

CHAPTER 3
BIOLOGY

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310 INTRODUCTION

This chapter presents a description of the biological resources found on the completed Centennial Project gob gas vent hole sites GVH#1, GVH#3, GVH#4, GVH#5 and GVH#6 as well as the proposed sites GVH#5A, GVH#7, GVH#8, and GVH#9. Details for each of the sites are provided in this Appendix.

311 Vegetation, Fish and Wildlife Resources

Vegetative, fish, and wildlife resource conditions in and adjacent to the proposed degassification wells are discussed in Section 320 of this submittal and the approved M&RP.

312 Potential Impacts to Vegetative, Fish, and Wildlife Resources

Potential impacts to vegetative, fish, and wildlife resources and the associated mitigation plan is presented in Section 330 and 340 of this chapter.

313 Description of Reclamation Plan

The reclamation plan used to restore the vegetative, fish, and wildlife resources to a condition suitable for the post mining land use is presented in Section 340.

320 ENVIRONMENTAL DESCRIPTION

321 Vegetation Information

This section and the approved M&RP contain the environmental descriptions of the vegetation for the permit and adjacent areas.

Andalex Resources has been drilling "gob" gas vent holes as a safety requirement necessary to conduct their coal mining operations within the plateaus of the Book Cliffs mountain range. Because of the extreme urgency of the situation in early 2005, permitting of some emergency gas holes began in January 2005, with drilling proceeding soon afterwards. Initially, drill holes numbered GVH-01, GVH-02, GVH-03 were proposed for drilling (GVH-02 was later dropped for the plan). Following these drilling activities, additional drilling was necessary in the late-winter/early spring months the same year (sites: GVH-05 and GVH-06). Because it was necessary for the drilling to proceed during in the winter and spring months, or when quantitative assessment of the impacted plant communities was not possible, Andalex employed "**Range Site**" methods in the permitting process to drive the revegetation plan and provide final revegetation standards of success.

More gas holes were necessary for venting requirements in the spring of 2005 beginning with GVH-04. Prior to disturbance by the drill rig, the plant communities to be impacted by

the drilling operations were quantitatively sampled including the proposed access road and drill pad. Additionally, a "Reference Area" with the same plant community was sampled. The Reference Area was used for comparisons of the proposed disturbed site at that time and will also be used at the time of final reclamation for standards of final revegetation success.

The next proposed gob gas holes were numbered GVH-05A, GVH-07, GVH-08, and GVH-09. The plant communities that would be impacted by these drilling operations were quantitatively sampled in the growing season of 2005. Reference Areas were also chosen and sampled for these communities during the same time period. The following document was submitted to Andalex to report the results of the 2005 vegetation sampling period; and is included as Attachment 3-1 of this Appendix:

VEGETATION OF THE GAS VENT HOLES:
GVH-04, GVH-05A, GVH-07, GVH-08,
GVH-09 & REFERENCE AREAS
2005

for the
CENTENNIAL MINE

by
MT. NEBO SCIENTIFIC, INC.

January 2006

Because the aforementioned emergency drill sites GVH-01, GVH-03, GVH-05 and GVH-06 were constructed in the winter and early spring months, or before vegetation sampling could be conducted, Reference Areas for them were chosen later in the growing season of 2005 when a better assessment of them could be made. These Reference Areas will be used later as standards for final revegetation success at these sites instead of using the Range Site method mentioned above. Based on a qualitative assessment of these sites, the **Sagebrush/Grass Reference Area** as reported in the above document will be used for the emergency, or first drill sites.

Soil Surveys are included in Attachment 2-1 and Vegetation Surveys are included in Attachment 3-1 for the proposed sites.

321.100 Plant Communities Within the Proposed Permit Area

Plate 19A of the M&RP shows the sites to be generally in the sagebrush-grass, aspen and oak brush communities. Vegetation specific to each of the sites is provided in this Appendix. A qualitative vegetative inventory (analysis) was completed during the summer

of 2005. (See Attachment 3-1)

Also, ARI has taken photographs of the proposed sites prior to disturbance. These photo locations are identifiable and repeatable. Although the photo locations were not staked, landmarks in the photos provide for identification as well as direction and location. The photos are included in Attachment 3-4.

321.200 Land Productivity Prior to Mining

TABLE 3-1
Land Productivity

Well No.	Range Site	Productivity (lbs.) Per Acre
GVH-1	High Mountain Loam	1800
GVH-3	High Mountain Loam	1800
GVH-4	High Mountain Loam	1800
GVH-5	High Mountain Loam	1800
GVH-6	High Mountain Loam	1800
GVH-5A	High Mountain Loam	1800
GVH-7	High Mountain Loam	1800
GVH-8	High Mountain Loam	1800
GVH-9	High Mountain Loam	1800

322 Fish and Wildlife Information

Fish and wildlife information associated with the degas wells is provided in this chapter. A summary of the fish and wildlife resource information for the permit and adjacent areas is contained in Section 322.100 through 322.200 of the approved M&RP.

322.100 Level of Detail

The scope and level of detail within the "Gob Gas Vent Holes" amendment are sufficient to design the protection and enhancement plan for wildlife and fish associated with the degas wells. Additional information pertaining to fish and wildlife in the permit area is located in the M&RP.

322.200 Site-Specific Resource Information

Raptors - An aerial raptor nest survey was done of the area by the Utah Division of Wildlife

Resource personnel in 2004. The results of the survey are provided in Appendix D of the M&RP. An additional survey has been done in 2005, and is included with this submittal in the Confidential Binder for the Centennial Project.

A raptor survey will be conducted of the well site areas, each year that the wells are in operation.

