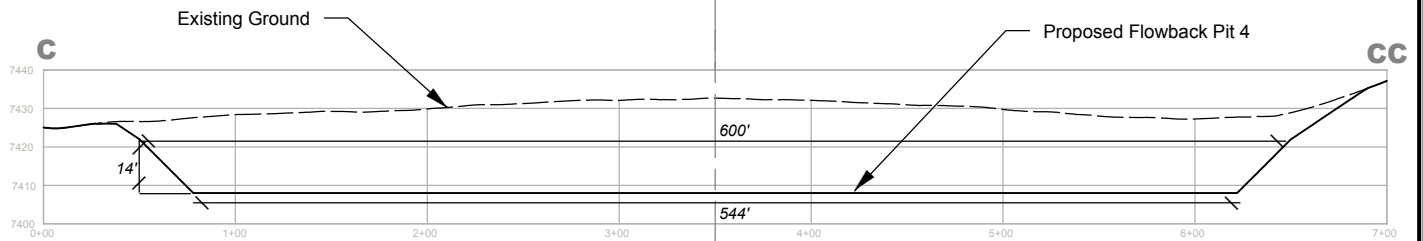
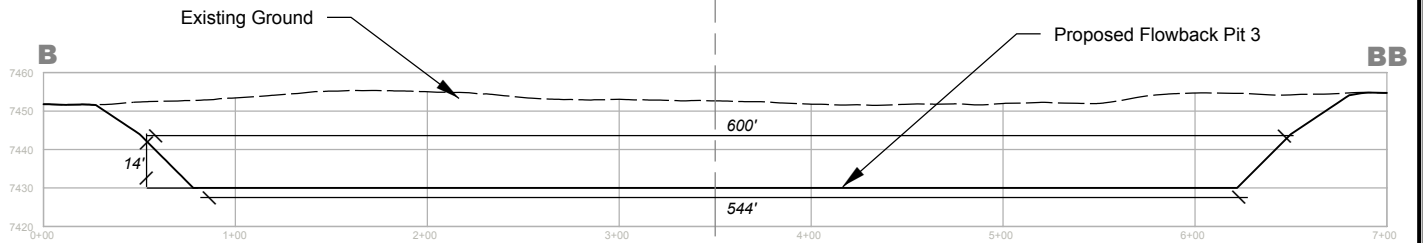
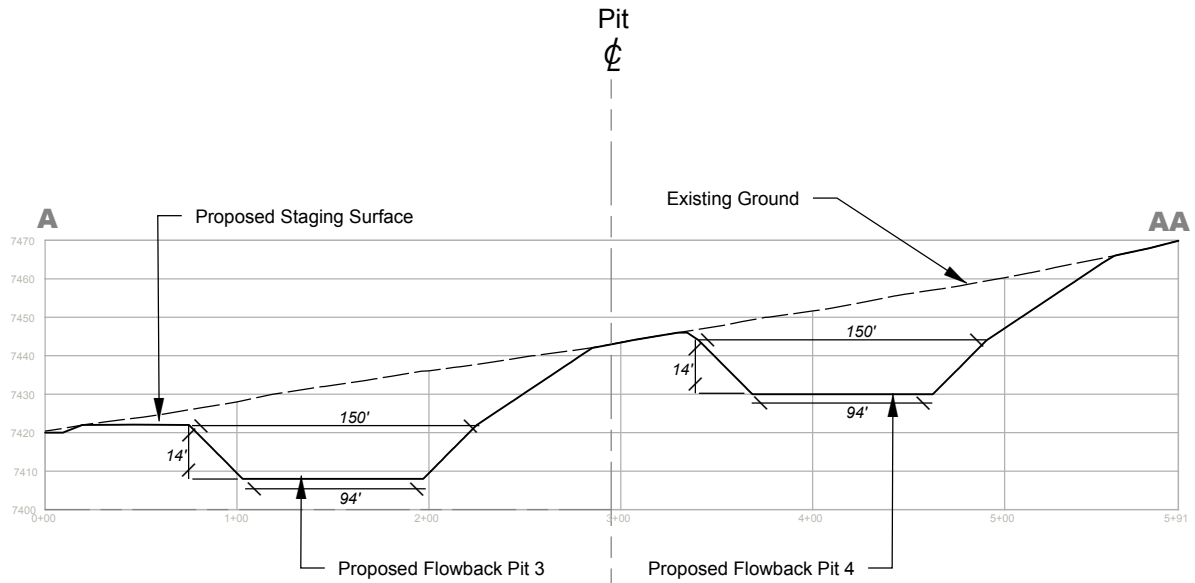






OF 1

Date	5/25/2011	By	nib	Checked	By
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Notes:  
1. Inner perimeter cut slopes = 2:1.  
2. Outer perimeter cut slopes = 3:1.

SCALE: Horiz.: 1" = 100'  
Vert.: 1" = 25'  
DATE: 10.22.2010



**SG Interests**  
PO Box 26  
Montrose, CO 81402  
970-252-0696

**Bull Mountain Unit**  
T. 11 S, R. 90 W, Section 26

**McIntyre Flowback Pits 3 & 4**  
**CONSTRUCTION CROSS SECTION**

## McIntyre Flowback Pit 3

### Pit Volume Calculations

Date: 10.25.2010



**SG Interests**  
PO Box 26  
Montrose, CO 81402  
970-252-0696

	Width	Length	Depth	Side Slopes		Total Pit Volume		Free Board		Usable Volume	
				Run	Rise			Required	Volume		
	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>cy.</i>	<i>bbls.</i>	<i>ft.</i>	<i>cy.</i>	<i>cy.</i>	<i>bbls.</i>
Flowback Pit 3	150	600	14	2	1	36,320	174,659	2	6,446	29,874	143,660

*Volume Calculation = (Area of top + Area of Bottom + (4 \* Area at Middle Height)) / 6 \* Height*

