SECTION 2:

ADDENDUM AND ERRATA

SECTION 2 - ADDENDUM AND ERRATA

2.1 INTRODUCTION

The following sections have been prepared in response to public and agency review comments on the DEIS. The Addendum Section, Section 2.2, expands upon the air quality analysis found in the DEIS. This expanded cumulative impact analysis is based upon the cumulative impacts from the standpoint of assessing the potential impacts from existing, reasonably foreseeable and proposed sources of emissions. The analysis addresses the construction and operation phases of oil and gas development, the details of which are available in a separate Technical Report entitled *DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis*. The Errata Section, Section 2.3, presents changes to the text of the DEIS organized by DEIS sections. Also, Figures 1-2, 1-3, 2-9, and 3-21 have been modified from the DEIS and are presented at the end of the Errata Section.

2.2 ADDENDUM

2.2.1 Air Quality

DEIS pages 5-3 through 5-6, Section 5.3 AIR QUALITY (CUMMULATIVE IMPACTS ANALYSIS)

[NOTE: This addendum should be read in the context of Section 5.3 of the DEIS and is incorporated as Section 5.3 of the FEIS.]

5.3 AIR QUALITY

The assessment of air quality impacts has considered cumulative impacts from the standpoint of assessing the potential impacts from all existing, reasonably foreseeable and proposed sources of emissions. A very detailed "Cumulative Air Quality Impacts Analysis - Technical Support Document", and accompanying Addendum (Addendum provided in Appendix A), has been prepared that describes the analysis and is available upon request.

It was found that although some deterioration of air quality would occur (and would be unavoidable), potential impacts would not be significant. Long-term, cumulative air quality degradation would be due primarily to direct carbon monoxide and nitrogen dioxide emissions (and potential secondary ozone formation) from compression, dehydration, separation and storage tank operations. In brief, the analysis produced the following conclusions about cumulative impacts:

- Construction and operations would not cause an exceedance of National Ambient Air Quality Standards or Wyoming Ambient Air Quality Standards; and,

- Pollutant concentrations from individual sources required for oil and gas operations would not significantly "overlap" even where well spacing reached the maximum density. In other words, ground level concentrations of air pollutants would be localized around a well site such that installing additional wells in the field would not produce overlapping, cumulative concentrations of emissions.

The conservative, "worst case" emission assumptions used in the air quality analysis have defined an extreme, upper limit estimate of potential emissions. A review of current production activities

in the project area suggested that, in actual operations, this level of emissions and potential impact would not be reached or exceeded. For example, the worst case analysis assumed that all of the potential well sites would be producing--that is, there would be no dry holes when it is very likely that some wells would be either dry or uneconomical to produce. The analysis assumed that all producing wells would be operational for 10 to 20 years. In reality, the productive life of a well could be much less and, in any case, production rates would not be constant over this period. Finally, the analysis assumed that all production activity would occur at the maximum possible emission rate and that this rate would be sustained continuously over the life of the field. In reality, emission rates would be variable. Equipment would seldom be operated continuously at a maximum capacity and emissions would vary under different production scenarios. Considering these assumptions, the analysis has produced an extreme, upper-bound estimate of potential air quality impacts that, in reality, would not be reached during implementation of the proposed activities.

Another factor mitigates against reaching this upper-bound estimate as well. Before emission sources could be constructed, the Wyoming Department of Environmental Quality (WDEQ) would require the project proponents to submit applications for air quality permits. These applications would address expected emissions from specific project components such as compressors. Additional site-specific air quality analysis and emission control measures could be required to ensure protection of air quality and compliance with applicable federal and state regulations. Considering this oversight, the possibility of reaching the "worst-case" emission scenario is reduced even further.

Nonetheless, due to public concerns about potential air quality impacts, an assessment of cumulative impacts was also performed to predict potential, cumulative air quality impacts at the Cloud Peak Class II Wilderness area to:

- calculate potential nitrate and sulfate deposition (and related water chemistry impacts) in sensitive lakes; and,

- to address potential changes in regional visibility.

Three groups of sources were considered:

- emissions from the Proposed Action and Alternative well field development; and,

- sources with Wyoming Department of Environmental Quality permits, considered as "Permitted but not Operational", including:

  Colloid Environmental Technologies, Lowell Plant - Big Horn County
  Texaco Garland Compressor Engine - Big Horn County
  Texaco 3 Oil Heaters - Big Horn County
  Texaco Glycol Dehydrator - Big Horn County
  WyoBen Sage Creek Bentonite Plant - Big Horn County
  WyoBen Stucco Bentonite Plant - Big Horn County
  AMOCO Big Sand Draw - Fremont County
  Colorado Interstate Gas, Bridger Compressor Station - Fremont County
  Moltz Construction Company - Johnson County

Department of Energy, Naval Petroleum Reserve - Natrona County
Equitable Resources - Natrona County
Forest Oil Company - Natrona County
Intoil, Inc - Natrona County
Kaycee Bentonite Ore Dryer - Natrona County
Rissler & McMurry Co. - Natrona County
Western Gas Resources, Sand Dunes Plant - Natrona County
Larry's Inc. Asphalt Plant - Sheridan County
Veterans Administration Medical Center - Sheridan County
Devon Energy Company - Washakie County
McGarwin -Moberly Construction - Washakie County

It is possible that these facilities may never become operational and add to cumulative impacts on air quality. However, in the interest of considering a "worst-case" scenario they were incorporated into this analysis.

- gas/oil wells that have been issued Wyoming Oil and Gas Conservation Commission permits since January 1996.

Many of these wells may never become operational and add to cumulative impacts on air quality. However, in the interest of considering a "worst-case" scenario they were incorporated into this analysis.

It is important to consider the level of conservatism factored into this analysis when reviewing the modeling results. The projected impacts reflect "screening" level modeling--a modeling approach that is conservative by design. Therefore if the modeling shows impacts less than the significance criteria, there is no need to perform a more refined analysis. The following, conservative assumptions have been incorporated into the analysis of impacts on the Cloud Peak Class II Wilderness Area:

- All sources were assumed to be operating simultaneously and continuously at the highest rate of emissions possible. Given the number of sources included in this analysis (approximately 400), the probability of such an emissions scenario occurring over a 24-hour time period or an entire year is extremely small. While this assumption is typically used in such modeling analyses, the resulting impacts will be overstated. It should be noted that as the number of sources increases, the level of conservatism also increases.

- The Industrial Source Complex-Short-term (3rd generation) or ISCST3 model assumes instantaneous, straight-line transport of the plume. In other words, the model does not account for the actual travel time, distance, nor the non-linear path a plume would actually follow as it traveled from a source to the Cloud Peak Class II Wilderness Area. Due to this assumption, the model significantly overestimates the number of times a plume would actually reach the wilderness area. Also, because the model cannot predict the varying route, the concentration of an actual plume is overstated. This limitation is not very important for near-field assessments but for plume distances greater than 50 kilometers, the assumption becomes very conservative.

- The ISCST3 model also conservatively addresses plume transport for large elevation increases (3000 feet) in complex terrain. Even though a trajectory could transport the plume

toward the Cloud Peak Class II area, it is doubtful that it would climb 3000 feet necessary to reach the sensitive area.

Since there are no federal or state atmospheric deposition or visibility protection regulations for a Class II wilderness area or for wilderness study areas (WSAs), the air quality impact assessment did not estimate potential impacts at BLM-administered WSAs. However, at the request of the USDA-Forest Service, estimates of potential atmospheric deposition and visibility impacts were made for the Cloud Peak Class II Wilderness Area.

Maximum, cumulative, SO_2(sulfur dioxide) and NO_2concentrations were predicted for Florence Lake located within the Cloud Peak Class II Wilderness Area. This lake was identified by the USDA-Forest Service as sensitive to atmospheric deposition and is one at which data has been collected. Its Acid Neutralizing Capacity, or ANC, has been estimated at 37.6 ueq/l (microequivalents per liter). Atmospheric deposition at Florence Lake was predicted to be 0.010 kg/ha-yr (kilograms per hectare per year of nitrogen) and 0.022 kg/ha-yr (sulfur). This compares to threshold values (Fox et al. 1989) of 3 kg/ha-yr (aquatic nitrogen) and 5 kg/ha-yr(terrestrial sulfur). The potential ANC change at Florence Lake was predicted to be 0.5 percent. The USDA - Forest Service has defined an ANC "limit of acceptable change" as 10 percent for lakes, such as Florence Lake, which have an ANC greater than 25 ueq/l.

Since emissions from the proposed activities would constitute many small sources spread out over a very large area, discrete, visible plumes are not likely to be created or to impact the Cloud Peak Class II Wilderness Area. However, the potential for cumulative visibility impacts--such as increased regional haze and visibility degradation--is a concern. Regional haze is caused by fine particles and gases scattering and absorbing light. Changes to regional haze are measured in terms of visibility differences relative to background (existing) conditions.

The Interagency Workgroup on Air Quality Modeling (IWAQM) has prepared a very conservative screening method to estimate potential, regional haze impacts (IWAQM 1993). This method involves modeling SO_2, NO_2, and particulate emissions to estimate fine particle concentrations at the area of concern and to compute the potential visibility reduction which is defined in terms of "deciview" change. The magnitude of deciview change, its frequency, time of the year and meteorological conditions during times when deciview thresholds are above 1.0, as well as the inherent conservatism of the analyses, must be considered when assessing the significance of potential visibility impacts.

The ISCST3 model was used to estimate the maximum 24-hour and annual average pollutant impacts created by the proposed development at receptors along the boundary of the Cloud Peak Class II Wilderness Area. For this analysis, NO_2 is the only pollutant of concern since sulfur emissions are unlikely during production of the "sweet" gas found in the field.

