2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the activities of Alternative 1: Do Not Permit (No Action), Proposed Action (Savoy's proposal), and Alternative 2: Modified Proposed Action with Conditions of Approval. It also presents the predicted attainment of project objectives and the predicted effects of all alternatives on the quality of the human environment in comparative form. This comparison provides a clear basis for choice among the options for the decision makers and the public. These predictions are based on the relevant resources and the predicted effects of all alternatives in Chapter 3.0 (Environmental Consequences).

2.2 History and Process Used to Formulate the Alternatives

A detailed timeline of the entire planning process to date can be found in Section 1.6. The interdisciplinary team (ID team) initiated internal and external public scoping in June 2003. The ID team sent a letter to 43 individuals, groups, organizations, or agencies. The ID team received over 600 responses.

In July, State Senator Bruce Patterson held meetings in Grayling and Lansing to solicit comments on the proposal. In addition, Governor Granholm wrote a letter to the Forest Service requesting reconsideration of the proposed location of the SB 1-8 and associated facilities. During July, the agencies met on-site with Savoy to discuss and consider alternative locations for drilling.

On August 18, 2003, a public meeting sponsored by the MDEQ in cooperation with the Forest Service, BLM, and MDNR was held to hear comments relating to this proposal. Approximately 150 people attended the meeting. Most comments requested that we not allow drilling, buy back the mineral rights, or, recognizing the rights granted, do what we can to protect the values of the Mason Tract.

In September, Savoy Energy filed a new drilling permit application with the State and the BLM. These new applications moved the surface hole location to one of the preferred alternative sites identified in July and also moved the production facilities almost 2 miles further to the east. On November 26, 2003, the DEQ approved the State drilling permit application. Savoy's proposal will be analyzed as the Proposed Action in this EA.

Based on comments received during scoping, the ID team identified issues as outlined in Section 1.8. One significant issue was documented. Using this issue, the ID team designed a modified proposed action alternative, Alternative 2, to address the issues, satisfy the needs, and meet the objectives of the project. The alternatives are described in detail in Section 2.5 below.

Due to the concerns raised over effects of noise on the users of the Mason Tract, the Forest Service, in cooperation with the BLM, contracted out a noise analysis. Hoover & Keith, Inc. completed the "Noise Impact Assessment for Proposed Production Facility associated with USA & State South Branch 1-8 (Proposed Natural Gas Well)" in July 2004 (located in the project administrative file at the Mio Ranger District Office). The results of this noise analysis

and recommended mitigation measures were considered in formulating the modified proposed action or Alternative 2.

2.3 Alternative Design, Evaluation, and Selection Criteria

The District Ranger, working with the ID Team, identified the following criteria to be used to design and evaluate alternatives. These criteria, along with the project objectives, will be used to decide which alternative to select.

The South Branch area is within Management Prescription Area (MPA) 4.5 (Kirtland's Warbler) and MPA 6.1 (SPNM) as identified in the Forest Plan. The proposed well pad location, road improvements, and a portion of the flowline installation are within MPA 6.1. The proposed production facility, flowline and pipeline installation are located in MPA 4.5. The team reviewed the desired future condition, goals, standards and guidelines for the management areas and identified the following project-area direction:

Management Direction for All MPAs, including the South Branch Area

For all MPAs, the Forest Plan (pages IV-33 through IV-66) states that:

- No surface occupancy will be permitted within 300 feet, measured at a perpendicular, from the normal high water mark of any river, stream, or lake. (IV-52)

- "Where there are reasonable alternatives, surface-disturbing activities will take place outside of old growth." (IV-64)

- "…The surface occupancy determination will be based on the presence of reasonable access within old growth areas. (IV-65)

- "The Forest Service will protect the rights of the Federal Government, encourage inventory and development of Federal minerals, respect private mineral rights, and ensure operators take reasonable and prudent measures to prevent unnecessary disturbance to the surface."(IV-65) The Plan also states, "Allow other types of exploration on a case-by-case basis following a site-specific environmental analysis." (IV-65)

