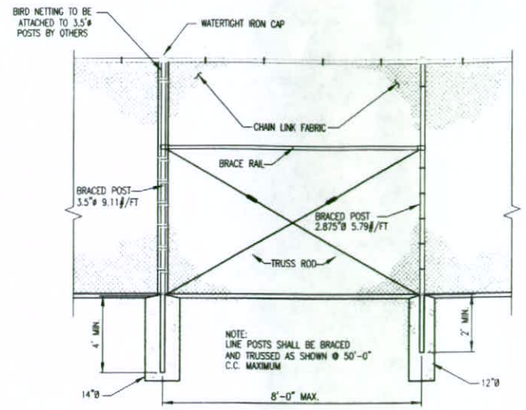
TITLE
B-16 PRODUCED WATER PIT RE-DESIGN
DIVERSION DITCH PLAN & PROFILE

PROJECT NO.
8053
DRAWING NUMBER
100-CE-304
REV 0



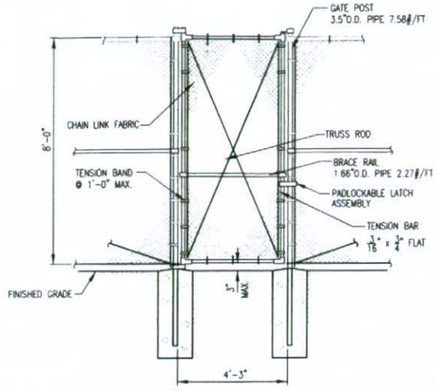
ELEVATION - CHAIN LINK FENCE

1 DETAIL 1"=1'-0"



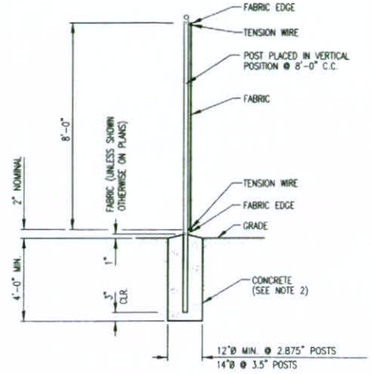
ELEVATION AT BRACED POST

2 DETAIL 1"=1'-0"



ELEVATION - PERSONNEL GATE

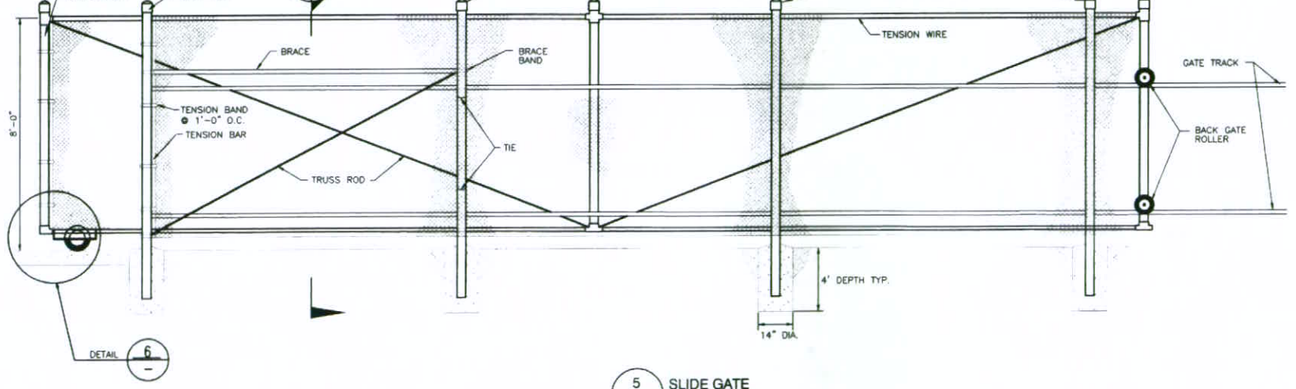
3 DETAIL 1"=1'-0"



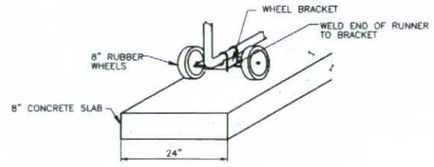
FENCE SECTION

4 DETAIL 1"=1'-0"

A SECTION N.T.S.



5 SLIDE GATE N.T.S.



6 ROLLER ASSEMBLY DETAIL N.T.S.

NOTES:

1. FENCING SHALL BE FABRICATED, FURNISHED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION NO. 02520.
2. CONCRETE FOR FENCE POST FOUNDATIONS AND ROLLER PAD SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI; 1" MAX. AGGREGATE SIZE, 3" MAXIMUM SLUMP AND 2-4% ENTRAINED AIR.
3. LOCATION OF FENCE, GATES, GATE WIDTH AND DIRECTION OF SLIDE SHALL BE AS SHOWN ON THE DESIGN DRAWINGS. ALL DIMENSIONS EXCEPT GATE WIDTH SHALL BE CENTER TO CENTER OF POSTS.

DWG NO.	DESCRIPTION
REFERENCE DRAWINGS	

NO.	DESCRIPTION	DATE	BY
0	ISSUED FOR CONSTRUCTION		
REVISIONS			

COLORADO REGISTERED PROFESSIONAL ENGINEER — 39396

SCALE:	1"=1'	DATE
DESIGNED:	M. LAMBERT	10/06/08
DRAWN:	E. TRUJILLO	10/06/08
CHECKED:	M. SKELSKEY	10/06/08
APPROVED:		
APPROVED:		

CLIENT: ConocoPhillips
LOCATION: Parachute, CO

Samuel Engineering, Inc.
We Provide Solutions
8450 E. CRESCENT PARKWAY
GREENWOOD VILLAGE, CO 80111
Phone: 303.714.4840
Fax: 303.714.4800