Background visibility was assumed to be 374 km (Standard Visual Range or SVR) based on data provided by the USDA-Forest Service monitoring program (Blett 1996). This represents a 90th percentile, best-case visibility for every day in a year. This is a very conservative assumption as the theoretical maximum, possible visibility is 391 km SVR. Conservative assumptions also were made about plume transport time, the occurrence of a 95 percent relative humidity, and the conversion efficiency of NOx to ammonium nitrate. Finally, the conservative nature of the analysis was taken one step further by including nearby sources which are "Permitted but not Operational." This meant that background visibility was assumed to be more clear than it otherwise might be if those already permitted sources were operating.

Using these conservative assumptions, the maximum, predicted deciview reduction was 0.5. Under "real-world," field development conditions it is likely that the actual reduction in visibility would be significantly less. The BLM considers a deciview change of 1.0 as potentially significant. This criteria was proposed by Pitchford and Malm (1994) and has been adopted by the Grand Canyon Visibility Transport Commission. A 1.0 deciview is defined as "about a 10 percent change in extinction coefficient, which is a small but perceptible scenic change under many circumstances." The USDA-Forest Service has established a 0.5 deciview as the "limit of acceptable change" to evaluate potentially significant visibility impacts at the Cloud Peak Class II Wilderness Area. But based on either criteria, the Proposed Action and project alternatives would not result in any perceptible visibility impact (even on the cleanest days) at the Cloud Peak Class II Wilderness Area.

In summary, while an incremental increase in cumulative impacts to air quality would occur as a result of the Proposed Action or project alternatives, the magnitude of this increase would be small and, even under "worst-case" conditions, would not result in the exceedance of any federal or state air quality standard. Despite the incorporation of very conservative assumptions into the analysis, emissions from the Proposed Action and project alternatives would not result in cumulative impacts in excess of USDA-Forest Service criteria for allowable atmospheric deposition and changes in visibility at the Cloud Peak Class II Wilderness Area. The Wyoming Department of Environmental Quality has been granted the authority to monitor cumulative changes in air quality and to implement air pollution controls where necessary to ensure compliance with federal and state air quality standards.

2.3 ERRATA

This section describes changes to the DEIS prepared in response to public comments. In some cases responses to public comment have been repeated here and incorporated into the FEIS. Where BLM response to a public comment referred the reader to the "errata", this change has been indicated below. Additional changes have been made in the DEIS by the BLM to correct minor errors in the text.

EXECUTIVE SUMMARY

INTRODUCTION

Page S-2. Paragraph 1, line 7 has been changed to: "The WRMG's preliminary report...relied upon by the BLM..."

AGENCY-PREFERRED ALTERNATIVE

Page S-5. Paragraph 2, lines 4 and 6, correct the two references of "GRRA" to "GRAA".

LIST OF ACRONYMS/ABBREVIATIONS

Page A-I. Add "FLPMA Federal Land Policy and Management Act"

Page A-ii. Add "PM10 Particulate Matter - up to 10 microns in effective diameter"

Page A-ii. Revise as follows:

TSP	Total Suspended Particulate Matter - up to 150 microns in effective diameter
VOC	Volatile Organic Compounds (ozone precursors)

CHAPTER 1
PURPOSE AND NEED

1.1 PROJECT DESCRIPTION AND LOCATION

1.1.2 Location

Page 1-1. Add the following to the last sentence of this section: "as shown on Figure 1-2."

1.1.3.2 Cave Gulch Unit

Page 1-6. Replace the last two paragraphs, in their entirety, with the following:

"In the absence of a special order by the WOGCC establishing or authorizing a different well density, the spacing pattern established by the WOGCC Rule 302 for unspaced areas applies. Rule 302 authorizes a well density of one well per 40 acres (16 wells per section).

Drilling activity within the Cave Gulch and Bullfrog Units is not regulated by a WOGCC spacing order. WOGCC Rule 302 has been vacated or suspended. By vacating Rule 302, Chevron and Barrett may develop Lance and Fort Union wells on any spacing pattern that would result in maximum efficient recovery of the natural gas reserves. In Areas 1 and 2 of the proposed action, wells would be developed on 1 well per 160 acres with a buffer zone where wells would be developed on 1 well per 80 acres. In Areas 3 and 4 of the proposed action, wells would be developed on 1 well per 40 acres, exclusive of Sections 30, 31, and 32. Wells in Sections 30, 31, and 32 would be developed on 1 well per 20 acres with a buffer zone where wells would be developed on 1 well per 40 acres.

1.1.4 Land Status

Page 1-7, Paragraph 1, sentence 2 is corrected as follows: "Of this total, approximately 7,375 acres are federal, 1,244 acres are State of Wyoming, and 16,474 acres are private lands.

Page 1-7. Tables 1-5 and 1-6 are corrected as follows:

Table 1-5. Surface Ownership of the Cave Gulch-Bullfrog-Waltman Project Area.

SURFACE OWNERSHIP	ACRES	PERCENT
Private	16,474	65.7
Federal (BLM)	7,375	29.4
State of Wyoming	1,244	4.9
TOTAL	**25,093**	**100.0**

Table 1-6. Mineral Ownership of the Cave Gulch-Bullfrog-Waltman Project Area.

MINERAL OWNERSHIP	ACRES	PERCENT
Private	5,105	20.3
Federal (BLM)	19,182	76.5
State of Wyoming	806	3.2
TOTAL	**25,093**	**100.0**

Page 1-8. Figure 1-3. Land status errors have been corrected; see corrected figure at end of the Errata section.

1.4 ENVIRONMENTAL ANALYSIS PROCESS

Page 1-10. Paragraph 1, replace the second sentence with the following: "The analysis is to disclose what impacts to the human environment would result from approval of the action, and disclose the information used in determining those impacts."

1.5 RELATIONSHIPS TO POLICIES, PLANS, AND PROGRAMS

1.5.1.1 Platte River Resource Area Management Plan EIS and Record of Decision

Page 1-12. Last paragraph: remove the last sentence from Surface Disturbance Stipulations and place at the end of the 8th paragraph, No. 2 of Energy and Minerals (M1).

Page 1-13. Wildlife Stipulation. 1st bullet. Modify first sentence to read: "To protect important raptor nesting habitat..." -AND- Add 2nd bullet: "Controlled Surface Use restriction within ¼-mile radius of each active sage grouse lek. An additional 1¾-mile radius is protected from construction activities from March 1 through June 15. Exceptions to the time and distance limitations in any particular year may be authorized by the district manager."

Page 1-13. Wildlife Stipulation. Add the following as 2nd bullet: "The following land use plan decision for raptor nesting is applied specifically when raptor nests have been identified:

> Where surface development proposals threaten the active nests of high federal or state interest raptor species, the PRRA will designate a suitable biologic buffer zone around the nest or nests where no surface development is permitted during the nesting season. Species identified jointly by the BLM the U.S. Fish and Wildlife Service, and the Wyoming Game and Fish Department as high interest species are bald eagle, golden eagle, osprey, peregrine falcon, prairie falcon, merlin, ferruginous hawk, Cooper's hawk, Swainson's hawk, burrowing owl, barn owl, great-horned owl, short-eared owl, long-eared owl, eastern screech-owl, northern saw-whet owl, northern goshawk, sharp-shinned hawk, northern harrier, and red-tailed hawk. An active nest is defined as one that has been used at least once during the previous three years.

The size of the buffer zone will be determined case by case by the BLM area manager, who will consider topography and raptor prey habitat surrounding the nest site. Usually the buffer zone will be ¼ to ½ mile. BLM personnel will determine buffer zones for active eagle nests and for cliff nesting sites of falcons in consultation with the U.S. Fish and Wildlife Service.

The general dates of restriction for all species are February 1 through July 31 (or until the young have fledged). If needed, specific dates for particular species will be defined at the time of a proposed action, and will be based upon the most recent nesting data."

1.5.1.3 Development of Federal Oil and Gas Leases in the Cooper Reservoir Unit - Environmental Assessment - Number WY-062-06-047

Page 1-15. Paragraph 3, sentence 3 is modified to read "...2 wells were proposed by Intoil, Inc. on private minerals."

Page 1-16. Table 1-7, add under Bureau of Land Management: Approves mineral material sales and free use permits for mining of common varieties of sand, stone, and gravel located on federal minerals.

Page 1-17. Table 1-7. Add the following under Wyoming Department of Environmental Quality:

Agency	Nature of Action
Air Quality Division	Permitting/approval for compression sites, flaring, and other natural gas production and processing facilities; burning of commercial garbage and any other open burning; fugitive dust suppression.
Land Quality Division	Approves permits for aggregate material (e.g. sand and gravel) mining activity.

Page 1-18. Table 1-7, under Natrona County, sentence 4 is modified as follows: "...new structures and non-mineral mining activity (aggregate material) where appropriate."

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVE SELECTION PROCESS

2.1.1 Proposed Action

Page 2-1. Paragraph 2, sentence 1, quoted material is modified as follows: "require that all operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources."

2.2 PROPOSED ACTION

2.2.2.1 Access Road Construction

Page 2-5. First paragraph, sentence 1 is modified as follows: "...in Figures 1-1 and 1-2."

Page 2-11. Last paragraph, sentence 2 is modified as follows: "...activities associated with drilling 16 wells (160 wells during the 10-year drilling program = 16 wells per year)."

2.2.2.3 Drilling Operations

Page 2-18. Paragraph 2, sentence 1 is modified to read: "...water produced by Chevron's wells during production operations is collected in a lined pit and then injected ..."

2.2.2.4 Pipeline Construction

Page 2-20. Paragraph 1, sentence 2 is modified to read: "...installation procedures along side roads..."

2.2.2.6.2 Production Operations

Page 2-22. Paragraph 3, last sentence, "Waltman Unit" is corrected to read "Bullfrog Unit".

