

APPENDIX C

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APPENDIX C-1

MASTER SURFACE USE PLAN

Petroleum Development Corporation (PEDCO)

Sun Dog Pod
Carbon County, Wyoming

Plan of Development - Interim Coalbed Methane Wells

The Petroleum Development Corporation (PEDCO) Sun Dog Interim Development Coalbed Methane Project is located in Carbon County, Wyoming. The Sun Dog Pod is one of nine pods that comprise the Atlantic Rim Coalbed Methane Interim Drilling Project.

Access to the Sun Dog Pod is by State Highway 789 north from Baggs, Wyoming for approximately 22 miles to its intersection with Carbon County Road 608 (Dad Road). The distance from State Highway 789 to the proposed pod is approximately 6 miles. The total Sun Dog Pod interim development proposal consists of +/- 10 wells with attendant developments and facilities as shown on the Sun Dog Project Plan Overview (attached). This Plan Of Development will address 6 of the +/- 10 planned interim development wells in the Sun Dog Pod. These 6 wells, identified below, are coalbed methane exploration/development wells. The proposed well sites are staked. The remaining 4 coalbed methane wells and one injection well, all located in T16N,R91W Sec.8:S2, were previously addressed under the Dry Cow Creek Pod Master Surface Use Plan.

The following wells and corresponding leases are located within the Sun Dog Pod Interim Development Project Area.

Well Name	Federal Lease No.	Location
<u>Sun Dog Pod Interim Wells</u>		
Federal 1691-2-17	WYW-126439	Sec. 17, T16N, R91W
Federal 1691-6-17	WYW-126439	Sec. 17, T16N, R91W
Federal 1691-8-17	WYW-126439	Sec. 17, T16N, R91W
Federal 1691-10-17	WYW-131778	Sec. 17, T16N, R91W
Federal 1691-14-17	WYW-131778	Sec. 17, T16N, R91W
Federal 1691-16-17	WYW-131778	Sec. 17, T16N, R91W

Lease WYW-126439 contains a special timing stipulation that affects raptor and/or sage and sharp-tailed grouse nesting habitat. This stipulation provides that drilling and surface disturbing activity will not be allowed during the period from February 1 to July 31 within certain areas of the lease.

Lease WYW-131778 contains special timing stipulations that affect big game crucial winter range and sage grouse and raptor nesting habitat as mapped on the Great Divide RMP Wildlife Distribution Overlays. The period from February 1 to July 31 is affected by sage grouse and raptor nesting and the period from November 15 to April 30 is affected by big game crucial winter range.

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All well sites are located on lands administered by the Bureau of Land Management (BLM) Rawlins Field Office.

The primary targeted reservoir in the Sun Dog Area is coalbed methane from the coal seams within the Mesaverde Group. Drill site locations will be on approved 80-acre spacing. All unproductive wells will be plugged and abandoned as soon as practical after the conclusion of production testing. Productive wells may be shut-in temporarily for gas pipeline connections and/or Sundry Notices by the BLM for production activities and facilities.

The Master Surface Use Program shall serve as right-of-way application for water lines, gas lines, electrical lines, access roads to well locations, compressor station, water injection wells, and water transfer facilities.

1) EXISTING ROADS

Access to the Sun Dog pod is provided by by State Highway 789 south from Interstate 80 (I-80) from Creston Junction to the intersection with Carbon County Road 608 (Dad Road), or north from Baggs, Wyoming for approximately 22 miles to its intersection with Carbon County Road 608. The distance from State Highway 789 to the proposed pod and the interim exploration and production wells is approximately 6 miles as shown on the attached Sun Dog Project Plan Overview.

The existing roads will be maintained in the same or better condition as existed prior to the start of operations. Maintenance of existing roads used to access the drill locations will continue until final abandonment and reclamation of the well locations occurs. Roads will not be flat bladed. Excessive rutting or other surface disturbance will be avoided. Operations will be suspended temporarily during adverse weather conditions if excessive rutting is occurring when access routes are wet, soft, or partially frozen.

Refer to the area and topographic maps in the individual well Application for Permit to Drill (APD) for the location of the well, access route, and for the location of existing roads nearby.

2) PROPOSED ACCESS ROADS

Well Access

Access to the individual well sites will be provided by crowned and ditched roads surfaced with a gravel material acceptable to the BLM. The access roads will follow existing terrain and the travelway will be approximately 14 feet wide. All equipment and vehicles will be confined to this travel corridor and other areas specific in the plan of development. All disturbances related to the access routes will be confined within the travel corridor.

Drainage crossings on the access routes within the project area would either be low water crossings or crossings using culverts. Low water crossings would be utilized in shallow channel crossings and at crossings of the main channel. Crossings of the main channel would consist of excavating an area approximately four feet deep under the travelway and filling it with rock and gravel to the level of the drainage bottom. Channel banks on either side of such crossings would be cut down to reduce grade where necessary. Culverts would be installed on smaller, steeper channel crossings. Topsoil would be saved before channel crossing construction occurs. Also, the total area to be disturbed would be flagged on the ground before construction begins.

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Where needed, a PEDCO representative will conduct a "Plans in Hand" review with contractors to review the access routes to well locations. Where needed, directional markers will be temporarily placed to mark access routes. All markers will be removed as soon as they are no longer needed.