TITLE: B-16 PRODUCED WATER PIT RE-DESIGN
TYPICAL FENCING AND WILDLIFE ACCESS CONTROL MEASURE DETAILS

PROJECT NO. 8053

DRAWING NUMBER 100-CE-305 REV 0

Established Wells

API number	Operator Name	Well Name/ COGCC Facility ID	Status	facility_t	facility_s	COGCC operator Number	well_num	well_name	qtrqtr	sec	twp	range	Ute Prime Meridian	Latitude	Longitude	Elevation	utm_x	utm_y	field_name	api_seq_nu	api_county
05-045-15495	CONOCO PHILLIPS COMPANY	CP01B-27 M23 49 SGU	LO_XX	WELL	XX	19160	CP01B-27 M23 49	SGU	SWSW	23	4S	96W	6	39.68131	-108.142769	8043	230466	4397109	WILDCAT	15495	45
05-045-15496	CONOCO PHILLIPS COMPANY	CP11D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP11D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68133	-108.142781	8043	230465	4397112	WILDCAT	15496	45
05-045-15497	CONOCO PHILLIPS COMPANY	CP12D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP12D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68136	-108.142792	8042	230464	4397115	WILDCAT	15497	45
05-045-15498	CONOCO PHILLIPS COMPANY	CP13D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP13D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68128	-108.142758	8043	230467	4397106	WILDCAT	15498	45
05-045-13537	CONOCO PHILLIPS COMPANY	CP12D-16 E16 5 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-16 E16 5	N. PARACHUTE	SWNW	16	5S	96W	6	39.61639	-108.183228	8382	226740	4390025	WILDCAT	13537	45
05-045-11544	CONOCO PHILLIPS COMPANY	CP11D 04 K04596 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D 04 K04596	N. PARACHUTE	NESW	4	5S	96W	6	39.64285	-108.17494	8204	227555	4392937	WILDCAT	11544	45
05-045-12977	CONOCO PHILLIPS COMPANY	CP02D-08 G08 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-08 G08 59	N. PARACHUTE	SWNE	8	5S	96W	6	39.6306	-108.191956	7684	226046	4391629	WILDCAT	12977	45
05-045-12976	CONOCO PHILLIPS COMPANY	CP07C08 G08 596 N.PARACHUTE	LO_XX	WELL	XX	19160	CP07C08 G08 596	N.PARACHUTE	SWNE	8	5S	96W	6	39.6306	-108.191919	7684	226050	4391628	WILDCAT	12976	45
05-045-12975	CONOCO PHILLIPS COMPANY	CP08D-08 G08 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP08D-08 G08 59	N.PARACHUTE	SWNE	8	5S	96W	6	39.63064	-108.191817	7685	226059	4391633	WILDCAT	12975	45
05-045-12974	CONOCO PHILLIPS COMPANY	CP12A-08G08 596 N.PARACHUTE	LO_XX	WELL	XX	19160	CP12A-08G08 596	N.PARACHUTE	SWNE	8	5S	96W	6	39.63064	-108.191958	7685	226046	4391633	WILDCAT	12974	45
05-045-12973	CONOCO PHILLIPS COMPANY	CP14A-08G08 596 N.PARACHUTE	LO_XX	WELL	XX	19160	CP14A-08G08 596	N.PARACHUTE	SWNE	8	5S	96W	6	39.63064	-108.191922	7685	226049	4391633	WILDCAT	12973	45
05-045-13007	CONOCO PHILLIPS COMPANY	CP14A-09 G09 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14A-09 G09 59	N. PARACHUTE	SWNE	9	5S	96W	6	39.63225	-108.17375	7645	227616	4391757	WILDCAT	13007	45
05-045-13003	CONOCO PHILLIPS COMPANY	CP01D-03 A03599 N.PARACHUTE	LO_XX	WELL	XX	19160	CP01D-03 A03599	N.PARACHUTE	NENE	3	5S	96W	6	39.64777	-108.148	8334	229887	4393402	WILDCAT	13003	45
05-045-13002	CONOCO PHILLIPS COMPANY	CP02B03A03596 N.PARACHUTE	LO_XX	WELL	XX	19160	CP02B03A03596	N.PARACHUTE	NENE	3	5S	96W	6	39.64779	-108.14798	8333	229888	4393404	WILDCAT	13002	45
05-045-13006	CONOCO PHILLIPS COMPANY	CP07B-09 G09 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07B-09 G09 59	N. PARACHUTE	SWNE	9	5S	96W	6	39.63225	-108.173717	7643	227619	4391757	WILDCAT	13006	45
05-045-13004	CONOCO PHILLIPS COMPANY	CP02D-09 G09 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-09 G09 59	N. PARACHUTE	SWNE	9	5S	96W	6	39.63225	-108.17378	7644	227613	4391757	WILDCAT	13004	45
05-045-13005	CONOCO PHILLIPS COMPANY	CP12A-09 G09 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12A-09 G09 59	N. PARACHUTE	SWNE	9	5S	96W	6	39.63219	-108.17378	7645	227613	4391750	WILDCAT	13005	45
05-045-13025	CONOCO PHILLIPS COMPANY	CP04C-02 A03 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP04C-02 A03 59	N. PARACHUTE	NENE	3	5S	96W	6	39.64794	-108.147825	8331	229902	4393420	WILDCAT	13025	45
05-045-13024	CONOCO PHILLIPS COMPANY	CP08D-03 A03 59 N. Parachute	LO_XX	WELL	XX	19160	CP08D-03 A03 59	N. Parachute	NENE	3	5S	96W	6	39.6479	-108.147864	8335	229899	4393415	WILDCAT	13024	45
05-045-14280	CONOCO PHILLIPS COMPANY	CP 13B-16 E16 5 N.PARACHUTE	LO_XX	WELL	XX	19160	CP 13B-16 E16 5	N.PARACHUTE	SWNW	16	5S	96W	6	39.61633	-108.18324	8382	226738	4390018	WILDCAT	14280	45
05-045-14293	CONOCO PHILLIPS COMPANY	CPO1D-8 G08 596 N.PARACHUTE	LO_XX	WELL	XX	19160	CPO1D-8 G08 596	N.PARACHUTE	SWNE	8	5S	96W	6	39.6306	-108.19188	7677	226053	4391629	WILDCAT	14293	45
05-045-14336	CONOCO PHILLIPS COMPANY	CP11D-8 G08 596 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-8 G08 596	N. PARACHUTE	SWNE	8	5S	96W	6	39.63059	-108.19199	7677	226043	4391628	WILDCAT	14336	45
05-045-14367	CONOCO PHILLIPS COMPANY	CP11A-06-E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP11A-06-E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64563	-108.21403	8339	224211	4393365	WILDCAT	14367	45
05-045-14366	CONOCO PHILLIPS COMPANY	CP08A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64996	-108.185331	8402	226691	4393758	WILDCAT	14366	45
05-045-14407	CONOCO PHILLIPS COMPANY	CPO2A-03 A03 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CPO2A-03 A03 59	N.PARACHUTE	NENE	3	5S	96W	6	39.64791	-108.14784	8331	229901	4393417	WILDCAT	14407	45
05-045-14505	CONOCO PHILLIPS COMPANY	CP07D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP07D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64568	-108.214	8339	224214	4393371	WILDCAT	14505	45
05-045-14504	CONOCO PHILLIPS COMPANY	CP04D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP04D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64566	-108.21401	8339	224213	4393368	WILDCAT	14504	45
05-045-14503	CONOCO PHILLIPS COMPANY	CP05D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP05D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64561	-108.21404	8339	224210	4393363	WILDCAT	14503	45
05-045-14519	CONOCO PHILLIPS COMPANY	CP 11D-35 G35 4 SGU	LO_XX	WELL	XX	19160	CP 11D-35 G35 4	SGU	SWNE	35	4S	96W	6	39.65969	-108.133903	8182	231143	4394683	WILDCAT	14519	45
05-045-14529	CONOCO PHILLIPS COMPANY	CP08A-35 G35 49 SGU	LO_XX	WELL	XX	19160	CP08A-35 G35 49	SGU	SWNE	35	4S	96W	6	39.65974	-108.133942	8184	231139	4394688	WILDCAT	14529	45
05-045-14528	CONOCO PHILLIPS COMPANY	CP07C-35 G35 49 SGU	LO_XX	WELL	XX	19160	CP07C-35 G35 49	SGU	SWNE	35	4S	96W	6	39.65972	-108.133922	8183	231141	4394686	WILDCAT	14528	45
05-045-14530	CONOCO PHILLIPS COMPANY	CP12B-36 G35 49 SGU	LO_XX	WELL	XX	19160	CP12B-36 G35 49	SGU	SWNE	35	4S	96W	6	39.65967	-108.133881	8180	231144	4394681	WILDCAT	14530	45
05-045-14531	CONOCO PHILLIPS COMPANY	CP01A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64995	-108.185384	8402	226687	4393757	WILDCAT	14531	45
05-045-14532	CONOCO PHILLIPS COMPANY	CP11A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64994	-108.185397	8403	226686	4393756	WILDCAT	14532	45