Page 2-25. Figure 2-9 has been modified to include a second dehydrator and a second separator; see corrected figure at end of the Errata section.

Page 2-26. Figure 2-10. Two references to "Waltman Unit" are corrected to "Bullfrog Unit".

2.2.2.12 Project-Wide Mitigation Measures

Page 2-30. Resource-Specific Mitigation, Air Quality. Paragraph 2, replace entire second paragraph as follows: "The operators will initiate immediate abatement of fugitive dust (by application of water, chemical dust suppressants, or other measures) when an air quality, soil loss, or safety concerns are identified by the BLM or the WDEQ/AQD. These concerns include, but are not limited to, potential exceedances of applicable air quality standards. The BLM will approve the

control measure, location, and application rates. If watering is the approved control measure, the operator must obtain the water from State-approved source(s)."

2.3 ALTERNATIVE A

Page 2-36. Paragraph 3, line 4 has been modified to read: "...seasonal 1-mile buffer zone for all selected ferruginous hawk nests (Figure 2-12)" and thereby is in agreement with the information presented in Figure 2-12 in the DEIS.

Page 2-38. Last paragraph, line 2, add two paragraphs following the first sentence:

"The number of wells identified under Alternative A includes the deep test wells. The deep test wells could be located within any of the spacing areas. Under Alternative A, individual or twin well pads would be designed or enlarged to accommodate centralized production facilities. The average area that would be used for individual or twin production facilities (shown on DEIS figures 2-7 and 2-9) is approximately 2.75 acres. The area that would be needed for facilities for centralized production is an additional disturbed area of approximately 0.625 acre per centralized facility (areas would range from 0.5 acre to 0.75 acre, for an average of 0.625 acre).

If 28 centralized production facilities were implemented, up to 17.5 acres in addition to the area disturbed by well pads would be required (28 X 0.625 = 17.5). Two centralized compression stations under Alternative A are estimated to require up to 3 acres each, for a total of 6.0 acres of disturbance. The total estimated disturbance that would result from centralized production facilities and centralized compression stations is 23.5 acres (17.5 + 6.0 = 23.5). This is included within the 35 acres analyzed for ancillary facilities."

2.4 ALTERNATIVE B (BLM PREFERRED ALTERNATIVE)

Page 2-40. Paragraph 1 (bold text). Sentence 2 is deleted.

Page 2-40. Paragraph 3, last sentence, add the following test at the end of the sentence: "...for projects in the proposed KRA."

Page 2-43. Paragraph 5, line 2. After the first sentence, add the following sentence: "The number of wells identified under Alternative B includes the deep test wells. The deep test wells could be located within any of the spacing areas."

2.5 ALTERNATIVE C - NO ACTION

Page 2-43. Paragraph 1, sentence 1 is modified to read: "The CEQ regulations ... (40 CFR 1502.14 (d)."

2.6 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Page 2-46. Add new paragraph to second bullet:

"The location of a liquid processing plant is greatly restricted by physical and engineering constraints. Some technical constraints include the need to connect the plant to transportation pipeline systems; the need for all weather access for operational purposes; and, close proximity to producing wells due to gas and pipeline pressures and associated compression. Information submitted for the plant includes information about alternative sites that were considered, including locations on private and/or state owned surface. However, the BLM does not have the authority to require a facility to be located on nonfederal surface. Therefore, in consideration of these limitations, a detailed analysis of alternative locations other than the site proposed by the Operators was not conducted."

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 GEOLOGY/PALEONTOLOGY

3.1.1.2 Mineral Resources

Page 3-8. Paragraph 5, line 7 is modified to read "...containing 0.04 percent U_3O_8 (Uranium oxide), from the Bridger Trail prospect (737N, R88W), developed in this zone (Harris and King 1993)."

3.1.1.3 Geologic Hazards

3-9. Paragraph 1, line 7, two references to "Cave Creek" are corrected to read "Cave Gulch".

3.1.2.1 Regional Paleontologic Overview

Page 3-10. Last paragraph, last line, reference to "Cave Creek" is corrected to read "Cave Gulch".

3.2 AIR QUALITY

3.2.1 Climate, Precipitation, and Winds

Page 3-13. Figure 3-2, add: "Source: (EPA 1996)"

Page 3-13. Figure 3-2. Revise as follows: "WIND SPEED CLASSES (knots)"

Page 3-14. Paragraph two. End of second sentence, replace "(SCRAM 1994)" with "(EPA 1996)".

Page 3-14. Add the following after the second paragraph:

"Potential severe weather conditions and frequency of occurrence may be summarized as follows (Rykaczewski et al. 1980). From 1916 through 1967, the Wyoming State Climatologist has reported fifteen tornadoes in the Casper District. Statewide (based on the same time period), 165 tornadoes were reported, with 45 per cent occurring in June, 42 percent in May and July, and twelve per cent occurring during the other nine months.

The majority of thunderstorms occur between April and September, with most occurring in June and July. The Casper District averages 40 to 50 days with thunderstorms annually. Large hail, strong winds, and occasional tornadoes are associated with severe thunderstorms. The Casper District averages between two and four days with hail each year.

Lightning is commonly associated with summer thunderstorms, although damage and occurrence data are not often reported. Strong, sustained winds occur quite often, and observations indicate winds of 70 to 80 miles per hour (with gust to 100 miles per hour) can occur throughout Wyoming."

Section 3.2.2 Air Quality

Page 3-14. First paragraph, end of last sentence, add "(WDEQ 1995) and (WESTAR 1995)."

Page 3-14. Third paragraph, end of first sentence, add "(WDEQ 1996)."

Page 3-14. Paragraph 3. End of second sentence, replace "(BLM 1983)" with (USDI-BLM 1983)"

Page 3-15. Replace Table 3-4 with the following:

Table 3-4. Background Air Quality Concentrations, Applicable Standards and PSD Increments (micrograms per cubic meter - $\mu g/m^3$)

Pollutant	Averaging Time [a]	Background Concentration	WAAQS	NAAQS	PSD Increments Class I	Class II
CO	1-hour	3,500	40,000	40,000	none	none
	8-hour	1,500	10,000	10,000	none	none
NO_2	Annual	2	100	100	2.5	25
Ozone	1-hour	110	160	235	none	none
SO_2	3-hour	93	1,300	1,300	25	512
	24-hour	32	260	365	5	91
	Annual	4	60	80	2	20
TSP	24-hour	70	150	none	none	none
PM10	24-hour	42	150	150	8	30
	Annual	19	50	50	4	17

Sources: WDEQ 1995, WDEQ 1996, and WESTAR 1995..

Note: [a] Short-term concentrations reflect the maximum measured values during the entire period of record (i.e.; NO_2 1986 through 1987, TSP and PM10 annual 1995, etc.), except for ozone, which reflects the 90th percentile maximum 1-hour value measured at Pinedale, Wyoming, during 1993 through 1994.

3.3 SOILS

3.3.2 Soil Map Unit Descriptions

Page 3-21. Table 3-5. Page 3 of the table is corrected to include Soil Map Unit #229 and the following: Map unit name: Orpha loamy sand (15% inclusions: Tullock loamy sand and Vonalee loamy sand); Slope phase: 10 to 30 percent ; Topography: stable dunes, 5,300 - 6,400 ft.; Series: Orpha loamy sand (85%); Parent material: eolian deposits; Depth: very deep; Predominant texture: loamy sand; Drainage: excessively drained; Permeability: very rapid; and Effective rooting depth: >60 in.

3.4 WATER RESOURCES

Page 3-32. Following paragraph 1, add new paragraph 2 as follows: "To date, water for drilling operations has been obtained from either Mel's Water Service, or the Flying A Ranch. The Mel's

Water Service water well is located just east of Waltman (NE¼ NE¼ Section 30, T36N, R86W). The water supplied by the Flying A Ranch is from a livestock reservoir in the project area (NE¼ SE¼¼ Section 30, T37N, R86W). Both of these sources are located on private surface.

3.4.2 Surface Water

Page 3-37. Paragraph 2, line 11, add the following sentence: "BLM and other agency authorization of the proposed project would require compliance with Pollution Prevention Act of 1990, EO on Pollution Prevention in 1993 (EO 12856); Spill Prevention Control Plan, Clean Water Act, CEQ guidelines, and NEPA."

Page 3-38. Paragraph 3 is corrected as follows: "... are Class 5 streams from a fisheries perspective (very low production waters - often incapable of sustaining a trout fishery)..."

3.5 VEGETATION AND WETLANDS

3.5.4 Special Status Plant Species and Communities

Page 3-46. Paragraph 1, line 6. Delete the following: "...and because of its being recommended for down-listing to 3C status".

Page 3-48. Table 3-13, column titled "Status" cell row numbers: 3,4,5, and 6. Delete C2, 3C, C, and C2, respectively.

Page 3-49. Under US Fish and Wildlife Service (Federal) Rank, change "C1" to "C"; change "Category 1 Candidate" to "Candidate"; and delete C2 and 3C categories from the table footnote.

3.6 RANGE RESOURCES AND OTHER LAND USES

3.6.2 Other Land Uses

Page 3-50. Paragraph 1, lines 1 and 2, surface ownership acreages are changed to: "...7,375 federally owned acres; 16,474 privately owned acres; and 1,244 acres that are State of Wyoming lands."

3.7 WILDLIFE

3.7.2 General Wildlife

Page 3-52. Paragraph 1, line 6, reference is corrected to read: "(HWA 1996)".

3.7.2.1 Big Game

Page 3-53. Paragraph 2, sentence 1 is corrected to read: "... harvest levels in this herd were reduced to allow it to increase to a new population objective of 9,000 animals."

Page 3-56. Paragraph 2, last sentence is completed as follows: "3.5 miles from the project area".

