Union Pacific Resources
A Subsidiary of Union Pacific Corporation

December 12, 1990

VIA FEDERAL EXPRESS

U.S. Dept. of the Interior
Bureau of Land Management
Canon City District Office
3170 E. Main Street
Canon City, CO 81212

RE: Application for Permit to Drill
Mount Pearl Unit 13G-30
Sec. 30-T13S-R47W
Cheyenne County, Colorado

Gentlemen:

Enclosed are four (4) copies of Union Pacific Resources' Application for Permit to Drill the Mount Pearl Unit 13G-30 well. The APD includes the following items:

1) Form 3160-3

2) Ten-Point Compliance Program with Exhibits A, B, and C

3) Surface Use Program with Exhibits #1 through #9

If you have any questions or need additional information, please contact me at 817/877-7325.

Respectfully yours,

UNION PACIFIC RESOURCES COMPANY

Kris Curran

Kris Curran
Regulatory Analyst

/kc

Enclosures

Union Pacific Resources Company
P.O. Box 7
Fort Worth, Texas 76101-0007
817 / 877-6000
TWX 910 893 5024
Telex 758-447

Form 3160-3
(November 1983)
(formerly 9-331C)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER — SINGLE ZONE [X] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: Union Pacific Resources Company

3. ADDRESS OF OPERATOR: P. O. Box 7 - MS 3407, Fort Worth, Texas 76101-0007

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 1580'FSL & 660' FWL
NW/4 SW/4 Sec. 30-T13S-R47W
At proposed prod. zone: 1650' FSL & 600' FWL NW/SW 30-13S-47W

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 8 miles North & 4 miles E. of Kit Carson, Colorado

5. LEASE DESIGNATION AND SERIAL NO.: C-37225 ACQ.
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A
7. UNIT AGREEMENT NAME: Mount Pearl Unit
8. FARM OR LEASE NAME: Mount Pearl Unit (Sec.30)
9. WELL NO.: 13G-30
10. FIELD AND POOL, OR WILDCAT: Mount Pearl Unit-Morrow
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T13S-R47W
12. COUNTY OR PARISH: Cheyenne
13. STATE: Colorado

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)	16. NO. OF ACRES IN LEASE	17. NO. OF ACRES ASSIGNED TO THIS WELL
660'	304.9	Unitized
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	**19. PROPOSED DEPTH**	**20. ROTARY OR CABLE TOOLS**
±1575'	5600'	Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 4344' GR

22. APPROX. DATE WORK WILL START*: Upon Approval

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT

See attachments for Casing/Cementing Program/Drilling Prognosis/BOP Program.

Blanket Surety Bond ID# 888994

API # 05-017-7202

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED Kris Curran KRIS CURRAN TITLE REGULATORY ANALYST DATE 12-11-90

(This space for Federal or State office use)

PERMIT NO. 90-1450 APPROVAL DATE Dec 20 1990 EXP DATE April 19, 1991

APPROVED BY Dennis R Buckell TITLE Director DATE Dec 20, 1990

CONDITIONS OF APPROVAL, IF ANY:
If abandoned set plugs on top of Dakota (1700'), Cheyenne (2000'), and Blaine (2750'), in addition to other required plugs

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

UNION PACIFIC RESOURCES COMPANY
MOUNT PEARL UNIT 13G-30
SW/4 Section 26-T13S-R47W
Morrow Development Well
Cheyenne County, Colorado
Lease #C-37225 Acq.

TEN-POINT COMPLIANCE PROGRAM

1. Geologic name of surface formation:

   Pierre Shale.

2. Estimated tops of geological markers:

FORMATION	DEPTH	SUBSEA
Lansing	4355'	- 2'
Marmaton	4748'	- 395'
Cherokee	4879'	- 526'
Atoka	5061'	- 708'
Morrow	5243'	- 890'
V-7	5377'	-1024'
Lower Morrow	5484'	-1130'
Spergen	5496'	-1153'
Total Depth	5600'	-1247'

3. Estimated depths of anticipated water, oil, gas, and other mineral bearing formations to be encountered:

MINERAL	FORMATION	DEPTH
Oil	Morrow V-7	5377'

   NOTE: All shows of fresh water will be reported.

4. Proposed casing program:

   Reference Exhibit "A" for casing design.

5. Operator's minimum specifications for pressure control equipment:

   Exhibit "B" is a schematic diagram of the blowout preventer equipment which will consist of one Reagan 10" 2000 psi annular hydraulic preventer with Baker pneumatic closing unit,

20 gallon accumulator, and National 2"x2" 2000 psi choke manifold.

The BOP will be hydraulically tested to 1000 psi after nippling up and after any use under pressure. Annular will be operationally checked every 24 hours as well as each time pipe is pulled out of the hole. Such checks will be noted on the tour sheets.

6. Mud program:

Reference Exhibit "A" for the mud program to be utilized.

7. Auxiliary equipment:

a) A kelly cock will be kept in the string at all times.
b) A float will be used at the bit at all times.
c) Monitoring equipment will not be required on mud system due to anticipated sub-normal pressure formations.
d) A stabbing valve will be available on the rig floor and will fit all rotary connections.

8. Testing, coring and logging programs:

a) Samples shall be taken at 10' intervals from 5000' to total depth.
b) One 60' core in top of Morrow.
c) DST's as needed.
d) Run DIL/GR log from total depth to base of surface casing. LDT-CNL with high resolution across Morrow from total depth to 4000'. SHDT on standby.
e) Mud logging consultant monitoring from 5000' to total depth.

9. Anticipated bottom hole pressure, abnormal pressures, temperatures or hazards:

BHP of 900 psi expected. No abnormal pressures nor hydrogen sulfide gas anticipated.

10. Anticipated starting date and duration:

Dirt work will begin within 7 days of approval.
Spud well 2 days after dirt work start-up.
Duration of drilling operations estimated at 15 days.

11. Additional information:

Exhibit "C" is Union Pacific Resources Company's drilling prognosis with additional information pertaining to our proposed drilling operations.

EXHIBIT "A"

CASING PROGRAM Vertical Hole

HOLE SIZE	SETTING DEPTH		AMOUNT			DESIGN FACTORS					
	FROM	TO	Excl. Threads	Size, Weight, Grade, Range, Thread	Mud Weight	Internal Yield	Collapse (derated f/tension)	Tension (in air)	Tension w/ 100,000#OP	Cmt'ing Depths	Estimated Fill Behind Casing (Linear Feet)
12-1/4"	0	320	320	8-5/8", 24#, J-55, R-3, STC	8.6	5.31 *	9.09	31.77	2.27	0'-320'	320'
7-7/8"	0	5600	5600	5-1/2", 17#, K-55, R-3, BTC	9.3	9.59 *	1.63	2.87	1.40	4500'-5600'	1100'

* Pore Pressure of "Morrow" Sand estimated at ± 4.0 ppg EMW.

CEMENTING PROGRAM Vertical Hole

Conductor:

Surface: 275 sx Class "A" + 3% $CaCl_2$ + 1/4#/sx celloflake mixed at 15.7 ppg & 1.17 ft^3/sx

Intermediate:

Production: 115 sx Pozmix "A" + 2% gel + .2% FL28 + .5% CD31 + 3% KCL + 1/4#/sx celloflake (14.7 ppg & 1.22 ft^3/sx). Tail w/100 sx Class "A" (or premium) + .6% FL 28 + .5% CD31 + 3% KCL + 1/4#/sx celloflake (16.0 ppg & 1.13 ft^3/sx) based on 35% excess.

MUD PROGRAM Vertical Hole

Interval (MD)	Weight	Viscosity	Fluid Loss	Remarks
0 - 320	8.3 - 8.6	28 - 42	N/C	FW - Gel mud
320 - 4300	8.3 - 8.6	42 - 50	N/C	FW - Gel mud + LCM materials (if needed)
4300 - 5000	9.0 - 9.3	32 - 36	15 - 20	LSND mud + LCM materials (if needed)
5000 - 5600	9.0 - 9.3	34 - 45	6 - 8	LSND mud + LCM materials (if needed)

EXHIBIT "A"

C A S I N G P R O G R A M Horizontal Hole

HOLE SIZE	SETTING DEPTH		AMOUNT			DESIGN FACTORS					
	FROM	TO	Excl. Threads	Size, Weight, Grade, Range, Thread	Mud Weight	Internal Yield	Collapse (derated f/tension)	Tension (in air)	Tension w/ 100,000#OP	Cmt'ing Depths	Estimated Fill Behind Casing (Linear Feet)
12-1/4"	0	320	320	8-5/8", 24#, J-55, R-3, STC	8.6	5.31 *	9.09	31.77	2.77	320'	320'
7-7/8"	0	5014	5014	4-1/2", 10.5#, K-55, R-3, BTC	9.3	8.6 *	1.79	2.87	1.05	4875'-5014'	139'
6-1/4"	5014	5474	460	4-1/2", 10.5#, K-55, R-3, BTC	9.3	8.6 *	1.79	2.87	1.05	5014'-5375'	361'

* Pore Pressure of "Morrow" Sand estimated at ± 4.0 ppg EMW.

C E M E N T I N G P R O G R A M Horizontal Hole

Conductor:

Surface: 275 sx Class "A" + 3% $CaCl_2$ + 1/4#/sx celloflake mixed at 15.7 ppg & 1.17 ft^3/sx

Intermediate:

Production: 80 sx Class "A" (or premium) + .6% FL28 + .5% CD31 + 3% KCL + 1/4#/sx celloflake (16.0 ppg & 1.13 ft^3/sx) based on 35% excess

Liner:

