

PCW 27-11 7 257518&lt;

STATE OF COLORADO  
OIL AND GAS CONSERVATION COMMISSION  
Department of Natural Resources

MAY 22 1996

LEA: Historical E 6/27/00 KD

## APPLICATION FOR PERMIT TO USE EARTHEN PIT

## 1. CHECK ONE

NEW PIT

☒

EXISTING PIT

RECEPTACLE

OTHER

## 2. NAME OF OPERATOR

C.I.S. Oil and Gas #12585

## 3. ADDRESS OF OPERATOR

Po. box 884 Chanute, KS 66720 1-800-467-8676

## 4. LEASE NAME

P.C.W. 23-27

## 5. PRODUCING FORMATION(S)

Vermejo Coal

## 6. PRODUCING OIL, COND., GAS

Gas

## 7. LOCATION-nearest 10 acres, 1/4 Sec. T. R.

T. 34S. R. 65W. Sec. 27NE, SW

## 8. COUNTY

Las Animas

## 9. FIELD NAME

Wildcat

## 10. SIZE OF PIT(S) or RECEPTACLE

1. Length 45' Ft. Width 25' Ft. Depth 12' Ft. 2. Length Ft. Width Ft. Depth Ft.

## 11. CAPACITY

## 12. ESTIMATED INFLOW

13. DISTANCE IN FEET TO CLOSEST  
STEAM, CREEK, POND, IRRIGA-  
TION DITCH

1. PIT 1,776 BBLs. 2. PIT BBLs.

150

BBLs/DAY

creek 1,250'

Ft.

## 14. MAXIMUM FLUID LEVEL

ABOVE AVG. GROUND LEVEL 0 Ft.

## 15. SURFACE SOIL TYPE

Shawa Loam

## 16. DISPOSAL OF PIT CONTENT

EVAPORATION

☒

HAULED (PIT LOC.)

DISPOSAL WELL (LOC.)

## 17. TYPE OF SEALING MATERIAL (including specifications)

produced water fines

## 18. ADDITIONAL INFORMATION (By attachment include detailed plan and drawing of operation, chemical analysis of produced water, maps, logs, retaining pits or receptacles and other information as may be required by Rules 328 and 329 of the Rules and Regulations of the Oil and Gas Conservation Commission.)

See attached information per Rule 904

## 19. I HEREBY CERTIFY THAT THE FOREGOING IS TRUE AND CORRECT

SIGNED

*Randy Moran*

TITLE

V.P.

DATE

5-21-96

THIS SPACE FOR COMMISSION USE

APPROVED BY

*J. Amis*

TITLE

EPS

DATE

SEP 09 1996

CONDITIONS OF APPROVAL, IF ANY:

PIT PERMIT  
APPROVED

00848452

Maintain a minimum of 2 feet of freeboard Rule 902c

**Long Canyon Pond Site Project  
Township 34 South & Range 65 West  
Las Animas County, Colorado**

**Water Retention Ponds**

**Pond Capacity - Dewatering wells through 3 years time**

<u>Pond Engineering</u>		
Pond Capacity 1,776 Bbls	Evaporation Rate 11 Bbls/Day	Percolation Rate 67 Bbls/Day
Drlg & Comp. Wells 50 Bbls/Day		
Water Input Rate 150 Bbls/Day	Water Accumulation 22 Bbls/Day	Days of Capacity 80

**Pond Capacity Calculations**

0.0148 X length in feet X width in feet = barrels per inch of depth  
0.0833 X length in feet X width in feet = cubic feet per inch of depth  
50 feet in length  
25 feet in width  
96 inches in depth

**Percolation Calculations**

clay loam soil at the footslopes aid in pond construction as directed by Soil Conservation Service (SCS)  
estimate 25% clay (pre saturation percolation rates may be as high as .2 inches per hour)  
natural soils work well for stable dam and slope construction  
Continued saturation swells clays and reduces permeability & percolation rates through time  
3.6 inches per day percolation (SCS information along with Field Observations)

**Evaporation Calculations**

semi arid environment with majority of days sunny, dry and windy  
0.6 inches per day of evaporation is estimated (peak evaporation days exceed .9 inches per day)