3.7.2.3 Raptors

Page 3-59. Paragraph 1, line 5 is corrected as follows: "... the operators recommended an increase in the size and extent of the raptor monitoring and inventory area."

Page 3-59. Paragraph 1, line 7 is modified as follows: "This expanded raptor analysis area, hereinafter referred to as the Greater Raptor Analysis Area (GRAA), is..."

Page 3-65. Paragraph 1, lines 2 and 5, references are corrected to read: "(HWA 1996)".

3.7.3 Special Status Wildlife Species

Page 3-68. Paragraph 2, sentence 1 is modified as follows: "... two species designated as Candidate wildlife species..."

Page 3-68. Table 3-20. The two references to "CI" Status have been corrected to "Candidate" Status.

Page 3-69. Add the following at the end of Section 3.7.3: "Aquatic Animals. No known endangered, threatened, candidate or sensitive species of aquatic animals are known to be or suspected to be associated with the wetland sites on the project area."

3.9 VISUAL RESOURCES

Page 3-70. Paragraph 1. Replace sentence 6 with the following clarification: "An estimated 4,000 acres within the analysis area have been classified as having Class A or B Scenic Quality. Between 700 and 1,000 acres have been impacted by oil and gas development when viewed from existing transportation roads within the analysis area. The remaining 3,000 to 3,300 acres will retain Class A or B scenic quality".

Page 3-73. Paragraph 4. Remove sentence 6 in its entirety, which reads: "Equally sensitive ... into the project area."

3.10 CULTURAL RESOURCES

3.10.1 Cultural Resource Data Base

Page 3-75. After the first paragraph add the following paragraph:

"None of the cultural resources discovered in the core area are of the type, density or distribution to suggest that there is any potential for the presence of Native American sacred sites or Traditional Cultural Properties. Instead, the known site inventory consists of routine domestic and utilitarian debris which lies well below the threshold of materials that would invoke evaluation as potential Traditional Cultural Properties. The spatial distribution of known sites suggests a fairly high density at the base of the rugged uplifted sandstone strata, which is a sheltered area at the ecotone between the lower open rolling terrain to the east and the upper flatter area to the west. Ecotone areas like this are optimal for seasonal occupation but do not represent a high sensitivity as sacred sites. The open areas surrounding the highland/lowland ecotone have a much sparser distribution

of prehistoric sites; these tend to be smaller open lithic scatters and small camp sites. Again, these are not the site types that tend to be associated with sacred site situations."

3.11 SOCIOECONOMICS

3.11.3.1 Employment, Unemployment, and Labor Force

Page 3-77. First paragraph, sentence 3 is corrected as follows: "Between the peak of 1981 and the trough of 1987, total Natrona County employment fell from 51,150 jobs to 36,403 jobs, a loss of 29 percent over the 6 year period."

3.11.3.2.2 Other Economic Sectors

Page 3-80. First paragraph is corrected as follows: "...Manufacturing employment grew from 1,880 in 1973 to 2,154 in 1981, an increase of 15 percent. From the peak, manufacturing employment declined to a low of 1,391 in 1983, a 35 percent loss, and has rebounded to 1,788 in 1994, a 28.5 percent increase over the low point."

Page 3-81. First paragraph is corrected as follows: "In contrast, Natrona County service sector employment has shown annual increases in all but three years during the 1973 through 1994 period, ending at 11,017 for a 109.6 percent increase over the 1973 level of 5,256."

3.11.3.4 Earnings

Page 3-84. First paragraph is corrected as follows: "...Between 1990 and 1994, per capita personal income increased 17.1 percent."

3.11.7.1 Natrona County

Page 3-87. First paragraph is corrected as follows: "Law enforcement and criminal justice systems (along with county roads which are discussed in Section 3.12)..."

3.11.9 County Fiscal Conditions and Mineral Tax Revenues

Page 3-92. Figures in the last row of Table 3-31 (General Fund Mill Levy) are in mills rather than percentages.

3.12 TRANSPORTATION

3.12.3 Existing Transportation System and Conditions within the Project Area

Page 3-94. Figure 3-21. The road classifications shown on the figure have been modified to reflect the correct status of the project area road network. See corrected figure at the end of the Errata section.

3.14 NOISE

Page 3-99. Paragraph 3, end of first sentence, replace "(BLM, PRRA Programmatic EA, p.56)" with "(USDI-BLM 1981, p.56)"

Page 3-100. Table 3-34, footnote one, second sentence, replace with: "Source: USDI-BLM (1990), as based on Federal Energy Regulatory Commission (no date)."

Page 3-100. Table 3-34, footnote two, replace with: "Actual noise level field data reported in Kruger (1981)."

Page 3-100. Table 3-34, footnote four, third sentence, replace with: "There can be times when the noise is higher or lower than this dBA level."

Page 3-100. Table 3-34, footnote five, replace with: "dBA = average sound level in decibels (audible frequency range)."

Page 3-101. Table 3-35, footnote one, replace with: "Actual noise level field data reported in Kruger (1981)."

Page 3-102. Table 3-36, footnote two, sentence 1, replace with: "Source: Federal Energy Regulatory Commission (1996)."

CHAPTER 4
ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

4.1 GEOLOGY/MINERALS/PALEONTOLOGY

4.1.5.3 Paleontology

Page 4-6. Specific Mitigation Measures, Paragraph 1, sentence 2 is corrected as follows: "A paleontologic report documenting the survey is provided in Appendix E."

4.2 AIR QUALITY

Section 4.2.1 Introduction

Page 4-7. Paragraph 1, sentence 5, is modified as follows: "Individual well sites could be permitted following a limited start-up period, as required by the WDEQ/AQD."

Section 4.2.2 Impact Significance Criteria

Page 4-7. Paragraph 1, last line is modified to read: "...allowed in specific areas, shown in Table 3-4."

Section 4.2.3.1 Proposed Action, Alternatives A, B, and C

Page 4-8. Paragraph 1, last sentence, replace "VOC (Ozone)," with "VOC (Volatile Organic Compounds - ozone precursors),"

Page 4-8. Paragraph 5. Replace entire paragraph as follows: "The air quality impact analysis assumed water and/or chemical dust suppressants would be applied in order to achieve a 50 percent control efficiency to minimize TSP and PM10 fugitive dust emissions."

Page 4-9. Replace first paragraph as follows: "The maximum direct CO impacts predicted to occur from the compressor engines during the maximum well field production phase are nearly 1,020 $\mu g/m^3$ (1-hour) and 727 $\mu g/m^3$ (8-hour). When these values are added to the assumed background concentrations, total maximum CO impacts become nearly 4,520 $\mu g/m^3$ (1-hour) and 2,227 $\mu g/m^3$ (8-hour), demonstrating compliance with the applicable CO standards of 40,000 $\mu g/m^3$ (1-hour) and 10,000 $\mu g/m^3$ (8-hour)."

Page 4-9. Third paragraph, end of second sentence, add "(Dailey 1996)."

Page 4-9. Paragraph 4, first sentence is modified as follows: "Possible NOx emission control measures include:"

Page 4-10. Paragraph 1, first sentence is modified to read: "At the predicted ratio (2.2)..."

Page 4-10. Add new second paragraph: "Potential emission levels would meet Prevention of Significant Deterioration (PSD) Class II increment limits (no PSD Class I areas are likely to be affected by the proposed project). The maximum modeled NO_2 concentration of 22.3 is below the

applicable PSD Class II increment of 25 $\mu g/m^3$. This comparison is not a comprehensive PSD Increment Consumption analysis (which is a regulatory inventory and compliance responsibility of the state regulatory agencies and the EPA), but is included to indicate the potential level of significance."

Page 4-10. Paragraph 3, replace the fifth through seventh sentences as follows: "In addition, there would be no further cumulative risk, since no residence would be affected by more than a group of eight wells and one compressor at the same time. Under the MLE scenario, the estimated cancer risks associated with long-term exposure to benzene and formaldehyde concentrations are 7e-08 and 4e-07, which are both below the 1e-06 threshold. The estimated total MLE cancer risk for the inhalation pathway (5e-07) is also less than 1e-06."

Page 4-10. Table 4-1, add "Source: (EPA 1997)"

Section 4.2.4 Impacts Summary

Page 4-11. Paragraphs 2 and 3 have been replaced with the following: "Potential cumulative air quality impacts at the Cloud Peak PSD Class II Wilderness Area are described in Section 5.3 (Cumulative Impacts Analysis - Air Quality). See **Addendum: Air Quality** above."

4.3 SOILS

4.3.2 Impact Significance Criteria

Page 4-12. Paragraph 2 (second bullet), add the following: "Should a watershed management plan be required for the Cave Gulch watershed, the BLM would coordinate with WDEQ and other appropriate federal, state, and local agencies."

Page 4-12. Paragraph 3 (third bullet) is deleted from the text.

4.3.3.1 Proposed Action

Page 4-18. Paragraph 3, line 17: disturbance of "394.07 acres" is corrected to "394.01 acres".

4.3.3.2 Alternative A

Page 4-21. Paragraph 2, line 2: disturbance of "788.39 acres" is corrected to "670.01 acres".

Page 4-23. Table 4-10. Well pad acres total is corrected from "160.09" to "160.10".

4.3.3.3 Alternative B

Page 4-26. Paragraph 1, line 3, "Alternative A" is corrected to read "Alternative B".

Page 4-27. Table 4-14. Well pad acres total is corrected from "185.51" to 185.50".

4.3.5 Mitigation Summary

Page 4-29. First bullet is modified as follows: "Reduce all soil disturbance...for safe construction and operation."

Page 4-29. Second bullet, line 2 is modified to read: "... areas with poor and very poor reclamation potential..."

Page 4-30. Paragraph 3 (third bullet) delete second sentence from the text.

