OIL AND GAS SURFACE PROTECTION PLAN

FORTIFICATION CREEK AREA

Bureau of Land Management

Buffalo Resource Area

April 1982

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OIL AND GAS SURFACE PROTECTION DEVELOPMENT PLAN

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OIL AND GAS SURFACE PROTECTION PLAN - FORTIFICATION CREEK AREA

A. INTRODUCTION

I. Authority

a. Regulations

Oil and gas leases are issued for public domain lands under authority of the Minerals Leasing Act of 02-25-1920 (41 Stat. 437, 30 U.S.C. 181) as amended. This act was supplemented by the Act of 08-08-1946 (60 State. 950) and the Act of 09-02-1960 (74 Stat. 781). Authority for leasing on acquired lands comes from the Leasing Act for Acquired Lands enacted on 08-07-1947 (61 Stat. 913). Oil and gas leasing is administered through regulations contained in 43 CFR 3100.

1. The 1920 Mineral Leasing Act applies to all public land and its provisions further apply to:

   "lands previously or thereafter patented wherein certain minerals were reserved to the U.S." The Act specifies that such leasing is conditioned by laws which reserved those mineral deposits (Sec. 34).

2. R.S. 2478 (43 U.S.C. 1201) empowers the Secretary of Interior to enforce and carry into execution, by appropriate regulation, every part of the title not specifically provided for. (1946 Reorg. Plan No. 3) The statue granted the Secretary complete authority, over public lands including mineral lands, to issue regulations concerning them.

   The statute authorizes "such departmental regulations only as are appropriate, reasonable, and within the limitations of the law for which the regulation is provided."

3. 43 CFR Group 3000 regulates the minerals' management program. Part 3100 addresses oil and gas leasing.

4. Subpart 3109 defines BLM responsibility for protection of lands. The term "lands" and "any permit or lease" appears as all inclusive.

5. 43 CFR 3814 specifies procedures which shall apply on private surface - federal minerals under the SGH Act.

b. Orders and Agreements

1. The BLM's involvement with oil and gas development stems from the Sec. Order 2948 (10-06-72).

The Order outlines departmental responsibilities and specifies BLM responsibilities as:

a) Issues leases, licenses, and permits.

b) Provides records for mineral leasing matters.

c) In cooperation with Minerals Management Service (MMS) formulates general requirements to be incorporated in leases, licenses, and permits for the protection of the surface and nonmineral resources and for reclamation. To that end, ten (10) standard stipulations were established which would apply to all leases, licenses, or permits. (See I.M. 7774)

d) Cancels leases, licenses, and permits at the request of the MMS in cases of noncompliance.

2. NTL-6

The Notice to Lessee - (NTL-6) issued by the USGS specifies requirements for operations on onshore oil and gas leases.

c. BLM Manual

The BLM Manual 3109 "Wyoming Supplement" outlines surface management requirements for oil and gas development. The manual is based on the USGS-BLM Agreement and NTL-6.

d. Public Land Laws

It is important to discuss the Act of 07-17-1914 (38 Stat. 509) and the Stock Grazing Homestead Act (39 Stat. 864; 12-26-1916). The 1914 Act created the concept of split estate but the SGH Act is by far the most significant of the public land laws relative to split estate. First, most of the split estate in eastern Wyoming resulted from this Act. Second, the mineral reservation clause in this act provided specific redress to a surface owner for mineral development damages. The clause remains virtually unchanged even though repeated in a host of other land laws including the FLPMA of 1976.

The law specified that "the U.S. or its permittees have the right to enter upon, explore for, mine and remove minerals, and to use whatever surface is reasonably necessary to effect removal."

The Act further declared certain conditions which protected a surface owner (Sec. 9). These are:

The mineral claimant would secure written consent or waiver from the landowner.

or

The landowner would receive payment for damages to crops and tangible improvements.

or

In cases where a mineral claimant could not reach an agreement with the surface owner the law provides that:

1) A bond be executed by the claimant which secured payment for damages to crops, tangible improvements, and surface rehabilitation.

We use the NEPA of 1969 for giving us broad general responsibility for assessing impacts and stipulating appropriate mitigating measures.

The FLPMA (Title 1) Sec. 103e defines "public lands" as "any land or interest therein." The definition has been interpreted to mean retained federal minerals beneath private surface are "public lands." Title VII, Sec. 701F states "no effect on any existing law." Sec. 702c relates procedures for disposal of minerals. The section uses the same wording as that contained in the 1916 Stockgrazing Homestead Act and 43 CFR 3814. The Act is not cited as an authority in BLM Manual 3109 but it is used verbally as legal authority.

NEPA also recognizes alternative uses of available resources and indicates a need to achieve a balance between resource uses.

The most recent Bureau Policy, in dealing with split estate lands, is we have a responsibility only for cultural and T&E resources on split estate lands.

II. Area Orientation

The Fortification Creek Area is located on the east side of, and adjacent to, the Powder River midway between Interstate 90, on the south, and Arvada, Wyoming, on the north (refer to the regional and area maps attached).

The Powder River provides the western boundary of the area (refer to the surface and mineral ownership map). A portion of the southern boundary is on the section lines from the intersection of the Powder River with the southwest corner of section 16, T. 51 N., R. 77 W. to the intersection of the Montgomery Road (County Road 201), in Antelope Draw, with the southern section line of section 15, T. 51 N., R. 76 W. at the southwest corner of the SE¼SE¼. County Road 201 is the boundary to its exit from the southern edge of section 31, T. 51 N., R. 75 W. in the SW¼SE¼. From the intersection of County Road 201 with the southern edge of section 31, the boundary is along the section lines easterly to the southwestern corner of the SE¼SE¼ of section 34, T. 51 N., R. 75 W., thence northerly to the intersection of the east line of section 13, T. 51 N., R. 75 W. with the Echeta Road (County Road 201). The northeastern boundary, from the intersection of the Echeta Road with the east line of section 13, T. 51 N., R. 75 W. to the intersection of the Burlington Northern Railroad with the south line of section 5, T. 53 N., R. 76 W. in the SE¼SE¼, follows either the Echeta Road or the Burlington Northern Railroad, whichever is the most southwesterly located, since they periodically cross one another. The northern boundary is the section lines from the intersection of the Burlington Northern Railroad with the south line of section 5, T. 53 N., R. 76 W. in the SE¼SE¼ west to the Powder River.

The Bureau of Land Management (BLM) administers all of the minerals under approximately 85% (83,000 acres) of the area. Most of the privately-owned minerals occur along the Powder River, Fortification Creek, and Wild Horse Creek. Mineral status is illustrated on Map #3 (surface and mineral ownership) and on the Master Title Plats (MTP) which are keyed to Map #4 (MTP key).

The Fortification Creek Area encompasses 97,834 acres. This includes 44,416 acres (45%) of public surface administered by the BLM, 48,138 acres (49%) of privately-owned surface, and 5,280 acres (6%) of state-owned land surface. The surface ownership, including the grazing lessees, is illustrated on Map #5 (surface ownership and lessee).

Generally, the State of Wyoming assigns 40 acres to oil wells and 160 acres spacing to gas wells. These acre spacings can be adjusted by the Oil & Gas Commission.

No special spacing designations are given for an area unless there is a discovery. Application for special spacing designation may be requested by any interested party - even the BLM. Since a large reservoir is approximately six miles long and one-to-one-and-one-half miles wide, normally up to 12 sections are covered by a single-spacing order. Spacing orders are issued for one year and reviewed each year. They can be increased or decreased based on the activity during the year.

There is no special spacing designation in the Fortification Creek area. Further information concerning spacing may be found in "Rules and Regulations of Wyoming Oil and Gas Conservation Commission" pages 12 and 13 (found in the appendix to this plan).

The Fortification Creek area has good potential for accumulations of oil and gas, primarily from stratigraphic traps in sand units within the Cretaceous Age Mesa Verde Formation. Such traps would most likely be similar to the northwest-southeast trending offshore bar and beach sands found in oil and gas fields to the south, such as Barber Creek. Trends perpendicular to this could result from similar traps related to meandering, discontinuous channel sands. Seven dry holes have been reported from the area with two oil and gas shows. Two minor KGSs are found on the west edge of the area. The Fortification Creek field was drilled and abandoned in 1957 with an oil and gas showing from the Parkman Sandstone within the Mesa Verde Formation. The Post Draw Field has one well producing three barrels of oil and a few mcf of gas per day from the Teapot Sandstone, also within the Mesa Verde Formation. Additional potential exists for petroleum accumulations along Lower Paleozoic pinchout trends.

Drilling within the area has been sparse although the Powder River Basin in general is receiving heavy exploration and drilling attention. Activity within the area eventually is expected to increase. However, the relatively poor showings here will not attract much attention until the more promising surrounding areas are more thoroughly explored.

Sources: Wyoming Geological Survey, 1976; County Resource Series #4, Johnson County, Verploeg, Alan, 1981; Wyoming Geological Survey, Personal Communication, Wayne Sutherland.

III. Purpose

As the demand for petroleum products grows, exploration and development are entering into land areas of critical resource values. Since these critical areas, such as the Fortification Creek area, are largely unmarred, plans must be developed to provide that the exploration and development activities progress in an orderly manner while affording protection to the surface resources.

Since most oil and gas leases are issued for ten years, having a development plan for the area would provide adequate stipulations which could be attached to each lease as it is terminated and reissued. Plans that are assembled before an area is developed for oil or gas will provide recommended resource protection stipulations which could be utilized by field personnel inspecting proposed exploration activities. Anticipated problem areas would also be identified so appropriate resource specialists could be present.

Surface owners, resource specialists, and other federal agencies would be informed of the manner in which oil and gas activities are expected to develop in an area, with respect to federal surface. Potential well locations and access road routes on private and state surface are shown in this plan. The rationale for this is so oil development can be visualized as it would continue across/on private or state surface.

In using this plan the BLM will proceed with caution when dealing with any private surface owner. Care will be used in expressing the concepts of this plan, on other than federal surface, to private surface owners or industry representatives.

Additional needs the plan would answer are:

1. Field personnel may not have the "big picture" of the area, at times, and are not aware of nearby resources that may be impacted by the activities they are inspecting.

2. Occasionally there is a lack of consistency in the stipulations attached to adjoining leases.

3. Due to the workload, inspecting field personnel must rely on the word of oil company representatives concerning the distance to and location of nearby roads, trails, pipelines, etc.

4. Field personnel do not have a number of prepared, specific, and possibly exotic stipulations to draw from when special problems are encountered and may be required to make on the spot decisions without adequate information on the area.

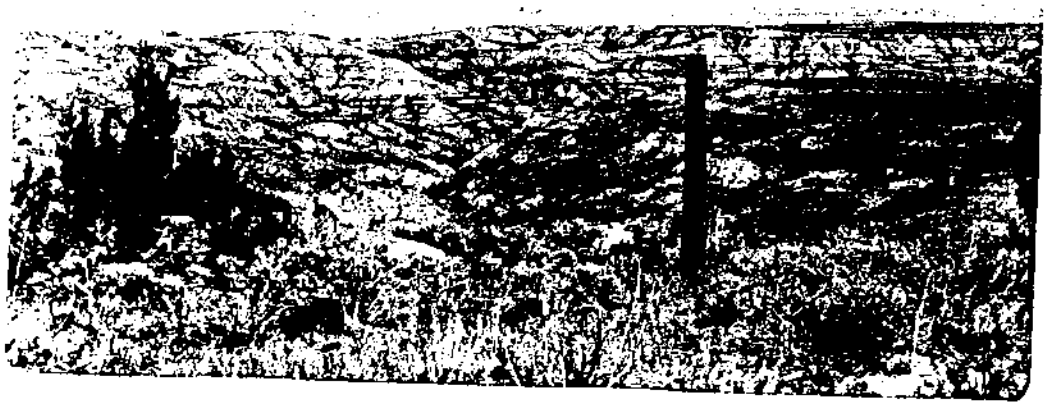
IV. Physical Factors

"The climate of the area is controlled by the continental land area and is classified as a semi-arid continental climate, which is distinguished by a relative sparcity of precipitation with hot summers and cold winters." The temperature at Arvada, located six miles northwest of the northern edge of the area, ranges from an average low of 13° to an average high of 84°. Precipitation ranges from 12 to 14 inches in the portion of the area in Johnson and Sheridan counties to 14 to 16 inches in Campbell County. This is illustrated on Map #6 (Moisture-Erosion-Soils). "Seventy percent of the annual precipitation is seasonally distributed through a six-month period from March through August, with April, May, and June being the peak "wet" months. A majority of this precipitation is received in the form of rain; the remaining thirty percent is received usually in the form of snow during the remainder of the year." (January 1973 - Environmental Assessment Record - Gulf Oil Company Oil Well Drilled on Bull Creek). The growing season for the area is 110 to 120 days.

The elevation of the area ranges from 3,680 feet in the Powder River floodplain to 4,678 at points west of Snell Canyon and at the head of Little Bull Creek.

The area is located in a topographic region called the Powder River Breaks. "As the name implies, the Breaks area is a badland type terrain. The soft shales and sandstone of the area have been carved into an intricately dissected surface of steep, raw slopes, extended escarpments, sharp ridges, buttes, precipitous bluffs, pinnacles and vertical walled gullies. The side drainages of the Powder River are typically a complex maze of numerous lateral drainages and gullies. Head cuts are found in all the drainages and some may exceed 30 feet in depth. The breaks are so thoroughly broken and dissected as to severely restrict access by horseback, let alone by vehicles." (Step II, Physical Profile, Powder River Resource Analysis (URA).

The URA divides the topography into four slope classes. The slope classes and their coverage of the Fortification Creek area are shown on Map #7 (slope). The topography of the entire area is shown on the topography maps which are keyed to Map #8 (topography key).



Typical Topography of the Powder River Breaks
Which Dominate the Fortification Creek Area

The soil associations in the Fortification Creek area are Shingle-Rock Outcrop, Shingle-Briggsdale-Cushman, Shingle-Thedalund-Kin, and Haverson-Glenbury-Bankard. The locations of the various soil association areas are shown on Map #6 (Moisture-Erosion-Soils).

The various soils are described as:

Shingle-Rock Outcrop: Shallow, well-drained, medium-textured soil interspersed with rock outcrop on ridge crests and sidehill slopes, and incised by numerous gullies. Bedrock is sandstone or shale.

Shingle-Briggsdale-Cushman: Shallow and moderately deep, well-drained loamy soils on sloping to moderately steep uplands.

Shingle-Thedalund-Kim: Shallow, moderately deep, and deep, well-drained loamy soils on rolling to steep uplands with deeply incised gullies.

Haverson-Glenberg-Bankard: Deep, coarse to moderately fine-textured soils on floodplains along major drainages.

The erosion potential is classified as severe, in the URA, for the entire area with the exception of the Shingle-Briggsdale-Cushman soils in the southeastern part of the area for which the erosion potential is moderate. The erosion potential areas are illustrated on Map #6.

The only flowing river in the area is the Powder River which forms the western boundary. Fortification Creek, Bull Creek, and Little Bull Creek are intermittent and only flow at times of snow melt or heavy rainfall. Reservoirs and water wells are scattered throughout the area to provide livestock water. There are a few springs in the area that are primarily used by wildlife for watering. The older reservoirs and water wells in the area are shown on the topography maps which are keyed to Map #8 (Topography Key).

The range throughout the entire area is in good condition.

Grasses present in the area include Cordgrass, Western wheatgrass, Little bluestem, Side oats gramma, Blue gramma, Green needlegrass, Indian ricegrass, Prairie sandreed, and Needle-and-thread grass. The major species of forbs and shrubs are big and silver sagebrush, rubber rabbitbrush, and prickly pear cactus. These forbs are heavily utilized during the winter. Fourwing saltbush, skunkbush sumac, and winterfat are scattered, usually on ridge tops and south-facing slopes, throughout the area. Other forage species, which are not heavily utilized, are chokecherry and currants that grow in some of the major draws, especially along Deer and Bull Creeks. Dense stands of Rocky Mountain juniper cover many north and eastfacing slopes.

There are no threatened and endangered plants identifed in the area.

The key wildlife species within the area is a herd of approximately 100-150 head of elk. The most abundant big game animal in the area is mule deer, these range over the entire area; the resident population is estimated at 1,000 animals by the Wyoming Game and Fish Department. Several bands of antelope range within the area. Most of the animals are located along the edge of the Fortification Creek area where the terrain is relatively flat. The antelope population within the area is estimated at 125 head.

The area also supports a variety of upland game birds. Included are sage grouse, sharptail grouse, chukar and hungarian partridge, mourning doves, and waterfowl. Turkeys are found along the Powder River.

The ranges of the elk, antelope, two sharptail dancing grounds, and a sgae grouse nesting area are shown on Map #9 (Wildlife).

Predominant nongame species in the area include coyotes, bobcats, and numerous song birds.

The possibility of threatened or endangered birds and animals exists in the area. Extensive praire dog towns occur along the perimeter of the area on the floodplain of the Powder River and Wild Horse Creek. Small towns are scattered throughout the area with most occurring in the Deer Creek drainage. Approximately 5,500 acres of densely populated prairie dog towns occur within the Fortification Creek area; federally-reserved minerals underlie approximately 95% of these. Prairie dog towns are potential inhabitations of the black-footed ferret.

A black-footed ferret was sighted by rancher Glen Sorenson, in section 24, T. 53 N., R. 77 W., for three consecutive days during the week of May 4-10, 1975. Also, a neighboring rancher, Paul Jones, sighted it once during that week. A verification of this sighting was attempted by BLM and Wyoming Game and Fish Department personnel about a month later but no sign of the ferret was evident. The authenticity of this sighting is not questioned as the observer had familiarized himself with ferret markings and activities via literature after the first sighting but prior to the last sighting. Another landowner, George Clabaugh, reported seeing a black-footed ferret once on the family ranch within the Foritification Creek area during his youth some 30+ years ago. The prairie dog towns and the black-footed ferret sighting are shown on Map #9 (Wildlife).

The endangered peregrine falcon along with golden and bald eagles have been sited within the Foritification Creek area, but no eyries have been located.

The critical game ranges in the area are those occupied by calving and wintering elk. During the late spring (calving time), summer, and fall the elk are dispersed in small bands ranging from about 4-10 head throughout the more broken and rough terrain north of Snell Canyon and Soft Water Draw. Most of the elk during this period are found along the Bull Creek, Little Bull Creek, Deer Creek, Fortification Creek and Snell Canyon drainages. The juniper covered slopes ~~within these five drainages serve~~ as the major calving areas. During the winter and early spring the elk gather into herds of 20-to-50 animals and occupy the less broken terrain found south of Snell Canyon and Soft Water Draw.

The dense stands of juniper provide escape cover and security for the elk as well as thermal cover. This is evidenced by the big sage brush growing among the juniper often being heavily browsed. Field observations also indicate the juniper stands are used by the elk as a sanctuary from vehicle traffic.

Escape Cover in Bull Creek

Escape Cover in Snell Canyon

The livestock type and season-of-use are listed on the chart given on the next page. The ranch boundaries and therefore the use areas are shown on Map #5 (the map that the chart is keyed to).

Designation on Surface Ownership and Lessee Map (Map #5)

No.	Surface Owner/Lessee	Type	Phone	Season-of-Use
1.	Paul Jones	cattle	736-2444 674-9522	year-long
2.	Glen Sorenson	cattle		Sept. 1-Dec. 31
3.	Fred Floyd	cattle	736-2231 736-2232	year-long
4.	Love Land & Cattle Co.	cattle	W. K. Love 672-7422	year-long
5.	Clabaugh Ranch, Inc.	cattle	Geo. Clabaugh 736-2225	year-long
6.	Ben Briles	cattle	736-2448	Setp. 1-May 30
7.	Floyd Land & Lvstk.	cattle	Fred Floyd, Jr. 736-2232	year-long
8.	Leo & Claire Hollcroft	cattle	736-2446 684-5145	Oct. 1-Mar. 31
9.	Robert & Pat Laramore	cattle	682-5316	year-long
10.	M. G. Ahern (John)	cattle	736-2453 758-2313	year-long
11.	Doyle Hayden (Bud)	cattle	682-3970	year-long
12.	Don & Doris Wagenson	cattle	682-4064 736-2471	year-long
13.	Eaton Brothers (Wm.)	cattle	736-2233	year-long
14.	Juaquin Michelena	sheep	736-2456	a. 4/1 - 7/15 and 9/15 - 10/31 b. 4/15 - 7/15 and 11/1 - 2/2815.
15.	Goldena Dixon			
16.	Gordon Mooney	cattle	682-3170	year-long
17.	John and Earl Throne	cattle	682-3924	year-long

The Fortification Creek area has a Class IV Visual Management rating. It has a scenery quality of "B", a high sensitivity level, and a visual zone of "seldom seen". In a Class IV area, changes may subordinate the original composition and character, but must reflect what could be a natural occurrence within the characteristic landscape. The area is semi-primitive and gives a sense of open space. The primary sensory impact is on sight. The extremely rough topography, outcrops of red shale, and scattered juniper make the area scenic and peaceful in appearance. A secondary sensory impact is on the sense of hearing. The area is normally silent or nearly silent.

Numerous trails, several roads, reservoirs, and a large amount of fences are present but their overall impact on naturalness is minor.

Preliminary examinations suggest there are about five archaeological sites per square mile. Sites are generally small-to-medium, located on uplands, and consist of tipi rings, hearths, or chipping stations. The majority of these sites have local significance, although some may have regional significance.

The Fortification Creek area contains Wilderness Study Area (WSA) WY-060-204. The area contains 12,419 acres. This is shown on Map #10 (wilderness). The WSA is to be treated in accordance with the Interim Management Policy and Guidelines for Lands Under Wilderness Review.

There are no roads inside the boundaries of the Fortification Creek ~~area which have~~ public access. The Echeta Road (county road) is adjacent to the northeast side of the area and the Montgomery Road (county road) borders a portion of the area. There is no physical access across the Powder River except at small bridges, constructed by the ranchers, and fords.

There are five sets of occupied ranch buildings within the area.

Roads, trails, and occupied ranch buildings are shown on Map #11 (roads and ranch buildings) and on the topography maps that are keyed to Map #8 (topography key).

Power lines within the area and within two miles of the area are shown on Map #12 (powerlines-pipelines). There are no pipelines within the area nor within two miles from the area.

B. IMPACTS (actual and potential)

I. Topography

The topography would not be noticeably impacted by oil field development. However, steep topography influences impacts on soils, vegetation, and water resources, as well as the changes for successful reclamation.

Refer to pages 68-70 of the Buffalo Oil and Gas Programatic Environmental Assessment (BOG) for a detailed description of the correlation/compatibility affects topography on oil and gas activities.

II. Soils

Impacts to soils from oil and gas activities are compaction, mixing, burial, contamination, and removal.