05-045-14533	CONOCO PHILLIPS COMPANY	CP07A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64993	-108.185331	8402	226691	4393755	WILDCAT	14533	45
05-045-14545	CONOCO PHILLIPS COMPANY	CP01B-04 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-04 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64549	-108.165164	8273	228405	4393201	WILDCAT	14545	45
05-045-14544	CONOCO PHILLIPS COMPANY	CP12D-03 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-03 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64541	-108.165192	8272	228402	4393192	WILDCAT	14544	45
05-045-14543	CONOCO PHILLIPS COMPANY	CP05B-03 04 596 N. PARACHUTE	LO_XX	WELL	XX	19160	CP05B-03 04 596	N. PARACHUTE	SENE	4	5S	96W	6	39.64544	-108.165181	8273	228403	4393195	WILDCAT	14543	45
05-045-14542	CONOCO PHILLIPS COMPANY	CP08D-04 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08D-04 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64547	-108.165172	8273	228404	4393198	WILDCAT	14542	45
05-045-14534	CONOCO PHILLIPS COMPANY	CP11D-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP11D-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65361	-108.161931	8373	228714	4394092	WILDCAT	14534	45
05-045-14698	CONOCO PHILLIPS COMPANY	CP14D-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP14D-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65349	-108.178397	8410	227300	4394129	WILDCAT	14698	45
05-045-14700	CONOCO PHILLIPS COMPANY	CP08D-32 M33 49 DWU	LO_XX	WELL	XX	19160	CP08D-32 M33 49	DWU	SWSW	33	4S	96W	6	39.65354	-108.178378	8410	227302	4394134	WILDCAT	14700	45
05-045-14699	CONOCO PHILLIPS COMPANY	CP11D-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP11D-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65357	-108.178367	8410	227303	4394137	WILDCAT	14699	45
05-045-14701	CONOCO PHILLIPS COMPANY	CP13B-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP13B-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65352	-108.178389	8410	227301	4394132	WILDCAT	14701	45
05-045-14702	CONOCO PHILLIPS COMPANY	CP14D-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP14D-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65358	-108.161931	8374	228714	4394088	WILDCAT	14702	45
05-045-14703	CONOCO PHILLIPS COMPANY	CP12B-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP12B-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65366	-108.161936	8374	228714	4394098	WILDCAT	14703	45
05-045-14704	CONOCO PHILLIPS COMPANY	CP13B-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP13B-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65363	-108.161933	8374	228714	4394095	WILDCAT	14704	45
05-045-14807	CONOCO PHILLIPS COMPANY	CP02B-18 N07 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02B-18 N07 59	N. PARACHUTE	LOT 4	7	5S	96W	6	39.62309	-108.213081	8120	224203	4390860	WILDCAT	14807	45
05-045-14818	CONOCO PHILLIPS COMPANY	CP07C-07 N07 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07C-07 N07 59	N. PARACHUTE	LOT 4	7	5S	96W	6	39.62312	-108.213061	8119	224205	4390863	WILDCAT	14818	45
05-045-14817	CONOCO PHILLIPS COMPANY	CP14D-07 N07 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-07 N07 59	N. PARACHUTE	LOT 4	7	5S	96W	6	39.62314	-108.213044	8118	224207	4390865	WILDCAT	14817	45
05-045-14979	CONOCO PHILLIPS COMPANY	CP01B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62088	-108.172239	8345	227701	4390490	WILDCAT	14979	45
05-045-14980	CONOCO PHILLIPS COMPANY	CP08B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62093	-108.172253	8344	227700	4390496	WILDCAT	14980	45
05-045-14981	CONOCO PHILLIPS COMPANY	CP02B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62096	-108.172258	8344	227700	4390499	WILDCAT	14981	45
05-045-14982	CONOCO PHILLIPS COMPANY	CP07D-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07D-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62091	-108.172244	8345	227701	4390493	WILDCAT	14982	45
05-045-14987	CONOCO PHILLIPS COMPANY	CP13A-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP13A-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68628	-108.162075	8085	228829	4397719	WILDCAT	14987	45
05-045-14988	CONOCO PHILLIPS COMPANY	CP14D-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP14D-22 L22 49	SGU	NWSW	22	4S	96W	6	39.6863	-108.162061	8085	228831	4397722	WILDCAT	14988	45
05-045-14989	CONOCO PHILLIPS COMPANY	CP11D-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP11D-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68633	-108.162044	8085	228832	4397724	WILDCAT	14989	45
05-045-14990	CONOCO PHILLIPS COMPANY	CP12A-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP12A-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68635	-108.162031	8085	228833	4397727	WILDCAT	14990	45
05-045-15030	CONOCO PHILLIPS COMPANY	CP07C-27 L27 49 SGU	LO_XX	WELL	XX	19160	CP07C-27 L27 49	SGU	NWSW	27	4S	96W	6	39.67174	-108.159783	8109	228969	4396098	WILDCAT	15030	45
05-045-15031	CONOCO PHILLIPS COMPANY	CP 13D-27 L27 4 SGU	LO_XX	WELL	XX	19160	CP 13D-27 L27 4	SGU	NWSW	27	4S	96W	6	39.67169	-108.159803	8110	228967	4396092	WILDCAT	15031	45
05-045-15032	CONOCO PHILLIPS COMPANY	CP11D-27 L27 49 SGU	LO_XX	WELL	XX	19160	CP11D-27 L27 49	SGU	NWSW	27	4S	96W	6	39.67171	-108.159792	8109	228968	4396095	WILDCAT	15032	45
05-045-15092	CONOCO PHILLIPS COMPANY	CP08B-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP08B-33 E34 49	DWU	SWNW	34	4S	96W	6	39.66023	-108.160558	8325	228858	4394822	WILDCAT	15092	45
05-045-15093	CONOCO PHILLIPS COMPANY	CP07D-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP07D-33 E34 49	DWU	SWNW	34	4S	96W	6	39.6602	-108.160561	8326	228857	4394819	WILDCAT	15093	45
05-045-15094	CONOCO PHILLIPS COMPANY	CP01B-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP01B-33 E34 49	DWU	SWNW	34	4S	96W	6	39.66028	-108.160544	8325	228859	4394828	WILDCAT	15094	45
05-045-15095	CONOCO PHILLIPS COMPANY	CP02D-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP02D-33 E34 49	DWU	SWNW	34	4S	96W	6	39.66025	-108.16055	8325	228858	4394825	WILDCAT	15095	45
05-045-15162	CONOCO PHILLIPS COMPANY	CP14B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60249	-108.172489	7972	227607	4388449	WILDCAT	15162	45
05-045-15163	CONOCO PHILLIPS COMPANY	CP01B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60252	-108.172553	7972	227602	4388452	WILDCAT	15163	45
05-045-15164	CONOCO PHILLIPS COMPANY	CP07B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60253	-108.172583	7972	227599	4388453	WILDCAT	15164	45
05-045-15165	CONOCO PHILLIPS COMPANY	CP 11B-21 G21 5 N. PARACHUTE	LO_XX	WELL	XX	19160	CP 11B-21 G21 5	N. PARACHUTE	SWNE	21	5S	96W	6	39.6025	-108.172519	7972	227605	4388450	WILDCAT	15165	45
05-045-15320	CONOCO PHILLIPS COMPANY	CP11D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58667	-108.152747	8108	229241	4386633	WILDCAT	15320	45