All construction work will be accomplished as specified by the landowner and the BLM. If no specific BLM field survey requirements are provided, the design, field survey and construction requirement for BLM Temporary Roads that are described in BLM 9113 Manual will be followed. Design drawings and templates will be submitted only if specifically required by the BLM.

After wells are completed and equipment is installed, travel to wells generally would be limited to one visit every other day. A light truck or utility vehicle would be used to check on operations, read meters, and provide light service during the life of the project. Well service trips could be rescheduled or postponed during periods of wet weather when vehicle traffic could cause rutting.

Compressor Site and Water Injection Well Access

If wells are productive, crowned and ditched roads will provide access to the compressor site and water injection facilities. These access roads will be surfaced with a gravel material that is acceptable to the BLM.

All construction work will be accomplished as specified by the BLM. If no specific BLM field survey requirements are provided, the design, field survey and construction requirements for BLM Temporary Roads that are described in BLM 9113 Manual will be followed. Design drawings and templates will be submitted only if specifically required by the BLM.

Culverts and other road drainage control structures, such as drainage dips, ditches, or water bars, will be installed at specific locations as specified by the BLM and the landowner. Drainage structures will be designed to pass all naturally occurring mean flows and flows from certain storm events, as specified by the BLM. Where needed, rip-rap will be placed at the outlets of culverts to minimize erosion.

The all-weather roads to the compressor site and water injection facilities will have a travelway approximately 14 feet wide. All equipment and vehicles will be confined to these travel corridors and other areas specified in the plan of development. All disturbances related to these access roads will be confined within the travel corridor.

Refer to the area and topographic maps in the individual well APD for the location of proposed access roads and site specific road information.

3) LOCATION OF EXISTING WELLS

A listing of permitted water wells and their locations, within one mile of the Sun Dog Interim Development CBM Project, is attached. This listing was obtained from the Wyoming State Engineer's Office (WSEO).

Also enclosed is a map showing the locations of disposal, drilling, producing, injection, and abandoned oil and gas wells within one mile of the Sun Dog Interim Development CBM Project.

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4) LOCATION OF EXISTING AND/OR PROPOSED FACILITIES IF WELL IS PRODUCTIVE

On the Well Pad

At each drill location, surface disturbance will be kept to a minimum. The areal extent of each drill pad is approximately 200 feet by 200 feet. Each drill pad will be leveled using cut and fill construction techniques where needed. Should drilling result in established commercial production, the wellhead area will require an area of approximately 15 feet by 15 feet. The surface equipment at each well will consist of the wellhead and an insulated wellhead cover. Each productive well is expected to require the installation of an electric pump, which will be used to produce water necessary to lower pressure with the coal seams. The lowered pressure will permit methane to be recovered. See the attached diagram of a typical wellhead configuration in the Master Drilling Plan. If different production facilities are required, a Sundry Notice will be submitted.

At each well site, water encountered or used during drilling will be placed in a temporary working pit. Any water that is encountered during drilling is expected to be of higher quality than natural occurring surface waters. The pit will be monitored to ensure that no overflow or subsequent discharge of these waters occurs.

Typically, wells will be shut-in until pipelines and discharge facilities are authorized and constructed. Working pits will be closed once the contents have dried. Once wells become operational, produced water will be separated from the gas and collected in a buried polyethylene flowline for transportation to an approved produced water disposal location.

The primary objectives are the Deep Creek and/or Cherokee Creek Sandstone. The Deep Creek and/or Cherokee Formations are isolated above and below by competent shale barriers that will prevent the initiation and propagation of fractures through overlying strata to any fresh water zones. Where possible, produced water flowlines and gas flowlines will be co-located with the road. Areas have been identified where it is uneconomical to co-locate water and/or gas lines with the access roads.

The surface equipment at the well will consist of the wellhead and an insulated wellhead cover. See the attached schematic diagram of typical cbm well site. Depending on site specific conditions, the housing will be painted either "Carlsbad Canyon" tan, color 2.5Y 6/2 or Desert Brown, color 10YR 6/3 of the "Standard Environment Colors", unless otherwise specified by the BLM.

Off the Well Pad

The compressor site facility is expected to be constructed within an approximate area of 200' X 200'. A drawing of a typical compression site is attached. About one-half of the compressor site will be affected by the construction, maintenance, and operation of the facility. The compressor site facility will be of all-weather construction having a thick layer of gravel over the pad site. If feasible, topsoil will be removed and conserved for later reclamation activities.

The compressor site will consist of an insulated header building containing allocation meters for each well and a single sales meter. The header building will also contain a de-hydrator that will remove water from the wet gas stream. If different production facilities are required, plans will be submitted in a Sundry Notice.

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Water injection facilities are expected to be constructed within an approximate area of 150' X 150'. A drawing of a typical injection facility is attached. The injection facility will be of all-weather construction having a thick layer of gravel over the pad site. Topsoil will be removed and conserved for later reclamation activities.

Approximately 4 water transfer pumping facilities would be utilized during production operations to transfer produced water from the coal bed methane well(s) to the injection well in areas where elevation differences require supplemental pumping to transfer the produced water. Each pumping station would be constructed within an approximate area of 120' X 120'. An approximate 3' berm would be constructed around the perimeter of the pumping station area to contain any potential spills. Water transfer facilities will be located near proposed areas of disturbance and will not be located within known cultural resource sites or sensitive wildlife areas. Locations of water transfer facilities will be submitted by Sundry Notice.