4.4 WATER RESOURCES

4.4.1 Introduction

Page 4-31. Paragraph 1, last sentence is modified as follows: "...protection, EO 11988 (floodplain protection), EO 11990 (wetlands protection), and the Federal..."

4.4.2 Impact Significance Criteria

Page 4-31. Second main bullet is modified as follows: "Compliance with Executive Orders 11988 (protection of floodplains) and 11990 (protection of wetlands)."

4.4.3.1 Proposed Action

Page 4-34. Paragraph 2, line 9 is modified as follows: "Therefore, total water demand including hydrostatic testing..."

Page 4-35. Paragraph 2, line 3 is modified as follows: "... in compliance with EPA standards on hazardous substances."

Page 4-36. Paragraph 1. Add the following text: "Due to unconsolidated bedding at shallow depths, the surface casing is typically set to a depth of 500 feet in the majority of the wells drilled in this field. For depths greater than 500 feet, the operators run well logs on potential oil and gas wells to determine formation characteristics and hole integrity. These logs can also be used to determine the presence of usable water and other water sources. The logs for wells drilled in the project area can be located at the WOGCC or the BLM's Casper District Office, WRMG."

Page 4-36. Paragraph 4, sentences 3 and 4 are modified as follows: "Water is produced from existing Barrett and Chevron wells within the Cave Gulch and Waltman field areas. Such water is either injected into the Chevron Waltman No. 15 well or disposed into the Barrett Bullfrog 1-6 lined evaporation pit without adverse effects."

4.4.3.2 Alternative A

Page 4-37. Paragraph 1, line 9 is corrected to read: "... as summarized in Table 4-7."

4.4.3.3 Alternative B

Page 4-39. Paragraph 1, line 1 is corrected to read: "Table 4-3 summarized the total disturbance under Alternative A according to slope class".

4.5 VEGETATION AND WETLANDS

4.5.3.3 Alternative B

Page 4-47. Paragraph 1, line 4 is corrected to read: "... as itemized in Table 4-17."

4.6 RANGE RESOURCES AND OTHER LAND USES

Add the following section to page 4-52:

"4.6.3.4 Alternative C

Alternative C would result in ongoing site disturbance with an associated loss of forage production. The amount of forage production lost is unquantifiable since the anticipated level of development is not known."

4.7 WILDLIFE

4.7.2 Impact Significance Criteria

Page 4-53. First bullet, sentence 1 is modified to read: "...management objectives and laws for wildlife..."

4.7.3.1 Proposed Action

Page 4-54. Paragraph 2, line 4 is modified to read: "... the construction and development phases..."

4.7.3.1.1 General Wildlife

Page 4-54. Paragraph 1, sentence 1 is modified to read: "... the construction and development of gas wells..."

Page 4-55. Paragraph 1, line 6, insert the following as the 4th sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

4.7.3.1.3 Upland Game Birds

Pages 4-56 and 4-57. Sage Grouse. Paragraph 2 is modified by deleting sentences 1 and 2, and replacing them with: "The results of sage grouse surveys conducted during the spring of 1997, and 3 years of ground work in the project area, revealed that crucial sage grouse habitats do not occur on or within two miles of the project area. Therefore, impacts are not expected."

Page 4-57. Paragraph 1, line 3 is modified by replacing "...during formal surveys in the spring..." with "in the future".

4.7.3.1.4 Raptors

Page 4-57. Paragraph 2, line 2 is modified to read: "...a total of 17 nests were..." Line 9 is modified to read: "The identification numbers of nests which were tended or active during 1995 and 1996 include: ferruginous hawk - 3&4, 15, 25&26, 32&34, 41, and 72..."

Page 4-57. Paragraph 3, line 1 is modified to read: "... zone of influence of active raptor nests..."

Page 4-59. Buffer Zones. Paragraph 1, line 1 is modified to read: "Under the Proposed Action, all active nests in the project area..." and line 8 is corrected to read: "... for other raptor species from March 15 through July 31."

Page 4-60. Artificial Nesting Structures. Paragraph 1, lines 8 and 9 are modified as follows: "within the project area and the Greater Raptor Analysis Area (GRAA) within which the project area occurs."

Page 4-60. Artificial Nesting Structures. Add the following text, as last paragraph at the end of the section: "Artificial raptor nesting structures are not expected to create visual impacts because they will be: (1) placed in remote areas away from and out of view of roads in areas not frequented by people, (2) constructed entirely of unpainted or stained wooden materials that will weather and blend with the surrounding landscape, and (3) are relatively insignificant visually (12 feet high) when integrated into the large scale landscape and topography of the GRAA."

Page 4-61. Use of ANSs for moving raptors from certain problem areas. Paragraph 1, last sentences is modified to read: "Apple (1994) and Call (1989 and 1994) have reported the success of this approach in other areas in Wyoming."

Page 4-62. Other Impacts. Paragraph 2, last sentence is modified as follows: ...*The State of the Art in 1996* (APLIC 1996)."

4.7.3.2.4 Raptors, Alternative A

Page 4-64. Paragraph 1, line 15 has been modified to read: "...1-mile buffer zone for all selected ferruginous hawk nests."

4.7.3.3.4 Raptors, Alternative B

Page 4-67. Paragraph 4, line 13 has been modified to read: "...and increased competition among birds in the surrounding area, including those in the proposed KRA ..."

4.7.4.1 Big Game, Upland Game Birds, Special Status and General Wildlife

Page 4-69. Paragraph 2, line 4, replace reference to "Section 2.2.4.1" with " Section 2.2.2.12".

Page 4-70. First bullet, line 4, insert the following as the third sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

4.9 VISUAL RESOURCES

4.9.4 Impact Summary

Page 4-78. Paragraph 3, is replaced with the following: " Impacts to the visual resource would be slightly higher under Alternative A as discussed in Section 4.9.3.2."

4.11 SOCIOECONOMICS

4.11.3.1 Proposed Action

Page 4-83. After the first paragraph, add the following: "The proposed seasonal raptor nesting restrictions are not expected to shut down drilling activity in a large portion of the project area under the Proposed Action or Alternative B. The socioeconomic impacts presented in this analysis should reflect foreseeable impacts provided that the proposed artificial nesting structures are implemented for raptor mitigation."

4.11.3.1.3 Earnings

Page 4-84. Paragraph 1, line 3 is modified as follows: "The average annual wage..."

4.11.3.1.11 Local Government Fiscal Conditions

Page 4-88. State Severance Tax. First paragraph, sentences 3 and 4 are corrected as follows: "The total state severance tax revenues generated by the Proposed Action over the ten year drilling program are estimated to be about $32.9 million. The estimated total state severance tax for the life of the project is estimated to be about $63 million."

Page 4-88. Replace the figures in the second column of Table 4-20 (Wyoming Severance Tax) with the following: 2,196,486; 3,244,053; 3,915,849; 4,386,105; 4,150,820; 3,590,996; 3,199,118; 2,924,804; 2,732,784; 2,598,370; 32,939,387.

Page 4-88. Mineral Royalties. Paragraph 1, sentence 4 is modified as follows: "... gas royalties are illustrated in Table 4-20."

Page 4-89. First paragraph, last sentence is corrected as follows: "Total federal mineral royalties and state royalties over the life of the project are estimated to be $116.8 million and $6 million, respectively."

Page 4-91. County Ad Valorem Property Taxes on Production. First paragraph, sentence 3 is corrected as follows: "The total estimated ad valorem property and production tax revenue for the life of the project is about $76 million..."

Page 4-91. Paragraph 2, line 2 is corrected as follows: "...as illustrated in Table 4-23."

Page 4-91. Revenue Impacts Summary. First paragraph, sentence 2 is corrected as follows: "Total revenues to all of these entities over the life of the project are estimated to be about $265 million."

4.11.4 Alternative A

Page 4-92. Replace the second and third paragraphs with the following: "The NSO restrictions and seasonal stipulations proposed under Alternative A would restrict drilling and unusual maintenance activities in about one third of the field and 67 of the 99 proposed well site locations during at least the February through May portion of the raptor nesting season (assuming that raptors are occupying the area). This would result in seasonal unemployment during that period for up to 63% of the estimated 172 FTEs directly employed on the project. (Drilling and field services represent about 63% of the total Wyoming oil and gas extraction employment.) The secondary effect of the reduced income and spending of direct project-related employees would be a reduction in secondary or induced employment in the Natrona County economy. The seasonal reduction in secondary employment could affect as many as 75 to 152 workers employed in secondary or induced jobs primarily in the retail and service sectors. This seasonal impact on secondary employment would be especially apparent in the highway 20/26 corridor.

The seasonal restrictions would result in a direct loss of income and workload seasonality for a number of oil and gas drilling and service businesses in Natrona County. The seasonal restrictions would make it difficult for many oil and gas drilling and service businesses to retain qualified workers. Seasonal employment opportunities may cause some portion of the unemployed workers in the oil and gas sector to temporarily or permanently relocate to find stable employment opportunities elsewhere. Replacement of these workers would likely result in increased training costs for many of the affected businesses and the reduced efficiency of less experienced workers. Employment of less experienced workers and the attempt to fit a year of drilling activity into 8.5 months may affect worker safety as well.

The seasonal loss of employment and income for households in Natrona County is very likely to cause additional family stress and related family and social problems. The seasonal restrictions would exacerbate the existing problems with underemployment and multiple job holding in Natrona County (see Section 3.11.3.5). Absentee wage-earners or reduced household incomes may place additional burdens on local social service agencies.

Increased seasonal unemployment and loss of income would result in increased government expenses for unemployment, food stamps, and other public assistance. Any associated increase in family stress or other social problems could cause additional expenses for state and local government social service agencies as well.

The potential out-migration of some Natrona County oil and gas workers and the concentration of activity during the mid-May through January time period may result in the need for more in-migrant workers to meet the seasonal employment demand during the open drilling period. Providing services to new residents would increase state and local government expenses for general government, education, law enforcement, etc."

