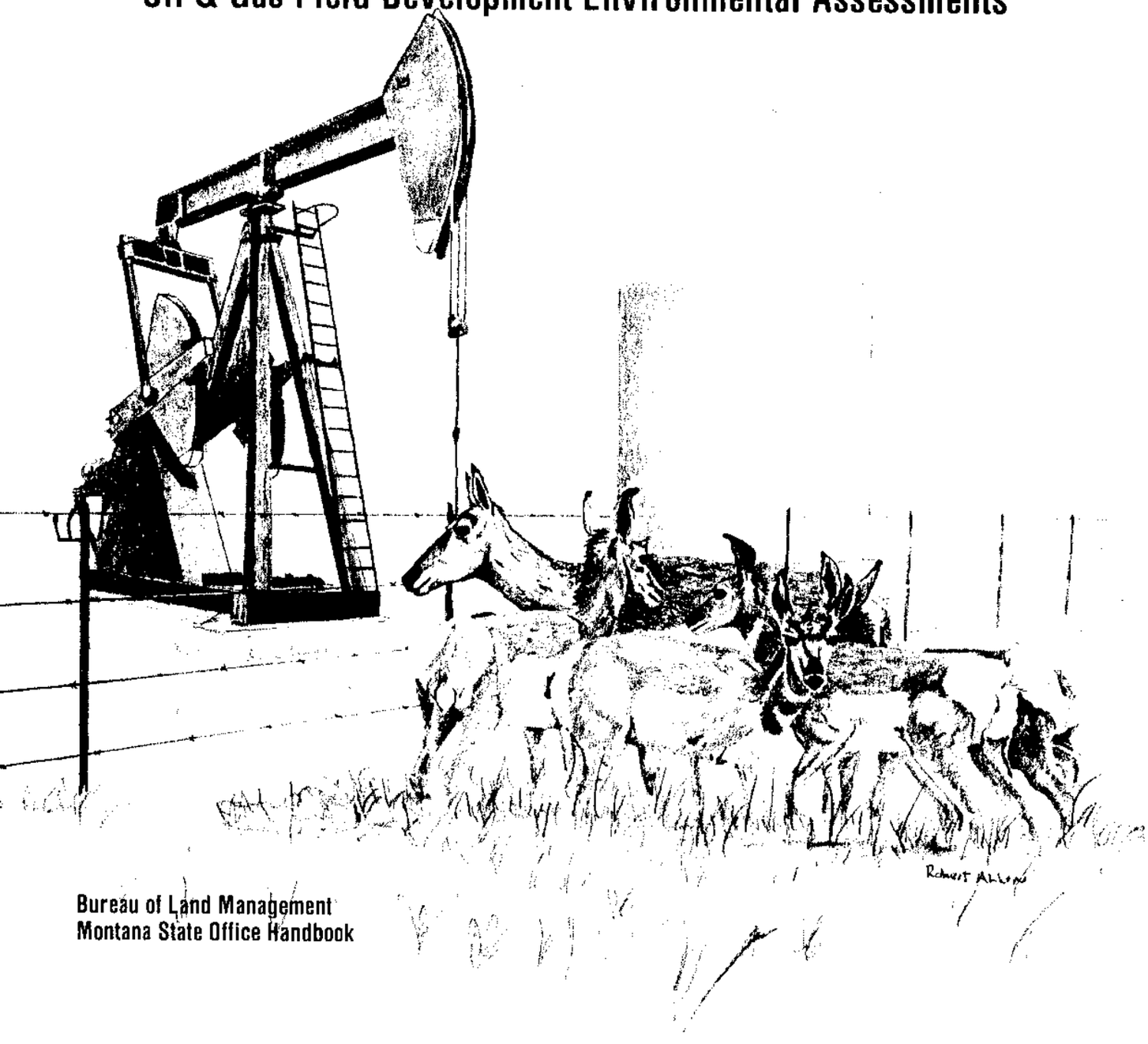
H-3160-1
Technical and Environmental Considerations

Oil & Gas Field Development Environmental Assessments



Bureau of Land Management
Montana State Office Handbook

H-3160-1 - TECHNICAL AND ENVIRONMENTAL CONSIDERATIONS

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H-3160-1 TECHNICAL AND ENVIRONMENTAL CONSIDERATION

I. INTRODUCTION

This Handbook is designed to supplement the BLM Manual 3160-1.16 and BLM Handbook H-3160-1 by providing MSO procedures for the development of oil and gas field development environmental assessments (EAs). The Handbook should be used in conjunction with the BLM Manual 3160-1 and BLM Handbook H-3160-1 and local district or resource area guidance on EA preparation. Other EA preparation guidance documents available are the Council on Environmental Quality Regulations regarding National Environmental Policy Act (NEPA) documentation (40 CFR 1500), the Bureau planning regulation 43 CFR 1600 and Departmental Manual (DM) 516.