## McIntyre Flowback Pit 4

### Pit Volume Calculations

Date: 10.25.2010



**SG Interests**  
PO Box 26  
Montrose, CO 81402  
970-252-0696

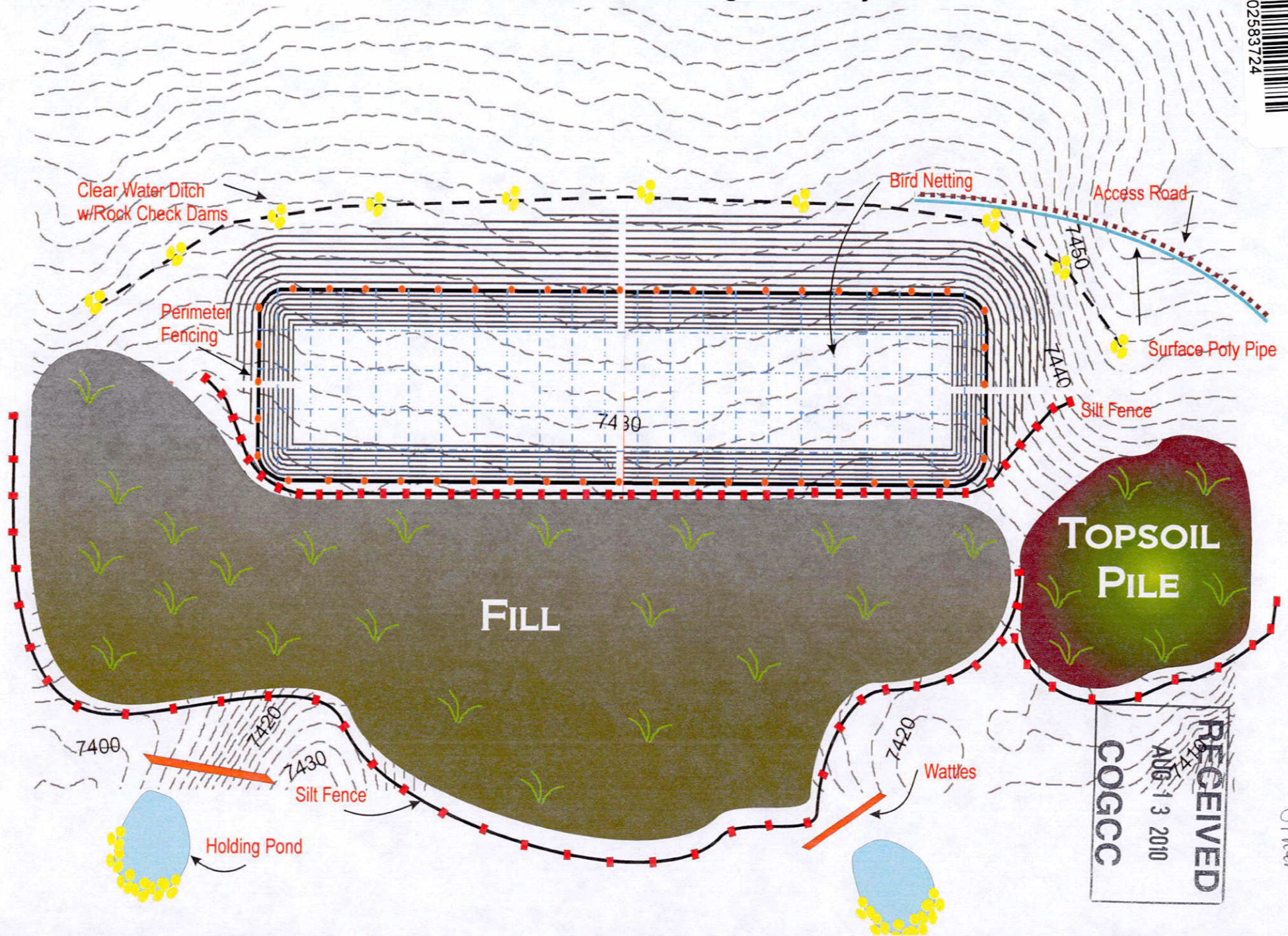
	Width	Length	Depth	Side Slopes		Total Pit Volume		Free Board		Usable Volume	
				Run	Rise			Required	Volume		
	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>Ft.</i>	<i>cy.</i>	<i>bbls.</i>	<i>ft.</i>	<i>cy.</i>	<i>cy.</i>	<i>bbls.</i>
Flowback Pit 4	150	600	14	2	1	36,320	174,659	2	6,446	29,874	143,660

*Volume Calculation = (Area of top + Area of Bottom + (4 \* Area at Middle Height)) / 6 \* Height*