A typical pumping station would consist of a 400 barrel water tank and a small centrifugal water pump. A small pump house would be constructed immediately outside of the bermed area to house the centrifugal pump.

5) LOCATION & TYPE OF DRILLING WATER SUPPLY

Water for drilling the wells will be provided by a nearby existing coalbed methane well and transported to the drill site by truck. Water volume used in drilling operations is dependent upon the depth of the well and any losses that might occur during drilling.

6) CONSTRUCTION MATERIALS

Gravel and/or rock will be purchased from a local supplier having a permitted source of materials for the area. This material will be used for road construction to access wells, compressor and injection facilities.

7) METHODS FOR HANDLING WASTE DISPOSAL

No hazardous substance as defined by CERCLA will be used in the drilling of the wells and/or construction of the well sites and access roads. Commercial preparations, which may contain hazardous substances, may be used in testing and production operations and will be transported over the ROW and within the project area. These materials, which may contain hazardous substances, will be handled in the appropriate manner to minimize potential for leaks or spills to the environment. No RCRA hazardous wastes will be generated in well drilling or production operations. Exempt reserve pit contents will be buried on-site.

Drilled cuttings and drilling fluids will be deposited in the reserve mud pit. The reserve pit will be fenced around 3 sides during drilling. A sheep tight woven wire will be used on the bottom with 2 strands of barbed wire above it. The fourth side of the reserve pit will be fenced as soon as the rig leaves the location. The pit will be backfilled within 2 to 3 weeks following completion of drilling or when sufficient drying has occurred, and topsoil replaced.

There will be no oil, salt water or other noxious fluids produced during drilling and completion operations.

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A portable, self-contained chemical toilet will be provided on location during drilling and completion operations. Upon completion of operations, or as required, the contents of the toilet holding tanks will be disposed of at an authorized sewage treatment and disposal facility. Disposal will be in accordance with the State of Wyoming, Carbon County, and BLM requirements regarding sewage treatment and disposal.

Garbage and non-flammable waste materials will be contained in a portable dumpster or similar unit. Upon completion of operations, or as needed, the accumulated trash will be hauled off-site to an approved sanitary landfill. No trash will be placed in the reserve pit.

Immediately after removal of the drilling rig, all debris and other waste materials not contained will be cleaned up and removed from the well location. No potentially adverse materials or substances will be left on the location.

Any spills of oil, gas, salt water or any other potentially hazardous substance will be reported immediately to the BLM, and other responsible parties, and will be mitigated immediately, as appropriate, through cleanup or removal to an approved disposal site.

8) ANCILLARY FACILITIES

Self-contained travel-type trailers may be used on-site during drilling operations. No facilities other than those described in this surface use plan (SUP) will be constructed to support the operations associated with the wells.

9) WELL SITE LAYOUT

Drilling operations would disturb an area approximately 200 feet by 200 feet at each well site (See the attached drawing). A temporary mud pit 15 feet wide by 10 feet deep by 35 feet long would be excavated at each well and reclaimed after completion operations. Topsoil would be removed and stockpiled prior to excavating the pit as required by BLM. PEDCO estimates the reserve pit would be open from 2 to 3 weeks to allow for evaporation of pit fluids. The pit would be fenced on all sides to prohibit wildlife and livestock from falling into the pit. A sheep tight woven wire will be used on the bottom with 2 strands of barbed wire above. Any open pit containing hazardous material will be covered with netting.

Ditches will be constructed, where necessary, around the well pads to divert water away from the pad.

Water discharged during testing/production will go into the water discharge line and will be transported to the disposal well.

Where needed, cut and fill construction techniques will be used to level the drill pads. All surface disturbance related to drilling will be confined to each drill site.

Plans for removal and storage of topsoil are presented in Item 10 below.

All equipment and vehicles will be confined to the access road, pad and area specified in the individual APD's.

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10) PLANS FOR RECLAMATION OF THE SURFACE

Well Site and Newly Constructed Access Road

Prior to reserve mud pit excavation, the top 6-8 inches (more if available) of soil and associated vegetative material will be removed and stockpiled. The reserve pit will be allowed to dry prior to the commencement of backfilling work. No attempts will be made to backfill the reserve pit until the pit is free of standing water.

Dry Hole - In the event of a dry hole, all equipment and debris will be removed from the location. Any improvements to the access road, such as culverts and gravel, will be removed. The drainages will be restored to their approximate original bank configuration and depth. Topsoil will be replaced over all cut areas. All disturbed areas will be seeded as indicated below.

Seeding - All disturbed areas will be reclaimed by replacing topsoil, grading, and seeding with a mixture agreed upon by the BLM and PEDCO. Seeding would occur during the spring months after ground frost, or in the fall prior to ground frost. Seed would be applied as directed by the surface owner, either drilled, broadcast, or a combination thereof. Mulching may be required to insure seedling establishment.

The seed mix will be planted (subject to approval by the surface owner) with a drill equipped with a depth regulator. The seed mix will be uniformly planted over the disturbed areas. Where drilling is not possible, seed will be broadcast and the area will be raked or chained to cover the seed. Seeding will be repeated until a satisfactory stand is established as determined by the surface owner.

11) SURFACE OWNERSHIP

The surface of the interim development project area is entirely under federal ownership.

12) OTHER INFORMATION

A Class III Cultural Resource Inventory of the proposed drill sites and access roads and other facilities has been completed by Western Archaeological Services. Reports have been filed with the BLM, Rawlins Field Office.

