COMPLIANCE / ENGINEERING / REMEDIATION

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November 5, 2010

Ms. Karen Spray
Colorado Oil and Gas Conservation Commission
P.O. Box 2651
Durango, CO 81302-2651

RE: 4M Operations and Maintenance and System Expansion Report

Ms. Spray:

LT Environmental, Inc. (LTE) is pleased to submit this Operations and Maintenance (O&M) and System Expansion Report for the 4M Outcrop Mitigation Project in La Plata County, Colorado to the Colorado Department of Natural Resources (DNR) Colorado Oil and Gas Conservation Commission (COGCC). This report includes the period of April 1, 2010 to September 21, 2010.

Background

The objective of the 4M methane mitigation system is to demonstrate the technical viability to recover and use the uncontrolled methane along the Outcrop. An additional system goal is to help protect the environment, which includes reducing carbon emissions and improving plant growth. To accomplish this objective, LTE designed and installed vapor collection and barrier systems for methane collection at both the South Fork Texas Creek site (Figure 1) and Pine River site (Figure 2). At the South Fork Texas Creek site, the recovered methane is being used to fuel a turbine, which is generating electricity to operate the collection system. The turbine is also returning any excess power to the local electrical grid for credit as a renewable energy resource. The initial design, installation, and startup of the 4M methane mitigation systems were completed in 2008 and 2009. Previous O&M operations beginning May 2009 are detailed in the O&M report dated April 22, 2010.

From June 14 to June 24, 2010, the South Fork Texas Creek system was expanded in order to increase methane collection. A collection liner designed to direct vapors into the existing collection system was installed beneath the creek, and 32 diagonal well points were installed along the creek and piped into the existing manifold to collect vapors in the sensitive riparian zone. In addition, gas from a COGCC monitoring well was piped to the collection system. The as-built construction drawings are provided in Attachment 1.

South Fork Texas Creek System Expansion

The vapor collection area was expanded by installing a liner beneath South Fork Texas Creek adjoining the existing collection areas. To accomplish this, the plant growth and top soil was removed to a depth of approximately 24 inches. Water was temporarily diverted around the excavation area, and a trash pump was used for additional dewatering during installation. The entire collection area was filled with approximately 9 inches of 3/8-inch to 1/2-inch gravel, and a 20-mil vapor barrier was installed over the gravel. The north and south edges of the vapor barrier

were laid beneath the existing collection vapor barriers with 3 feet of overlap. The east and west edges were rolled down to direct the vapors toward the collection zones. The top soil and native vegetation were replaced on top of the barrier and additional native wetland flora was planted.

To evaluate an alternative methane collection method and to access methane beneath the portion of the creek surrounded by willow bushes without a vapor barrier, diagonal well points were installed. The well points were installed using a direct push drilling rig. The wells consist of 2-inch diameter schedule 40 PolyVinylChloride (PVC) installed at a 45-degree angle with slots cut into the underside of the casing. Individual wells were connected to collection pipes which were connected to the existing system manifold. Sampling ports allow for collection and analytical testing of the gas for each of the three diagonal well collection areas. Valves allow for flow adjustment, making it possible to focus on more productive areas for gas collection.

A COGCC methane monitoring well located approximately 1,000 feet south of the collection equipment building was connected to the system to evaluate the monitoring well as an additional source of methane. The well and piping locations are shown on Figure 3. Initial well pressure (approximately 80 pounds per square inch [psi]) was not sustained during system operation. The valves allowing flow from the well were closed on August 6, 2010, without any associated decrease in system performance. This suggests that the COGCC well did not contribute enough gas to improve the system operation, and is better served as a subsurface pressure monitoring point.

Following the restarting of the system, the turbine was increased from 12 Kilowatts (kW) to a power output of 20 kW. The system was able to sustain operation without disruption due to vacuum/pressure or gas quality issues. Normal system operation utilizes approximately 6 kW of electrical power, allowing the remaining 14 kW to be returned to the grid.

Mitigation System Operation and Maintenance

Routine system operations are conducted at each site. O&M activities included maintaining the equipment per manufacturer's instructions, collecting data used to evaluate system performance, and adjusting the operating parameters to optimize system effectiveness. Operational parameters were recorded and included: methane and oxygen concentrations in the collected gas; operational hours for the blower and turbine generator; applied vacuum to the subsurface piping; and electrical generation of the turbine.

O&M activities conducted during the reporting period included:

- Routine O&M activities to monitor and adjust system performance;
- Field screening the inlet gas quality;
- Collecting gas quality data stored in the data loggers for analysis;
- Changing oil and filters in the compressor system;

- Changing the air filter on the turbine;
- Changing the water filters on the compressor lines;
- Troubleshooting the weather station;
- Upgrading the turbine software at the South Fork Texas Creek site;
- Replacing the emitter in the Scott methane sensor; and
- Evaluation of electrical conditions that have resulted in temporary shutdown of the generator.

During normal operation, gas composition and flow remained fairly consistent at each site, with better gas quality recorded at the South Fork Texas Creek system. During the reporting period methane concentrations remained relatively stable (approximately 80%) at the South Fork Texas Creek site (Figure 4). At the Pine River site, methane concentrations remained near 10%. Fluctuations ranged from a low of 7.4% to a high of 25% (Figure 5). O&M data are provided in Table 1 for the South Fork Texas Creek site and in Table 2 for the Pine River site.

The percent methane was measured at both sites from all four collection zones. A methane flow rate was calculated using the resultant methane concentrations. In Figure 6, the average flow rate and cumulative recovered methane are plotted over time for the South Fork Texas Creek site. Typical collected gas flow ranged from 100 cubic feet per hour (cfh) to 450 cfh. Collected methane gas flow ranged from 3 cfh to 24 cfh at the Pine River site. The Pine River site was previousy collecting gas at a rate of approximately 500 cfh. The flow rate was decresed in an attempt to increase methane concentrations, but methane concentrations remained similar to previous readings.

The Pine River site operated more continuously during this reporting period compared to the previous period. The system experienced brief downtime during the report period due to water accumulation in the water trap and desiccant filter. These filters were installed in April to reduce water accumulation in the methane sensor line.

The South Fork Texas Creek system produces the gas needed to operate the turbine, and excess gas is re-circulated within the compression system. The turbine was set at 20 kW following system expansion. This setting was increased to attempt to optimize methane gas collection and use during the reporting period. The operational setting of 20 kW appears to be the point at which sustained operation can be accomplished while maintaining high inlet gas quality. With normal system operation utilizing approximately 6 kW of electrical power, the remaining 14 kW are distributed back into the electrical grid for a net gain. The system operation commenced with an electrical meter reading of 51,540 kilowatt-hours (kW-h). From startup to September 21, 2010, the electrical meter reading was reduced to 10,437 kW-h (Figure 7), indicating 41,103 kW-h has been returned to the grid.

These results, along with visual observations of vegetation growth, suggest that the methane mitigation system is operating successfully. Considerable plant growth at both sites has occurred in areas previously prohibitive of vegetative growth.

Planned Activities

During the next reporting period, the South Fork Texas Creek system will continue operation to optimize electrical generation. The Pine River site will be operated with the goal of optimizing methane recovery to reduce harm to plant growth.