# McIntyre Flowback Pit #3

## Proposed Stormwater Management Layout





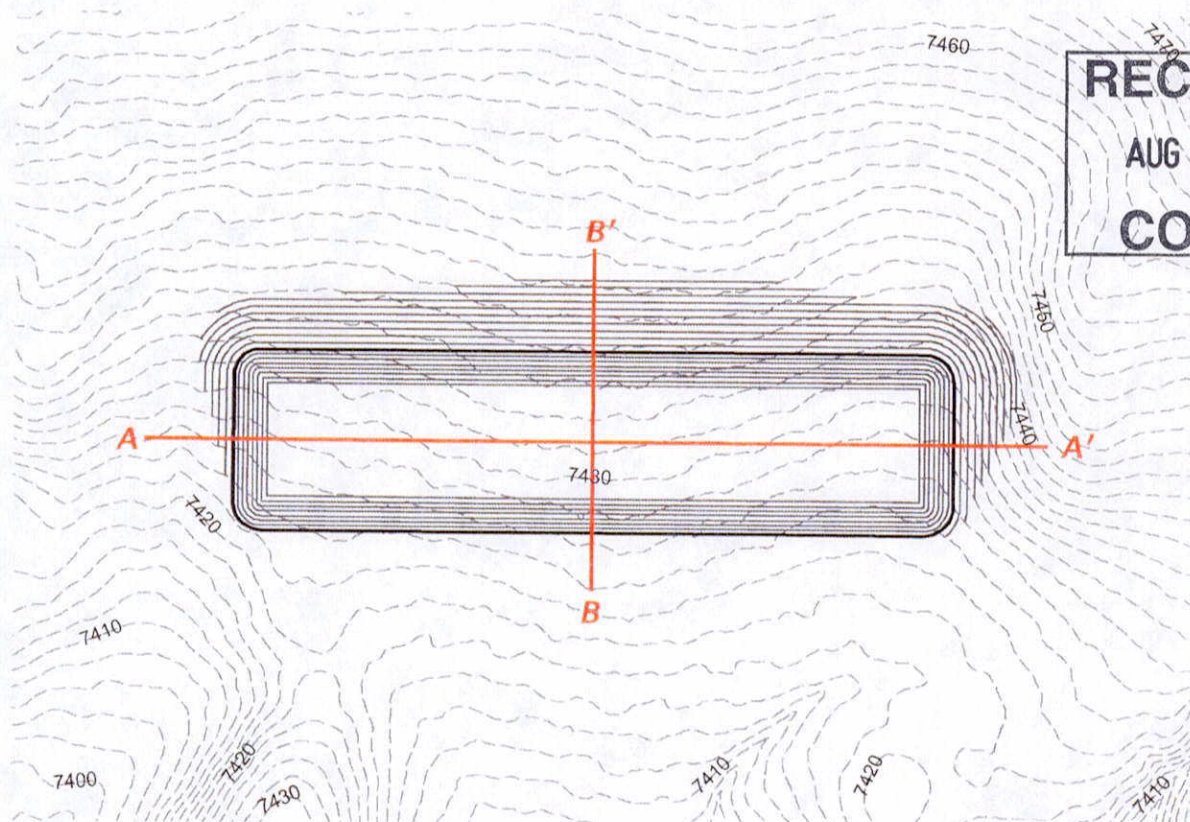


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Other

**RECEIVED**

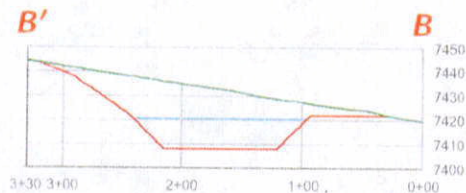
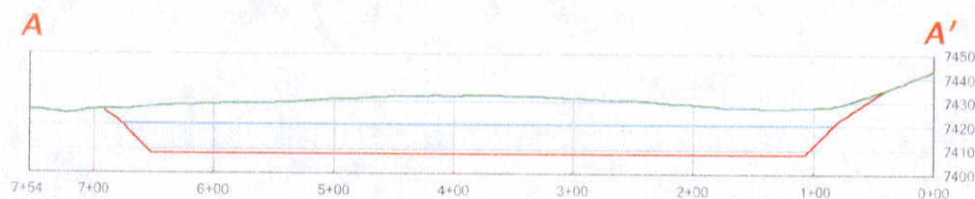
AUG 13 2010

**COGCC**

Scale: 1" = 150'

Existing Countour

Proposed Countour

**PLAN**

Horizontal Scale 1" = 150'

Vertical Scale 1" = 75'

Existing Grade Surface

Finished Grade Surface

**SECTION****CALCULATIONS**

Pit Perimeter Elevation: 7,422'

Pit Bottom Elevation: 7,408'

Pit Depth: 14'

Pit Width: 600'

Pit Length: 150'

Fluid Volume: 143,455 bbls.

**Note:**

Existing 2-ft surface contours interpolated from LIDAR base data. LIDAR data acquired in November 2008 with 1-meter posting resulting in < 6 in. vertical RMSE (Root Mean Square Error).

**Disclaimer:**

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McIntyre Flowback Pit #3

Pit Design &amp; Cross Section

07.30.2010



**SG Interests**  
PO Box 26  
Montrose, CO 81402

Prepared By: ZDP  
Prepared For: SG Interests, Ltd.  
Contour Interval: 2 ft.