A comprehensive water disposal plan is attached to this Master Surface Use Plan that addresses how produced water will be handled during the testing and production of the CBM wells.

If archaeological, historical or vertebrate fossil materials are discovered during the course of any construction activities, PEDCO will suspend all operations that further disturb such materials and immediately contact the BLM, Rawlins Field Office (307-328-4200). Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM Authorized Officer (AO).

PEDCO will be fully responsible for the actions of their subcontractors. A copy of the approved APD and the Conditions of Approval will be on location during drilling and completion operations.

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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 currently 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 PEDCO and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

I also certify that PEDCO will comply with the provisions of the law or the regulations governing the Federal or Indian right of reentry to the surface under 43 CFR 3814.

I also certify that PEDCO shall use its best efforts to conduct its approved operations in a manner that avoids adverse effects on any properties which are listed, or may be eligible for listing, in the National Register of Historic Places (NRHP). If historic or archaeological materials are uncovered during construction, the operator will immediately stop work that might further disturb such materials, and contact the AO (or his/her representative) at the BLM Rawlins Field Office. Any paleontological resources or fossils discovered as a result of operations associated with these wells will be brought to the attention of the AO or his/her representative immediately. All activities in the vicinity of such discoveries will be suspended until notified to proceed by the AO.

PEDCO hereby certifies that:

1. All potentially affected landowners having properly permitted water wells with the WSEO within each proposed well's Circle of Influence (one-half mile radius) were offered a Water Well Agreement; and
2. If a Water Well Agreement is not reached with the landowner, PEDCO agrees to mitigate the impacts of its coalbed methane wells in accordance with State of Wyoming water laws; and
3. PEDCO has applied for a Permit to Appropriate Groundwater from the WSEO, concurrently with this APD.

Lessees Representation and Certification - Sun Dog Pod

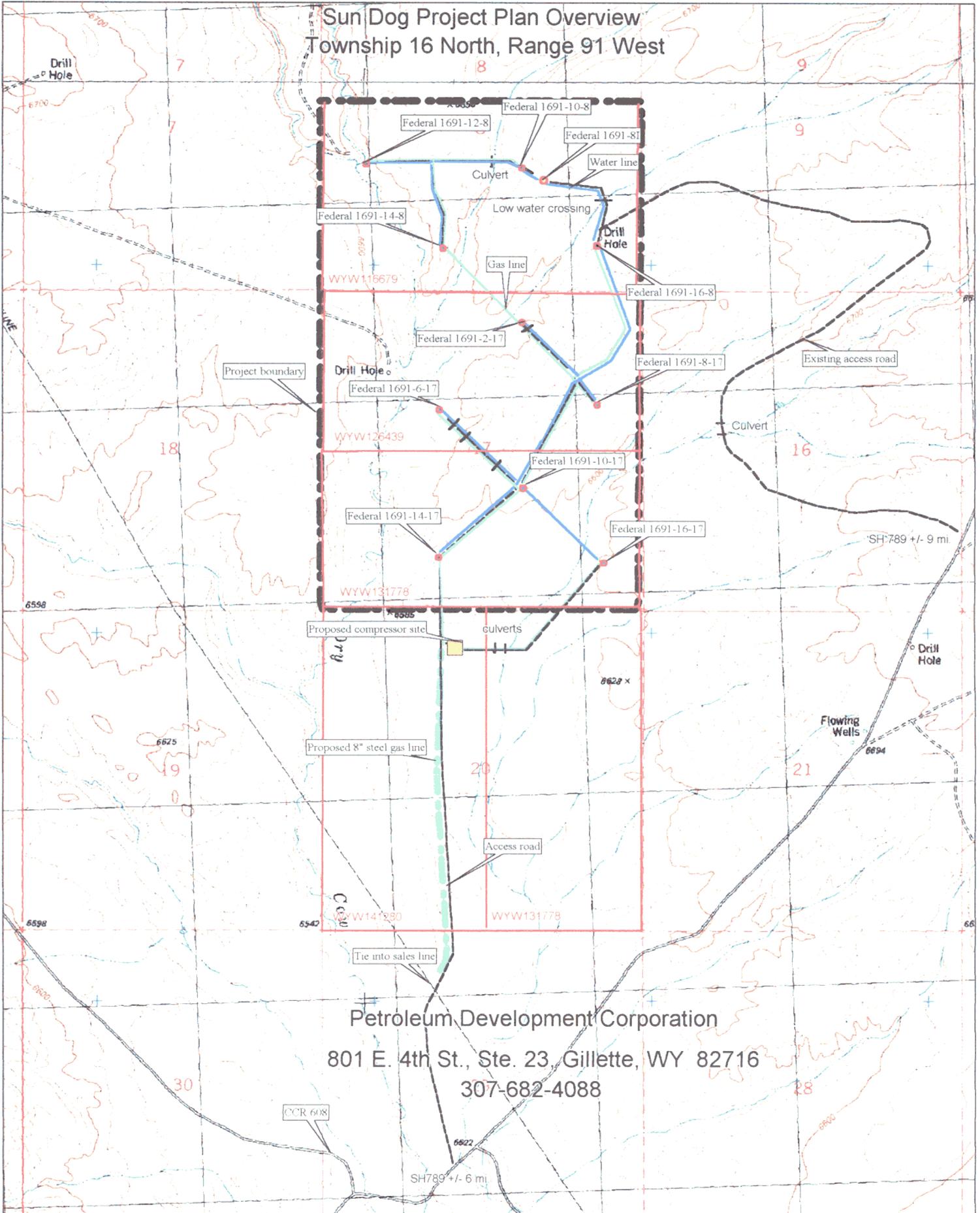
Mr. Scott Hedlund
Compliance Technician
PEDCO
801 East 4th Street, Suite 23
Gillette, Wyoming 82716
Phone: (307) 682-4088