Management Direction for MPA 4.5, including the South Branch area

- No drilling, exploration, construction, or maintenance involving the use of heavy equipment shall take place within one-half mile of or create noise greater than 85 decibels in occupied habitat, between May 1 and September 30. (IV-171)

- "Any well emitting toxic or sour gases into the air within one-half mile of occupiable habitat may not be operated during May 1 to September 30." (Page IV-172)

- "Noise from production operations will be less than 85 decibels at 100 feet." (Page IV-172)

Management Direction for MPA 6.1 Semiprimitive Nonmotorized (SPNM)

The Forest Plan (pages IV-182 through IV-198) states that it provides opportunities for mineral exploration and development consistent with the semiprimitive experience designation.

- "The existing road that provides access to the Mason Chapel will remain open to motorized use to allow elderly people to continue viewing this historic site." (IV-190)
- "Federal oil and gas leases will contain a controlled surface use stipulation with a maximum surface development density of 1 location per 640 acres." (IV-195)
- "Flowlines follow the access road where practical." (IV-195)
- "Needed pumps are run by electric motors or equipped to minimize noise." (IV-195)
- "On-site facilities are painted earth tone colors." (IV-195)
- "Access to oil and gas development is by low standard road with minimum clearing. These roads are gated. " (IV-196)
- "Production facilities are outside the area when practical. "(Page IV-195)

2.4 Alternatives Considered but Eliminated from Detailed Study

Savory's original proposed surface hole location was considered but eliminated from detailed study. It was partially analyzed but due to concerns raised by the public and other agencies, the site was moved to a different location. (Section 2.2). Savoy filed a new drilling permit application for this new location. The agencies and Savoy also evaluated two other possible surface hole locations. All of these alternatives are summarized below, including the rationale for eliminating each from further study.