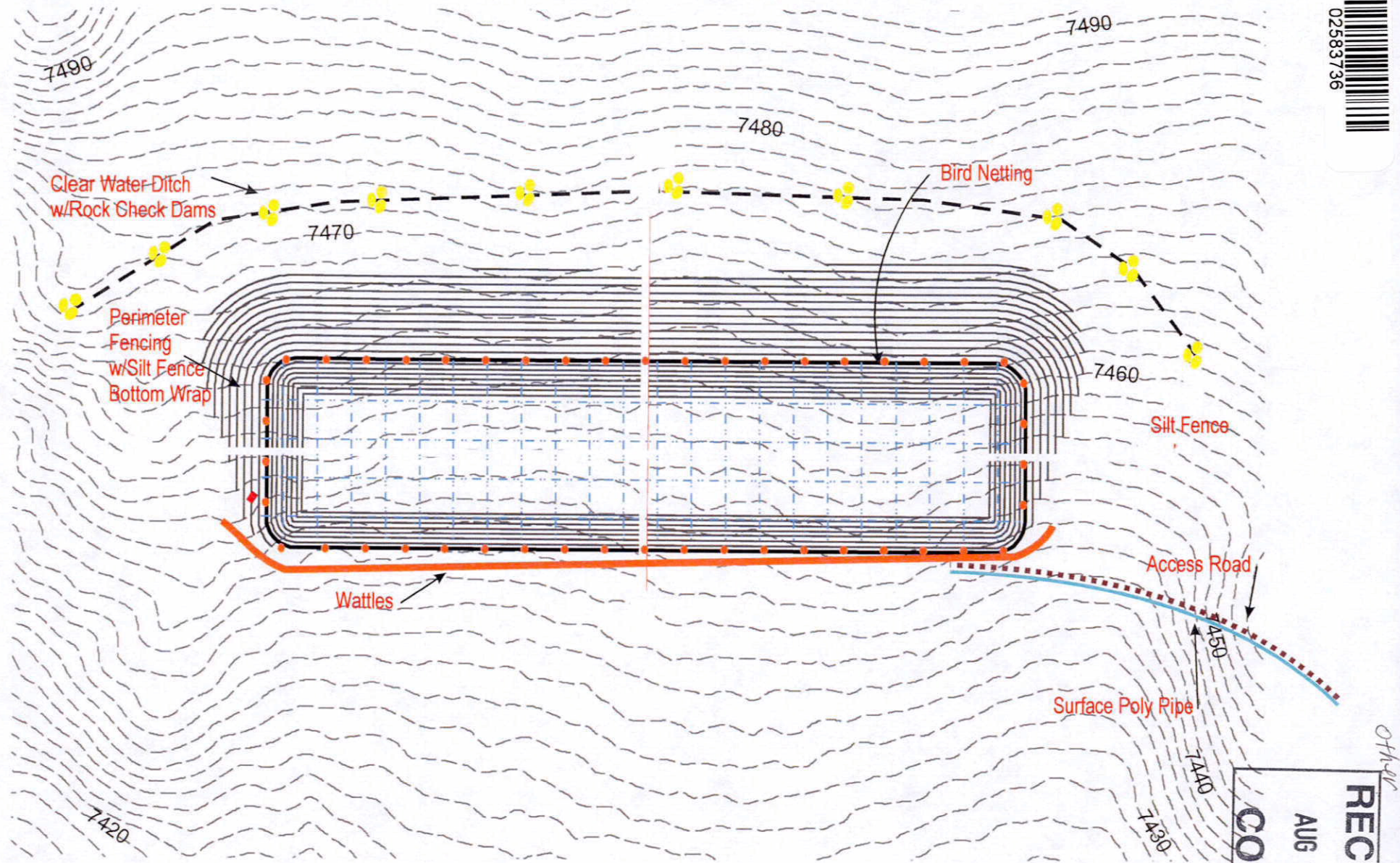


# McIntyre Flowback Pit #4

## Proposed Stormwater Management Layout



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OTHER  
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COGCC





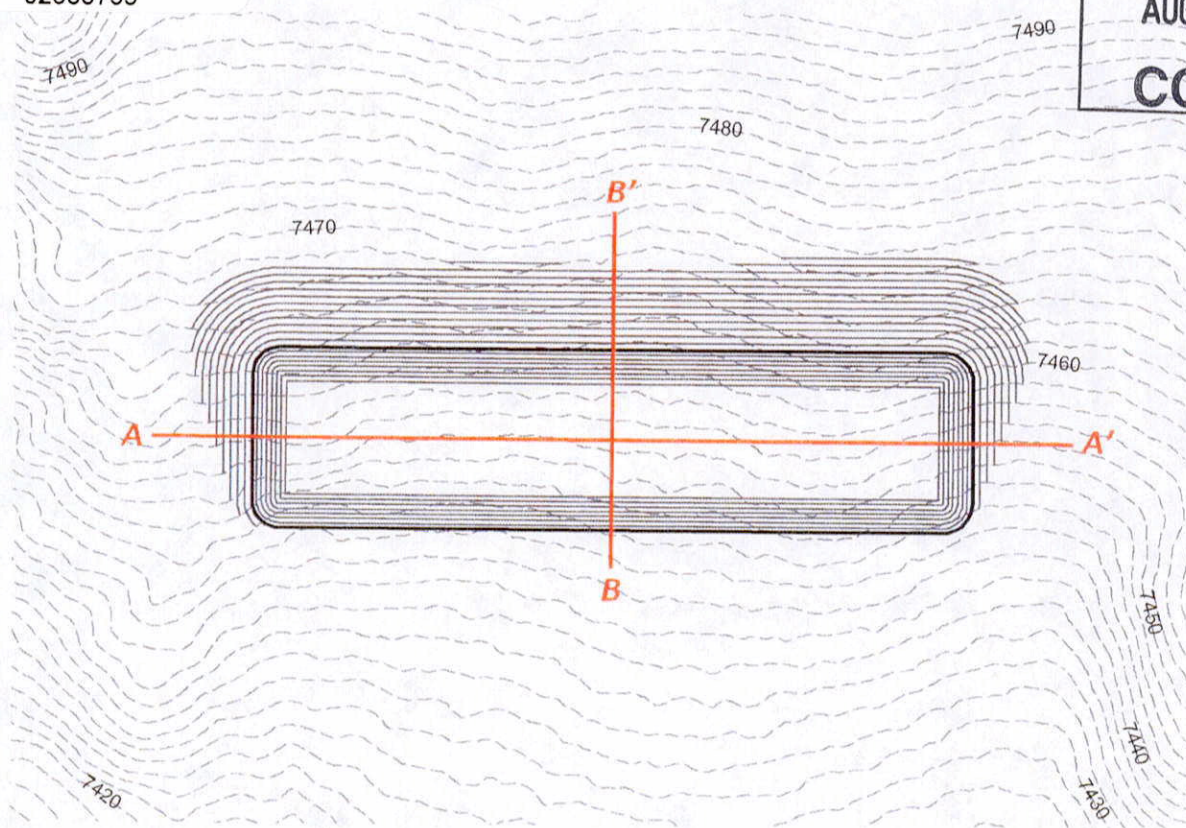
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other

RECEIVED

AUG 13 2010

COGCC

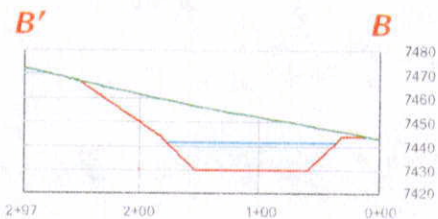
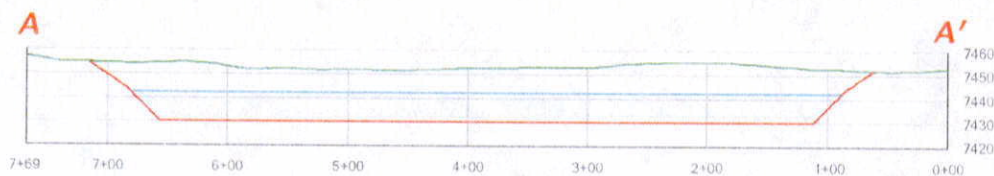


Scale: 1" = 150'

Existing Contour

Proposed Contour

PLAN



Horizontal Scale: 1" = 150'

Vertical Scale: 1" = 75'

Existing Grade Surface

Finished Grade Surface

SECTION

CALCULATIONS

Pit Perimeter Elevation: 7,444'

Pit Bottom Elevation: 7,430'

Pit Depth: 14'

Pit Width: 600'

Pit Length: 150'

Fluid Volume: 143,455 bbls.

**Note:**

Existing 2-ft surface contours interpolated from LIDAR base data. LIDAR data acquired in November 2008 with 1-meter posting resulting in < 6 in. vertical RMSE (Root Mean Square Error).