M U D P R O G R A M Horizontal Hole

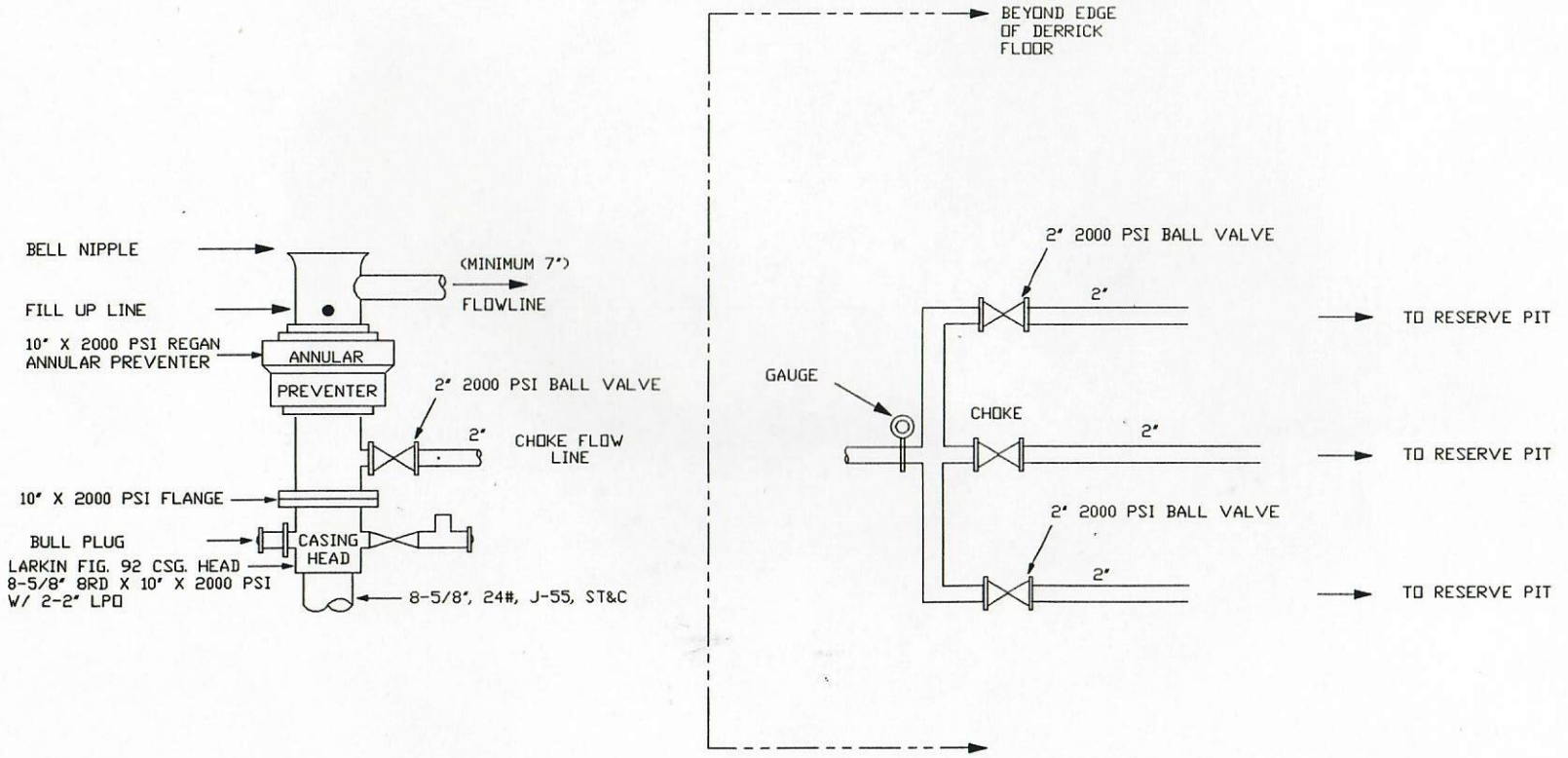
Interval (MD)	Weight	Viscosity	Fluid Loss	Remarks
0 - 320	8.3 - 8.6	28 - 42	N/C	FW - Gel
320 - 4300	8.3 - 8.6	42 - 50	N/C	FW - Gel + LCM (if needed)
4300 - 5000	9.0 - 9.3	32 - 36	15 - 20	LSND + LCM (if needed)
5000 - 5474	9.0 - 9.3	34 - 45	6 - 8	LSND + LCM (if needed)

EXHIBIT "B"

Union Pacific Resources

A Subsidiary of Union Pacific Corporation

BOP DIAGRAM
2000 PSI
ANNULAR PREVENTER



DRAWN BY JOE D. DOUGHARTY 12-12-90

EXHIBIT "C"

DRILLING PROGNOSIS
UNION PACIFIC RESOURCES COMPANY
MPU 13G-30
1580' FSL & 660' FWL
SECTION 30-T13S-R47W
CHEYENNE COUNTY, COLORADO
AFE 01859
UPRC WI = 51.4418%
GROSS ESTIMATED COST: PROD. - $388M
DH - $200M

SUMMARY:

The MPU 13G-30 is initially proposed as a straight hole development well designed to penetrate the "Morrow" formation vertically to a depth of 5600' MD. Low permeability results from whole core and log analysis will necessitate the proposed plugback of the vertical hole. A directional well will be drilled horizontally through the Morrow formation to approximately 5243' TVD/5474' MD with ± 100' of horizontal displacement in a N45°E direction.

Location and Access:

See attached map.

Elevation:

GL - 4344' Act.
KB - 4353' Est.

Estimated Formation Tops:

Formation	Depth	Datum
Lansing	4355'	- 2
Marmaton	4748'	- 395
Cherokee	4879'	- 526
Atoka	5061'	- 708
Morrow	5243'	- 890
V-7	5377'	-1024
Lower Morrow	5484'	-1130
Spergen	5496'	-1153
TD	5600'	-1247

Primary Objective: Morrow "B" Sand

Zones of Interest: Morrow "V" Sand

Cores: 60' core in top of "Morrow".

DST's: As needed.

Logging Program:

DIL from TD to base of surface casing.
LDT-CNL from TD to 4000'. High resolution across Morrow Sand.
SHDT on standby.

Proposed Directional Program:

Drill a 7-7/8" hole vertically through the Morrow formation to 5600' MD. Plug back to a KOP of ± 5000' MD (pick up monel drill collar on last bit trip and gyro multishot the open hole from KOP to surface). Drill a 6-1/4" hole, building angle 25°/100' to 90° by 5243' TVD/5374' MD in a N45°E direction. Continue drilling, holding angle and direction for ± 100' of horizontal displacement to 5474' MD/5243' TVD. Surveys in the build and horizontal sections will be taken by MWD in course lengths of 32' or less.

Special Instructions:

1. After setting surface casing, NU BOP's and test BOP's and casing to 1000 psi prior to drilling out. Record on tour sheet.

2. BOP's should be operated daily and recorded on tour sheet.

3. Strap pipe on all trips prior to DST's, cores, and logs.

KAA:cv
KAA\MPU13G.PRO

UNION PACIFIC RESOURCES COMPANY
MOUNT PEARL UNIT 13G-30
SW/4 Section 26-T13S-R47W
Morrow Development Well
Cheyenne County, Colorado
Lease #C-37225 Acq.

SURFACE USE PROGRAM

1. Existing roads:

   A. Proposed well site as staked is illustrated on Exhibit #1.

   B. Route and distance from nearest locatable reference is shown on Exhibit #2.

   C. Map showing existing and proposed access roads is illustrated on Exhibit #2.

   D. Access to location will be via the following:

ROAD	LENGTH	TYPE & CONDITION
Hwy 40	from Kit Carson	Existing asphalt - state hwy
Road 25	7 miles	Existing county road-graveled, crowned & ditched
Road V	1 mile	Existing county road-graveled, crowned & ditched
Road 24	1/4 mile	Existing county road-graveled, crowned & ditched
Drillsite	600'	To be constructed - flat bladed

   E. All roads, with the exception of drillsite 600' driveway, are county and state maintained.

   F. All existing roads are either county or state roads. No federal surface is involved with any of the existing roads.

2. Planned access roads:

   A. Map showing all necessary access roads existing and to be constructed are shown on Exhibit #2. There is 600' of

newly-constructed access needed on private land. No federal lands are involved with newly-constructed access.

B. Access to be constructed:

(1) The surface owner for this newly-constructed access is Garret Mitchek (719/765-4524).

(2) The 600' newly-constructed access road will be flat bladed.

(3) Running surface will be flat bladed to a width of 18' at a maximum.

(4) There will be no turnouts.

(5) Road grades are less than 3%.

(6) Water bars will not be needed.

(7) No gates, cattleguards, or culverts will be needed.

(8) Any cultural values that are revealed during construction will be left intact and the BLM-Canon City will be notified.

(9) Native soils from private lands will be sufficient for road work.

(10) If well proves productive, the road will be upgraded and graveled to service production operations.

3. Location of existing wells:

Exhibit #3 is a map showing location of all wells within a 1-mile radius of location.

4. Existing and/or proposed location of production equipment on/off well pad:

Exhibit #4 is a map showing existing production facilities within a 1-mile radius including the tank battery to which this well will be connected if productive.

Exhibit #5 is a survey of the proposed flowline location connecting this well to the Section 30 tank battery.

Exhibit #6 is a diagram of the Section 30 tank battery to which this well would be hooked up if it is productive.

Exhibit #7 is the current site security plan for the Section 30 tank battery shown in Exhibit #6.

5. Location and type of water supply:

Water will be supplied from a water well on the Mitchek lease and will be transported by a water hauler over the existing roads detailed in this APD.

6. Source of construction material:

For construction of 600' of access road and a 400' x 255' drill site, the native soils from the Mitchek leased lands should be sufficient.

EARTHWORK:

Top soil:	1890 cu. yds. (6" depth)
Total cut:	2759 cu. yds.
Total fill:	2334 cu. yds.

7. Methods for handling waste disposal:

Cuttings will be jetted into the reserve pit.

Garbage will be contained in trash baskets and hauled to an approved sanitary landfill.

Salts are not anticipated.

Sewage will be placed in a self-contained, chemically treated porta-potty.

Chemicals are not anticipated on location.

Oil and water from testing operations will be contained in tanks on location. Drilling fluids will be hauled and spread on fee lands.

8. Ancillary facilities:

No air strip, camp or other facilities will be built or needed during the drilling operations.

There will be trailers on site for the tool pusher, drilling foreman and mud logger.

9. Well site layout:

Exhibit #8 shows the well site layout, cuts and fills, topsoil stockpile, and excess cut pile.

The reserve pit will not be lined.

10. Plans for restoration of surface:

Configuration of reshaped topography will be contoured to harmonize with surrounding topography. Since this location is in a flat wheat field, no water bars or other drainage installations are necessary.

If the well is a dry hole, the excess dirt, then topsoil, will be spread evenly over the location. Soil will be disked to accommodate planting of wheat. The newly-constructed access road will also be disked for planting wheat. The site will be reclaimed as stipulated in our Surface Owner's Rehabilitation Agreement with Garret Mitchek.

If the well is productive, the reserve pit will be backfilled and the location reduced to accommodate the necessary production facilities. All portions of the well pads not used for production facilities will be disked to accommodate planting of wheat. Topsoil shall be spread evenly over the location. The newly-constructed access road will be upgraded and graveled to service production operations.

Reference item #7 for handling of waste disposal.

Commencement of reclamation will be within approximately 90 days after drilling operations are completed. Completion estimated within 30 days of start-up pending no adverse weather delays.

11. Cultural resource studies:

Studies for this location were conducted by Chris Zier and Daniel A. Jepson of Centennial Archaeology at the request of Union Pacific Resources Co. and are included herein as Exhibit #9.