PEDCO:

Date: August 9, 2001

Sun Dog Project Plan Overview

Township 16 North, Range 91 West



Petroleum Development Corporation

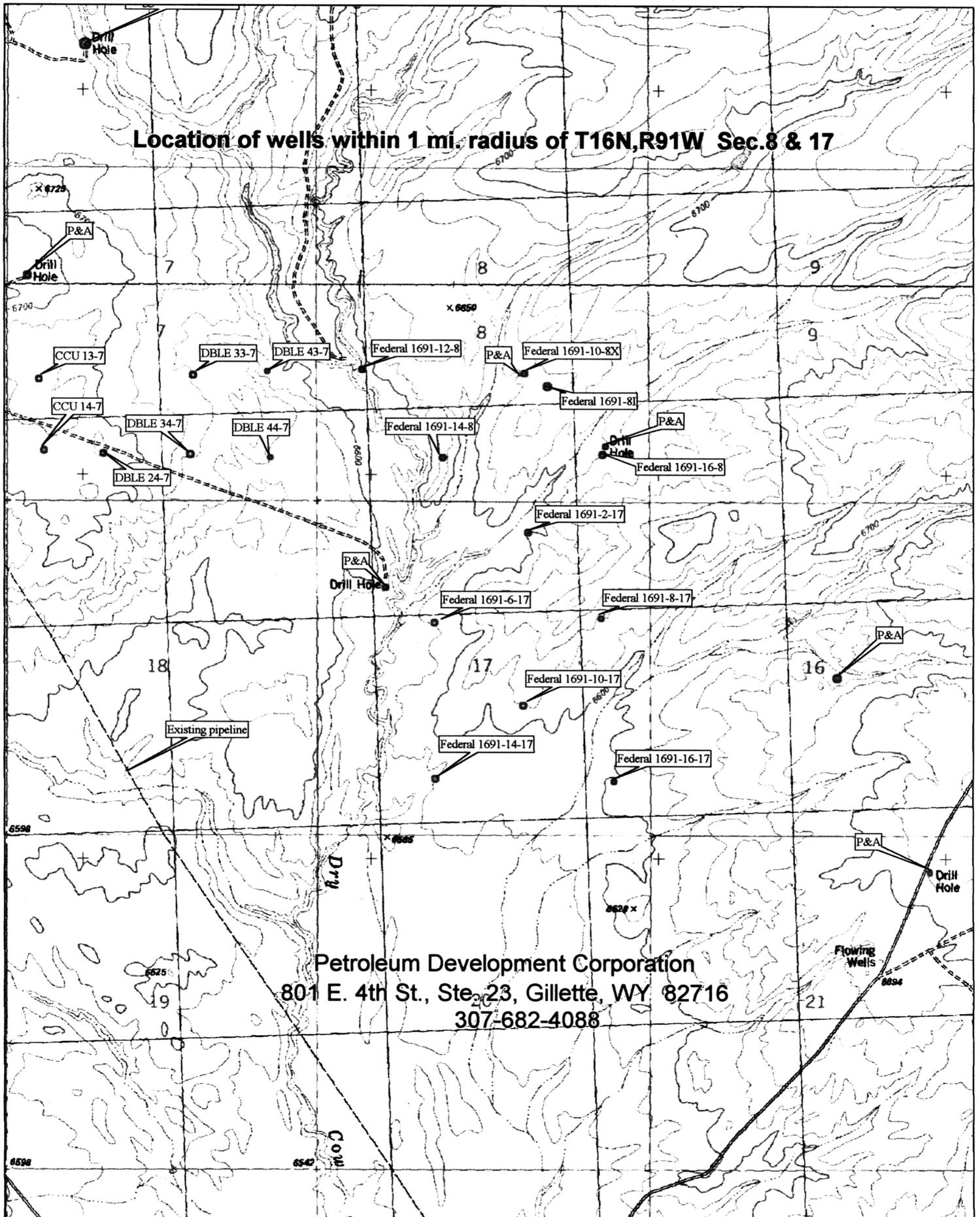
801 E. 4th St., Ste. 23, Gillette, WY 82716