Bats - No known open mine shafts, caves, adits or other man made structures that might provide habitats for bats are known to exist in the degas project area. The sites are open and the lack of a food source would force the bats to seek habitat and nourishment elsewhere.

Threatened and Endangered Plant and Wildlife Species - There are no known federally or state listed threatened and endangered plant and wildlife species within the sites planned for degassification wells. This is based on research and analysis by Mt. Nebo Scientific of Springville, Utah and EIS of Helper Utah. The Bureau of Land Management has also reviewed the access and drill sites and has stated that although this area represents important habitat for both Mule deer and Elk, it is not characterized as crucial or critical.

There are no known groundwater or surface water flows to the Colorado or Green Rivers with potential for impact by the drilling of the degas wells. Potential adverse affects to the four Colorado River endangered fish species (refer to Table 3-3) would not be likely since there is no direct route to the Colorado River or Green River from the proposed well locations. Per the Windy Gap Process consumption estimates for the degas wells are as follows: Drilling - approximately 100,000 gallons per hole; road watering - approximately 5,000 gallons per day for 70 days per year; evaporation from ventilation - zero, drill holes will not intersect the coal seam being mined, therefore no access to mine ventilation until after area is sealed; coal preparation - zero, no coal preparation at degas sites (see Sections 522 and 523); sediment pond evaporation - zero, no sediment pond at degas sites (see Section 732.200); subsidence effects on springs - zero, no anticipated subsidence at degas sites (see Section 525); alluvial aquifer abstraction into mines - zero, no alluvial aquifer abstractions associated with degas drill holes (see Sections 513.500 and 600); postmining inflow to workings - zero, no workings for postmining inflow associated with degas wells (see Sections 513.500 and 600); coal moisture loss - zero, no coal therefore no moisture loss (See Sections 522 and 523). The overall impact of the mining operations, (including the degas holes) is shown on Table 3-4. Based on these calculations, the mining operation has a net positive impact to the Colorado River Drainage by the addition of 45.001 ac.ft./year.

Table 3-3
Federal and State Listed, Threatened, Endangered and Candidate Species
Plants and Wildlife
Carbon County, Utah
October, 2002

CARBON

Graham Beardtongue	<i>Penstemon grahamii</i>
Uinta Basin Hookless Cactus	<i>Sclerocactus glaucus</i>
Bonytail ^{4, 10}	<i>Gila elagans</i>
	E
Colorado Pikeminnow ^{4, 10}	<i>Ptychocheilus lucius</i>
Humpback Chub ^{4, 10}	<i>Gila cypha</i>
E	
Razorback Sucker ^{4, 10}	<i>Xyrauchen texanus</i>
E	
Bald Eagle ³	<i>Haliaeetus leucocephalus</i>
T	
Mexican Spotted Owl ⁴	<i>Strix occidentalis lucida</i>
T	
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>
Black-footed Ferret ⁶	<i>Mustela nigripes</i>
E	

1 Nests in this county of Utah

2 Migrates through Utah, no resident populations.

3 Wintering populations (only five known nesting pairs in Utah).

4 Critical habitat designated in this county.

5 Critical habitat proposed in this county

6 Historical range.

7 Experimental nonessential population

8 Introduced, refugia population.

9 Candidate species have no legal population under the Endangered Species Act. However, these species are under active consideration by the Service for addition to the Federal List of Endangered and Threatened Species and may be proposed or listed during the development of the proposed project.

10 Water depletions from any portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

For additional information contact: U.S. Fish and Wildlife Service, Utah Field Office, 2369 West Orton Circle, Suite 50, West Valley City, Utah 84119 Telephone (801) 975-3330.

**Table 3-4
Potential Water Depletion
to
Colorado River Drainage**

The following calculations are intended to define the potential depletion or addition of water to the Colorado River Drainage System, as a result of mining at this operation. It should be noted that the criteria is based on the U.S. Fish and Wildlife Service Windy Gap Process, and only those parameters that apply to this operation have been calculated.

Projected Water Depletion

- 1- Bathhouse/Office
 - a. 140 people @ 35 gpd/ea x 240 days/yr = 1,176,000 gal/yr

- 2- Ventilation
 - a. Evaporation
 - 1) 450,000 cfm = 236,520 M cf/yr
 - 2) 2.5 gallon/M cf = 591,300 gal/yr

- 3- Drilling GVH Wells
 - a. 5 holes/yr @ 100,000 gal/hole = 500,000 gal/yr

- 4- Road Watering (GVH Sites)
 - a. 5,000 gpd x 70 days/yr = 350,000 gal/yr

Total Loss = 2,617,300 gal/yr
 8.033 ac ft/yr

Projected Water Addition

- 1- Mine Discharge
 - a. 100 gpm x 120 days/yr = 17,280,000 gal/yr

Total Gain = 17,280,000 gal/yr
 53.034 ac ft/yr

Summary

Projected Depletion =	-8.033 ac ft/yr
Projected Addition =	+53.034 ac ft/yr
Total Addition =	<u>+45.001 ac ft/yr</u>

Note: Moisture loss from mined coal and use of sprays have not been included, since the spray water is derived from perched aquifers and is recycled within the mine. Any excess water from the perched aquifers is eventually discharged, resulting in the addition to streamflow.

322.300 Fish and Wildlife Service Review

If requested, Andalex Resources, Inc. authorizes the release of information pertaining to Section 322 and 333 to the U.S. Fish And Wildlife Service Regional and Field Office for their review.

323 Maps and Aerial Photographs

Location of the well sites can be seen in Figure 1-1 of this submittal.

323.100 Location and Boundary of Proposed Reference Area

Reference areas for all well sites have been established as described in Section 321. Subsequent holes will also use standard reference areas including baseline data.