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McIntyre Flowback Pit #4

Pit Design &amp; Cross Section

07.30.2010



**SG Interests**  
PO Box 26  
Montrose, CO 81402

Prepared By: ZDP  
Prepared For: SG Interests, Ltd.  
Contour Interval: 2 ft.

### **Liner and Leak Detection System**

The leak detection system will be constructed at the low end (approximately 1 foot lower than the rest of the pit bottom) of the pit. The pit bottom will slope down toward this leak detection sump. The liner in the sump can be shaped into this rounded and sloped configuration and no special welding is required for the detection sump. All seams will be tested to the manufacturer's requirements. The following is a typical drawing of this leak detection system. Its actual shape will vary from this drawing based on field conditions.

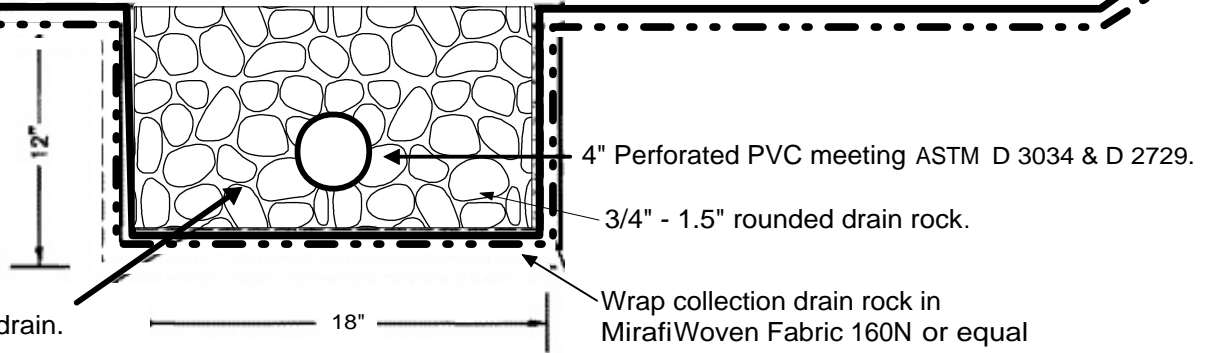


# Liner & Leak Detention System Details

## Pit Liner System:

- \* 60 milHDPE Liner (CL)
- \* 200 milHypernetGeonetDrain Mat (GSE)
- \* 36 milHDPE Liner (CL)
- \* BentoMatDN Geosyntetic Bentonite Liner (CETCO)

Place pipe 2" above bottom of collection drain.  
Slope pipe toward deep end of pit.



Monitoring Stand Pipe with 4" PVC  
Removeable Cap to be located at  
deep end of pit. Place steel fence  
posts for protection.

Install Pocket Vents per manufacturer's  
recommendations every 50 liner feet along  
perimeter at top of liner. Vent to perforate  
both HDPE liners.

- \* 60 milHDPE Liner
- \* 200 milHypernetGeonetDrain Mat
- \* MirafiNX160 Fabric Wrap

4 ft. min.  
Pad Grade

12" deep minimum anchor  
trench per manufacturer's  
instructions.

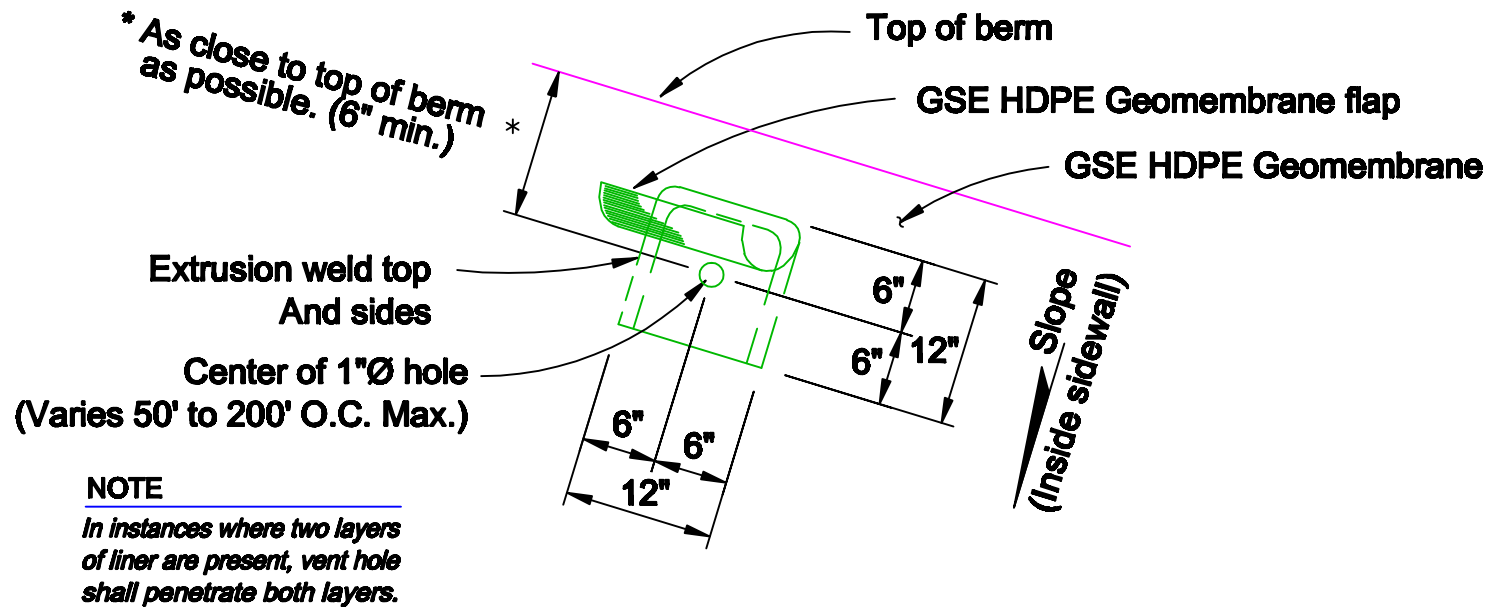
4" PVC meeting ASTM D 3034 & D 2729.