The purpose of this handbook is to provide an MSO procedural format for consistent development of oil and gas field development EAs, to establish consistent levels of intensity guidance for the EAs, dictate appropriate timeframes for completion, and provide guidance on appropriate levels of interagency coordination.

II. POLICIES AND PROCEDURES

A. When Field Development Environmental Assessments are Required

The BLM Manual, 3160-1.16 requires that "The proposed drilling of the first confirmation well following discovery by an exploratory well . . . requires an Environmental Assessment (EA)." The H-3160-1 further states that "An EA must be prepared automatically when an application is filed to drill the first Federal or Indian confirmation well in a newly discovered field." Thus, each new field involving Federal minerals should be analyzed at this point for the cumulative impacts of full field development and the findings and necessary mitigation measures documented in an EA. To accomplish this, the manager selects a team leader familiar with oil and gas development and related impacts to coordinate the field EA effort. The operator(s) should be asked to provide a conceptual development plan for the field to assist in this analysis. The term "confirmation well" is loosely defined, but is construed usually as the second well drilled after a discovery in the same formation, regardless of surface ownership. However, management may allow one or two additional wells after the discovery well is completed with a Categorical Exclusion Review (CER) if these are needed to better define the extent of the discovery. If the oil and gas operator elects, he may engage a third party contractor to conduct the required field analysis. Normally, the Bureau must, at a minimum, accomplish internal scoping prior to contract issuance.

B. Timeframes for Completion

The BLM is committed by Onshore Order No.1 to processing and approving APDs within 30 days except in the case of delay due to EA preparation or existence of other involved environmental issues (OO No. 1; III, D, Processing Timeframes). We anticipate Field EA timeframes of 30-90 days (for a low level EA as identified by scoping) to 3-6 months (for high level EA's with public involvement). If timeframes are to be exceeded due to the above delays, the operator of the proposed APD must be apprised of progress on the application monthly.

C. Field Analysis as a Basis for a Managed Oil and Gas Program

Even though oil and gas development is unpredictable to a certain extent, there are scientific ways to forecast development activity. These include use of seismic surveys, and available industry and government geologic data.

Activity can be predicted in a general area by the above methods, but these methods still do not detail exactly where development will occur. However, spacing regulations in most states allow wildcat drilling only in certain "windows" with predictable subsequent field spacing. These can be superimposed over a topographic map or aerial photos and areas with geologic potential and suitable surface locations plotted. Once these suitable locations are identified, then alternative road and pipeline systems can be developed to link the identified areas in a planned network. For obvious reasons this method should not be used for "rank" wildcat wells and applies only to field development EAs. Normally, not all spacing units in an area will be developed even in a developing productive area, due to geologic, economic and petroleum engineering factors. In any field spacing analysis, Bureau and Industry specialists in this area must be consulted.

Extreme caution must be exercised in utilizing a spacing window grid as a guide to development in wildcat areas or areas just beginning development.

The team leader obtains specialist input as needed, and public involvement is accomplished pursuant to a public input plan designed commensurate to the level of controversy involved. The key points to remember are: (1) the use of potential field geology and related spacing windows as a framework for an EA, and (2) consideration of needs for facilities beyond the drilling phase. These facilities include production facilities, pipelines of various types, high standard roads, power lines, water disposal facilities, and other facilities such as gas compressor stations.

D. Objectives of Field Analysis

Preparing field analyses for oil and gas operations, and getting basic preliminary information concerning projects out front, can help forestall public and management concerns.

In addition to compliance with NEPA and BLM manual directives, the field analysis should meet the following objectives:

1. The facilitation of processing and decisions on future APDs, production facilities, access roads, and other special use permits.

2. The addressing of cumulative environmental effects to develop a programmatic assessment addressing specific actual field operational concerns.

3. The providing of an analysis process that can be revised and updated as new information is obtained.

4. The facilitation of public involvement and understanding by industry and the public of oil and gas development.

5. The addressing of the effects of a reasonable full field development scenario pursuant to current Council on Environmental Quality (CEQ) guidelines.

6. The identification of problem areas or areas sensitive to development because of surface resource concerns and the development of mitigation packages.

