NM - 65

GENERAL CORRESPONDENCE

YEAR(S): 1993

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Revised 5/93

State of New Mexico
Energy, Minerals and Natural Resources Department
OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, NM 87501

APPLICATION FOR SURFACE WASTE DISPOSAL FACILITY

(Refer to OCD Guidelines for assistance in completing the application)

☐ Commercial ☐ Centralized

I. Type: ☑ Produced Water ☐ Drilling Muds ☐ Other _____
☐ Solids/Landfarm ☐ Treating Fluids

II. OPERATOR: Tierra Aqua

ADDRESS: Box 55 Aztec NM 87410

CONTACT PERSON: T. (Tweeti) Blancett PHONE: 334-6067 334-9761

III. LOCATION: SE 1/4 NW 1/4 Section 27 Township 32 Range 9W
Submit large scale topographic map showing exact location.

IV. IS THIS AN EXPANSION OF AN EXISTING FACILITY? ☐ Yes ☑ No

V. Attach the name and address of the landowner of the disposal facility site and landowners of record within one-half mile o the site.

VI. Attach discription of the facility with a diagram indicating location of fences, pits, dikes, and tanks on the facility.

VII. Attach detailed engineering designs with diagrams prepared in accordance with Division guidelines for the construction/installation of the following: pits or ponds, leak-detection systems, aerations sytems, enhanced evaporation (spray) systems, waste treating systems, security systems, and landfarm facilities.

VIII. Attach a contingency plan for reporting and clean-up of spills or releases.

IX. Attach a routine inspection and maintenance plan to ensure permit compliance.

X. Attach a closure plan.

XI. Attach geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water. Depth to and quality of ground water must be included.

XII. Attach proof that the notice requirements of OCD Rule 711 have been met (Commercial facilities only).

XIII. Attach a contingency plan in the event of a release of H_2S.

XIV. Attach such other information as necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.

XV. CERTIFICATION

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: T. Tweeti Blancett Title: Administrator for Tierra Aqua

Signature: T. Tweeti Blancett Date: 8-20-93

DISTRIBUTION: Original and one copy to Santa Fe with one copy to appropriate Division District Office.

August 12, 1993

To: Roger Anderson

From: T. (Tweeti) Blancett

Re: Disposition of Transported Produced Water for a Pilot Project

Roger thank you for seeing me so quickly. The OCD has responded very promptly to ever question we have asked as well as being supportive of the entire project.

I received a copy of RULE 710 and 711. The following is my response. This will give us a starting place, since some of the requirements are easy to provide.

Rule 710

A. In all the described pieces of private land there are natural seeps or springs. When the family homesteaded these lands years ago they chose the ones with some source of water. Unfortunately the water is very scarce. There is little to no possibility of produced water constituting a hazard to spring/seep water.

B. The delivery of the produced water will be via pipeline directly from the adjacent coal seam wells. The water will go either into a lined pit or directly into the irrigation system. The area where is the pit will be placed is on a ridge that well above the 50' alluvium designated area and will be lined with a felt padding, 30ml PVC top lining, and 1' to 1 1/2' of soil that will naturally stop seepage a meet your 10-7 requirements..

C. The exception that we would request for this pilot project would be for the construction of an irrigation system to place the produced water to beneficial use on flats that will be planted with natural grasses and livestock and wildlife waterers.

D. Not Applicable

Rule 711 Commercial Surface Waste Disposal Facilities

A. Our pits will receive produced water that has been tested and which we feel are beneficial for agricultural purposes.

1. Prior to construction we will address the following items:

a. The legal descriptions for the following four pieces of deeded land and topographical map show the proposed locations for pits. There are roads as identified on the enclosed map, there are no watercourses (unfortunately), no wells, and no dwellings within one mile of the any of the sites.

T.32N. R.9W.
SEC. 4: LOT 4
SEC. 5: LOT 1 AND 2

T.32N. R.9W.
SEC. 14: W1/2NW/1/4 SE1/4NW14, NE1/4SW1/4
SEC. 22: SW1/4SW1/4
SEC. 27: N1/2NW1/4, SE14MW14. NW1/4NE1/4, S1/2NE1/4, NE1/4SW1/4
SEC. 33: SW1/4, NW1/4SE1/4

T.31N. R9W.
SEC. 6: NE1/4SE1/4, N1/2SW1/4, SE1/4SW1/4, W1/2SE1/2
SEC. 5: SE1/4SE1/4
SEC 4: SW1/4SW1/4

b. The landowners are as follows:
Linn R. Blancett
Treciafaye W. Blancett
Richard M. Blancett

P.O. Box 55
Aztec, N. M. 87410
505-334-6067

c. The enclosed description of the facility is designed for an irrigation system and not a Waste Storage/Disposal Pit. This plan has the component I feel necessary to implement the pilot project and put the incidental water to beneficial use.

d. There is no accumulation of waste solids. All water will be placed directly on the plots and rain and snowfall will dissolve and disseminate any particles. The water will rarely build up in the pits even in the winter, since it is the intent of the project to water even on the snow with a high pressure pump that is already bringing the water to the pit. The water will also leave the pit from the bottom which will provide a natural flushing of solids so there will be little mineral build up.

e. With only 400-900 barrels a day that will allow 1/2" to 1" of water on 20 acres in a 20-40 day period. There is 320 acres that could receive the water if it were available. The problem is to little-not to much.

f. Since this is our private land we will do all the monitoring and inspecting. A baseline soil analysis will be requested from NMSU and then the acreage will be tested biannually before the growing season and after the growing season. The facility will receive no water that has not come from a pretested well with a water analysis that is acceptable. This is our private land that has been in the family for several generations, it is our intent to enhance the environment and range conditions.

g. Closure Plan will include a stockpile with one (1) foot of top soil to be used upon closure and reseeded with natural grasses.

h. There will be no oil field wastes placed on the land and no fresh water will be impacted.

i. N/A

j. Certification on application

k. In developing this idea the State Engineer in Aztec and Albuquerque, BLM in Farmington, SCS, and the OCD were consulted. Since this has never been done there was little information available, but all entities thought the idea was good and wished to be kept informed. If the pilot projects are successful the information gained on these projects can be used on Federal and State Lands.

2. N/A

3. N/A

4. I hope this can be permitted quickly since the seed beds for the grasses need to be prepared and planned this month and September.

5. N/A

6. Linn Blancett will install and keep the records on the pastures watered and seeded. This will include the source, location, volume, type of produced water, amount of water put on each acreage, soil analysis, grasses used, and time of year waters were used.

7. The water will be pumped directly from the wells into the pit. The oil company will be required to provide us with a monthly water analysis so physical monitoring of the pit will not be necessary.

8. Acceptable.

9. This project will provide grasses and water for the migratory birds and we request that no netting or covering is required. In addition this project will have livestock and wildlife waterers on the exterior fencing of the large tracts.

10. N/A

11. N/A

12. N/A

August 17, 1993

To: Roger Anderson and Bill Olsen

From: T. Blancett

When we met in Santa Fe you gave me a list of areas you would like addressed for this pilot project they are as follows:

1. Identify the exact area for the proposed pit and where we will irrigate. Enclosed you will find a map done by NEC and higlighted to show these areas.

2. Spring analysis. Enclosed are the spring analysis for our livestock springs.

3. Depth and quality of the ground water. This documentation is enclosed. All the records we can find are for cathodic holes and information supplied by Charles Wohenlberg with the State Engineer's Office, Meridan Oil, El Paso Natural Gas, Koch Productions and us. We have personally drilled three dry holes in T32N R9W SECTIONS 34, 16, AND 14. The depth was 200' to 400'---all three are dry holes. Bill was taken to the first of these wells.

4. Water analysis on the Koch Wells for VOC (EPA Method 602) and the ICAP scan (EPA 6010) are requested and pending from Koch.

5. Soil analysis for a baseline is being prepared by NMSU.

6. Compaction of the pit. We have addressed your requests for the 10-7 seepage requirement by lining the pit. ORE Systems of Farmington has suggested the following to address this concern. See the enclosed specifications.

Slopes will be 3:1
Base of pit will be smoothed and a felt padding installed for puncture protection
PVC 30ml lining will be placed in the entire pit to prevent any seepage. This product is not subject to mildew and/or rot.
We are also putting a layer of soil to protect the lining from ultraviolet radiation.

This application has significantly increased the cost of the pit, but we feel that this pilot project is beneficial to disposal of produced water in the future and our operation needs the water.
SEE RULE 6

We would reference the Order No. R-7940-C Exhibit "A"

Rule 1 APPLICABILITY This rule applies to the proposed project.

Rule 2. DEFINITIONS All definitions have been applied and where applicable.

Rule 3. PROHIBITIONS Subject pit area is not in the Vulnerable Area per enclosed highlighted map. All subheadings under rule 3 are not applicable except (f). Request for authorization by Director of the Division under Rule 6.

Rule 4. SURFACE DISPOSAL FACILITIES TO BE APPROVED/REGISTERED
The enclosed is application for approval by the Division.

Rule 5. PIT CLOSURE N/A

Rule 6. VARIANCES

Our pit will be will be located well above the designated vulnerable areas and will initially irrigate a 20 acre pilot project out of the vulnerable area as highlighted on the enclosed map. Our pit capacity will be for 100,000 to 130,000 barrels of water storage. The pit will be built according to the above specifications.

Under Order No. 7940-c Case 10436 page 5 no. 24 and 25 addresses the "unnecessary regulation without offsetting public health and environmental benefits". Our project in no way affects public health and the environmental benefits should be enhanced by the stabilization of grasses for livestock and wildlife where none previously existed. There will also be livestock and wildlife waterers and forage installed where none now exist. See enclosed Environmental Assessment.

a. Request for an administrative variance to discharge

1. This discharge site is (sites are) not located in alluvium per the map enclosed.

2. N/A

3. No practicable ground water (as defined by the New Mexico State Engineer) is present. The enclosed letter from the State Engineer's Office with the sections completely surrounding the subject section 27. The cathodic logs where available are also enclosed demonstrate little to no ground water.

4. The discharge is not located within a Wellhead Protection Area per the enclosed map.

b. Such variance may be granted for multiple sites under a single application upon demonstration by the applicant that the sites possess common characteristics that would justify the granting of the variance.

c. Notice of request for variance for a specific discharge point will be sent by operator to surface owners of record and occupants of permanent residences within 1/2 mile of the site for which the variance is sought. The owners are listed on the first page and are all Blancetts who are applying for this permit.

RE: New Mexico Statues 70-2-12 21-b "to protect public health and the environment"

AFFECTED ENVIRONMENT

In this section, only those resources identified as affected by the proposed action or as a special concern are addressed. Neither the proposed action nor the alternative will have an impact of the land use, public health and safety, minerals, or geology within the project areas.

There are no prime or unique farmlands, known paleontological resources, wilderness areas, or wild and scenic rivers within the project area. There will be no production or disposal of hazardous or solid wastes. No wetlands occur in the project area. No socioeconomic impacts of significance are expected.

CLIMATE

The project area is located in the San Juan Basin, which has a semi-arid continental climate. Wide variations in temperature, both diurnal and seasonal, are common. Winters in the Basin are cold, with snow between December and April accounting for slightly less than half of the annual precipitation. Snow may reach depths of one to three feet on the level, and frequently drifts over brush along the north faces of canyons. There are 135 frost-free days with 12" of annual rainfall.

AIR QUALITY

Air quality in the San Juan Basin is affected both by nearby industry and by the natural terrain, since the Basin is a depression which frequently experiences air stagnation and resultant decrease in air quality. At this time, no air quality monitoring has been done in or near the project area.

TOPOGRAPHY

The primary topographic features of the San Juan basin are broad mesas and plateaus, interspersed with deep canyons and dry washes. Elevations is approximately 6500 feet.

HYDROLOGY

Surface Water

Surface water is marginal ideating to the pilot project and nonexistent on the project.

Ground Water

Ground water is marginal at 200' to 400'

Produced Water

Data from the coal seam wells ideating to this pilot project range from 11460 to 11720 mg/l of total dissolved solids (TDS). Sodium content of

as "saline"

SOILS

The soils in the project area have been surveyed by the Soil Conservation Service. In general, the soils form from alluvium, colluvium, or residuum derived from shale and /or sandstone. The soils reflect the regional aridity and high variability in topographic relief. these upland soils are characterized by severe wind erosion hazards and moderate to severe water erosion hazards. The predominate vegetation type on these soils is pinon-juniper-woodland with grass species in the understory. Livestock grazing is the primary use.