Refer to pages 71-76 of the BOG for a detailed description of the impacts that are caused to the soil by oil and gas activities.

A detailed study was initiated by the Montana State University at the Rosebud Mine at Colstrip, Montana on root penetration and compaction in 1976. From the study, completed in 1977, it was recommended that reclamation programs and policies be aimed at providing soils which have at last a two-meter root zone, free of toxic overburden and compacted layers (copy is in the appendix).

III. Water (rivers, impoundments, wells, springs)

Impacts to the water resources are not significant, although surface water may be occasionally contaminated by an oil spill or ruptured reserve pit. Refer to pages 78-82 of the BOG for a more detailed discussion on this subject.

The Division of Resources (Casper District) will be contacted when presite inspections are shceduled so the hydrologist can be present if available. The decision of whether or not to place monitoring devices will be made by the area manager after considering input by the hydrologist.

IV. Vegetation

Impacts to the vegetation ranges from the complete removal of the vegetation to trampling, crushing, and covering by dust.

There are no threatened and endangered vegetative species known to be in the area.

Refer to pages 86-89 in the BOG for a more detailed description.

V. Wildlife

Impacts to wildlife are in part, due to the removal or altering of their habitat. A detailed description of impacts to terrestrial and aquatic wildlife habitat is given from page 92 through the top of page 94 of BOG.

Impacts to the wildlife varies with the species. Refer to pages 94-99 of BOG for a detailed description of impacts to those involved.

The most impacted, as described by BOG pages 94-95, is elk. The areas they are most impacted in are winter ranges and calving areas. The greatest single impact is caused by road construction because it opens up escape cover.

V. Ranching (livestock)

Oil and gas activities cause both adverse and beneficial impacts to livestock and thus ranching operations. Impacts range from loss of forage to loss of and/or unsettling of livestock. Roads and, occasionally, water wells are provided by oil and gas activities.

A more detailed description of impacts to ranching in general and specifically livstock are found on pages 117, 122 and 123 of BOG.

VII. Visual Resources

All areas of surface disturbance, specifically for pipelines, roads, and drilling locations, impact the visual quality of an area. Disturbance on ridgetops or in forested areas cause a significant impact. Structures, such as pump jacks and tanks, are also intrusive.

A more detailed description of impacts to the visual resources of the area and a decision on the noise impact are given on page 109 of BOG.

VIII. Natural, Cultural, Historical, Wilderness

The naturalness of the area would be impacted by roads, pipelines, drilling locations, etc. The more uninterrupted and organized the network of disturbances are, when viewed from any once place, the more the impact on naturalness would be.

The potential for impacts to cultural resources exists. However, these are minimized because of the standard operating procedure of requiring archaeological clearances prior to approval of any surface disturbing activities.

Refer to pages 103 and 104 of BOG for a detailed description of impacts to cultural resources.

Oil and gas development would impact wilderness areas. As directed by Chapter II - subhead 3a of the Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) and EA has been prepared to determine if the oil and gas exploration or activity will satisfy the nonimpairment criteria given on page 18 of IMP. The results (mitigating measures) of the EA are addressed in the portions of this plan that are addressed to oil field exploration and/or development in the WSA.

IX. Improvements

Roads and trails in the area would be rerouted in some areas, improved, and maintained until abandonment.

Ranch buildings in the area are all in areas underlain by private minerals ~~or by federally-reserved coal~~. None are underlain by federal oil and gas reserves. All the ranch buildings within the Fortification Creek area ~~could~~ be impacted by the dust from traffic relating to oil and gas activities and the general nuisance of having oil field workers in an area largely unused by anyone but the ranchers themselves previously.

C. OBJECTIVES

I. Opportunities Afforded

This plan would afford the opportunity for orderly development of an area that is unmarked by oil and gas activities, with the exception of seven dry holes and associated roads.

II. Correlation with Other Use Plans

The Interim Management Policy for Fortification Creek, Gardner Mountain and North Fork of Powder River Wilderness Study areas (WSA Plan) has been written for Wilderness Study Area (WY-060-204) which is located in the Fortification Creek area. The portion of this oil and gas plan that covers the portion of the area in the wilderness study area follows the criteria set forth in the WSA Plan.

The portion of the Fortification Creek area in Johnson County is also addressed in an ORV (Off the Road Vehicle) Implementation Plan - WY-060-8104. ORV travel in the Johnson County portion of the Fortification Creek area is to be governed by the following designations:

1. Vehicle travel is permitted only on roads and vehicle routes designated by the BLM.

2. ~~Vehicle travel is limited to time or season-of-use.~~

Since any person, group, or company having special access needs may apply to the district manager for a permit to enter a restricted area, there will be no problem in coordinating the two plans.

A fire control plan for the Fortification Creek Wilderness Study Area (WY-060-204) has been assembled. There will be no conflict between the two plans and coordination is not necessary.

The actions proposed in this plan are addressed in the Buffalo Resource Area Oil and Gas Environmental Assessment (WY-061-0-29) and the Interim Management Policy for Fortification Creek WSA - EA (WY-061-1-61). Both of these documents are located at the Buffalo Resource Area Office.

D. DEVELOPMENT PLAN

The first portion of the plan deals with oil and gas stipulations. All of the lease stipulations that are to be recommended for leases, or the portions of leases that are within the boundaries of the Fortification Creek Area, are shown on the pages, "Leasing Stipulations," following Map #8 - Topography Key. These stipulations have been derived from MFP Decisions, Environmental Assessment WY-061-0-29, Instruction Memorandums, law (as in the case of wilderness) and field examinations.

The second portion of this plan, which commences below, deals with exercising the privilege of the lease. This is the application of surface protection stipulations derived from environmental assessments, manuals, policy, decisions, field observations and evaluations.

There are no special oil or gas well spacing orders in the Fortification Creek Area. Therefore, this plan is being written as though there were a possibility for a drilling location at the center of a 40 acres, or other land subdivision, as described and within the tolerances outlined by Rule 302 of the Rules and Regulations of the Wyoming Oil and Gas Conservation Commission (included in the appendix).

I. Short-Term (until production is obtained)

a. Areas Outside the Wilderness Study Area (it is to be noted that these stipulations apply only to federal surface)

Areas of no surface occupancy are shown on the mylar overlays that accompany each topography map which is keyed to Map 8 - Topography Key.

The two reasons for no surface occupancy are: 1) critical elk habitat, and 2) steep topography combined with critical watershed. The "no surface occupancy" designation has been strictly adhered to concerning drilling locations; however, there is occasion, as shown on the topography maps, for crossing areas designated as no surface occupancy with roads. The rationale for this is there may not be a suitable drill location in a subdivision but a suitable situation may exist for constructing a road.

Proposed drilling locations and road routes are shown on the topography maps. Since it is physically impossible to check the routes in the field, they are drawn on the topography maps at, with a few exceptions, a grade of 10% or less.

The proposed routes, unless prevented by topography, may be altered on privately-owned surface, if requested by the surface owner.

Existing roads are to be used, as shown on the topography maps, as much as possible to gain access to drill sites. Portions of the existing roads that are to be rerouted to avoid ranch dwellings, wells, or steep topography are shown on the topography maps.

During the presite inspection for the well location, an off-site vegetation referrence point is to be selected. This is to be marked by driving a steel post and be noted on the presite check sheet with respect to direction and distance from the drill point. The point is to be in an area with vegetation that is representative of the vegetation on the location. The point is to be acceptable to the oil company, MMS, and BLM. The point is to be located so as not to be disturbed by construction and rehabilitation activities. It will be used to evaluate success of rehabilitation and is addressed further later in this plan.

The standards for the access roads to drill exploratory wells are to be minimal. Portions of existing roads that are smooth enough for vehicle travel are not to be maintained prior to the rig moving in. All temporary roads that are constructed to gain access to drill sites are to be flat-bladed as shown on page 21 of "Surface Operating Standard for Oil and Gas Exploration and Development" (SOS for O&G), included in the appendix. Portions of the access road meeting any or all of the following criteria are to be slope staked: a) profile grade that is greater than 10%; b) side (cross) slopes greater than 25%; c) cuts or fills over 10 feet in height; d) terrain showing evidence of past landslides, sloughing, or severe erosion. Portions of the access road requiring a sidehill cut of three feet or more are to be constructed with a ditch and be backsloped at a 2:1 slope, if the natural land surface is not steeper than that. When constructing roads that require less than a three-foot cut, surface soil material should be windrowed and stockpiled for later rehabilitation of the roadway. Stockpiles should be located on the uphill side of the road. The removal of soil material and construction of roads that are located on narrow ridges may require the use of scrapers to prevent the soil material from being lost down the hillside.

Drainage crossings are to be of the typical dry creek drainage crossing type as pictured on page 22 of SOS for O&G. It may be necessary to place scoria or rock in the crossings to provide a hard bottom. Culverts will be required if it is not possible to use the dry creek crossing. A more complete description of standards for temporary roads is given on pages 21-25 of SOS for O&G and illustrated in the appendix for use in preparing stipulations.

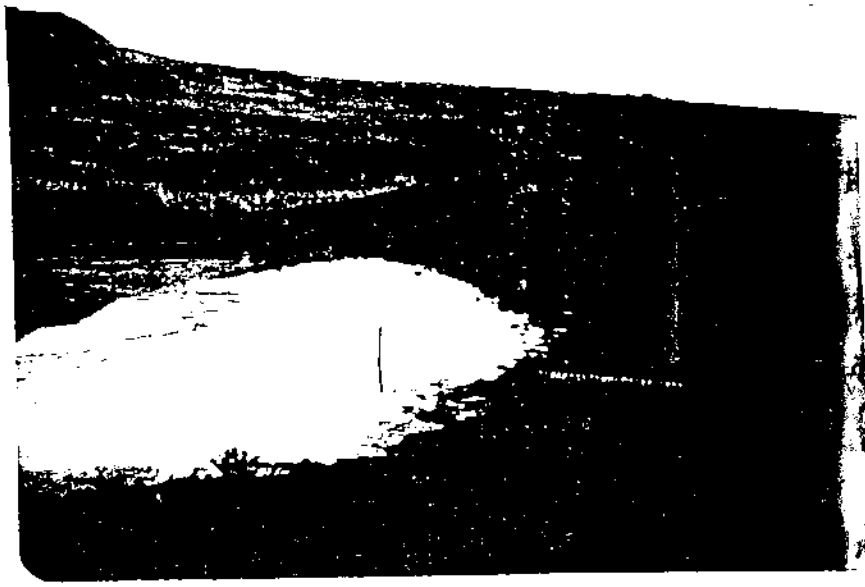
Temporary roads that pass through unstable areas, as evidenced by slumping of hillsides, and that will be used during the spring thaw, will be constructed to standards that apply to permanent roads. This means the road will be crowned, ditched, maintained, and culverts, drainage relief ditches and relief culverts will be installed. These standards are more completely addressed in the long-term aspect of this plan that follows.

Reservoirs may be constructed in the deeper drainages to lessen the grade of the roads and to provide a source of livestock and wildlife water. Care must be taken during the locating of these reservoirs so that a livestock trap is not created. Careful selection of the reservoir site should also ensure that no rimrocks, rock outcrops, scoria or coal seams, or extensive sandy areas are present. It should be noted that construction of a reservoir should be approved of by the BLM before it can be retained; otherwise it is a fill that is to be used in conjunction with a culvert or culverts. All reservoirs that are constructed as drainage crossings are to be constructed in the manner pictured on page 23 and are to be of a permanence needed in the event of a productive well.

Although the photos do not entirely depict the proper installation of a culvert in a reservoir bank, they present a visual application.

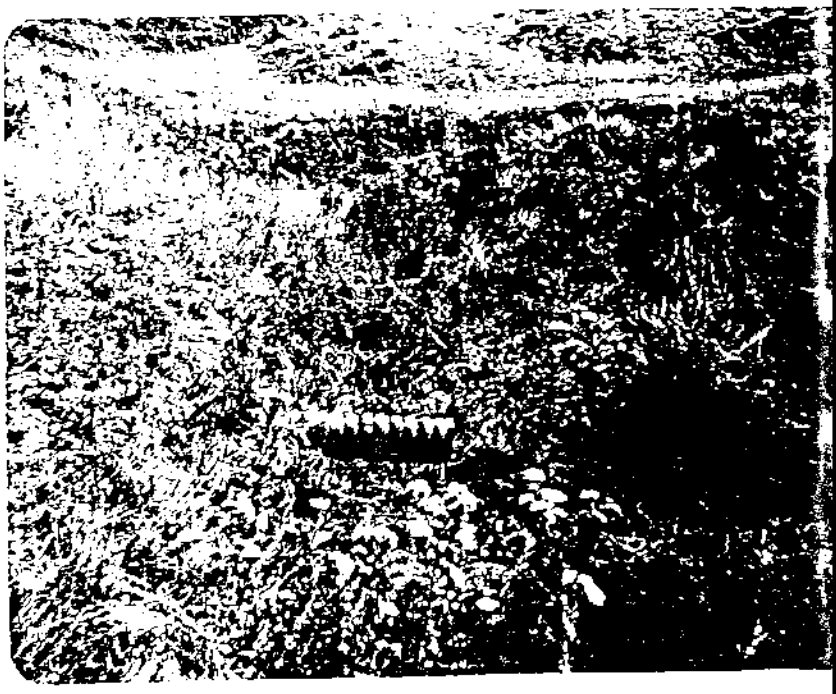
The reservoirs are to be constructed as shown in the reservoir diagrams in the appendix.

The area manager and the range conservationist are to be consulted prior to the commitment to construct a reservoir. Concerns of the National Resource Defense Council (NRDC) are to be considered. Reservoirs can be constructed if it is close enough to existing water so a grazing pattern is not altered by creating "new" water. The Chief, Division of Operations, is to be contacted so he can apply for a "Permit to Appropriate Surface Water" with the State of Wyoming.



The inlet end of the culvert. The spillway of the reservoir is on the far end of the dike.

Positioning of the culvert through the reservoir dike.



The outlet of the culvert empties into a well-vegetated drainage way.

Although the locations of potential reservoir sites are not specifically indicated on the topography maps, that show the proposed road routes, the possibility of constructing a reservoir in conjunction with an access road should be considered.

Wells that are to be acquired as water for livestock or wildlife, if they are nonproductive for oil or gas, will be handled on a case-by-case basis. Criteria to be used in determining the acceptability of a "dry hole" oil or gas well for a water well is, 1) be located on federal surface; 2) produce a minimum of five gallons per minute, 3) be a maximum of 500 feet to the static water level; 4) have a conversion cost acceptable to the BLM.

Water well conversions may take place on privately-owned surface, but the BLM does not get involved.

Since the NRDC suit has not been answered, "dry holes", meeting the criteria given above, are being acquired by the BLM for water wells but not equipped or developed. The only time a well (dry hole) can be acquired for a water well is at the time of drilling. The Chief, Division of Operations, is to be contacted so he can file the necessary applications, etc. for a water well.

Roads that are to be upgraded and/or to be retained are the existing roads which are shown on map #11. No newly-constructed roads that are on federal surface will remain. The only upgrading that will be necessary, in addition to the temporary road standards given above, would be a maintenance blading when the abandoned location is reclaimed and the installation of "Thank-U-Mam" type waterbars, as shown on page 24 of SOS for O&G and illustrated in the appendix for use in preparing stipulations. Thank-U-Mams are to be constructed so they extend entirely to the cut slope of the road. This is to ensure that the runoff water, that may be following the cut slope of the road, will be turned off the road. Spacing of the Thank-U-Mams, as given in the illustration, is not to exceed 1000 feet. Spacing may be more frequent and will be determined on a case-by-case basis at the time of the field examination.

All the roads that are to be retained will be reseeded. The culverts will not be removed.

All the locations on federal surface will be reshaped. This will be accomplished by pushing the fill material back to and over the cut slope. This is addressed to a greater degree in the portion of this plan that is addressed to protecting the quality of visual resources.

The entrance from an existing road on to a rehabilitated road, that is to be closed, will be barricaded with rocks, posts or a deep, steep-walled waterbar to prevent vehicular travel.

Oil and gas exploration in the portion of the area that is labeled as having severe erosion characteristics (fragile watershed) on map #6 (moisture-erosionsoil) will be restricted to between the dates of June 15 and March 1.

This restriction is dropped if the well is productive.

Soil treatment techniques to break up compaction will be similar to those that have been studied by and utilized during coal mine reclamation. A study at Coalstrip, Montana, copy of the article in Journal of Range Management attached, concluded that reclamation programs should be aimed at providing soils with two meters of soil layers ~~free of compaction~~. This would allow better root penetration and water percolation.

~~USFS - General Technical Report - Int. 68 - Use Guide to~~ Soils states that topsoil or subsoil spread over a smooth, hard surface may be subject to slippage or slumping unless the hydralic conductivity of the the spoil is sufficiently reduced and unless the site is sufficiently sloped. Ripping or deep tillage of the surface during regrading would improve this situation.

To provide for adequate root penetration, water percolation, and to aid in preventing slumps, all areas that are to be covered by fill material during construction will be ripped to a depth of three feet spaced six feet apart. All fill material that is placed during recontouring will also be ripped to a depth of three feet spaced six feet apart.

Every three feet thick layer will be ripped before the next lift is made. Ripping on locations will be done on the contour.

Access roads that are reshaped will be ripped or scarified to a depth of at least 12 inches. The ripped places are to be no further than 24 inches apart. Access roads that are basically on the contour will be ripped during reshaping. Those that are perpendicular to the slope or that follow ridges are not to be ripped.

Erosion control devices that are constructed on locations and reshaped access roads are to be waterbars constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended onto established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from sitting in the trench.

As a rule of thumb, the following is to be used as a guide in determining waterbar spacing during rehabilitation:

a. on the access road
   1. 0-5% grade.....200 foot intervals
   2. 5-8% grade.....100 foot intervals
   3. 8-10% grade.....50 foot intervals
   4. +10% grade.....25 foot intervals

b. on the location
   1. 10% or flatter.....100 foot intervals
   2. 10% to 15%.....75 foot intervals
   3. 15% to 25%.....50 foot intervals
   4. 25% and greater.....25 foot intervals

Wind erosion, and to a certain degree water erosion, is to be controlled on sandy locations by:

Mulch with hay, straw or excelsior wood fiber at a rate of 70 pounds per 1,000 square feet. If straw or hay is used, they are to be seed free. The mulch shall be applied prior to seeding and anchored with a straight colter-type machine. The mulch shall be anchored to a depth of two inches with a minimum of 12 inches between colters.

or:

Following the seeding and waterbreaks construction, mulch nettings made of paper, jute, cotton, or plastic shall be stapled to the soil surface according to manufacturer's recommendations. Mesh size of fabric shell not to exceed 1½ inches by 3 inches.

or:

Planting wintergraze, at a rate of 10 pounds per acre with the grass seed mixture. A description of wintergraze, as included in Mobil Oil Corporation's Rojo Caballo Coal Mine Plan, is given in the appendix.

Surface water is to be protected from siltation by allowing no surface disturbance within 500 feet of the Powder River or a reservoir, whether a lease stipulation or not. At times topography or some other factor may be present so the 500-foot buffer is not possible; this is to be considered. Siltation of surface water and/or vegetation will be prevented by constructing a silt trap in the form of a waterbar or terrace adjacent to, and downslope from, the disturbed area.

The recommended grass species is to be made up of the species found in the vicinity of the disturbed area, while giving consideration to seed availability.

At least three species of grass and yellow blossom sweetclover are to be included in the seed mixture used. The total grass seed mixture is to amount to at least 15 pounds of pure live seed per acre. The variety of grass seed is to be selected from, but not limited to the following list: green needlegrass, ~~bluebunch wheatgrass, thickspike wheatgrass, western wheatgrass,~~ little bluestem, Indian ricegrass, prairie sand reed, and streambank wheatgrass. The ration of each variety of grass seed in a mixture is found by using the formula given on "~~Seeding Rates~~ for the Geographic Condition Areas" in the appendix. All disturbed areas will be seeded as follows. Ninety percent pure live seed shall be used. The seed shall be applied by a drill equipped with a depth regulator. Planting depth shall not exceed one-half inch. Where drilling is not possible, seed shall be broadcast at twice the rate recommended for drilling and the area shall be raked or chained to cover the seed. It is recommended that seeding be done during the months of April and May or September and October following construction completion. The seeding will be repeated until a satisfactory stand, as determined by the authorized officer, is obtained. Evaluation of growth will not be made before completion of the first growing season after seeding. The authorized officer is to be notified 15 days prior to seeding so that arrangements can be made for inspection of the seeding project.

Critical wildlife ranges will be protected by avoidance and limiting the season-of-use. The elk calving areas are included in the "No Surface Occupancy - Elk" areas as delineated on the applicable mylar pages that coincide with the topography map pages.

A black-footed ferret sighting is identified on map #9 (wildlife). All surface disturbing activities within one mile shall be addressed in an analysis which shall include, on the initiative of the BLM, formal consultation pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1536) with the U. S. Fish and Wildlife Service to determine whether or not the proposed activity will jeopardize the continued existence of the species. This process may consume several months and may receive certain restrictions on surface disturbance. To assist in this process, the operator may be required to provide a statement from a wildlife biologist acceptable to the District Manager, identifying the impact that any proposed operations will have on endangered species habitat.

Escape cover for wildlife (elk) is protected by the routing of the proposed roads and the drilling locations so the cover is avoided. This has been done on the topography maps that are keyed to map #8 (topography key).

Due to the excellent range condition there is no need to rehabilitate any particular areas for wildlife. The only exceptions are to include clover in the seed mixture recommended for disturbed areas and to replace trees that are removed from federal surface with containerized seedlings at a rate of 400 per acre of trees removed. The seedlings are to be obtained from a source acceptable to the BLM.

Protection of disturbed areas, from overuse by livestock, until vegetation is reestablished will be accomplished by fencing. Upon the completion of rehabilitation of a dry hole on federal surface, the operator will fence the entire location for two growing seasons to prevent livestock grazing. Exclusion of livestock from the site for two growing seasons by any other means is an acceptable alternative to fencing.

Caution will be used when requiring a disturbed area to be fenced. A situation is not to be created that could cause livestock to become trapped or impeded when drifting with a storm or so they are prevented from using established routes to water sources.

The quality of the visual resources will be protected by:

1. roads have been routed along natural contours (see the topography maps);
2. having road slopes reduced to permit revegetation;
3. natural vegetation and topographic features that are used to screen development (see the topography maps).

Oil and gas exploration in the portion of the area that is designated as "Elk - Critical Winter and Yearlong" on map #9 (wildlife) and on applicable mylar pages will be restricted to between May 1 and November 30.