Page 4-92. Fourth paragraph, lines 5 and 6 are corrected as follows: "... (Table 4-24)..."

Page 4-92. Fifth paragraph, last sentence is corrected as follows: "The estimates of reductions in revenues associated with Alternative A are based on the portion of unrecoverable gas reserves that would likely be recovered without the NSO restriction, as under the Proposed Action (54.9 bcf)."

Page 4-93. Line 1 of the first paragraph after Table 4-24 is corrected as follows: "It is estimated that Alternative A would generate approximately $249 million in revenues for federal, state and local governments over the life of the project..."

4.11.5 Alternative B

Page 4-95. Table 4-25. Total Yearly Rentals is corrected from "$9,610.00" to "$9,510.00".

4.11.7 Impacts Summary

Page 4-96. Paragraph 1 is changed as follows: "Given the relatively few wells to be drilled annually under the Proposed Action and Alternatives A and B, ... the socioeconomic effects of the Proposed Action and Alternatives A and B would be largely positive. ... Anticipated tax revenues associated with the Proposed Action and Alternatives A and B would also be substantial. ..."

Page 4-96. After Paragraph 1 add the following: "The value of projected natural gas production from the Proposed Action and Alternative B would increase the total assessed valuation of Natrona County by about 18 percent by 1999 (compared to 1996 total assessed valuation). The increase under Alternative A would be about 16.7 percent. The estimated revenues to be received by the taxing entities in Natrona County including Natrona County School District would be significant in that their ability to provide services will be significantly enhanced relative to the potential increases in expense associated with Proposed Action or Alternatives A or B. The revenue impact is significant compared to the minimal in-migrant population anticipated to move into Natrona County.

The seasonal and year-round restrictions proposed for Alternative A would result in the following adverse socioeconomic impacts (compared to the Proposed Action and Alternative B): reduced incomes, reduced tax revenues, seasonal unemployment, compressed development schedules, worker dissatisfaction and potentially increased in-migration."

4.12 TRANSPORTATION

4.12.4 Alternative A

Page 4-99. Paragraph 1, line 6 is modified as follows: "...impacts presented in Table 4-26".

4.14 NOISE

Section 4.14.3.1 Proposed Action

Page 4-105. Paragraph four, line 9, reference is corrected to read: "(Montana Board of Oil and Gas Conservation 1989, p. 126)."

Page 4-106. Paragraph 1, last line, reference is corrected to read: "(Montana Board of Oil and Gas Conservation 1989)."

CHAPTER 5
CUMULATIVE IMPACTS ANALYSIS

5.1 PROPOSED ACTIVITY AND ACTUAL ACTIVITY REASONABLY FORESEEABLE IN THE PROJECT AREA

Page 5-2. Paragraph 2, line 4 is modified as follows: "Therefore, future surface disturbance in the project area ..."

5.3 AIR QUALITY

Page 5-3. Based on new information obtained after the DEIS was published, Section 5.3 (Air Quality) has been fully re-written, and appears in **Section 2.2 Addendum: Air Quality** above.

5.4 SOILS

5.4.1 Introduction

Page 5-6. Paragraph 1, line 3 is corrected to read: "... such other actions or projects (40 CFR 1508.7)."

Page 5-9. Table 5-1. All references to area are in "acres".

Page 5-10. Table 5-2. All references to area are in "acres".

5.8 WILDLIFE

5.8.1 Pronghorn Antelope

Page 5-17. Add the following text, as an introductory paragraph: "Impacts to pronghorn were assessed over each of the four herd units that the Cave Gulch-Bullfrog-Waltman project area is a part of. These include the 863,744-acre North Natrona Herd Unit, the 660,160-acre Badwater Herd Unit, the 2,882,496-acre Beaver Rim Herd Unit, and the 656,192-acre Rattlesnake Herd Unit. No development activities are proposed for the Rattlesnake Herd Unit."

5.8.2 Mule Deer

Page 5-19. Add the following text, as introductory paragraph: "Impacts to mule deer were assessed over the four herd units that the Cave Gulch-Bullfrog-Waltman project area is a part of. These include the 848,768-acre North Natrona Herd Unit, the 788,544-acre Rattlesnake Herd Unit, the 904,768-acre Beaver Rim Herd Unit, and the 2,161,600-acre Southwest Bighorn Herd Unit. Designated mule deer habitats do not occur within the portions of the Project Area that lie within the Southwest Bighorn and Beaver Rim Herd Units and no development activities are proposed for the Rattlesnake Herd Unit."

5.8.4 Raptors

Summary and Discussion

Page 5-26. Paragraph 1, line 2 is modified to read: "...which is determined by the availability of suitable nesting structures..."

Page 5-26. Last paragraph, beginning with line 5 modify as follows: "When both prey base and suitable nesting structures...as several square miles (Call 1989 and 1994)."

Page 5-27. Paragraph 2, line 4 is modified as follows: "...a finite quantity of suitable nesting areas...".

Page 5-27. Paragraph 2, lines 6, 7 and 8 are modified to read: "...availability of suitable natural... the placement of elevated ANSs in suitable locations ... in otherwise suitable areas where no natural structures exist..."

Page 5-27. Paragraph 2, last sentence is modified as follows: "...would be expected to accept properly located ANSs during the first year (Call 1988 and 1989)."

Page 5-27. Insert the following text between paragraphs 2 and 3: "The BLM will ensure that appropriate raptor mitigation measures, that are as effective as those described in this EIS, are applied to other oil and gas operations (such as Cooper Reservoir) within the GRAA."

Page 5-27. Paragraph 4, modify sentence 1 as follows: "Given the application of mitigative procedures described in Sections 4.7.5.2 and 2.2.2.12, and in the paragraph preceeding this one,..."

5.12 SOCIOECONOMICS

Page 5-29. Paragraph 2 is modified beginning with sentence 2 as follows: "Over the life of the project, it is estimated that all project activities would have a positive, cumulative impact of $265 million on government revenues under the Proposed Action and Alternative B. The estimated cumulative impact on government revenues is $249 million under Alternative A.

Page 5-30. Fifth bullet. Replace the last two sentences with the following: "An exploratory drilling permit for 5 core holes was authorized in February 1997, and the testing program is underway to determine if a quarry on the west end of the Rattlesnake Mountains would contain the quantity and quality of material needed to cover the tailings. No quarry application or proposal has been submitted; after the testing is completed, UMETCO will decide if a quarry application should be pursued. There is no estimate for when their decision will be reached."

5.16 SUMMARY OF COMPARATIVE AND CUMULATIVE IMPACTS

Page 5-33. Table 5-8. Summary of Comparative and Cumulative Impacts, Air Quality, second column (Proposed Action), fifth row (Worst Case Change in lake ANC: Cloud Peak Class II Wilderness), replace "0.02%" with "0.5%" **[NOTE: new value based on revised cumulative air quality impact assessment in Section 5.3 (Air Quality).]**

Page 5-33. Table 5-8. Summary of Comparative and Cumulative Impacts, Air Quality, second column (Proposed Action), fourth row (Worst Case Visibility Reduction: Cloud Peak Class II Wilderness), replace "0.45 deciview" with "0.5 deciview" **[NOTE: new value based on revised cumulative air quality impact assessment in Section 5.3 (Air Quality).]**

Page 5-37. Socioeconomics Section of Table 5-8 is corrected as follows: "Federal Mineral Royalties (life of project) for the Proposed Action = $116.8 million. Federal Royalties Returned to the State (life of project) for the Proposed Action = $58.4 million."

CHAPTER 6
PUBLIC PARTICIPATION, CONSULTATION, AND COORDINATION

6.2 LIST OF PREPARERS

Page 6-10. Table 6-4, Wyoming State Office, first and second columns (Name and Title), fifth row, replace "Wyoming State Office, Scott Archer, Air Quality Analyst" with "National Applied Resource Sciences Center, Scott F. Archer, Senior Air Resource Specialist."

REFERENCES CITED

Page R-1. Add: "Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. The Edison Electric Institute/Raptor Research Foundation, Washington, D.C."

Page R-1. Add: "Blett, T. 1996. Letter and accompanying data addressed to Mr. Jim Zapert, TRC Environmental Corporation, from Ms. Tamara Blett, Air Resource Management Specialist, U.S. Department of Agriculture, Forest Service, December 1996; accompanying 'Cloud Peak Wilderness AQRV Information'."

Page R-2. Add: "Call, M.W. 1989. Raptor Monitoring in the Shamrock Hills - A 1989 Monitoring Study. Unpublished report prepared for Energy International, Inc. 111pp."

Page R-2. Add: "Call, M.W. 1988. Feruginous Hawk Monitoring and Construction of Artificial Nests in the Shamrock Hills of Carbon County, Wyoming. Unpublished report prepared for Energy International, Inc. 91pp."

Page R-3. Add: "Dailey, B. 1996. Verbal comment at the Cave Gulch "Stakeholders" Air Quality Protocol Meeting, held December 18, 1996. Cheyenne, Wyoming."

Page R-3. Add: "EPA. 1995a. Compilation of Air Pollutant Emission Factors - Volume 1: Stationary Point and Area sources (Fifth Edition). Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina."

Page R-3. Add: "EPA. 1995b. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models. Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina."

Page R-3. Add: "EPA. 1996. Support Center for Regulatory Air Models (SCRAM). Electronic bulletin board system. Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina."

Page R-3. Add: "EPA. 1997. National Air Toxics Information Clearinghouse (NATICH). Data base (January). Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina."

Page R-3. Add: "EPA. 1997a. Integrated Risk Information System (IRIS). Data base (January). Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina."