307-682-4088

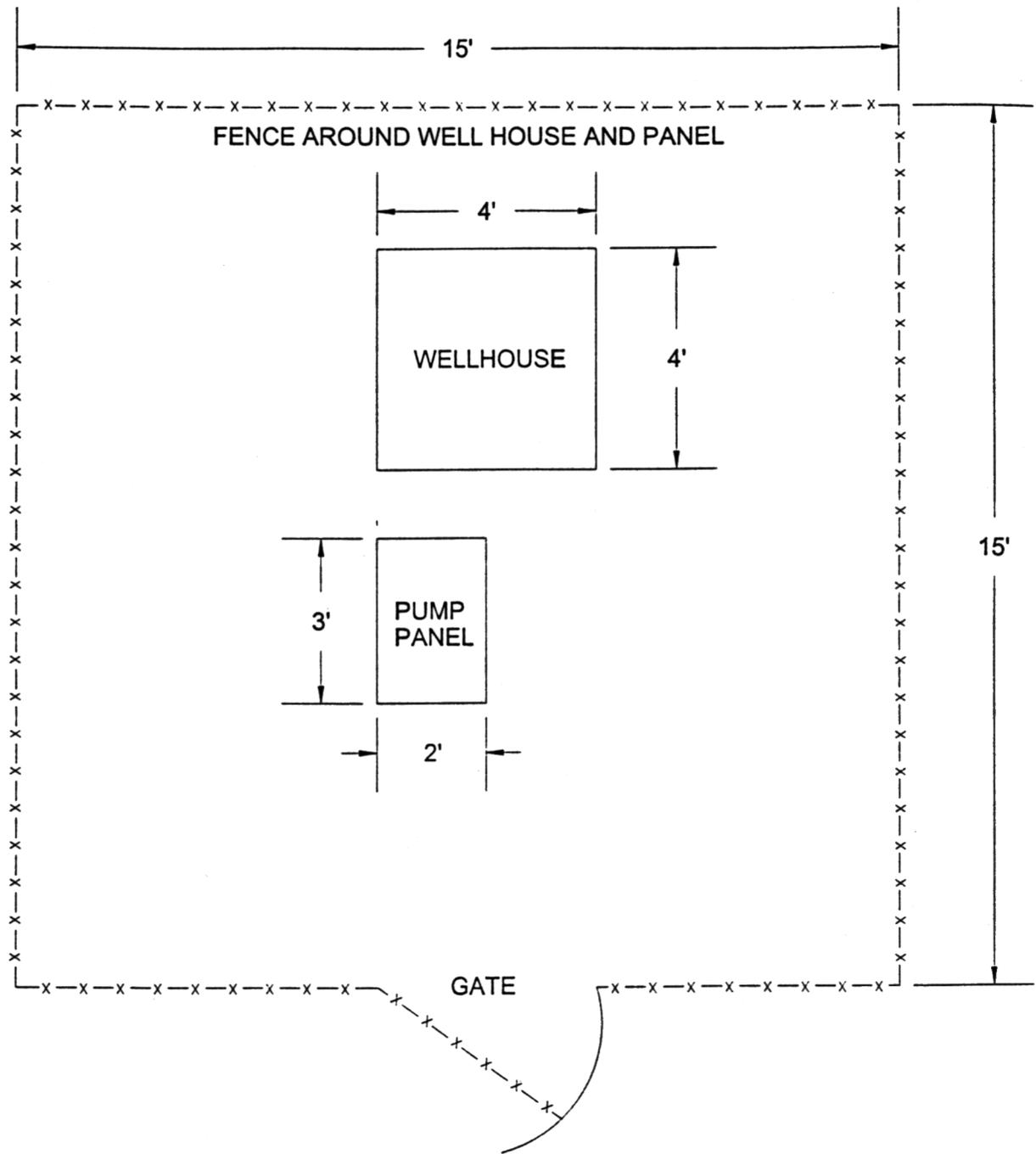
Permitted Water Wells Within One Mile of the Sun Dog Project Area

Permit No.	Tw	Rng	Sec	Qtr/Qtr	Applicant	Facility Name	Use	YldAct	Well Depth	Stat Depth
P56794W	16	91	8	SESE	BLM	Coyote	STO	20	10913	Flowin
P6143P	16	91	21	SWNE	BLM	Dry Cow Well #1	STO	20	8500	Artesian
P6144P	16	91	21	SWNE	BLM	Dry Cow Well #2	STO	20	605	Artesian