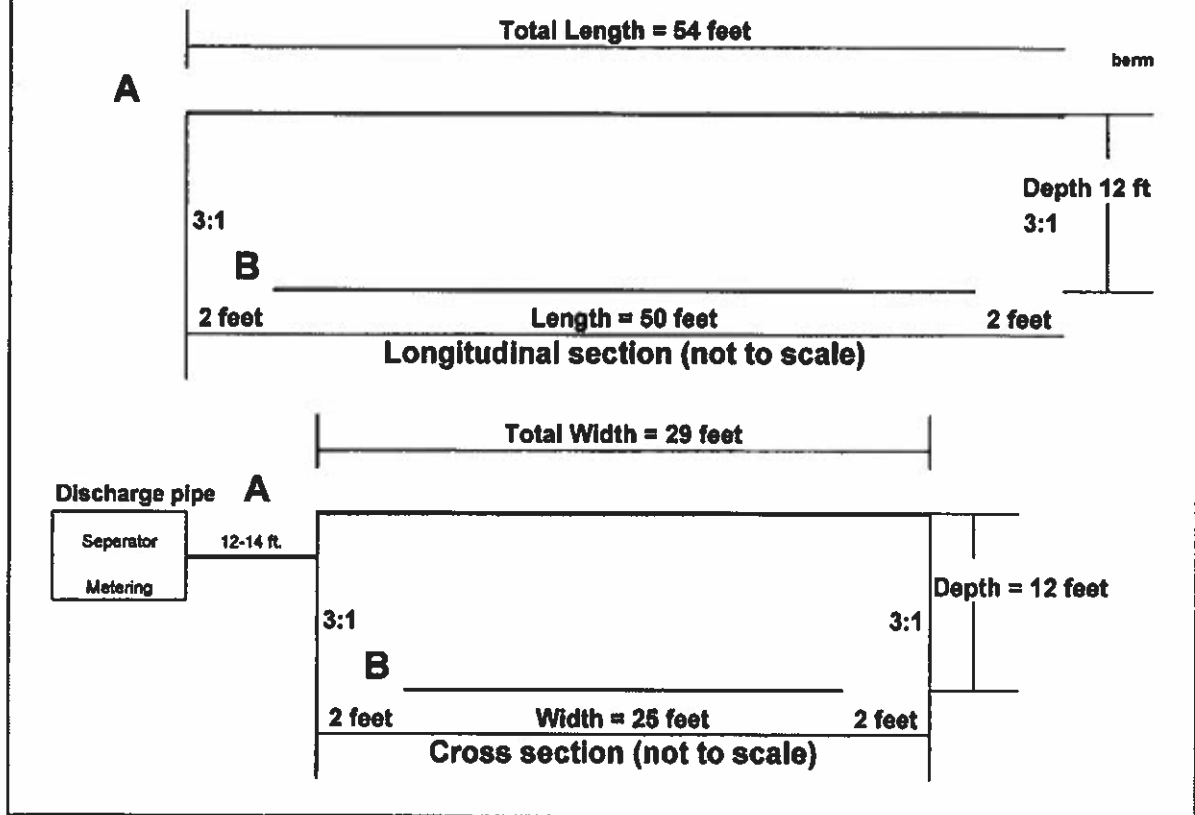
**Water Usage Calculations**

Usage of produced waters  
1,500 Barrels per month for drilling and completion of field development wells

**Water Volumes Input Calculations**

Maximum potential for pit design is based 1 pit per well location  
Present production based on Long Canyon wells first years average production rate of 100 B/day  
water production declines at rates greater than 25% per annum  
Within 5 years coal seams become "dewatered" to rates less than 25 B/day  
Pit site will be reclaimed at the end of discharge use  
150 Barrels of water is estimated initial discharge rate to pit daily (pump capacity of 175 bwpd)

**Well Name & Location**  
**PCW 27-11**  
**Township 34 South & Range 65 West**  
**Las Animas County, Colorado**  
**Sections of Production Pond**



Surface Elevation 6660 ft.  
Average Pit Base Elevation 6648 ft.

Distance from Wellhead 20 ft.  
Distance from Road 175 ft.