Exploration is also restricted to between June 1 and March 31 in areas designated as sharptail grouse strutting grounds on map #9 (wildlife) and on the applicable mylar pages. No occupancy is allowed within 250 yards of the strutting grounds at any time.

These restrictions are to be dropped if the well is productive.

Impacts to the visual resources, as well as exposing less surface area to erosion than a conventional well location, will be reduced if the drilling locations are oriented similar to those illustrated in "Case Study Area in Overthrust Region" which is in the appendix. Although the case study was accomplished in the overthrust region and the locations are large, the principal is applicable to drill locations on slopes between 20% and 40% in the Fortification Creek Area.

The locations will be reshaped by pushing the fill material back to and over the backslopes. On locations with less than 12 feet of cut, all the fill material will be pushed back into the cut to reshape the location. On locations with 12 feet or more of cut, one-half to three-fourths of the fill material, at its maximum depth, is to be removed from the foreslope and be placed in the cut area of the location. At least three-fourths of the total cut, measured at the toe of the cut slope is to be filled. This is illustrated on the page "Well Site Restoration and Stabilization by Slope Reduction" (which was derived from the illustration on page 34 of SOS for O&G) in the appendix.

Cultural resources will be protected by the standard requirement of an archaeology clearance prior to surface disturbing activities.

The Wilderness Study Area is addressed in the next section of this plan entitled - "Areas Within the Wilderness Study Area." Whenever an access road is adjacent to a WSA, signs will be placed every one-half mile to alert the road users to the fact. The signs will be provided and installed by the oil company and be to BLM specifications.

Ranch buildings and dwellings have been protected by directing proposed access routes around those buildings. This is shown on the topography maps keyed to map #8. Since the proposed routes are on privately-owned surface, the final approval of the routes rests with the surface owner.

b. Areas Inside the Wilderness Study Area

There are presently five oil and gas leases that were issued in WSA WY-060-204 (Fortification Creek) prior to the passage of the Federal Land Policy and Management Act (FLPMA). A copy of these leases, including the legal descriptions, is in the appendix of this plan.

These leases are "grandfathered" and do not come under wilderness nonimpairment criteria. The development of these leases, as far as exploratory drilling is concerned, is to be conducted following the first portion of this plan (which addresses exploratory drilling outside the WSA).

The exception is: All activities will be confined to an access road and the well site. The extremities of the surface disturbance WILL BE STAKED by the BLM in conjunction with the MMS and oil company representative. These stakes or steel posts are to remain in place, until after reclamation activities have been completed.

Development of leases that were issued after the passage of FLPMA will be in accordance with the Interim Management Policy for WSAs (a copy of the applicable portion is in the appendix of this plan) and stipulations that were derived from an environmental assessment written for that plan (copy of the applicable portion is in the appendix of this plan).

Development of post-FLPMA leases are to be accomplished in accordance with the first portion of this plan (which addresses exploratory drilling outside the WSA and the following stipulations:

1. A sign will be placed at the entrance of the access road into a WSA. The sign will be provided by and installed by the oil company. It is to alert the users of the road that a WSA is being entered and constructed to BLM specifications.

2. No wells will be drilled unless rehabilitation can be completed by July 1, 1984.

3. Access roads will not be constructed on side slopes of more than 15%. The road grades will not be more than 8%.

4. No drill location will be located on terrain steeper than 15%.

5. Chemical toilets are to be used for sewage and human waste rather than drilling holes on the location.

6. Garbage, trash, and disposable containers for drilling supplies are to be placed in a covered truck or dumpster-type container and periodically taken to an approved dump site.

7. If any cultural values are observed during construction and operations, leave them intact and notify the District Supervisor, MMS, Casper, Wyoming.

8. No surface disturbance or construction activity shall be allowed within 500 feet of any river or creek. Any deviations from this requirement must be approved in writing by the authorized officer.

9. All low-water crossings shall be constructed to prevent any blockage or restriction of the existing channel. Material removed shall be stockpiled for use in rehabilitation of the crossing.

10. Right-of-way clearing prior to beginning construction shall be limited to 20 feet on each side of the centerline. (roads)

11. In order to minimize watershed damage and protect important seasonal wildlife habitat, construction activity and surface disturbance will be allowed during the period from June 15 to November 30. This limitation does not apply to maintenance and operation of this (right-of-way, permit). Any exceptions to this requirement must be authorized in writing by the authorized officer.

12. Traffic and equipment parking will be confined to existing or approved newly-constructed roads.

13. Remove all of the top soil from the location including areas of cut, fill, and/or subsoil storage areas and stockpile at the site.

14. BLM will monitor access road and site construction and rehabilitation in all cases.

15. Slope-stake the location to determine the cut and fill limits, before beginning construction.

16. Slope-stake the cut and fill areas of the new access road portion before beginning construction.

17. Slope-stakes are needed on the location for construction guidance and BLM monitoring. They are to be left in place, and, if they are destroyed or removed during construction, it is the operator's responsibility to replace them. Soil material will not be allowed to fall into drainages and down hillsides where it cannot be retrieved.

18. "The operator will mulch all areas of disturbance including roads with native hay, straw, or excelsior wood fiber and/or soil retention blankets or nettings made of paper, jute, cotton, or biodegradable plastic. All manurfactured or processed materials are to be installed according to manufacturer's specifications. Native hay or straw is to be weed-free and be applied at the rate of approximately two tons per acre. The mulch is to be anchored 2 to 3 inches deep with a straight colter with 6 to 12 inch spacing. ~~A disk may be used if the mulch is left sufficiently exposed to afford protection. Mulch should be anchored~~ perpendicular to the prevailing wind on flat sites and on the contour on slopes. Mulch is to be applied after the reseeding is completed."

19. All seeding will be done by broadcasting and raking or hydromulching. Seeding will not be done with a drill as this creates definite rows that are very evident when the grass is short.

20. Grasses and forbs that are compatible to the area adjacent to disturbed areas will be reseeded or transplanted. This may include yucca and sage.

21. Complete fall seeding after September 1 and prior to ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15. To maintain purity and quality, certified seed will give the best results.

22. All weeds that may become evident on the disturbed areas will be removed by hand or sprayed with an approved herbicide.

23. Supplemental watering and/or reseeding may be required if a significant amount of vegetation has not been established by July 1, 1985.

24. The entire disturbed area will be fenced, with a fence of sufficient quality to prevent entry of livestock frequenting the area, for two growing seasons prior to July 1, 1984. The fence will be removed July 1, 1986.

25. The reserve pit will be constructed on the side of the drilling location next to the cut slope.

26. After drilling is completed all fluids are to be removed from the rserve pit and taken to an approved disposal area within 30 days.

27. If sufficient top soil is not available to reestablish vegetation to a satisfactory degree, it may be necessary to haul in top soil.

28. During reclamation of the drill site and access road, push the fill material back into the cuts and up over the backslope to reshape so the site blends exactly with the existing topography. Leave no depressions that will trap water or form ponds.

29. Distribute the topsoil evenly over the entire location and prepare the seedbed by disking to a depth of 4 to 6 inches following the contour.

30. No dry hole marker will be installed.

31. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be consructed with the berm on the downhill side to prevent the soft material from silting in the trench. Waterbar spacing on the location is to be as follows: 50 feet apart from the top of the cut slope to the lower edge of the disturbed area.

II. LONG-TERM (after production is obtained)

a. Areas Outside the Wilderness Study Area

When an oil or gas well is drilled and is proved to be productive it is deemed a "discovery well." With each "discovery well," application for spacing will be filed with the Wyoming Oil and Gas Conservation Commission by the BLM. This will be done in accordance to Rules 302 and 305 of the Wyoming Oil and Gas Commission. This is to be done so as to establish spacing at the earliest opportunity and thus minimize impacts to the area.

Road standards for all access roads will be such that will permit all weather travel. The roads will be constructed as shown on the "Typical Road Section" as shown on page 26 of SOS for O&G and on a page of that name in the appendix of this plan. This has been prepared for use in preparing stipulations. The driving surface of the road will be 16 to 18 feet wide. The top soil that was saved during initial road construction will be spread on the slopes of the ditch. Relief and/or drain ditch relief turn outs, as pictured below, will be installed every .2 mile, as a rule of thumb, or less if the soil condition and the steepness of the road dictates. A culvert spacing table, which would be applicable for relief culverts and drain ditch relief turnouts, ~~is given in the index of~~ this plan. The table is a composite of tables from the ~~Wyoming Supplement to the~~ BLM 3109 Manual.

Properly Installed Relief Culvert

Properly Constructed Drainage Ditch Relief Turnouts

At times the topography requires that long lengths of the road be constructed entirely in cut and there is no possibility of turning drainage out of the ditches. To prevent ditch erosion, the ditches will be lined with scoria, ~~gravel~~, or rock. Loads of large pieces of scoria or rock may also be placed in piles in the ditch to slow the force of the water.

A Road Ditch Lined With Gravel to Prevent Ditch Erosion

Piles of Rock in an Eroded Road Ditch
to Retard the Velocity of the Flow

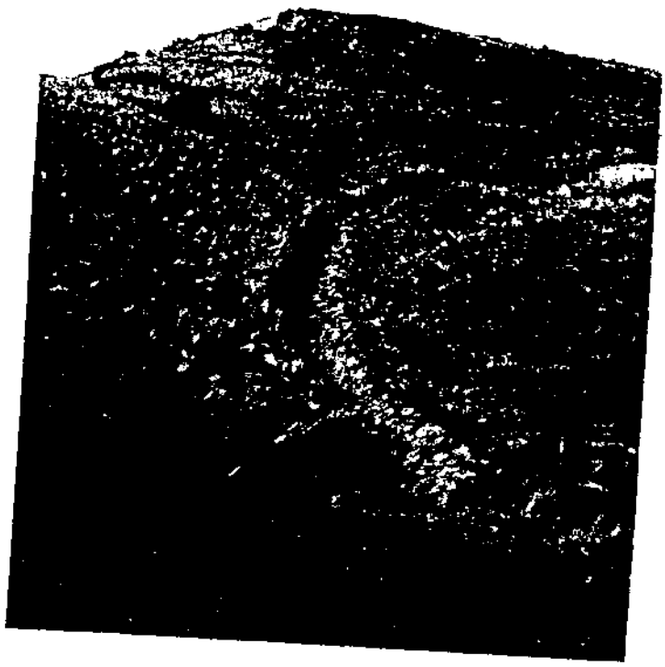
Although it is not required for every road, surfacing the roads with scoria or gravel is a definite possibility.

Production water will be acquired ~~for livestock and wildlife use~~ if there is not a water well, reservoir, or developed spring within one mile. ~~The water must be pure enough~~ for discharge as determined by the Wyoming State Department of Environmental Quality (DEQ). There will be no production water for use inside the WSA or inside the critical elk winter range. The decision has been made that no separator facilities or tank batteries be located in those areas.

Water that is acquired from this source for livestock or wildlife use will be transported via pipe or open ditch (concrete or rock lined) to the place it is impounded, enters live water, or enters a drainage. If the water is discharged into a drainage, conditions of slope, soil, and rate of flow must be such to prevent erosion. One method of transporting produce water is shown below.

It should be noted that any discharge will require a permit from DEQ. The BLM has no authority for setting water quality standards. This responsibility also belongs to DEQ.

Cement Lined Ditch



Unused portions of locations as well as flowlines and other disturbed areas will be reshaped to blend with the existing topography. All locations will be reshaped by reducing the cut slope and the fill slope to 3:1. This will be accomplished by bringing fill material up from the foreslope and extending the cut slope out onto the location. The ends of the location and other unused areas will be rounded to fit the topography. Flowlines will be reshaped by pushing the fill material back into the cut area. This is illustrated below.

The soil treatments to break-up compaction and improve the percolation of run-off water that was given in the part of this plan dealing with exploration drilling is applicable. The ripping is to take place on the cut and fill areas and the portion of the location that is not needed for production.

The standards for erosion control devices on roads are included in the paragraphs above, that deal with road standards. Water erosion control devices on producing locations will be waterbars. These are to be constructed at least one (1) foot deep on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage and extend onto established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench.

As a rule of thumb the following is to be used as a guide in determining waterbar spacing on producing locations. Unstable soil may require a closer spacing, whereas the spacing on stable soils or rock outcrop may be wider.

25% slope or flatter: at the top and bottom of the cut slope; at the top of the fill slope; adjacent to and below the lower edge of the disturbed area.

25% to 33% slope: at the top, middle, and bottom of the cut slope; at the top and middle of the fill slope; adjacent to and below the lower edge of the disturbed area.

more than 33% slope: at the top, middle, and bottom of the cut slope or at the top of the cut slope and spaced 25 feet apart from the top of the cut slope to the bottom of the cut slope, whichever is at the closer interval; at the top, middle, and bottom of the fill slope or at the top of the fill slope and spaced 25 feet apart from the top of the fill slope to the lower edge of the disturbed area, whichever is at the closer interval and adjacent to and below the lower edge of the disturbed area.

Erosion control devices for pipelines will be waterbars that are to be constructed and oriented as shown on the "Water Bar Placement and Cross-Section Diagram" in the appendix. The spacing may be closer or farther apart, depending on soils, but as a general rule the following spacing is to be followed; less than 2% slope - 200 feet apart, 2% to 4% slope - 100 feet apart, 4% to 5% slope - 75 feet apart, greater than 5% slope - 50 feet apart.

Central tank batteries and truck depots will not be located on ridges that are less than 200 yards wide, within one-half mile of any area vegetated with juniper that is larger than ten acres in size, within one-half mile of any surface water, or within the critical elk winter range. All pipelines and flowlines are to be placed under or adjacent to the access roads. Powerlines, where permitted, will be along the access roads unless they are on ridge tops. If the access roads are along ridge tops the powerlines are to be placed so they are generally below the ridge line. Buried power cable is to be placed so they are generally below the ridge line. Buried power cable is to be placed along the access roads. All tank batteries and separator facilities are to be located outside the critical elk winter range.

All electric power in the Fortification Creek area is to be distributed by buried cable unless there is existing powerlines in the area. This may be altered, in the case of the WSA, by District Manager decision. All engines used in production of oil or gas in the area will be muffled so the decible level is at or below 86 when measured 50 feet from the source. This would minimize impacts to ranchers, recreationists, and wildlife in the area.

Road surfacing material will not be mined in the area unless it is from areas of privately-owned minerals or "coal only" federal minerals.

b. Areas Inside the Wilderness Study Area

1. Right-of-way clearing prior to beginning construction shall be limited to 20 feet on each side of the centerline.

2. Natural gas pipelines require underground placement due to freezing and will be considered on a case-by-case basis. If a pipeline is allowed it will be placed adjacent to existin road rights-of-way.

3. If sufficient top soil is not available to reestablish vegetation to a satisfactory degree, it may be necessary to haul in top soil.

4. "The operator will mulch all areas of disturbance including roads with native hay, straw, or excelsior wood fiber and/or soil retention blankets or nettings made of paper, jute, cotton, or biodegradable plastic. All manufactured or processed materials are to be installed according to manufacturer's specifications. Native hay or straw is to be weed-free and be applied at the rate of approximately two tons per acre. The mulch is to be anchored 2 to 3 inches deep with a straight colter with 6 to 12 inch spacing. ~~A disk may be used if the mulch is left sufficiently~~ exposed to afford protection. Mulch should be anchored perpendicular to the prevailing wind on flat sites and on the contour on slopes. Mulch is to be applied after the reseeding is completed."

5. All seeding will be done by broadcasting and raking or hydromulching. Seeding will not be done with a drill as this creates definite rows that are very evident when the grass is short.

6. Grasses and forbs that are compatible to the area adjacent to disturbed areas will be reseeded or transplanted. This may include yucca and sage.

7. Complete fall seeding after September 1 and prior to ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15. To maintain purity and quality, certified seed will give the best results.

8. All weeds that may become evident on the disturbed areas will be removed by hand or sprayed with an approved herbicide.

9. Supplemental watering and/or reseeding may be required if a significant amount of vegetation has not been established by July 1, 1985.

10. Prior to July 1, 1984 all disturbed areas, including the location and access road will be reclaimed by pushing fill material back into the cuts up and over the backslope so the site blends exactly with the existing topography. Leave no depressions that will trap water and form ponds.

11. Access to the location will be only by foot, horseback, or helicopters.

12. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench. Waterbar spacing on the location is to be as follows: 50 feet apart from the top of the cut slope to the lower edge of the disturbed area.

13. Distribute stockpiled top soil evenly over those areas not required for production and reseed as ~~described above.~~

14. The pumping unit is to be located in a basement-type structure.

15. All production facilities, except for the pump, will be located outside of the WSA. Flowlines will be in roadways approximately six feet away from the bottom of the cut slope.

16. Pipeline trenches shall be compacted during backfilling. Pipeline trenches shall be maintained in order to correct settlement and erosion.

Pipeline Transmission

Oil and gas operators must meet requirements of the Department of Transportation and the Interstate Commerce Commission as outlined in Title 49 CFR Parts 191 and 192 for transportation of natural gas and oil by pipeline.

II. Private Surface

This plan is directed at the leasing of federally-reserved oil and gas underlying federal surface. The plan also addresses the development of federally-reserved oil and gas underlying both private and state surface. The portion of the plan that addresses private or state surface is provided only so the whole picture is presented. The BLM will not be involved in the development of oil and gas underlying any private or state-owned surface.

The only involvement the federal government has in the development of privately-owned minerals is the issuance of rights-of-way where federal surface is crossed.

~~III. State Surface - Federal Minerals~~

There are is no federally-reserved minerals underlying state-owned surface in the Fortification Creek Area.

IV. Post Studies

1. Evaluation of the applicability of stipulations attached to the lease and/or "Application for Permit to Drill" (APD).

   An evaluation of stipulations attached to the lease will be made at the time of the presite inspection. Care must be taken to avoid personal bias to enter into the evaluation but the stipulation is to be evaluated as to the potential impact that is present and applicability of the mitigation. For record purposes, this should be done on the presite check sheet.

   Stipulations that are attached to the APD will be evaluated for applicability during compliance inspections. To avoid overlooking stipulations, the applicable ones and those that do not apply should be listed, by number, on the compliance inspection sheet.

2. Evaluation of the effectiveness of Stipulations:

The effectiveness of stipulations is, to some extent, subject to personal bias with several exceptions.

a) Waterbars will control runoff, by shortening slopes, if they are properly spaced and constructed.

b) Erosion is excessive and must be stabilized if:

1) rills or gullies deeper than nine inches, regardless of the width, are present;

2) areas of erosion that are at least three inches deep and four feet wide are present.

c) Vegetative cover must be capable of stabilizing the soil surface from erosion. The vegetative cover, exluding weeds, on at least 75% of the drilling location, must be at least 50% of the vegetative cover on the reference area that was decided on at the onsite inspection. This could be expected to be 3-to-5 years.

3. Areas requiring periodic monitoring after a producing field is established:

a) roads

1) ditches - for excessive erosion; more culverts, relief culverts, or drainage relief culverts may be required;

2) surfacing may be required on all or part of the road;

3) unnecessary roads may need to be reclaimed.

b) locations

1) erosion on the cut slope; more waterbars, cross-slope ripping and reseeding may be required; fertilizer may also be required;

2) erosion on the foreslope; the slope may be excessively steep and reshaping and water bars may be required; water should not be allowed to run off the location and over the foreslope at any time during the production life of an oil or gas well;

3) rutting and a general damaging of the location during wet weather; this may require surfacing the location or a road onto the location and a work area around the production facilities including the well head;

4) flagging on production pits and fencing around pits; flowlines - erosion and subsidence; more water bars may be required along with backfilling and reseeding.