12. Company representatives and contact personnel:

Please direct all correspondence to:

Union Pacific Resources Company
P.O. Box 7 - MS 3407
Ft. Worth, TX 76101-0007
Attention: Ms. Kris Curran

Union Pacific Resources Company
Cheyenne Wells Field Office
Phone: 719/767-5467

UPRC Drilling Personnel: Troy Schindler
Doug Genrich

13. Certification:

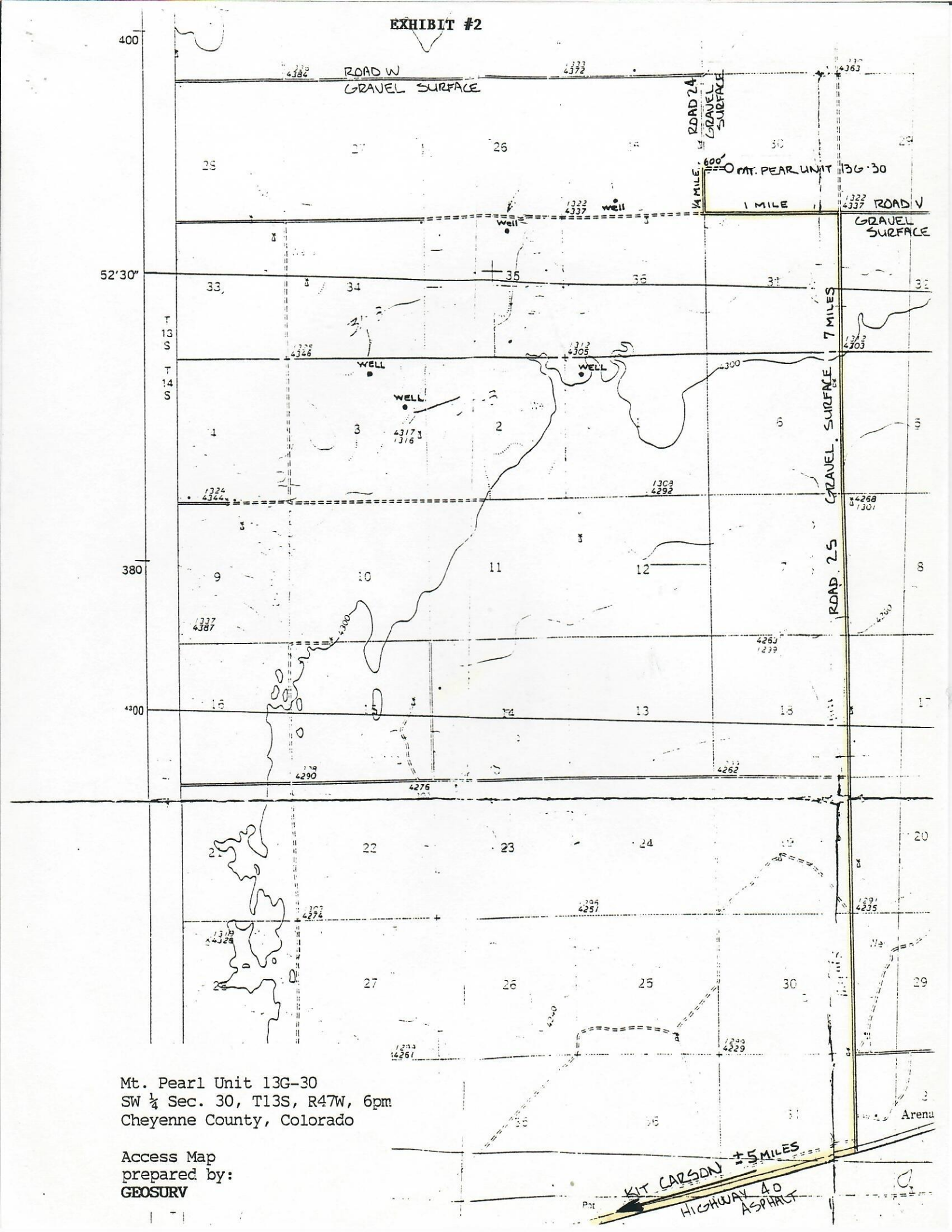
I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route, that I am familiar with the conditions which presently exist, that the statements made in this plan are, to the best of my knowledge, true and correct, and, that the work associated with operations proposed herein will be performed by Union Pacific Resources Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

12 DEC 1990
Date

Kris Curran
Kris Curran
Regulatory Analyst

UNION PACIFIC RESOURCES CO.
P.O. Box 7 - MS 3407
Ft. Worth, Texas 76101-0007
817/877-7325

EXHIBIT #2



Mt. Pearl Unit 13G-30
SW ¼ Sec. 30, T13S, R47W, 6pm
Cheyenne County, Colorado

Access Map
prepared by:
GEOSURV

EXHIBIT #3

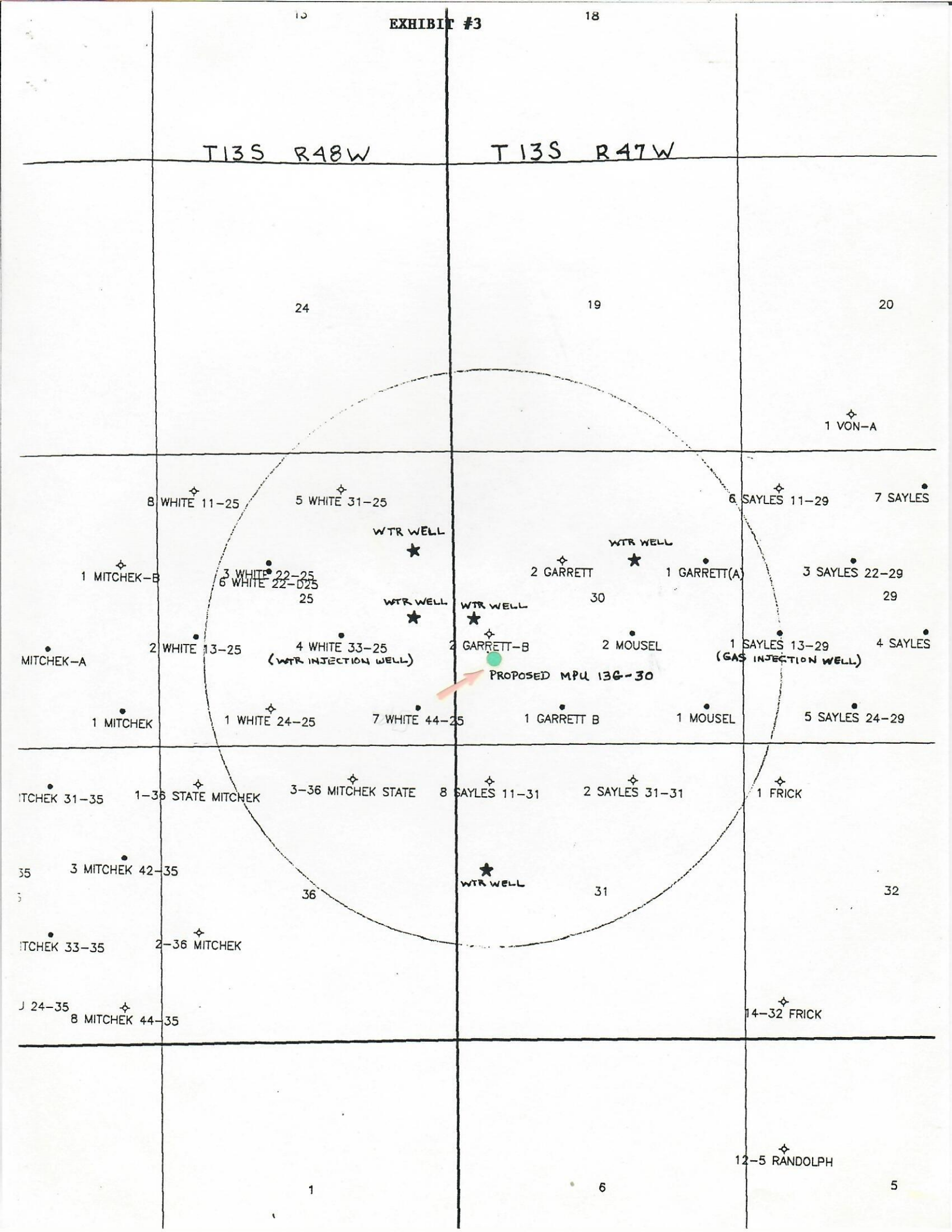
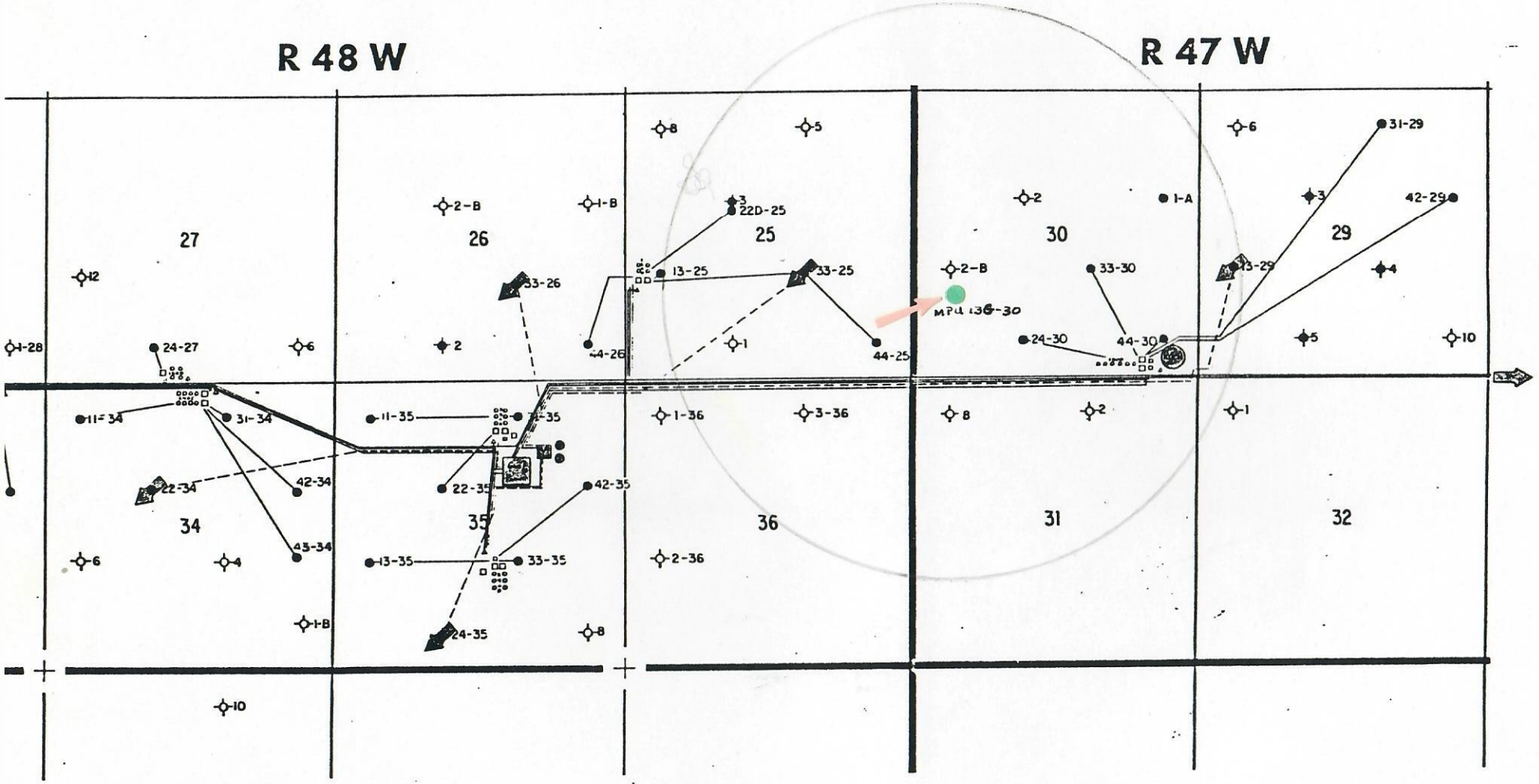