THORNTON DRILLING COMPANY  
132 SE CHOLWILL  
BARTLESVILLE, OK 74006

Residence  
534-1987

Operator:	Well No.	Lease	Loc.	1/4	1/4	1/4	Sec.	Twp.	Rge.
C.I.S. Oil & Gas	27-11	P.C.W.					27	34S	65W
County:	State.	Type/Well	Depth:	Hours.	Date Started	Date Completed.			
Las Animas	Colorado		843 ft.		02-08-96	02-09-96			
Driller:	Driller:	Casing Used:	796" of 7"						
J. Cunningham	L. Atchison	Cement Used:							
					Rig No				
From	Formation	From	To	Formation	From	To	Formation		
0	Overburden	197	215	Shale	413	419	Coal		
12	Mixed Sand & Clay	215	220	Sdy-Shale	419	446	Shale		
21	Coal	220	225	Shale	446	448	Sand		
24	Shale	225	232	Sdy-Shale	448	450	Sdy-Shale		
29	Sdy-Shale	232	234	Shale	450	453	Coal		
42	Sand	234	235	Coal	453	455	Shale		
47	Sdy-Shale	235	247	Shale	455	456	Shale		
51	Shale	247	248	Coal	456	458	Coal		
60	Coal	248	257	Shale	458	463	Shale		
62	Shale	257	258	Sand	463	466	Coal		
63	Coal	258	259	Shale	466	467	Shale		
64	Sdy-Shale	259	267	Sand	467	469	Coal		
72	Sand	267	281	Sdy-Shale	469	476	Shale		
81	Coal	281	334	Shale	476	478	Coal		
82	Shale	334	335	Coal	478	481	Shale		
83	Coal	335	364	Shale	481	482	Coal		
84	Shale	364	367	Coal	482	517	Sdy-Shale		
90	Coal	367	379	Shale	517	524	Sand		
93	Shale	379	390	Sand wet	524	538	Sdy-Shale		
95	Sand	390	397	Sdy-Shale	538	555	Sand		
109	Sdy-Shale	397	401	Sand	555	558	Coal		
124	Shale	401	403	Coal	558	563	Shale		
127	Coal	403	407	Sdy-Shale	563	564	Sdy-Shale		
128	Shale	407	409	Coal	564	594	Sand		
142	Coal	409	410	Shale	594	597	Coal		
144	Shale	410	411	Sand	597	619	Sand/Shale laminated		
160	Sdy-Shale	411	413	Coal	619	627	Coal		

Office Phone  
335-0711

THORNTON DRILLING COMPANY  
132 SE CHOLWELL  
BARTLESVILLE, OK 74006

Residence  
534-1987

Operator:	Well No.	Lease	Loc.	1/4	1/4	1/4	Sec	Twp	Rge
C.I.S. Oil & Gas	27-11 (cont'd)	P.C.W.						27	34S 65W
County:	State:	Type/Well	Depth:	Hours	Date Started:	Date Completed:			
Las Animas	Colorado		843 ft		02-08-96	02-09-96			
Driller:	Driller:	Casing Used:	Cement Used:						
J. Cunningham	L. Atchison	79'6" of 7"							
From	To	Formation	From	To	Formation	From	To	Formation	
627	630	Shale							
630	639	Sand							
639	641	Coal							
641	688	Sdy-Shale laminated							
688	695	Coal							
695	700	Shale							
700	702	Sand/Strate laminated							
702	704	Coal							
704	709	Sdy-Shale							
709	710	Coal							
710	716	Sand							
716	717	Coal							
717	843	Sand							
		Gas test @ 843' 260,000 MCF							
	843	TD							



PETROLEUM LABORATORY  
AND GAS ENGINEERING  
401 N.E. 46th Oklahoma City, Ok. 73105-3338  
(405) 528-8255

Laboratory Certification No. 8306

LABORATORY REPORT NO. 75427

JUNE 27, 1995

PROJECT INFORMATION

SAMPLE I.D.  
LAB SAMPLE I.D.  
TYPE OF SAMPLE  
SAMPLED BY  
DATE SAMPLED  
TIME SAMPLED  
DATE RECEIVED  
DATE RUN

PSEC, INC.  
LONG CAYON  
27-13 WELLHEAD  
5268S 1  
WATER  
PSEC  
JUNE 24, 1995  
4:00 PM  
JUNE 26, 1995  
JUNE 27, 1995

EPA METHOD	DETECTION LIMITS	PARAMETER	REGULATED LIMITS*	SAMPLE RESULTS
8020	0.2 ug/l	BENZENE		ND
8020	0.2 ug/l	TOLUENE		ND
8020	0.2 ug/l	ETHYL BENZENE		ND
8020	0.2 ug/l	KYLENE		98
		SURROGATE (Trifluorotoluene) RECOVERY %		

QA/QC  
LAB BLANK

ND

ug/l Milligrams per Liter, equivalent to parts per million.  
ug/l Micrograms per Liter, equivalent to parts per billion.  
ND None Detected above stated detection limits.

\* EPA Regulated Limits — Check with Local Authorities for variations.

Second Column Verification run on request only! Unless OILAB receives prior notification, all sample material not consumed in analysis will be retained for a period of 30 days before disposal.