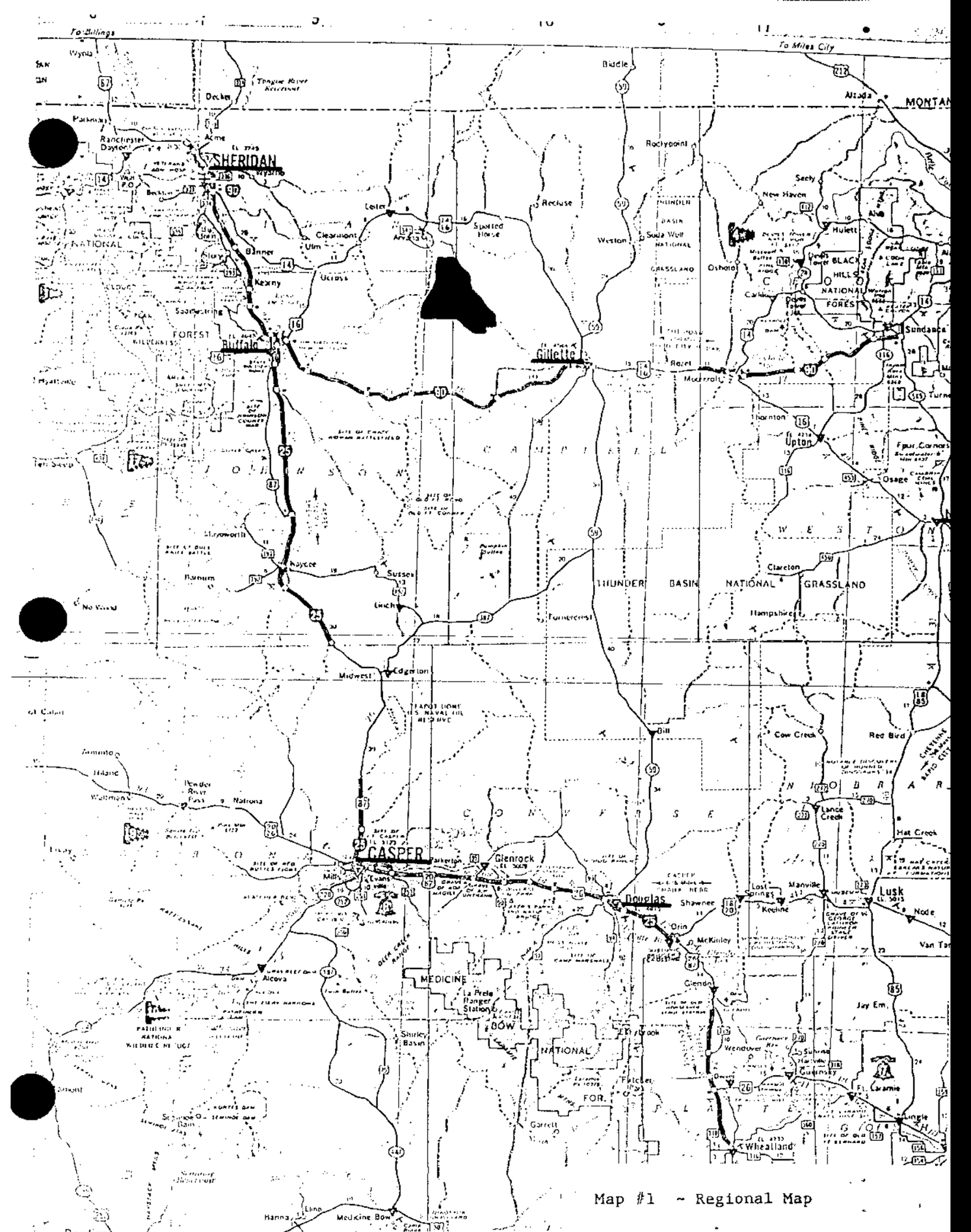
F. SIGNATURES

Prepared By: Donald E. Crawford 11-10-82

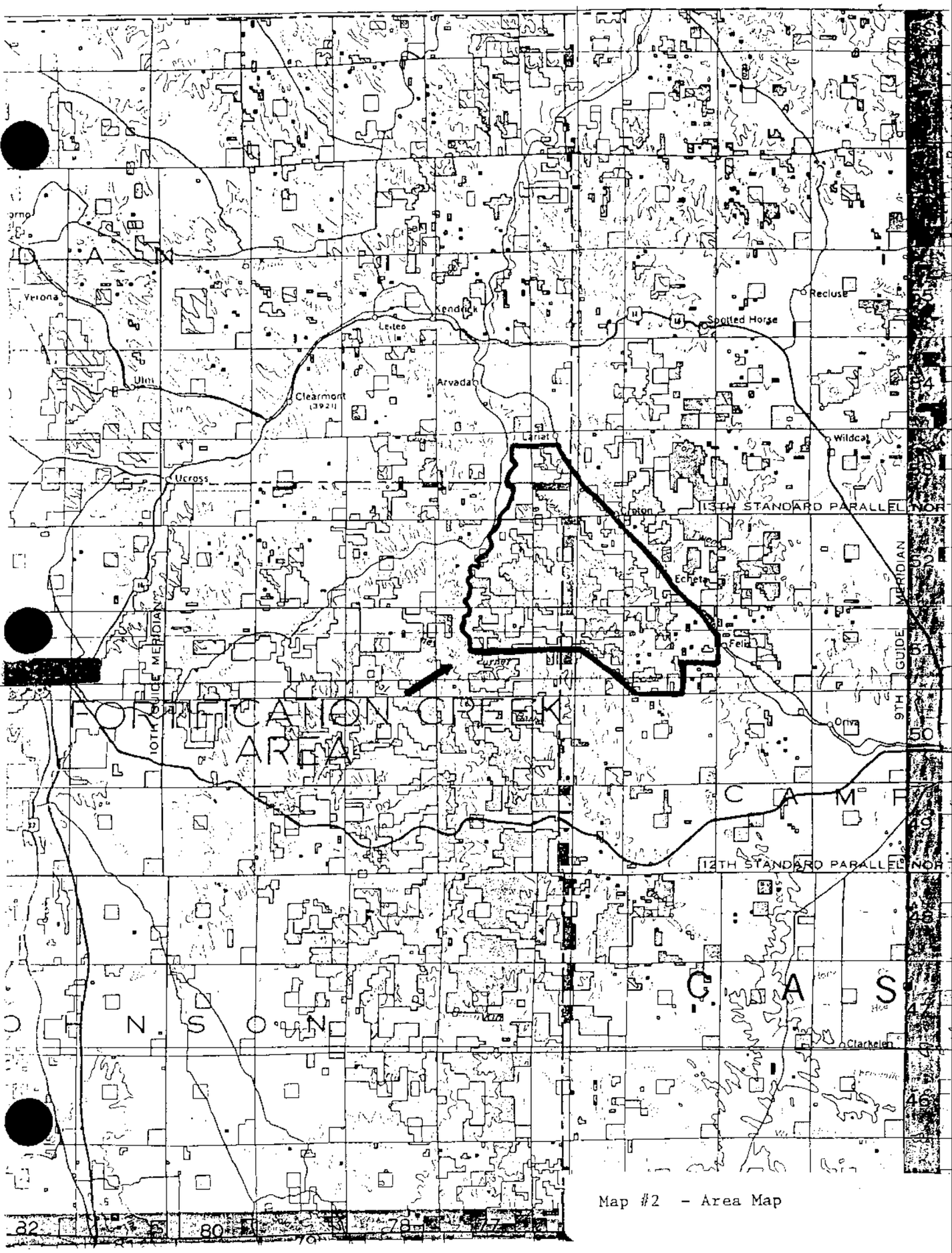
Reviewed By:

Approved By: Area Manager 11/10/82 Date

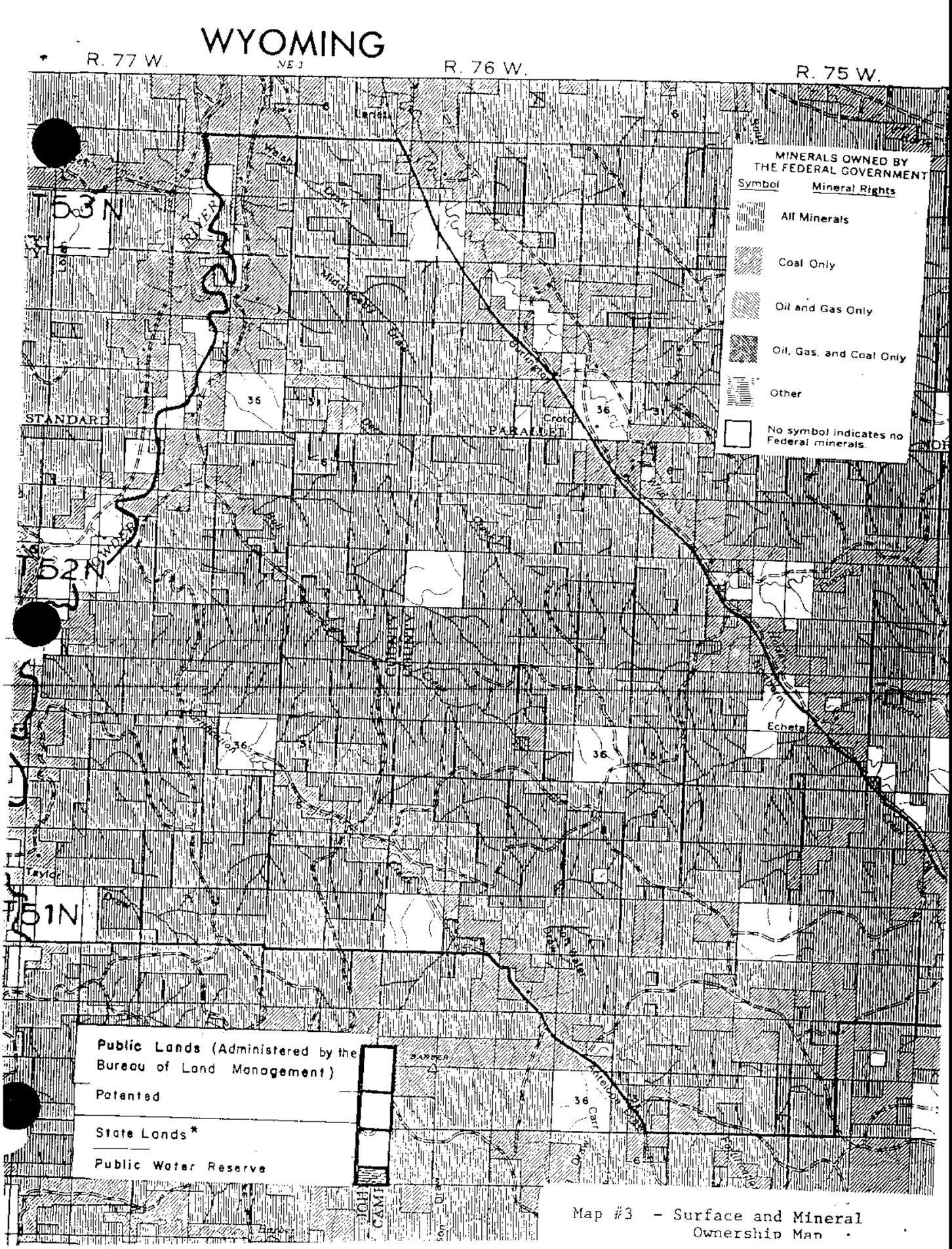
District Manager 11/17/82 Date



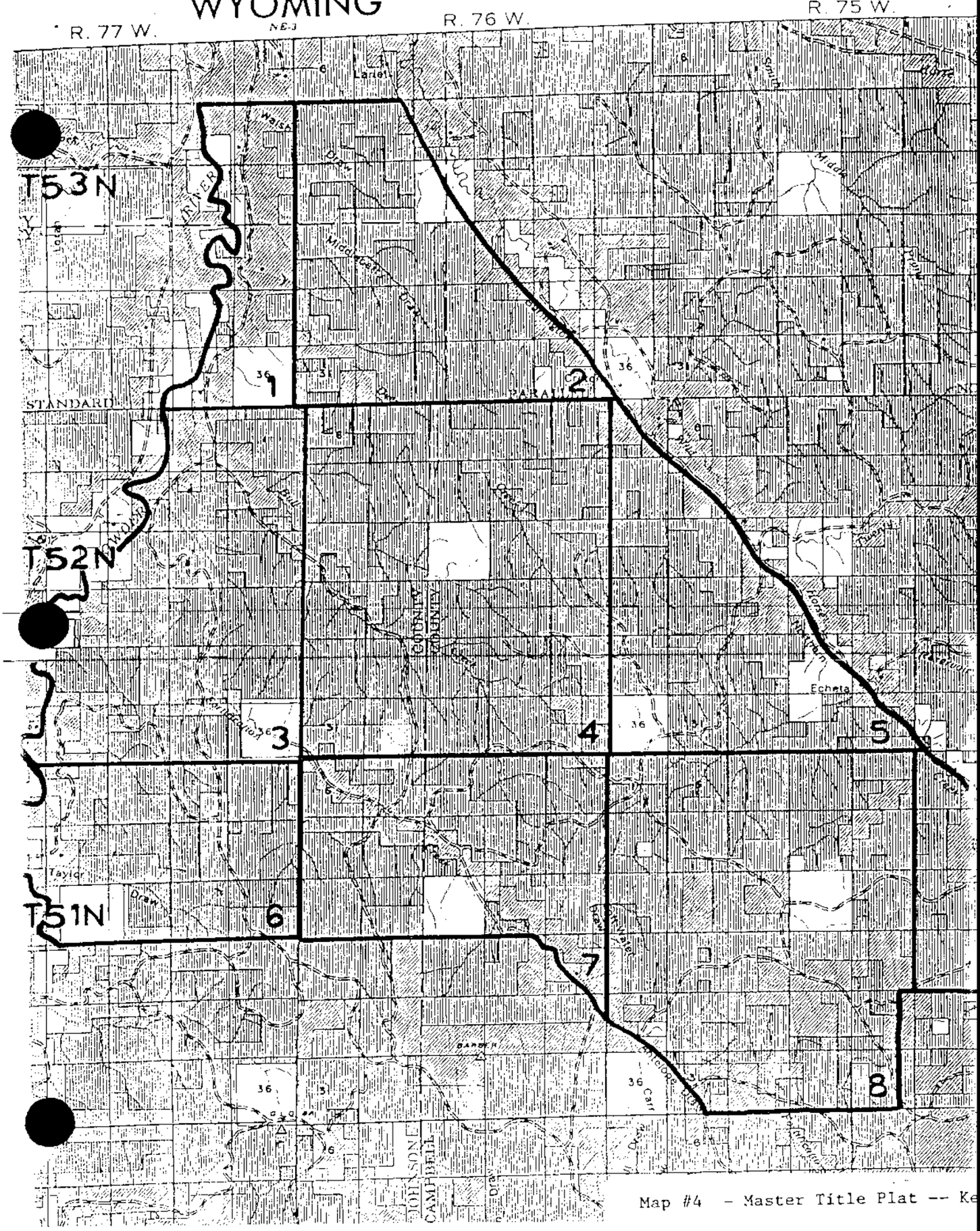
Map #1 ~ Regional Map



Map #2 - Area Map



Map #3 - Surface and Mineral Ownership Map



Map #4 - Master Title Plat -- Ke

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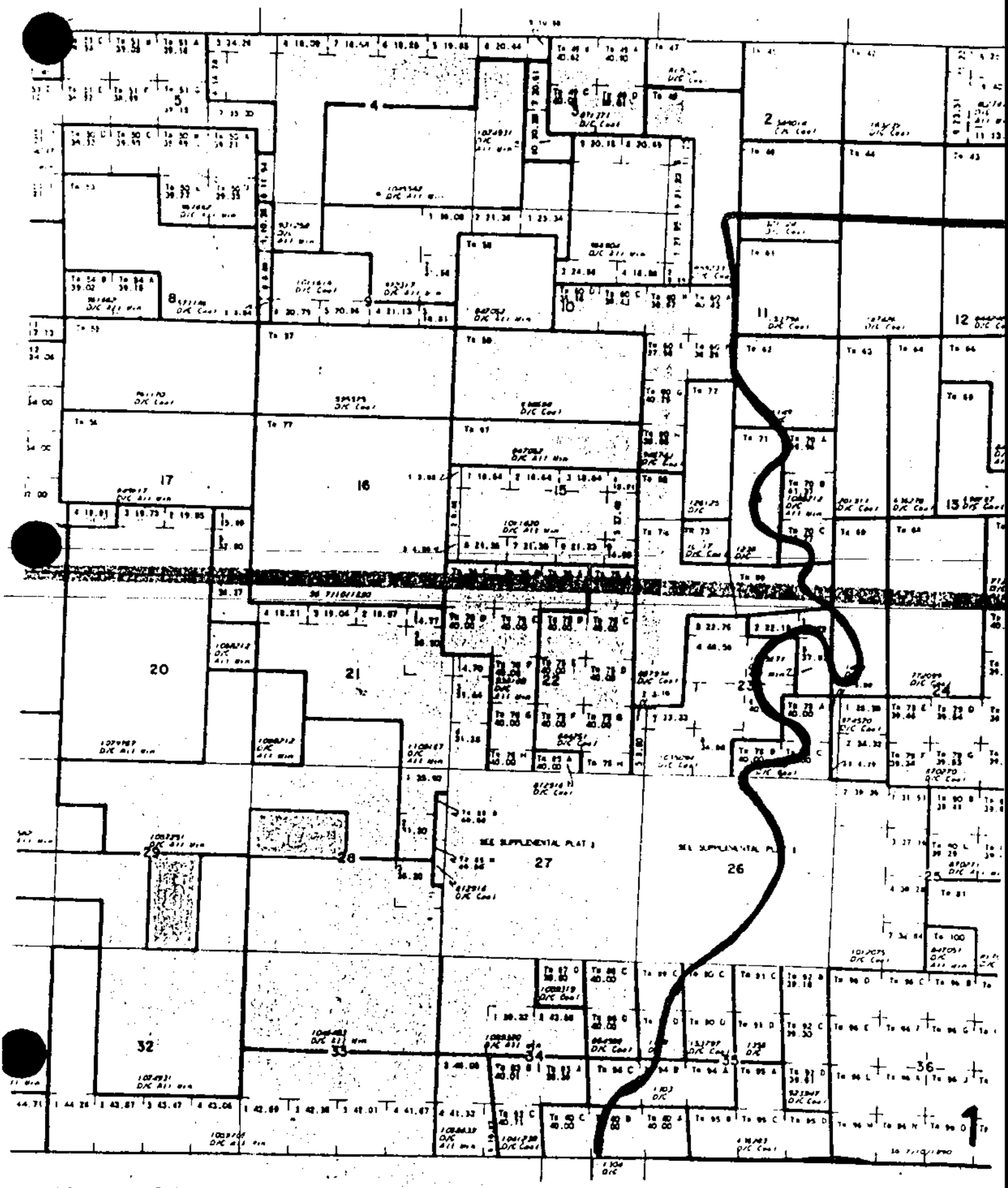

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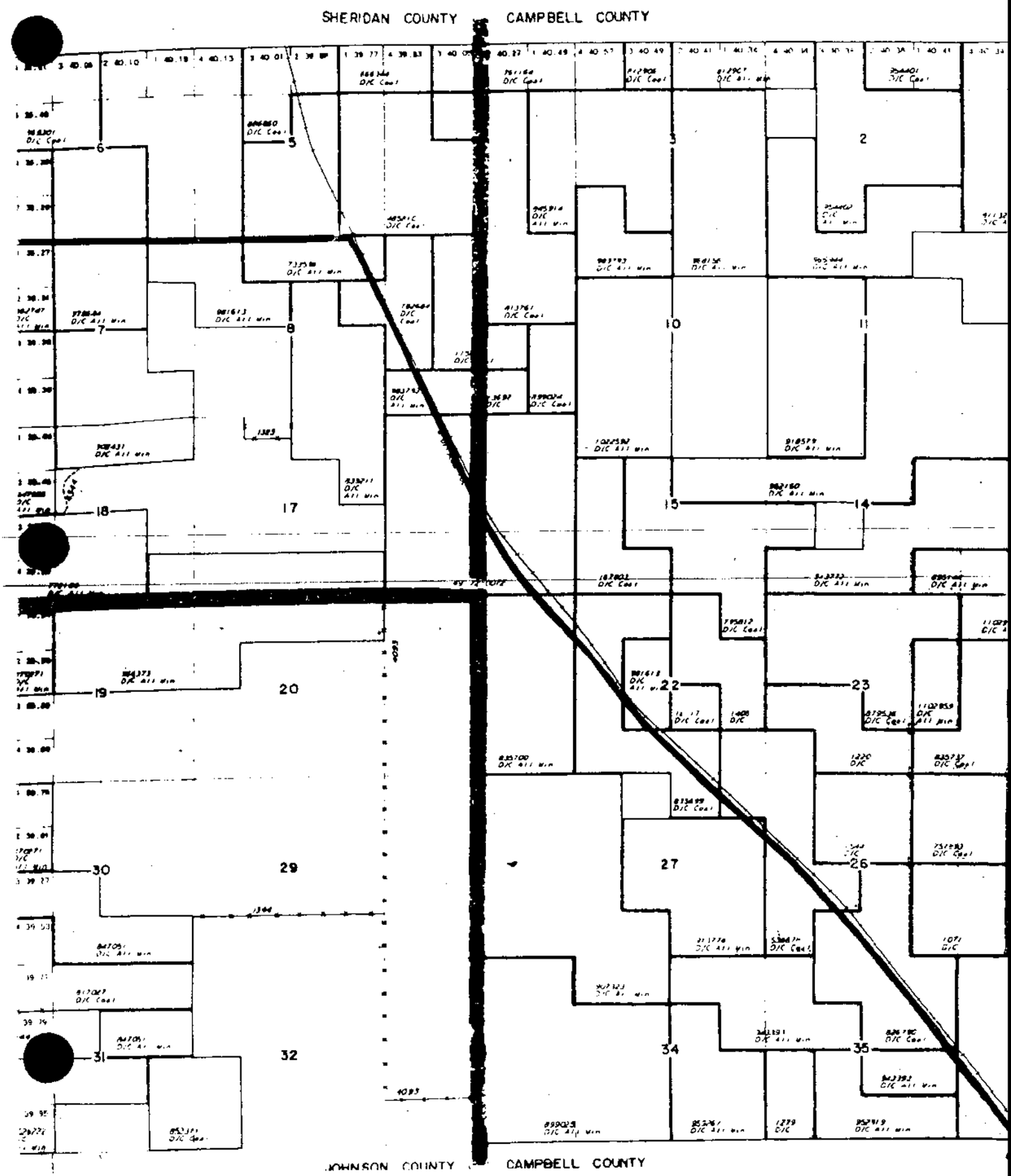
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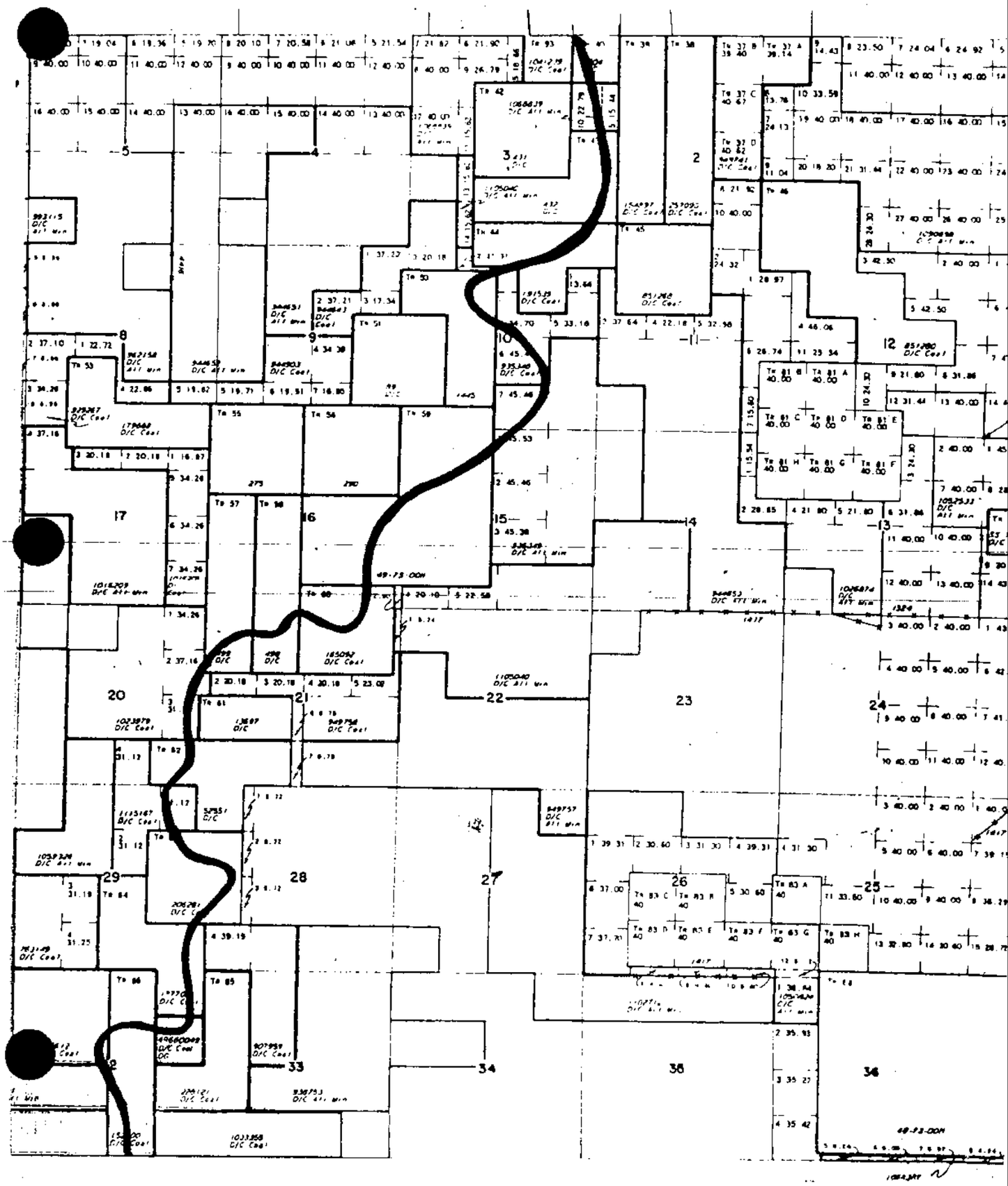