323.200 Elevation and Locations of Monitoring Stations

N/A

323.300 Facilities for Protection and Enhancement

Section 333.300 and 358.500 of the approved M&RP contain additional discussion pertaining to protective measures to be taken by Andalex Resources, Inc.

323.400 Vegetation Type and Plant Communities

Vegetative types and plant communities will be outlined in the vegetative report in Attachment 3-1 upon completion.

330 OPERATION PLAN

331 Measures Taken to Disturb the Smallest Possible Area

The well sites will be sized to disturb the smallest acreage possible and still meet the requirements for the drilling equipment. The drainage control required will be built to satisfy the environmental requirements. Please refer to the typical proposed site plans for the gob gas wells which show estimated dimensions, location and type of sediment control, location of topsoil storage as well as approximate size and set-up of equipment.

332 Description of Anticipated Impacts of Subsidence

Refer to Section 525.

333 Plan to Minimize Disturbances and Adverse Impacts

General control and mitigation measures addressing potential related biological impacts will include the following:

- Well sites will be fenced per landowner requirements and suitable for wildlife protection.
- Minimizing the total area of disturbance.
- Yearly raptor surveys during operations.
- Utilizing existing roads where possible.
- Water used for drilling and dust suppression is pumped from mine.
- Providing erosion protection and dust control as needed on roads.
- Design, construction and operation of well sites to minimize adverse impacts.
- Coordination and planning with the interdisciplinary wildlife team.
- Reclamation of disturbed areas when no longer needed.

333.100 Minimize Disturbance to Endangered or Threatened Species

Andalex Resources, Inc. will apply all methods necessary to minimize disturbances or any adverse effects to threatened or endangered species. Note that T&E species are not anticipated to be discovered, however, should ARI determine that such species exist, the regulatory authority will be notified and appropriate remedial action taken. Also, See Section 322.200.

333.200 Species and Habitats

All species and habitats within the permit area will be protected to the best of Andalex Resources, Inc. ability. Note that T&E species are not anticipated to be discovered, however, should ARI determine that such species exist, the regulatory authority will be notified and appropriate remedial action taken.

333.300 Protective Measures

Refer to Section 333.300 of the approved M&RP, and Section 333 above. All well sites will be fenced and road construction will be minimized by utilizing existing roads where possible.

340 RECLAMATION PLAN

341 Revegetation

Revegetation of the sites will occur in two phases. The first phase is to redistribute topsoil and seed the well area not needed for access and operation of the gas exhaust blower. The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The short-term goal of this revegetation plan is the immediate stabilization of the disturbed sites through erosion control this objective will be achieved through controlled grading practices, proper seedbed preparation to encourage rapid plant establishment, inclusion of rapidly establishing species in the seed mixture to be planted, and mulch application.

The long-term goals are to establish useful, and productive range. These goals will be attained through the selection and placement of desirable and productive plant species and a commitment to monitor and maintain revegetated areas throughout the bond liability period.

The well sites will be fenced to discourage wildlife and livestock from grazing the reclaimed areas until bond release.

341.100 Schedule and Timetable

The reclamation timetable shown in Figures 5-6 of this submittal and the reclamation monitoring schedule is found in Chapter 2, R645-301-240 of the approved M&RP.

341.200 Descriptions

Species and Amounts of Seed - The well sites will be planted with the seed mix listed on Table 3-2. The seed mix will be used in both contemporaneous and final reclamation phases. The seed will be incorporated with a small amount of wood fiber mulch and applied by hydroseeding equipment or broadcast. Refer to Section 234.200 for topsoil stockpile seeding description.

Methods Used for Planting and Seeding - The degassification sites will be graded to final contour, then ripped to relieve compaction. The depth of ripping will be from 18 to 24 inches. Following ripping, topsoil will be applied to the ripped surface and left in a gouged and roughened state.

Mulching Techniques - Wood fiber mulch will be applied on top of the seed with hydroseeding equipment at the rate of 2,000 pounds per acre and anchored with a tackifier.

Irrigation, Pest, and Disease Control - No irrigation is planned and pesticides will not be used unless previously approved by the Division.

Measures Proposed for Revegetation Success - Refer to Section 356.

341.300 Greenhouse Studies, Field Trials, or Other Equivalent Studies

Refer to the Section 341.300 of the approved M&RP.

342 Fish and Wildlife

342.100 Enhancement Measures

Post bond release enhancement measures will include the establishment of vegetation for wildlife food, cover, and the break up of large blocks of monoculture to diversify habitat.

342.200 Plants Used for Wildlife Habitat

Nutritional Value - The nutritional value will be consistent with that of vegetation in the surrounding areas.

Cover - Cover will be comparable to the cover on the associated reference area.

342.300 Cropland

Cropland is not a postmining land use.

342.400 Residential, Public Service, and Industrial Land Use

No residential, industrial or public service use is planned.

350 PERFORMANCE STANDARDS

351 General Requirements

Andalex Resources, Inc. commits to conduct all operations in accordance with the plans submitted in Sections R645-301-330 through R645-301-340 of the permit application.

352 Contemporaneous Reclamation

Reclamation activities prior to final reclamation will, to the extent feasible, be performed contemporaneously. Contemporaneous reclamation will be performed at the well sites following construction of the wells. Refer to Section 341 for additional details.

353 Revegetation: General Requirements

A vegetative cover will be established on all reclaimed areas to allow for the designated postmining land use of grazing. Refer to Section 411 for additional information.

353.100 Vegetative Cover

The seed mix proposed for revegetation is intended to provide vegetative cover that will be diverse, effective, and permanent. The seed mixture was selected with respect to the climate, potential seedbed quality, erosion control, drought tolerance, and the mixture's ability for quick establishment and spreading.

