



United States Department of the Interior
NATIONAL PARK SERVICE

INTERMOUNTAIN REGION
Intermountain Support Office - Denver
12795 West Alameda Parkway
Post Office Box 25287
Denver, Colorado 80225-0287

IN REPLY REFER TO: DES 00/0057

VIA ELECTRONIC MAIL: NO HARD COPY TO FOLLOW

February 14, 2001

Don Englishman
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, CO 81301

RE: Draft Environmental Impact Statement for the Southern Ute Reservation Oil and Gas Development, San Juan NM, Montezuma, La Plata, Archuleta Counties, CO.

Dear Mr. Englishman:

The National Park Service has reviewed the aforementioned DEIS and has the following comments:

Air Resources

The Bureau of Land Management, Bureau of Indian Affairs, and the Southern Ute Indian Tribe Department of Energy and Minerals prepared this DEIS to identify and evaluate the potential environmental impacts associated with oil and gas development within the boundaries of the reservation. The DEIS evaluates three alternatives for oil and gas development. Alternative 1 is the No Action alternative. It is the continuation of present management, involving the potential drilling of 269 conventional wells and 81 coalbed methane (CBM) wells. Alternative 2 – Coalbed Methane Infill Development could result in the potential drilling of 269 conventional wells and 367 CBM wells. Alternative 3 - Enhanced Coalbed Methane Recovery is the Preferred Alternative, and could result in the potential drilling of 70 injection wells, 269 conventional wells, and 367 CBM wells. The Reservation where oil and gas development would occur is located southeast of Mesa Verde National Park (NP), a mandatory federal Class I air quality area managed by the National Park Service (NPS). Mandatory federal Class I areas are defined by Congress in the Clean Air Act Amendments of 1977 and receive special protection from air pollution impacts. Due to the nature of this development project, many of the wells would be developed at distances much greater than the closest point between Mesa Verde NP and the Southern Ute Indian Reservation.

Nitrogen oxide (NO_x) emission controls

Alternatives 1, 2, and 3, were each evaluated using three NO_x emission rates from compressor engines: 1.0, 1.5, and 2.0 grams per horsepower-hour (g/hp-hr). The DEIS describes a 1.0 g/hp-hr emission rate as reflecting currently available, clean-burning equipment. An emission rate of 1.5 g/hp-hr reflects recently

permitted equipment, and 2.0 g/hp-hr reflects historically permitted equipment. There are several basic technologies now used to reduce NO_x emissions from natural gas fired compressors used as prime movers in gas fields: lean burn, clean burn, Non-Selective Catalytic Reduction (NSCR), and Selective Catalytic Reduction (SCR). A statistical analysis of gas compressor permits in the RACT/BACT/LAER clearinghouse indicates that, prior to 1997, the median permit limit for NO_x was 2.00 g/hp-hr. However, since then the median limit has dropped substantially to 1.00 g/hp-hr. A review of permits indicates that numerous sources have been issued permits for emission rates that are equal to or lower than the 1.0 g/hp-hr rate evaluated in this DEIS. For example, Williams Field Services received a permit from the State of Colorado for 14 natural gas-fired compressors with lean burn technology at 0.9 g/hp-hr. In 1995, Meridian Oil was issued New Mexico permit NM-0026 for a clean burn natural gas-fired engine at 0.70 g/hp-hr. In 1998, Saba Petrol in California was issued permit CA-0789 for 0.15 g/hp-hr, in which NO_x emissions would be controlled by use of SCR. Based upon these examples, we believe that the compressor emission rates for this project should be held to less than 1.0 g/hp-hr. This is a lower emission rate than is evaluated within the DEIS. The best available control technology for reducing NO_x emissions should be adopted, in order to minimize potential impacts at Mesa Verde NP.

Air Quality Impact Analysis

The air quality impact analysis to assess impacts at Mesa Verde NP was performed using CALMET/CALPUFF, a non steady-state modeling system. This model was used to predict if the Prevention of Significant Deterioration (PSD) Class I NO₂ increment might be exceeded, and to predict potential impacts to visibility. The analysis indicates that the impacts would be below the Class I NO₂ significant levels for all averaging times.