VEGETATION

The vegetation of the project area consist primarily of six major vegetation types. The pinon-juniper, the sage brush, and the mixed shrub types are the most common ones; greasewood, rabbitbrush, oakbrush, and bull weed.

WILDLIFE

The primary wildlife species are mule deer, elk, and mountain lions. Other mammals typical of these ecologies and found in the general area include cottontail, antelope ground squirrel, spotted ground squirrel, coyote, gray fox, porcupine, raccoon, bobcat, and occasionally the black bear.

CULTURAL RESOURCES

This project area contains evidence of over ten thousand years of human activity and occupation. The activity ranges from the Paleo-Indian period to current owner/farmers.

TRANSPORTATION

There are many bladed roads in the project area maintained by the oil and gas industry, but no paved roads.

VISUAL QUALITY

The project study areas in the San Juan Basin/Arkansas Loop area. The landscape contains wide arid mesas and sage brush flats sprinkled with pinon and juniper. Until recently this area had no access.

RECREATION

There are two ROS classes within the study area: semiprimitive motorized and roaded natural.

SPECIAL MANAGEMENT AREAS

Nebo Mountain Eagle Refuge

This site is approximately 8-10 miles for the the project area and is monitored by the BLM.

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section identifies and analyzes the environmental impacts to those resource components which would be affected by the proposed action. Environmental impacts can be described as being either direct or secondary and can be either short-term or long-term. Short-term impacts affect the environment for a limited period, after which the environmnet usually reverts to its original condition. Long-term impacts often result in changes to the environment which are often difficult to reverse.

AIR QUALITY

Construction and operation of the proposed gathering system would result in the short-term release of emissions from construction equipment and operations vehicles including produced-water haul trucks. There would be short-term increases in fugitive dust caused by increased traffic and other activity. This would include clearing, grading, and other soil disturbing activities. Impacts would be short-term.

4mitigation Measures

Construction and operations equipment/vehicles would be maintained to minimized emissions. If dust caused by project-related traffic is identified as a problem, PPCo would treat the affected roads with water or a dust preventative chemical.

HYDROLOGY

Surface Water

No springs or seeps will be impacted. If spills of produced water occur, the spills would be small, localized events, chances of impacting surface water are minimal.

Ground Water

No ground water will be impacted. Only ground water identified is at 290' and contains greater percentages of calcium, chloride, and sulfate than the project water. Migration of produced water into other formation is not expected to occur.

Produced Water

The produced water will be placed of a 20 acre parcel that has been cleared of understory and reseeded with natural grasses. Due to the small amount of produced water available for application no chemical buildup is expected.

SOILS

This project will disturb approximately 25 acres of private land.

Mitigation Measures

All soil removed from the pit area will be used in construction. The land cleared for planting will be limited to removal of the understory of sage and shrubs. The large pinons and junipers will be retained and planted around. The produced water will not be applied for more than 3 years to any given parcel. The establishment of grasses will stabilize the soils and aid in preventing erosion. The land will be contoured to control the flow of water and sediments.

VEGETATION

Natural vegetation would be removed from the pit sit and the understory vegetation in the 20 acre reseeded area. The removal of vegetation would temporarily decrease the available habitat for wildlife and domestic species. This would be a short-term impact.

Mitigation Measures

Revegetation would occur concurrently with the construction of the pit. The grasses and shrubs introduced will be saline resistant/tolerant and recommended by BLM/NMSU.

WILDLIFE

Impacts to wildlife would be primarily related to an increase in human activity and the conversion of the habitat. The total area being disturbed is so small that the effect is not anticipated to represent a noticeable reduction in wildlife numbers or species.

Mitigation Measures

Reseeding and rehabilitation would generally result initially in the establishment of grass. This would provide additional forage primarily in the summer months. The change and increase in big game habitat should remain for 10 to 35 years, until the original natural vegetation is reestablished.

CULTURAL RESOURCES

The only know cultural resource is a turn of the century cabin that will be moved and placed in Aztec.

TRANSPORTATION

The transportation system would be short-term and would occur during the construction phase of the project. Construction is expected to last for 2 months. No new roads will be required.

VISUAL QUALITY

The visual impact on the property will be very small.

Mitigation Measures

The pit will be located on a sand rock shelve that is surrounded by pinon-juniper trees. After the pit is complete the entire pit will be greenbelted and planted with natural shrubs. The motor access to the pit would be very limited since the water will be piped to the location. General maintenance to the pit will be done by tractor or off road vehicle and not accessible to other motorized vehicles. The flats will be removed of all sagebrush and understory, but the larger pinon and juniper trees will remain and be planted around.

RECREATION

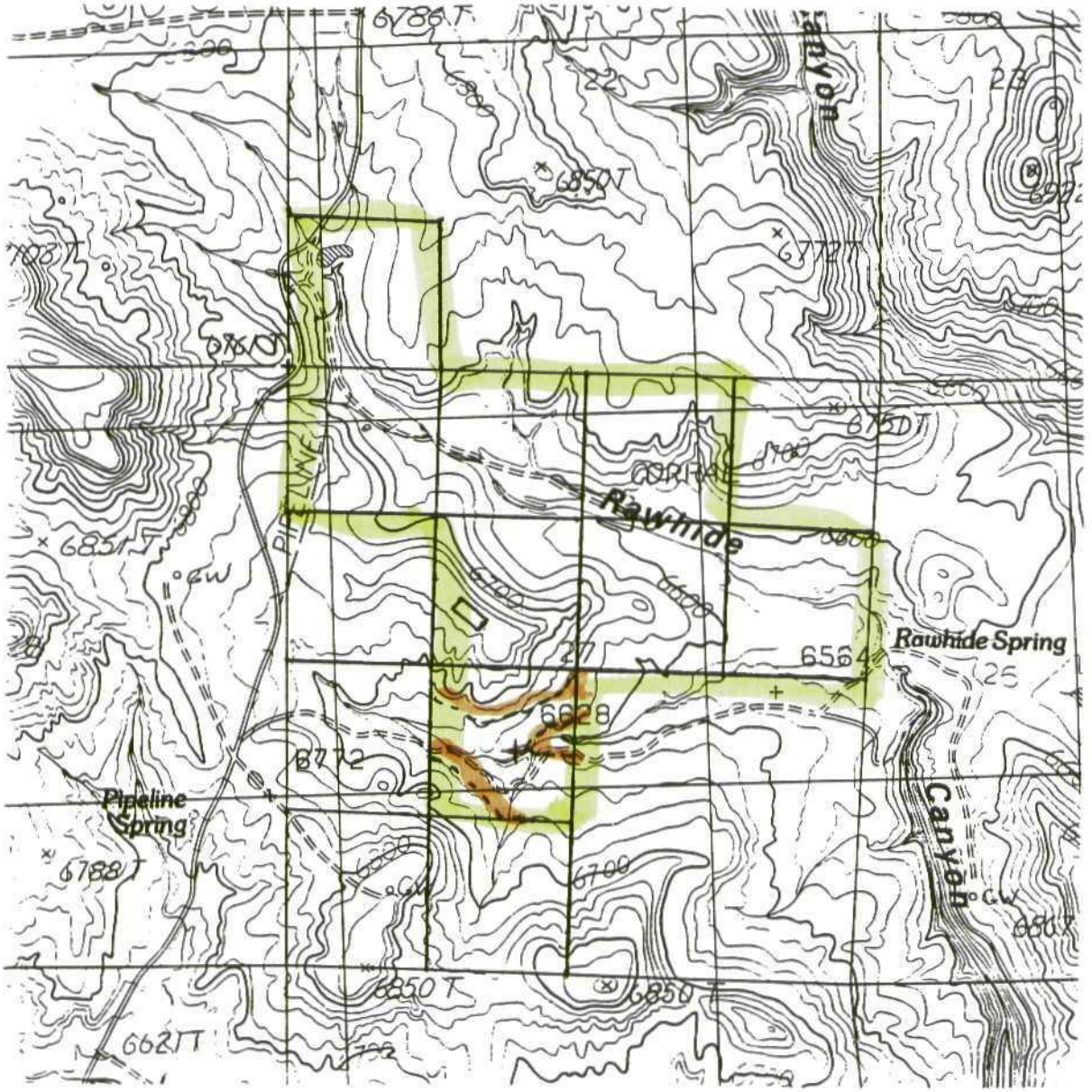
Little to no impact.

SPECIAL MANAGEMENT AREAS

Little to no impact.

NCE SURVEYS INC.

P.O. Box 6612
Farmington, NM 87499-6612
(505) 325-2654



This plat shows the Blancett property: SW¼SW¼, Sec.22 NW¼NW¼, E½NW¼, W½NE¼, SE¼NE¼, NE¼SW¼, Sec.27 Township 32 North, Range 9 West, NMPM, San Juan County, New Mexico.

Along with a proposed holding pond in the SE¼NW¼ Sec.27 and 20 acres to be watered in the NE¼SW¼ Sec.27.

Neale C. Edwards
NMRLS 6857

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-302

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.

Collection Date: 16-Aug-93

Well Name: Camp Spring (West)

Collection Time: 3:00 PM

Formation: Groundwater (Spring)

County: San Juan State: NM

Location: Sec. 27-T32N-R9W

Analyst: S. Spencer

Remarks: West side of cabin

Analysis Date: 8/19/93

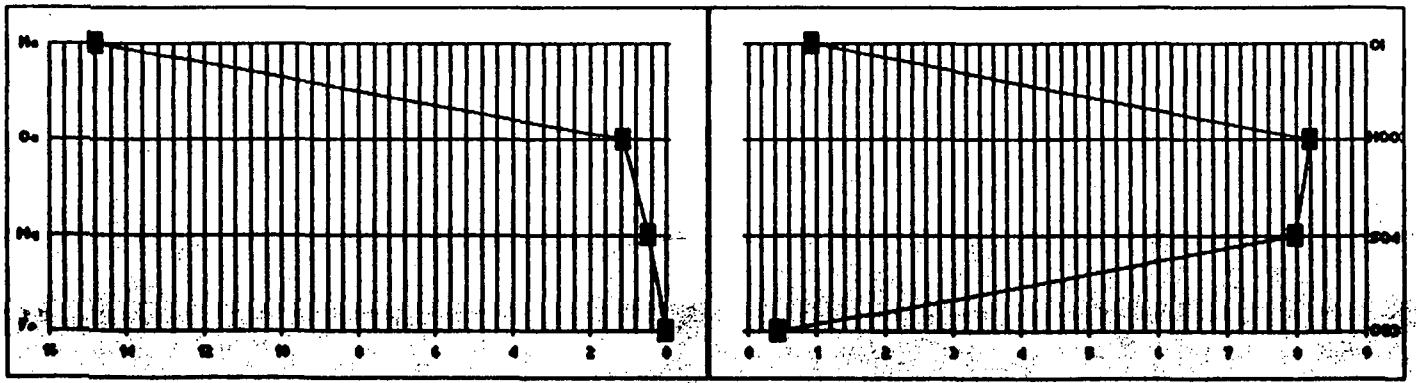
PARAMETER	As ION		Comment	PARAMETER	As ION		Comment
Sodium , Na	340	mg/l		Chloride , Cl	33	mg/l	
Potassium, K	4	mg/l					
Calcium , Ca	23	mg/l		Sulfate, SO4	384	mg/l	
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	6	mg/l		Carbonate, CO3	13	mg/l	
Iron, Fe (Total)	0.0	mg/l	NR	Bicarbonate, HCO3	500	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	6.835	ohm-m	
pH	8.45	Units		Conductivity	1,463	uS	
				Specific Gravity (@ 60 Degrees F)	1.000	Units	
TDS	979	mg/l					

Remarks: None.

NR = Test Not Run

Anion/Cation: 106.1%

Stiff Diagram



Scale: Meq/L

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-301

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.