LTE appreciates the opportunity to provide services to the COGCC. Please call us at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

Rob Rebel, P.E.
Project Engineer

Christopher E. Shephard, P.E.
Principal/Group Manager

Attachments:

Table 1 – O&M Data South Fork Texas Creek
Table 2 – O&M Data Pine River

Figure 1 – South Fork Texas Creek Mitigation System Layout
Figure 2 – Pine River Site Layout
Figure 3 – South Fork Texas Creek Monitoring Well Piping
Figure 4 – South Fork Texas Creek Methane Concentrations
Figure 5 – Pine River Methane Concentrations
Figure 6 – South Fork Texas Creek Methane Gas Flow
Figure 7 – South Fork Texas Creek Surplus Electricity Generated

Attachment 1 – As-Built Drawings Methane Mitigation System Expansion

TABLES

TABLE 1

OPERATIONS AND MAINTENANCE DATA
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

Date	System Status Upon Arrival	Electric Meter (kw)	Turbine (hours)	Turbine Demand (kw)	From Chart, Btu/hr needed	Compressor (hours)	Methane (%)	Oxygen (% or ppm)	Calculated Methane Flow (scfh)	Cumulative Calculated Methane Recovered (mcf)
05/22/09	OFF	51,540	34	10	166000	--	81.6	130	203	7
05/27/09	OFF	50,355	90	10	166000	--	81.4	33	204	18
05/29/09	OFF	50,368	113	10	166000	--	81.6	15.2	203	23
06/08/09	OFF	50,967	192	10	166000	--	79.4	14.9	209	40
06/15/09	OFF	50,683	286	10	166000	289	78.2	83	212	59
06/19/09	OFF	50,510	305	10	166000	308	79	19.8	210	63
06/23/09	OFF	50,004	310	10	166000	402	79.2	0.16	210	65
06/25/09	OFF	--	318	10	166000	411	--	--	--	--
07/07/09	OFF	50,983	338	10	166000	431	80.2	51.2	207	69
07/15/09	ON	--	523	10 to 12	188,000	620	--	--	--	--
07/22/09	OFF	50,519	558	12	188,000	659	79	48	238	121
07/24/09	OFF	50,365	600	12	188,000	700	--	--	--	--
08/05/09	ON	46,840	891	10	166,000	993	76	5.25	218	185
08/14/09	ON	45,536	1,106	12	188,000	1,208	76	3.25	247	238
08/20/09	ON	44,501	1,251	12	188,000	1,353	80	4.25	235	272
09/02/09	OFF	42,246	1,538	14	209,000	1,602	60	0.39	348	372
09/08/09	ON	41,236	1,666	14	209,000	1,779	82	0.1	255	404
09/21/09	ON	39,298	1,934	14 to 16	209,000	2,101	104	0.1	201	458
10/05/09	OFF	40,322	2,009	OFF	166,000	2,332	--	3	--	--
10/05/09	SYSTEM OFF FOR REPAIRS				166,000				--	--
11/19/09	ON	41,776	1	12	166,000	--	100	93 ppm	166	458
12/01/09	ON	39,960	286	12	166,000	2,623	84.5	1.9 ppm	196	514
12/11/09	OFF	38,941	495	12	166,000	2,866	89	2.0 ppm	187	553
12/16/09	ON	38,235	615	12	166,000	2,986	89.6	1.8 ppm	185	576
12/29/09	OFF	37,548	876	12	166,000	3,321	87	3.0 ppm	191	625
01/12/10	OFF	37,127	1,109	12	166,000	3,632	84.5	3.25 ppm	196	671
01/27/10	ON	35,875	1,469	12	166,000	3,993	79.2	0.1	210	747
03/05/10	OFF	37,586	1,723	12	166,000	4,246	74	0.16	224	804
03/11/10	OFF	37,217	1,723	12	166,000	4,247	64	130 ppm	259	804

TABLE 1

OPERATIONS AND MAINTENANCE DATA
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

Date	System Status Upon Arrival	Electric Meter (kw)	Turbine (hours)	Turbine Demand (kw)	From Chart, Btu/hr needed	Compressor (hours)	Methane (%)	Oxygen (% or ppm)	Calculated Methane Flow (scfh)	Cumulative Calculated Methane Recovered (mcf)
03/12/10	ON	37,172	1,747	12	166,000	4,271	80	23.2 ppm	208	809
03/23/10	ON	35,364	2,009	12	166,000	4,533	59	0.1	281	882
04/14/10		33,275	2,379	12	166,000	4,900	51	52 ppm	325	1,003
05/21/10	OFF	34,290	2,573	8	145,000	5,099	60		242	1,050
05/28/10	OFF	34,589	2,573	8	145,000	5,099	80		181	1,050
06/16/10	ON	35,119	2,574	8	145,000	5,101	87	0.1	167	1,050
6/24/2010*	OFF	34,436	2,720	18	253,000	5,249	83	0.1	305	1,094
06/29/10	ON	34,412	2,733	20	274,000	5,262	82	0.1	450	1,100
07/12/10	ON	31,780	3,035	20	274,000	5,576	80	0.1	349	1,205
08/06/10	ON	24,587	3,613	19.2	265,000	6,171	79	0.1	341	1,402
08/24/10	ON	18,172	4,035	19	265,000	6,605	79	0.1	342	1,547
09/21/10	ON	10,437	4,690	18.1	253,000	7,279	78	0.1	340	1,769

Notes:
kw - kilowatts
Btu/hr - British thermal units per hour
% - percent
ppm - parts per million
scfh - standard cubic feet per hour
mcf - 1,000 cubic feet
-- - reading not collected/not applicable'
* - New flow meter was installed

TABLE 2

OPERATIONS AND MAINTENANCE DATA
PINE RIVER
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

Date	System Status Upon Arrival	Blower (hrs)	Differential hrs	Blower Inlet Vacuum (" wc)	Calculated Methane Flow Rate (cfh)	Calculated Cumulative Methane Recovered (mcf)	Electric Meter (kW-h)	Methane (%)	Oxygen (%)
05/22/09	OFF	--	0	1	807	--	16	35	OFF
05/27/09	OFF	11	11	1	1,015	11	17	44	OFF
05/29/09	ON	60	49	1	600	40	39	26	OFF
06/15/09	OFF	440	380	1	807	347	293	35	3.21
06/23/09	ON	627	187	1	992	533	372	43	5.67
07/07/09	ON	963	336	1	969	858	425	42	3.86
07/22/09	OFF	1,306	343	1	530	1,040	662	23	2.76
07/24/09	--	1,354	48	1	--	--	--	--	--
08/05/09	OFF	1,363	9	1	1,015	1,049	686	44	7.57
08/14/09	OFF	1,368	5	1	738	1,053	698	32	3.98
09/02/09	OFF	1,500	132	1	258	1,087	1,056	11.2	3.35
09/08/09	ON	1,540	40	1	512	1,107	1,064	22.2	2.81
09/21/09	OFF	1,556	16	1	909	1,122	1,071	39.4	3.52
10/05/09	OFF	1,567	11	1	849	1,131	1,092	36.8	4
10/23/09	--	1,568	1	1	567	1,132	--	24.6	6.18
10/27/09	OFF	--	0	1	553	1,132	--	24	5.8
11/05/09	ON	1,775	207	1	392	1,213	--	17	6.54
11/05/09	ON	1,777	2	7	700	1,214	--	33	11
11/06/09	ON	1,797	20	7	603	1,226	--	28.4	4
11/12/09	ON	1,942	145	7	577	1,310	1,142	27.2	2.42
11/19/09	ON	1,988	47	7	594	1,338	1,188	28	3.56
12/01/09	OFF	2,167	179	7	441	1,417	1,522	20.8	5.61
12/16/09	OFF	2,224	56	7	815	1,463	2,104	38.4	4.6
12/29/09	OFF	2,245	21	1	--	--	2,641	--	--
01/12/10	OFF	2,245	0	8	986	1,463	3,120	48.6	4.3
01/27/10	OFF	2,267	22	1	--	--	3,610	--	--

TABLE 2

OPERATIONS AND MAINTENANCE DATA
PINE RIVER
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

Date	System Status Upon Arrival	Blower (hrs)	Differential hrs	Blower Inlet Vacuum (" wc)	Calculated Methane Flow Rate (cfh)	Calculated Cumulative Methane Recovered (mcf)	Electric Meter (kW-h)	Methane (%)	Oxygen (%)
05/21/10	RESTART	2,375	108	30	20	1,465	3,701	20.8	7.06
05/28/10	ON	2,648	273	26	8	1,467	3,768	10	10.4
06/04/10	ON	2,816	168	27	11	1,469	3,836	14.2	4.35
06/11/10	ON	3,504	856	25	21	1,487	3,904	18	1.67
06/24/10	ON	4,426	922	25	3	1,489		7.8	2.01
06/28/10	ON	5,445	1,020	25	11	1,500	4,073	6.4	1.82
06/29/10	ON	5,864	419	25	3	1,501		6.8	1.8
08/09/10	ON	6,374	510	25	11	1,507	4,455	7.4	1.12
09/21/10	OFF	6,620	246	20	24	1,512		5.2	

Notes:
hrs - hours
" wc - inches water column
cfh - cubic feet per hour
mcf - 1,000 cubic feet
kW-h - kilowatt-hours
% - percent
< - less than