05-045-15321	CONOCO PHILLIPS COMPANY	CP08D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58669	-108.152722	8108	229243	4386635	WILDCAT	15321	45
05-045-15322	CONOCO PHILLIPS COMPANY	CP07D-27 G27 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP07D-27 G27 59	N.PARACHUTE	SWNE	27	5S	96W	6	39.58673	-108.152667	8108	229248	4386639	WILDCAT	15322	45
05-045-15323	CONOCO PHILLIPS COMPANY	CP02D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58671	-108.152694	8108	229246	4386637	WILDCAT	15323	45
05-045-15324	CONOCO PHILLIPS COMPANY	CP04D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP04D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67817	-108.211681	8039	224542	4396970	WILDCAT	15324	45
05-045-15325	CONOCO PHILLIPS COMPANY	CP03D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP03D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67823	-108.211747	8037	224537	4396977	WILDCAT	15325	45
05-045-15326	CONOCO PHILLIPS COMPANY	CP06D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP06D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67819	-108.211703	8039	224540	4396973	WILDCAT	15326	45
05-045-15327	CONOCO PHILLIPS COMPANY	CP05D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP05D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67821	-108.211725	8038	224539	4396975	WILDCAT	15327	45
05-045-15377	CONOCO PHILLIPS COMPANY	CP02D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP02D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66063	-108.189064	8170	226413	4394953	WILDCAT	15377	45
05-045-15378	CONOCO PHILLIPS COMPANY	CP07D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP07D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66057	-108.189092	8170	226411	4394947	WILDCAT	15378	45
05-045-15379	CONOCO PHILLIPS COMPANY	CP11D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP11D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66055	-108.189106	8170	226409	4394945	WILDCAT	15379	45
05-045-15380	CONOCO PHILLIPS COMPANY	CP01D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP01D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.6606	-108.189078	8170	226412	4394951	WILDCAT	15380	45
05-045-15381	CONOCO PHILLIPS COMPANY	CP13B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP13B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.68228	-108.179186	7516	227346	4397327	WILDCAT	15381	45
05-045-15382	CONOCO PHILLIPS COMPANY	CP14B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP14B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.6823	-108.179169	7516	227348	4397330	WILDCAT	15382	45
05-045-15407	CONOCO PHILLIPS COMPANY	CP06B-29 C29 49 DWU	LO_XX	WELL	XX	19160	CP06B-29 C29 49	DWU	NENW	29	4S	96W	6	39.67984	-108.195389	7592	225946	4397106	WILDCAT	15407	45
05-045-15408	CONOCO PHILLIPS COMPANY	CP05B-29 C29 49 DWU	LO_XX	WELL	XX	19160	CP05B-29 C29 49	DWU	NENW	29	4S	96W	6	39.67987	-108.195369	7590	225948	4397109	WILDCAT	15408	45
05-045-15409	CONOCO PHILLIPS COMPANY	CP03B-29 C29 49 DWU	LO_XX	WELL	XX	19160	CP03B-29 C29 49	DWU	NENW	29	4S	96W	6	39.67989	-108.19535	7589	225950	4397111	WILDCAT	15409	45
05-045-15410	CONOCO PHILLIPS COMPANY	CP04B-29 C29 49 DWU	LO_XX	WELL	XX	19160	CP04B-29 C29 49	DWU	NENW	29	4S	96W	6	39.67991	-108.195331	7587	225952	4397114	WILDCAT	15410	45
05-045-15411	CONOCO PHILLIPS COMPANY	CP11B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP11B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.68233	-108.17915	7515	227349	4397332	WILDCAT	15411	45
05-045-15534	CONOCO PHILLIPS COMPANY	CP12D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60957	-108.208867	8471	224511	4389346	WILDCAT	15534	45
05-045-15535	CONOCO PHILLIPS COMPANY	CP13D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60954	-108.208881	8471	224510	4389343	WILDCAT	15535	45
05-045-15536	CONOCO PHILLIPS COMPANY	CP12D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61225	-108.194831	8296	225727	4389600	WILDCAT	15536	45
05-045-15537	CONOCO PHILLIPS COMPANY	CP11D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61228	-108.194769	8295	225733	4389603	WILDCAT	15537	45
05-045-15538	CONOCO PHILLIPS COMPANY	CP11D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60959	-108.208856	8471	224512	4389348	WILDCAT	15538	45
05-045-15539	CONOCO PHILLIPS COMPANY	CP13D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61224	-108.194861	8295	225724	4389599	WILDCAT	15539	45
05-045-15608	CONOCO PHILLIPS COMPANY	CP02D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP02D-34H34 496	SGU	SENE	34	4S	96W	6	39.65946	-108.145994	8291	230104	4394693	WILDCAT	15608	45
05-045-15605	CONOCO PHILLIPS COMPANY	CP01D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP01D-34H34 496	SGU	SENE	34	4S	96W	6	39.65948	-108.145983	8290	230105	4394696	WILDCAT	15605	45
05-045-15606	CONOCO PHILLIPS COMPANY	CP08D-34 H34 49 SGU	LO_XX	WELL	XX	19160	CP08D-34 H34 49	SGU	SENE	34	4S	96W	6	39.65943	-108.146003	8291	230103	4394690	WILDCAT	15606	45
05-045-15607	CONOCO PHILLIPS COMPANY	CP07D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP07D-34H34 496	SGU	SENE	34	4S	96W	6	39.6594	-108.146014	8291	230102	4394687	WILDCAT	15607	45
05-045-15624	CONOCO PHILLIPS COMPANY	CP02D-33 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-33 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58175	-108.175333	8286	227282	4386155	WILDCAT	15624	45
05-045-15625	CONOCO PHILLIPS COMPANY	CP14B-28 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14B-28 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.5817	-108.175364	8286	227279	4386150	WILDCAT	15625	45
05-045-15626	CONOCO PHILLIPS COMPANY	CP13B-28 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13B-28 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58173	-108.17535	8285	227280	4386153	WILDCAT	15626	45
05-045-15627	CONOCO PHILLIPS COMPANY	CP03B-33 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP03B-33 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58168	-108.175381	8285	227277	4386148	WILDCAT	15627	45
05-045-15798	CONOCO PHILLIPS COMPANY	CP14D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60951	-108.208894	8472	224509	4389340	WILDCAT	15798	45
05-045-15811	CONOCO PHILLIPS COMPANY	CP14D-17 D17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-17 D17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61226	-108.1948	8295	225730	4389602	WILDCAT	15811	45