Collection Date: 16-Aug-93

Well Name: Camp Spring (East)

Collection Time: 3:00 PM

Formation: Groundwater (Spring)

County: San Juan State: NM

Location: Sec. 27-T32N-R9W

Analyst: S. Spencer

Remarks: East side of cabin

Analysis Date: 8/19/93

S Spencer

PARAMETER	as ION		Comment
Sodium , Na	370	mg/l	
Potassium, K	3	mg/l	
Calcium , Ca	33	mg/l	
Magnesium , Mg	5	mg/l	
Iron, Fe (Total)	0.0	mg/l	NR
Hydrogen Sulfide	0	mg/l	NR
pH	7.66	Units	
TDS	975	mg/l	

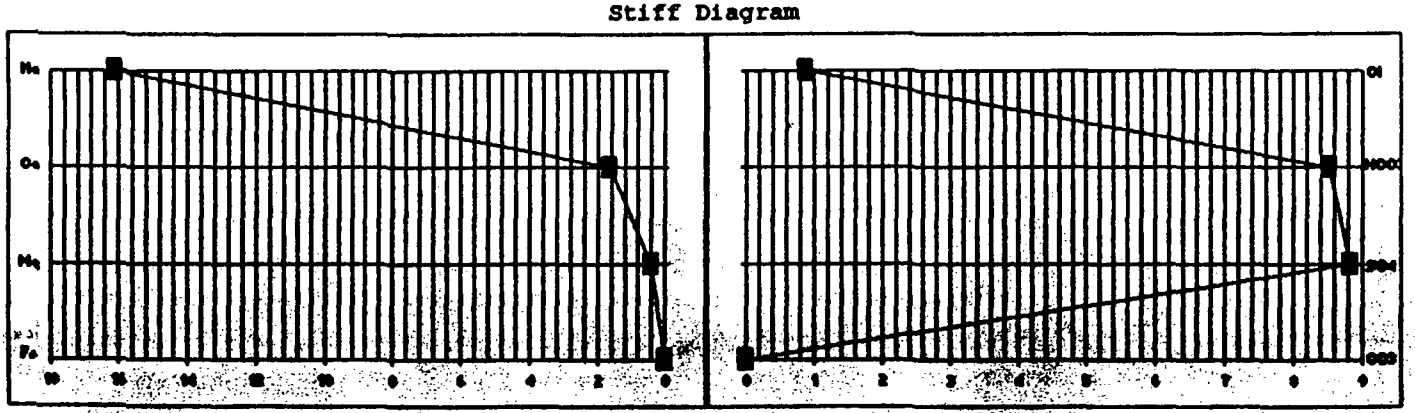
PARAMETER	as ION		Comment
Chloride , Cl	31	mg/l	
Sulfate, SO4	425	mg/l	
Hydroxide, OH	0	mg/l	
Carbonate, CO3	0	mg/l	
Bicarbonate, HCO3	520	mg/l	
Resistivity (@25 Degrees C)	6.916	ohm-m	
Conductivity	1,446	uS	
Specific Gravity (@ 60 Degrees F)	1.000	Units	

Remarks: None.

NR = Test Not Run

Anion/Cation: 100.1%

Stiff Diagram



Scale: Meq/L

Faxed to Mike 8-19-93

DATA SHEET FOR DEEP GROUND BED CATHODIC PROTECTION WELLS
NORTHWESTERN NEW MEXICO
(Submit 3 copies to OCD Aztec Office)

Operator KOCH EXPLORATION COMPANY Location: Unit G Sec. 26 Twp 32 Rng 9

Name of Well/Wells or Pipeline Serviced GARDNER-5

Elevation 6570' Completion Date 11-8-85 Total Depth 397' Land Type* F-NM-013642

Casing, Sizes, Types & Depths NONE

If Casing is cemented, show amounts & types used

NONE

If Cement or Bentonite Plugs have been placed, show depths & amounts used

NONE

Depths & thickness of water zones with description of water when possible:

Fresh, Clear, Salty, Sulphur, Etc. 0-40'-CLEAR,ALKALI.

Depths gas encountered: NONE

Type & amount of coke breeze used: METALLURGICAL,3500#

Depths anodes placed: 375'-365'-355'-345'-290'-250'-200'-120'-110'-55'

Depths vent pipes placed: 390'

Vent pipe perforations: FROM 75'DOWN

Remarks:

If any of the above data is unavailable, please indicate so. Copies of all logs, including Drillers Log, Water Analyses & Well Bore Schematics should be submitted when available. Unplugged abandoned wells are to be included.

*Land Type may be shown: F-Federal; I-Indian; S-State; P-Fee.
If Federal or Indian, add Lease Number.

BIOTECH LABORATORIES

EPA METHOD 8020
PURGABLE AROMATICS

PAGE 2 - QUALITY CONTROL

CLIENT:	KOCH EXPLORATION COMPANY	SAMPLE MATRIX:	WATER
CLIENT NUMBER:		PRESERVATIVE:	HGCL2
PROJECT NAME:	KOCH EXPLORATION COMPANY	REPORT DATE:	08/23/93
PROJECT LOCATION:	SEC 26-32N-9W, SAN JUAN COUNTY	DATE SAMPLED:	08/18/93
SAMPLE ID:	GARDNER 5C	DATE RECIEVED:	08/19/93
SAMPLE NUMBER:	W0508183	DATE ANALYZED:	08/20/93

QUALITY CONTROL:	SURROGATE	PERCENT RECOVERY	ACCEPTANCE LIMIT
	BROMOCHLOROMETHANE	94.7 %	85-115%
	2-BROMO-1-CHLOROPROPANE	97.5 %	85-115%

REFERENCE: METHOD 5030, PURGE AND TRAP
METHOD 8020, PURAGABLE AROMATICS
TEST METHOD FOR EVALUATION SOLID WASTE,
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, SW-846,
VOLUME IB, NOVEMBER 1990

COMMENTS:

ANALYST

REVIEW

THRIFTWAY PROFESSIONAL BUILDING 710 EAST 20TH STREET SUITE 400 FARMINGTON, NEW MEXICO 87401
LABORATORY OFFICE (505) 632-3365 FAX (505) 632-3365

BIOTECH LABORATORIES

EPA METHOD 8020
PURGABLE AROMATICS

CLIENT:	KOCH EXPLORATION COMPANY	SAMPLE MATRIX:	WATER
CLIENT NUMBER:		PRESERVATIVE:	HGCL2
PROJECT NAME:	KOCH EXPLORATION COMPANY	REPORT DATE:	08/23/93
PROJECT LOCATION:	SEC 26-32N-9W, SAN JUAN COUNTY	DATE SAMPLED:	08/18/93
SAMPLE ID:	GARDNER SC	DATE RECIEVED:	08/19/93
SAMPLE NUMBER:	W0508183	DATE ANALYZED:	08/20/93

ANALYTE	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
BENZENE	ND	1.0
TOLUENE	ND	1.0
ETHLYBENZENE	ND	1.0
M,P-XYLENE	ND	1.0
O-XYLENE	ND	1.0

ND - ANALYTE NOT DETECTED AT STATED DETECTION LIMIT

THRIFTWAY PROFESSIONAL BUILDING 710 EAST 20TH STREET SUITE 400 FARMINGTON, NEW MEXICO 87401
LABORATORY OFFICE (505) 632-3386 FAX (505) 632-3385

BIOTECH LABORATORIES

EPA METHOD 8020
PURGABLE AROMATICS
QUALITY CONTROL

CLIENT:	KOCH EXPLORATION COMPANY	SAMPLE MATRIX:	WATER
CLIENT NUMBER:		PRESERVATIVE:	HGCL2
PROJECT NAME:	KOCH EXPLORATION COMPANY	REPORT DATE:	08/23/93
PROJECT LOCATION:	SEC 26-32N-9W, SAN JUAN COUNTY	DATE SAMPLED:	08/18/93
SAMPLE ID:	SPIKE SAMPLE, GARDNER 5C	DATE RECIEVED:	08/19/93
SAMPLE NUMBER:	SPIKE SAMPLE	DATE ANALYZED:	08/20/93

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE RESULTS (ug/L)	SPIKED SAMPLE RESULTS (ug/L)	PERCENT RECOVERY
BENZENE	10.0	ND	10.7	107
TOLUENE	10.0	ND	10.1	101
ETHLYBENZENE	10.0	ND	10.6	106

ND - ANALYTE NOT DETECTED AT STATED DETECTION LIMIT

REFERENCE: METHOD 5030, PURGE AND TRAP
METHOD 8020, PURAGABLE AROMATICS
TEST METHOD FOR EVALUATION SOLID WASTE,
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, SW-846,
VOLUME IB, NOVEMBER 1990

THRIFTWAY PROFESSIONAL BUILDING 710 EAST 20TH STREET SUITE 400 FARMINGTON, NEW MEXICO 87401
LABORATORY OFFICE (505) 632-3365 FAX (505) 632-3365

[redacted]
5796 US Highway 64-3014 • Farmington, New Mexico 87401
Phone: (505) 632-0615 • Fax: (505) 632-1865

TRACE METAL ANALYSIS

Client:	Biotech Remediation	Project #:	91100
Sample ID:	Gardner 5C	Date Reported:	08-23-93
Laboratory Number:	5934	Date Sampled:	08-18-93
Sample Matrix:	Water	Date Received:	08-19-93
Preservative:	Cool	Date Analyzed:	08-20-93
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ALUMINUM	ND	0.001
ARSENIC	ND	0.0001
BARIUM	39.9	0.01
CADMIUM	ND	0.0001
CALCIUM	17.24	0.001
CHROMIUM	ND	0.0001
COBALT	ND	0.0001
COPPER	ND	0.001
IRON	ND	0.001
LEAD	ND	0.0001
MAGNESIUM	23.72	0.001
MANGANESE	0.037	0.001
NICKEL	ND	0.001
POTASSIUM	17.52	0.01
SELENIUM	ND	0.0001
SILICON	11.78	0.001
SILVER	ND	0.0002
ZINC	ND	0.001

Method: Methods 3005, 3020, Acid Digestion of Waters for Analysis of Metals by FLAA and GFAA, SW-846, USEPA, 1986 - 1990

Methods 7020, 7060, 7080, 7131, 7140, 7191, 7201, 7210, 7380, 7421, 7450, 7460, 7520, 7610, 7740, 7761, 7950 Analysis of Metals by GFAA and FLAA, SW-846, USEPA

ND - Parameter not detected at the stated detection limit.

Comments: Koch Exploration

Analyst

Review

BIOTECH LABORATORIES

EPA METHOD 8020
PURGABLE AROMATICS

PAGE 2 - QUALITY CONTROL

CLIENT:	KOCH EXPLORATION COMPANY	SAMPLE MATRIX:	WATER
CLIENT NUMBER:		PRESERVATIVE:	HGCL2
PROJECT NAME:	KOCH EXPLORATION COMPANY	REPORT DATE:	08/23/93
PROJECT LOCATION:	SEC 27-32N-9W, SAN JUAN COUNTY	DATE SAMPLED:	08/18/93
SAMPLE ID:	BLANCETT COM 1C	DATE RECIEVED:	08/19/93
SAMPLE NUMBER:	W0108183	DATE ANALYZED:	08/20/93

QUALITY CONTROL:	SURROGATE	PERCENT RECOVERY	ACCEPTANCE LIMIT
	BROMOCHLOROMETHANE	98.6 %	85-115%
	2-BROMO-1-CHLOROPROPANE	101.4 %	85-115%

REFERENCE: METHOD 5030, PURGE AND TRAP
METHOD 8020, PURAGABLE AROMATICS
TEST METHOD FOR EVALUATION SOLID WASTE,
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, SW-846,
VOLUME IB, NOVEMBER 1990

COMMENTS:

ANALYST

REVIEW

THRIFTWAY PROFESSIONAL BUILDING 710 EAST 20TH STREET SUITE 400 FARMINGTON, NEW MEXICO 87401
LABORATORY OFFICE (505) 632-3365 FAX (505) 632-3365

BIOTECH LABORATORIES

EPA METHOD 8020
PURGABLE AROMATICS

CLIENT:	KOCH EXPLORATION COMPANY	SAMPLE MATRIX:	WATER
CLIENT NUMBER:		PRESERVATIVE:	HGCL2
PROJECT NAME:	KOCH EXPLORATION COMPANY	REPORT DATE:	08/23/93
PROJECT LOCATION:	SEC 27-32N-9W, SAN JUAN COUNTY	DATE SAMPLED:	08/18/93
SAMPLE ID:	BLANCETT COM 1C	DATE RECIEVED:	08/19/93
SAMPLE NUMBER:	W0108183	DATE ANALYZED:	08/20/93