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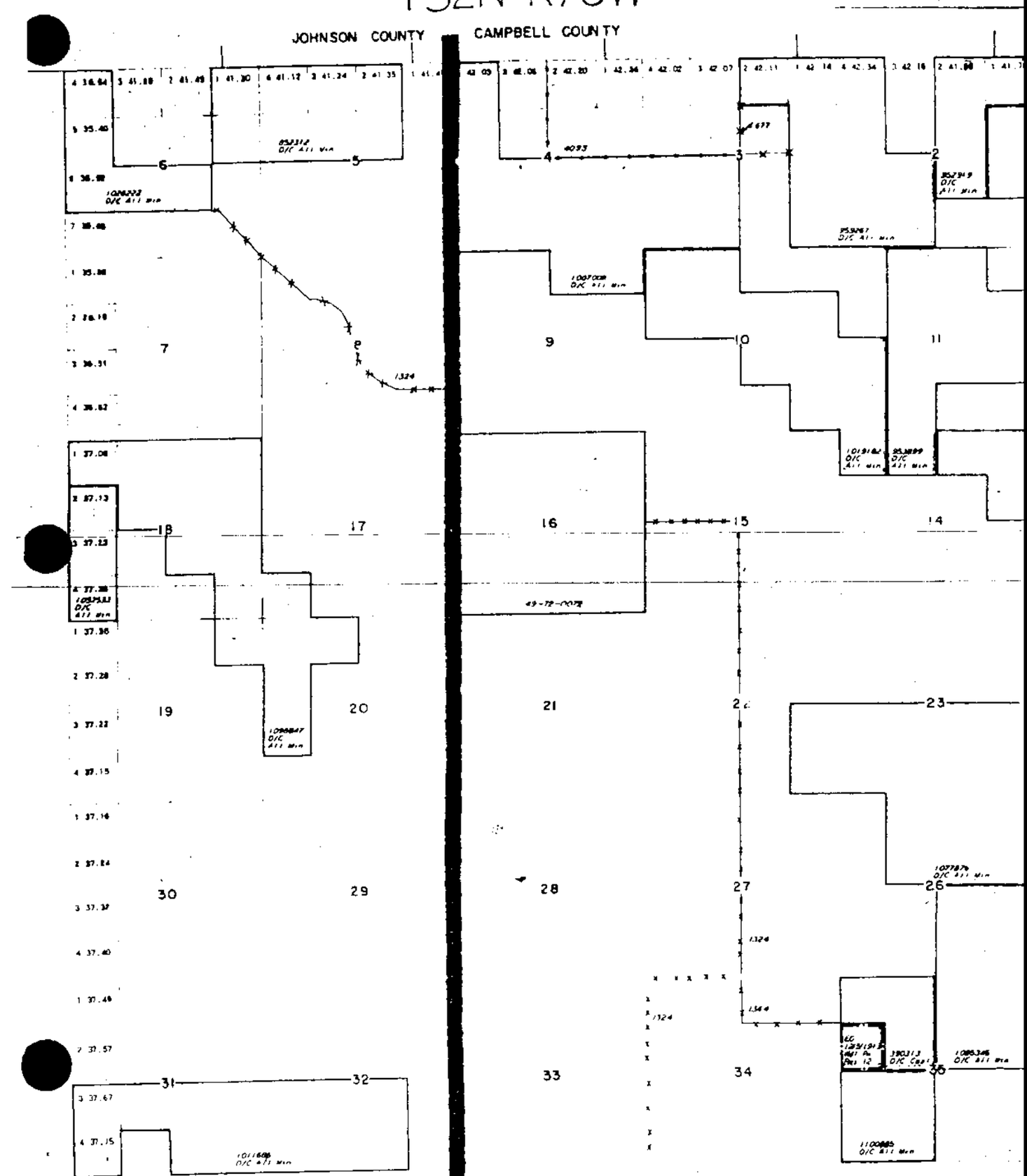
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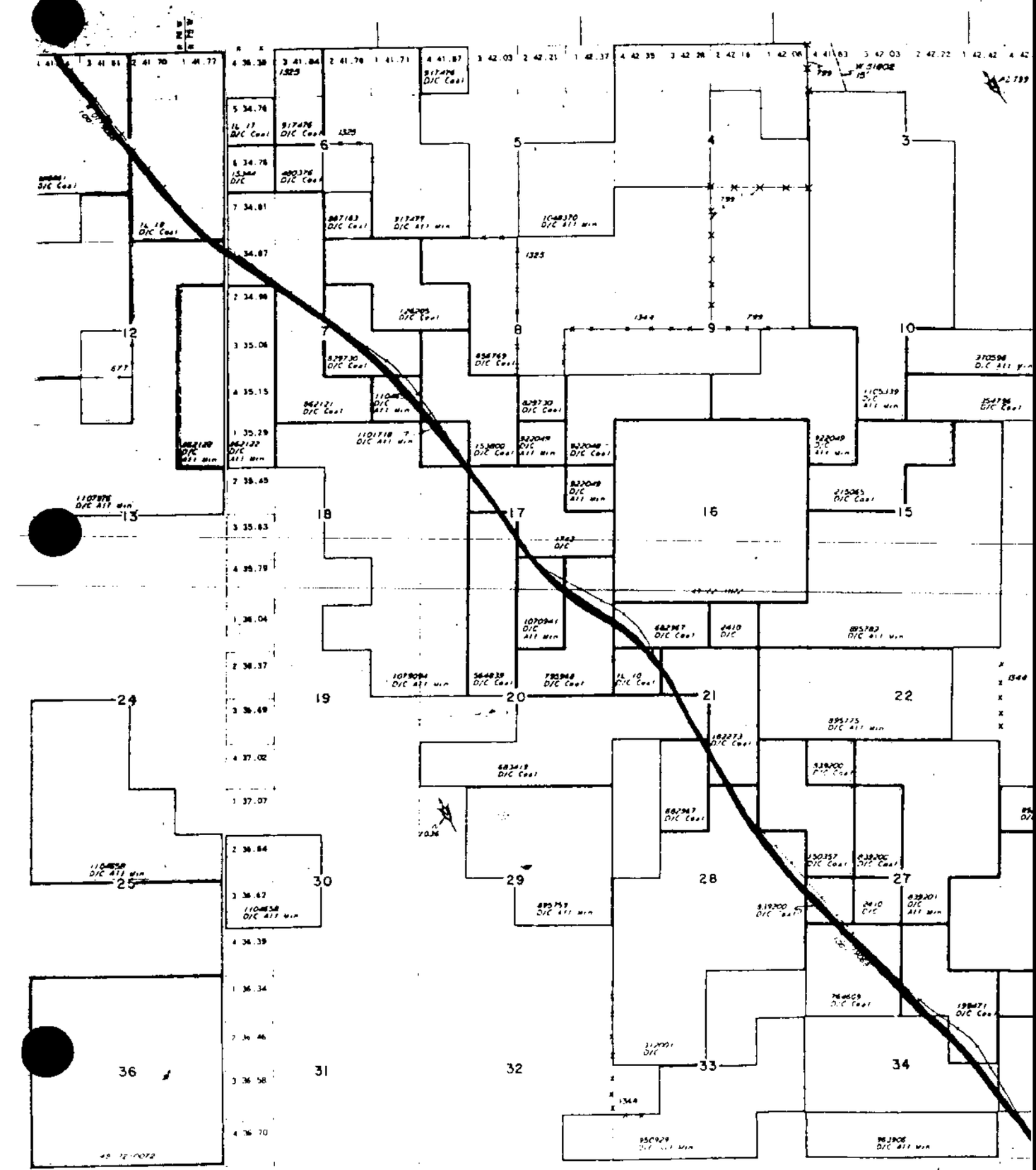
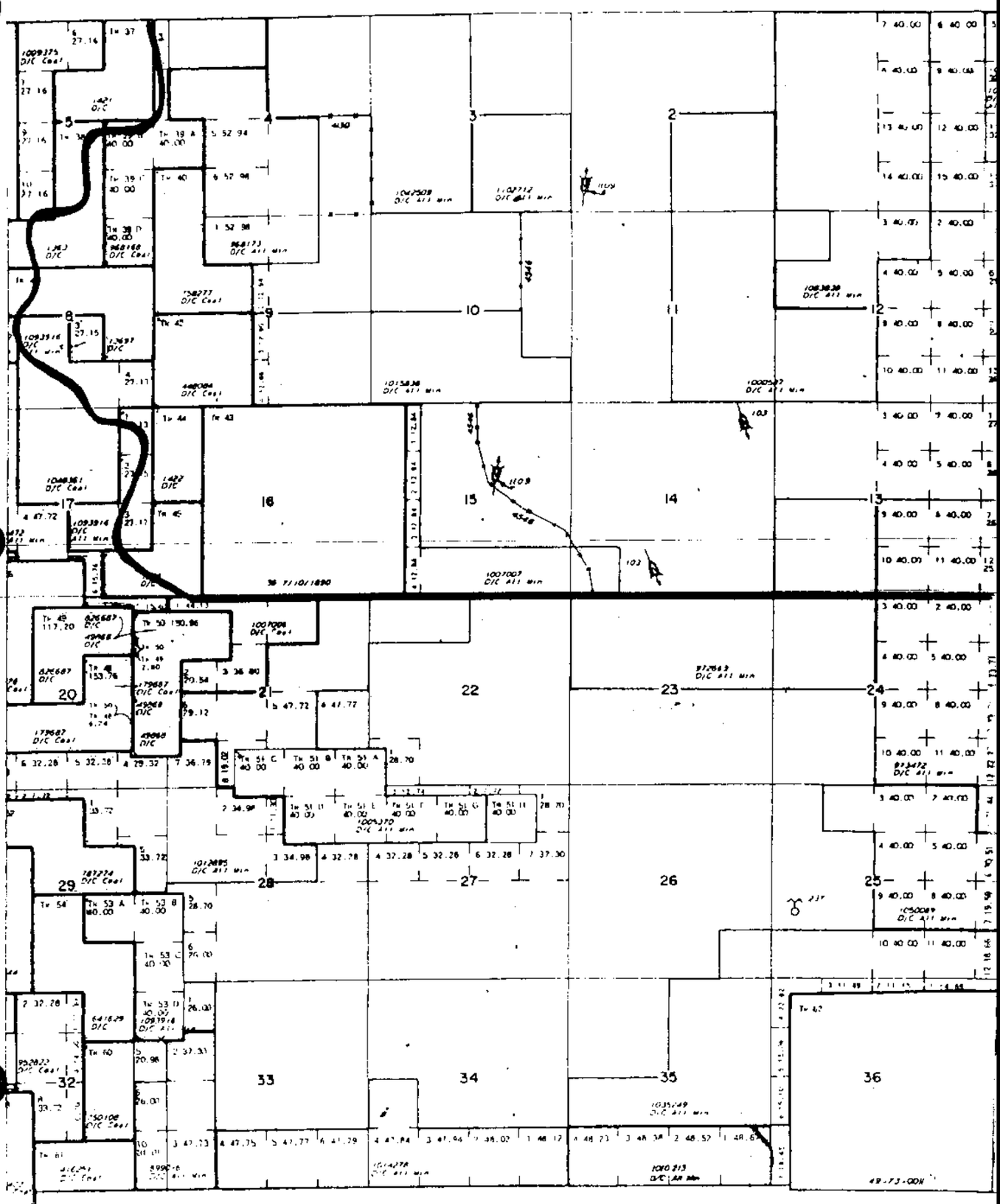


T51N R77W

JOHNSON COUNTY



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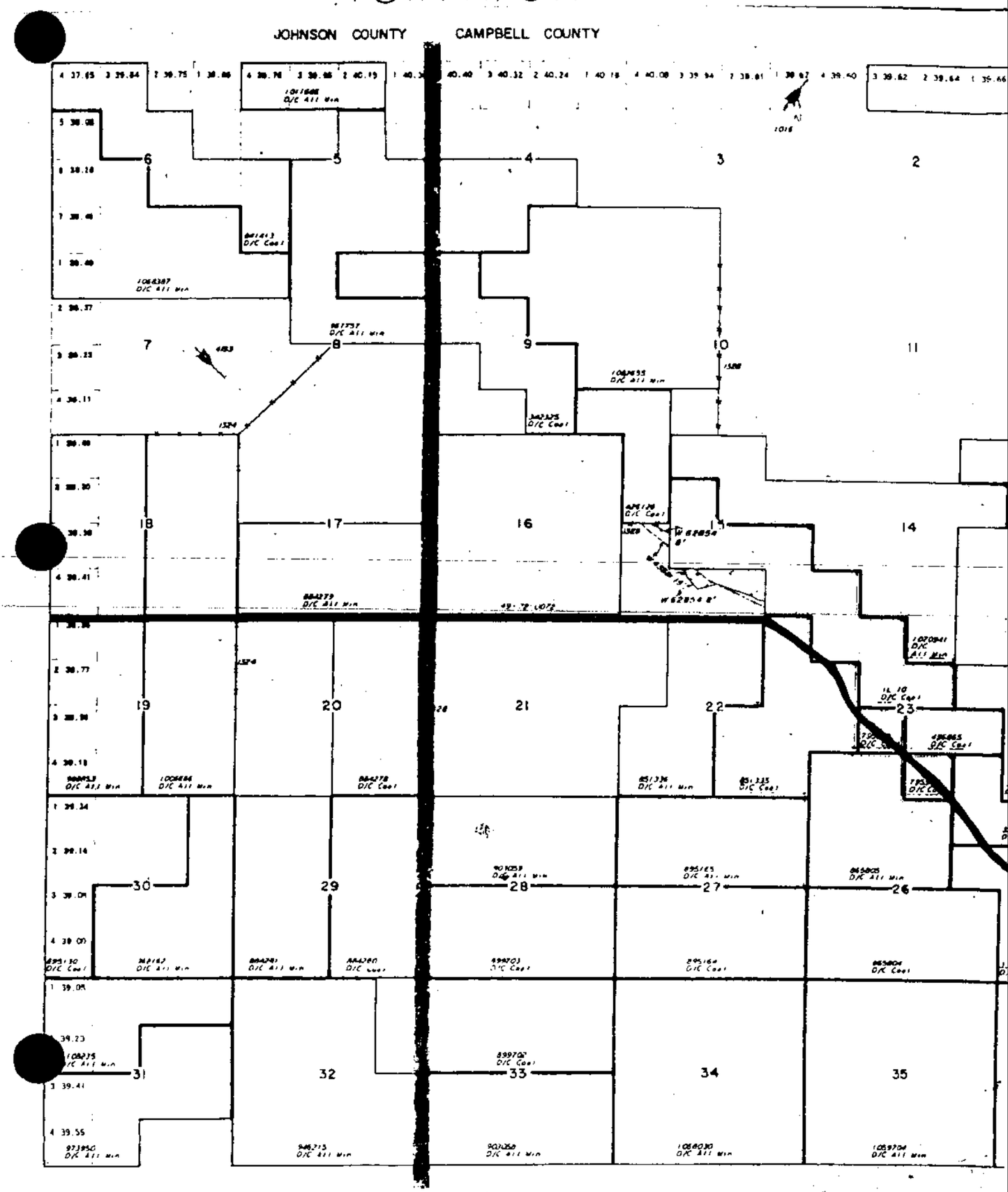
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CAMPBELL COUNTY

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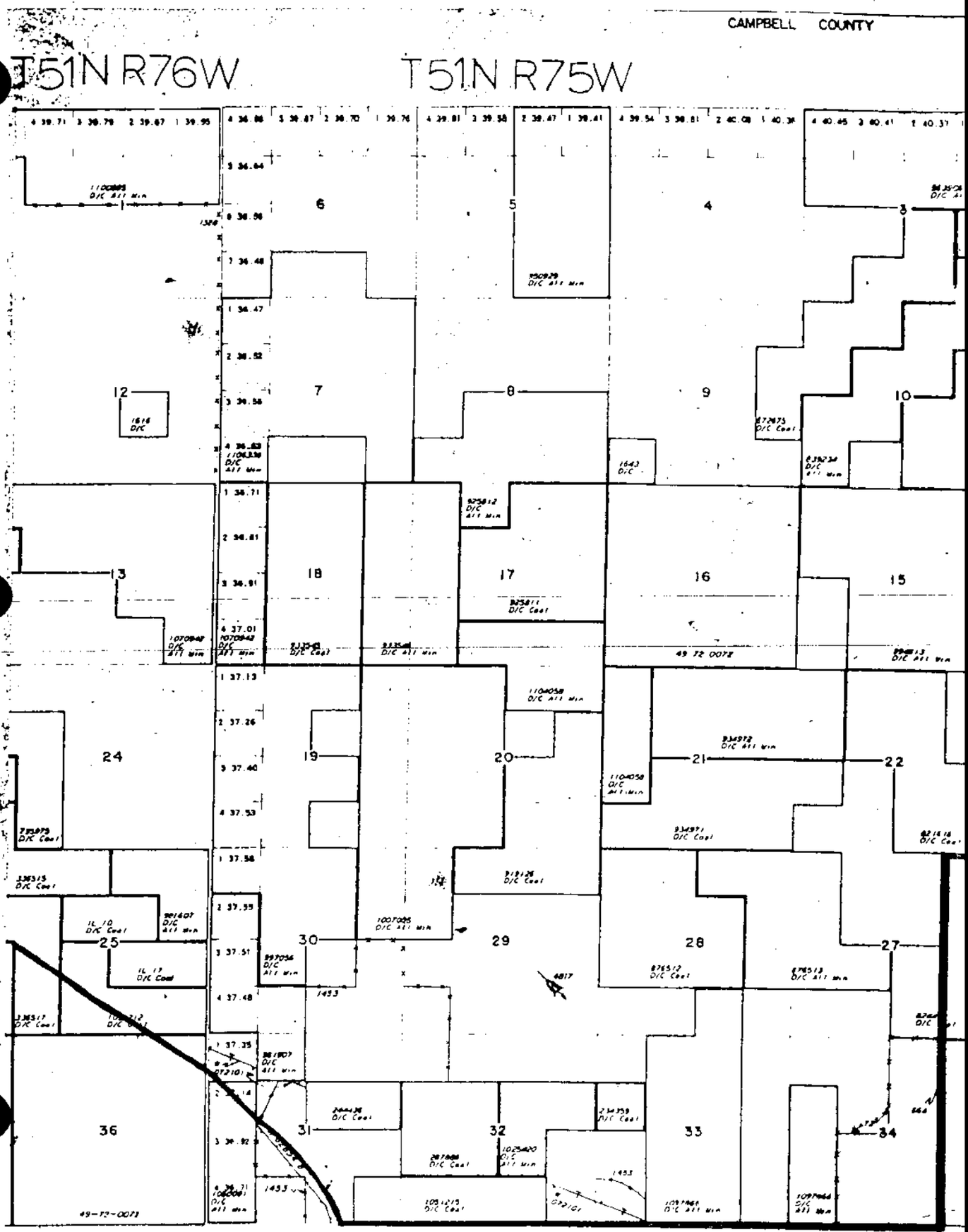