Randy Kitemiller  
Certified by:



PETROLEUM LABORATORY  
AND GAS ENGINEERING  
401 N.E. 46th Oklahoma City, Ok. 73105-3338  
(405) 528-8255

LABORATORY REPORT NO. 75427

WATER ANALYSIS

PSEC  
WELL #27-13 (AT WELLHEAD)

SEC 27 34S 65W  
LAS ANIHAS CO/CO

SAMPLED BY: PSEC  
DATE SAMPLED: 06-24-95  
DATE RUN 06-27-95  
COLOR BEFORE FILTRATION:  
COLOR AFTER FILTRATION:

COLORLESS  
COLORLESS

\*\*\*\* CHEMICAL CHARACTERISTICS \*\*\*\*

	mg/l
CALCIUM (Ca)	56
MAGNESIUM (Mg)	6.7
SODIUM (Na)	2,250
POTASSIUM (K)	2
BARIUM (Ba)	< 1
IRON (Fe)	0.8
SILICA (SiO <sub>2</sub> )	5
BICARBONATE (HCO <sub>3</sub> )	1,189
CARBONATE (CO <sub>3</sub> )	0
HYDROXIDE (OH)	0
SULFATE (SO <sub>4</sub> )	<1
CHLORIDE (Cl)	2,895

	mg/l
*P* ALKALINITY (AS CaCO <sub>3</sub> )	0
*M* ALKALINITY (AS CaCO <sub>3</sub> )	975
TOTAL HARDNESS (AS CaCO <sub>3</sub> )	168
TOTAL DISSOLVED SOLIDS	6,400

RESISTIVITY @ 77 DEG. F.	1.075
SPECIFIC GRAVITY @ 74 DEG. F.	1.010
PH VALUE	8.20

NOTES:

BICARBONATE AS CaCO<sub>3</sub> = 975

U.S. Department of Agriculture  
Soil Conservation Service

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NONTECHNICAL SOILS DESCRIPTION REPORT  
FOR DESCRIPTION CATEGORY - SOI

Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANIMAS COUNTIES

Map Symbol	Description
C11C	<p>LIMON-GAYNOR COMPLEX, 4 TO 12 PERCENT SLOPES This map unit is on foot slopes of plains and foothills. It is about 60 percent Limon soil and 30 percent Gaynor soil. Limon soils are on the lower part of foot slopes and Gaynor soils are on the upper part.</p> <p>The Limon soil is deep and well drained. It formed in alluvium on stream terraces and on foot slopes. Typically the soil is silty clay loam to a depth of 60 inches or more. Permeability is slow. Available water capacity is high but maybe effected by salinity on stream terraces. Effective rooting depth is 60 inches or more. Runoff is slow on terraces and rapid on foot slopes. The hazard of water erosion is high on slopes over 3 percent. Stream terraces are subject to rare flooding.</p> <p>The Gaynor soil is moderately deep and well drained. It formed in residuum on foot slopes and hilltops in the plains. Typically the soil is silty clay loam to a depth of 30 inches over shale. Some areas have a gravelly clay loam surface layer. Permeability is slow. Available water capacity is moderate to high. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is moderate to high.</p>
C3F	<p>SARUCHE-ROMBO COMPLEX, 35 TO 50 PERCENT SLOPES This map unit is on very steep side slopes of the foot hills. It is about 45 percent Saruche soil and 45 percent Rombo soil. Saruche soils are near the top of the side slopes and Rombo soils are in the middle and near the bottom of side slopes.</p> <p>The Saruche soil is shallow and well drained. It formed in residuum and colluvium from shale. Typically the surface is channery silty clay loam 4 inches thick. The underlying material is very shaly silty clay loam 12 inches thick. Permeability is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid and the hazard of water erosion is very high.</p> <p>The Rombo soil is moderately deep and well drained. It formed in colluvium and residuum from siltstone and shale. Typically the soil channery silty clay loam 34</p>



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NONTECHNICAL SOILS DESCRIPTION REPORT  
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Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANI  
S COUNTIES

Map  
Symbol

Description

inches thick over shale. Shale fragments in the soil increase with depth. Permeability is slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is high.

CeB

MANZANO LOAM, 0 TO 2 PERCENT SLOPES The Manzano soil is deep and well drained. It formed in alluvium on stream terraces, foot slopes, and in drainageways. Typically the surface is loam 6 inches thick. The underlying material is loam or clay loam to a depth of 60 inches or more. The soil is dark with high amounts of organic matter throughout. Permeability is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the erosion hazards are slight.

CeD

SHAWA LOAM, 5 TO 15 PERCENT SLOPES The Shawa soil is deep and well drained. Typically the surface layer is loam 31 inches thick. The underlying material is loam or clay loam to a depth of 60 inches or more. Permeability is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow to medium and the hazard of water erosion is high.