7. The coordination of interagency responsibilities to afford streamlining of procedures to meet required timeframes.

E. Scoping

An important element of scoping is the review of the operator's plans for the area. These should preferably be submitted in writing and discuss definite wellsites, probable wellsites and marginal areas. The discussion should include facility location, powerline locations, access routes, etc.

It is important to involve the oil and gas operator in all phases of the field analysis process.

As a result of scoping, the field assessment may vary from an abbreviated low level EA (7-10 pages), to a high level, indepth EA involving interdisciplinary teams and public involvement. A significant determination would result in preparation of a Field Development Environmental Impact Statement (EIS). If significant public controversy is apparent, it may be appropriate to conduct an EIS rather than a high level EA. An EIS need not cost more than a high level EA.

Scoping should result in:

1. An environmental assessment area of a size that can be efficiently (i.e., in a reasonable timeframe) evaluated by team specialists.

2. The selection of a homogenous area that corresponds to an overall transportation plan and other resource activity.

3. A selected area that considers topographic and physical barriers and major geological features.

4. The consideration of public issues and management concerns identified via the scoping process.

5. An area consistent with unit area boundaries if these are applicable.

6. An area consistent with KGS boundaries if these are applicable.

7. The incorporation of local or site-specific areas where critical problems or management concerns are known to exist (i.e. archeological, historical sites, wildlife, grazing allotments, special management areas, etc.).

8. A literature search showing all existing management decisions and constraints for the area.

F. Physical Needs for an Oil Field

The team leader, or member of the team, must be familiar with the components of construction, development, and production and abandonment of an oil field. The following list of considerations is not exhaustive, but should serve as a guide as to items needing consideration.

1. Well siting: Usually the size of the drilling rig and attendant equipment govern the dimension of the pad. As a rule, deep wells require the larger drill rig which requires a pad size of at least 400' x 300'.

2. Spacing requirements: Rules vary greatly and those specific to the area must be researched to determine spacing "windows."

3. The addressing of traffic and heavy trucks required to move large and over-width and over-weight loads. Average number of truck loads of equipment requirement to move and "rig up" a drill rig is 42 to 45. Turning radii must be determined.

4. Road Access: Use of scratch grade versus upgraded roads, standards pursuant to the BLM "Gold Book." Determine number of acres to be disturbed.

5. Pipelines: Producing wells may require one to five pipelines. Pipelines generally will parallel access roads to a main pipeline corridor. Gas pipelines are essential to all wells having natural gas to transport gas to a processing plant. Flaring of gas is not only an environmental concern but may be a waste of a natural resource. Flaring/venting should be addressed within the context of NTL-4(a). If the well produces a large quantity of water, a pipeline disposal system may be necessary. Some oil companies utilize a hydraulic or fluid lift system to pump oil to the surface. This requires a "dry gas" pipeline from a processor plant to the wellsite.

6. Tank batteries and production facilities: All producing oil wells require a storage facility of a sufficient size to accommodate production. Most well locations are constructed large enough to accommodate heater treaters, separators, and storage tanks. Water disposal systems per NTL-2b must be addressed.

Central Tank Batteries (CTBs) can be located up to a mile from the oil well and several wells on the same lease can be connected to the CTB by flowlines. The use of CTBs reduces overall length of major pipeline corridors.

7. Powerlines: Normally each oil well and production facility and compressor station requires 100 horsepower of electricity for continued operation. Normally the power grid system consists of 14.4 kV, three-phase lines and centralized substations which are supplied by either a 41.6 kV or 115 kV transmission lines. In large oil fields, an electrical grid system usually accommodates 30 facilities per one 14.4 kV three-phase distribution system. Powerlines up to 33 kV can be buried as well as 7.2 and 14.4 kV distribution systems from the substation to wells and facilities.

The team should contact local power companies and a Rural Electric Association (REA) representative and become acquainted with the overall electrical delivery systems for its area. Electrical engineering consulting firms can aid the team and provide technical answers.

8. Telephone: Telephone communication systems are sometimes necessary to the oil and gas industry for its operations. Most drilling operations need a temporary telephone system while on location, or utilize a satellite communication dish. Usually these lines are laid on the ground or attached to a fenceline. Permanent telephone lines are buried and require a surface junction/terminal box at periodic intervals.

9. Subcamps and crew quarters: In remote locations, occasionally a self-contained work center is needed to house drilling and operation crews for the duration of the project. The team should identify areas suitable for these facilities in the initial field model, if needed.