ANALYTE	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
BENZENE	ND	1.0
TOLUENE	ND	1.0
ETHLYBENZENE	ND	1.0
M,P-XYLENE	ND	1.0
O-XYLENE	ND	1.0

ND - ANALYTE NOT DETECTED AT STATED DETECTION LIMIT

THRIFTWAY PROFESSIONAL BUILDING 710 EAST 20TH STREET SUITE 400 FARMINGTON, NEW MEXICO 87401
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5796 US Highway 64-3014 • Farmington, New Mexico 87401
Phone: (505) 632-0615 • Fax: (505) 632-1865

TRACE METAL ANALYSIS

Client:	Biotech Remediation	Project #:	91100
Sample ID:	Blancett Com 1C	Date Reported:	08-23-93
Laboratory Number:	5933	Date Sampled:	08-18-93
Sample Matrix:	Water	Date Received:	08-19-93
Preservative:	Cool	Date Analyzed:	08-20-93
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ALUMINUM	0.005	0.001
ARSENIC	ND	0.0001
BARIUM	46.5	0.01
CADMIUM	0.0001	0.0001
CALCIUM	12.81	0.001
CHROMIUM	ND	0.0001
COBALT	ND	0.0001
COPPER	ND	0.001
IRON	0.153	0.001
LEAD	ND	0.0001
MAGNESIUM	22.36	0.001
MANGANESE	ND	0.001
NICKEL	ND	0.001
POTASSIUM	18.56	0.01
SELENIUM	ND	0.0001
SILICON	11.88	0.001
SILVER	ND	0.0002
ZINC	ND	0.001

Method: Methods 3005, 3020, Acid Digestion of Waters for Analysis of Metals by FLAA and GFAA, SW-846, USEPA, 1986 - 1990

Methods 7020, 7060, 7080, 7131, 7140, 7191, 7201, 7210, 7380, 7421, 7450, 7460, 7520, 7610, 7740, 7761, 7950 Analysis of Metals by GFAA and FLAA, SW-846, USEPA

ND - Parameter not detected at the stated detection limit.

Comments: Koch Exploration

Analyst

Review

[redacted]
5796 US Highway 64-3014 • Farmington, New Mexico 87401
Phone: (505) 632-0615 • Fax: (505) 632-1865

TRACE METAL ANALYSIS

Client: Biotech Remediation
Sample ID: Blancett Com 1C
Laboratory Number: 5933
Sample Matrix: Water
Preservative: Cool
Condition: Cool & Intact

Project #: 91100
Date Reported: 08-23-93
Date Sampled: 08-18-93
Date Received: 08-19-93
Date Analyzed: 08-20-93
Analysis Needed: Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ALUMINUM	0.005	0.001
ARSENIC	ND	0.0001
BARIUM	46.5	0.01
CADMIUM	0.0001	0.0001
CALCIUM	12.81	0.001
CHROMIUM	ND	0.0001
COBALT	ND	0.0001
COPPER	ND	0.001
IRON	0.153	0.001
LEAD	ND	0.0001
MAGNESIUM	22.36	0.001
MANGANESE	ND	0.001
NICKEL	ND	0.001
POTASSIUM	18.56	0.01
SELENIUM	ND	0.0001
SILICON	11.88	0.001
SILVER	ND	0.0002
ZINC	ND	0.001

Method: Methods 3005, 3020, Acid Digestion of Waters for Analysis of Metals by FLAA and GFAA, SW-846, USEPA, 1986 - 1990

Methods 7020, 7060, 7080, 7131, 7140, 7191, 7201, 7210, 7380, 7421, 7450, 7460, 7520, 7610, 7740, 7761, 7950 Analysis of Metals by GFAA and FLAA, SW-846, USEPA

ND - Parameter not detected at the stated detection limit.

Comments: Koch Exploration

Analyst

Review

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401

(505) 325-1085

Lab Sample No.: W93-236

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Company

Collection Date: 21-Jul-93

Well Name: Blancett Com 1C

Collection Time: 11:00 AM

Formation: Basin Fruitland Coal

County: San Juan State: NM

Location: Sec.27 T32N R9W NE 1/4.

Analyst: K. Lambdin Karen C Lambdin

Remarks: None.

Analysis Date: 7/25/93

PARAMETER	as ION		Comment
Sodium , Na	4,300	mg/l	
Potassium, K	15	mg/l	
Calcium , Ca	26	mg/l	
Magnesium , Mg	22	mg/l	
Iron, Fe (Total)	0.0	mg/l	NR
Hydrogen Sulfide	0	mg/l	NR
pH	7.89	Units	
TDS	11,490	mg/l	

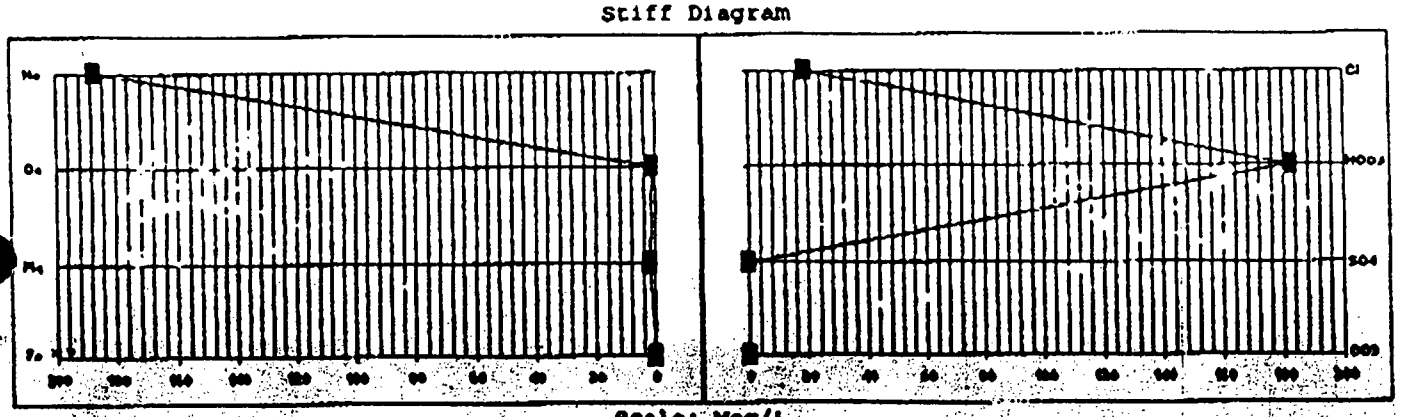
PARAMETER	as ION		Comment
Chloride , Cl	686	mg/l	
Sulfate, SO4	0	mg/l	<5
Hydroxide, OH	0	mg/l	
Carbonate, CO3	0	mg/l	
Bicarbonate, HCO3	11,124	mg/l	
Resistivity (@25 Degrees C)	0.679	ohm-m	
Conductivity	14,720	uS	
Specific Gravity (@ 60 Degrees F)	1.016	Units	

Remarks: None.
Not enough sample to run H2S.

NR = Test Not Run

Anion/Cation: 105.98

Stiff Diagram



Scale: Meq/L

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-40

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.

Collection Date: 2-Feb-93

Location: NE 1/4 Sec.26-T32-R9

Collection Time: Unknown

Formation: Fruitland Coal

County: San Juan State: NM

Well Name: Gardner 7-C

Analyst: K. Lambdin Karen C Lambdin

Remarks: none

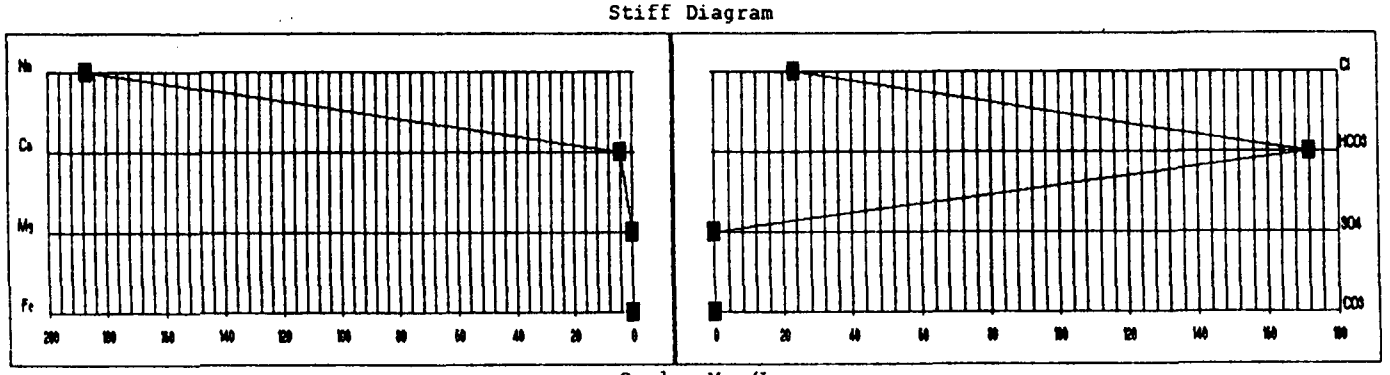
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,300	mg/l		Chloride , Cl	822	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	82	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
, Fe(Diss.)	0.0	mg/l	NR	Bicarbonate,HCO3	10,480	mg/l	
Hydrogen Sulfide	0.1	mg/l		Resistivity (@25 Degrees C)	0.674	ohm-m	
pH	7.58	Units		Conductivity	14,840	uS	
				Specific Gravity (@ 60 Degrees F)	1.008	Units	
TDS	11,460	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run Fe .

NR = Test Not Run

Anion/Cation: 102.0%

Stiff Diagram



Scale: Meq/L

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-38

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.

Collection Date: 2-Feb-93

Location: SW 1/4 Sec.26-T32-R9

Collection Time: Unknown

Formation: Fruitland Coal

County: San Juan State: NM

Well Name: Gardner 5-C

Analyst: K. Lambdin Karen C Lambdin

Remarks: none

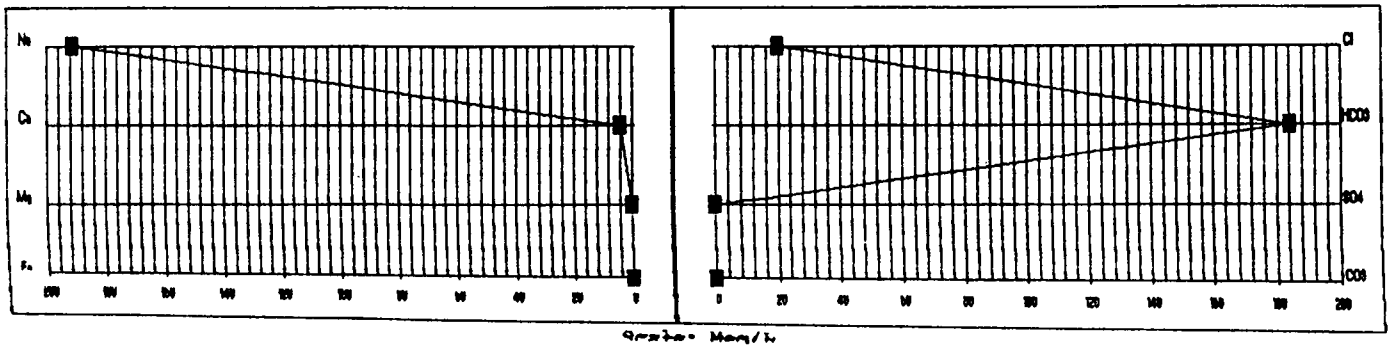
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,400	mg/l		Chloride , Cl	709	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	79	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
I[redacted], Fe(Diss.)	0.0	mg/l	NR	Bicarbonate,HCO3	11,224	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	0.654	ohm-m	
pH	7.70	Units		Conductivity	15,300	uS	
				Specific Gravity (@ 60 Degrees F)	1.022	Units	
TDS	11,720	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run Fe and H2S.