FIGURES

LEGEND

- DIAGONAL COLLECTION WELL
- VAULT
- Extended Methane Collection (20 mil barrier)
- Process Equipment Footprint
- Overhead Electrical Line

2009 Methane Flux Results (mole/m^2/day)

- 0.00000
- 0.00001 - 0.10000
- 0.10001 - 0.50000
- 0.50001 - 1.00000
- 1.00001 - 10.00000
- 10.00001 - 50.00000
- 50.00001 - 100.00000
- 100.00001 - 1175.00000
- 20 mil Impervious Membrane
- Parcel Boundary & Owner (white)
- Stressed Vegetation

Piping

- 2" SCH 40 PVC
- 2" SCH 80 PVC
- 3" SCH 40 PVC
- 3" SCH 80 PVC
- 4" ADS Corrugated Piping (Slotted)
- 4" ADS Corrugated Piping (Solid)
- 1" HDPE

Geology

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

0 50 100
Feet

N

FIGURE 1
MITIGATION SYSTEM LAYOUT
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
DURANGO, COLORADO
COLORADO OIL AND GAS CONSERVATION COMMISSION

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LEGEND

- Visible Methane Seeps in Surface Water
- Gas Monitoring Probes
- Power Pole
- Process Equipment Footprint
- Stressed Vegetation
- Parcel Boundary & Owner (white)
- Power Line

2009 Methane Flux Results (mole/m^2/day)

- 0.00000
- 0.00140 - 0.10000
- 0.16615 - 0.50000
- 0.52514 - 1.00000
- 1.09969 - 10.00000
- 10.98770 - 50.00000
- 100.00000
- 1175.00000

Piping

- 3" SCH 40 PVC
- 4" ADS Corrugated Piping (Slotted)
- 4" ADS Corrugated Piping (Solid)

Geology

- Fruitland Formation (Kf)
- Fruitland Formation Tongue (Kft)
- Kirtland Formation (Kk)
- Pictured Cliffs Formation (Kpc)
- Pictured Cliffs Formation Tongue (Kpct)
- Quaternary Alluvium (Qa)
- Quaternary Gravel (Qg)

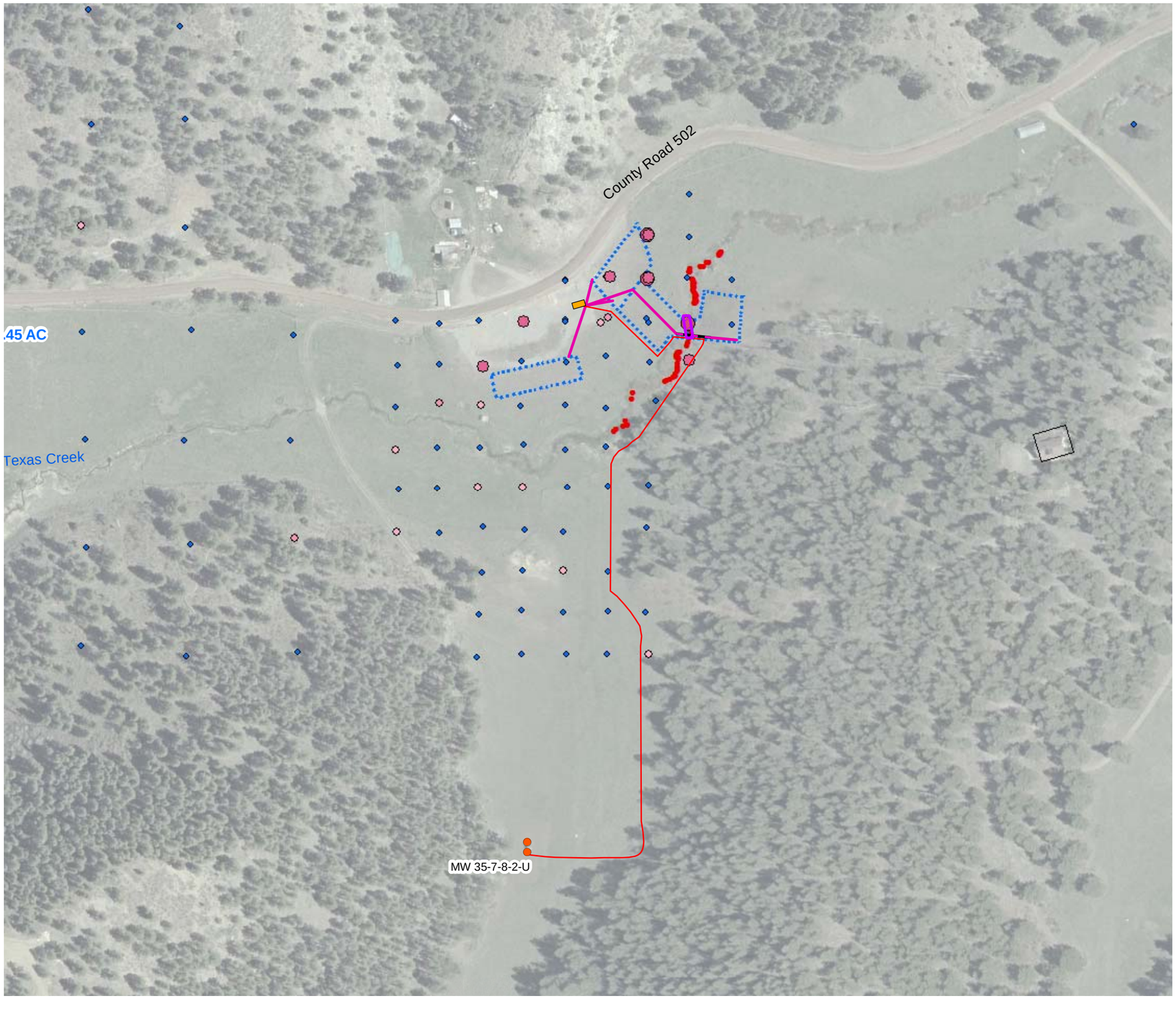
0 60 120
Feet

N

FIGURE 2
MITIGATION SYSTEM LAYOUT
PINE RIVER
4M OUTCROP MITIGATION PROJECT
DURANGO, COLORADO

COLORADO OIL AND GAS CONSERVATION COMMISSION

P:\COGCC\GIS\MXD\4M MITIGATION\App2_CH4_FLUX_PINE_RIVER_07032008_zoom1.mxd



LEGEND

- COGCC MONITORING WELL
- 2006 VISIBLE METHANE SEEPS IN SURFACE WATER
- Extended Methane Collection (20 mil barrier)
- Process Equipment Footprint
- 1" HDPE
- 3" SCH 40 PVC
- 3" SCH 80 PVC
- 20 MIL IMPERVIOUS MEMBRANE

2009 Methane Flux Results (mole/m^2/day)

- 0.00000
- 0.00001 - 0.10000
- 0.10001 - 0.50000
- 0.50001 - 1.00000
- 1.00001 - 10.00000
- 10.00001 - 50.00000
- 50.00001 - 100.00000
- 100.00001 - 1175.00000

0 200 400
Feet

N

FIGURE 3
MONITORING WELL PIPING
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
DURANGO, COLORADO
COLORADO OIL AND GAS CONSERVATION COMMISSION

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FIGURE 4
SOUTH FORK TEXAS CREEK METHANE CONCENTRATIONS
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

