

PCW 27-11 7 257518<

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

05-071-06331

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

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

12. ESTIMATED INFLOW

150 BBLs/DAY

13. DISTANCE IN FEET TO CLOSEST STEAM, CREEK, POND, IRRIGATION DITCH

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. [Signature]

TITLE EPS

DATE

SEP 09 1996

CONDITIONS OF APPROVAL, IF ANY:

PIT PERMIT APPROVED



00848452

Maintain a minimum of 2 feet of freeboard Rule 902-c

**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 Bbbs	Evaporation Rate 11 Bbbs/Day	Percolation Rate 67 Bbbs/Day
Drg & Comp. Wells 50 Bbbs/Day		
Water Input Rate 150 Bbbs/Day	Water Accumulation 22 Bbbs/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)

THORNTON DRILLING COMPANY
 132 SE CHOLWELL
 BARTLESVILLE, OK 74006

Residence
 534-1987

Operator: C.L.S. Oil & Gas Well No. 27-11 Lease P.C.W. Loc. 1/4 1/4 1/4 Sec. 27 Twp. 34S Rge. 65W
 County: Las Animas State: Colorado Type Well: Depth: 843 ft Hours: Date Started: 02-08-96 Date Completed: 02-09-96
 Driller: J. Cunningham L. Atchison Casing Used: 796" of 7" Cement Used: Rig No.

From	To	Formation	From	To	Formation	From	To	Formation
0	12	Overburden	197	215	Shale	413	419	Coal
12	21	Mixed Sand & Clay	215	220	Sdy-Shale	419	445	Shale
21	24	Coal	220	225	Shale	446	448	Sand
24	29	Shale	225	232	Sdy-Shale	448	450	Sdy-Shale
29	42	Sdy-Shale	232	234	Shale	450	453	Coal
42	47	Sand	234	235	Coal	453	455	Shale
47	51	Sdy-Shale	235	247	Shale	455	456	Coal
51	60	Shale	247	248	Coal	456	458	Shale
60	62	Coal	248	257	Shale	458	463	Coal
62	63	Shale	257	258	Sand	463	466	Shale
63	64	Coal	258	259	Shale	466	467	Coal
64	72	Sdy-Shale	259	267	Sand	467	469	Coal
72	81	Sand	267	281	Sdy-Shale	469	476	Shale
81	82	Coal	281	334	Shale	476	478	Coal
82	83	Shale	334	335	Coal	478	481	Shale
83	84	Coal	335	364	Shale	481	482	Coal
84	90	Shale	364	367	Coal	482	517	Sdy-Shale
90	93	Coal	367	379	Shale	517	524	Sand
93	95	Shale	379	390	Sand wet	524	538	Sdy-Shale
95	109	Sand	390	397	Sdy-Shale	538	555	Sand
109	124	Sdy-Shale	397	401	Sand	555	558	Coal
124	127	Shale	401	403	Coal	558	563	Shale
127	128	Coal	403	407	Sdy-Shale	563	564	Sdy-Shale
128	142	Shale	407	409	Coal	564	594	Sand
142	144	Coal	409	410	Shale	594	597	Coal
144	160	Shale	410	411	Sand	597	619	Sand/Shale laminated
160	197	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 P.C.W. Loc. 1/4 1/4 1/4 Sec Twp Rge
27 34S 65W

C.I.S. Oil & Gas 27-11 (cont'd) State: Colorado Depth: 843 ft Date Started: 02-08-96 Date Completed: 02-09-96

County: Las Animas Driller: J. Cunningham L. Atchison Formation: L. Atchison Formation Casing Used: 79/6" of 7" Cement Used: Rig No:

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						
	843	Gas test @ 843' 260,000 MCF						
		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

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

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	XYLENE		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 Kitamiller
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)

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

COLORLESS
COLORLESS

SEC 27 34S 65W
LAS ANIHAS CO/CO

**** 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 (SiO2)	5
BICARBONATE (HCO3)	1,189
CARBONATE (CO3)	0
HYDROXIDE (OH)	0
SULFATE (SO4)	< 1
CHLORIDE (Cl)	2,895

	mg/l
P ALKALINITY (AS CaCO3)	0
M ALKALINITY (AS CaCO3)	975
TOTAL HARDNESS (AS CaCO3)	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 CaCO3 = 975

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><u>SARUCHE-ROMBO COMPLEX</u>, 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>

NONTECHNICAL SOILS DESCRIPTION REPORT
FOR DESCRIPTION CATEGORY - SOISurvey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANI
S COUNTIESMap
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.

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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>

NONTECHNICAL SOILS DESCRIPTION REPORT
FOR DESCRIPTION CATEGORY - SOI

Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANI
1AS 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. Louviars 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 Louviars 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>

U.S. Department of Agriculture
Soil Conservation Service

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Survey Area- LAS ANIMAS COUNTY AREA, COLORADO PARTS OF HUERFANO AND LAS ANI
1AS COUNTIES

Map Symbol	Description
Rv.	<p>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.</p> <p>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.</p>