Native Species - The reclamation vegetation mixture will be comprised of species indigenous to the area and capable of achieving the postmining land use. Diversity of species should allow utilization of plants by wildlife and domestic livestock. The recommended seed mix is comprised of native species.

Extent of Cover - The vegetative cover will be at least equal in extent to the cover at the designated reference areas.

Stabilizing - The vegetative cover mixture is capable of stabilizing the soil surfaces from erosion.

353.200 Reestablished Plant Species

Compatible - The reestablished plant species have been selected to ensure their compatibility with the approved postmining use.

Seasonal Characteristics - The revegetation plant species will have the same growing season as the adjacent areas.

Self-Generation - The reestablished plants are species capable of self-generation and plant succession.

Compatibility - The seed mix suggested for revegetation contains plants native to the area and compatible with the plant and animal species of the permit area.

Federal and Utah Laws or Regulation - The seed mix purchased to revegetate the degassification well sites will contain no poisonous or noxious plants (see Section 234.200). No species will be introduced in the area without being approved by the Division.

**Table 3-2
Reclamation Seed Mix**

The final reclamation seed mixture from the Centennial MRP will also be used for all interim, contemporaneous reclamation on the Gob Gas project sites and road slopes:

<u>SPECIES</u>	<u># PLS/acre</u>
<u>Grasses:</u>	
<u>Leymus cinereus</u> Great Basin Wildrye	2.0
<u>Agropyron spicatum</u> Bluebunch Wheatgrass	2.0
<u>Agropyron trachycaulum</u> Slender Wheatgrass	2.0
<u>Bromus inermis</u> Smooth Brome	3.0
<u>Oryzopsis hyminooides</u> Indian Ricegrass	2.0
<u>Poa sandbergii (secunda)</u> Sandberg Bluegrass	0.25
<u>Forbs:</u>	
<u>Artimisia ludoviciana</u> Louisiana Sagebrush	0.1
<u>Hedysarum borealis</u> Northern Sweetvetch	1.0
<u>Linum lewisii</u> Lewis Flax	1.0
<u>Penstemon strictus</u> "Bandera" Rocky Mountain Penstemon	0.25
<u>Shrubs:</u>	
<u>Amelanchier alnifolia</u> Serviceberry	1.0
<u>Artemisia tridentata vaseyana</u> Mountain Big Sagebrush	0.2
<u>Cercocarpus montanus</u> True Mountain Mahogany	1.0
<u>Cercocarpus ledifolius</u> Curleaf Mountain Mahogany	1.0
<u>Chrysothamnus nauseosus albicaulis</u> Whitestem Rubber Rabbitbrush	1.0
<u>Purshia tridentata</u> Bitterbrush	3.0
<u>Symphoricarpos oreophilus</u> Mountain Snowberry	1.0
Total	21.8

Rate is pounds Pule Live Seed per acre for drill seeding. Broadcast seeding is double the drill rate.

353.300 Vegetative Exception

Andalex Resources, Inc. does not require vegetative exception at this time.

353.400 Cropland

The permit area contains no land designated as cropland.

354 Revegetation: Timing

Andalex Resources, Inc. will follow the recommended guidelines for revegetation and planting during the first normal period for favorable planting conditions after replacement of the topsoil. In Utah the planting period is usually Fall due to the precipitation events.

355 Revegetation: Mulching and Other Soil Stabilizing Practices

Mulch and/or other soil stabilizing practices (roughing, etc.) Will be used on all areas that have been regraded and covered by topsoil (Section 341.200). Andalex, Resources, Inc. will exercise care to guard against erosion during and after application of topsoil.

356 Revegetation: Standards for Success

356.100 Success of Revegetation

The success of revegetation will be judged on the effectiveness of the vegetation for postmining land use, the extent of cover on each degassification well site compared to their respective reference areas as described in Section 321 and in Attachment 3-1.

Sampling Techniques - Andalex Resources, Inc. will comply with the standards for success, statistically valid sampling techniques for measuring success, and the approved methods outline in the Division's "Vegetation Information Guidelines, Appendix A" for sampling.

The sampling methods to be used during reclamation will be specific to the requirements at the time of reclamation. Nonetheless, according to the currently approved UDOGM guidelines, these sampling methods would be used: sample adequacy, cover (line interception), density (belt transects or plots) and productivity (clipping). The Jaccard's Community Coefficient will be used to calculate acceptable plant similarity and diversity.

Standards for Success - The standards for success will include criteria representative of undisturbed lands in the area of the degas wells as means to evaluate ground cover,

production and stocking of the reclaimed site.

356.200 Standards for Success

Standards of success will be applied in accordance with the approved postmining land use as described in this section.

Grazing Land and Pasture Land - The ground cover and production of living plants on the revegetated area will be at least equal to the reference area.

Cropland - There is no area designated as cropland within the degassification well sites.

Fish and Wildlife Habitat - The postmining land use for the degas well sites will be wildlife habitat on pre-existing roads. Pre-existing roads will be returned to their approximate original contour and compacted.

Industrial, Commercial or Residential - The postmining land use for the permit area is not designated for industrial, commercial, or residential use.

Previously Disturbed Areas - N/A

356.300 Siltation Structures

Siltation structures will be maintained until the disturbed areas have been stabilized and revegetated. For additional details on siltation structures, see Sections 542 and 763 of this amendment.

356.400 Removal of Siltation Structures

The land on which siltation structures are located will be revegetated in accordance with the reclamation plan discussed in Section 353 and 357. Refer to Section 763 for additional information pertaining to the removal of siltation structures.