Location of wells within 1 mi. radius of T16N,R91W Sec.8 & 17



Petroleum Development Corporation
801 E. 4th St., Ste. 23, Gillette, WY 82716
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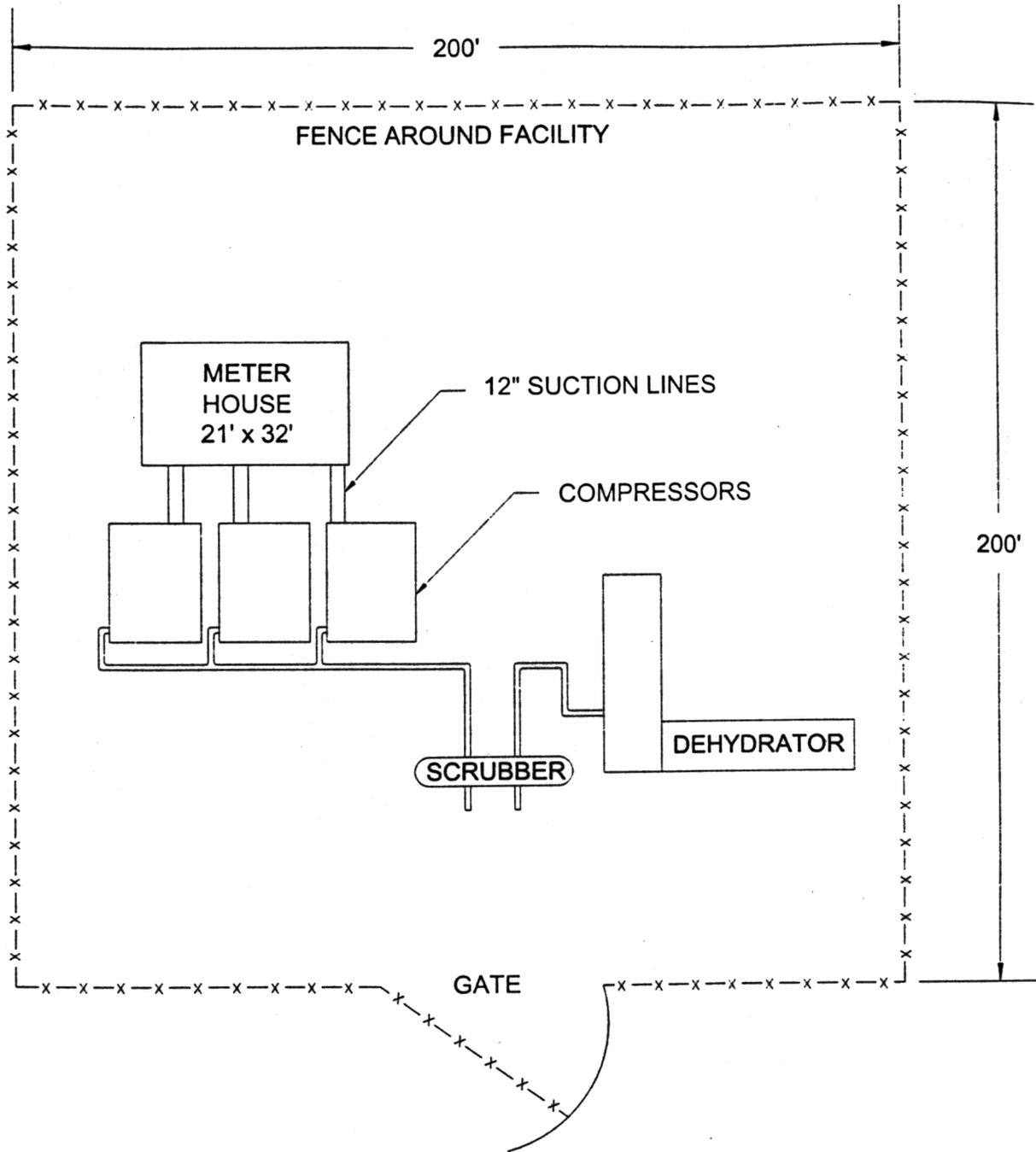
TYPICAL CBM WELL SITE

SCALE: NTS

DATE: 05.04.01

DRAWN BY: MTM

FIGURE: 5



PETROLUUM DEVELOPMENT CORP.



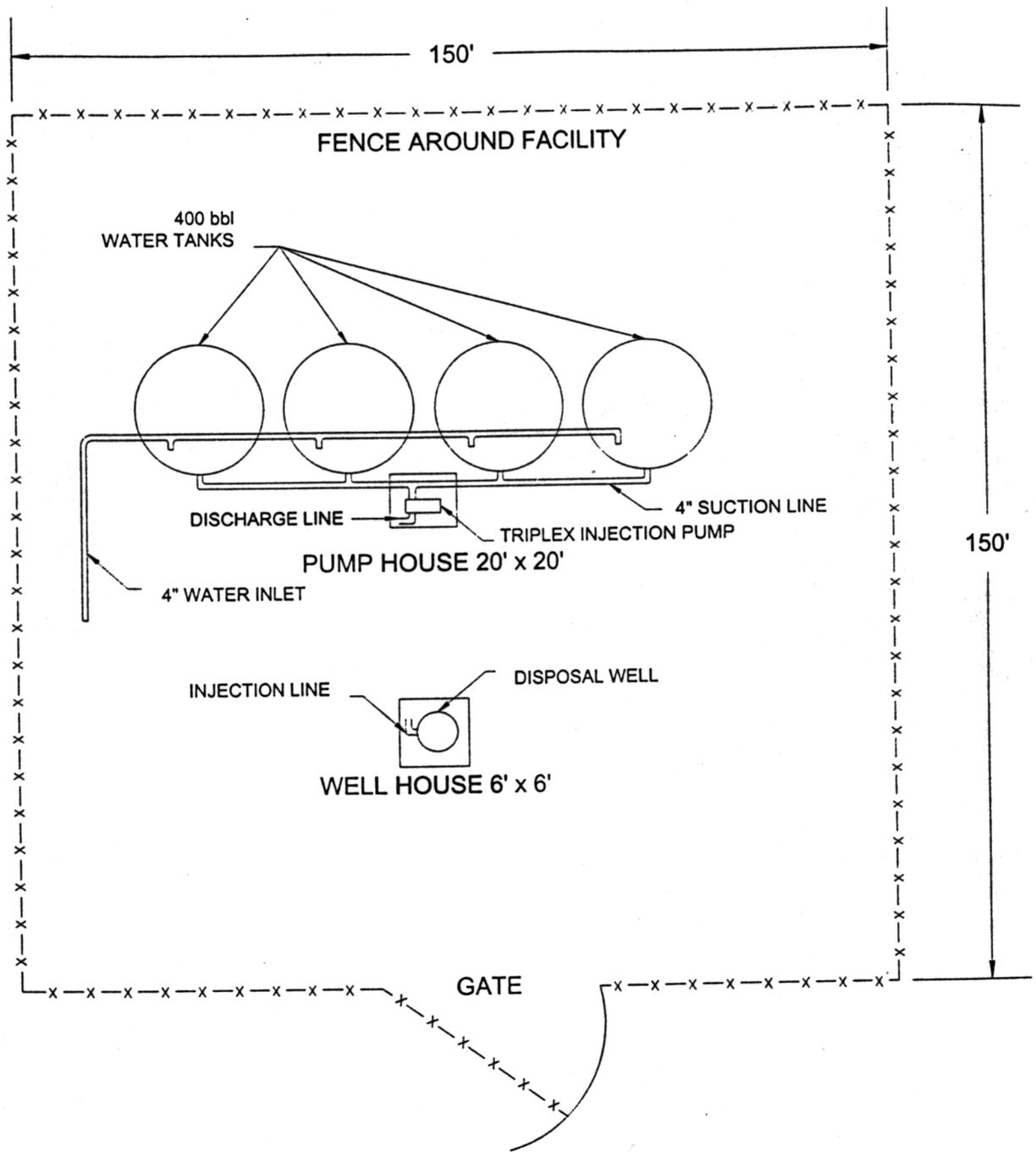
TYPICAL COMPRESSOR STATION & METER FACILITY