T13S R48W
T13S R47W
18
24
19
20
1 VON-A
8 WHITE 11-25
5 WHITE 31-25
6 SAYLES 11-29
7 SAYLES
WTR WELL
WTR WELL
1 MITCHEK-B
3 WHITE 22-25
6 WHITE 22-D25
2 GARRETT
1 GARRETT(A)
3 SAYLES 22-29
25
30
29
WTR WELL
WTR WELL
2 WHITE 13-25
4 WHITE 33-25
(WTR INJECTION WELL)
2 GARRETT-B
2 MOUSEL
1 SAYLES 13-29
(GAS INJECTION WELL)
4 SAYLES
MITCHEK-A
PROPOSED MPU 13G-30
1 MITCHEK
1 WHITE 24-25
7 WHITE 44-25
1 GARRETT B
1 MOUSEL
5 SAYLES 24-29
ITCHEK 31-35
1-36 STATE MITCHEK
3-36 MITCHEK STATE
8 SAYLES 11-31
2 SAYLES 31-31
1 FRICK
35
3 MITCHEK 42-35
WTR WELL
36
31
32
ITCHEK 33-35
2-36 MITCHEK
J 24-35
8 MITCHEK 44-35
14-32 FRICK
12-5 RANDOLPH
1
6
5

EXHIBIT #4



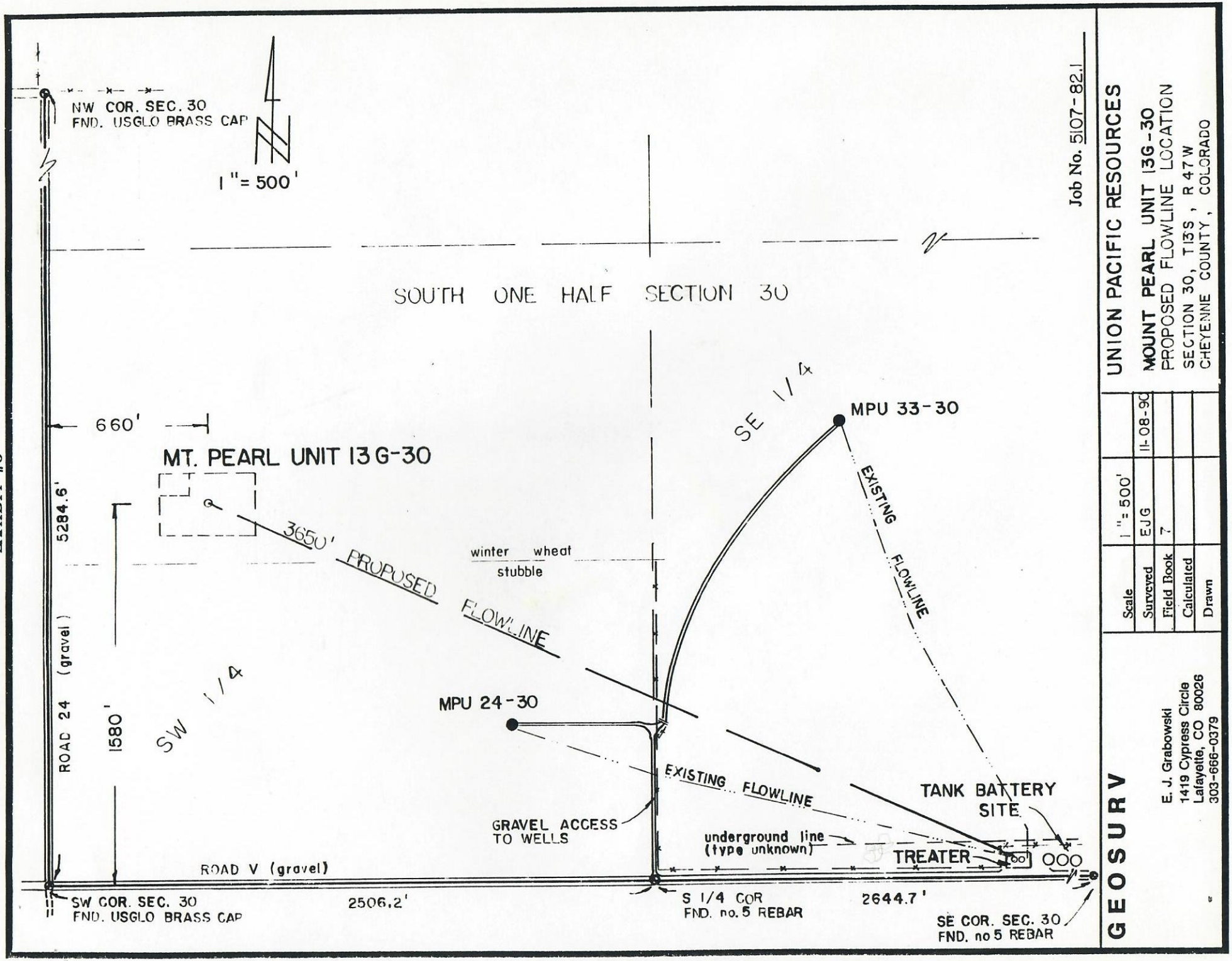
Union Pacific Resources

MOUNT PEARL UNIT
CHEYENNE COUNTY, COLORADO
PRODUCTION FACILITIES

REVISIONS	
DATE	BY

INTERPRETED BY | DRAFTED BY | D-CO-O-M033(1)

EXHIBIT #5



Job No. 5107-82.1

UNION PACIFIC RESOURCES

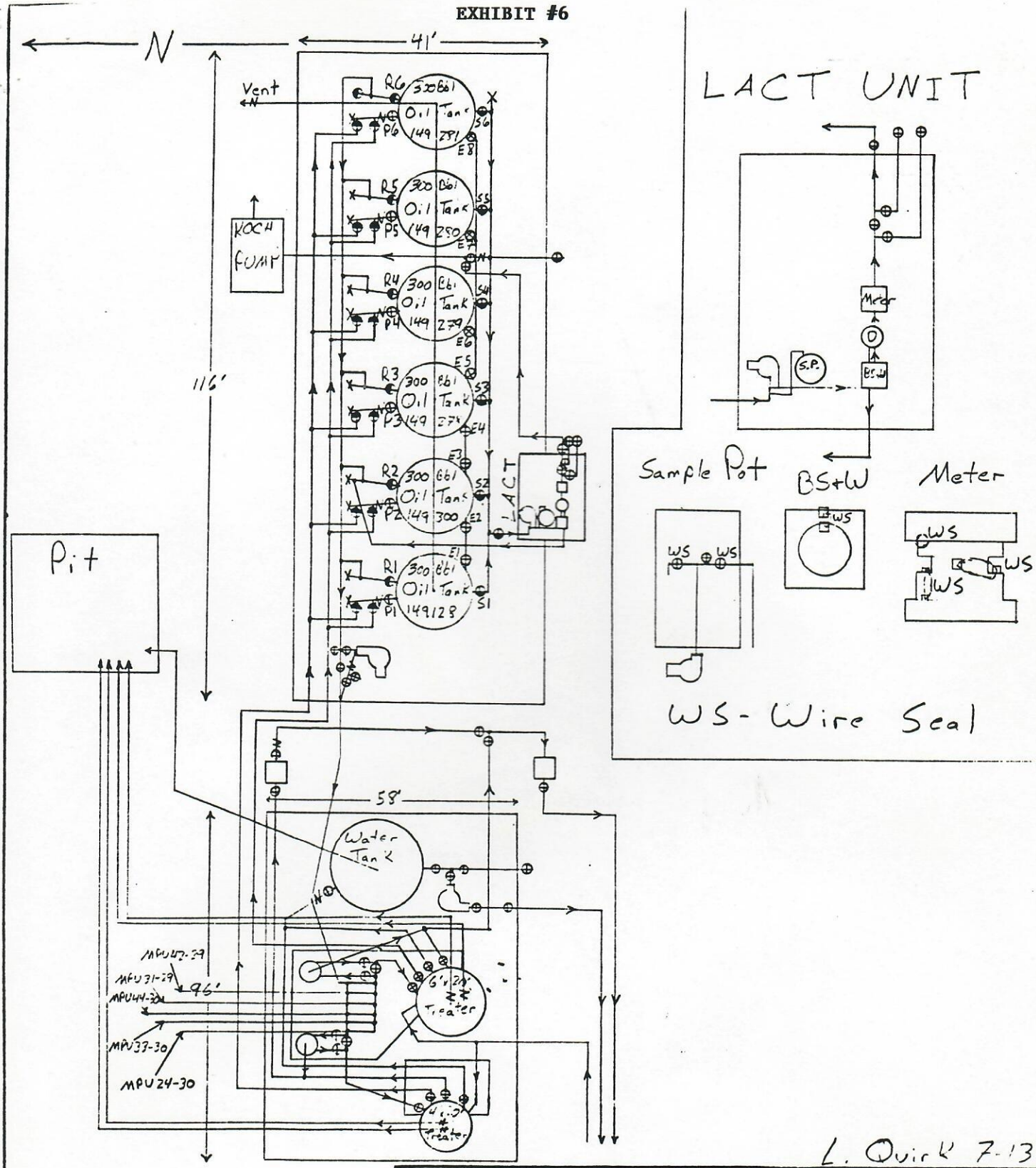
MOUNT PEARL UNIT 13G-30
PROPOSED FLOWLINE LOCATION
SECTION 30, T13S , R 47 W
CHEYENNE COUNTY , COLORADO

Scale	1 "= 500'	
Surveyed	EJG	11-08-90
Field Book	7	
Calculated		
Drawn		

GEOSURV

E. J. Grabowski
1419 Cypress Circle
Lafayette, CO 80026
303-666-0379

EXHIBIT #6



L. Quirk 7-13-5?

30 Battery @ SE SE Sec. 30 - T13S - R47W (CO C47703X)
C-37225
Mount Pearl Unit; Cheyenne county, Colorado

- Production intake valves
- Sales valves
- Recycle valves
- Check valves
- Other valves
- Pressure gauge
- Pump
- Plug

Verification of sealing procedures and site conditions as illustrated

Date: _____

-not drawn to scale-

Union Pacific Resources

Site Security Plan: Mount Pearl Unit (designated Unit Agreement #COC47703X)