As stated in the DEIS (page 4-20), BLM chose to also analyze and report potential visibility impacts using the Federal Land Managers Air Quality Related Values Workgroup (FLAG) Draft Phase I Report (dated May 4, 1999) procedures. NPS has established a 5% change in existing background extinction (corresponding to a 0.5 deciview) as a significant impact threshold. A 10% change in extinction (corresponding to 1.0 deciview) constitutes a likely adverse impact. Table 4-4 indicates that under the Preferred Alternative; there would be 3, 3, and 6 days that would exceed the 0.5 deciview limit for the 1.0 g/hp-hr, 1.5g/hp-hr, and 2.0g/hp-hr scenarios, respectively. This Table also indicates that all Alternative 2 scenarios would result in days exceeding 0.5 deciview change. Table E-3 of the Technical Support document (Dames & Moore, June 2000) lists the specific values for the Alternative 3, 2.0 g/hp-hr scenario as 8.33%, 8.21%, 7.79%, 5.67%, 5.54%, and 5.13%. Also listed, but not included in the Table 4-4 tally, is a value of 4.99%. Neither the DEIS nor the Technical Document (Dames & Moore, June 2000) provide specific value tables for the Alternative 3, 1.0g/hp-hr and 1.5 g/hp-hr scenarios, or the Alternative 2 1.0g/hp-hr, 1.5g/hp-hr, and 2.0 g/hp-hr scenarios. The NPS was able to obtain the specific values for these other alternatives by examining the project data files located in a second Technical Support Document (Earth Tech, January 2001). While the DEIS does report the number of days that deciview limits are exceeded, it is also important that the specific percentage of deciview change for each of those events is also reported. We believe that these specific values should be incorporated into the Final EIS in such a manner that they are clearly known to the readers.

None of the alternatives or NO_x emission scenarios exceeded a 1.0 deciview level using the May 4, 1999 FLAG procedures. To quantify “significant”, the DEIS cumulative visibility impact analysis “assumed a 1.0 deciview “just noticeable change” would be a reasonably foreseeable significant adverse impact, although there are no applicable state, tribal, or Federal regulatory visibility standards” (pages 4-19, 4-21). However, it would not be appropriate to only use this 1.0 deciview value to determine whether an adverse impact would occur. Rather, the 0.5 deciview value is most appropriate for NPS Class I areas. A statement within the DEIS also supports this, page 4-20 states:

“For potential visibility impacts predicted to be at or above a “1/2 just noticeable change” (0.5 deciview) for any day, the FLAG Draft Phase I Report states “The FLM (Federal Land Management Agency) would take into account magnitude, frequency, duration, and other factors in making an adverse impact determination”...”

The Alternative 3, 2.0 g/hp-hr scenario exceeds this 0.5 deciview threshold on six occasions. The Alternative 3, 1.5 g/hp-hr scenario exceeded the 0.5 deciview threshold on three occasions, with values of 7.17%, 7.01%, and 6.93%. Based upon the frequency and magnitude of these predicted visibility impacts, the NPS has determined that Alternative 3, 2.0 g/hp-hr and Alternative 3, 1.5 g/hp-hr may create an adverse impact to visibility at Mesa Verde NP. Given this information, the NPS does not believe that the Executive Summary statement (page ES-7) that “Potential air quality impacts would not be significant under any Alternative, for the entire range of analyzed compressor air pollutant emission rates” can be supported. Neither can the statement in Section 4.2.6 (page 4-14), which states that “No significant, adverse direct and indirect impacts to air quality are anticipated from implementation of the Proposed Action or Alternatives.”