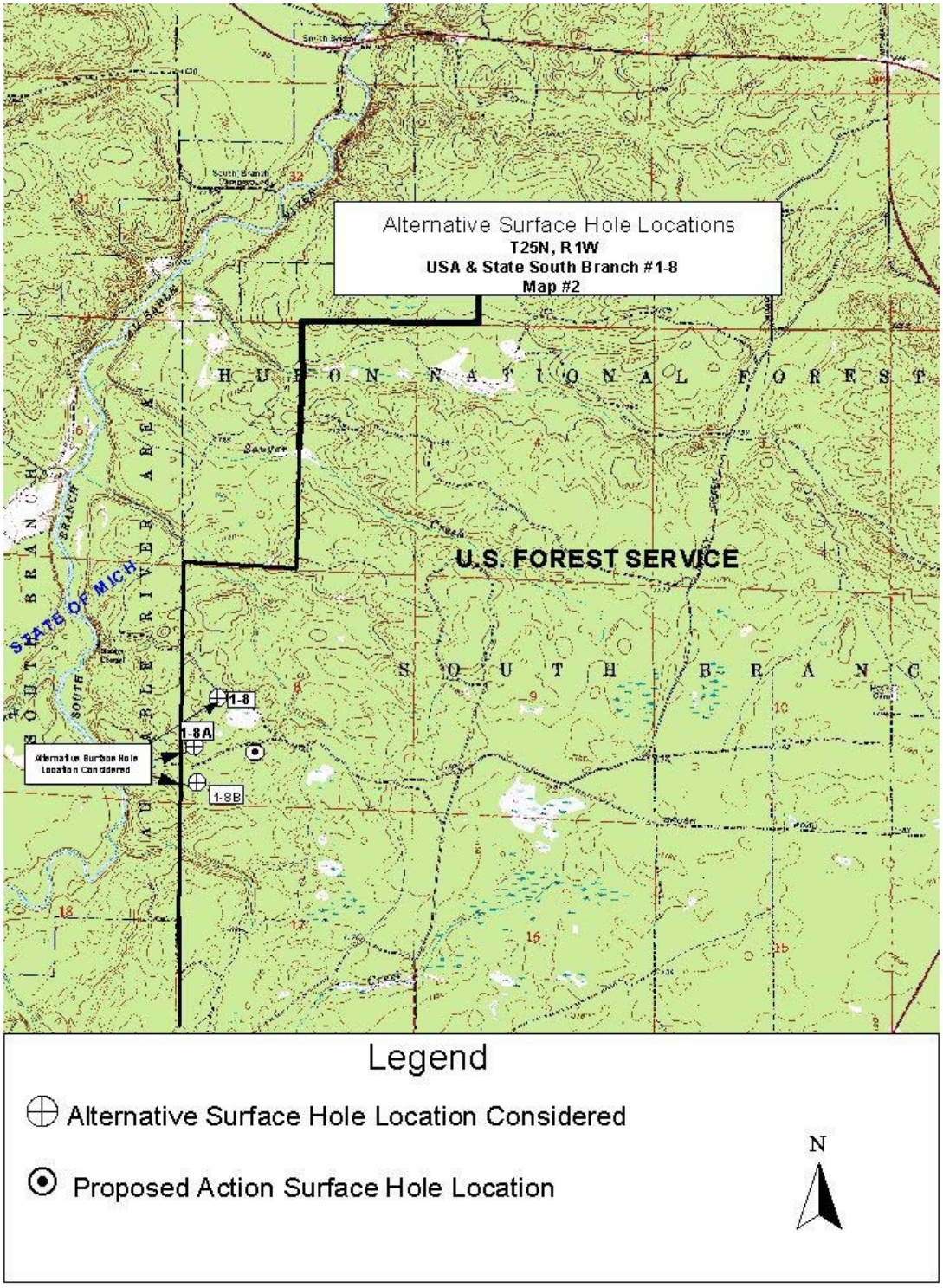
1. The original location was for the well and production facility as shown on the Map 2. It was approximately one half mile from the South Branch of the Au Sable River, along Forest Service Road (FSR) 4209 leading to the Mason Chapel, 700 feet from the Mason Tract boundary and 2,738 feet from the Mason Chapel. Based on the lease rights held by Savoy in this area, this was a viable location. However, during public scoping, objections were raised to the proposed location because it created a visual conflict for visitors traveling to the Mason Chapel, there were concerns raised over long-term impacts of noise and road improvements, and, in general, some thought that oil and gas development was not appropriate in this area. Forest visitors would not expect to see a well pad and production facilities along the road, to hear well drilling and production activities, nor to experience improved road conditions. FSR 4209 (Mason Chapel Road) is maintained as a road to provide access to the Mason Chapel. Management activities along FSR 4209 are sensitive to maintaining a natural looking environment in a semiprimitive nonmotorized area even with the existing road use and

man-made improvements (Mason Chapel, gated roads, and river docks) in the Mason Tract, which is managed by the Michigan Department of Natural Resources (MDNR). This alternative was dropped from further consideration when a second proposed location was voluntarily submitted.

2. Site 1-8A was located off of FSR 4208 (spur road off of FSR 4209), approximately one-third mile from the South Branch, 300 feet from the Mason Tract Boundary and 1,205 feet from the Mason Chapel. The production facility was moved 1.7 miles east of the original location along River Lake Rd. outside the SPNM area. The well location was too close to the Mason Tract boundary and in preliminary hand auguring, 10-15 feet deep, the water table was close to the surface. This was a viable well location however the same concerns for the original proposed location held true except that access would not be directly from FSR 4209. The well pad was also next to a wetland. The agencies were suggesting locations further from the boundary to eliminate the close proximity to the river, the Mason Chapel, and the Mason Tract boundary.

3. Site 1-8B was located off of FSR 4208, less than one-third mile from the South Branch, 280 feet from the Mason Tract Boundary and 3,691 feet from the Mason Chapel. The production facility was also located at the same location as 1-8A. This location was eliminated from detailed analysis because the well pad location was even closer to the Mason Tract boundary and the South Branch of the Au Sable River.