Battery Locations: NENE Section 30 T13S, R47W

Plan Located at:

Union Pacific Resources Co.
MidContinent District Off.
801 Cherry St. - MS 3412
Fort Worth, TX 76101

Union Pacific Resources Co.
Kit Carson Field Office
P.O. Box 174
Kit Carson, CO 80825

**Appropriate valves, components and sealing procedures are as follows:

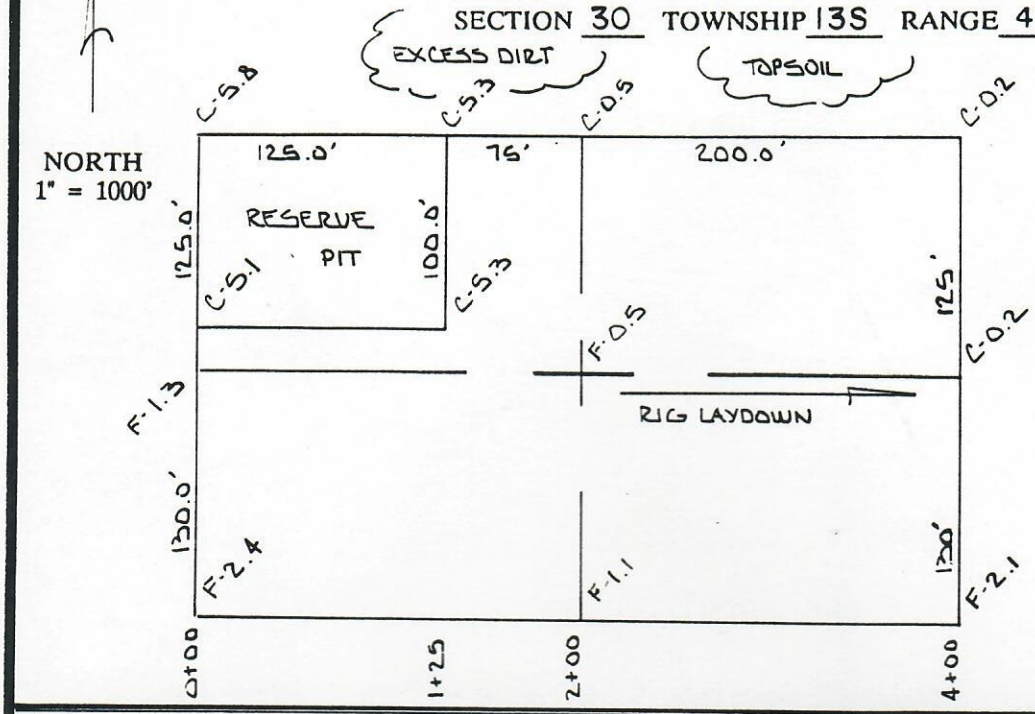
SEAL LOCATIONS	SEALING PROCEDURES
A1 ..... (Access Valve for sales in the event of LACT failure)	A1 is effectively sealed closed. In the event of LACT failure*, seal changes are to be witnessed and recorded by a UPRC representative for sales or any other measured removal of oil.
L1, L2 ..... (LACT Sample pot - Access valves) (Proving Loops)	L1 and L2 are effectively sealed in closed during sample period by purchasing agent. Seal changes and drainage of composite sample are to be witnessed and recorded by a UPRC representative.
L3, L4, L5, L6, L7, L8 ..... (LACT Meter) (DACO Temperature Computer - L7) (Back Pressure Valve - L8) (Sample Probe and Volume Control - L9)	L3, L4, L5, L6, L7 and L8 are seals placed on LACT meter and its components purchasing agent. Adjustment of meter and seal changes during meter provings are to be witnessed and recorded by a UPRC representative. BS&W monitor does not require seal accountability.
A2 ..... (Access Valve recycle line)	A2 is effectively sealed closed during production, sales, and recirculation. Seals on the closed valve are to be recorded by a UPRC representative. Any use of the line requiring seal replacement shall be explained under remarks section of seal reports.

* In the event of LACT failure, tank batteries will also utilize seal accountability for all appropriate tank valves during the sales and production phases (reference site security diagram and sealing procedure for Mount Pearl Unit LACT Failure Plan - pg. 16)

**Should Federal regulations change or be interpreted differently by the BLM such that our above-described sealing procedures happen to be determined inappropriate or inadequate, UPRC's District Office requests to be informed (without penalty) by the Canon City District for further clarification of the seal requirements.

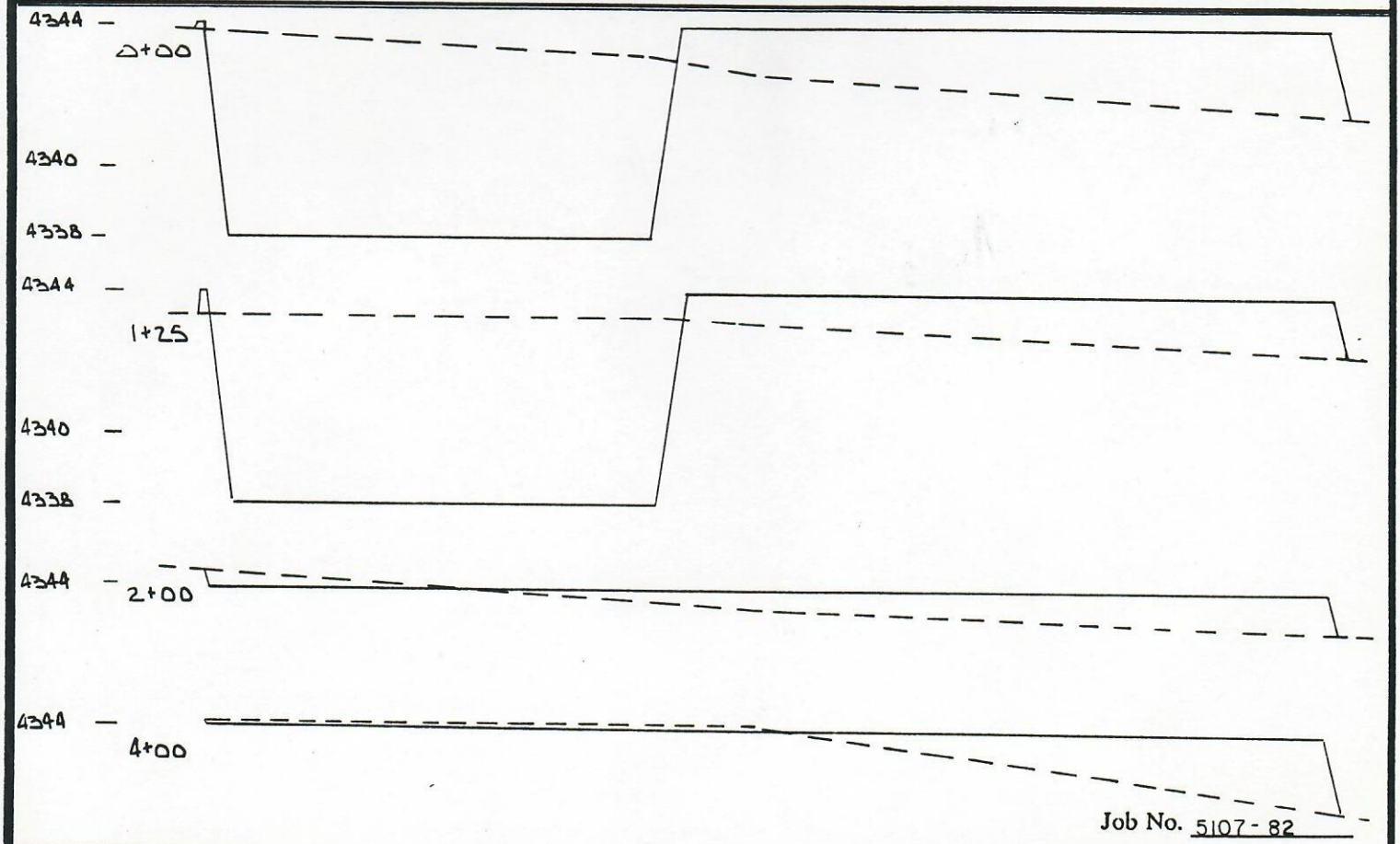
WELL LOCATION MAP

SECTION 30 TOWNSHIP 13S RANGE 47 W



Note: all cut/fill are to subsoil elevation after removal of 0.5' of top soil.

Top Soil= 1890 cu. yds.
Total Cut= 2759 cu. yds.
Total Fill= 2334 cu. yds.



Job No. 5107-82

GEOSURV				
E. J. Grabowski 1419 Cypress Circle Lafayette, CO 80026 303-666-0379	Scale	H-1"=40' V-1"=5'		UNION PACIFIC RESOURCES
	Surveyed	EJG	9-90	MOUNT PEARL UNIT 13G-30
	Field Book	6		Drill Pad Layout & Cross Sections
	Calculated	EJG		
	Drawn	EJG	9-90	

EXHIBIT #9

CLASS III ARCHAEOLOGICAL INVENTORY OF THE MOUNT PEARL UNIT 13G-30 WELL LOCATION, CHEYENNE COUNTY, COLORADO

by

Daniel A. Jepson

Prepared for

Union Pacific Resources
Fort Worth, Texas

by

Centennial Archaeology, Inc.
Fort Collins, Colorado

Christian J. Zier
Principal Investigator

(All work performed under the terms of Cultural Resource Use Permit No. C-47121 issued by the Bureau of Land Management, Colorado State Office)

October 1990

ABSTRACT

An intensive (Class III) cultural resources inventory of a proposed well location in central Cheyenne County, Colorado was conducted by Centennial Archaeology, Inc. on September 19, 1990, on behalf of Union Pacific Resources of Fort Worth, Texas. The purpose of the inventory was to identify, document, and evaluate all cultural resource locations within the proposed area of impact surrounding the well location and to formulate recommendations for mitigation of impacts to significant resources. The total area surveyed around the well location is 40 acres. Two prehistoric isolated finds were recorded; neither resource is evaluated as significant, and they are considered ineligible for inclusion on the National Register of Historic Places. No further work is recommended for the area surveyed.

CONTENTS

INTRODUCTION

An intensive (Class III) cultural resources inventory of a proposed well location and surrounding impact zone was conducted by Centennial Archaeology, Inc. (CAI), on behalf of Union Pacific Resources. The study area is located in central Cheyenne County, Colorado, approximately 35 miles west of the Kansas state line (Figure 1). Although the surface is privately owned, subsurface minerals are under the jurisdiction of the Bureau of Land Management, Canon City District. The inventory was conducted in compliance with the National Historic Preservation Act of 1966 (as amended), Executive Order 11593, and the Archeological and Historical Preservation Act of 1974.

The proposed well location and a construction buffer zone surrounding it (40 acres total) was subjected to intensive pedestrian inventory. The well location, known as Mount Pearl Unit 13G-30, lies in the southwest quarter of Section 30, T13S-R47W, on the Eureka Creek North 7.5' USGS Quadrangle (Figure 2).