Permitted Wells

API number	Operator Name	Well Name/ COGCC Facility ID	Status	facility_t	facility_s	COGCC operator Number	well_num	well_name	qtrqtr	sec	twp	range	Ute Prime Meridian	Latitude	Longitude	Elevation	utm_x	utm_y	field_name	api_seq_nu	api_county	Permit Type	Expiration Date
05-045-15495	CONOCO PHILLIPS COMPANY	CP01B-27 M23 49 SGU	LO_XX	WELL	XX	19160	CP01B-27 M23 49	SGU	SWSW	23	4S	96W	6	39.68131	-108.142769	8043	230466	4397109	WILDCAT	15495	45	DR	2/11/2009
05-045-15496	CONOCO PHILLIPS COMPANY	CP11D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP11D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68133	-108.142781	8043	230465	4397112	WILDCAT	15496	45	DR	2/11/2009
05-045-15497	CONOCO PHILLIPS COMPANY	CP12D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP12D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68136	-108.142792	8042	230464	4397115	WILDCAT	15497	45	DR	2/11/2009
05-045-15498	CONOCO PHILLIPS COMPANY	CP13D-23 M23 49 SGU	LO_XX	WELL	XX	19160	CP13D-23 M23 49	SGU	SWSW	23	4S	96W	6	39.68128	-108.142758	8043	230467	4397106	WILDCAT	15498	45	DR	2/11/2009
05-045-15537	CONOCO PHILLIPS COMPANY	CP12D-16 E16 5 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-16 E16 5	N. PARACHUTE	SWNW	16	5S	96W	6	39.61639	-108.183228	8382	226740	4390025	WILDCAT	13537	45	DR	8/23/2008
05-045-13025	CONOCO PHILLIPS COMPANY	CP04C-02 A03 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP04C-02 A03 59	N. PARACHUTE	NENE	3	5S	96W	6	39.64794	-108.147825	8331	229902	4393420	WILDCAT	13025	45	RC	12/19/2008
05-045-14336	CONOCO PHILLIPS COMPANY	CP11D-8 G08 596 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-8 G08 596	N. PARACHUTE	SWNE	8	5S	96W	6	39.63059	-108.19199	7677	226043	4391628	WILDCAT	14336	45	DR	7/9/2008
05-045-14367	CONOCO PHILLIPS COMPANY	CP11A-06-E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP11A-06-E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64563	-108.21403	8339	224211	4393365	WILDCAT	14367	45	DR	7/12/2008
05-045-14366	CONOCO PHILLIPS COMPANY	CP08A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64996	-108.185331	8402	226691	4393758	WILDCAT	14366	45	DR	7/12/2008
05-045-14407	CONOCO PHILLIPS COMPANY	CPO2A-03 A03 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CPO2A-03 A03 59	N.PARACHUTE	NENE	3	5S	96W	6	39.64791	-108.14784	8331	229901	4393417	WILDCAT	14407	45	DR	7/22/2008
05-045-14505	CONOCO PHILLIPS COMPANY	CP07D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP07D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64568	-108.214	8339	224214	4393371	WILDCAT	14505	45	DR	8/2/2008
05-045-14504	CONOCO PHILLIPS COMPANY	CP04D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP04D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64566	-108.21401	8339	224213	4393368	WILDCAT	14504	45	DR	8/2/2008
05-045-14503	CONOCO PHILLIPS COMPANY	CP05D-06 E06 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP05D-06 E06 59	N.PARACHUTE	SWNW	6	5S	96W	6	39.64561	-108.21404	8339	224210	4393363	WILDCAT	14503	45	DR	8/2/2008
05-045-14519	CONOCO PHILLIPS COMPANY	CP 11D-35 G35 4 SGU	LO_XX	WELL	XX	19160	CP 11D-35 G35 4	SGU	SWNE	35	4S	96W	6	39.65969	-108.133903	8182	231143	4394683	WILDCAT	14519	45	DR	8/7/2008
05-045-14529	CONOCO PHILLIPS COMPANY	CP08A-35 G35 49 SGU	LO_XX	WELL	XX	19160	CP08A-35 G35 49	SGU	SWNE	35	4S	96W	6	39.65974	-108.133942	8184	231139	4394688	WILDCAT	14529	45	DR	8/7/2008
05-045-14528	CONOCO PHILLIPS COMPANY	CP07C-35 G35 49 SGU	LO_XX	WELL	XX	19160	CP07C-35 G35 49	SGU	SWNE	35	4S	96W	6	39.65972	-108.133922	8183	231141	4394686	WILDCAT	14528	45	DR	8/7/2008
05-045-14530	CONOCO PHILLIPS COMPANY	CP12B-36 G35 49 SGU	LO_XX	WELL	XX	19160	CP12B-36 G35 49	SGU	SWNE	35	4S	96W	6	39.65967	-108.133881	8180	231144	4394681	WILDCAT	14530	45	DR	8/8/2008
05-045-14531	CONOCO PHILLIPS COMPANY	CP01A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64995	-108.185384	8402	226687	4393757	WILDCAT	14531	45	DR	8/9/2008
05-045-14532	CONOCO PHILLIPS COMPANY	CP11A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64994	-108.185397	8403	226686	4393756	WILDCAT	14532	45	DR	8/9/2008
05-045-14533	CONOCO PHILLIPS COMPANY	CP07A-05 A05 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07A-05 A05 59	N. PARACHUTE	NENE	5	5S	96W	6	39.64993	-108.185331	8402	226691	4393755	WILDCAT	14533	45	DR	8/9/2008
05-045-14545	CONOCO PHILLIPS COMPANY	CP01B-04 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-04 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64549	-108.165164	8273	228405	4393201	WILDCAT	14545	45	DR	8/14/2008
05-045-14544	CONOCO PHILLIPS COMPANY	CP12D-03 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-03 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64541	-108.165192	8272	228402	4393192	WILDCAT	14544	45	DR	8/14/2008
05-045-14543	CONOCO PHILLIPS COMPANY	CP05B-03 04 596 N. PARACHUTE	LO_XX	WELL	XX	19160	CP05B-03 04 596	N. PARACHUTE	SENE	4	5S	96W	6	39.64544	-108.165181	8273	228403	4393195	WILDCAT	14543	45	DR	8/14/2008
05-045-14542	CONOCO PHILLIPS COMPANY	CP08D-04 H04 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08D-04 H04 59	N. PARACHUTE	SENE	4	5S	96W	6	39.64547	-108.165172	8273	228404	4393198	WILDCAT	14542	45	DR	8/14/2008
05-045-14534	CONOCO PHILLIPS COMPANY	CP11D-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP11D-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65361	-108.161931	8373	228714	4394092	WILDCAT	14534	45	DR	8/12/2008
05-045-14698	CONOCO PHILLIPS COMPANY	CP14D-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP14D-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65349	-108.178397	8410	227300	4394129	WILDCAT	14698	45	DR	9/19/2008
05-045-14700	CONOCO PHILLIPS COMPANY	CP08D-32 M33 49 DWU	LO_XX	WELL	XX	19160	CP08D-32 M33 49	DWU	SWSW	33	4S	96W	6	39.65354	-108.178378	8410	227302	4394134	WILDCAT	14700	45	DR	9/19/2008
05-045-14699	CONOCO PHILLIPS COMPANY	CP11D-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP11D-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65357	-108.178367	8410	227303	4394137	WILDCAT	14699	45	DR	9/19/2008
05-045-14701	CONOCO PHILLIPS COMPANY	CP13B-33 M33 49 DWU	LO_XX	WELL	XX	19160	CP13B-33 M33 49	DWU	SWSW	33	4S	96W	6	39.65352	-108.178389	8410	227301	4394132	WILDCAT	14701	45	DR	9/19/2008
05-045-14702	CONOCO PHILLIPS COMPANY	CP14D-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP14D-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65358	-108.161931	8374	228714	4394088	WILDCAT	14702	45	DR	9/19/2008
05-045-14703	CONOCO PHILLIPS COMPANY	CP12B-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP12B-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65366	-108.161936	8374	228714	4394098	WILDCAT	14703	45	DR	9/19/2008
05-045-14704	CONOCO PHILLIPS COMPANY	CP13B-34 M34 49 SGU	LO_XX	WELL	XX	19160	CP13B-34 M34 49	SGU	SWSW	34	4S	96W	6	39.65363	-108.161933	8374	228714	4394095	WILDCAT	14704	45	DR	9/19/2008
05-045-14807	CONOCO PHILLIPS COMPANY	CP02B-18 N07 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02B-18 N07 59	N. PARACHUTE	LOT 4	7	5S	96W	6	39.62309	-108.213081	8120	224203	4390860	WILDCAT	14807	45	DR	10/10/2008
05-045-14817	CONOCO PHILLIPS COMPANY	CP14D-07 N07 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-07 N07 59	N. PARACHUTE	LOT 4	7	5S	96W	6	39.62314	-108.213044	8118	224207	4390865	WILDCAT	14817	45	DR	10/11/2008
05-045-14979	CONOCO PHILLIPS COMPANY	CP01B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62088	-108.172239	8345	227701	4390490	WILDCAT	14979	45	DR	11/8/2008