Cumulative Air Quality Impact Analysis

The DEIS also presents an analysis that evaluates the cumulative air quality impacts, beginning in Section 4.2.7, page 4-14. Cumulative impacts are effects on the environment that result from the incremental impact of the Preferred Alternative when added to other past, present, and reasonably foreseeable future emissions sources in the area. A 10% change in extinction (corresponding to 1.0 deciview) constitutes a likely adverse impact in a NPS Class I area. Cumulative visibility impacts are presented in Table 4-3, indicating that two days at Mesa Verde NP would exceed the 1.0 deciview change under the Alternative 3, 1.5 g/hp-hr scenario, and that three exceedances would be recorded under the Alternative 3, 2.0 g/hp-hr scenario. Alternative 2, 2.0 g/hp-hr is predicted to have a single day exceeding a 1.0 cumulative visibility impact. The specific contribution made by this proposed project to the cumulative impacts is not discussed, and such an analysis should be incorporated into the Final DEIS.

The NPS recognizes the difficulty in preparing a DEIS that describes the project’s potential impacts before the exact number of operational wells and their exact locations are known. Having reviewed the very conservative assumptions used in the impact analysis, we agree with the DEIS statements that actual impacts at the time of development are likely to be less. However, the results presented in this DEIS indicate that numerous visibility impacts would occur. Based upon the frequency and magnitude of those impacts, an adverse impact may occur at Mesa Verde NP under the Alternative 3, 2.0 g/hp-hr and Alternative 3, 1.5 g/hp-hr scenarios. To minimize emissions and the potential for visibility impacts, we recommend the use of controls to reduce compressor engine NO_x emissions to less than 1.0 g/hp-hr.

In addition, the air quality monitoring station at Mesa Verde National Park has been detecting a steady increase in growing season ozone and sulfur levels since the mid 1990's. Impacts to air quality resulting from increased ozone levels should be considered since the park considers this area a Class I airshed and additional fossil fuel production in the subject area could add to ozone levels.

Adjacent Lands

The draft environmental impact statement (DEIS) for Oil and Gas Development on the Southwestern Ute Indian Reservation fails to adequately address possible impacts to adjacent lands from proposed exploration and development activities. The DEIS analyzes, in a programmatic fashion, additional exploration and production of conventional natural gas wells and development of the coal bed methane resource in the San Juan Basin.

Recent increases in natural gas prices coupled with electricity shortages in the west are an indication of a market driven need to increase sources of energy. Well field infill and development of coal bed methane

resources are promising prospects to help alleviate energy shortages according to industry sources. With the average coal bed methane well having a life span of 20+ years, and the promising prospects of vast amounts of this resource available in the San Juan Basin, it is important that the DEIS for oil and gas development on the Southern Ute Indian Reservation contain a thorough analysis of impacts on the immediate and surrounding environment.

Activities analyzed in the DEIS mainly consist of a significant increase in well density (spacing) on approximately 200,000 acres in a 421,000 acre study area. The area consists of Tribal trust lands that are contained in the boundaries of the Southern Ute Indian Reservation. Location maps included in the DEIS reveal that the Study Area lies on the Colorado side of the Colorado/New Mexico border, just south of Durango, Colorado. DEIS maps, although not confirmed in the text, reveal that the study area is near the extreme southeast corner of Mesa Verde National Park. The northern boundary of the Study Area parallels U.S. Highway 160, which leads to Mesa Verde's main entrance road.

Analysis of increased gas and coal bed methane exploration and development contained in the DEIS is limited to impacts within the study area itself. The environmental document scantily acknowledges the existence of adjacent National Park Service (NPS) lands, and completely fails to analyze any possible impacts from increased drilling or production activities to NPS lands or visitors. In addition to the document's failure to address possible impacts on areas adjacent to reservation lands, the DEIS states that scoping for the project was completed in 1995. We are concerned that a six year-old scoping effort may not adequately address current issues in need of analysis.

While it is impossible to comment on specific sections of the DEIS due to the document's lack of analysis of adjacent lands, we believe that it is important that the DEIS acknowledge the existence of sensitive NPS resources adjacent to the Study Area. Analysis should include, but not be limited to possible impacts from:

- Dust;
- Noise;
- Drilling and production equipment emissions;
- Night lighting;
- Viewshed impacts;
- Impacts on animal species, including threatened, endangered, and sensitive species that may cross between the study area and adjacent lands;
- Offsite ground and surface water quality;
- Air quality (including impacts on Mesa Verde's Class I air designation); and,
- Safety issues relating to visitor travel near the study area to and from nearby NPS units, particularly on U.S. Highway 160.