NR = Test Not Run

Anion/Cation: 104.5%

Stiff Diagram



WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-39

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.
Collection Date: 2-Feb-93

Location: NE1/4 Sec.25-T32-R9
Collection Time: Unknown

Formation: Fruitland Coal
County: San Juan State: NM

Well Name: Gardner 6-C
Analyst: K. Lambdin Karen C Lambdin

Remarks: none

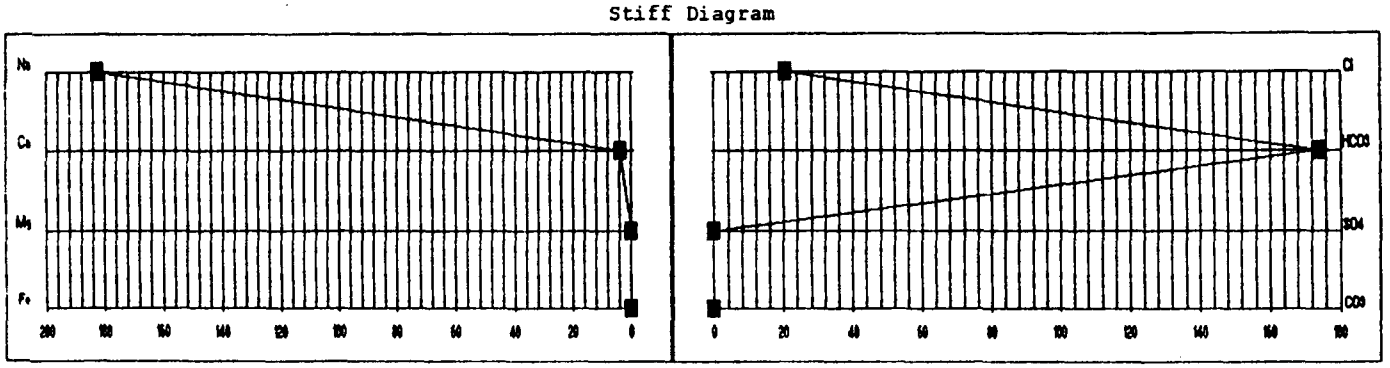
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,200	mg/l		Chloride , Cl	728	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	76	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
, Fe(Diss.)	0.0	mg/l	<1	Bicarbonate,HCO3	10,590	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	0.679	ohm-m	
pH	7.52	Units		Conductivity	14,730	uS	
				Specific Gravity (@ 60 Degrees F)	1.012	Units	
TDS	11,520	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run H2S .

NR = Test Not Run

Anion/Cation: 104.1%

Stiff Diagram



Scale: Meq/L

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-35

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.

Collection Date: 2-Feb-93

Location: NE 1/4; Sec.31-T32-R8

Collection Time: Unknown

Formation: Fruitland Coal

County: San Juan State: NM

Well Name: Gardner 2-C

Analyst: K. Lambdin

Remarks: none

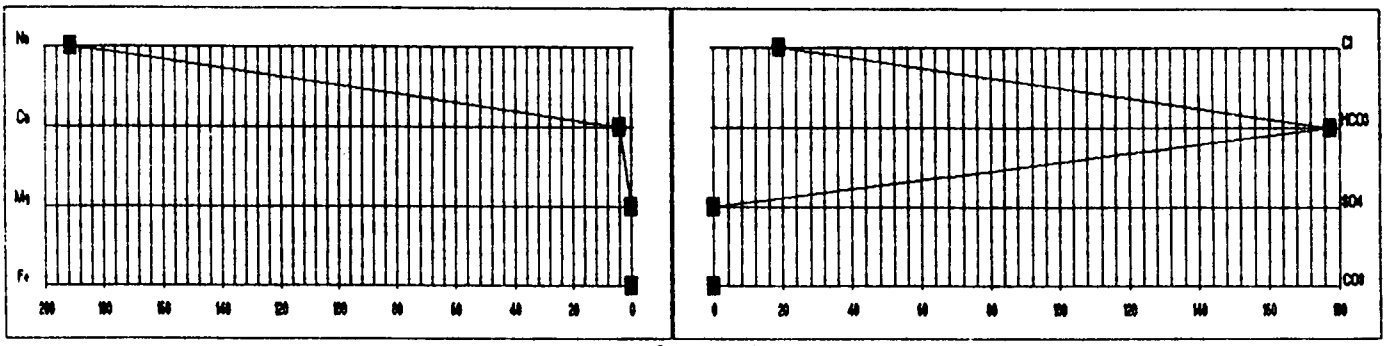
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,400	mg/l		Chloride , Cl	675	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	80	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
I[redacted], Fe(Diss.)	0.0	mg/l	NR	Bicarbonate,HCO3	10,821	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	0.678	ohm-m	
pH	7.85	Units		Conductivity	14,760	uS	
				Specific Gravity (@ 60 Degrees F)	1.018	Units	
TDS	11,680	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run Fe and H2S .

NR = Test Not Run

Anion/Cation: 100.6%

Stiff Diagram



Scale: Meq/L

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-36

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co.
Collection Date: 2-Feb-93

Location: SW 1/4 Sec.31-T32-R8
Collection Time: Unknown

Formation: Fruitland Coal
County: San Juan State: NM

Well Name: Gardner 3-C
Analyst: K. Lambdin Karen C Lambdin

Remarks: none

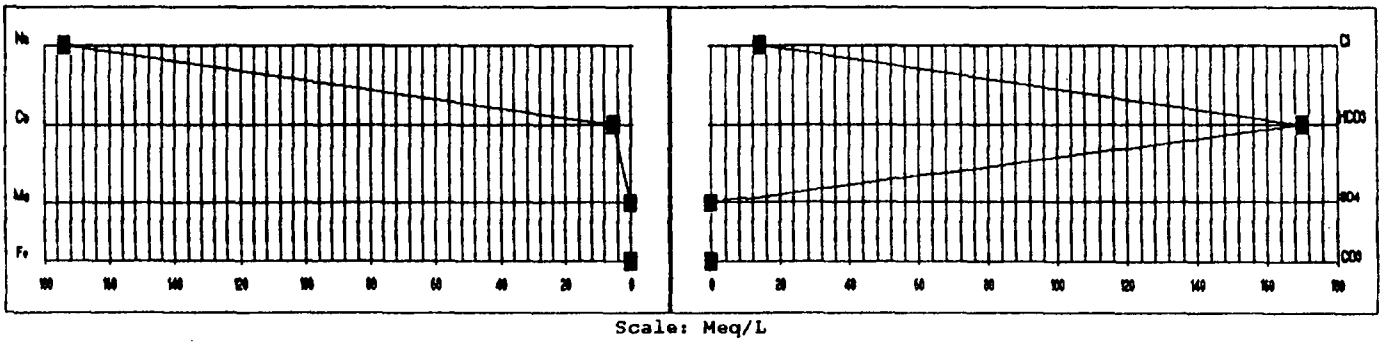
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,000	mg/l		Chloride , Cl	497	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	105	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
, Fe(Diss.)	0.0	mg/l	NR	Bicarbonate,HCO3	10,370	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	0.716	ohm-m	
pH	7.95	Units		Conductivity	13,960	uS	
				Specific Gravity (@ 60 Degrees F)	1.019	Units	
TDS	10,880	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run Fe and H2S .

NR = Test Not Run

Anion/Cation: 102.7%

Stiff Diagram



Scale: Meq/L

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-37

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Co. | Collection Date: 2-Feb-93

Location: SW 1/4 Sec.25-T32-R9 | Collection Time: Unknown

Formation: Fruitland Coal | County: San Juan | State: NM

Well Name: Gardner 4-C | Analyst: K. Lambdin Karen C Lambdin

Remarks: none

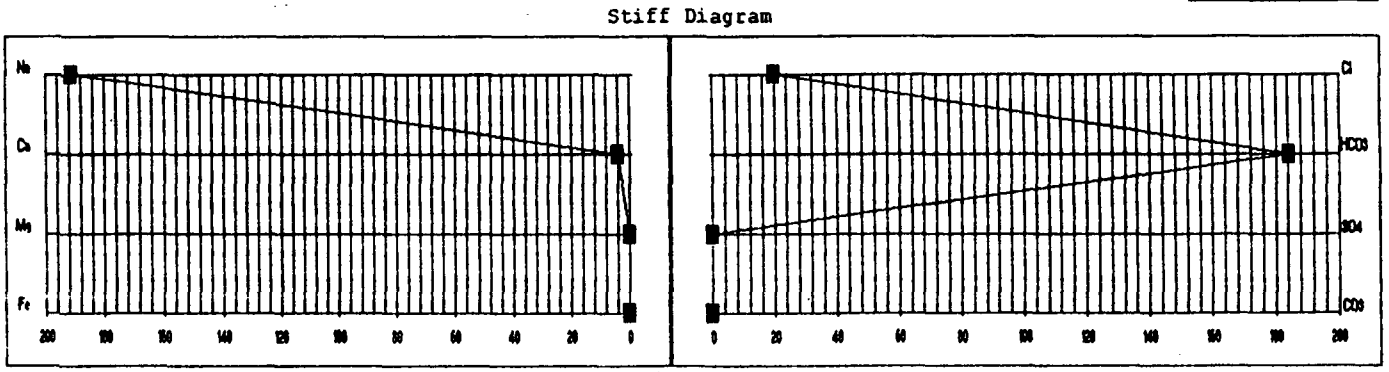
PARAMETER	as ION		Comment	PARAMETER	as ION		Comment
Sodium , Na	4,400	mg/l		Chloride , Cl	709	mg/l	
Potassium, K	0	mg/l	NR				
Calcium , Ca	79	mg/l	TH as Ca	Sulfate, SO4	0	mg/l	<10
				Hydroxide, OH	0	mg/l	
Magnesium , Mg	0	mg/l	NR	Carbonate, CO3	0	mg/l	
[redacted], Fe(Diss.)	0.0	mg/l	NR	Bicarbonate,HCO3	11,224	mg/l	
Hydrogen Sulfide	0	mg/l	NR	Resistivity (@25 Degrees C)	0.654	ohm-m	
pH	7.70	Units		Conductivity	15,300	uS	
				Specific Gravity (@ 60 Degrees F)	1.022	Units	
TDS	11,720	mg/l					

Remarks: Ca and Mg reported as Total Hardness as Ca.
This determination required a 30 minute acid digestion.
Not enough sample to run Fe and H2S.

NR = Test Not Run

Anion/Cation: 104.5%

Stiff Diagram



Scale: Meq/L

[redacted]

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-237

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Company
Collection Date: 21-Jul-93

Well Name: NA
Collection Time: 10:45 AM

Formation: Ground water spring
County: San Juan State: NM

Location: P/L spring on Arkansas Loop F
Analyst: K. Lambdin

Remarks: None.
Analysis Date: 7/25/93

PARAMETER	as ION		Comment
Sodium , Na	82	mg/l	
Potassium, K	3	mg/l	
Calcium , Ca	110	mg/l	
Magnesium , Mg	29	mg/l	
Iron, Fe (Total)	0.0	mg/l	NR
Hydrogen Sulfide	0	mg/l	NR
pH	7.62	Units	
TDS	671	mg/l	

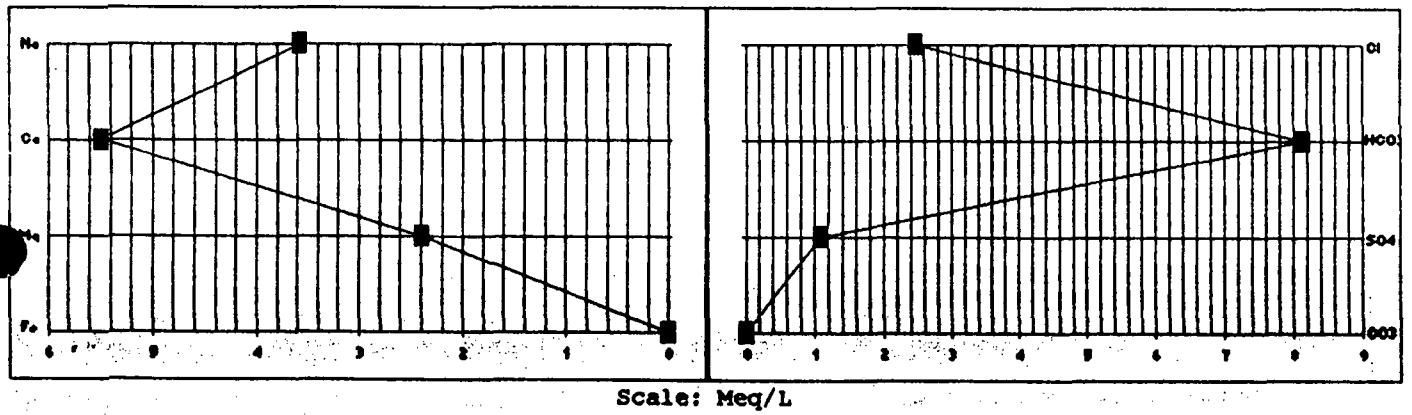
PARAMETER	as ION		Comment
Chloride , Cl	88	mg/l	
Sulfate, SO4	52	mg/l	
Hydroxide, OH	0	mg/l	
Carbonate, CO3	0	mg/l	
Bicarbonate, HCO3	496	mg/l	
Resistivity (@25 Degrees C)	9.960	ohm-m	
Conductivity	1,004	uS	
Specific Gravity (@ 60 Degrees F)	1.000	Units	

Remarks: None.