Map 2. Alternative Locations Map for USA & State South Branch 1-8 Exploratory Well



2.5 Description of Alternatives, Including the Proposed Action and No Action

Alternative 1: Do Not Permit (No Action)

Under the No Action alternative, The Forest Service would not approve the SUPO and /or the BLM would not approve the APD. Current direction would continue to guide management of the project area. No exploratory wells would be drilled, no flow lines installed, nor production facility constructed to accomplish project goals. This alternative would not comply with the laws, regulations, policies and Forest Plan direction guiding mineral development on NFS lands.

- **Public vehicle access** – The FSR 4209 and 4208 would remain open to allow access to the Chapel and the Mason Tract.
- **Road maintenance** – Normal and emergency road maintenance would continue on all existing roads by the Forest Service, the MDNR and Crawford County.
- **Fire suppression** – Human-caused and naturally occurring wildfires would be suppressed.
- **Hunting and trapping** – Hunting and trapping would continue under the rules of the MDNR.
- **Camping** – Dispersed camping would continue under the management rules of the Huron-Manistee National Forests and MDNR.
- **Recreation** – Hiking, biking, canoeing, rafting, kayaking, horseback riding, berry and mushroom picking for personal use would continue under the Huron-Manistee National Forests management and MDNR.
- **Well and Pipeline maintenance** – Maintenance of the existing natural gas well in SWSENW, Section 19, T25N, R1W, and the pipeline along River Lake Road (aka Hickey Creek Road), would continue under the existing Huron-Manistee National Forests leases and special use permits.

Proposed Action (Savoy's Proposal)

BLM approves APD and FS approves SUPO subject to standard conditions of approval and mitigation.

1. Drill a single directional well to explore oil and gas potential on a 640 acre drilling unit, E ½, Section 7 and W ½, Section 8, T 25 N R 1W, as shown on the project area and location Map 3. The bottomhole location would be approximately 2,200 feet NW of the surface hole. Drilling and well completion would expect to take 45 days in late fall / winter, 2004-5 (MDEQ permitted drilling from December 1 – April 15). The well pad would be approximately 3.5 acres. Standard and accepted drilling techniques and practices using a rotary rig would be used. This includes a casing program, pressure control equipment, and proposed drilling fluids program. At the end of drilling, the contents of the reserve pit would be removed and disposed of by a licensed waste hauler. Hazardous materials, including stimulation and completion fluids, would be