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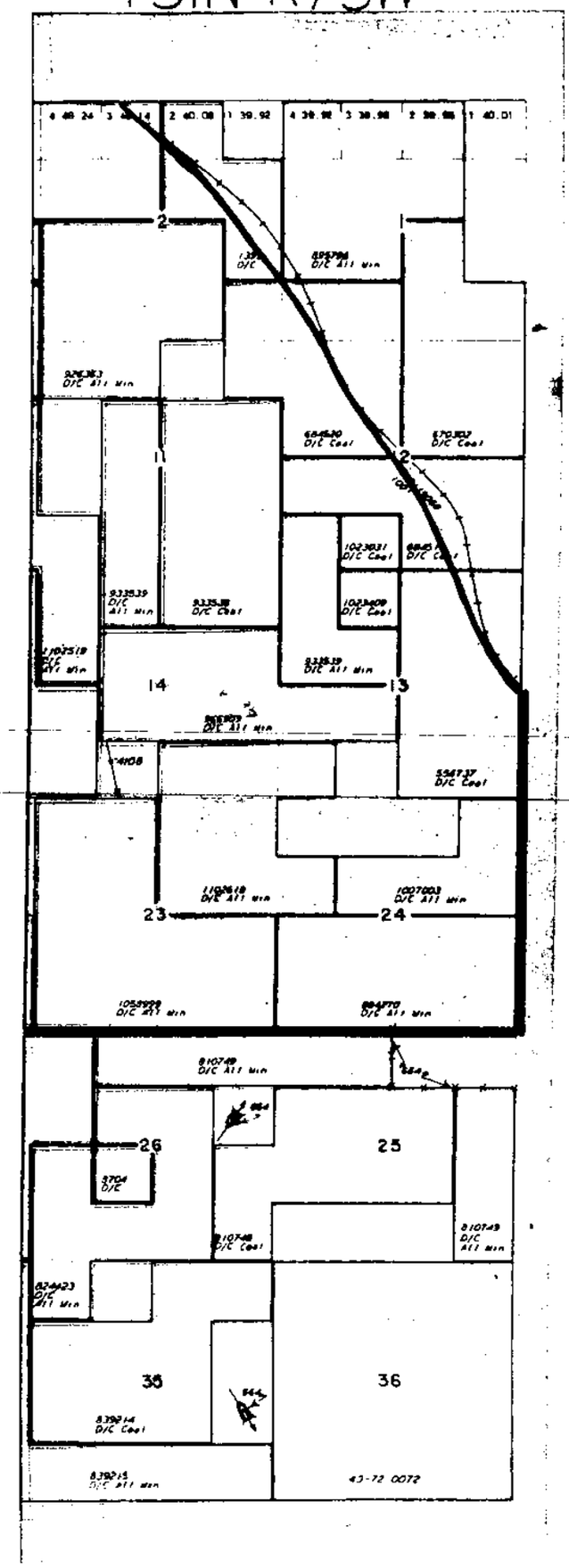
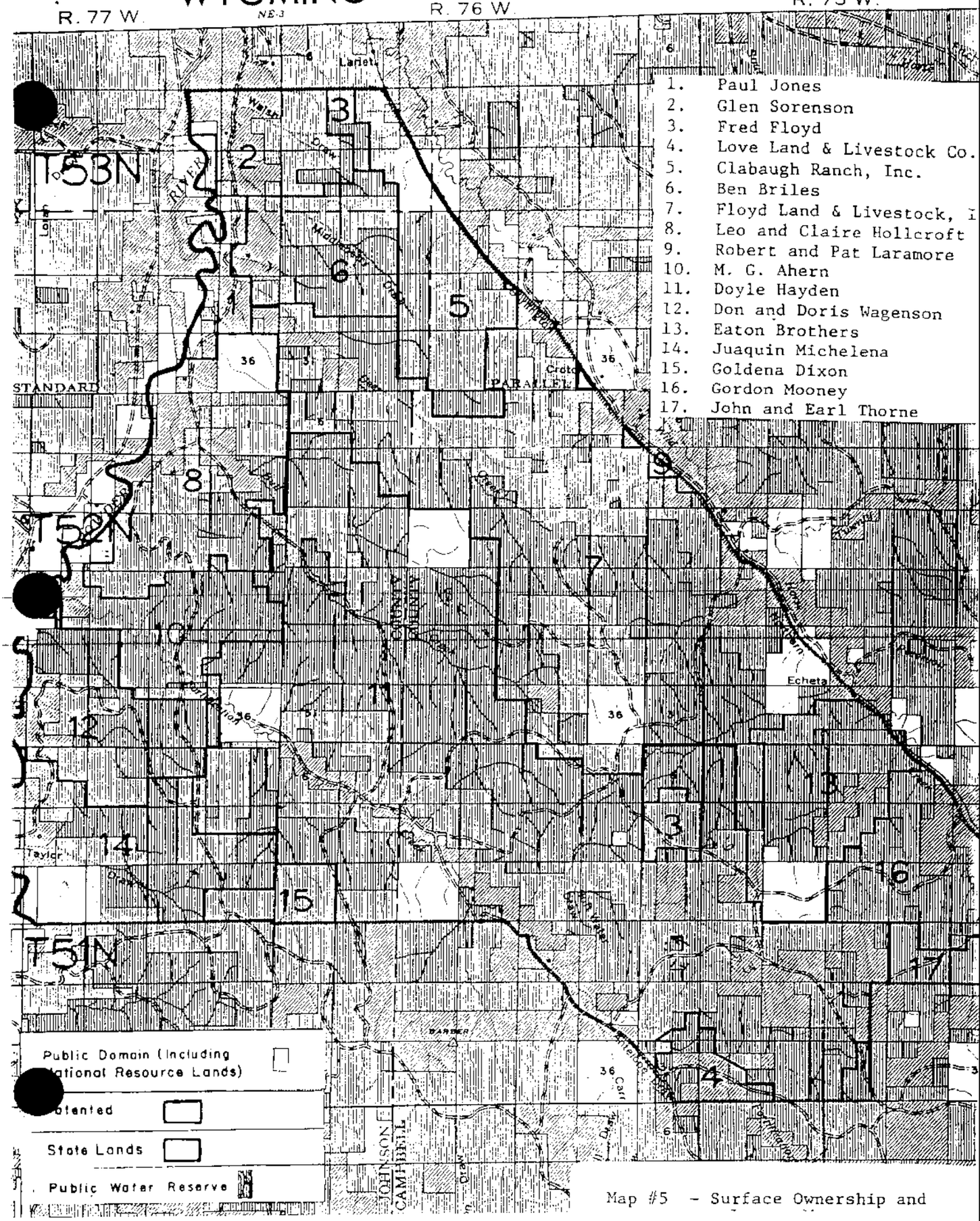
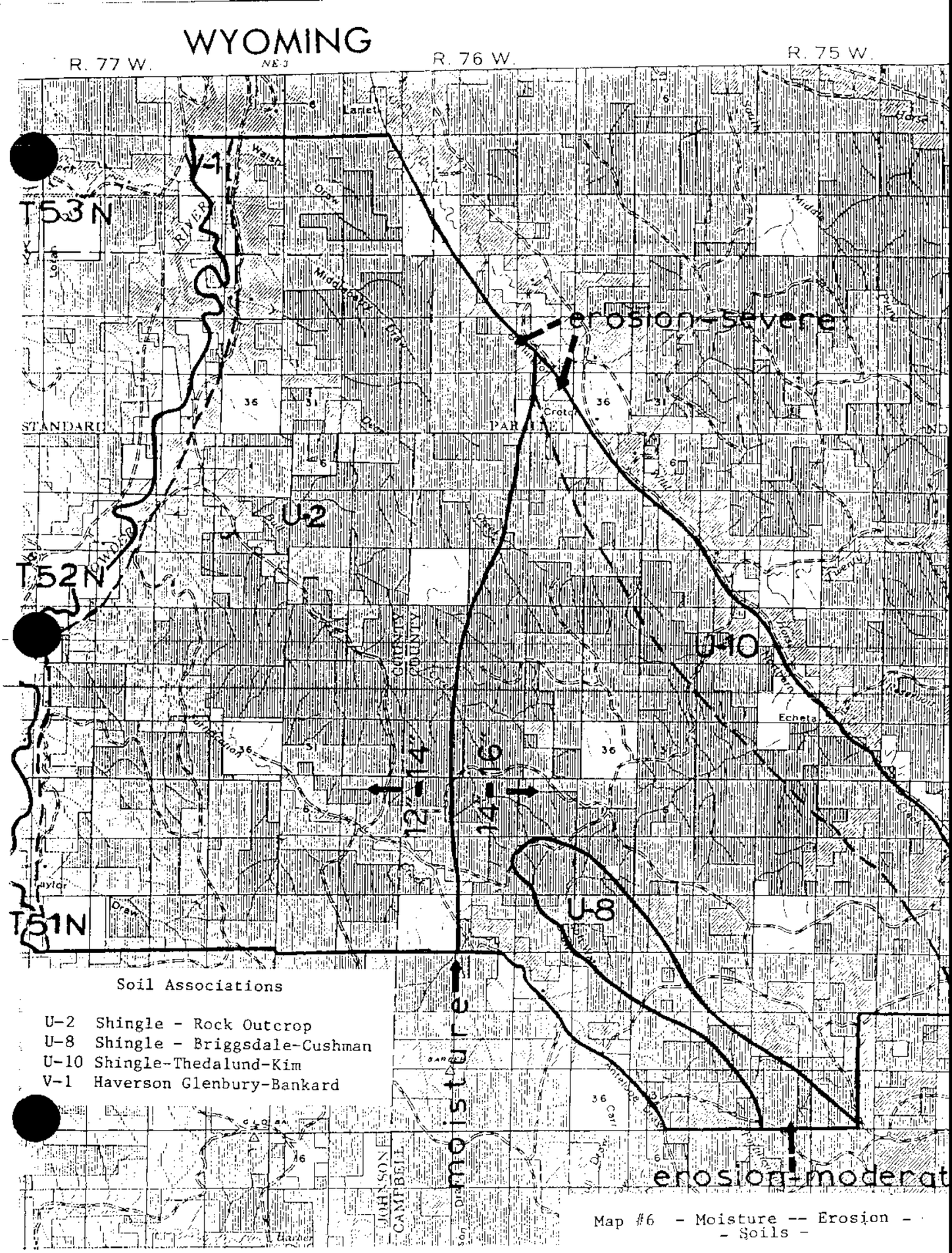
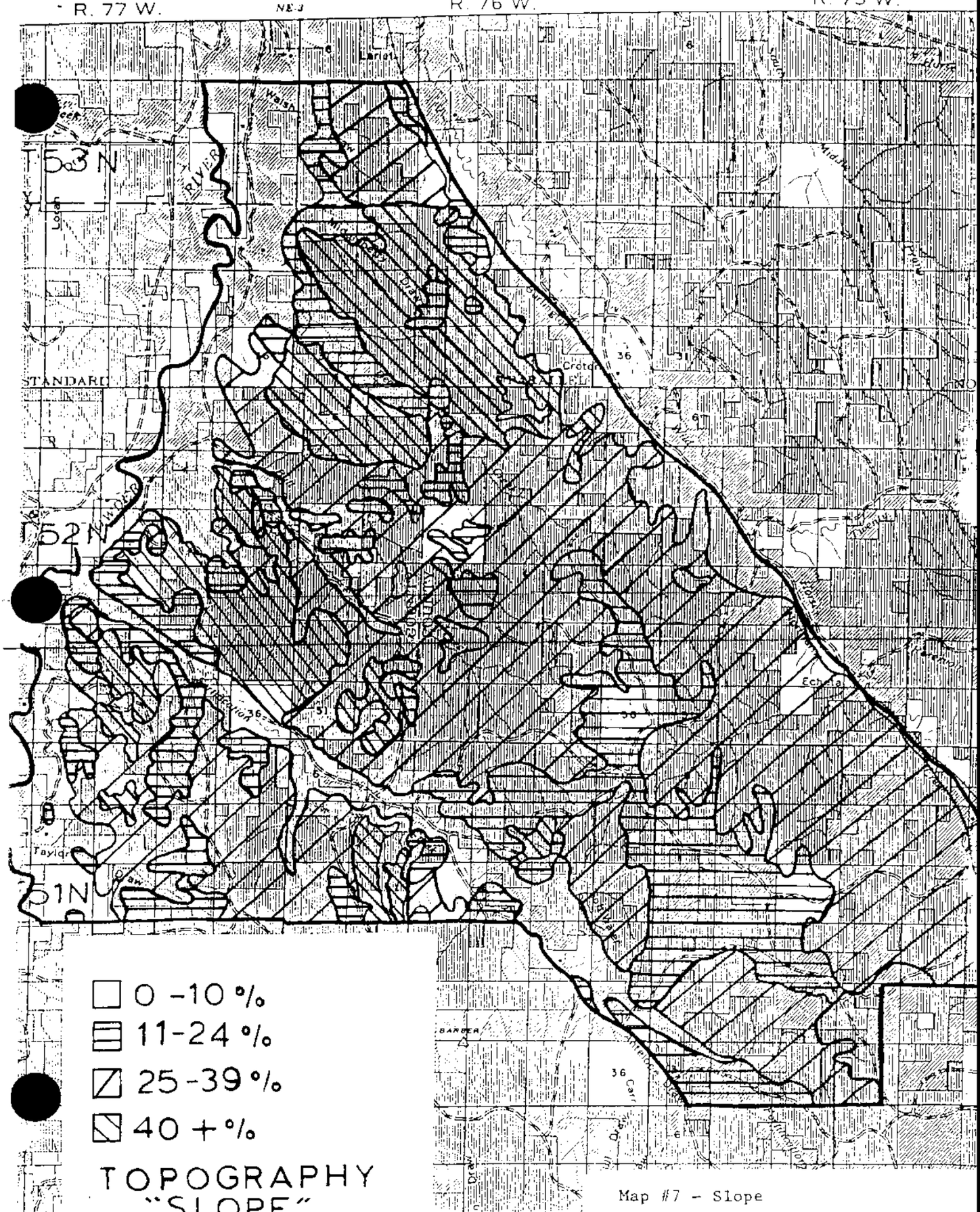




Map #5 - Surface Ownership and



Map #6 - Moisture -- Erosion -
- Soils -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R. 76 W.
R. 75 W.
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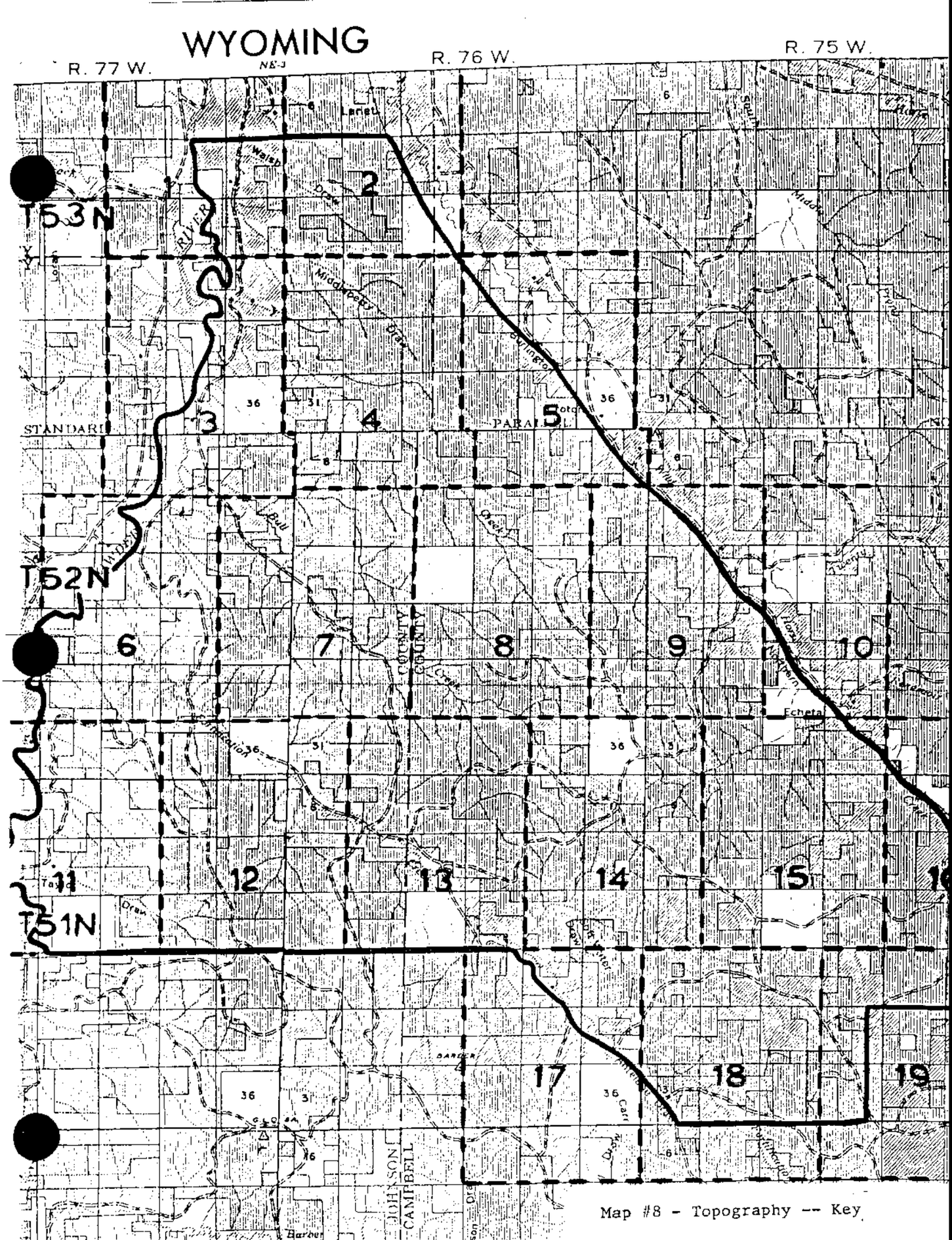
STANDARD
0 -10 %
11-24 %
25-39 %
40 + %
TOPOGRAPHY
"SLOPE"

Map #7 - Slope



Map #8 - Topography -- Key

LEASING

When a parcel is being considered for leasing it should be screened for impacts on Maps 6, 7, 9, 10 and the topography maps that are keyed to Map 8. The chart on the following pages lists the stipulations that are to be used to offer protection to the impacted resources. It should be noted that several stipulations apply to the entire area.

Concurrence from the MMS is to be obtained before recommending any of the special stipulations.

Note: There are areas covered by this plan that are "no lease" areas. All no lease areas must consider an inventory of the oil and gas resource.

Outline for Oil and Gas Inventory

1. General mode of occurrence of oil and gas in the region/district. Emphasis on source rocks and their permeability.

2. Stratigraphy and geology of localized area, possible source rocks, and related porosity/permeability.

3. Potential of subsurface structural traps (folding, faulting, and jointing) in area of concern, if not readily apparent at the surface.

4. Potential of stratigraphic traps (depositional irregularities such as pinchouts, unconformities, and facies changes) in area of concern, if not readily apparent at the surface.

5. Possibility for stratistructural traps (combination of strata and structural traps).

6. Analysis of producing or dry wells within proximity or in the area under investigation. Examine well logs if possible. Note depth, productive formations, horizons, lithologies, etc.

7. Current interest/activity in area. Consultation with companies in close vicinity may provide insight to interest/future activity.

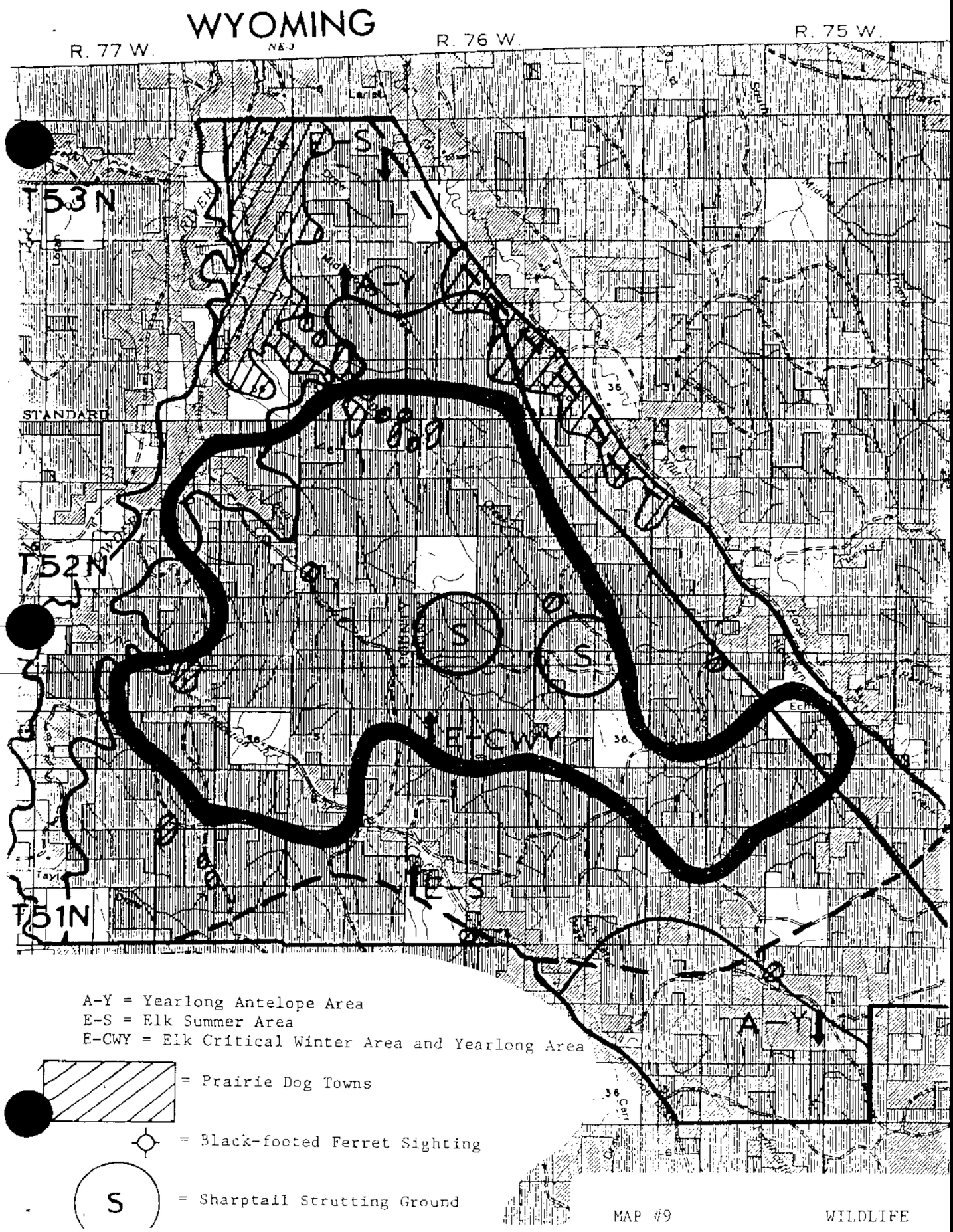
8. Existence/nonexistence of leases in area.

9. Examine USGS Leasable Mineral and Waterpower Land Classification Maps if available.

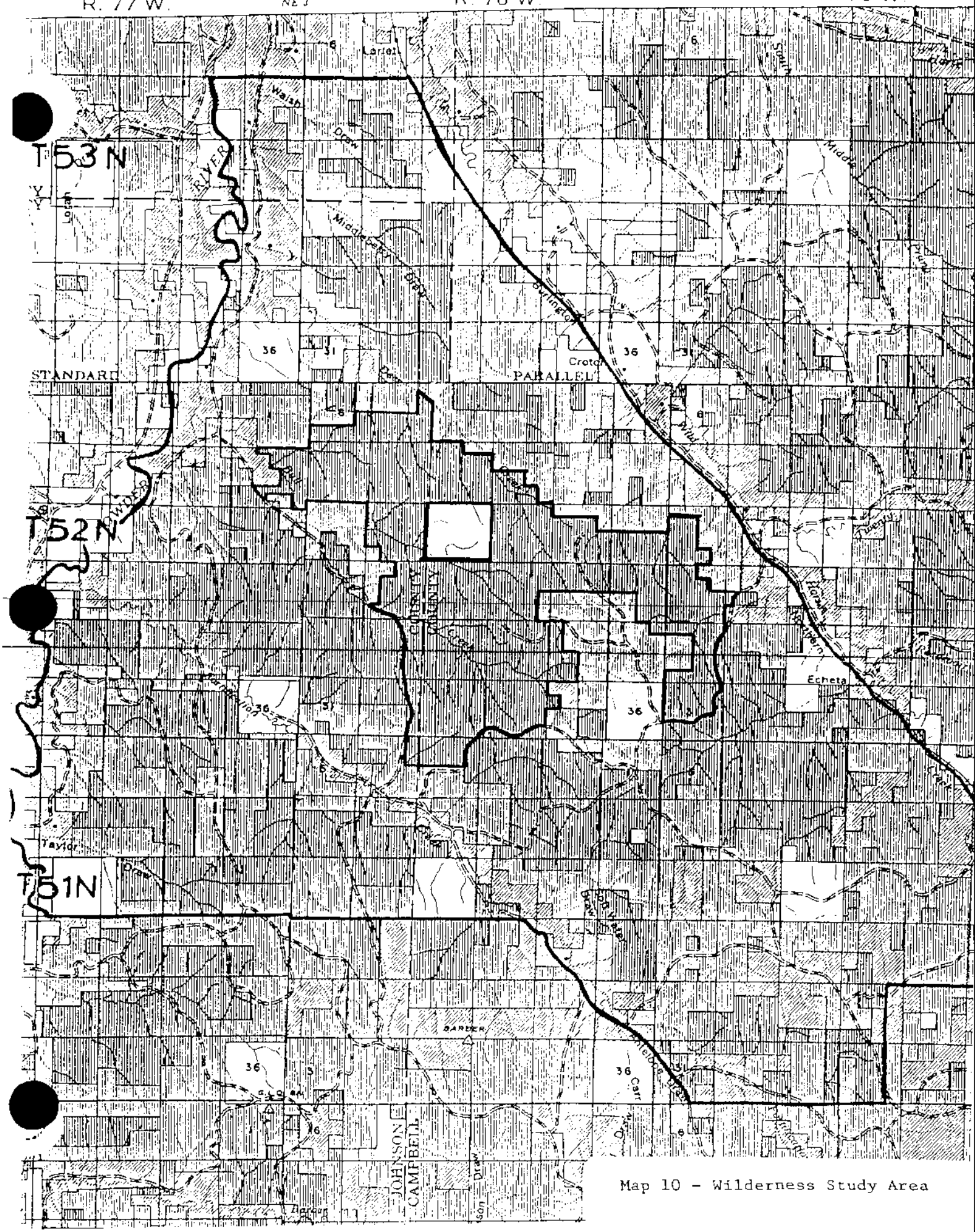
10. Consultation with local oil companies in area about potential of significant results and document in report.