NR = Test Not Run

Anion/Cation: 101.5%

Stiff Diagram



Scale: Meq/L

WATER ANALYSIS TESTING ENVIRONMENTAL REPORTS

1115 Farmington Avenue - Farmington , NM 87401
(505) 325-1085

Lab Sample No.: W93-233

Standard A.P.I. Water Analysis Report

Collected By: Don Johnson

Company: Koch Exploration Company

Collection Date: 19-Jul-93

Well Name: NA

Collection Time: 2:00 PM

Formation: Spring

County: San Juan State: NM

Location: Rawhide Spring

Analyst: K. Lambdin Karen C Lambdin

Remarks: None.

Analysis Date: 7/20/93

PARAMETER	as ION		Comment
Sodium , Na	21	mg/l	
Potassium, K	0	mg/l	<5
Calcium , Ca	92	mg/l	
Magnesium , Mg	15	mg/l	
Iron, Fe (Total)	0.0	mg/l	NR
Hydrogen Sulfide	0	mg/l	NR
pH	8.00	Units	
TDS	435	mg/l	

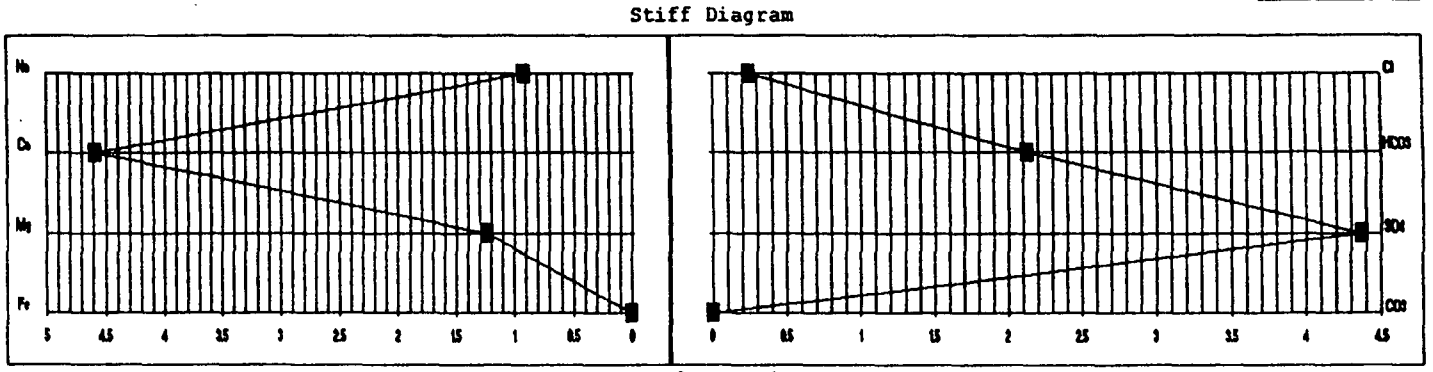
PARAMETER	as ION		Comment
Chloride , Cl	9	mg/l	
Sulfate, SO4	210	mg/l	
Hydroxide, OH	0	mg/l	
Carbonate, CO3	0	mg/l	
Bicarbonate,HCO3	130	mg/l	
Resistivity (@25 Degrees C)	14.925	ohm-m	
Conductivity	670	uS	
Specific Gravity (@ 60 Degrees F)	1.000	Units	

Remarks: None.

NR = Test Not Run

Anion/Cation: 100.2%

Stiff Diagram



Scale: Meq/L

STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ALBUQUERQUE

ELUID L. MARTINEZ
STATE ENGINEER

DISTRICT 1
3311 CANDELARIA, N.E. SUITE A
ALBUQUERQUE, NM 87107

August 18, 1993

T. Tweeti Blancett
P. O. Box 55
Aztec, NM 87410

Dear Ms. Blancett:

In response to your FAX which was received yesterday afternoon, a review of the files of this office has located no record of any water well in Sections 21, 22, 23, 26, 27, 28, 33, 34, or 35 of Township 32 North, Range 9 West, NMPM.

Very truly yours,

C. A. Wohlenberg
Assistant District Supervisor
(505) 841-9482

CAW:sjr

August 18, 1993

Re: Cathodic Drillings in the Pilot Project Area

From: Bill Worley
El Paso Natural Gas
599-3317

Bill gave me the following information:

CPS (cathodic protection system) 1186 drilled on Feb. 20, 1992 in the northeast corner of Section 33 hit moisture in sandy clay soil at 170'

CPS 1489 1981 in T31 R9W SECTION 18 hit no moisture at 800'

Query1 (WELLDATA.DBF) Page: 1

	CPS	WELLNAME		WELLNO	Sec.	TWN	RNG	L_UL
1	2256W	SAN JUAN 32-9 UNIT		283	33	032N	009W	L 125' yes
2	2212W	SAN JUAN 32-9 UNIT		282	33	032N	009W	G 105' yes
3	0429W	SAN JUAN 32-9 UNIT		71	33	032N	009W	A n/a no
4	0428W	SAN JUAN 32-9 UNIT		36	33	032N	009W	M n/a no
5	0430W	SAN JUAN 32-9 UNIT		37	32	032N	009W	H
6	0430W	SAN JUAN 32-9 UNIT		226	32	032N	009W	H 90' yes
7	0319W	SAN JUAN 32-9 UNIT		281	32	032N	009W	K n/a no
8	0319W	SAN JUAN 32-9 UNIT		7	32	032N	009W	M
9	1530W	SAN JUAN 32-9 UNIT		32A	31	032N	009W	C N/A
10	0353W	SAN JUAN 32-9 UNIT		278	31	032N	009W	A n/a no
11	0353W	SAN JUAN 32-9 UNIT		41	31	032N	009W	A
12	0321W	SAN JUAN 32-9 UNIT		279	31	032N	009W	N n/a no
13	0321W	SAN JUAN 32-9 UNIT		32R	31	032N	009W	N
14	0358W	SAN JUAN 32-9 UNIT	N	2	30	032N	009W	J N/A no
15	0355W	SAN JUAN 32-9 UNIT		277	30	032N	009W	N n/a no
16	0355W	SAN JUAN 32-9 UNIT		40	30	032N	009W	N
17	0431W	SAN JUAN 32-9 UNIT		275	29	032N	009W	M n/a no
18	0431W	SAN JUAN 32-9 UNIT		51	29	032N	009W	M
19	2255W	SAN JUAN 32-9 UNIT		274	28	032N	009W	H 185' yes
20	2255W	SAN JUAN 32-9 UNIT		60	28	032N	009W	H
21	2258W	SAN JUAN 32-9 UNIT		53	27	032N	009W	M 220' yes
22	2258W	SAN JUAN 32-9 UNIT		276	27	032N	009W	M

API WATER ANALYSIS REPORT FORM

2258w

Laboratory No. 2591072 4-2F

Company		Sample No.	Date Sampled
MERIDIAN OIL			7/21/91
Field	**Legal Description**	**County or Parish**	**State**
	M 27-32-9	San Juan	N.M.
Lease or Unit	**Well**	**Depth**	**Formation**	**Water, B/D**
	SJ 32-9 #276		FC	
Type of Water (Produced, Supply, etc.)	**Sampling Point**	**Sampled By**
GROUND BED		MRW

DISSOLVED SOLIDS

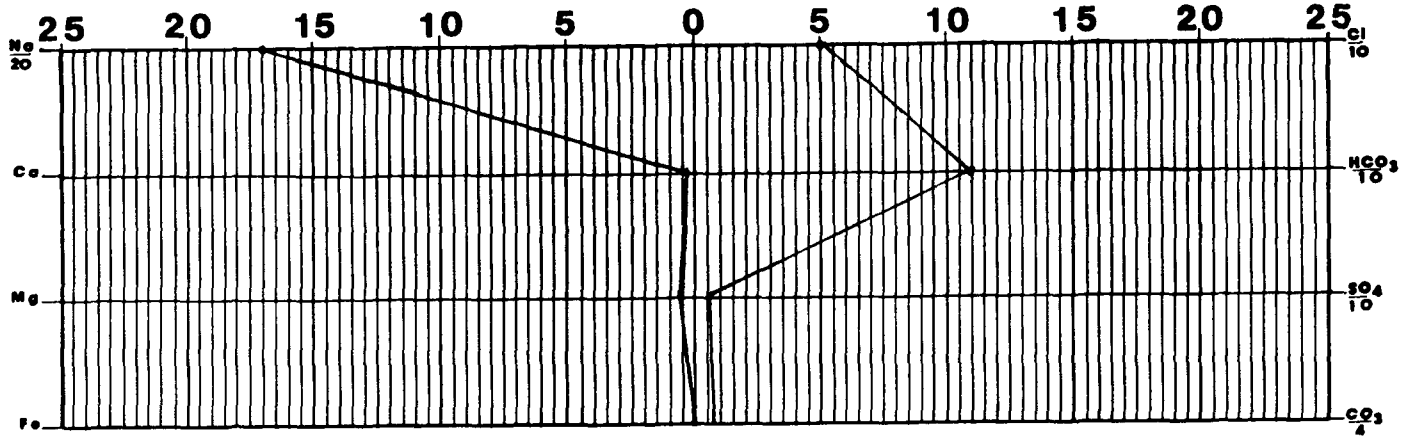
CATIONS	*mg/l*	*me/l*
Sodium, Na (calc.)	4000	170
Calcium, Ca	8.0	0.4
Magnesium, Mg	7.3	0.6
Barium, Ba		

ANIONS		
Chloride, Cl	1800	50
Sulfate, So_4	320	6.7
Carbonate, CO_3	210	7.0
Bicarbonate, HCO_3	6600	110

OTHER PROPERTIES

pH	8.5
Specific Gravity, 60/60 F.	0.9949
Resistivity (ohm-meters) 72° F.	0.87
Total Dissolved Solids (calc.)	13000
Iron, Fe (total)	
Sulfide, as H_2S	

REMARKS & RECOMMENDATIONS:



Date Received	Preserved	Date Analyzed	Analyzed By
07/24/91	n/a	07/24/91	EK

TECH, Inc.
333 East Main
Farmington
New Mexico
87401
505/327-3311

Midwest Canvas Corporation
INSUL/TARPS • TRUCK COVERS • CONTRACTORS' TARPS
4635 WEST LAKE STREET • CHICAGO, ILLINOIS 60644
(312) 287-4400

30 MIL P.V.C. SPECIFICATIONS

TENSILE STRENGTH	M= 2000 - 2500 D= 2000 - 2500
100% MODULAS	M= 550 - 750 D= 550 - 750
ENLONGATION	M= 380 - 500 D= 380 - 500
ELEMENDORF TEAR	M= 160 - 260 260
	300 300
	25
	- 0.8
	- 73

O.R.E. SYSTEMS
#30 Road 5911 P.O. Box 3677
FARMINGTON, NEW MEXICO 87499
(505) 327-2161

AMOCO NONWOVEN CONSTRUCTION FABRICS

SPECIFICATIONS*

Grab Tensile	ASTM-D-4632	lbs.	90	120	185	250	300	90	120
Grab Elongation	ASTM-D-4632	%	50	50	50	50	50	55	50
Mullen Burst	ASTM 3786	psi	215	300	380	>750	>750	215	300
Puncture	ASTM 3787 (mod)	lbs.	65	90	130	200	250	60	90
Trapezoidal Tear	ASTM-D-4533	lbs.	45	50	70	90	100	35	45
U.V. Resistance Strength Retained)	ASTM 4355	%	70	70	70	70	70	70	70
Abrasion Resistance Strength Retained)	ASTM-D-1175 (1000 cycles-CS17 wheel)	lbs.	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Equivalent Opening Size	CW02215	U.S. Sieve Number	70 min	70 min	70 min	70 min	70 min	n/a	n/a
Permittivity	ASTM-D-4491	gal/min/ft²	100	90	80	60	50	n/a	n/a
Permeability	ASTM-D-4491	cm/sec	.2	.2	.25	.15	.2	n/a	n/a
Asphalt Retention	TX DOT 3099 TF 25 #8	gal/s.y. (oz./sq. ft.)	n/a n/a	n/a n/a	n/a n/a	n/a n/a	n/a n/a	.25 3.5	.35 4.5

Minimum roll average values. All non functional properties such as color and thickness are not shown.