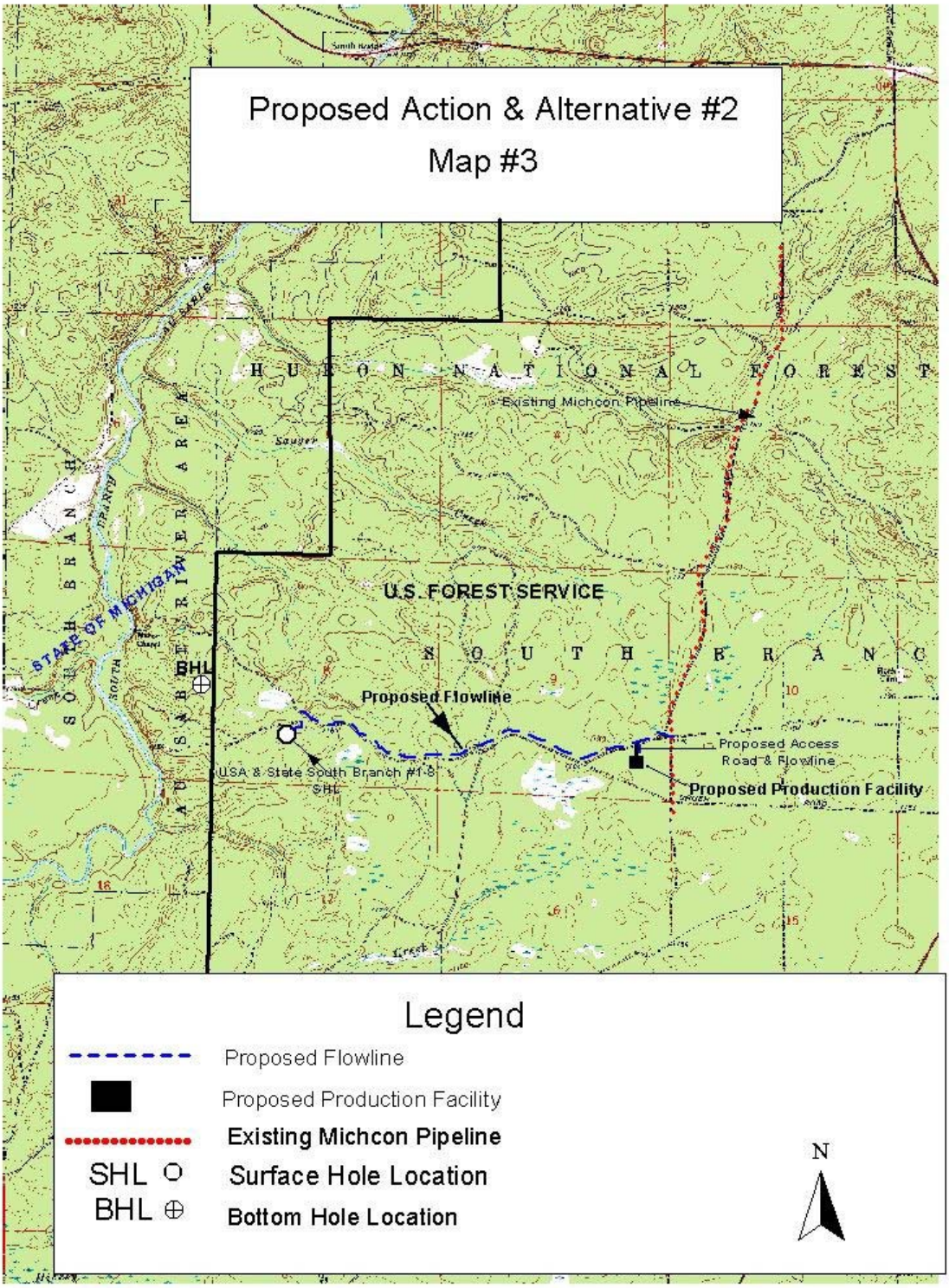
contained in steel tanks and disposed of by a licensed waste hauler. Hospital type mufflers (required by MDEQ) would be used to minimize the sound in the area.
2. Cut and fill the well pad area (approximately 3.5 acres) using a bull dozer, to level the surface for well drilling rigs, equipment, and pits.
3. Use and maintain existing roads for year-round access including snow plowing along: River Lake Road, FSR 4209 (Mason Chapel Road), and FSR 4208, to access the well site.
4. Construct and maintain 50 feet of new road across NFS land, 20 feet wide (approximately 0.05 acre) to access the well pad from FSR 4208.
5. Drill a water well at the well pad site to provide water for drilling and salt control during the life of the oil and gas well.

Activities 2, 3, 4, & 5 would occur prior to drilling the well.

Additional actions proposed if the well is productive include:

6. Production facility, SE, Section 9, T25N, R1W, (approximately 1.5 miles from the well pad) construction on approximately 2.0 acres located as shown on Map 3, including a gas/water separator, oil and brine tanks, dehydrator, compressor, volume bottle, and various meters for gas and oil monitoring.
7. Flowlines installed from the well site to the production facility site, buried along side the road bed and the pipeline to the Michigan Consolidated Gas transmission line, totaling approximately 1.7 miles.
8. Reclamation of the well pad leaving only 1/3 acre used for well operations.

Map 3. Proposed Action and Alternative 2 Map



Mitigation Measures Common to All Action Alternatives (Proposed Action and Alternative 2)

Access Roads and Flowlines/Pipelines

- Michigan Department of Natural Resources' *Water Quality Management Practices on Forest Land* will be used to manage the roads.
- Roads will be crowned or outsloped, which ever is appropriate, for drainage during construction and/or maintenance.
- The width of the road will not exceed 14 feet. An additional 3 feet of clearing can be done on each side of the road. Clearing width will not exceed 20 feet.
- Soil disturbed with the placement of the flowline/pipeline will be seeded with mix below.
- Slash created by flowline/pipeline placement will be placed on the disturbed areas after seeding.
- Roads into the well pad and production facility will be gated and locked.
- Comply with the *Manual on Uniform Traffic Control Devices* for placement of warning and work zone signs to control traffic during construction.
- Slash from the flowline location will be lopped and scattered to lie within 12 inches off the ground.
- Prior to reconstructing FSR 4209, approximately 150 feet of silt fence will be placed for wetland protection.