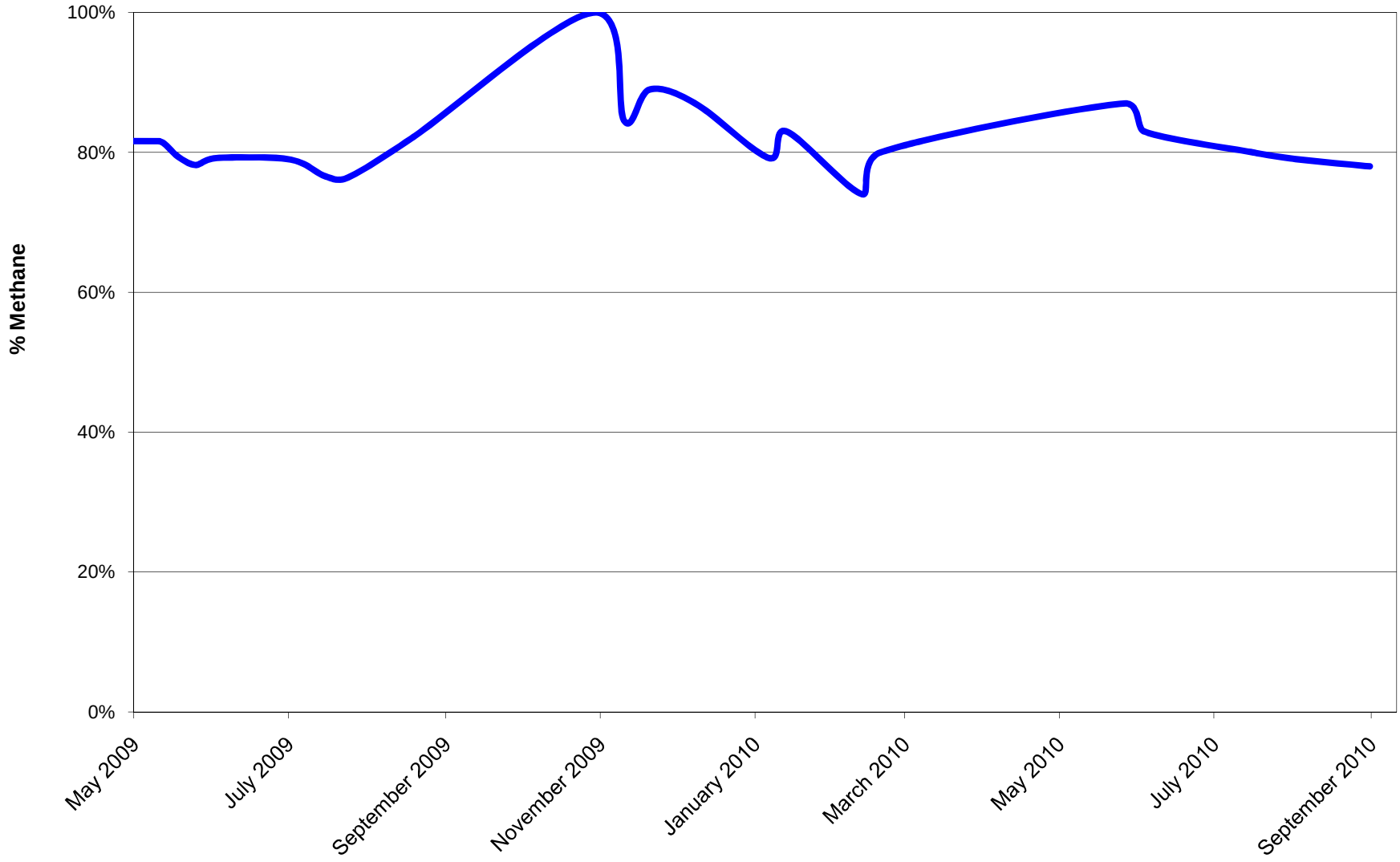


FIGURE 5
PINE RIVER METHANE CONCENTRATIONS
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

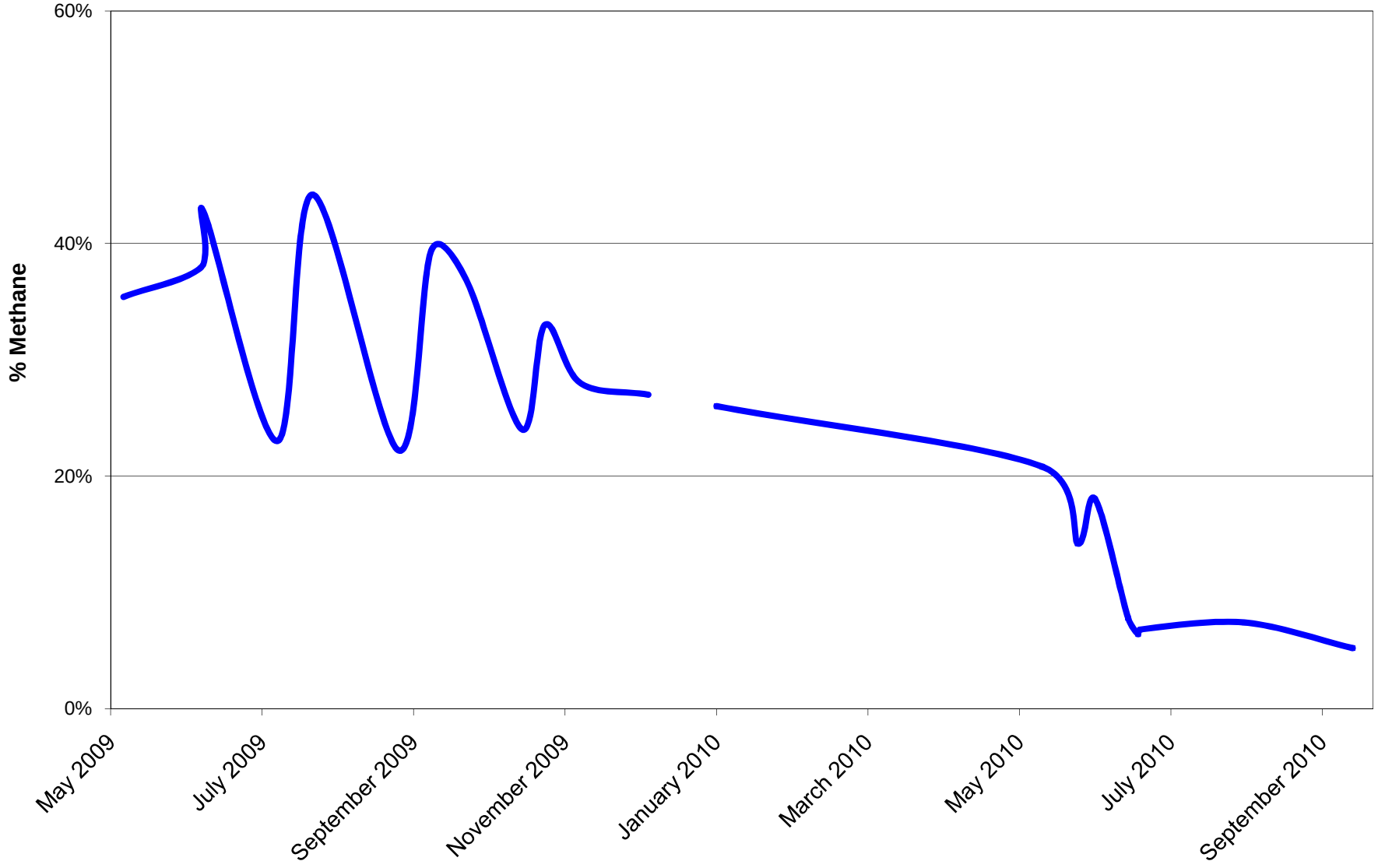


FIGURE 6
SOUTH FORK TEXAS CREEK METHANE GAS FLOW
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION

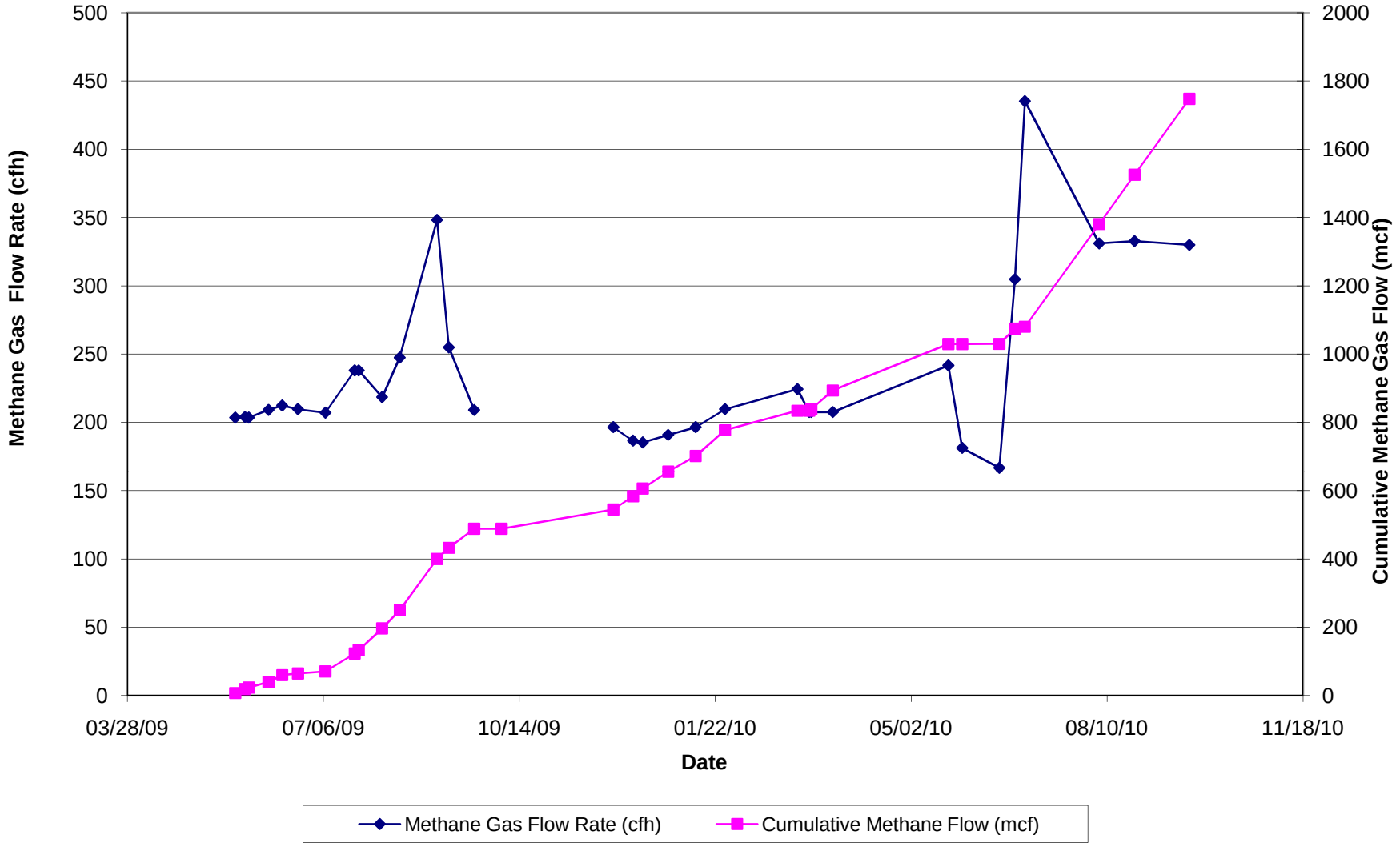
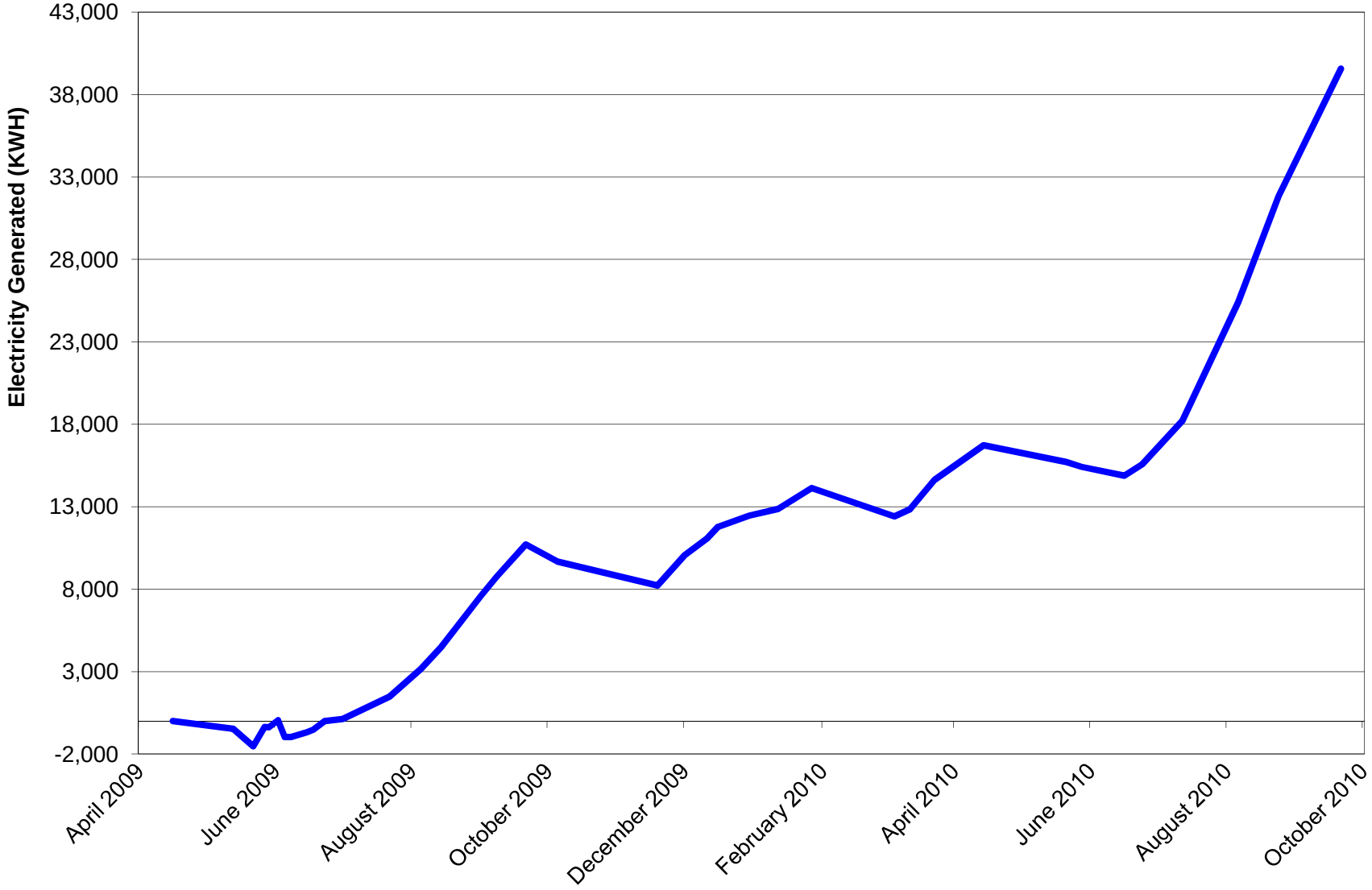


FIGURE 7
SOUTH FORK TEXAS CREEK
SURPLUS ELECTRICITY GENERATED
4M OUTCROP MITIGATION PROJECT
COLORADO OIL AND GAS CONSERVATION COMMISSION



ATTACHMENT 1

AS-BUILT DRAWINGS
METHANE MITIGATION SYSTEM EXPANSION

METHANE MITIGATION SYSTEM EXPANSION
4M OUTCROP MITIGATION PROJECT–SOUTH FORK TEXAS CREEK
LA PLATA COUNTY, COLORADO

COLORADO OIL AND GAS CONSERVATION COMMISSION

G100	TITLE SHEET AND INDEX OF DRAWINGS
C110	MITIGATION SYSTEM EXPANSION
C112	TEMPORARY CREEK DIVERSION PIPING
C114	VAPOR BARRIER INSTALLATION AT CREEK CROSSING
C116	WELL POINT INSTALLATION DETAILS
C118	HEADER PIPING AT CREEK CROSSING