05-045-14980	CONOCO PHILLIPS COMPANY	CP08B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62093	-108.172253	8344	227700	4390496	WILDCAT	14980	45	DR	11/8/2008
05-045-14981	CONOCO PHILLIPS COMPANY	CP02B-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02B-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62096	-108.172258	8344	227700	4390499	WILDCAT	14981	45	DR	11/8/2008
05-045-14982	CONOCO PHILLIPS COMPANY	CP07D-16 B16 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07D-16 B16 59	N. PARACHUTE	NWNE	16	5S	96W	6	39.62091	-108.172244	8345	227701	4390493	WILDCAT	14982	45	DR	11/11/2008
05-045-14987	CONOCO PHILLIPS COMPANY	CP13A-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP13A-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68628	-108.162075	8085	228829	4397719	WILDCAT	14987	45	DR	11/11/2008
05-045-14988	CONOCO PHILLIPS COMPANY	CP14D-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP14D-22 L22 49	SGU	NWSW	22	4S	96W	6	39.6863	-108.162061	8085	228831	4397722	WILDCAT	14988	45	DR	11/11/2008
05-045-14989	CONOCO PHILLIPS COMPANY	CP11D-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP11D-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68633	-108.162044	8085	228832	4397724	WILDCAT	14989	45	DR	11/11/2008
05-045-14990	CONOCO PHILLIPS COMPANY	CP12A-22 L22 49 SGU	LO_XX	WELL	XX	19160	CP12A-22 L22 49	SGU	NWSW	22	4S	96W	6	39.68635	-108.162031	8085	228833	4397727	WILDCAT	14990	45	DR	11/11/2008
05-045-15030	CONOCO PHILLIPS COMPANY	CP07C-27 L27 49 SGU	LO_XX	WELL	XX	19160	CP07C-27 L27 49	SGU	NWSW	27	4S	96W	6	39.67174	-108.159783	8109	228969	4396098	WILDCAT	15030	45	DR	11/14/2008
05-045-15031	CONOCO PHILLIPS COMPANY	CP 13D-27 L27 4 SGU	LO_XX	WELL	XX	19160	CP 13D-27 L27 4	SGU	NWSW	27	4S	96W	6	39.67169	-108.159803	8110	228967	4396092	WILDCAT	15031	45	DR	11/14/2008
05-045-15032	CONOCO PHILLIPS COMPANY	CP11D-27 L27 49 SGU	LO_XX	WELL	XX	19160	CP11D-27 L27 49	SGU	NWSW	27	4S	96W	6	39.67171	-108.159792	8109	228968	4396095	WILDCAT	15032	45	DR	11/14/2008
05-045-15092	CONOCO PHILLIPS COMPANY	CP08B-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP08B-33 E34 49	DWU	SWNW	34	4S	96W	6	39.66023	-108.160558	8325	228858	4394822	WILDCAT	15092	45	DR	11/25/2008
05-045-15093	CONOCO PHILLIPS COMPANY	CP07D-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP07D-33 E34 49	DWU	SWNW	34	4S	96W	6	39.6602	-108.160561	8326	228857	4394819	WILDCAT	15093	45	DR	11/25/2008
05-045-15094	CONOCO PHILLIPS COMPANY	CP01B-33 E34 49 DWU	LO_XX	WELL	XX	19160	CP01B-33 E34 49	DWU	SWNW	34	4S	96W	6	39.66028	-108.160544	8325	228859	4394828	WILDCAT	15094	45	DR	11/25/2008
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05-045-15162	CONOCO PHILLIPS COMPANY	CP14B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60249	-108.172489	7972	227607	4388449	WILDCAT	15162	45	DR	12/12/2008
05-045-15163	CONOCO PHILLIPS COMPANY	CP01B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP01B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60252	-108.172553	7972	227602	4388452	WILDCAT	15163	45	DR	12/12/2008
05-045-15164	CONOCO PHILLIPS COMPANY	CP07B-21 G21 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP07B-21 G21 59	N. PARACHUTE	SWNE	21	5S	96W	6	39.60253	-108.172583	7972	227599	4388453	WILDCAT	15164	45	DR	12/12/2008
05-045-15165	CONOCO PHILLIPS COMPANY	CP 11B-21 G21 5 N. PARACHUTE	LO_XX	WELL	XX	19160	CP 11B-21 G21 5	N. PARACHUTE	SWNE	21	5S	96W	6	39.6025	-108.172519	7972	227605	4388450	WILDCAT	15165	45	DR	12/12/2008
05-045-15320	CONOCO PHILLIPS COMPANY	CP11D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58667	-108.152747	8108	229241	4386633	WILDCAT	15320	45	DR	1/6/2009
05-045-15321	CONOCO PHILLIPS COMPANY	CP08D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP08D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58669	-108.152722	8108	229243	4386635	WILDCAT	15321	45	DR	1/6/2009
05-045-15322	CONOCO PHILLIPS COMPANY	CP07D-27 G27 59 N.PARACHUTE	LO_XX	WELL	XX	19160	CP07D-27 G27 59	N.PARACHUTE	SWNE	27	5S	96W	6	39.58673	-108.152667	8108	229248	4386639	WILDCAT	15322	45	DR	1/6/2009
05-045-15323	CONOCO PHILLIPS COMPANY	CP02D-27 G27 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-27 G27 59	N. PARACHUTE	SWNE	27	5S	96W	6	39.58671	-108.152694	8108	229246	4386637	WILDCAT	15323	45	DR	1/6/2009
05-045-15324	CONOCO PHILLIPS COMPANY	CP04D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP04D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67817	-108.211681	8039	224542	4396970	WILDCAT	15324	45	DR	1/6/2009
05-045-15325	CONOCO PHILLIPS COMPANY	CP03D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP03D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67823	-108.211747	8037	224537	4396977	WILDCAT	15325	45	DR	1/6/2009
05-045-15326	CONOCO PHILLIPS COMPANY	CP06D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP06D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67819	-108.211703	8039	224540	4396973	WILDCAT	15326	45	DR	1/6/2009