Visual Quality

- Leave a strip of undisturbed vegetation approximately 150 feet between River Lake Road and the production facility.
- The access road to the production facility will be curved to reduce visibility of the opening from the road.

Odor

- Each sales tank (contains commercial product) shall be equipped with a pressure-vacuum thief hatch and/or vent-line valve. (BLM Onshore Order #4)
- A person shall not cause a nuisance odor in the exploration for, or in the development, production, handling, or use of, oil, gas brine or in the handling of any product associated with the exploration, development, production, or use of oil, gas, or brine. (Michigan's Oil and Gas Regulations)

Noise

In summary, MDEQ Rule 324.1015 Nuisance noise stipulates that:

- A person shall not cause a nuisance noise in the production, handling, or use of oil, gas, or brine or in the handling of any product associated with the production or use of oil, gas or brine. As stipulated in the rule, "nuisance noise" means any noise from a well or its associated surface facilities that causes injurious effects to human health or safety or the unreasonable interference with the comfortable enjoyment of life or property.
- The noise attributable to a surface facility must not exceed 45 dBA at a distance of 1,320 feet from the facility.

- The State of Michigan Supervisor of Wells is authorized to use administrative controls to require the surface facility permittee measure sound levels at nearby noise-sensitive areas and at a distance of 1,320 feet, if the Supervisor of Wells receives 1 or more complaints of noise.
- The State of Michigan Supervisor of Wells is also authorized to require appropriate noise control measures for a surface facility permittee after all applicable information is considered and even if the 45 dBA noise level at 1,320 feet from the facility is not exceeded.
- In summary, Rule 324.1016 stipulates minimum construction standards for noise abatement at surface facilities.

Reclamation - Well Pad and Production Facility

- All woody debris (slash and stumps) associated with clearing the site will be stock piled along the edge of the site.
- Top soil generated during site leveling will be stock piled along the edge of the site.
- During restoration, the top soil will be spread evenly over the site except the road.
- Stock piled woody debris will be spread over the site but not violate Michigan's Oil and Gas Regulations, which states "…the area around the well and surface facilities is kept clear of flammable and combustible material stored within a radius of 75 feet,…, using the well or dike wall as the point of measurement."
- Site will be seeded with the following mix:

Common Name	Scientific Name	Pounds per Acre
Big Bluestem	*Andropogon gerardii*	3.8
Junegrass	*Koeleria macrantha*	1.1
Little Bluestem	*Schizachyrium scoparium*	3.6
Smooth Blue Aster	*Aster laevis*	0.1
Western Sunflower	*Helianthus occidentalis*	0.4
Cylindrical Blazing Star	*Liatris cylindracea*	0.4
Wild Bergamot	*Monarda fistulosa*	0.1
Gray Goldenrod	*Solidago nemoralis*	0.1
Oats	*Avena sativa*	14.0
Canada Wild Rye	*Elymus canadensis*	11.0

Invasive Plants

- Off-road equipment will be inspected by a Forest Service representative and washed to prevent introduction of non-native invasive plants that are not already present in the project area.
- Any new sensitive plants that are discovered will be evaluated and mitigation measures will be added if needed.