357 Revegetation: Extended Responsibility Period

Andalex Resources, Inc. will be responsible for the success of revegetation for a period of 10 years following seeding of the reclaimed area or upon Diviison bond release.

357.100 Extended Period Begins

The period of extended responsibility will begin after disturbed areas have been reseeded.

357.200 Vegetation Parameters

Vegetation parameters will equal or exceed the approved success standard during the last 2 years of the responsibility period. The success standards are outlined in Section 356 of

this application.

357.300 Husbandry Practices

The use of husbandry practices are not being requested.

358 Protection of Fish, Wildlife, and Related Environmental Values

Andalex Resources, Inc. will minimize disturbances and adverse impacts on wildlife and their related environments as outlined in Section 333 of the approved M&RP and Section 342 of this submittal. See Chapter 7, Section 731.100 of the approved M&RP for methods to protect water sources in the area.

358.100 Existence of Endangered or Threatened Species

The well sites will not be constructed or operated where they might jeopardize the existence of any endangered or threatened species. Refer to Section 322.200 and Attachments 3-1, 3-2 and 3-3 for additional information pertaining to threatened, endangered, and sensitive species.

State or federally listed endangered or threatened species will be reported to the Division upon its discovery.

358.200 Bald and Golden Eagles

Andalex Resources, Inc. understands that there is no permission implied by these regulations for taking of bald or golden eagles, their nest, or eggs. If found, nests will be reported to the Division.

358.300 Taking of Endangered or Threatened Species

Andalex Resources, Inc. understands that there is no permission implied by these regulations for taking of endangered or threatened species, their nest, or eggs.

358.400 Replacement of Wetland or Riparian Vegetation

The sites contain no wetland or riparian vegetation.

358.500 Manmade Wildlife Protection Measure

Electric Power Lines - No utilities will exist at the well sites.

Potential Barriers - No potential barriers will exist at any of the well sites. No ponds exist at the well sites. Refer to Section 231.100 and 242 for information pertaining to the mud pit.

CHAPTER 4
LAND USE AND AIR QUALITY

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LIST OF ATTACHMENTS

Attachment 4-1 Cultural Resource Survey and Inventory
Attachment 4-2 Surface Land Owner Notification (Moved to Confidential Binder)

410 LAND USE

411 Environmental Description

A statement of the conditions and capabilities of the land to be affected by mining and reclamation operations follows in this section.

411.100 Premining Land Use

The area is utilized for the landowners private use, including hunting and as open range for livestock and wildlife.

411.110 Land Use Map and Narrative

Refer to the same section of the approved M&RP.

411.120 Land Capability

The major plant communities at the well sites are identified in Section 321. No cultivated lands lie within the well boundaries, due to the limiting terrain and lack of water for irrigation. Refer to Section 321.200, Table 3-1 of this submittal for forage production per acre for each well site.

411.130 Land Use Description

The wells are located on land administered by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. and zoned by Carbon County for mining and grazing (MG-1).

No industrial or municipal facilities are located on or immediately adjacent to the well sites.

411.140 Cultural and Historic Resources Information

Archeological surveys will be conducted on any future proposed well sites as soon as weather and ground conditions allow. The Cultural Resource Survey will be included in Attachment 4-1 of this application. For Gob Gas Holes 1, 3, 4, 5 and 6, preliminary research and file search has been conducted by Senco-Phenix of Price, Utah and the research indicates that there is a very low probability of the occurrence of cultural resources at the proposed drill sites. Senco-Phenix has also completed a Cultural Resource Survey of the proposed sites GVH#5A, GVH#7, GVH#8 and GVH#9. Results of this survey are included in Attachment 4-1. (Confidential Binder)

Andalex Resources, Inc. agrees to notify the Division and State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of operations. Andalex also agrees to have any such cultural resources evaluated in terms

of NRHP eligibility criteria. Protection of eligible cultural resources will be in accordance with Division and SHPO requirements. Andalex will also instruct its employees that it is a violation of federal and state law to collect individual artifacts or to otherwise disturb cultural resources.

411.200 Previous Mining Activity

Andalex Resource, Inc. has no knowledge of the removal of coal or other minerals in the well site areas.

412 Reclamation Plan

412.100 Postmining Land-Use Plan

All uses of the land prior to the wells construction/operation and the capacity of the land to support prior alternate uses will remain available throughout the life of the sites.

Andalex Resource, Inc. intends the postmining land use to be livestock and wildlife grazing and other uses as indicated by the land owner (hunting, etc.). Final reclamation activities will be completed in a manner to provide the lands to parallel the premining land use.

412.200 Land Owner or Surface Manager Comments

Surface lands are owned by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. Appropriate landowner approvals have been obtained for the proposed wells. Required notification of drilling will be sent to the landowners prior to start. Copies of the notification letters have been included in Attachment 4-2.

413 Performance Standards

413.100 Postmining Land Use

Postmining land uses are discussed in Section 412.100. The postmining lands will be reclaimed in a timely manner and capable of supporting such uses (see Chapters 2, 3, 5 and 7).

413.200 Determining Premining Uses of Land

Refer to Section 411.100.

413.300 Criteria for Alternative Postmining Land Use

No alternative postmining land uses have been planned.

414 Alternative Land Use

No alternative postmining land uses have been planned.

420 AIR QUALITY

421 Air Quality Standards

Gas vent hole activities will be conducted in compliance with the requirements of the Federal Clean Air Act and the Utah Air Conservation Rules.

422 Compliance Efforts

See Fugitive Dust Control Plan, Section 424.

423 Monitoring Program

Refer to the same section in the approved M&RP.

424 Fugitive Dust Control Plan

Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. The application of water will be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition unless it is below freezing.