M11D

TRAG LOAM, 3 TO 9 PERCENT SLOPES The Trag soil is deep and well drained. It formed in alluvium on fans and valley side slopes. Typically the surface is loam 6 inches thick. The subsoil is clay loam and sandy clay loam 30 inches thick. The substratum is loam to a depth of 60 inches or more. Permeability is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate to high. Much of this soil is irrigated hayland in the Apishapa drainage.

P3E

FUERA-DARGOL-VAMER COMPLEX, 10 TO 45 PERCENT SLOPES This map unit is on steep mountain side slopes and ridgetops. It is about 35 percent Fuera soils, 30 percent Dargol soils and 20 percent Vamer soils. The Dargol soil is on side slopes below ridges. The Fuera soil is on north-facing side slopes and foot slopes. The Vamer soil is on ridgetops.

NONTECHNICAL SOILS DESCRIPTION REPORT  
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Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANIMAS COUNTIES

Map Symbol	Description
	<p>The Fuera soil is deep and well drained. It formed in residuum and colluvium from shale. Typically the surface is cobbly loam 9 inches thick. The subsoil is cobbly clay 36 inches thick. The substratum is cobbly clay or clay loam to a depth of 60 inches or more. Permeability is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is very high.</p>
	<p>The Dargol soil is moderately deep and well drained. It formed in residuum from shale. Typically the surface is stony loam 5 inches thick. The subsoil is clay 23 inches thick over shale. Permeability is very slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches. Runoff is very rapid and the hazard of water erosion is very high.</p>
	<p>The Vamer soil is shallow and well drained. It formed in residuum from interbedded shale, siltstone and sandstone. Typically the surface is stony loam 4 inches thick. The subsoil is clay loam and clay 12 inches thick over hard sandstone. Permeability is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is slight.</p>
<u>PJE</u>	<p><u>LOUVIERS-SARCILLO-TRAG COMPLEX, 3 TO 25 PERCENT SLOPES</u> This map unit is on very steep side slopes and ridgetops of the foot hills. It is about 40 percent Louviers soils, 30 percent Sarcillo soils, and 20 percent Trag soils. Louviers soils are on very steep side slopes. Sarcillo soils are on ridgetops and Trag soils are on foot slopes.</p> <p>The Louviers soil is shallow and well drained. It formed in residuum on very steep foothill side slopes. Typically the surface is channery clay loam 4 inches thick. The underlying material is clay loam grading to shaly clay 12 inches thick over shale. Permeability is slow. Available water capacity is low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid and the hazard of water erosion is very high.</p> <p>The Sarcillo soil is shallow and well drained. It</p>

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Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANI  
LAS COUNTIES

Map Symbol	Description
	<p>formed in reiduum and colluvium from sandstone and shale. Typically the surface is loam 5 inches thick. The subsoil is clay loam and clay 11 inches thick over hard sandstone. Permeability is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is very high.</p> <p>The Trag soil is deep and well drained. It formed in alluvium on fans and valley side slopes. Typically the surface is loam 6 inches thick. The subsoil is clay loam and sandy clay loam 30 inches thick. The substratum is loam to a depth of 60 inches or more. Permeability is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate to high. Much of this soil is irrigated hayland in the Apishapa drainage.</p>
PjF	<p>LOUVIERS-ROMBO-TRAVESSILLA COMPLEX, 30 TO 65 PERCENT SLOPES This map unit is on very steep side slopes of the foothills. It is about 40 percent Louviars soils, 30 percent Rombo soils, and 20 percent Travessilla soils. Louviers soils are on very steep south-facing slopes. Rombo soils are on very steep north-facing slopes. Travessilla soils are on ridgetops.</p> <p>The Louviers soil is shallow and well drained. It formed in residuum on very steep foothill side slopes. Typically the surface is channery clay loam 4 inches thick. The underlying material is clay loam grading to shaly clay 12 inches thick over shale. Permeability is slow. Available water capacity is low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid and the hazard of water erosion is very high.</p> <p>The Rombo soil is moderately deep and well drained. It formed in colluvium and residuum from silstone and shale. Typically the soil channery silty clay loam 34 inches thick over shale. Shale fragments in the soil increase with depth. Permeability is slow. Available water capacity is low to moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is high.</p> <p>The Travessilla soil is shallow and well drained. It</p>

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1AS COUNTIES

Map  
Symbol

Description

formed in residuum from sandstone. Typically the soil is sandy loam 14 inches thick over hard Dakota sandstone. Permeability is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium to rapid and the water erosion hazard is very high.

Rv.

RIVERWASH Riverwash consists of stratified sands instream channels that are unstable and often flooded. A water table normally fluctuates between 0 and 2 feet deep.