Wildlife, Threatened and Endangered Species

- Regional Forester's Sensitive Species will be protected. New sensitive species locations that are discovered will be evaluated.
- If drilling has not begun by March 1st, all activity in Section 8, T25N, R1W, will be delayed until after August 31st to protect northern goshawks.
- If the well is productive, normal well-associated activities such as driving roads, checking the well, etc. will be permitted in T25N, R1W, Section 8 year-round.
- After project-associated actions are completed in T25N, R1W, Section 8, the March 1 – August 31 timing restriction for northern goshawks will apply to maintenance activities in this section that result in a high-level of ground disturbance and/or human presence, such as access road reconstruction, extensive grading and/or other similar activities. Prior to these actions, the Mio Ranger District will be notified to allow the district's wildlife biologist to determine whether the activity would have potential adverse impact(s) on northern goshawks within the area. (An exception to this timing stipulation will apply only to a broken or leaking flowline/pipeline where immediate action would be required to prevent economic loss and environmental damage, and for human health concerns.) If the Forest Service determines that the action would not adversely impact the species, the timing restriction will not apply. However, any allowances to the timing restriction could not be applied universally to other similar actions that may arise in the future (i.e., each action – other than the previously mentioned flowline/pipeline exception - requires a separate determination). If the Forest Service determines that the action would adversely impact the species, then the activity will not be permitted during the goshawk timing restriction mentioned above.
- All open-vent exhaust stacks on production equipment (e.g. heater-treaters, separators, dehydrators, in-line units, etc.) will be constructed, modified, and/or otherwise equipped to prevent birds and bats from entering and to the extent practical, to discourage perching and nesting.

Heritage Resources

- Protect cultural resources that may be identified from earth-disturbing activities. If during implementation of project activities additional cultural or historical sites were encountered, the project would be stopped. The site would be surveyed and evaluated by a professional archeologist, and the State Historic Preservation Office (SHPO) would be provided the report for review. The site area would be excluded from all treatments until this review could be completed. After evaluation of the site and review by SHPO the site would be permanently excluded from treatment, activities would be modified, or the project would proceed under the mitigation provided for in the report.

Monitoring

- The Forest Service will monitor the known northern goshawk nest in the area. If not active, determine the location of the new nest, if possible.
- The Forest Service, the BLM, and MDEQ will coordinate inspections to ensure close monitoring.

Alternative 2: Modified Proposed Action with Conditions of Approval

Alternative 2 – BLM would approve the APD and Forest Service would approve the SUPO subject to additional conditions of approval necessary for resource protection.

Alternative 2 would be the same as the proposed action except with additional conditions of approval to the SUPO based on mitigation measures developed for the issues.

Mitigation Measures Specific to Alternative 2

Visual Quality

- Stumps will be placed out of view of FSR 4209 and FSR 4208. They can be placed at the well pad or other location approved by Forest Service representative.
- Slash will be chipped or lopped and scattered to lie within 12 inches of the ground.
- Seed mix will be applied to disturbed areas after flowline/flowline/pipeline placement.

Noise

- The total sound level for the production facility shall not exceed **36 dBA** at 1,320 feet if more than one well is being processed. When the production facility is processing gas from one well the sound level shall not exceed **33 dBA** at 1,320 feet.
- If the District Ranger determines that the sound standards identified above are not being met, the operator would perform a sound survey within 60 days of notification by the Forest Service. A copy of the sound survey would be submitted to the Forest Service for approval. Remedial actions would be taken as necessary.
- Notify the Forest Service and BLM 30 days prior to any equipment changes or modifications at the production facility
- Only high speed compressor units shall be utilized for the production facility. The exhaust system for each compressor unit engine will include a new muffler system that provides the following dynamic sound insertion loss values at the rated engine operating conditions:

  - **DIL Values in dB per Octave-Band Center Frequency (in Hz)**

31.5	63	125	250	500	1000	2000	4000	8000
22	33	40	50	50	45	45	40	35

- The exhaust piping located outside the building (i.e., between building and muffler) will be covered with an acoustical lagging consisting of a heavy-gauge steel jacketing (minimum 20-ga.) along with a 3-inch thick layer of 6-8 pcf insulation.
- Any compressor unit utilized at the production facility will be located inside a building. The building (and compressor unit) will be designed to permit compressor unit operations at all outside ambient temperatures with the equipment doors closed. The building roof, wall and bear den exterior panels shall be 22 gage steel. The interior building insulation for the roof can be the typically utilized 3" white metalized polypropylene building insulation. The building wall interior surfaces (including the bear den inlet air plenums) shall have a layer of 6 inch thick unfaced mineral wool insulation (6-8 pcf uniform density) that is covered with a 26 gage perforated metal liner. Thermal insulation such as "R-13", "R-19", etc. is not acceptable, as this insulation has a density of approximately 0.6 pcf.