The objective of the inventory was to locate and record all cultural resource locations potentially affected by pad preparation, drilling, operation/maintenance, and any access route construction, upgrading and maintenance. All cultural resource locations within the surveyed tract were evaluated for National Register of Historic Places (NRHP) eligibility based upon guidelines provided under 36 CFR 60 and in accordance with the research questions developed by the Colorado Office of Archaeology and Historic Preservation (OAHP) for Colorado Plains historic and prehistoric contexts (Buckles and Buckles 1984; Mehls 1984; Mehls and Carter 1984;

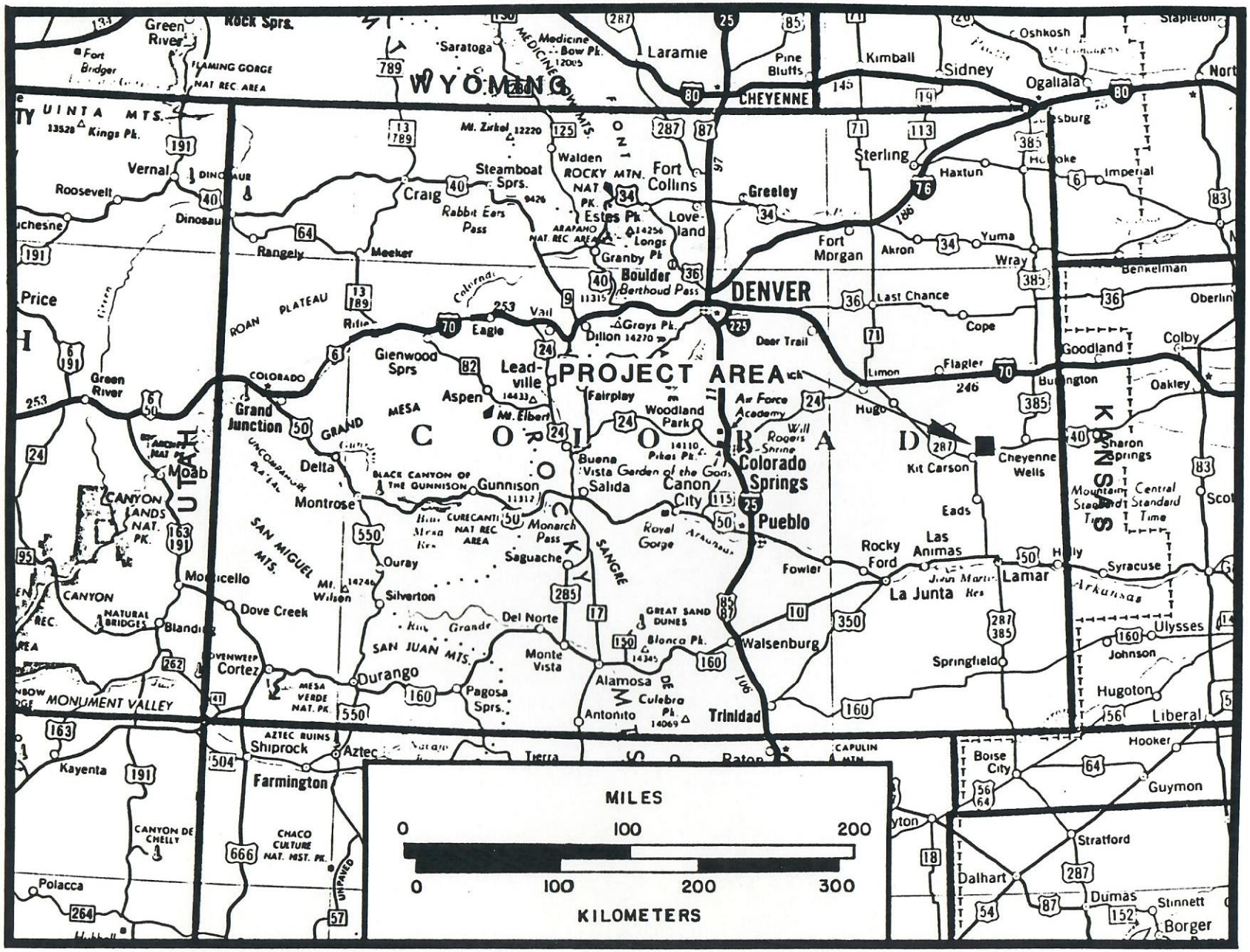


Figure 1. Map of Colorado showing project area location (scale, 1:4,000,000).

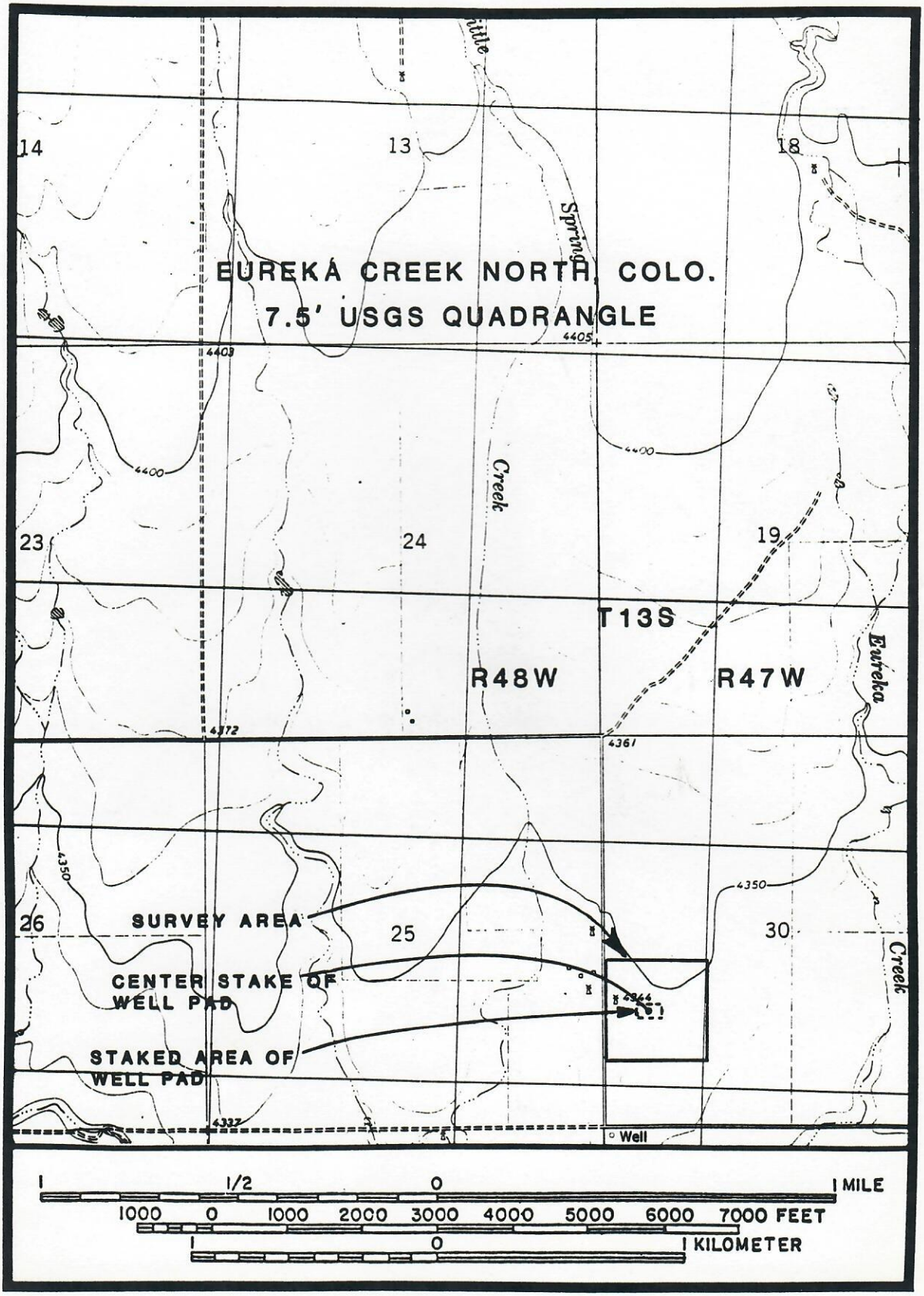


Figure 2. Portion of Eureka Creek North, Colorado 7.5' USGS Quadrangle (1982) showing surveyed area surrounding Mount Pearl Unit 13G-30 well.

Eighmy 1984). Management recommendations were formulated for the two cultural resources recorded.

Fieldwork was conducted on September 19, 1990. Christian J. Zier served as principal investigator. Daniel A. Jepson supervised the fieldwork and Bridget M. Ambler was field assistant. Investigations were conducted under the terms of BLM Cultural Resource Use Permit No. C-47121 (expiration date, 2/7/92). Cultural resource records are on file at the Colorado OAHP, Denver. Original field notes are retained in the files of Centennial Archaeology, Inc., Fort Collins, Colorado. No artifacts were collected during the survey.

GENERAL ENVIRONMENTAL SETTING

The project area is located northeast of the community of Kit Carson in extreme east-central Colorado. The area is part of the Kansan Biotic Province (Dice 1943:26) and the Great Plains Physiographic Province (Fenneman 1931; Osterkamp et al. 1987) within the Central High Plains. It is characterized by generally featureless, rolling prairie atop the High Plains escarpment. The topography is occasionally broken by geologic idiosyncrasies known as Teepee Buttes, conical remnants of reef-like aggregates that formed on the floor of a shallow Cretaceous sea between 65 and 135 million years ago (Chronic 1980:44, 46). These cones remain prominent in much of southeastern Colorado due to the fact they contain more limestone than the softer underlying Pierre Shale, a gray fine-grained rock deposited 80 to 90 million years ago as sea bottom mud.

The Great Plains in general, and the Central High Plains in particular, has been sculpted by a variety of geomorphic processes including, but not limited to, fluvial, eolian, and glacial deposition, and by erosion resulting from surface and groundwater movement, wind transport, and glaciation. As Osterkamp et al. (1987:167) note, "The extent to which most of the [creation] processes have acted in an area of the Great Plains has been dependent on regional climate and geology, but as is generally true elsewhere, none of the landforms are the result of a single process." Soils in the study area consist of eolian dunal sand and silt and Peoria Loess of late Wisconsin (Pleistocene) age (Osterkamp et al. 1987:200; Tweto 1979). In addition, Quaternary fluvial incision--accelerated by groundwater erosion--has formed a complex of pediment surfaces, strath, and alluvial terraces in much of western Kansas, immediately adjacent to the study area (Osterkamp et al. 1987:166, after Scott 1965, 1982). In the general project vicinity, all soils appear to be of eolian origin, except for highly localized alluvial sediments along the larger drainages such as Big Sandy Creek and Eureka Creek.