Roll Width (ft.)	15	15	15	15	15	12.5	12.5
Roll Length (ft.)	420	300	240	165	120	360	300
Roll Diameter (inches)	17	19	19	19	20	13	14
Gross Weight (lbs.)	210	200	215	220	220	155	170
Area (sq. yd.)	700	500	400	275	200	500	416

*All Roll Goods Available With Lift Straps For Easy Handling..

FEDERAL HIGHWAY ADMINISTRATION JOINT AASHTO-AGC-ARTBA-TASK FORCE 25 RECOMMENDED GUIDELINES BY END USE

STABILIZATION		
Low	4545	2090
Medium	4551	2000
High	4553	2002
Very high	4561	2006
DRAINAGE		
Protected	4545	1198, 1199
Unprotected	4553	1198, 1199
EROSION CONTROL		
Protected	4545	1198, 1199, 2006
Unprotected	4557	1198, 1199, 2006
PAVING	AmoPave 4599	n/a
SILT FENCE	n/a	1380, 2125

TASK FORCE 25 GUIDELINES

MECHANICAL PROPERTIES (Average Roll Minimum Value Weakest Direction)

Grab Strength	ASTM-D-4632	lbs.	80	180	90	200	90	130	180	270	90
Puncture	ASTM-D-3787	psi	25	80	40	80	30	40	75	110	-
Trapezoidal Tear	ASTM-D-4533	lbs.	25	50	30	50	30	40	50	75	-
Mullen Burst	ASTM-D-3786	psi	130	290	140	320	145	210	290	430	-
Elongation	ASTM-D-4632	%	-	-	15%	15%	-	-	-	-	15% min 50% max (at 45 lbs.)
EOS	CW02215	U.S. Sieve No.	← Refer to No. I →								20 min
Permittivity	ASTM 4491	sec.⁻¹	-	-	-	-	-	-	-	-	>.01
U.V. Resistance (500 hours exposure)	ASTM 4355	%	-	-	-	-	-	-	-	-	70

HYDRAULIC SPECIFICATIONS FOR DRAINAGE, EROSION CONTROL, ROAD STABILIZATION

I. PIPING RESISTANCE (soil retention – all applications)
A. EOS NO. (fabric) ≥ 30 Sieve (<50% soil passing #200 Sieve)
B. EOS NO. (fabric) ≥ 50 Sieve (>50% soil passing #200 Sieve)

II. PERMEABILITY
CRITICAL/SEVERE APPLICATIONS k (fabric) ≥ 10k (soil)
NORMAL APPLICATION k (fabric) ≥ k (soil)

PAVING SPECIFICATIONS

Midwest Canvas Corporation
INSUL/TARPS • TRUCK COVERS • CONTRACTORS' TARPS
4635 WEST LAKE STREET • CHICAGO, ILLINOIS 60644
(312) 287-4400

30 MIL P.V.C. SPECIFICATIONS

TENSILE STRENGTH	[redacted]	M= 2000 - 2500 D= 2000 - 2500
100% MODULAS		M= 550 - 750 D= 550 - 750
ENLONGATION		M= 380 - 500 D= 380 - 500
ELEMENDORF TEAR		M= 160 - 260 D= 160 - 260
GRAVES TEAR		M= 200 - 300 D= 200 - 300
WATER EXTRACTION		0-0.25
VOLATILITY		05. - 0.8
COLD CRACK		-20
SHORE HARDNESS		68 - 73
PIN HOLES		0-1
THICKNESS		+ 8%

August 11, 1993

To Whom It May Concern:

Enclosed you will find a short biographical sketch of my qualifications. I was requested on August 10, 1993 to view and evaluate a large tract of land in northwestern New Mexico for Linn and Treciafaye Blancett.

In my opinion the land and coal seam water would be put to a beneficial and productive use by establishing a pilot irrigation project.

The preliminary site and water gathering system for the two existing wells on the Blancett Federal would have the capacity and storage for 400 barrels of coal seam water per day. By designing the pipeline and pit system in conjunction with the planned irrigation system, the same system can serve two purposes. The systems would be developed on a 20 acre pilot project in a 320 acre deeded plot. The small acreage allows for control and the large surrounding tract allows for possible future expansion.

The use of natural grasses and browse would improve the present range conditions. The coal seam water that is presently not being used for beneficial use, would provide the much needed moisture for the vegetation.

The natural contours of the land are suited for a sprinkler irrigation type system and livestock/wildlife waterers can be placed to enhance the watering capacity of the existing range.

I see no threat of the natural water flow into the existing arroyos due to the small amount of water being used. The sodium and bicarbonate buildup would be very minimum due to the limited quantities of coal seam water being distributed and the large tract being irrigated.The natural snow and rainfall will dissolve and disseminate those traces left on the soils and I feel little chemical additives would ever be needed.

The soil types are such that they will be very receptive to salt tolerant grasses and allow for a successful pilot project.

I would recommend closely monitoring the soils and water in the pilot plot. This type of project for long range analysis would be between 5 (five) and 15 (fifteen) years or until the water availability is no longer viable.

The placement of the dirt pits for water storage and irrigation should not damage any surface water sources or underground water supplies.

This looks to be a very viable project and the Blancetts are willing to have their private land used in this manner and for the study that they will carefully control. The environmental impact should be very positive since the water will greatly enhance the land's productivity.

I see no reason this project should not be approved and permitted.

Sincerely yours,

Lewis McCuistian

Biographical Sketch:

Lewis McCuistian
338 Centre
Hereford, Texas 79045
1-806-364-4311

Age: 57 years

Education: BA in Agronomy from Texas Tech University, Lubbock, Texas

Experience: 33 years in designing and developing irrigation systems

Present Position: Soil Engineer, Soil Conservation Service, Canyon, Texas

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time: 9:00 A.M.

Date: Sept. 10, 1993

Originating Party	Other Parties
Dale	Kathy Brown
Koch Exploration	OCD

Subject: Koch Evaporation Ponds
San Juan County

Discussion: Koch has decided to go with Bob Frank's (double-lined evaporation ponds) and not Tweety's proposal based on Koch's concern over environmental liability & the costs. Will only need to permit the pond on the east side of the canyon which will be on BLM land. Want to hold off on the pond on the west side since the water has not increased as predicted. Will install a centralized tank battery for the west side wells (4) and see what happens with water production next year. Tank battery will also be on BLM land.

Conclusions or Agreements: Need centralized 711 permit for pond on east side canyon. Letter from Koch stating intentions of centralized tank battery for west side of canyon will be suffic - no permit required.

Distribution: file: Koch
Tweety

Signed: Kathy Brown

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal	Time	Date
	8:00 A.M.	Sept. 7, 1993

Originating Party	Other Parties
Michael Scates - Koch	K Brown OCD

Subject: Koch Exploration - Evaporation Pits

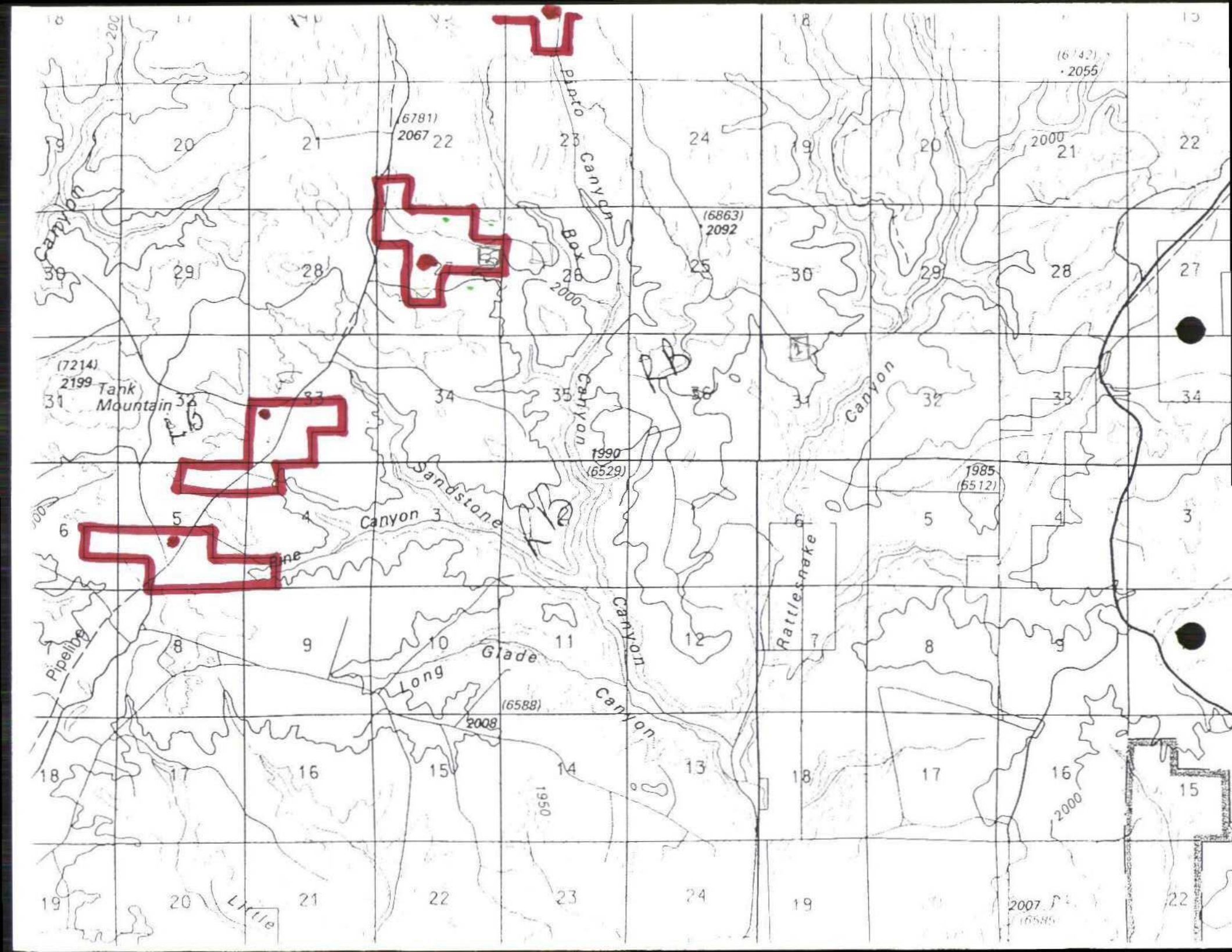
Discussion: KB - What pond do you want permitted.
Scates - skeptical about Tweety's project.
Is going to meet with Tweety on Thurs.
Also Tweety's pond hasn't been renewed by State Engineer.
East + West side of canyon - pond applications submitted by Koch Tweety's is the alternative for the east pond.
~~East & West sides of canyon~~
Mike has environmental concerns about Tweety's operation - high salts, run off into arroyo (NMNES), State Engineer approval.

Conclusions or Agreements

Will hear from Mike on Kochs decision on Thursday
Will go ahead & review west canyon pond.