- The building housing the compressor shall use an overhead sectional roll-up door for equipment access. The door sections will have a 24 gage exterior and back skin with an insulation core.
- For vertical engine driven coolers with fan tip speeds over 8,000 fpm, the vertical engine driven cooler exhaust plenum shall be constructed with 22 gage metal panels inside and outside of the building, and with a 26 gage perforated metal panels inside the plenum. Eighteen (18) inches of unfaced fiberglass insulation (1 pcf density) shall be placed between the perforated and solid metal panels (on the 2 long sides), and the plenum shall have a minimum length of 8 feet. Note that the 26 gage perforated metal panel is on the inside of the plenum, and the 22 gage solid metal panel will be visible from inside the compressor building.
- For vertical engine driven coolers with fan tip speeds of 8,000 fpm, or less, the vertical engine driven cooler exhaust plenum shall be constructed similar to the building walls. In this instance, the 26 gage metal perforated liner will be visible from inside the compressor building, and the 22 gage metal panel wall will be inside the plenum. The plenum does not have a minimum length requirement, and 6-8 pcf mineral wool insulation shall be placed between the solid and perforated metal panels.
- Noise during venting or blow down events will not exceed 60 dBA at 300 feet.

Facilities

- The operator will maintain a dike around the oil and brine tanks of sufficient size and height so as to contain 150% of the total capacity of the tanks.

Table 2. Summary Comparison of Project Activities, Predicted Achievement of Project Objectives, and Predicted Effects on Resources Issues by Alternative.

	Activity	Alt. 1 No Action	Proposed Action	Alt. 2 w/ add. Conditions of Approval
Activities	Well pad (acres)	0	3.5	3.5
	Flowline/pipeline if well produces (miles)	0	1.7	1.7
	Road improvement (miles)	0	1	1
	Production facility if well produces (max. acres)	0	2	2
Objective	Lease obligations met	No	Yes	Yes
Issues	VQO's met FSR 4209 - Retention	Yes	Yes after 5-10 years	Yes, Expected after one growing season
	VQO's met FSR 4208 – Retention	Yes on NFS lands.	Yes after 5 - 10 years if not productive, & 20 -30 years if productive.	Same as Proposed Action.
	VQO's met River Lake Rd (aka Hickey Ck Rd) Partial Retention	River Lk Rd (aka Hicky Creek Rd) – Partial Retention	Yes, Proposed activities would meet the VQO.	Yes, Proposed activities would meet the VQO.
	Odor - Long Term (Distance)	No additional odor other than exhaust from vehicles entering the SPNM and Mason Tract, including unauthorized snowmobiles.	Detectable 100-200 ft from production facility and storage tanks. Located outside the SPNM & only effect visitors as they pass by if conditions were right.	Same as Proposed Action.
	Noise- Long Term – **Dominant**	No additional dominant noise would be created.	The noise could be dominant adj to the production facility & cumulatively at the SPNM.	The noise would be dominant adjacent to the production facility.
	Noise– Long Term – **Background**	No additiional background noises would be created.	A background noise could be heard at the Mason Tract Boundary & within the SPNM.	A background noise could be heard within the SPNM area only.
	Noise – Long Term **–** Not higher than ambient sound levels.	No additional sound would be created.	No sound higher than the ambient level at the Mason Chapel and beyond.	No sound higher than the ambient level at the Mason Tract Boundary and beyond.
	Max. # of add. wells if productive	N/A	3	3

Dominant – Production Facility sounds would be louder than natural sounds.
Background – Natural sounds would be louder than production facility sounds.
Distance from the production facility: Adjacent to the Production - 100 ft, SPNM area – 5,500 ft, Mason Tract Boundary – 9,800 ft, and Mason Chapel – 11,800 ft.