3/4" - 1.5" round drain rock.  
(No crushed gravel allowed.)

4" Perforated PVC meeting ASTM D 3034 & D 2729.

- \* Mirafi160N Fabric Wrap
- \* 36 milHDPE Liner
- \* BentoMatDN Geosyntetic Bentonite Liner

\* Install HPDE / Bentonite Liners;  
Hypernetand Vent Pockets  
per manufacturer's instructions.



## Typical Vent Pocket Detail

Not to scale



GSE Lining Technology, LLC  
19103 Gundie Road  
Houston, Texas 77073-3598  
(800)435-2008 / (281)443-8564

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01/10/2010

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GSE-030

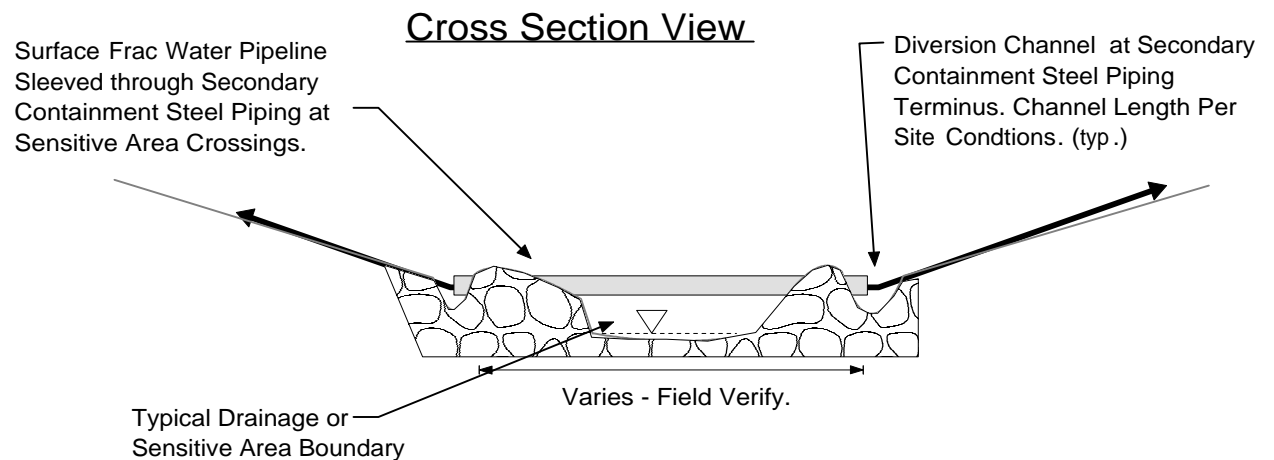
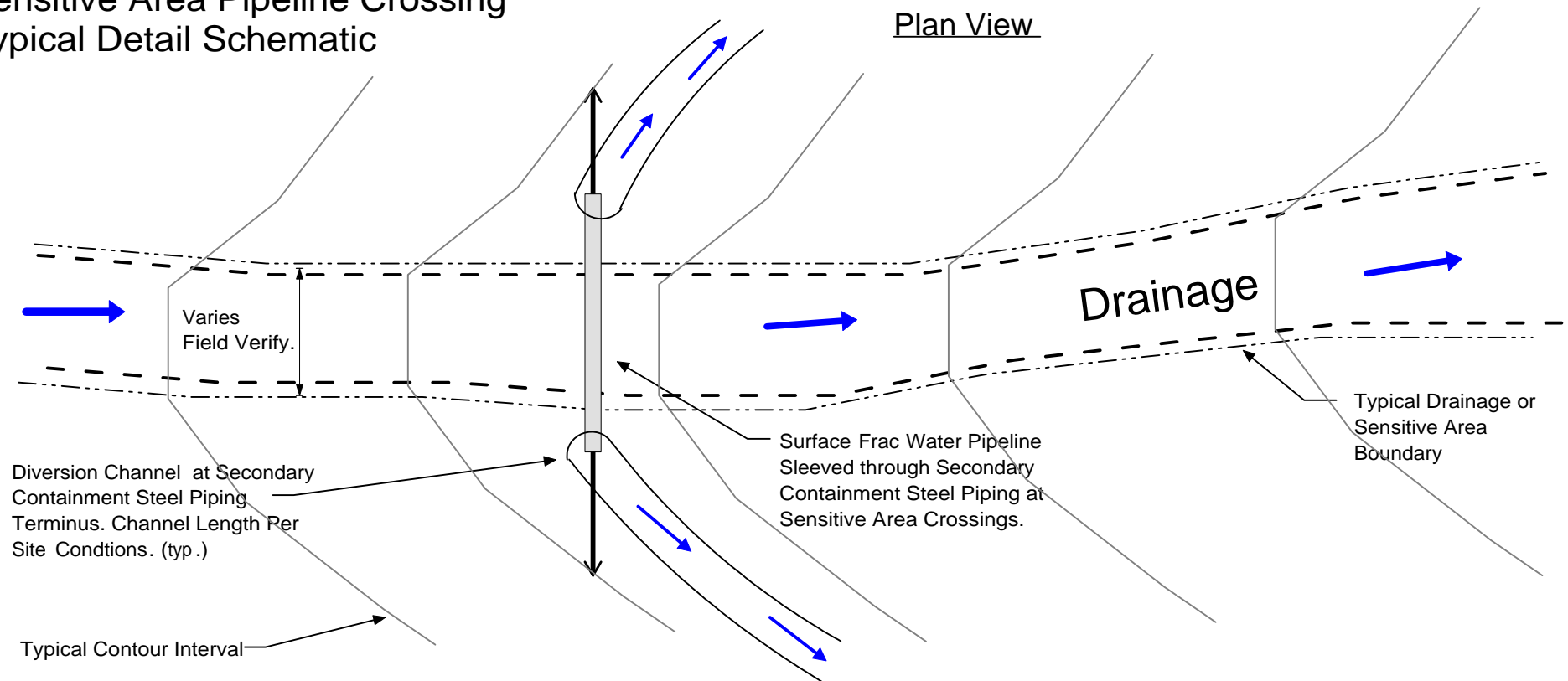
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### **Sensitive Area Pipeline Crossing**