425 Additional Division Requirements

Refer to the same section of the approved M&RP.

ATTACHMENT 4-1
CULTURAL RESOURCE SURVEY
(Relocated to Confidential Binder)

**ATTACHMENT 4-2
SURFACE LAND OWNER NOTIFICATION**

The surface owner land use agreement is also on file at the Carbon County Recorder's office in Price, Utah

CHAPTER 5
ENGINEERING

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510 INTRODUCTION

This chapter provides a discussion of general engineering aspects, an operation plan, a reclamation plan, design criteria, and performance standards related to the degassification well sites. The activities associated with the construction and reclamation of the well sites have been or will be designed, located, constructed, maintained, and reclaimed in accordance with the operation and reclamation plans.

Designs and other information herein presented will be of a general nature or in the form of typical, since the proposed sites are not yet accessible for detailed surveying or studies. Site specific information will be provided in this chapter as it becomes available.

511 General Requirements

The permit application includes descriptions of construction, maintenance, and reclamation operations of the proposed well sites with maps and plans. Potential environmental impact as well as methods and calculations utilized to achieve compliance with the design criteria are also presented.

512 Certification

Where required by the regulations, cross sections and maps in this permit application have been prepared by or under the direction of, and certified by, qualified registered professional engineers or land surveyors. As appropriate, these persons were assisted by experts in the fields of hydrology, geology, biology, etc.

512.100 Cross Sections and Maps

Cross sections for the degassification well pads will be provided upon completion of surveys. Typical road cross sections are shown on Figures 5-5.

512.200 Plans and Engineering Designs

Excess Spoil - No excess spoil will be generated from the well sites.

Durable Rock Fills - No durable rock fills will exist at the well sites.

Coal Mine Waste - No coal mine waste will exist at the well sites.

Impoundments - Refer to Section 733.200 of this submittal.

Ancillary Roads - Short sections of road may be required to access certain well sites. Topsoil will be stripped from the road alignment and stored with the topsoil stripped from the pad area prior to grading the new access road. When possible, well sites will be placed on existing roads.

As shown on Figure 1-1, proposed GVH sites 7, 8 and 9 are located on existing access roads. GVH-8 can be accessed via an existing road along the fence line without crossing either the Right or Left Fork of Antone Creek.

Approximately 800' of new access road will be constructed to site GVH-5A. This road will be constructed according to the approved plan. The road will be constructed with a berm on the downhill side and slightly sloping to the pad area; therefore, runoff from the road will be contained on the pad area.

Variance from Approximate Original Contour - No variance from approximate original contour is required for the well sites.

513 Compliance with MSHA Regulations and MSHA Approval

513.100 Coal Processing Waste Dams and Embankments

No coal processing waste dams and embankments will exist at the well sites.

513.200 Impoundments and Sedimentation Ponds

Refer to Section 733.200 of this submittal.

513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil

No underground waste, coal processing waste, and excess spoil will exist at the well sites.

513.400 Refuse Piles

No refuse piles will exist at the well sites.

513.500 Underground Openings to the Surface

The well will be equipped with a valve that will be closed and locked when not in use. A typical well head is shown in Figure 5-4.

513.600 Discharge to Underground Mine

No discharge to the underground mine will occur at the well sites.

513.700 Surface Coal Mining and Reclamation Activities

No surface coal mining, or reclamation activities associated with surface coal mining will occur at the well sites.

513.800 Coal Mine Waste Fire

No coal waste will be developed, therefore, no coal waste fires will occur at the well sites.

514 Inspection

514.100 Excess Spoil

No excess spoil will be stored at the well sites.

514.200 Refuse Piles

No refuse piles will exist at the well sites.

514.300 Impoundments

Refer to Section 7133.200 of this submittal.

515 Reporting and Emergency Procedures

515.100 Slides

Refer to Section 515.100 in the approved M&RP.

515.200 Impoundment Hazards

No impoundments will exist at the well sites.

515.300 Temporary Cessation of Operations

If temporary cessation of the mining operations does occur, the wells will remain open. Once liberation of the gob gas is completed, the wells will be sealed as discussed in Section 542.700 of this submittal.

520 OPERATION PLAN

521 General

Detailed maps will be provided of each of the well sites when conditions allow access.

521.100 Cross Sections and Maps

Existing Surface and Subsurface Facilities Features - No buildings are located on or within 1,000 feet of any of the well sites.

Landowner, Right-of-Entry, and Public Interest - The land which the wells will be drilled on is owned by Dave R. & Mildred Cave, et al., and Mathis Land, Inc. Andalex Resources, Inc. will complete landowner agreements to allow access for the construction and drilling

of the wells (see Attachment 4-2).

Mining Sequence and Planned Subsidence - Refer to Section 525.

Land Surface Configuration - Surface contours of undisturbed well sites will be included when completed.

Surface Facilities - No permanent surface facilities will exist at the well sites.

521.200 Signs and Markers

Mine and Permit Identification Signs - A mine and permit identification sign will be displayed at each well site. This sign will be a design that can be easily seen and read, will be made of durable material, will conform to local regulation, and will be maintained until after the release of all bonds for the well site areas. The sign will contain the following information:

- Mine name,
- Company name,
- Company address and telephone number,
- MSHA identification number, and
- Permanent program permit identification number

Perimeter Markers - The perimeter of all areas affected will be clearly marked before beginning drilling activities. The markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until after the release of all bonds for the permit area.

Buffer Zone Markers - Stream buffer zone markers will not be required at any of the well sites.

Topsoil Markers - Markers will be placed on all topsoil stockpiles. These markers will be a design that can be easily seen and read, will be made of durable material, will conform to local regulations, and will be maintained until topsoil is redistributed on the well sites.