The study area is located along the crest of the High Plains escarpment west of which the land drops away into the valley of Big Sandy Creek, which is floored with both Tertiary and Cretaceous river floodplain deposits (Chronic 1980:46). As such, the survey area is situated between two distinct drainage basins. Significant watercourses to the north and east (e.g., the Smoky Hill River and its North Fork, the South Fork of the Republican River, the Arikaree River, and the Ladder River) drain to the Missouri River watershed; streams such as Big Sandy Creek, Rush Creek, and

Adobe Creek are tributaries of the Arkansas River to the south. The greater Republican River drainage area, as well as portions of the Arkansas River drainage east of the Front Range, do not convey runoff from the Rocky Mountains but are fed principally by effluent from the Ogallala Formation and deeper aquifers (Osterkamp et al. 1987:189).

Two major vegetation associations, grassland and riparian, are located in the general project area. The semi-arid shortgrass prairie association is dominant throughout the vicinity and consists mainly of blue grama, buffalo grass and various other grasses in addition to yucca, saltbrush, rabbitbrush, skunkbrush, and prickly pear. Riparian areas near creek beds exhibit cottonwood and willow trees as well as a variety of forbs and grasses endemic to moister areas of the High Plains. Most of the survey area proper is presently under cultivation with winter wheat, while a small portion lies fallow subsequent to recent harvesting of an unknown crop. It should be noted that present vegetation patterns should not be considered indicative of the prehistoric or even earlier historic environment of the study area. Beginning with the post-1890 dryland farming boom (Mehls 1984; Mehls and Carter 1984), the Colorado Plains have been subjected to major biotic disturbance and change.

The semi-arid environment of southeastern Colorado in general supports a diverse faunal assemblage. Mammal species which inhabit the vicinity of the well location include antelope, coyote, striped and spotted skunk, jackrabbit, cottontail, black-tailed prairie dog, and a variety of gophers, squirrels, ground squirrels, mice, and voles (Burt and Grossenheider 1976;

Gilbert 1980). Reptiles are common, and numerous bird species utilize the area as year-round or part-round residents, including various raptors.

Detailed data concerning the climate, physiography, and geology of southeastern Colorado may be found in Berry (1959), Graf (1987), Thornbury (1965), and Tweto (1979), and will not be duplicated here. For a summary of paleoclimatic conditions and their influences on prehistoric utilization of the study area, as well as a comprehensive prehistoric overview, the reader is referred to Eighmy (1984). In-depth historical overviews of the region are provided by Mehls (1984) and Mehls and Carter (1984).

The survey area is currently under cultivation (winter wheat) or lies fallow subsequent to harvesting. Gravel county roads border the well location on two sides, and these roads, in conjunction with recently cultivated areas and nearby residences, are the major loci of human disturbance in the vicinity. Ground visibility averaged better than 80% throughout the survey parcel. There were no major barriers to access to the study area or resource visibility within the well pad.

EXISTING DATA AND LITERATURE REVIEW

Cultural-Historical Background

Human occupation of southeastern Colorado extends back 10,000-12,000 years from the present. Although the Paleo-Indian stage (12,000-7000 B.P.) and the Early and Middle Archaic periods of the Archaic Stage (7000-3000 B.P.) are not extensively documented in the area, a small number of sites exhibiting substantial Paleo-Indian components have been discovered (Dick and Mountain 1960; Stanford 1974, 1979; Wheat 1972, 1979). Late Archaic

(3000-1800 B.P.) manifestations are somewhat better documented (Campbell 1969; Eddy 1982; Lutz and Hunt 1979; Shields 1980; Wood-Simpson 1976), although occupations from the Early and Middle Ceramic periods of the Ceramic stage (1800-500 B.P.) are much more prevalent archaeologically, particularly south of the Arkansas River (Eddy 1982; Eighmy 1984:Figure 14; Withers and Huffman 1965; C. E. Wood et al. 1981; W. R. Wood 1971, 1972). Historic Indian occupation of the general region is well documented (Grinnel 1972, Volumes 1 and 2; see review in Zier et al. 1987), although no direct evidence has been found in the study area.

Early historic Anglo-American use of the general area is also well documented (Lecompte 1978) but unknown archaeologically in the project area proper. Direct physical evidence of historic occupation and use post-dates 1860 and is associated almost entirely with the themes of homesteading/ agriculture, transportation, and, further west near the foothills-mountains transition zone, mining and quarrying (Mehls 1984; Mehls and Carter 1984; Van Ness et al. 1990; Zier and Carrillo 1989; Zier et al. 1987). The great majority of known historic sites are homesteads of the 1880-1920 period.

File Search Data

Prior to the implementation of fieldwork, a file search for known cultural resource locations in and near the study area was conducted through the Colorado Office of Archaeology and Historic Preservation (OAHP), Colorado Historical Society, Denver, on September 17, 1990. OAHP records indicate that no previous surveys have been conducted in the immediate project area and no sites recorded. Cheyenne County in general has not been subjected to extensive archaeological research as evidenced by

the fewer than 100 documented cultural resources listed by the Colorado OAHP, while other southeastern Colorado counties, such as Las Animas County, contain several thousand recorded sites.

RESEARCH ORIENTATION

The principal objective of the inventory was to locate and record all cultural resources which may be affected by the proposed well construction and to formulate appropriate management recommendations. These data are intended for integration into the broader data base for southeastern Colorado. It is only through a process of data integration that results from areally limited inventories such as the present effort can contribute to the specific research topics formulated in response to existing cultural overviews.

Since data from this inventory were gathered from the surface at a very limited number of sparsely represented prehistoric localities, their application to regional research topics is somewhat limited. Based on the evidence currently available it appears that these recorded resources may marginally address a single research topic outlined in Eighmy (1984): lithic source identification and distribution.

EXPECTED RESULTS

Anticipated results are based largely on earlier surveys in the project area and/or southeastern Colorado in general (Andrefsky 1990; Eddy 1982; Jepson 1988; Kingsbury and Nowak 1980; Nowak and Berger 1982; Nowak and Kingsbury 1981) and the prehistoric and historic rsearch contexts for

the southeastern Colorado Plains, produced by the Colorado Historical Society (Eighmy 1984; Mehls 1984; Mehls and Carter 1984). Common prehistoric site types are lithic and lithic-and-ground stone scatters, occurring both with and without hearths/fire-cracked rock. Many lithic sites exhibit evidence of quarrying and testing/reduction of locally available tool stone. A protracted temporal range of occupation is known to be represented in sites in the area, although most dated sites are of Early Ceramic age or later. Prehistoric sites may occur in a variety of settings but are commonly found in association with drainages, playas, and low ridge systems, or combinations thereof (Eighmy 1984).

Historic sites in eastern Colorado are mainly associated with the homesteading theme, and consist of actual homestead remnants or associated materials and facilities such as corrals, fences, and refuse dumps (Jepson 1988; Mehls and Carter 1984). Most homesteads date to the post-1890 era. Because homesteaders settled land units of standard size based on the predetermined cadastral grid systems (e.g., a quarter-section consisting of 160 acres), homesteads may be found in almost any area of the shortgrass prairie. However, specific locations of dwellings and other structural remains within homestead tracts often reflect a concern with shelter and availability of water.

FIELD METHODS

A prehistoric site is defined as any locality exhibiting structures or features (e.g., stone circle or hearth/hearth remnant) or having four or more artifacts in apparent association with one another and occurring within a restricted area. Prehistoric isolated finds (IFs) are nonstructural remains and consist of three or fewer artifacts with no associated features.

A historic site is defined minimally as any structure or structural remnant (e.g., house, outbuilding, root cellar), any trash concentration or scatter suggesting residential or industrial use of the area, or any refuse dump. Historic IFs are individual historic artifacts or small clusters of artifacts that do not represent established refuse dumps. The minimum age criterion for historic sites and isolates is 50 years.

The survey area was inspected by two archaeologists, the project supervisor and a field assistant. A 40-acre area surrounding the well center stake (which was clearly marked at the time of the survey) was walked using parallel, back-and-forth sweeps with spacing between individual transects of 65 ft (20 m). An access road extending from adjacent County Road 24 to the well location is planned; this access road is located entirely within the 40-acre parcel subjected to pedestrian inventory and as such a specific survey of this route was unnecessary. Given that the well center stake is situated approximately 625 ft (190 m) east of County Road 24, the road was used as the western boundary of the survey area; thus, the entire inventory was conducted within the SW 1/4 of Section 30, T13S-R47W. A Colorado OAHP Isolated Find Form was completed

for each of the IFs located during the survey. No artifacts were collected.

INVENTORY RESULTS

Two isolated finds were recorded and assigned numbers 5CH85 and 5CH86. They consist of a large gray quartzite biface and a basalt primary flake. Data about these localities are summarized in Table I; locational information may be found in Appendix A. All worthwhile information was gleaned from these localities at the time of recording, and they retain minimal potential to yield additional important data. Both are evaluated as ineligible for inclusion on the National Register of Historic Places.

SUMMARY AND RECOMMENDATIONS

An intensive cultural resource inventory of 40 acres surrounding a proposed well pad location resulted in the recording of two prehistoric cultural resources. Both are single isolated artifacts; neither of the artifacts is considered a significant resource, and all pertinent information has been recorded for each locality.

Survey results are generally in line with expectations, although meaningful comparisons were hampered by the limited scope of the current study. The types of cultural resources found are fully consistent with expectations (see "Expected Results" sections, above). No further management actions are recommended at either artifact locality, and all areas surveyed are recommended for cultural resources clearance.

TABLE I

CULTURAL RESOURCE SUMMARY DATA

Permanent Number	Field Number	Description	Physical Setting	Elevation (feet)	Vegetation	Recommendations
5CH85	IF-1	Quartzite biface	Flat to gently rolling prairie	4350	Fallow field	Not eligible for National Register
5CH86	IF-2	Basalt primary flake	Flat to gently rolling prairie	4350	Fallow field	Not eligible for National Register

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APPENDIX A

CULTURAL RESOURCE LOCATIONAL DATA

APPENDIX A

Permanent Number	Field Number	Cadastral Location	UTM Location (Zone 13)	USGS Map Reference
5CH85	IF-1	T13S-R47W, Sec. 30, NE/NE/SW/SW	697900 mE 4306185 mN	Eureka Creek North 7.5' (1982)
5CH86	IF-2	T13S-R47W, Sec. 30, SW/NE/NW/SW	697850 mE 4306490 mN	Eureka Creek North 7.5' (1982)

APPENDIX B

CULTURAL RESOURCE INVENTORY FORMS

Office of Archaeology and Historic Preservation
1300 Broadway, Denver, CO 80203
(303) 866-3395

ISOLATED FIND RECORD

1) RESOURCE NO.: 5CH85 2) Temp.No.: IF-1 3) County Cheyenne

I. LOCATION

4) Legal Location NE ¼, NE ¼, SW ¼, SW ¼, Sec. 30 T 13S R 47W PM 6th

5) USGS Quad: Name Eureka Creek North Size 7.5' Date 1982

6) UTM: Zone 13, 6 9 7 9 0 0 mE, 4 3 0 6 1 8 5 mN. Attach copy of portion of USGS Quad.