11. Obtain report from USGS as to oil/gas potential of area. When requesting report, instruct GS to provide geologic specifics as to potential.

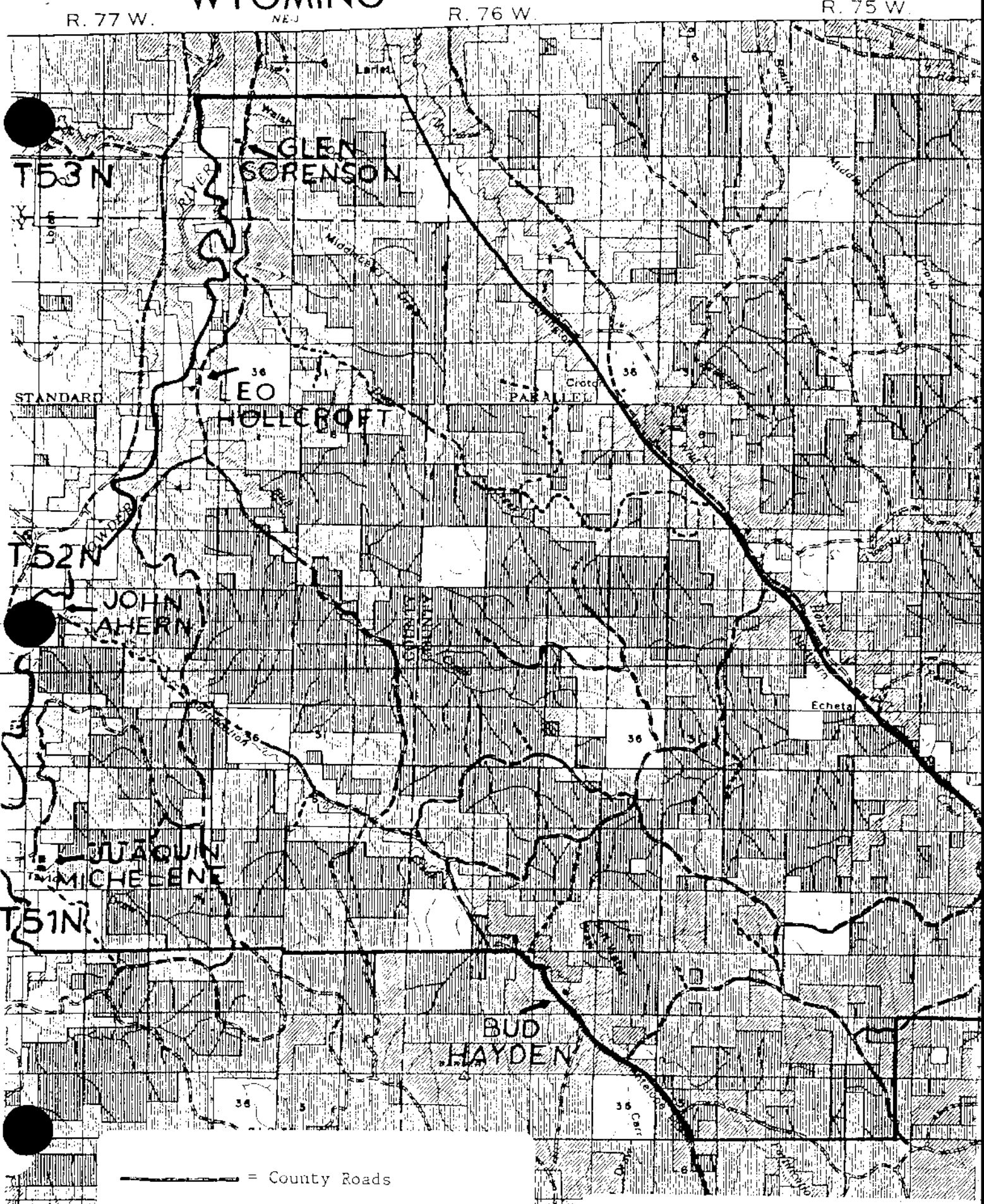
This no/lease oil and gas inventory is addressed in Instruction Memorandum WY-80-290.



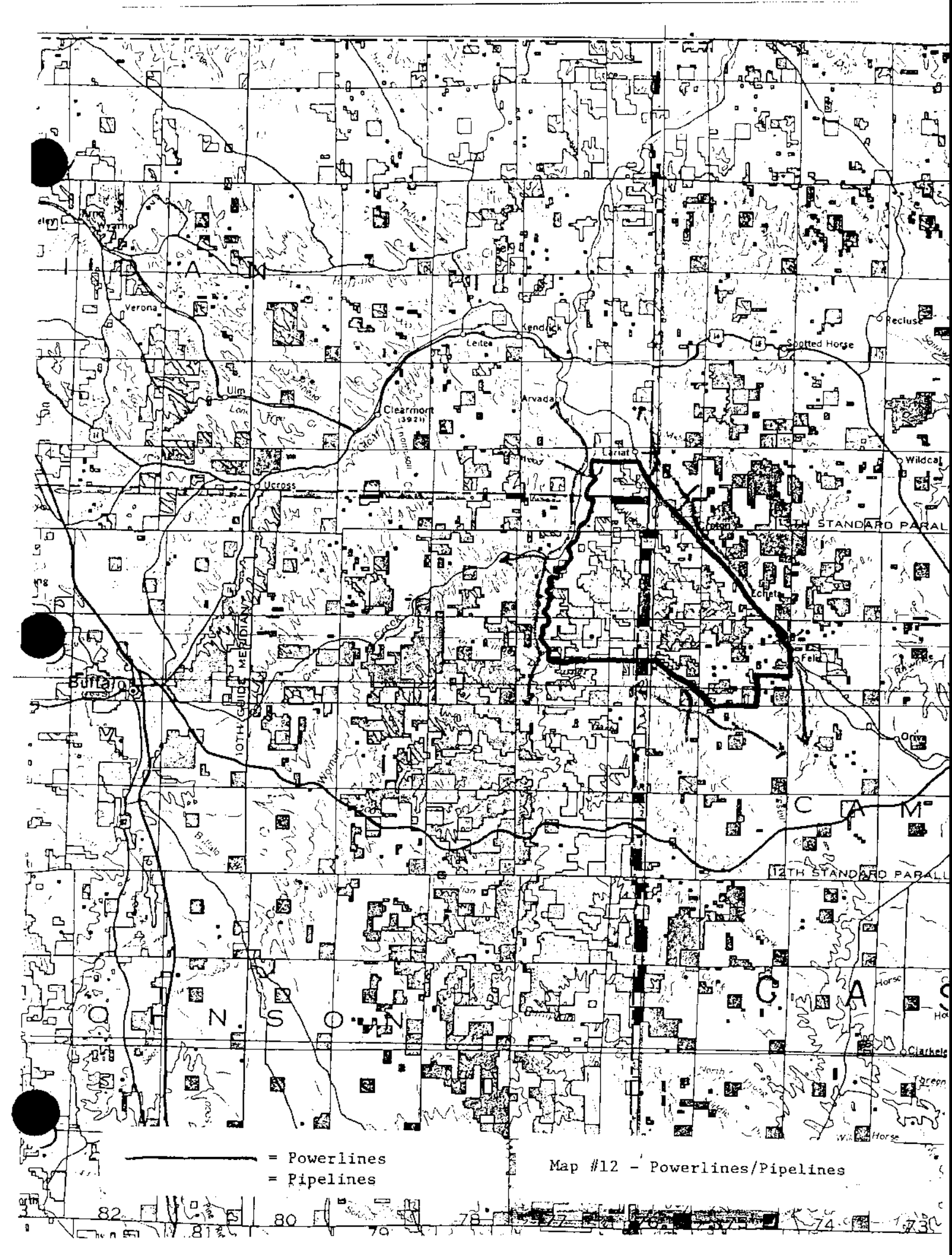
MAP #9 WILDLIFE



Map 10 - Wilderness Study Area



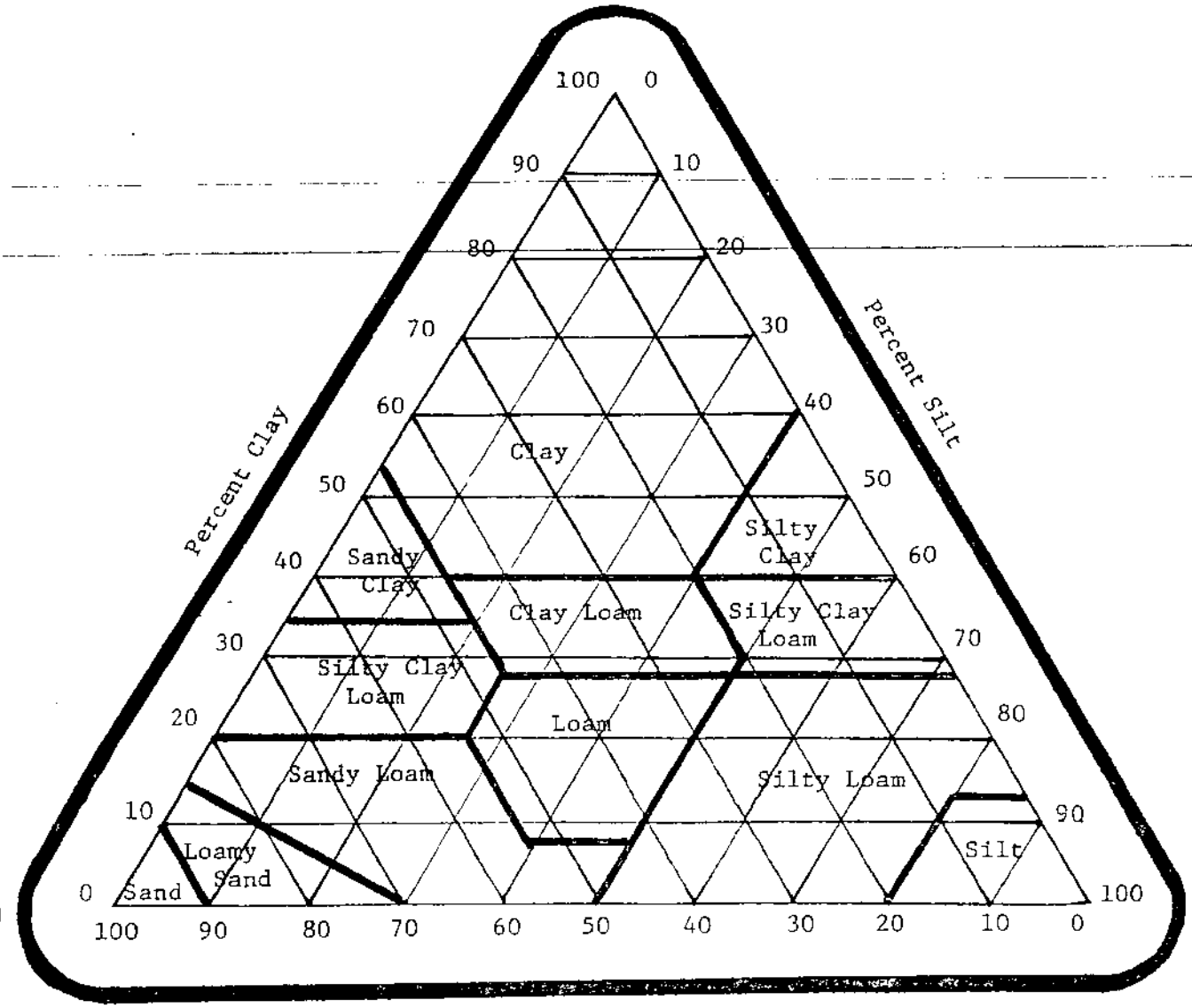
Map #11 - Roads and Ranch Building

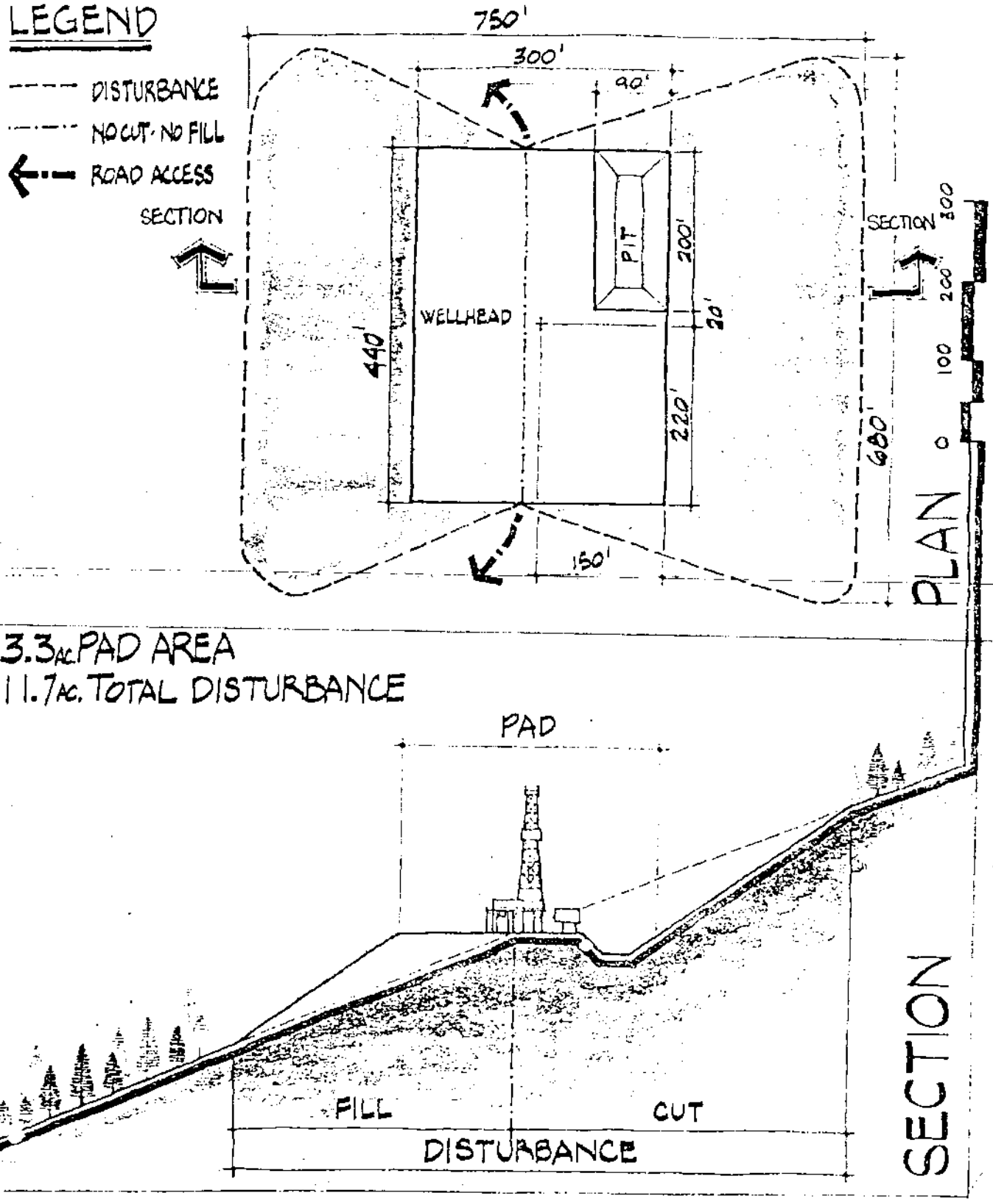


Map #12 - Powerlines/Pipelines

Fill a beaker or jar two-thirds full of water and add soil until it is almost full. Shake vigorously and let the soil settle. In a short time the heavier sand particles will settle and form a visible layer. It may take hours for the silt and clay to settle out.