SCALE: NTS

DATE: 5.04.01

DRAWN BY: MTM

FIGURE: 10



PETROLUUM DEVELOPMENT CORP.



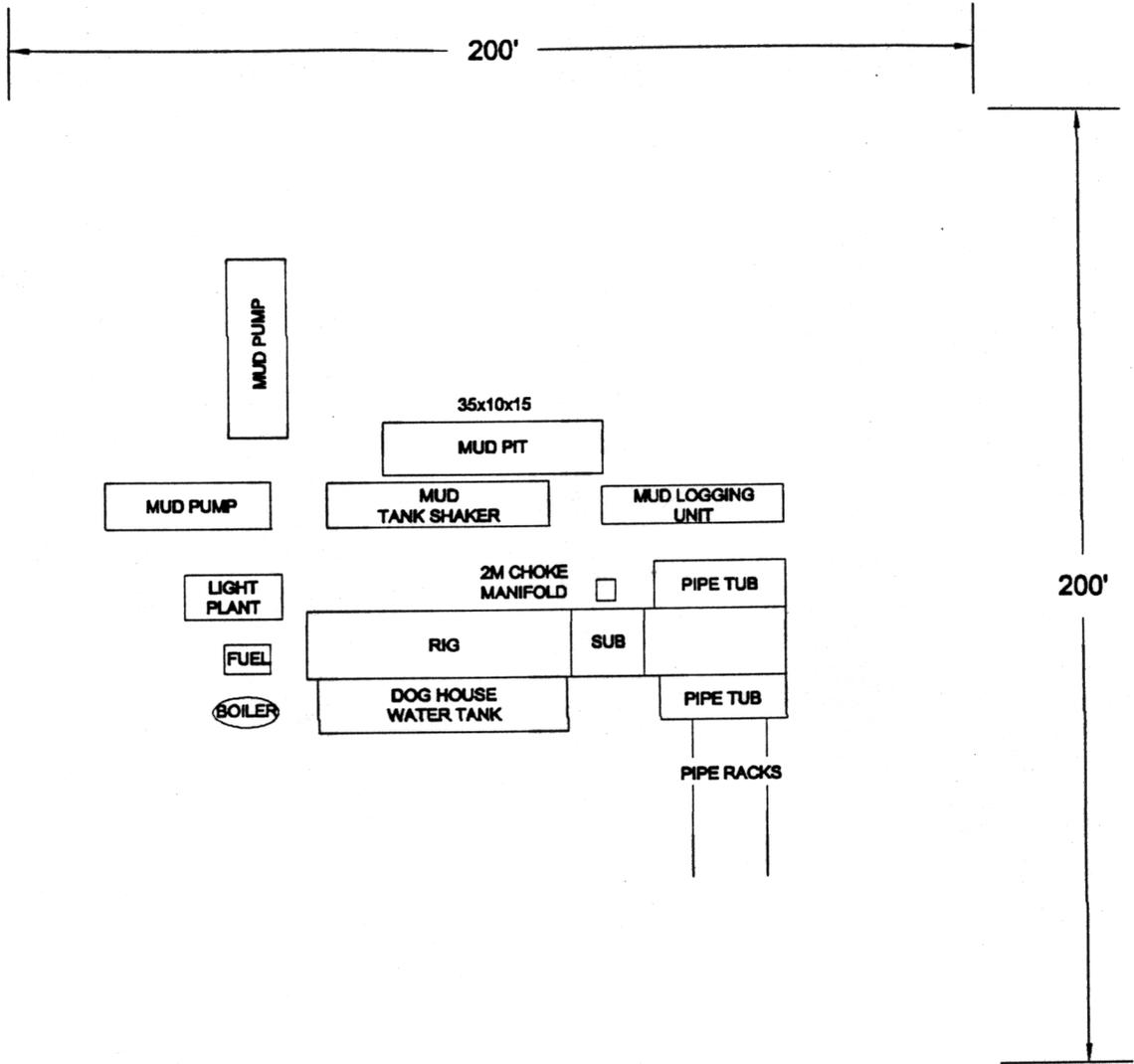
TYPICAL WATER DISPOSAL FACILITY

SCALE: NTS

DATE: 05.04.01

DRAWN BY: MTM

FIGURE: 8



 PETROLUUM DEVELOPMENT CORP. 			
TYPICAL DRILLSITE LAYOUT			
SCALE: NTS	DATE: 5.18.01	DRAWN BY: ML	FIGURE: -