G. Developing the Field Analysis

The team assembles the data for the EA. The following procedure and methodology is suggested:

1. Delineate the area boundary using internal agency and public (if necessary) scoping process.

2. Map the surface ownership: private, State and Federal.

3. Map the existing Federal oil and gas leases, their status, and any special requirements (especially no surface or restricted occupancy areas).

4. Map the existing roads, pipelines, powerlines, oil and gas wells, and abandoned wells.

5. Identify existing air quality permits, issues and concerns.

6. Map the current transportation plan for the area.

7. Identify other necessary resource protection mitigations, including activity limitations, due to air quality T&E plant and animal species issues, and cultural resource concerns.

8. Map the ecogroups (Breaks, Bottoms, Grasslands, Slopes, etc.).

9. Map all existing range developments (water wells, pipelines, dugouts, dams, fences) and allotments.

10. Map any sensitive wildlife areas (bighorn sheep, eagle nests, grizzly bear habitat areas, grouse dancing grounds, etc.) and unique vegetation and special management areas.

11. Identify the spacing windows.

12. Map geology, identify most desirable locations geologically. Use of KGS geologists is encouraged if KGSs are involved.

13. Identify from aerial photos and field checks the best well location in window. If there is not a suitable location in the window, identify a suitable directional drilling location, as required by critical geology or special lease stipulations.

14. Identify main pipeline and powerline corridors (usually these are associated with the transportation plan). These corridors would follow main routes and arterials.

15. Connect well location identified with the transportation plan.

16. Select the different alternatives for road collecting systems and through routes.

H. Spacing Window Discussion

1. Each state oil and gas commission has established a set of field rules which govern the spacing distance between oil wells and gas wells. The commission has set these rules, via a public hearing process, to prevent waste, avoid the drilling of unnecessary wells, protect correlative rights and establish a spacing pattern that is uniform in size and shape for a particular hydrocarbon reservoir.

2. The BLM utilizes these public hearings to gather input on cases involving Federal land, and issues decisions independent of any commission decision.

3. The state spacing orders as adopted by BLM for certain reservoirs shall cover all lands underlaid by the reservoirs. When found necessary to prevent waste or to avoid more drilling or to protect correlative rights, the spacing order for these pools may be modified to increase or decrease the size of the spacing unit. The commission and BLM may permit the drilling of additional wells on a reasonably uniform plan to efficiently develop the pool or producing zone and to identify the outer limits of the new pool.

4. Most states, including North and South Dakota and Montana, have developed an initial well spacing distance according to the producing formation and are generally identified to a legal government quarter-quarter section configuration, and these statewide spacing orders have been adopted by the BLM.

5. When a wildcat field is evaluated and the porosity of the producing zone is determined, temporary field spacing rules are placed in effect until additional development wells are drilled and placed on production. The BLM conducts a similar spacing review of Federal mineral estate and makes spacing decisions. As discussed, these generally are consistent with the state orders. It is important to remember that normally not all spacing units in an identified area are developed. Development will be dependent on reservoir geology, economic and petroleum engineering considerations. Coordination with Bureau and Industry Specialists in these areas is essential to the development of a credible field EA.

6. The team can effectively use these development spacing patterns and criteria to identify potential drilling areas within any proposed development area.

7. Secondary and tertiary recovery methods require additional wells to stimulate and enhance production. These wells usually are not adaptable to a predetermined spacing pattern but rather are sited based on reservoir engineering needs. The Interdisciplinary Team (ID team) should be aware of the additional requirements and access road needs. A typical configuration called a 5-spot recovery system would include up to four injection wells clustered around a producing well. If this configuration was superimposed on an established field, there might be up to 20 wells/section for shallow formations with an additional 10 wells for deep formations all on a single section (640 acres) per formation. In addition, there could be as many as four disposal wells per oil field which, in places, could have an additional impact on a few sections. Many fields in eastern Montana and western North Dakota have up to seven producing formations. In a typical large-field complex on level to rolling topography, the normal configuration for a secondary recovery system is approximately 16 to 20 wells per section near the outer defined limits of the producing reservoir.

8. In steep, undulating topography, the team will have limited drilling options and access routes due to the terrain. Therefore, the team will have to pick alternate sites which may be suitable for a directional drilling location.

I. Team Coordination

1. District Manager and Area Manager identify the area of concern (internal agency scoping), and assign a team leader for the project, usually a staff person with multidisciplinary background and a familiarity with oil and gas development and related impacts. In cases where other SMA surface is involved, consideration should be given to assigning the other SMA the lead for the project; especially if the majority of impacts, issues and concerns are located in the other SMAs jurisdictional area.