Construction Markers - Not applicable.

522 Coal Recovery

No coal recovery will be performed at the well sites.

523 Mining Methods

No mining will be performed at the well sites.

524 Blasting and Explosives

No explosives are to be used at the well sites.

525 Subsidence

No subsidence will occur at the well sites, as a result of drilling and development of the degassification well sites. Subsidence could occur at the well site because of underground mining see Section 525 of the approved M&RP.

526 Mine Facilities

526.100 Mine Structures and Facilities

No buildings exist or are proposed at the well sites; therefore, no existing building will be used in connection with or to facilitate this proposed coal mining and reclamation plan.

526.200 Utility and Support Facilities

No utilities are to be installed at the well sites. A portable exhaust unit will be temporarily installed to draw gob gas to the surface from the mined panel. The exhaust blower will be started by using propane from portable tanks. Once started and running, the unit will be powered by burning the extracted gas. Excess gob gas will be vented to the atmosphere. The blower is approximately 12-feet long by 6-feet wide and about 10-feet tall. It is not known how long the degassification of the longwall panel will take.

527 Transportation Facilities

527.100 Road Classification

Well sites will be developed near existing private roads whenever possible. The new access roads will be classified as ancillary roads and will be maintained by the permittee.

527.200 Description of Transportation Facilities

The well sites have been chosen close to existing roads whenever possible in the area to limit surface disturbance. The existing roads were constructed and are maintained by the land owner. The existing roads are approximately 16 feet wide. See Figure 5-5 for a typical cross section of the existing roads.

The following is a description of each of the roads used to access the GVH Sites:

Right Fork of Deadman Canyon - This road is located in the bottom of Deadman Canyon north of the Centennial Project Minesite surface facilities. The road was existing,

constructed by the surface owner; however, it did require minor drainage control upgrades in the form of 18" and 24" culverts, and slight widening of sharp turns for drilling equipment access. This road is approximately 12,300' long with an average slope of 11.79% and is approximately 16' wide. The road runs from the Centennial Minesite to the top of the ridge. The road is native rock and gravel surfaced, and is protected from runoff by a combination of berms, road ditches and culverts. This road will remain in place upon completion of the drilling project.

GVH-5 - This road runs from the top of Deadman Canyon to the GVH-5 Site. This is an existing road, approximately 16' wide, 4400' in length, with an average slope of approximately 5.00%. The road is constructed on native material and protected from runoff by berms, ditches and culverts as needed. There are no plans to remove or reclaim this road.

GVH-1 - This is a short section of road running from Road GVH-5 to the GVH-1 Site. The road was constructed on native material by ARI, and is approximately 16' wide, 300' in length and has an average slope of 3.33%. The drainage is controlled by ditches and berms, with runoff retained on the pad. This road will be removed and reclaimed unless requested otherwise by the landowner.

GVH-6 - This is a constructed access road running from Road GVH-5 to the GVH-6 Site. The road is approximately 16' wide, 4300' long and has an average slope of 2.67%. It is constructed on native material, with gravel used as needed on soft areas. Drainage is controlled by a combination of ditches and berms. This road will be removed and reclaimed unless otherwise directed by the landowner.

Ridge Road - This is an existing road along the ridge above the Right and Left Forks of Deadman Canyon. The road is approximately 16' wide, 7100' long and has an average grade of 3.10%. It runs westward from the top of the Right Fork of Deadman Canyon to the turnoff to the road to GVH-9. The road is constructed on native material and being on the ridgeline, has need for only minimal drainage control in the form of ditches where needed. This road will remain in place after the project is completed.

GVH-3 - This is an existing road from the Ridge Road to the GVH-3 Site. The road is approximately 16' wide, 1200' long and has an average grade of 4.17%. The road is constructed on native material and hydrologic controls consist of berms and ditches. This road is not scheduled for removal after the project is completed.

GVH-7 - This section of road is from GVH-3 to GVH-7 and is a continuation of the existing road to GVH-3. This section is approximately 16' wide, 1600' long and at an average grade of 8.13%. The road is constructed on native material and hydrologic controls are primarily from ditches. This road is also scheduled to remain after the project.

GVH-8 - This is a road from the Ridge Road, north along the fence line and then west to the GVH-8 site. The road is existing; however, it will require some upgrading to provide

access for a drill rig. The upgrade will consist of grading and slight widening as needed. The road is to be approximately 16' wide, 2500' long , and will have an average grade of approximately 5.33%. The road is on native material and runoff is controlled by ditches. Since this is an existing road, it will not be removed unless requested by the landowner.

GVH-4 - This road runs from the Ridge Road to the GVH-4 Site. This road was constructed by ARI, and is approximately 16' wide, 1100' long at an average grade of approximately 3.64%. The road was constructed on native material, and runoff is controlled by ditches and berms with containment on the pad. This road will be removed and reclaimed unless otherwise requested by the landowner.

GVH-9 - This is an existing road from the Ridge Road to the GVH-9 Site. The road is approximately 16' wide, 3500' long and has an average grade of approximately 8.14%. The road is constructed on native material and runoff is controlled by ditches and berms. Since this is also an existing road, it will not be removed unless requested by the landowner.

All roads described above are shown on Figure 1-1 of this Appendix.

528 Handling and Disposal of Coal, Excess Spoil, and Coal Mine Waste

No disposal of coal, excess spoil, and coal mine waste will occur at the well sites.

529 Management of Mine Openings

The perimeter of the sites, including the topsoil stockpiles will be fenced with gates on the access roads. The well casing will have a valve that is closed and locked. The valve will also prevent access by animals or other material. Mine openings will be monitored in accordance with Federal and State Regulations.