05-045-15327	CONOCO PHILLIPS COMPANY	CP05D-30 C30 49 DWU	LO_XX	WELL	XX	19160	CP05D-30 C30 49	DWU	NENW	30	4S	96W	6	39.67821	-108.211725	8038	224539	4396975	WILDCAT	15327	45	DR	1/6/2009
05-045-15377	CONOCO PHILLIPS COMPANY	CP02D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP02D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66063	-108.189064	8170	226413	4394953	WILDCAT	15377	45	DR	1/10/2009
05-045-15378	CONOCO PHILLIPS COMPANY	CP07D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP07D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66057	-108.189092	8170	226411	4394947	WILDCAT	15378	45	DR	1/10/2009
05-045-15379	CONOCO PHILLIPS COMPANY	CP11D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP11D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.66055	-108.189106	8170	226409	4394945	WILDCAT	15379	45	DR	1/10/2009
05-045-15380	CONOCO PHILLIPS COMPANY	CP01D-32 G32 49 DWU	LO_XX	WELL	XX	19160	CP01D-32 G32 49	DWU	SWNE	32	4S	96W	6	39.6606	-108.189078	8170	226412	4394951	WILDCAT	15380	45	DR	1/10/2009
05-045-15381	CONOCO PHILLIPS COMPANY	CP13B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP13B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.68228	-108.179186	7516	227346	4397327	WILDCAT	15381	45	DR	1/10/2009
05-045-15382	CONOCO PHILLIPS COMPANY	CP14B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP14B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.6823	-108.179169	7516	227348	4397330	WILDCAT	15382	45	DR	1/10/2009
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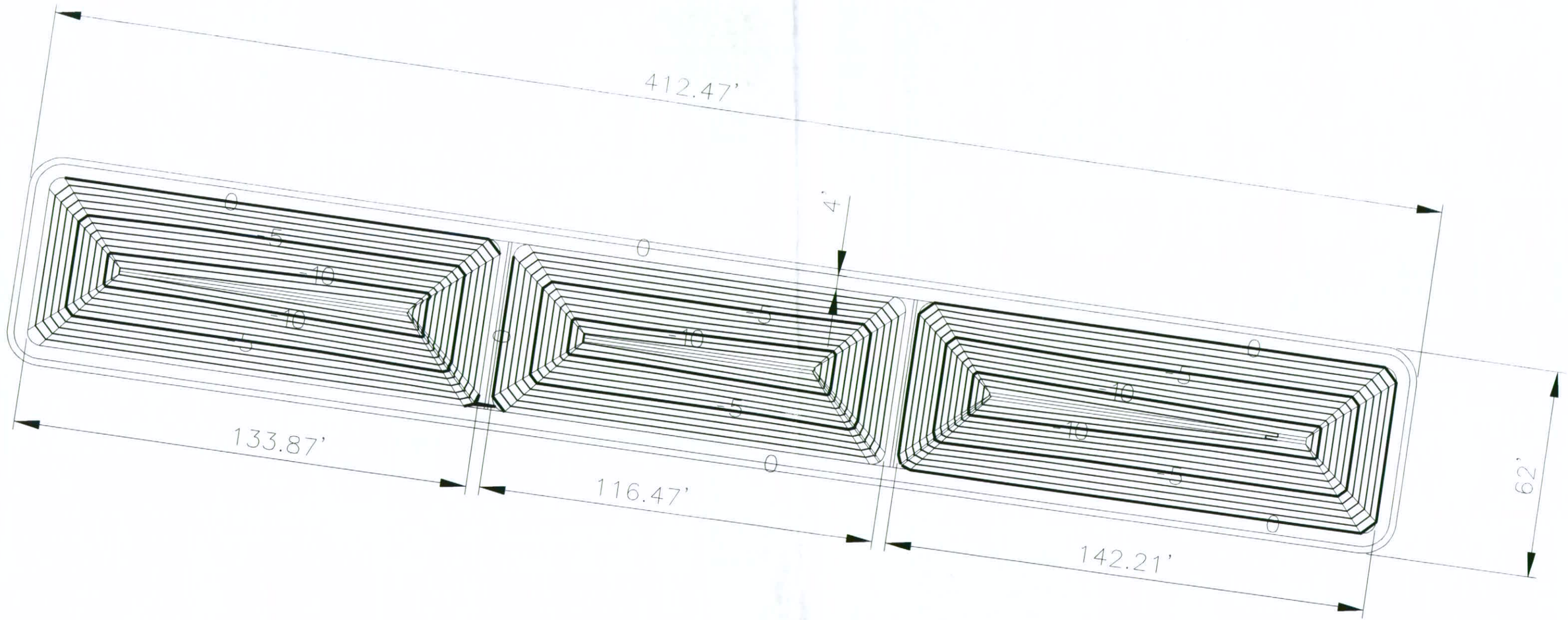
05-045-15411	CONOCO PHILLIPS COMPANY	CP11B-21 M21 49 DWU	LO_XX	WELL	XX	19160	CP11B-21 M21 49	DWU	SWSW	21	4S	96W	6	39.68233	-108.17915	7515	227349	4397332	WILDCAT	15411	45	DR	1/13/2009
05-045-15534	CONOCO PHILLIPS COMPANY	CP12D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60957	-108.208867	8471	224511	4389346	WILDCAT	15534	45	DR	2/20/2009
05-045-15535	CONOCO PHILLIPS COMPANY	CP13D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60954	-108.208881	8471	224510	4389343	WILDCAT	15535	45	DR	2/20/2009
05-045-15536	CONOCO PHILLIPS COMPANY	CP12D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP12D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61225	-108.194831	8296	225727	4389600	WILDCAT	15536	45	DR	2/20/2009
05-045-15537	CONOCO PHILLIPS COMPANY	CP11D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61228	-108.194769	8295	225733	4389603	WILDCAT	15537	45	DR	2/20/2009
05-045-15538	CONOCO PHILLIPS COMPANY	CP11D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP11D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60959	-108.208856	8471	224512	4389348	WILDCAT	15538	45	DR	2/20/2009
05-045-15539	CONOCO PHILLIPS COMPANY	CP13D-17 K17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13D-17 K17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61224	-108.194861	8295	225724	4389599	WILDCAT	15539	45	DR	2/20/2009
05-045-15608	CONOCO PHILLIPS COMPANY	CP02D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP02D-34H34 496	SGU	SENE	34	4S	96W	6	39.65946	-108.145994	8291	230104	4394693	WILDCAT	15608	45	DR	3/4/2009
05-045-15605	CONOCO PHILLIPS COMPANY	CP01D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP01D-34H34 496	SGU	SENE	34	4S	96W	6	39.65948	-108.145983	8290	230105	4394696	WILDCAT	15605	45	DR	3/4/2009
05-045-15606	CONOCO PHILLIPS COMPANY	CP08D-34 H34 49 SGU	LO_XX	WELL	XX	19160	CP08D-34 H34 49	SGU	SENE	34	4S	96W	6	39.65943	-108.146003	8291	230103	4394690	WILDCAT	15606	45	DR	3/4/2009
05-045-15607	CONOCO PHILLIPS COMPANY	CP07D-34H34 496 SGU	LO_XX	WELL	XX	19160	CP07D-34H34 496	SGU	SENE	34	4S	96W	6	39.6594	-108.146014	8291	230102	4394687	WILDCAT	15607	45	DR	3/4/2009
05-045-15624	CONOCO PHILLIPS COMPANY	CP02D-33 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP02D-33 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58175	-108.175333	8286	227282	4386155	WILDCAT	15624	45	DR	3/6/2009
05-045-15625	CONOCO PHILLIPS COMPANY	CP14B-28 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14B-28 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.5817	-108.175364	8286	227279	4386150	WILDCAT	15625	45	DR	3/6/2009
05-045-15626	CONOCO PHILLIPS COMPANY	CP13B-28 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP13B-28 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58173	-108.17535	8285	227280	4386153	WILDCAT	15626	45	DR	3/6/2009
05-045-15627	CONOCO PHILLIPS COMPANY	CP03B-33 N28 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP03B-33 N28 59	N. PARACHUTE	SESW	28	5S	96W	6	39.58168	-108.175381	8285	227277	4386148	WILDCAT	15627	45	DR	3/6/2009
05-045-15798	CONOCO PHILLIPS COMPANY	CP14D-18 O18 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-18 O18 59	N. PARACHUTE	SWSE	18	5S	96W	6	39.60951	-108.208894	8472	224509	4389340	WILDCAT	15798	45	DR	4/16/2009
05-045-15811	CONOCO PHILLIPS COMPANY	CP14D-17 D17 59 N. PARACHUTE	LO_XX	WELL	XX	19160	CP14D-17 D17 59	N. PARACHUTE	NESW	17	5S	96W	6	39.61226	-108.1948	8295	225730	4389602	WILDCAT	15811	45	DR	4/22/2009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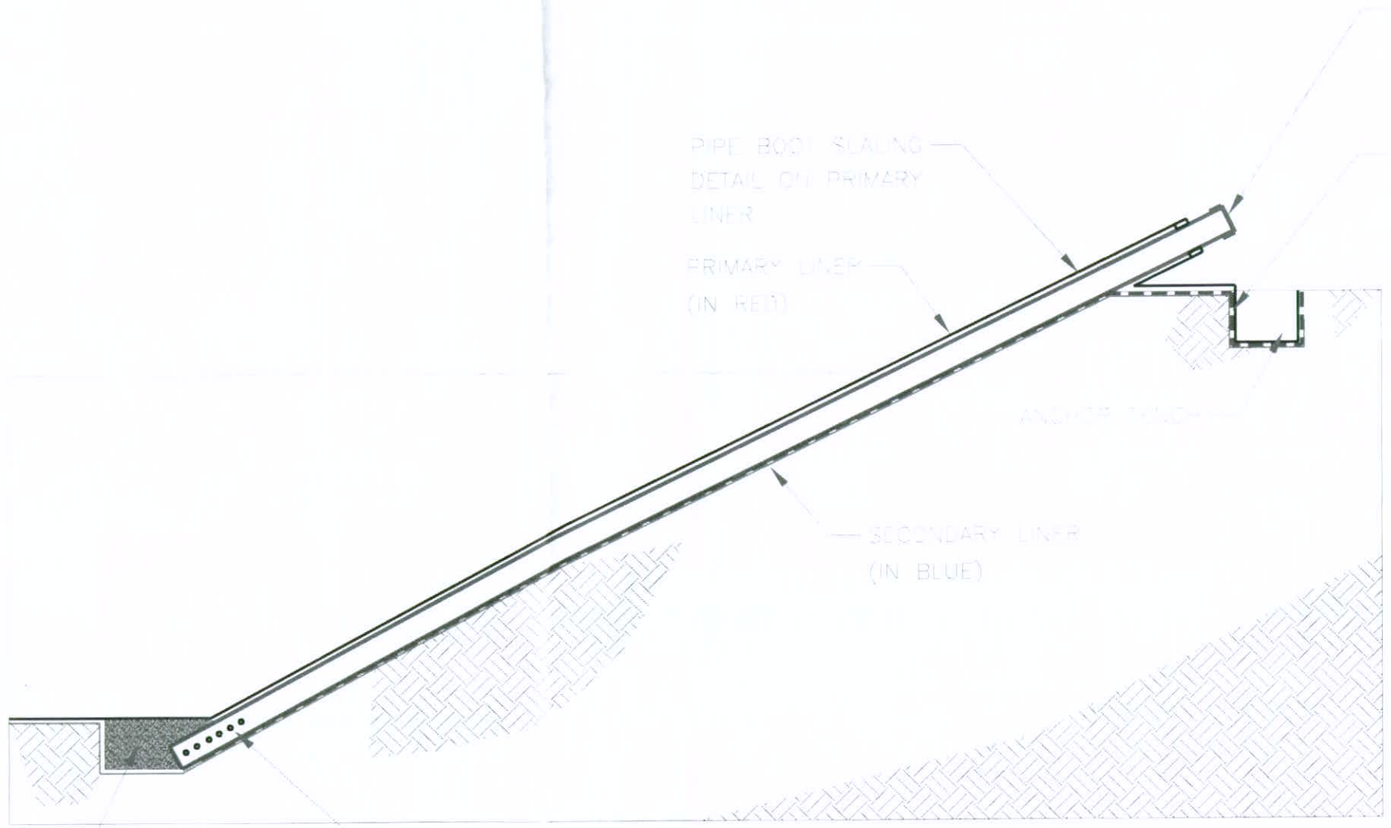