2. The team leader is responsible for the following:

a. Identifying and drafting a preliminary list of known issues and concerns.

b. Identifying if specialists are needed and identifying personnel. If a team is not utilized, the team leader will be the primary author of the EA with assistance and oversight provided by the Area or District Office Environmental Coordinator.

c. Establishing contact with local public as necessary.

d. Setting up a preliminary meeting and assembling the team when needed.

e. Preparing an information package for the team. This should contain:

1. Surface and mineral estate ownership, status, and special stipulations.

2. Lease information derived from State and District Office Files.

3. Ecogroup map.

4. Transportation plans.

5. Other resource information; i.e., wildlife, timber sales, grazing allotments, special use permits, etc.

6. Existing oil and gas developments and/or vicinity of nearest developments.

7. Alternative discussion map which identifies legal operating windows (state oil well spacing) access, roads, lease information, etc.

f. Selecting team members. When a team is required, the core group should consist of a minerals specialist, (Minerals Specialist, Natural Resource Specialist/Geologist/Petroleum Engineer, etc.), lands and recreations specialist, wildlife biologist, transportation planner, and a range conservationist. Additional members may include an archeologist, a visual management specialist, hydrologist, writer/editor, sociologist, economist, and an air quality specialist/meteorologist. When other SMA surface is involved, team members from the SMA with special expertise in these areas, and a knowledge of oil and gas issues, should be selected.

g. Setting up team meetings. The first team meeting should:

1. Provide team members with necessary background information.

2. Review preliminary issues and concerns and identify additional concerns (finalize internal agency scoping).

3. Assign team member responsibilities.

4. Establish a schedule and timeframe.

5. Formalize alternatives. The team formalizes objectives and alternatives and prepares evaluation criteria.

6. Input preparation. Each specialist prepares a list of effects of implementation, mitigating measures, assumptions, and his/her recommended alternative.

J. Public Involvement Package Preparation (if deemed necessary by the team)

1. The team leader assembles an information package for the public which includes:

a. Cover letter explaining the objective of the project.

b. List of identified issues and concerns.

c. Description of alternatives.

d. Effects of implementation by alternative.

e. A map showing each of the alternatives.

2. Public involvement participants should include:.

Leaseholders
Oil companies
Oil Industry associations (IPAMs, RMOGA)
Private landowners
Federal and state agencies
County commissioners
Landowners associations
Sportsman groups
Concerned citizens
Environmental Groups (i.e., Sierra Club, Friends of the Earth, National Wildlife Federation, etc.)

3. Followup on public involvement. Team leader makes personal contact with those who have not replied within the allotted time if necessary.

a. To summarize public input, the Interdisciplinary (ID) team assembles all public input and evaluates their concerns and issues (public scoping). Input is then incorporated in the analyses process. The team leader prepares a response to the public input and identifies how their comments and concerns were used.

b. The entire team develops the preferred alternative and prepares a list of management constraints and requirements.

K. EA Finalization

1. Prepare EA and Decision Notice following existing Bureau guidance.

2. Draft EA reviewed by Area and District Managers, and public if necessary.

3. Final revision and signature

4. Mail approved EA/Decision Notice to interested public. Advise public and applicant of formal appeal rights. Note that in an APD approval the permit is not rendered invalid by an appeal. For the permit to be "suspended," IBLA must grant the appellant a stay, or a court order must enjoin the applicant from further action on the lease.

L. A Properly Completed Oil and Gas Field Development EA is Achieved When:

1. The manager is able to look at resource concerns on an areawide basis and comes up with an overall plan that effectively assesses overall resource impacts.

2. The manager has achieved effective coordination with the public, other agencies, landowners, permittees, leaseholders, etc. before the actual drilling permits are applied for.

3. Response times to individual subsequent drilling permits and special use permit requests are significantly streamlined, while at the same time a better overall product is achieved on-the-ground.

4. Quality of on-the-ground development is higher because concerns are identified early in the planning process and management constraints/ alternatives can be built in to resolve problems.

5. The companies have pre-identified sites as much as possible, which will result in improved APD response times.

6. Leasing recommendations are made in sensitive areas where very definitive lease stipulations are needed.

7. The manager is comfortable that routine development activities have the outcome desired, thereby providing time to focus on cases where proposals do not conform to the plan and which generate unusual or undesirable results.