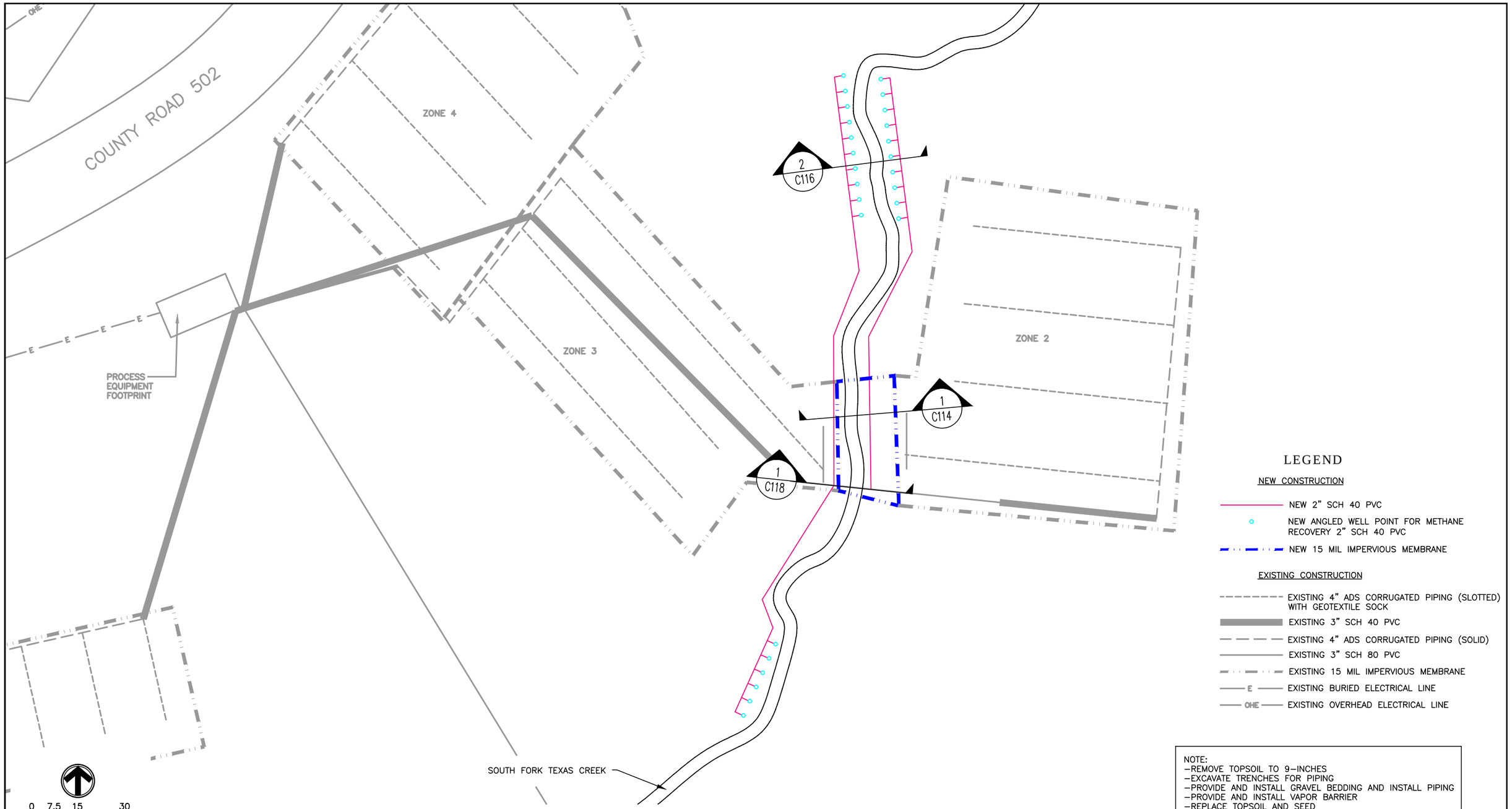
NO.	REVISIONS	BY	APPROVED	DATE
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	4/22/10
DRAWN	GVM	4/22/10
CHECKED	CES	4/22/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\G100		
SCALE: AS SHOWN		

LT Environmental, Inc.
Denver, Colorado
Compliance • Engineering • Remediation

TITLE SHEET AND INDEX OF DRAWINGS
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

PROJECT LOCATION: LA PLATA COUNTY, COLORADO	PROJECT NO. OGCC1001	
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. C	DWG NO. G100



NOTE:
–REMOVE TOPSOIL TO 9–INCHES
–EXCAVATE TRENCHES FOR PIPING
–PROVIDE AND INSTALL GRAVEL BEDDING AND INSTALL PIPING
–PROVIDE AND INSTALL VAPOR BARRIER
–REPLACE TOPSOIL AND SEED

NO.	REVISIONS	BY	APPROVED	DATE
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	4/22/10
DRAWN	GVM	4/22/10
CHECKED	CES	4/22/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\ C100		
SCALE: AS SHOWN		

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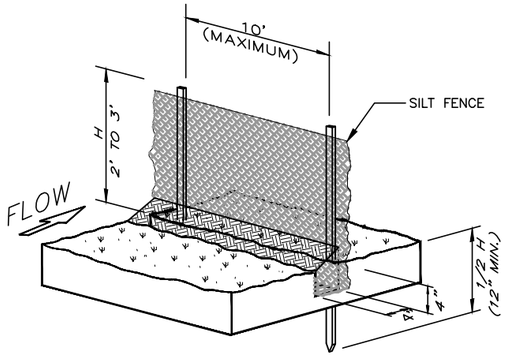
MITIGATION SYSTEM EXPANSION
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

PROJECT LOCATION: LA PLATA COUNTY, COLORADO	PROJECT NO. OGCC1001	
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. C	DWG NO. C110

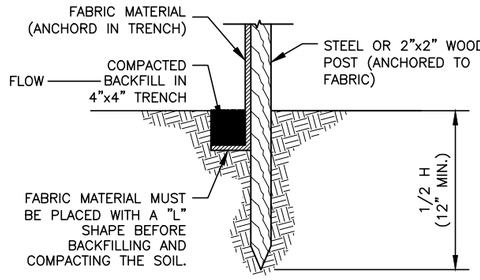
SILT FENCE
NOT TO SCALE

DEFINITION
A TEMPORARY SEDIMENT CONTROL CONSISTING OF A FILTER FABRIC STRETCHED ACROSS AND ATTACHED TO SUPPORTING POSTS AND ENTRENCHED.

PURPOSE
TO MINIMIZE SEDIMENT LADEN SHEET FLOW FROM LEAVING DISTURBED AREAS.