Page R-4. Add: "Federal Energy Regulatory Commission. No date. Final EIS on Trailblazer Pipeline System, FERC/EIS-0018"

Page R-4. Add: "Fox, D.G. et al. 1989. A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas. Report RM-168, Rocky Mountain Range and Forest Experiment Station, USDA-Forest Service. Fort Collins, Colorado."

Page R-5. HWA 1995 and 1996 are replaced with: "Hayden-Wing Associates (HWA). 1996. Raptor Technical Report for the Cave Gulch Analysis Area - 1994,1995 and 1996. Unpublished report prepared for Barrett Resources Corporation, Chevron U.S.A. Production Company, and Bureau of Land Management - Platte River Resource Area. Hayden-Wing Associates, Environmental Consultants, Laramie, Wyoming. 33 pp. plus maps and app."

Page R-6. Add: "IWAQM. 1993. Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 1 Report: Interim Recommendation For Modeling Long Range Transport and Impacts on Regional Visibility. Technical Support Division, U.S. Environmental Protection Agency. Research Triangle Park, North Carolina."

Page R-8. Add: "Pitchford, M. L., and W. C. Malm. 1994. "Development and Applications of a Standard Visual Index." Atmospheric Environment, Vol. 28, No. 5, pp. 1049-1054."

Page R-9. Add: "Rykaczewski et al. 1980. Final Report: Baseline Climate and Air Quality for BLM Lands in Wyoming - Volume I: Chapters 1-4. Report prepared for the USDI-Bureau of Land Management, Cheyenne, Wyoming. Science Applications, Inc. La Jolla, California."

Page R-9. Add: "Scheffe. 1988. VOC/NO_x Point Source Screening Tables. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina."

Page R-9. Delete: "SCRAM. 1994. Support Center for Regulatory Air Models electronic bulletin board system, U.S. Environmental Protection Agency, Research Triangle Park, NC."

Page R-10. Add: "TRC. 1997a. DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis. Report prepared for the USDI-Bureau of Land Management, Cheyenne, Wyoming. TRC Environmental Corporation. Englewood, Colorado."

Page R-10. Add: "TRC. 1997b. FEIS Supplement: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis. Report prepared for the USDI-Bureau of Land Management, Cheyenne, Wyoming. TRC Environmental Corporation. Englewood, Colorado."

Page R-12. Add: "WESTAR. 1995. Summary of Air Quality Standards and PSD Increments for the WESTAR States. Portland, Oregon."

Page R-13. Delete: " Wyoming Department of Environmental Quality (WDEQ). 1983. Wyoming's Ambient Air Monitoring Data. Wyoming Department of Environmental Quality, Hershler Building, Cheyenne, WY."

Page R-13. Revise the following reference: "_____. (WDEQ). 1990. Water quality rules and regulations. Department of Environmental Quality, Wyoming." should read "Wyoming Department of Environmental Quality (WDEQ). 1990. Water quality rules and regulations. Wyoming Department of Environmental Quality. Cheyenne, Wyoming."

Page R-13. Add: "_____ (WDEQ). 1996. Background Air Pollutant Information File. Wyoming Department of Environmental Quality. Cheyenne, Wyoming."

Page R-14. Add: "Wyoming Reservoir Management Group 1996 (March). Summary of Federal Oil and Gas Leasing in the Northeast Wind River Basin, Wyoming. 3pp."

GLOSSARY

Page GL-1. Delete "**airshed**: A geographic area that shares the same air because of topography, meteorology, and climate."

Page GL-1. Add the following to the list of definitions: **"Best Management Practices (BMPs):** Relative to soils, water, and vegetation resources (including reclamation) this is a practice or combination of practices that are determined to optimize the reduction and/or avoidance of adverse impacts to acceptable non-significant levels. Such practices are practicable in regard to technological, economic, and strategic considerations. In general, BMPs incorporate operator standard operating practices, but usually go further towards reducing or avoiding an adverse impact."

Page GL-5. Paragraph 10 (**injection well**) is modified as follows: "... reservoir pressure; can also be used to dispose of produced water."

Page GL-6. Paragraph 7 (**mineral rights**) is replaced with the following: "rights of ownership, conveyed by deed, of gas, oil, and other minerals beneath the surface of the earth. In the United States, mineral rights are the property of the surface owner, unless disposed of separately."

Page GL-7. Replace: **"Prevention of Significant Deterioration (PSD):** A regulatory program under the Clean Air Act (P.L. 84-159, as amended) to limit air quality degradation in areas currently achieving the National Ambient Air Quality Standards. The PSD program established land management classes in which differing amounts of additional air pollution above background (or baseline) conditions would be considered significant. Almost any additional air pollution would be considered significant in PSD Class I areas (existing large National Parks and Wilderness Areas). PSD Class II areas allow that deterioration associated with moderate, well-controlled growth (most of the country, outside of nonattainment areas)."

Page GL-8. Add the following to the list of definitions: **"reserved mineral rights:** Reserved mineral rights are the retention of ownership of all or part of the mineral rights by a person or party conveying land to the United States. Conditions for exercising these rights have been defined in the *Secretary's Rules and Regulations to Govern Exercising of Mineral Rights Reserved in Conveyances to the Unties States* attached to and made a part of deeds reserving mineral rights."

GL-9. Modify the definition of **stipulation** as follows: "A legal requirement, specifically a requirement that is part of the terms of a mineral lease or a right-of-way grant. Some stipulations are standard on all federal leases and right-of-way grants. Other stipulations may be applied to the lease/grant at the discretion of the surface management agency to protect valuable surface resources.

Page GL-10. Paragraph 16 (**wellbore**) is replaced with the following definition: "the hole drilled by the bit. It may have casing in it or it may be open (uncased); or a portion of it may be cased, and a portion of it may be open. Also called borehole or hole."

Technical Reports Prepared for the Cave Gulch-Waltman-Bullfrog Natural Gas Field Development Project EIS

Soils, Water, and Vegetation Resources Technical Report

Page 52. Section 4.1.2. Delete second sub-bullet of first main bullet (SWA3 Soil Protection).

Page 71. Section 4.1.5. Seventh bullet. Delete last sentence.

Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis

Page 2-8. Table 2.4. Replace title with "Summary of Maximum Annual Production Emissions (tons per year).

Page 2-8. Table 2.4. Last column (Total Emissions), last six rows, replace "Formaldehyde 17.4, n-Hexane 0.1, Benzene <0.1, Toluene 0.6, Ethyl benzene 0.3, Xylene 1.3" with "Formaldehyde 17.4, n-Hexane 35.1, Benzene <4.9, Toluene 23.7, Ethyl benzene 5.5, Xylene 22.4"

Page 5-7. Figure 5.2. Add footnote "Note: basic receptor grid spacing is 100 meters; additional receptor spacing is less, as indicated."

Page 5-10. Figure 5.3. Add footnote "Note: basic receptor grid spacing is 100 meters; additional receptor spacing is less, as indicated."

Page 5-11. Table 5.6. Third column, replace "Range of State AACLs" with "Range of State 8-hour AACLs."

Page 5-12. Section 5.2.2. Paragraph 1, last sentence is replaced with "Potential cancer risks are considered acceptable up to 1e-06 for determining risk-based remediation."

Page 5-13. Table 5.7. Add footnote "Note: n/a - non-additive."

Page 5-14. Section 5.3. Paragraph 2, last sentence, replace "southwestern Wyoming" with "the analysis area."

Page 5-15. Section 5.4.1. First sentence has been modified to read: "... -- the well site separator heaters and dehydration units, and the compressor engines, as the "worst case" emission scenario."

Page 5-18. Section 5.4.3. Paragraph 3, first sentence has been modified to read: "Gaseous and particulate deposition velocities for NO, NO_2, and nitrate used in this spreadsheet..."