During the life of the wells, the sites will be inspected as needed by mine personnel to verify the continued operation of the pumping equipment and general site conditions.

530 OPERATIONAL DESIGN CRITERIA AND PLANS

531 General

This section contains the general plans for the construction of sediment controls and general construction and maintenance of the well sites.

The decision to construct each well will be based on the amount of gas encountered during mining. If small amounts of gas are encountered and the mine's ventilation system can dilute the gob gas, no well will be drilled. The proposed well site locations are shown on Figure 1-1.

532 Sediment Control

Sediment control measures for the well sites are described in Sections 732 and 742 of this submittal. Runoff control structures at the well sites have been designed to convey runoff in a non-erosive manner. Sediment yields in the well permit area are minimized by:

- Disturbing the smallest practicable area during the construction of the well site and
- Contemporaneously reclaiming areas suitable for such reclamation.

533 Impoundments

No impoundments will exist at the well sites.

534 Roads

Refer to Section 527 of this submittal.

535 Spoil

No spoil will be generated at the well sites.

536 Coal Mine Waste

No coal mine waste will be stored at the well sites.

537 Regraded Slopes

537.100 Division Approval

No mining or reclamation activities will be conducted in the permit area that requires approval of the Division for alternative specifications or for steep cut slopes.

537.200 Regrading of Settled and Revegetated Fills

Upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour. Because of the nature of the well site, settling is not anticipated. However, if settlement does occur, these areas will be regraded.

540 RECLAMATION PLAN

541 General

541.100 Commitment

Upon the permanent cessation of gob gas venting, Andalex Resources, inc. permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan.

541.200 Surface Coal Mining and Reclamation Activities

Not applicable.

541.300 Underground Coal Mining and Reclamation Activities

Upon completion of the gob gas venting activities the wells will be reclaimed.

541.400 Environmental Protection Performance Standards

The plan presented is designed to meet the requirements of R645-301 and the environmental protection performance standards of the State Program.

542 Narratives, Maps, and Plans

542.100 Reclamation Timetable

A general timetable for the completion of each major step in the reclamation plan is presented in Figure 5-6.

542.200 Plan for Backfilling, Soil Stabilization, Compacting, and Grading

Following completion of the venting activities, the well site will be prepared for contouring and soil distribution. Details regarding topsoil placement and revegetation are provided in Section 242 and Section 353, respectively.

Sedimentation Pond Removal and Interim Sediment Control - See Section 542.500 of this submittal.

542.300 Final Surface Configuration Maps and Cross Sections

The sites will be regraded to the approximate original contour, the contours representing the pre-disturbance topography also represent the reclamation topography. Cross sections representing the final surface configuration will be included upon completion.

542.400 Removal of Temporary Structures

The well sites will not have surface structures.

542.500 Removal of Sedimentation Pond

No sedimentation pond will be constructed at the well sites.

542.600 Roads

The roads which existed prior to the drilling program will be retained after reclamation. The access roads established during the drilling program will be reclaimed after gob gas extraction has been completed. See Section 242 for additional detail concerning the reclamation plan.

542.700 Final Abandonment of Mine Openings and Disposal Areas

All openings will be sealed in accordance with Federal and State Regulations. The casings will be plugged at the bottom to hold concrete. A lean concrete mixture will be poured into the casing until the concrete is within five (5) feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is completed.

542.800 Estimated Cost of Reclamation

Refer to Appendix B of the existing M&RP. It is anticipated that the cost of reclamation of the well sites is adequately covered by the Centennial Project Reclamation Bond. Refer to Chapter 8 for additional detail.

550 RECLAMATION DESIGN CRITERIA AND PLANS

551 Casing and Sealing of Underground Openings

Permanent sealing is described in Section 542.700.

552 Permanent Features

552.100 Small Depressions

No permanent small depressions will be created as part of the well site construction and reclamation.

552.200 Permanent Impoundments

See Section 515.200 of this submittal.

553 Backfilling and Grading

553.100 Disturbed Area Backfilling and Grading

Approximate Original Contour - The well sites will be returned to their approximate original contour after reclamation is completed.

Erosion and Water Pollution - Sediment controls will consist of gouging the surface to create depressions and mounds which store and impede the movement of water. As vegetation becomes established on the reclaimed surface, erosion potential will be further minimized.

Post-Mining Land Use - The disturbed area will be reclaimed in a manner that supports the approved post-mining land use. Refer to Section 411 and 412 for additional detail.

553.200 Spoil and Waste

Spoil - No Spoil will be generated within the well sites.

Coal Processing Waste - No coal processing waste will be generated within the well sites.

553.250 Refuse Piles

No refuse piles will exist at the well sites.

553.300 Exposed Coal Seams, Acid and Toxic Forming Materials and Combustible Materials

No coal seams will be left exposed at the well sites. All wells will be sealed according to Federal and State regulations.

553.400 Cut and Fill Terraces

No cut and fill terraces will be constructed at the well sites.

553.500 Highwall From Previously Mined Areas

No highwalls exist or will be built at the well sites.

553.600 Previously Mined Area

No previously mined areas exist at the well sites.

553.700 Backfilling and Grading - Thin Overburden

No surface mining and reclamation activities involving thin overburden will occur at the well sites.

553.800 Backfilling and Grading - Thick Overburden

No surface mining and reclamation activities involving thick overburden will occur at the well sites.

553.900 Regrading of Settled and Revegetated Rills

If settlement or rills occur at the well sites, they will be regraded and revegetated. Refer to Section 244.300.

560 PERFORMANCE STANDARDS

Performance of the well sites will be conducted in accordance with the approved permit and the requirements of R645-301-510 through R645-301-553.