Distribution: file Tweety Koch

Signed: Kathy Brown


Pipeline Canyon
(6781)
2067
Pipeline Canyon
Box
2000
(6863)
2092
2055
2000
(7214)
2199
Tank
Mountain
Pipeline
Sandstone
Canyon
1990
(6529)
Canyon
1985
(6512)
Pine
Canyon
Rattlesnake
Canyon
Long
Glade
(6588)
2008
1950
2000
Little
2007

8/26/93 OCD/Blancett Meeting 10:00 am

participants - Bill Olson - Envir. Bureau
Roger Anderson - "
Kathy Brown - "
Tweeti Blancett
Lynn Blancett

T.B. - Presented application for centralized facility

RCA - OCD requires double lined pond

T.B. - bottom will be compacted with Geotextile membrane
can install sump for leak detection

B.O. - OCD will set monitor requirements for land application

LB - Land application for pilot project will be outside UA

KB - OCD will review by next week

August 12, 1993

To: Roger Anderson

From: T. (Tweet) Blancett

Re: Disposition of Transported Produced Water for a Pilot Project

Roger thank you for seeing me so quickly. The OCD has responded very promptly to ever question we have asked as well as being supportive of the entire project.

I received a copy of RULE 710. The following is my response. This will give us a starting place, since some of the requirements are easy to provide.

Rule 710

A. In all the described pieces of private land there are natural seeps or springs. When the family homesteaded these lands years ago they chose the ones with some source of water. Unfortunately the water is very scarce. There is little to no possibility of produced water constituting a hazard to spring/seep water.

B. The delivery of the produced water will be via pipeline directly from the adjacent coal seam wells. The water will go either into a dirt pit or directly into the irrigation system. The area where is the pit will be placed is on a ridge that is blue clay that will naturally seal.

C. The exception that we would request for this pilot project would be for the construction of an irrigation system to place the produced water to beneficial use on flats that will be planted with natural grasses and livestock and wildlife waterers.

D. Not Applicable

Rule 711 Commerical Surface Waste Disposal Facilities

A. Our dirt pits will receive produced water that has been tested and which we feel are beneficial for agricultural purposes.

1. Prior to construction we will address the following items:

a. The legal descriptions for the following four pieces of deeded land and topographical map show the proposed locations for dirt pits. There are roads as identified on the enclosed map, there are no watercourses (unfortunately), no wells, and no dwellings within one mile of the any of the sites.

Tract 1 T.30N. R.12W.
SEC. 13: SW1/4SE1/4 AND THE WEST 1076 FEET OF THE SE1/4SE1/4
SEC. 24: NE1/4

TRACT 2 T.32N. R.9W.
SEC. 4: LOT 4
SEC. 5: LOT 1 AND 2

TRACT 3 T.32N. R.9W.
SEC. 14: W1/2NW/1/4 SE1/4NW14, NE1/4SW1/4
SEC. 22: SW1/4SW1/4
SEC. 27: N1/2NW1/4, SE1/4NW1/4, NW1/4NE/14, S1/2NE1/4, NE1/4SW1/4
SEC. 33: SW1/4, NW1/4SE1/4

TRACT 4 T.31N. R9W.
SEC. 6: NE1/4SE1/4, N1/2SW1/4, SE1/4SW1/4, W1/2SE1/2
SEC. 5: SE1/4SE1/4
SEC 4: SW1/4SW1/4

b. The landowners are as follows:
Linn R. Blancett
Treciafaye W. Blancett
Richard M. Blancett

P.O. Box 55
Aztec, N. M. 87410
505-334-6067

c. The enclosed description of the facility is designed for an irrigation system and not a Waste Storage/Disposal Pit. This plan has the component I feel necessary to implement the pilot project and put the incidental water to beneficial use.

d. There is no accumulation of waste solids. All water will be placed directly on the plots and rain and snowfall will dissolve and disseminate any particles. The water will rarely build up in the pits even in the winter, since it is the intent of the project to water even on the snow with a high pressure pump that is already bringing the water to the pit.

e. With only 400-900 barrels a day that will allow 1/2" to 1" of water on 20 acres in a 20-40 day period. There is 320 acres that could receive the water if it were available. The problem is to little-not to much.

f. Since this is our private land we will do all the monitoring and inspecting. A baseline soil analysis will be requested from SCS and then the acreage will be tested biannually before the growing season and after the growing season. The facility will receive no water that has not come from a pretested well with a water analysis that is acceptable. This is our private land that has been in the family for several generations, it is our intent to enhance the environment and range conditions.

g. Closure Plan will include a stockpile with one (1) foot of top soil to be used upon closure and reseeded with natural grasses.

h. There will be no oil field wastes placed on the land and no fresh water will be impacted.

i. N/A

j. Certification on application

k. In developing this idea the State Engineer in Aztec and Albuquerque, BLM in Farmington, SCS, and the OCD were consulted. Since this has never been done there was little information available, but all entities thought the idea was good and wished to be kept informed. If the pilot projects are successful the information gained on these projects can be used on Federal and State Lands.

2. N/A

3. N/A

4. I hope this can be permitted quickly since the seed beds for the grasses need to be prepared and planned this month and September.

5. Do I need this?

6. Linn Blancett will install and keep the records on the pastures watered and seeded. This will include the source, location, volume, type of produced water, amount of water put on each acreage, soil analysis, grasses used, and time of year waters were used.

7. The water will be pumped directly from the wells where possible into the pit. The oil company will be required to provide us with a monthly water analysis so physical monitoring will not be necessary.

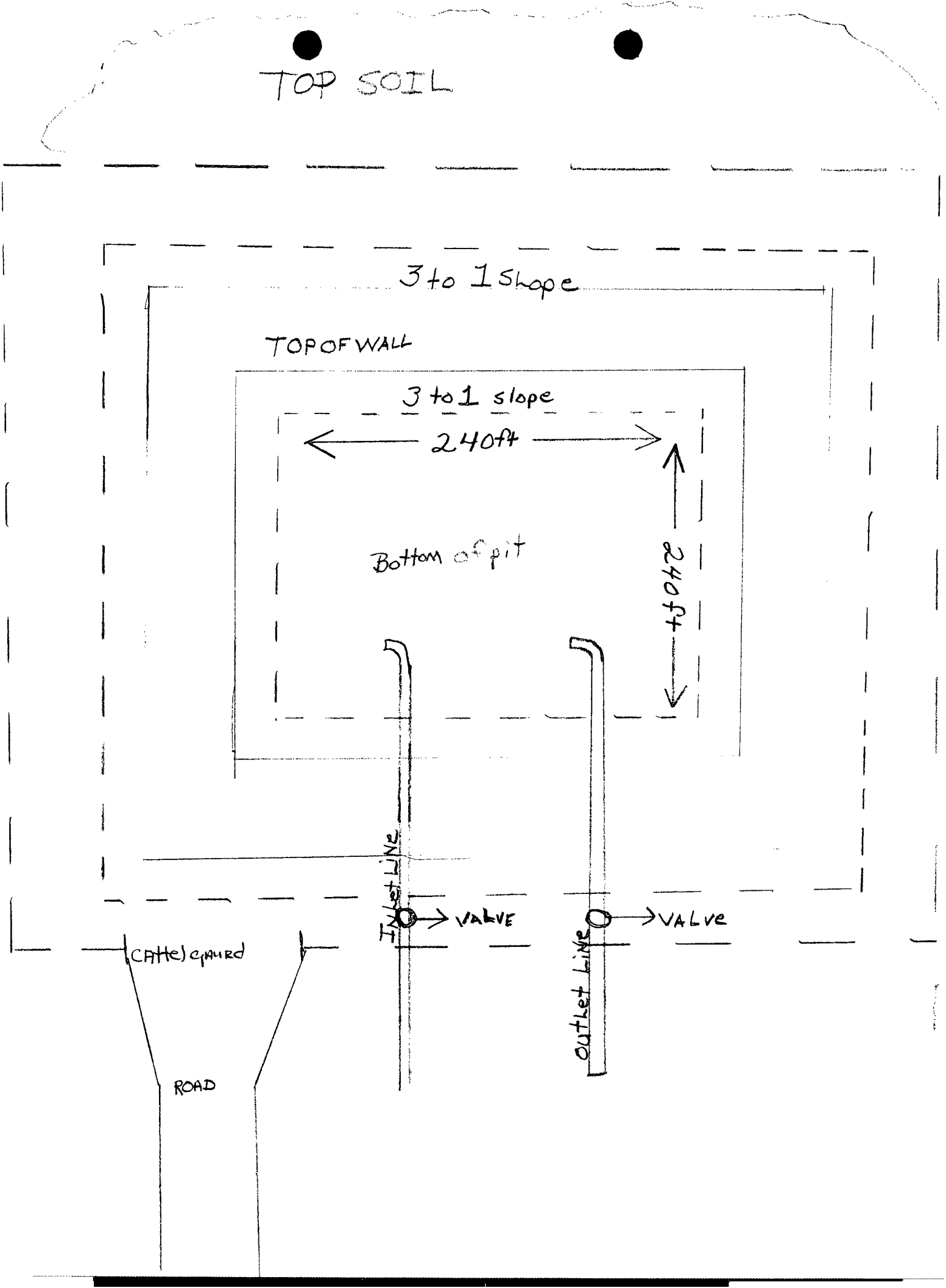
8. Acceptable.

9. This project will provide grasses and water for the migratory birds and we request that no netting or covering is required. In addition this project will have livestock and wildlife waterers on the exterior fencing of the large tracts.

10. N/A

11. N/A

12. N/A


TOP SOIL
3 to 1 Slope
TOP OF WALL
3 to 1 slope
240ft
240ft
Bottom of pit
Inlet Line
VALVE
VALVE
Outlet Line
CATTLEGUARD
ROAD

Roger

OIL CONSERVATION DIVISION
RECEIVED

'93 AUG 16 AM 10 17

August 11, 1993

RECEIVED
AUG 11 1993
OIL CON. DIV
DIST. 3

Oil Conservation Division
Denny Foutz
1000 Rio Brazos
Aztec, N.M. 87410

Dear Denny;

Thank you for the time you and Frank spent reviewing the proposed pilot project in the Mesa Mountains.

Please accept this letter a request for permitting to receive the coal seam water from Koch Energy.

After analysis of the overall project, I would like to be able to put the water to beneficial use on a 20 acre pilot plot. This land would be in a 320 acre parcel that would allow for future expansion if more water was received.

I have decided to build the pits, prepare the land for planting and install the irrigation system. I will then put in place all the controls to monitor the water and the soil on our private land.

Koch will provide the pipeline network to connect the existing wells on the Blancett Federal and delivery system to place the water in a dirt pit on our private land.

Enclosed is a letter addressing the concerns we discussed earlier. It is my hope that a decision can be made very soon. The water is a very small amount and won't go far, but we would like to make it available for a fall planting. Now is the time to plant the fall grasses to establish the root system for the winter and spring.

Thank you again for your help and assistance. We are very excited about being able to use a water for beneficial purposes. After having conversation with the State Engineer's Office, BLM, Lewis McCuistian, and your office, we feel this project could establish the basis for multi-use of existing resources. I always hear about recycling and improving our environment, this is a way I can be involved.

Sincerely yours,

Tweeti Blancett

T. (Tweeti) Blancett

STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ALBUQUERQUE

ELUID L. MARTINEZ
STATE ENGINEER

DISTRICT 1
3311 CANDELARIA, N.E. SUITE A
ALBUQUERQUE, NM 87107

August 6, 1993

T. Tweeti Blancett
P. O. Box 55
Aztec, NM 87410

Dear Ms. Blancett:

In response to your letter dated August 3, 1993, and confirming our conversation Thursday afternoon, please be advised that no permit from the State Engineer Office is necessary for the use of the waste water described in said letter. However, said use may require permits from the Oil Conservation Division and/or the New Mexico Environment Department.

Very truly yours,

Charles Wohlenberg

C. A. Wohlenberg
Assistant District Supervisor
(505) 841-9482

CAW:sjr

This looks to be a very viable project and the Blancetts are willing to have their private land used in this manner and for the study that they will carefully control. The environmental impact should be very positive since the water will greatly enhance the land's productivity.

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Lewis McCuistian

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Biographical Sketch:

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338 Centre
Hereford, Texas 79045
1-806-364-4311

Age: 57 years

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