DETERMINATION OF SOIL TEXTURE CLASSES





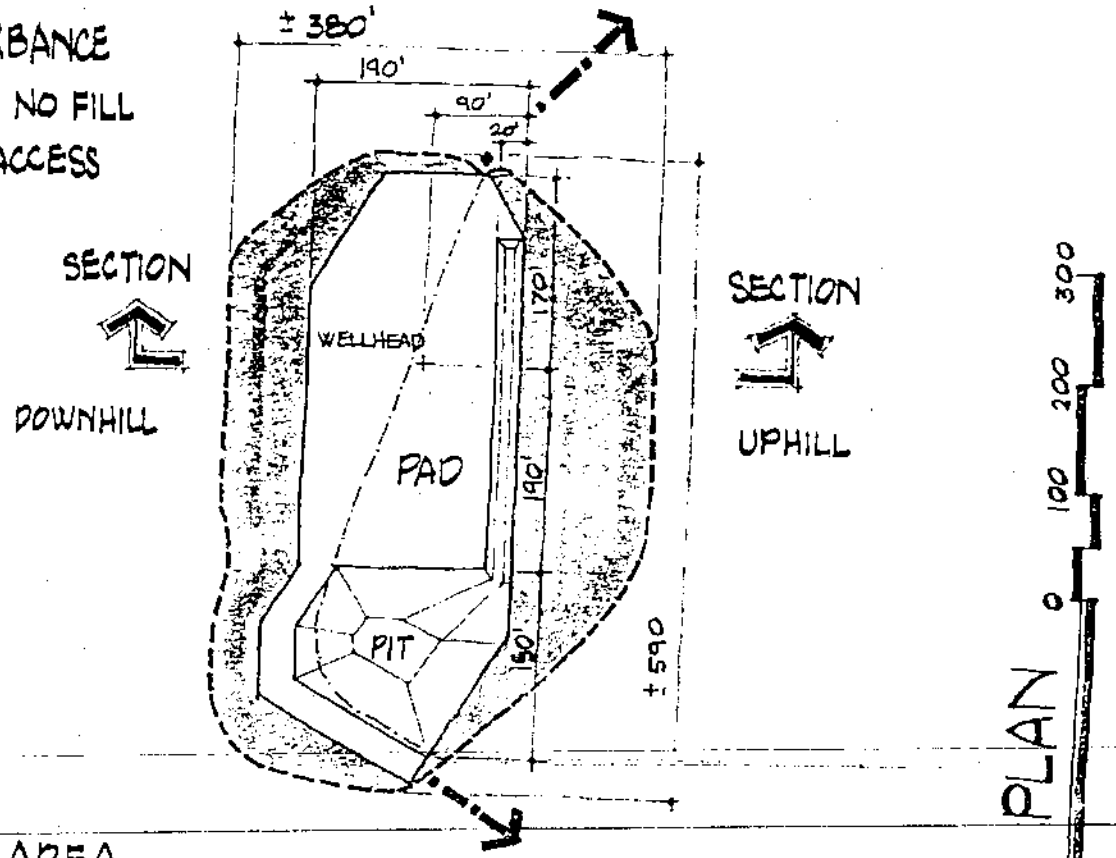
Traditional Drill Pad Layout

LEGEND

---- DISTURBANCE

-·-·- NO CUT · NO FILL

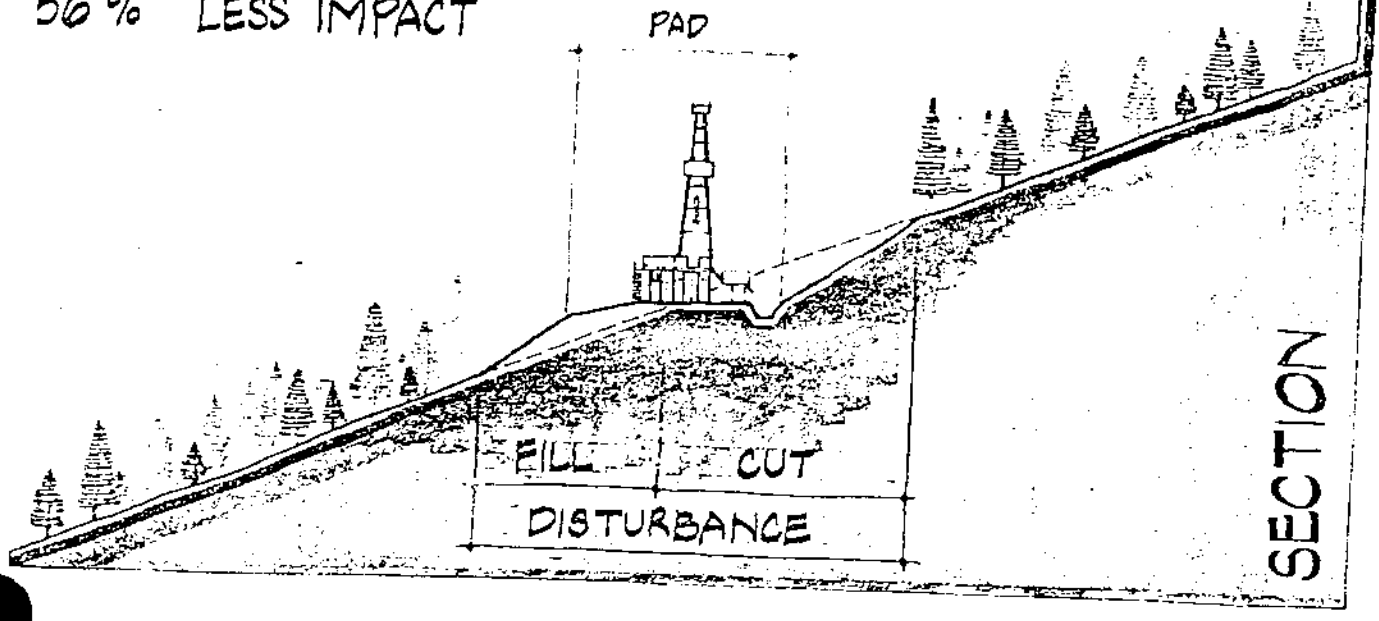
←·-· ROAD ACCESS



2.2 Ac. PAD AREA

5.15 Ac. TOTAL DISTURBANCE

56 % LESS IMPACT



Alternative A- Side Slope

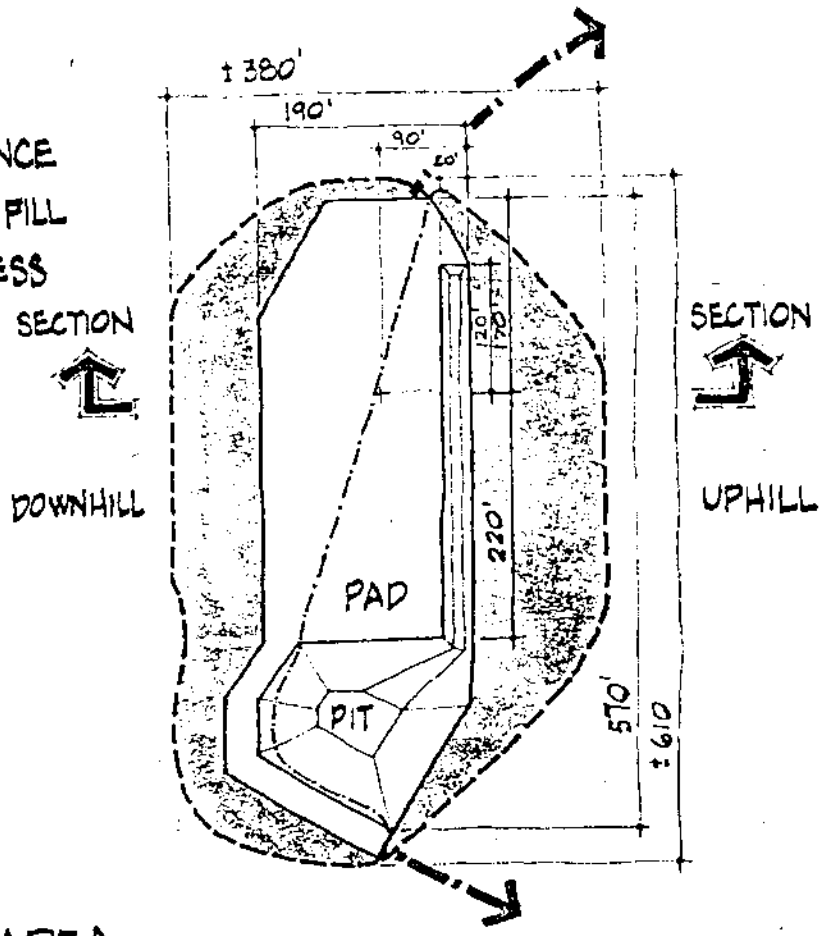
No Stimulation Activity

LEGEND

---- DISTURBANCE

-·-·- NO CUT · NO FILL

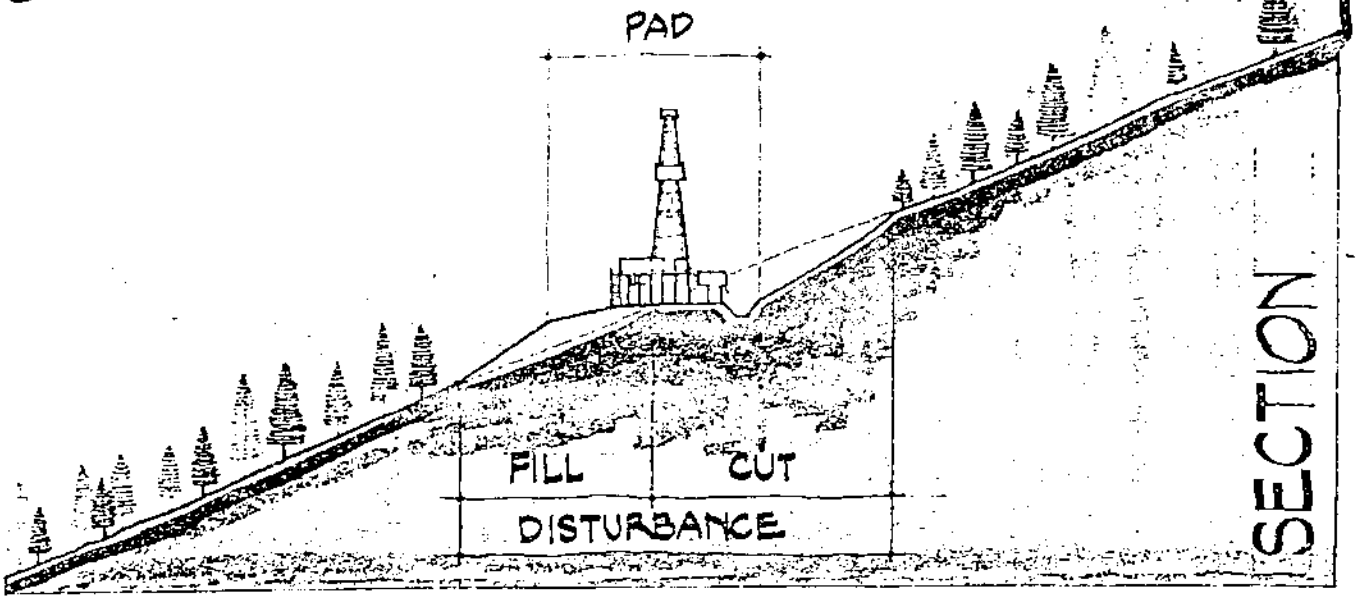
← ROAD ACCESS



2.49 AC. PAD AREA

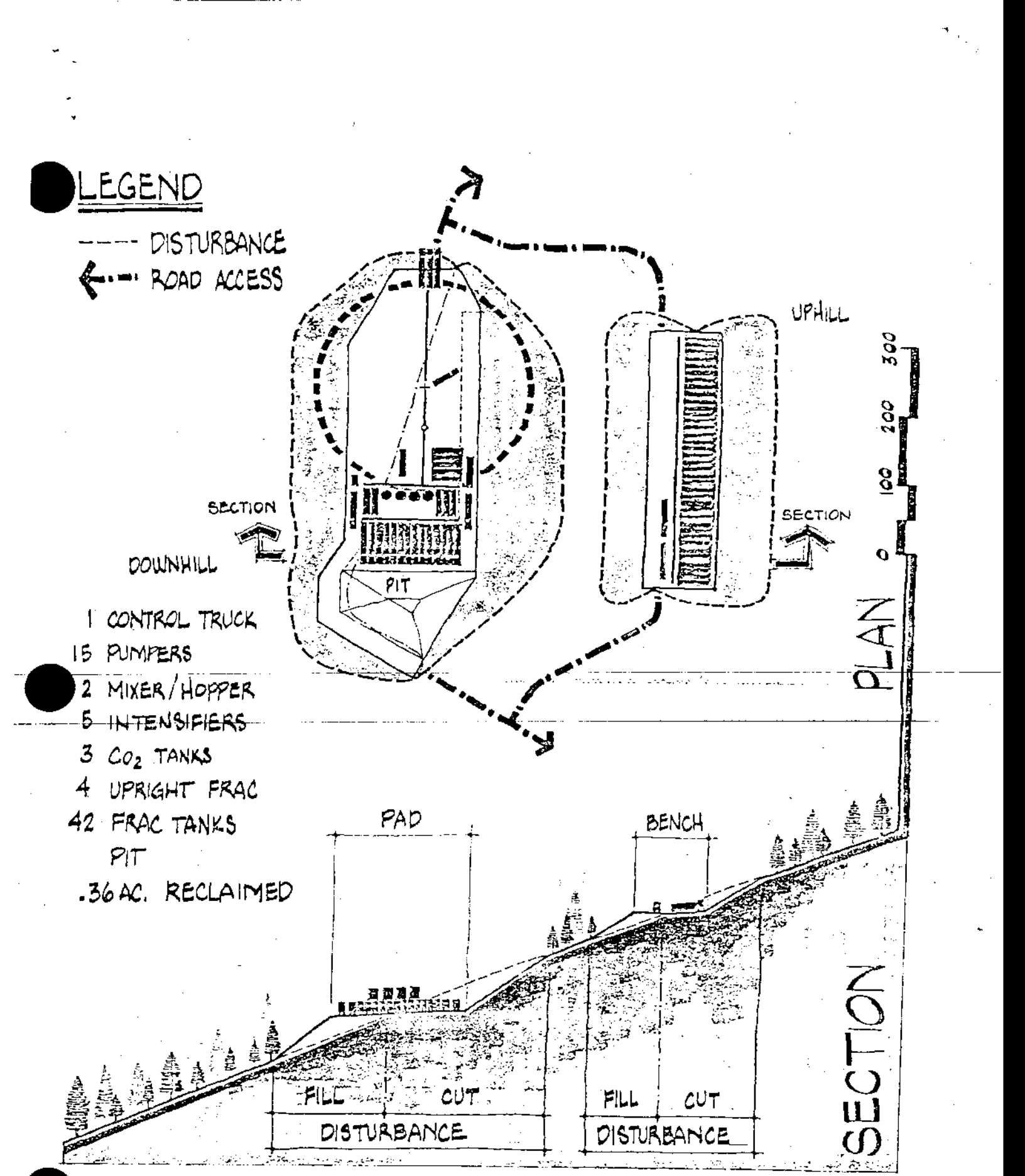
5.32 AC. TOTAL DISTURBANCE

55% LESS IMPACT



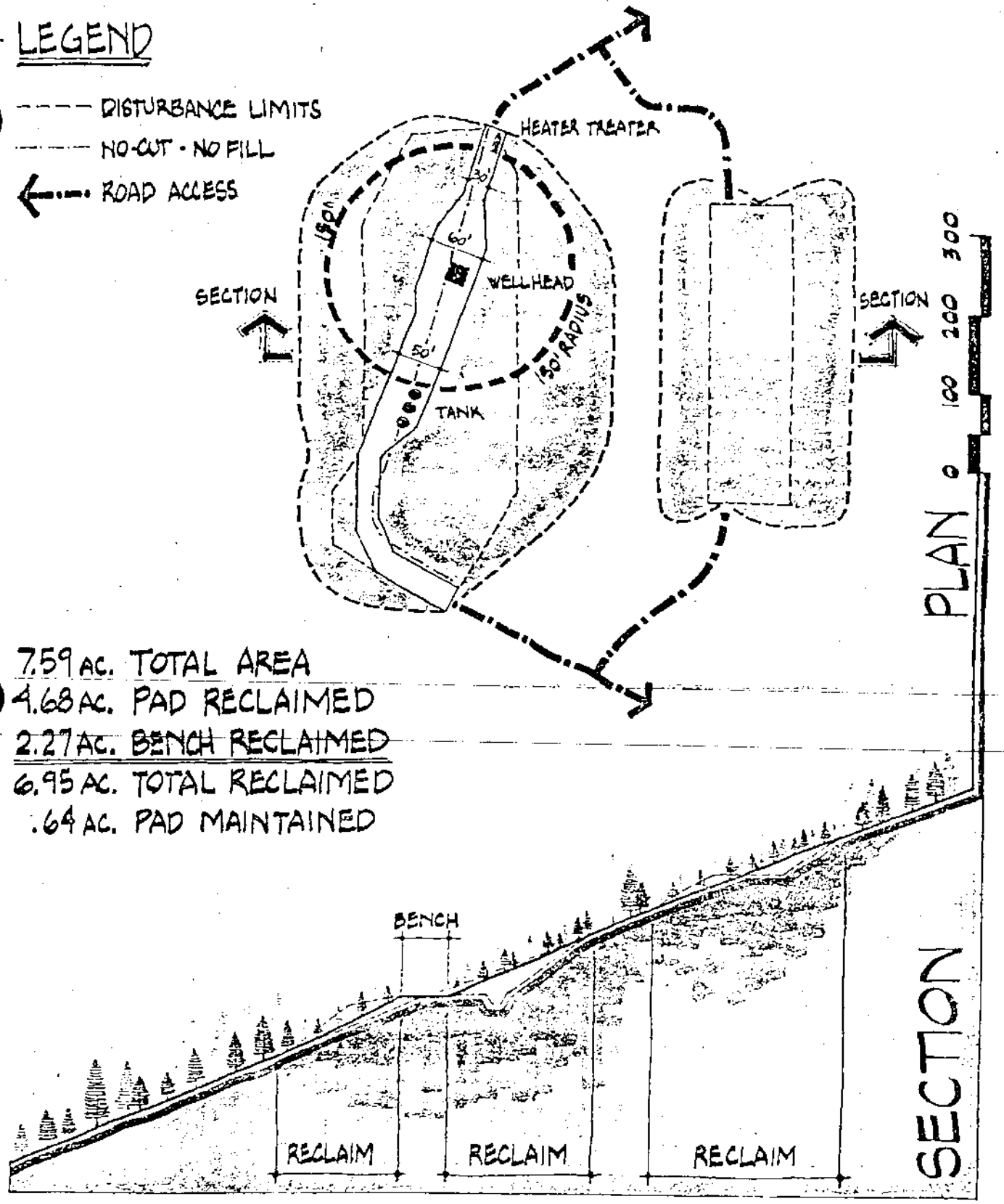
Alternative B - Side Slope

High Pressure Low Fluid Stimulation Activity



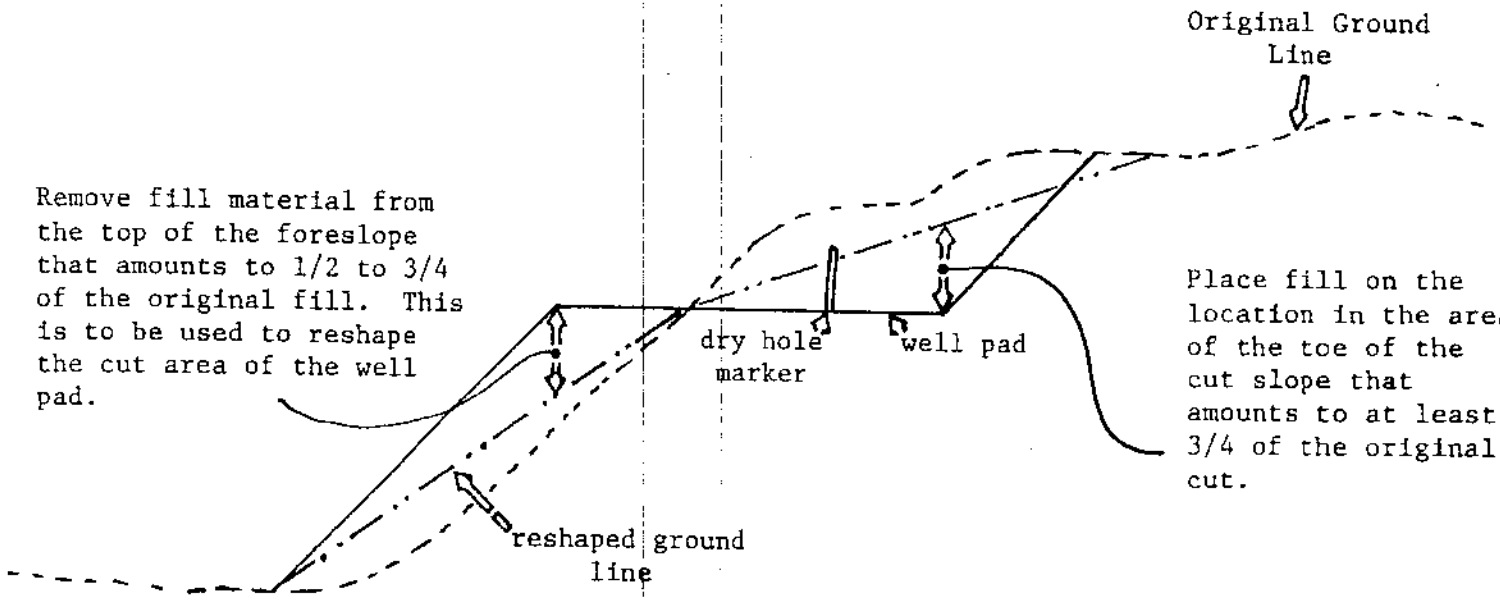
Alternative C - Side Slope

Equipment in Place



Alternative C

Rehabilitation for Production



WELL SITE RESTORATION
AND
STABILIZATION BY SLOPE REDUCTION

Central tank batteries and truck depots will not be located on ridges that are less than 200 yards wide, within one-half mile of any area vegetated with juniper that is larger than ten acres in size, within one-half mile of any surface water, or within the critical elk winter range. All pipelines and flowlines are to be placed under or adjacent to the access roads. Powerlines, where permitted, will be along the access roads unless they are on ridge tops. If the access roads are along ridge tops the powerlines are to be placed so they are generally below the ridge line. Buried power cable is to be placed so they are generally below the ridge line. Buried power cable is to be placed along the access roads. All tank batteries and separator facilities are to be located outside the critical elk winter range.

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Road surfacing material will not be mined in the area unless it is from areas of privately-owned minerals or "coal only" federal minerals.

b. Areas Inside the Wilderness Study Area

1. Right-of-way clearing prior to beginning construction shall be limited to 20 feet on each side of the centerline.

2. Natural gas pipelines require underground placement due to freezing and will be considered on a case-by-case basis. If a pipeline is allowed it will be placed adjacent to existin road rights-of-way.

3. If sufficient top soil is not available to reestablish vegetation to a satisfactory degree, it may be necessary to haul in top soil.

4. "The operator will mulch all areas of disturbance including roads with native hay, straw, or excelsior wood fiber and/or soil retention blankets or nettings made of paper, jute, cotton, or biodegradable plastic. All manufactured or processed materials are to be installed according to manufacturer's specifications. Native hay or straw is to be weed-free and be applied at the rate of approximately two tons per acre. The mulch is to be anchored 2 to 3 inches deep with a straight colter with 6 to 12 inch spacing. A disk may be used if the mulch is left sufficiently exposed to afford protection. Mulch should be anchored perpendicular to the prevailing wind on flat sites and on the contour on slopes. Mulch is to be applied after the reseeding is completed."

5. All seeding will be done by broadcasting and raking or hydromulching. Seeding will not be done with a drill as this creates definite rows that are very evident when the grass is short.

6. Grasses and forbs that are compatible to the area adjacent to disturbed areas will be reseeded or transplanted. This may include yucca and sage.

7. Complete fall seeding after September 1 and prior to ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15. To maintain purity and quality, certified seed will give the best results.

8. All weeds that may become evident on the disturbed areas will be removed by hand or sprayed with an approved herbicide.

9. Supplemental watering and/or reseeding may be required if a significant amount of vegetation has not been established by July 1, 1985.

10. Prior to July 1, 1984 all disturbed areas, including the location and access road will be reclaimed by pushing fill material back into the cuts up and over the backslope so the site blends exactly with the existing topography. Leave no depressions that will trap water and form ponds.

11. Access to the location will be only by foot, horseback, or helicopters.

12. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench. Waterbar spacing on the location is to be as follows: 50 feet apart from the top of the cut slope to the lower edge of the disturbed area.

13. Distribute stockpiled top soil evenly over those areas not required for production and reseed as described above.

14. The pumping unit is to be located in a basement-type structure.

15. All production facilities, except for the pump, will be located outside of the WSA. Flowlines will be in roadways approximately six feet away from the bottom of the cut slope.

16. Pipeline trenches shall be compacted during backfilling. Pipeline trenches shall be maintained in order to correct settlement and erosion.

Pipeline Transmission

Oil and gas operators must meet requirements of the Department of Transportation and the Interstate Commerce Commission as outlined in Title 49 CFR Parts 191 and 192 for transportation of natural gas and oil by pipeline.

II. Private Surface

This plan is directed at the leasing of federally-reserved oil and gas underlying federal surface. The plan also addresses the development of federally-reserved oil and gas underlying both private and state surface. The portion of the plan that addresses private or state surface is provided only so the whole picture is presented. The BLM will not be involved in the development of oil and gas underlying any private or state-owned surface.

The only involvement the federal government has in the development of privately-owned minerals is the issuance of rights-of-way where federal surface is crossed.

III. ~~State Surface — Federal Minerals~~

There are is no federally-reserved minerals underlying state-owned surface in the Fortification Creek Area.

IV. Post Studies

1. Evaluation of the applicability of stipulations attached to the lease and/or "Application for Permit to Drill" (APD).

   An evaluation of stipulations attached to the lease will be made at the time of the presite inspection. Care must be taken to avoid personal bias to enter into the evaluation but the stipulation is to be evaluated as to the potential impact that is present and applicability of the mitigation. For record purposes, this should be done on the presite check sheet.

   Stipulations that are attached to the APD will be evaluated for applicability during compliance inspections. To avoid overlooking stipulations, the applicable ones and those that do not apply should be listed, by number, on the compliance inspection sheet.

3) rutting and a general damaging of the location during wet weather; this may require surfacing the location or a road onto the location and a work area around the production facilities including the well head;

4) flagging on production pits and fencing around pits; flowlines - erosion and subsidence; more water bars may be required along with backfilling and reseeding.

F. SIGNATURES

Prepared By: Donald E. Crockford 11-10-82

Reviewed By:

Approved By: Area Manager 11/10/82 Date

District Manager 11/17/82 Date

2. Evaluation of the effectiveness of Stipulations:

The effectiveness of stipulations is, to some extent, subject to personal bias with several exceptions.

a) Waterbars will control runoff, by shortening slopes, if they are properly spaced and constructed.

b) Erosion is excessive and must be stabilized if:

1) rills or gullies deeper than nine inches, regardless of the width, are present;

2) areas of erosion that are at least three inches deep and four feet wide are present.

c) Vegetative cover must be capable of stabilizing the soil surface from erosion. The vegetative cover, exluding weeds, on at least 75% of the drilling location, must be at least 50% of the vegetative cover on the reference area that was decided on at the presite inspection. This could be expected to be 3-to-5 years.

3. Areas requiring periodic monitoring after a producing field is established:

a) roads

1) ditches - for excessive erosion; more culverts, relief culverts, or drainage relief culverts may be required;

2) surfacing may be required on all or part of the road;

3) unnecessary roads may need to be reclaimed.

b) locations

1) erosion on the cut slope; more waterbars, cross-slope ripping and reseeding may be required; fertilizer may also be required;

2) erosion on the foreslope; the slope may be excessively steep and reshaping and water bars may be required; water should not be allowed to run off the location and over the foreslope at any time during the production life of an oil or gas well;