"STANDARD" LEAK DETECTION WELL DETAIL WITH PIPE RESTING ON SLOPE GRADE

N.T.S.

NOTE: POND BOTTOM TO BE SLOPED TOWARDS SUMP PIT

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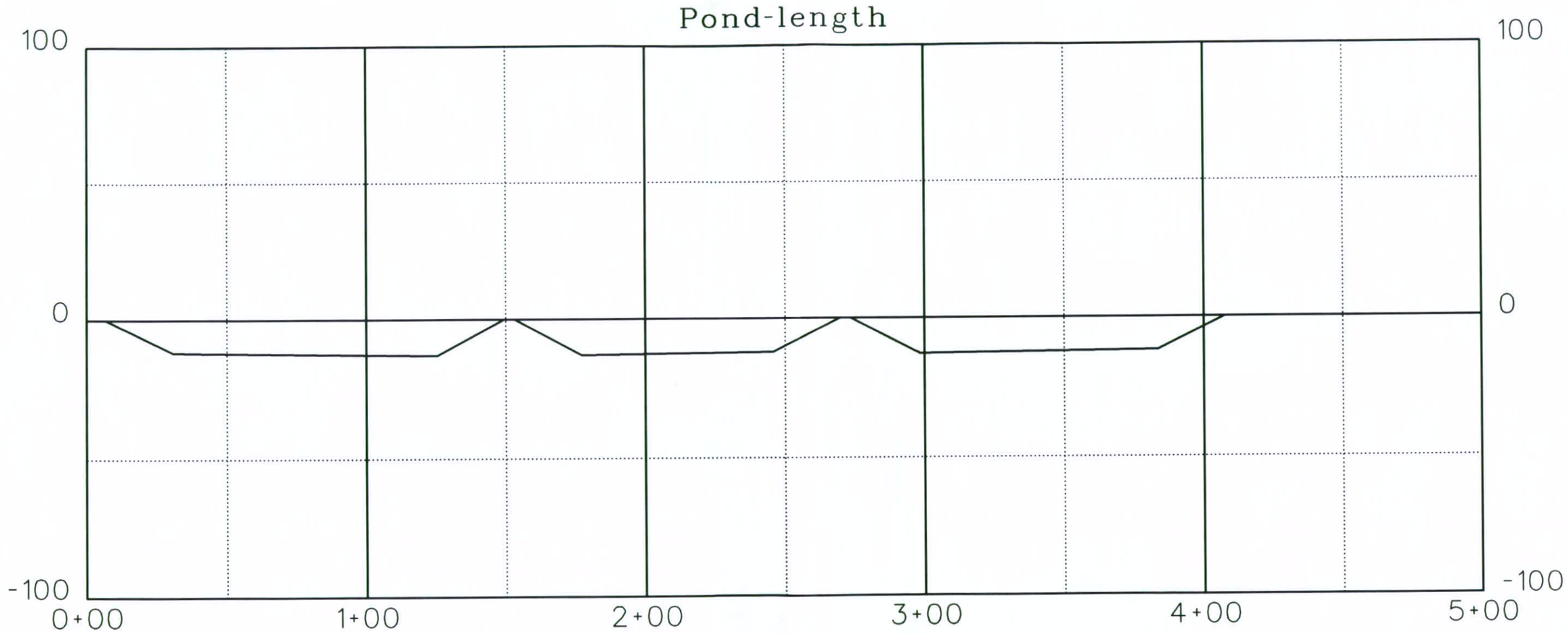
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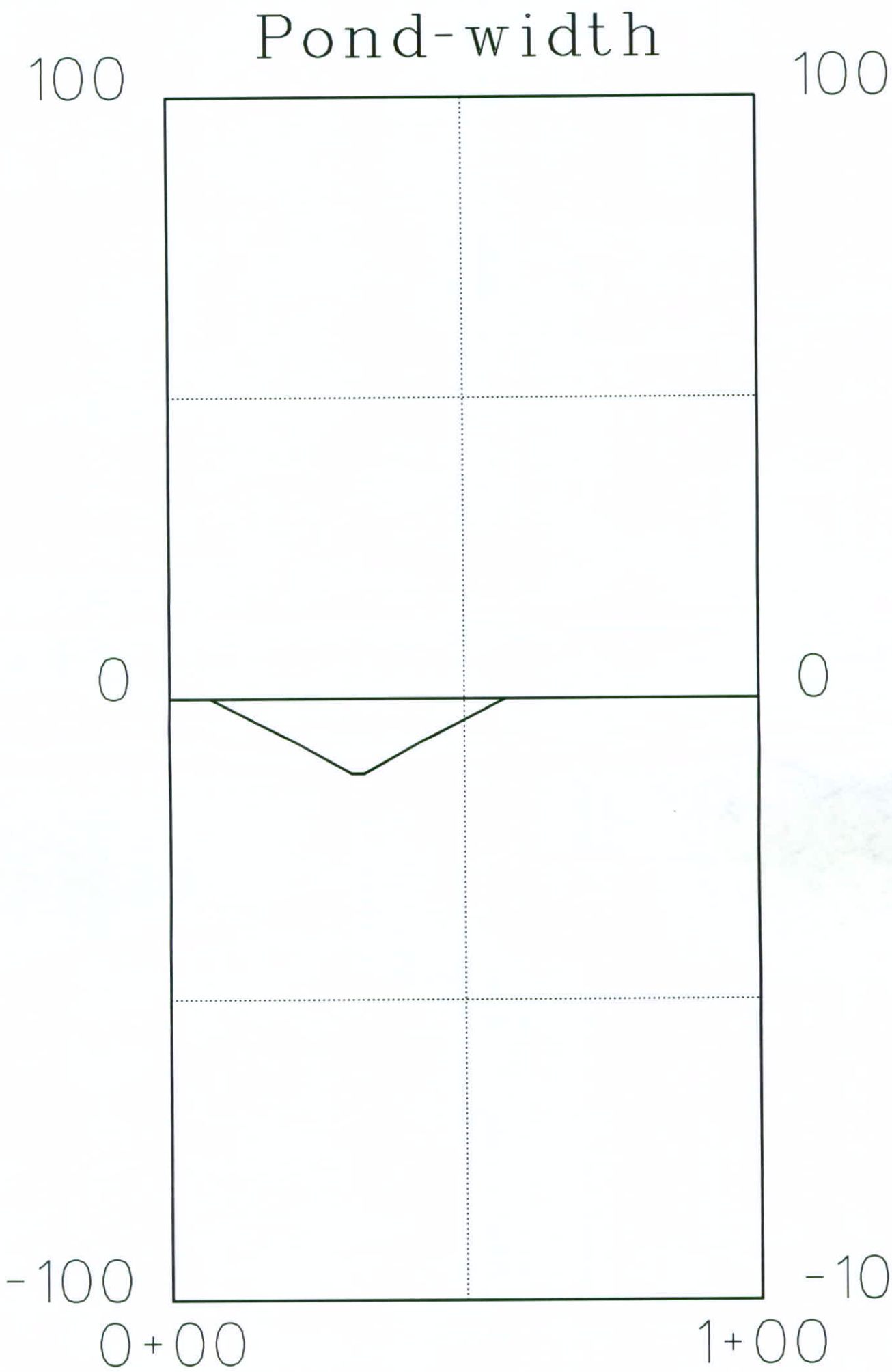
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