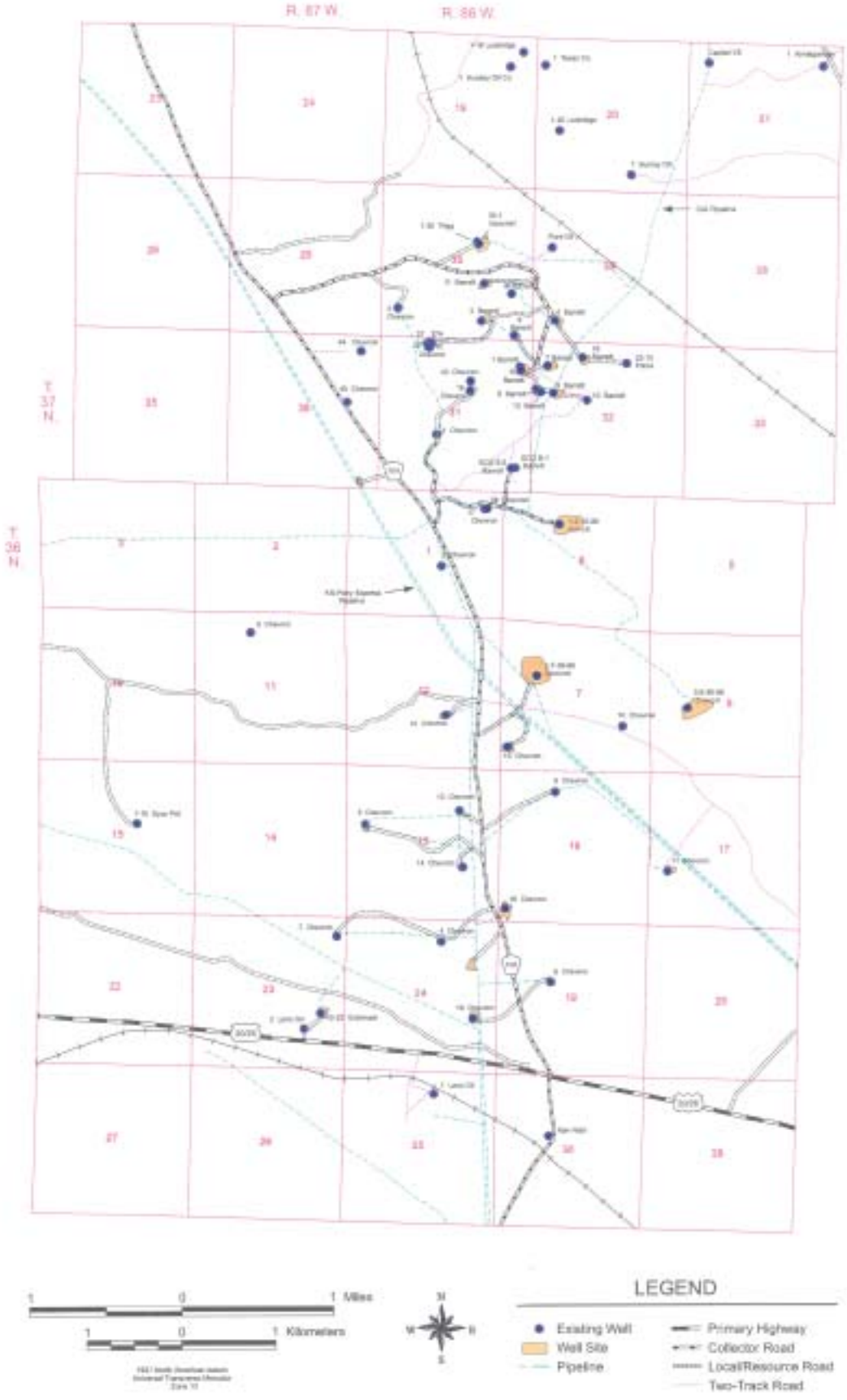

Figure 1-2. Existing Drill Sites and Production Facilities within the Cave Gulch-Bullfrog-Waltman Project Area.

Figure 1-3. Surface and Mineral Ownership for the Cave Gulch-Bullfrog-Waltman Project Area.

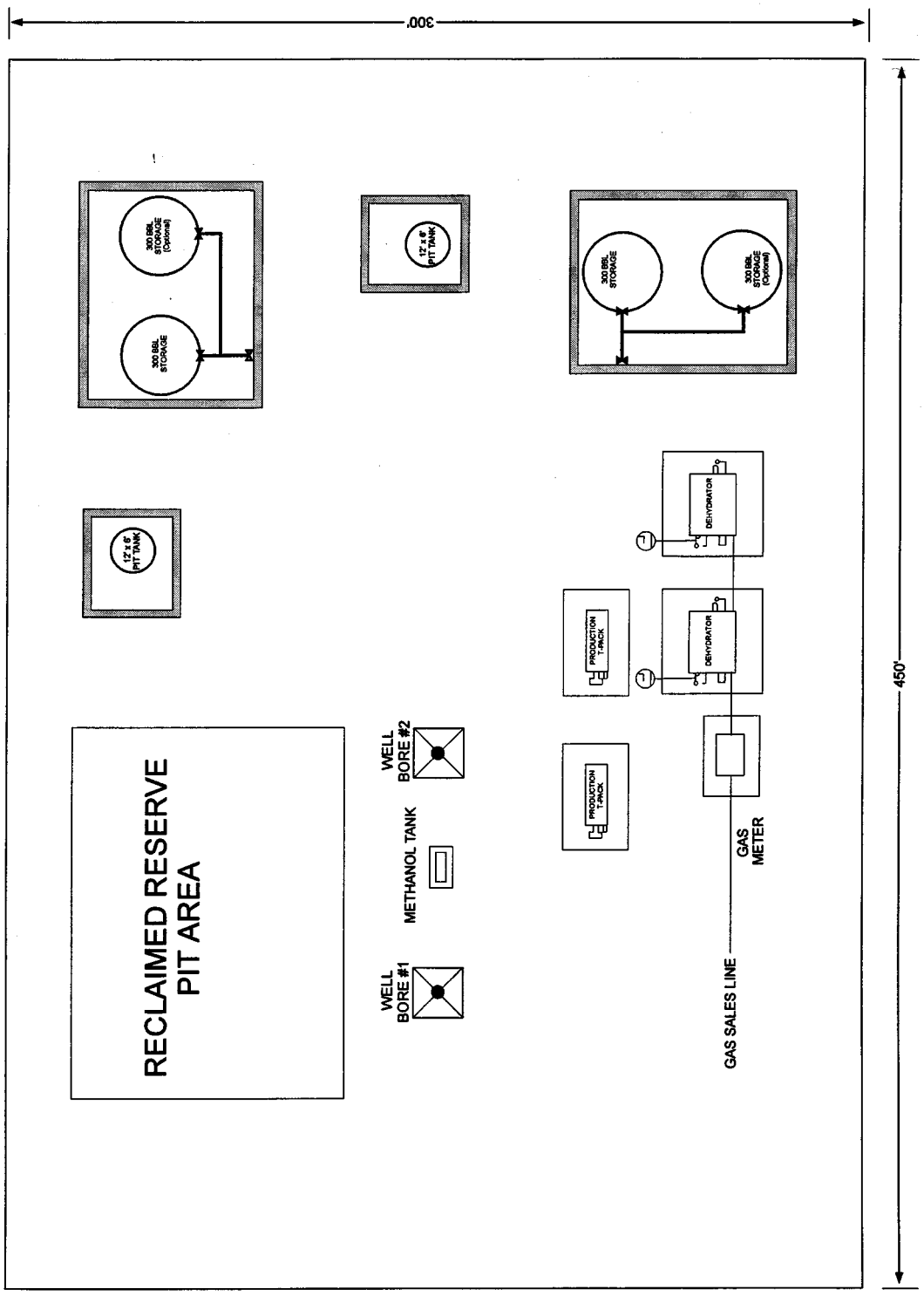

Figure 2-9. Typical Production Facilities Layout for a Twin Well.

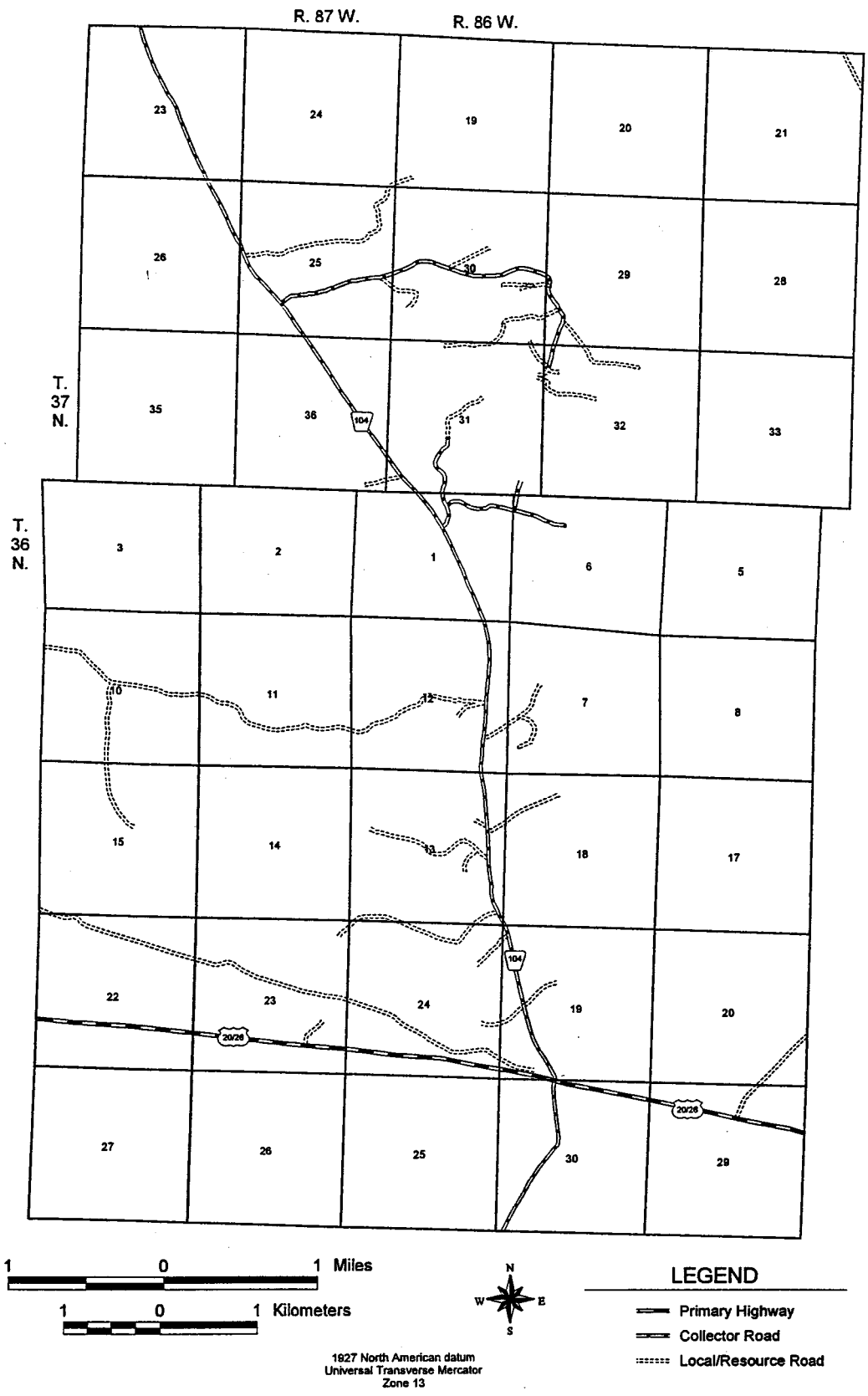

Figure 3-21. Transportation Routes within the Cave Gulch-Bullfrog-Waltman Project Area.