Where SG Interests uses a poly pipeline to transport water to or from the McIntyre Flowback Pits over a sensitive area (a stream, wetland or other waterbody), the poly pipe will be contained within a secondary containment system to prevent flowback fluids from contaminating the surface water in the event of a leak in the poly pipeline. The surface poly pipeline will be cased within a steel pipeline of larger diameter for the length of the sensitive area. The ends of the steel casing will extend from upland area to upland area through the entire sensitive area. At the ends of the steel casing, diversion channels will be constructed to direct fluid away from the sensitive area and into containment basins in the event of a leak in the surface poly line. The design of the diversion ditch and the containment basin will be site specific depending on local terrain in the vicinity of that particular crossing. These containment features will be designed by a qualified stormwater inspector with training and experience in sizing and designing these features. A qualified stormwater inspector will monitor and inspect all sensitive areas crossed by such poly pipelines on a daily basis during use and operation. A typical of this secondary containment system for use in sensitive area crossings follows this narrative.

# SG Interest, I Ltd. Sensitive Area Pipeline Crossing Typical Detail Schematic



## Notes:

\* Pipelines hydraulic including total dynamic and static head pressures shall be verified to insure that the allowable working pressure of the pipeline is not compromised.

\* Storm water and erosion control BMP's shall be installed as necessary by SG Interest, I Ltd. or designated contractor.

\* Field verify location of all underground utilities, gas, water, phone, cable and electric lines. Call Before You Dig. Statewide One Call 1-800-922-1987.

\*Verify field grades and elevations.

\* Not to Scale.



### **Liner and Leak Detection System**

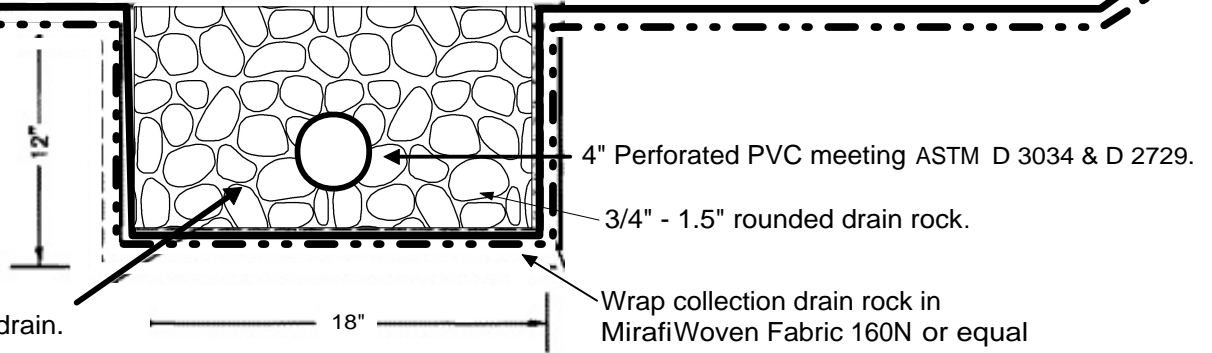
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## Pit Liner System:

- \* 60 milHDPE Liner (CL)
- \* 200 milHypernetGeonetDrain Mat (GSE)
- \* 36 milHDPE Liner (CL)
- \* BentoMatDN Geosynthetic Bentonite Liner (CETCO)

Place pipe 2" above bottom of collection drain.  
Slope pipe toward deep end of pit.



Monitoring Stand Pipe with 4" PVC  
Removeable Cap to be located at  
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Install Pocket Vents per manufacturer's  
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4 ft. min.  
Pad Grade

12" deep minimum anchor  
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4" PVC meeting ASTM D 3034 & D 2729.

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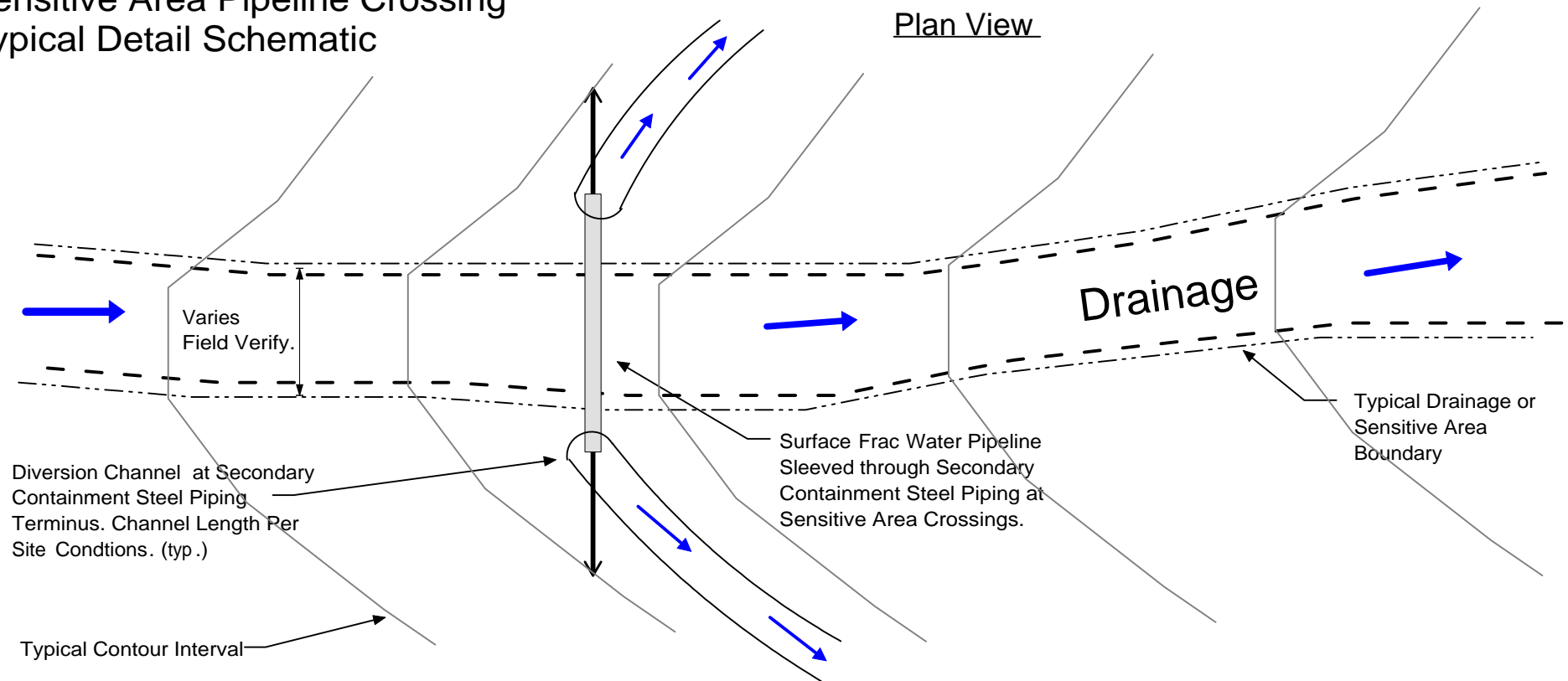
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Hypernetand Vent Pockets  
per manufacturer's instructions.