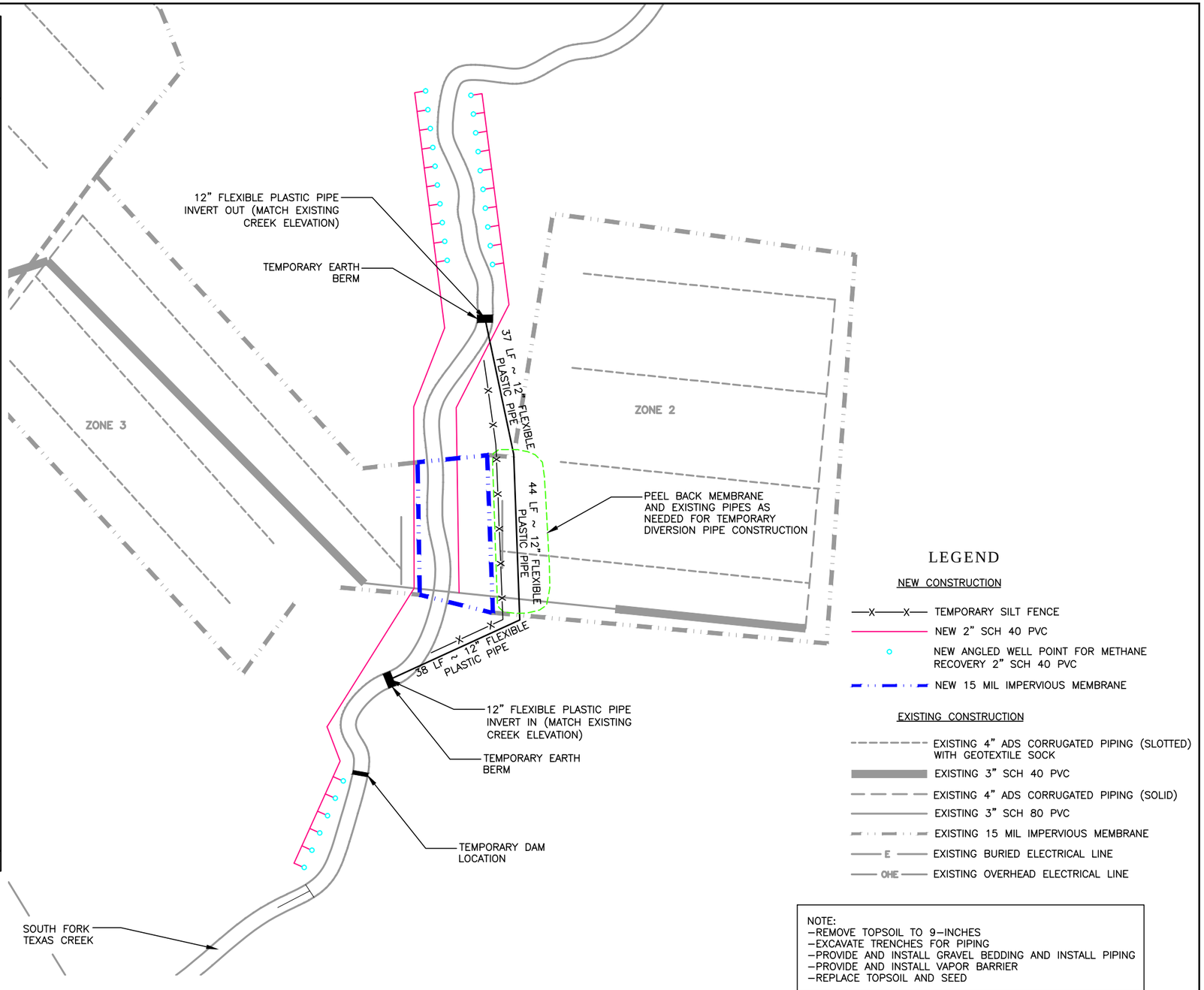
SILT FENCE INSTALLATION



SILT FENCE TRENCH SECTION

NOTES
1. SILT FENCING MUST NOT BE INSTALLED WHERE CONCENTRATED FLOWS WILL OCCUR (SUCH AS DRAINAGE CHANNELS, AROUND AREA DRAINS, OR UPSTREAM/DOWNSTREAM OF CULVERTS) UNLESS PROPERLY SUPPORTED.
2. MAXIMUM DRAINAGE AREA SHALL NOT EXCEED 0.25 ACRES PER 100-FT FENCE LENGTH. MAXIMUM SLOPE LENGTH ABOVE THE FENCE SHALL NOT EXCEED 100 FT.

DETAIL BASED ON URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CRITERIA MANUAL, VOL III, 1999



LEGEND

NEW CONSTRUCTION
- TEMPORARY SILT FENCE
- NEW 2" SCH 40 PVC
- NEW ANGLED WELL POINT FOR METHANE RECOVERY 2" SCH 40 PVC
- NEW 15 MIL IMPERVIOUS MEMBRANE

EXISTING CONSTRUCTION
- EXISTING 4" ADS CORRUGATED PIPING (SLOTTED) WITH GEOTEXTILE SOCK
- EXISTING 3" SCH 40 PVC
- EXISTING 4" ADS CORRUGATED PIPING (SOLID)
- EXISTING 3" SCH 80 PVC
- EXISTING 15 MIL IMPERVIOUS MEMBRANE
- E — EXISTING BURIED ELECTRICAL LINE
- OHE — EXISTING OVERHEAD ELECTRICAL LINE

NOTE:
- REMOVE TOPSOIL TO 9-INCHES
- EXCAVATE TRENCHES FOR PIPING
- PROVIDE AND INSTALL GRAVEL BEDDING AND INSTALL PIPING
- PROVIDE AND INSTALL VAPOR BARRIER
- REPLACE TOPSOIL AND SEED

0 7.5 15 30
FEET

NO.	DESCRIPTION	BY	APPROVED	DATE
	REVISIONS			
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	4/22/10
DRAWN	GVM	4/22/10
CHECKED	CES	4/22/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\ C112		
SCALE: AS SHOWN		

LT Environmental, Inc.
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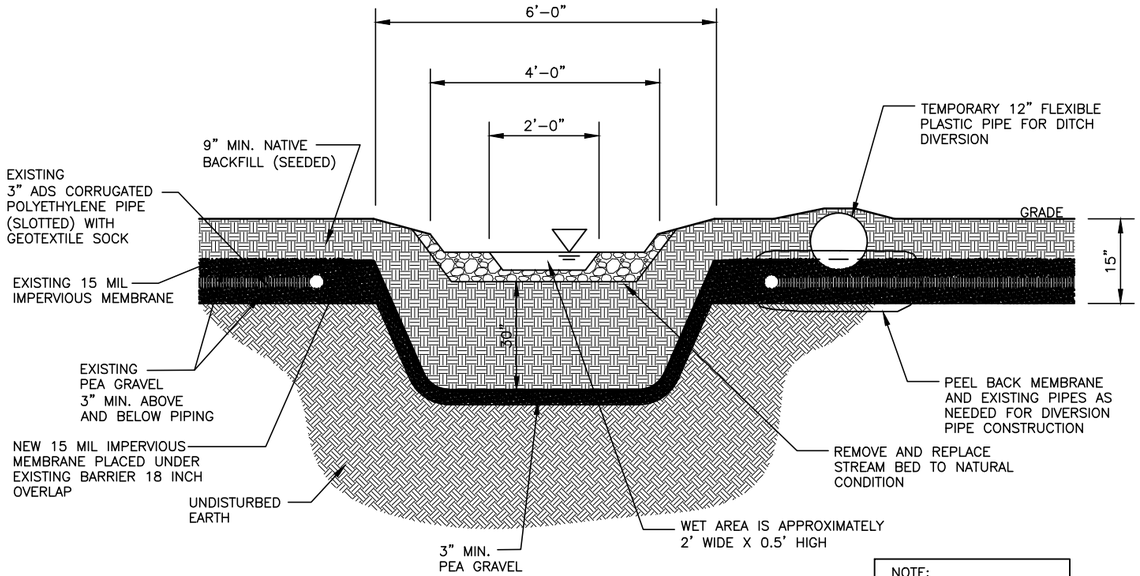
TEMPORARY CREEK DIVERSION PIPING
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

PROJECT LOCATION: LA PLATA COUNTY, COLORADO	PROJECT NO. OGCC1001	
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. C	DWG NO. C112



1
C114

HORIZONTAL VENT LINE AT CREEK CROSSING

SCALE: NOT TO SCALE

NO.	DESCRIPTION	BY	APPROVED	DATE
	REVISIONS			
B	AS–BUILT	MAE	CES	6/30/10
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	6/30/10
DRAWN	GVM	6/30/10
CHECKED	CES	6/30/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\C114		
SCALE: AS SHOWN		

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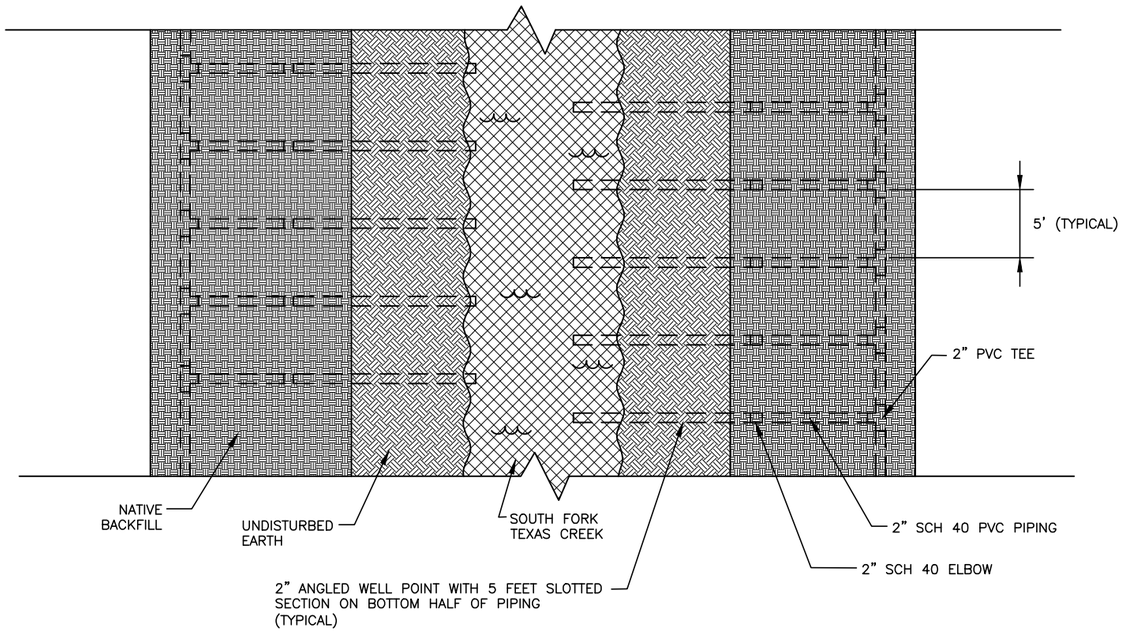
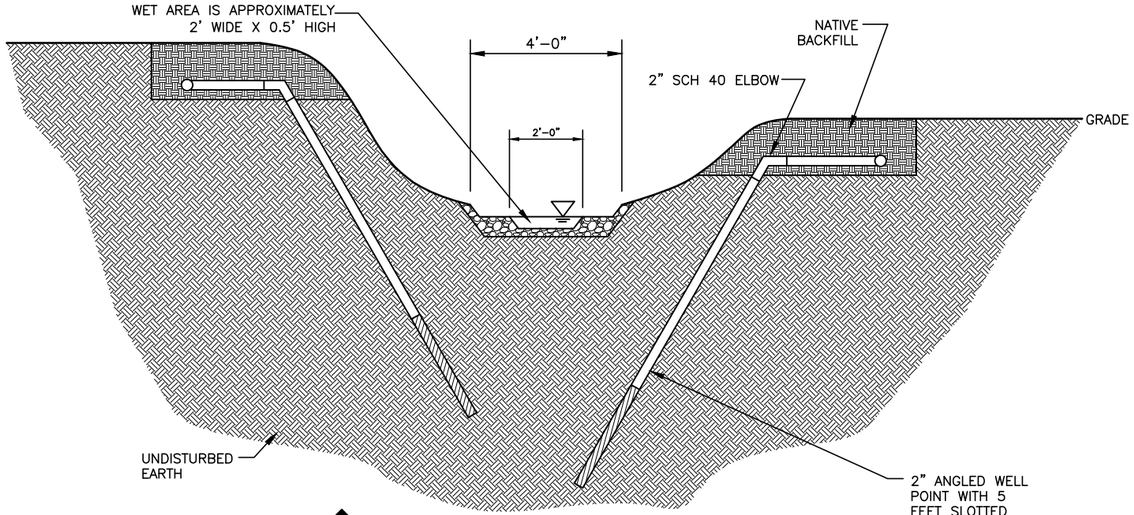
VAPOR BARRIER INSTALLATION AT CREEK CROSSING
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