II. ARCHAEOLOGICAL DATA:

7) Artifacts:

large quartzite flake

8) Inferred function/description:

lithic reduction

9) Cultural Affiliation Prehistoric American Indian Time Period unknown BC AD

10) IF Dimensions 1 m X 1 m

III. ENVIRONMENTAL DATA:

11) Elev. 4350 ft. 1326 m. 12) Soil brown silty sand with extensive stream cobbles

13) Topography flat to gentle rolling prairie 14) Slope: Site 0-1° surrounding 0-1°

15) Nearest water: name/nature Little Spring Creek/interm. elev. 1323m dist. 650m direction 300°

Nearest permanent water Rush Creek elev. ca. 1300m dist. 16km direction 200°

16) Veg. on site none-fallow cultivated field. 17) Surrounding veg. shortgrass prairie association

Additional Comments:

IV. ADDITIONAL INFORMATION: (Narrative, drawings, sketch map)

V. REFERENCE DATA:

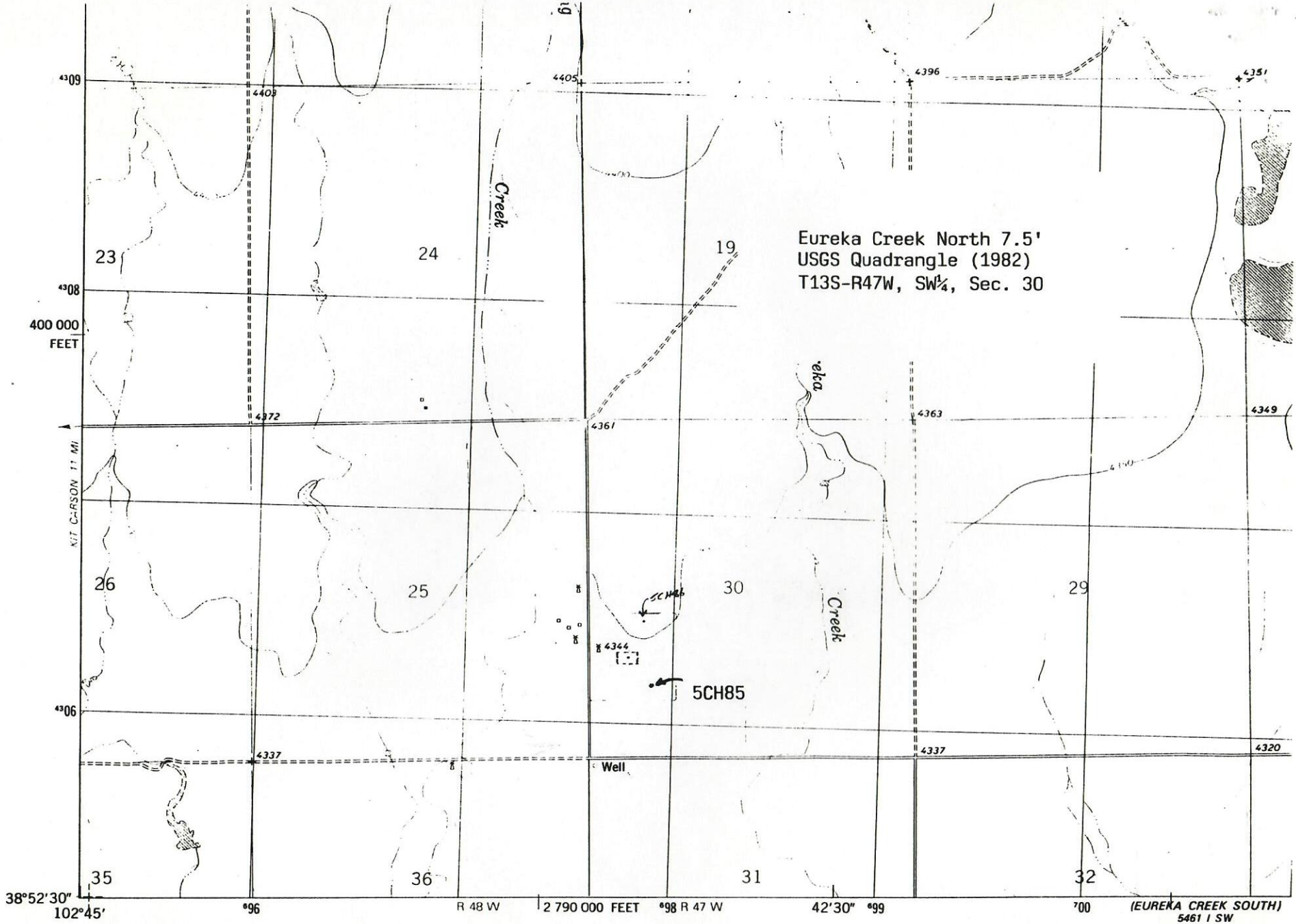
18) Collection: yes ___ no x describe

19) Repository: N/A 20) Landowner Garrett Mitcheck/BLM

21) Report title Archaeol. Inventory of Mt. Pearl Unit 13G-30, Cheyenne Co., CO 22) Recorder B. Ambler

23) Affiliation Centennial Archaeology, Inc. 24) Date 9 / 19 / 90

Form No. 602



Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1975. Field checked 1976. Map edited 1982

Projection and 10,000-foot grid ticks: Colorado coordinate system, central zone (Lambert conformal conic)

SCALE 1:24 000

Office of Archaeology and Historic Preservation
1300 Broadway, Denver, CO 80203
(303) 866-3395

ISOLATED FIND RECORD

1) RESOURCE NO.: 5CH86 2) Temp.No.: IF-2 3) County Cheyenne

I. LOCATION

4) Legal Location SW ¼, NE ¼, NW ¼, SW ¼, Sec. 30 T 13S R 67W PM 6th

5) USGS Quad: Name Eureka Creek North Size 7.5' Date 1982

6) UTM: Zone 13, 6 9 7 8 5 0 mE, 4 3 0 6 4 9 0 mN. Attach copy of portion of USGS Quad.

II. ARCHAEOLOGICAL DATA:

7) Artifacts:
basalt primary flake

8) Inferred function/description:

lithic reduction

9) Cultural Affiliation Prehistoric American Indian Time Period unknown BC AD

10) IF Dimensions 1 m X 1 m

III. ENVIRONMENTAL DATA:

11) Elev. 4350 ft. 1326 m. 12) Soil brown silty sand with extensive stream cobbles

13) Topography gently rolling to flat prairie 14) Slope: Site 0-1° surrounding 0-1°

15) Nearest water: name/nature Little Spring Creek/interm. elev. 1323m dist. 520m direction 270°

Nearest permanent water Rush Creek elev. ca. 1300m dist. 16km direction 200°

16) Veg. on site none-fallow cultivated field. 17) Surrounding veg. shortgrass prairie association

Additional Comments:

IV. ADDITIONAL INFORMATION: (Narrative, drawings, sketch map)

V. REFERENCE DATA:

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19) Repository: N/A 20) Landowner Garrett Mitchek/BLM

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23) Affiliation Centennial Archaeology, Inc. 24) Date 9 / 19 / 90

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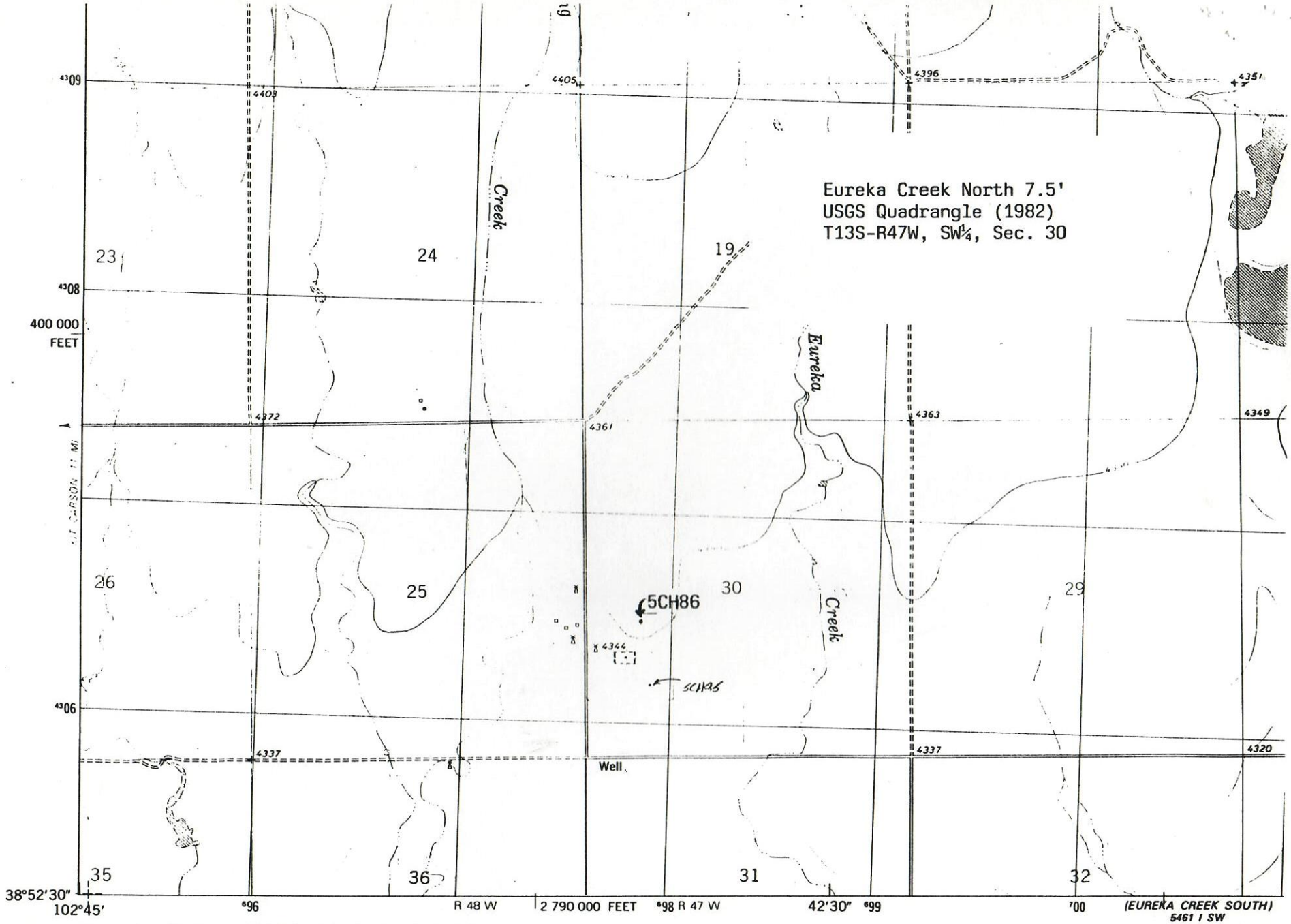

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