### **Sensitive Area Pipeline Crossing**

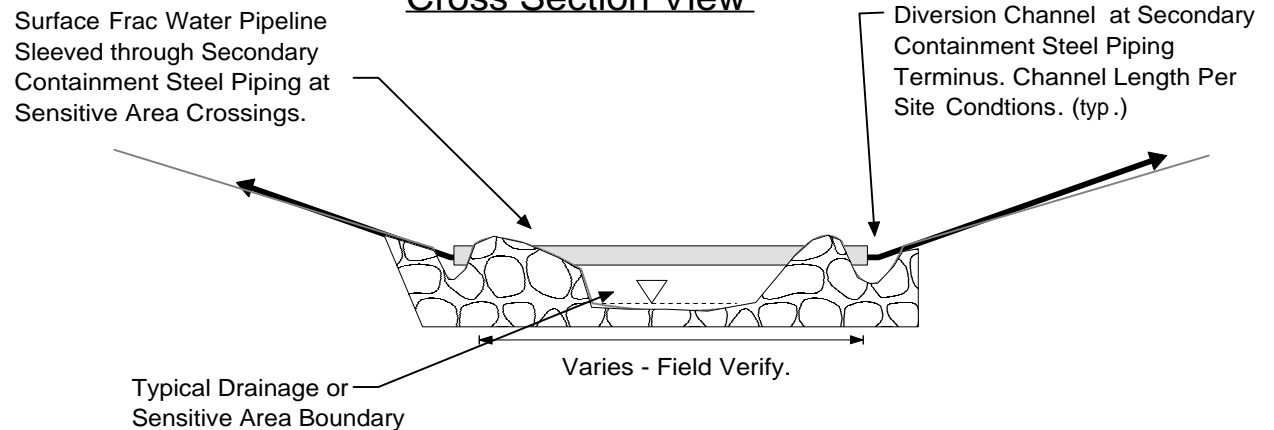
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# SG Interest, I Ltd. Sensitive Area Pipeline Crossing Typical Detail Schematic



## Cross Section View



### Notes:

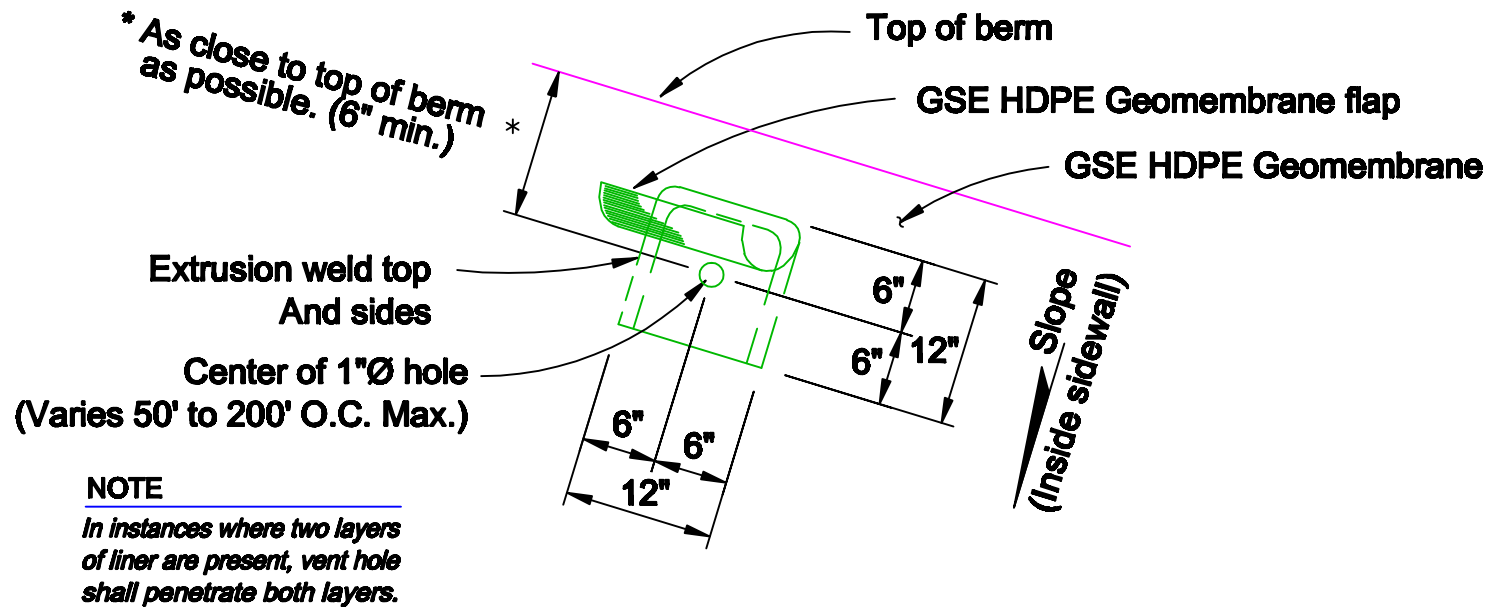
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\*Verify field grades and elevations.

\* Not to Scale.



## Typical Vent Pocket Detail

Not to scale



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