PROJECT LOCATION: LA PLATA COUNTY, COLORADO	PROJECT NO. OGCC1001	
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. B	DWG NO. C114



1 / C116 **HEADER PIPING AT CREEK CROSSING**

SCALE: NOT TO SCALE



2 / C116 **WELL POINT COLLECTION PIPING SECTION**

SCALE: NOT TO SCALE

NO.	DESCRIPTION	BY	APPROVED	DATE
	REVISIONS			
B	AS-BUILT	MAE	CES	6/30/10
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	6/30/10
DRAWN	GVM	6/30/10
CHECKED	CES	6/30/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\ C101		
SCALE: AS SHOWN		

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TYPICAL WELL POINT INSTALLATION DETAILS
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

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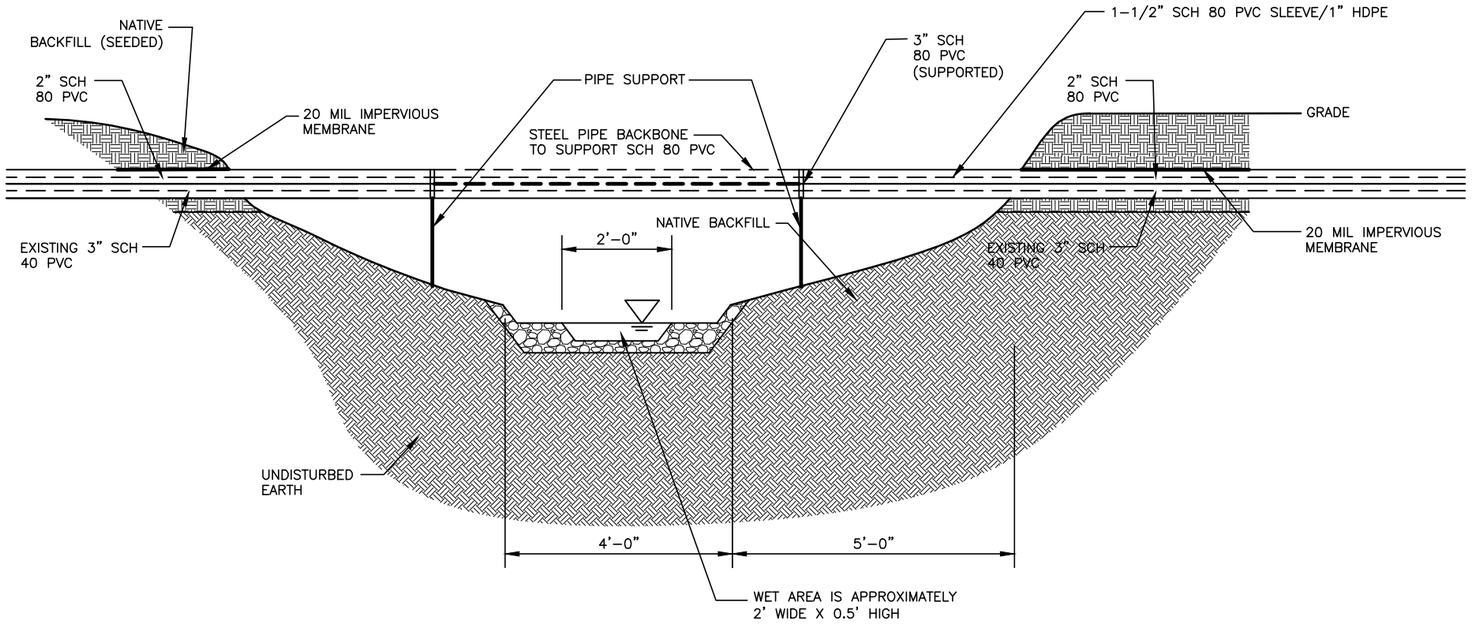
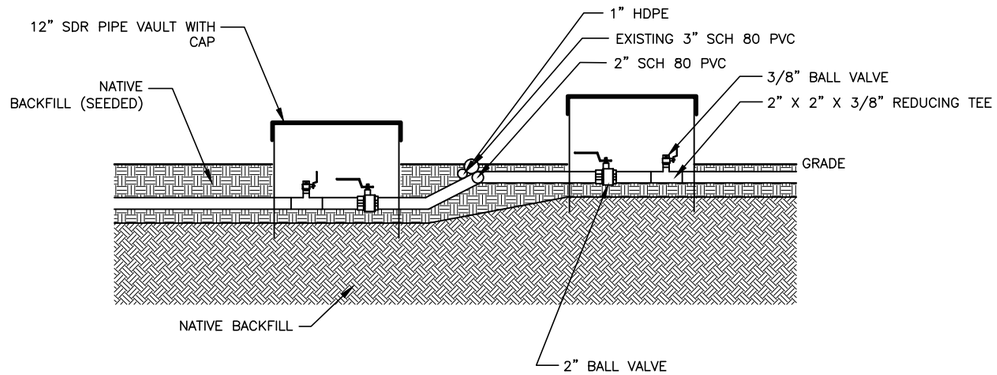
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. B	DWG NO. C116



1 C118 **HEADER PIPING AT CREEK CROSSING**
SCALE: NOT TO SCALE



2 C118 **VAULT PIPING**
SCALE: NOT TO SCALE

NO.	DESCRIPTION	BY	APPROVED	DATE
	REVISIONS			
B	AS-BUILT	MAE	CES	6/30/10
A	PRELIMINARY DESIGN	CES	CES	4/22/10

DRAWING INFORMATION	BY	DATE
DESIGNED	CES	6/30/10
DRAWN	GVM	6/30/10
CHECKED	CES	6/30/10
REVIEWED	–	–
APPROVED	–	–
FILE: OGCC1001\C101		
SCALE: AS SHOWN		

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HEADER PIPING AT CREEK CROSSING
SOUTH FORK TEXAS CREEK
4M OUTCROP MITIGATION PROJECT
LA PLATA COUNTY, COLORADO

PROJECT LOCATION: LA PLATA COUNTY, COLORADO	PROJECT NO. OGCC1001	
CLIENT: COLORADO OIL AND GAS CONSERVATION COMMISSION	REV NO. B	DWG NO. C118