We appreciate the opportunity to comment on the draft environmental impact statement for oil and gas development on the Southern Ute Indian Reservation. If you have any questions or specific concerns regarding these comments, please contact me at (303) 969-2036.

Sincerely,

/s/ Laurie Domler
NEPA/Section 106 Specialist

Noah Volz
15 Rio Vista Cir
Durango, CO 81301

RECEIVED

FEB 26 2001

Bureau of Land Management
Durango Colorado

Feb. 16, 2001

Dear Mr. Englishman:

I have examined the Southern Ute EIS, and I do not feel it accurately assesses the situation and I am not convinced that oil and gas development is the best allocation of this land. Are these additional wells truly necessary?

Greenpeace published a report in the 1970's stating that at the current rate of natural gas expansion coal bed methane is expected to only last another sixty years. With all the price increases we in the Southwestern counties of Colorado have been experiencing it seems that additional production of natural gas will not remedy this problem until at least 10 years in the future. That is not a good precept on which to base the decision to drill these wells. The land that is there can be used to for multiple uses such as raising cattle or as real estate that would bring more property tax revenue to the counties involved. The EIS doesn't assess all the roads, stations, and pipelines necessary to expand to 706 wells. This expansion will leave that land unuseable after the initial profit and what will be done to clean up there mess after the wells are no longer productive? Will it also be a long time before the oil and gas can actually be harvested? This issue has not been correctly assessed or even mentioned in the current EIS. There is also the issue of using pipelines from the additional wells, will this impact be less than the proposed impact on the land? Alternatives in the EIS are vague and not well thought out, the scientific evaluation having to do with ecosystem management does not exist therein. What real alternatives or compromises can be considered with the land and biology in mind?

I would appreciate an immediate response to the questions above and a real assessment of the problems that will occur with this expansion. I am a concerned lifelong resident and beleive that additional published research about the negative impacts of this project must be available to the public. Thank you for your continued effort to manage public land in th most sustainable efficient management.

Sincerly,



Noah Volz
Lifelong Resident

COMMENT B

DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
for
OIL AND GAS DEVELOPMENT ON THE SOUTHERN UTE INDIAN RESERVATION
Bureau of Land Management, Bureau of Indian Affairs and Southern Ute Indian Tribe

PUBLIC COMMENT SHEET

Please note your comments, being specific as possible, on the Draft EIS for Oil and Gas Development on the Southern Ute Indian Reservation, and return this comment sheet by March 20, 2001, to:
Don Englishman, BLM, San Juan Field Office, 15 Burnett Court, Durango, CO 81301. Thank You!

The meeting structure is
Self-defeating to the General
Public. I protest!!!
It diffuses public comment process
Sage Remington
SUIG

Do you wish to remain on the mailing list to receive information about this project? Yes No

How do you wish to receive the Final EIS documents? (Please check one)

- Printed Summary Only
 Printed Final EIS and Summary
 Electronic Final EIS and Summary on CD

Name: _____
Organization (if applicable): _____
Address: _____

1 UNITED STATES DEPARTMENT OF THE INTERIOR
2 BUREAU OF LAND MANAGEMENT

3 PUBLIC MEETING
4 SOLICITATION OF COMMENTS ON THE DRAFT ENVIRONMENTAL
5 IMPACT STATEMENT: OIL AND GAS DEVELOPMENT ON THE
6 SOUTHERN UTE INDIAN RESERVATION

7 TUESDAY, FEBRUARY 27, 2001 - 6:00 p.m.
8 ROLLING THUNDER HALL - SOUTHERN UTE TRIBE
9 IGNACIO, COLORADO

10
11
12 AUTHORIZED BY:

13 JOHN PECOR, ACTING MINERALS STAFF CHIEF
14 PUBLIC LANDS CENTER
15 USDI BUREAU OF LAND MANAGEMENT
16 SAM JUAN FIELD OFFICE
17 DURANGO, COLORADO

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21 REPORTED BY:

22 SUSAN K. VANDENBERG, RPR, CSR #98
23 Professional Court Reporting Services
24 P. O. Box 3025
25 Durango, Colorado 81302

RECEIVED

MAR 06 2001

Bureau of Land Management
Durango Colorado

Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107

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A P P E A R A N C E S

REPRESENTATIVES FROM BUREAU OF LAND MANAGEMENT

Walt Brown
John Pecor
Don Englishman
Matt Janowiak
Scott Archer

REPRESENTATIVES FROM THE SOUTHERN UTE INDIAN TRIBE:

Barbara Wickman
Rex Richardson

COMMENTS PROVIDED BY:

BALTY QUINTANA, TOWN MANAGER, TOWN OF IGNACIO
CARL WESTON
M. THERESA FITZGERALD
HEATHER SNOW
DARSI OLSON

Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107

P R O C E E D I N G S

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2
3 THE FOLLOWING STATEMENTS WERE GIVEN ORALLY TO THE
4 REPORTER:

5
6 BALTY QUINTANA
7 TOWN MANAGER - TOWN OF IGNACIO
8 970-563-9494.
9

10 My name is Balty Quintana, Town Manager
11 with the Town of Ignacio. I work for the Town of
12 Ignacio, and I'm here to state a comment based on
13 our concerns about the effects of heavy traffic as
14 it pertains to the development of the natural gas
15 fields of the intersection of State Highway 151 and
16 172.

17 Our desire is to get involvement among
18 the developing corporations, the Tribe, the State
19 of Colorado, and the Colorado Department of
20 Transportation, along with any other entity or
21 agency that may need to be involved to see what
22 needs to be done to upgrade the conditions of that
23 intersection so that the situation, as it exists
24 currently, can be rectified. That's about the
25 extent of it.

*Susan K. VanDerBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107*

COMMENT D

1 An additional written comment will be
2 provided once we have professional assessment by
3 the Colorado Department of Transportation. That's
4 it. Thank you.

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Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107

COMMENT D

1 CARL WESTON
2 3905 HIGHWAY 550
3 BONDAD, COLORADO 81303
4 970-247-9594
5 email: Crweston@mindspring.com.

6
7 My name is Carl Weston. My address is
8 3905 Highway 550, Durango or it's located at Bondad
9 where the Florida-Animas rivers come together.
10 I've been there 35 years. And I'm, I guess I would
11 say, I'm a charter member of San Juan Citizens
12 Alliance, if that makes any difference to anybody.

13 I've been involved in these issues for a
14 long, long time. They've taken six years to come
15 up with these 30-EIS notices. We get less than 60
16 days effectively to comment on it. Then you set up
17 this format to explain it where it's a one-on-one
18 thing, where nobody gets to know what anybody else
19 is saying. So there's really no public mutual
20 support in this kind of setup. And my main
21 concerns are how they're handling air quality and
22 water quality.

23 There are a lot of other things that get
24 involved in it to some extent, but mostly air
25 quality and water quality. We're now involved in

*Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
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COMMENT E

1 permit application processes with compressor
2 stations. One of them, namely Red Cedar, and it
3 turns out that there's no monitoring for the people
4 who live where the pollution from these compressor
5 stations get to them, but of radiation inversion.
6 All the pollution follows water courses.

7 And all the non-Indians live along the
8 water courses, because that is the way the land got
9 homesteaded when they opened the reservation. Some
10 of them are up on Florida Mesa, but the private
11 land pretty well follows the water sheds.

12 We're disenfranchised. There is no
13 clear-cut process for us to address these impacts
14 if we live within boundaries of the reservation.
15 The perception is that the regulatory and oversight
16 powers that are delegated to the Utes is primarily
17 carried out for the Utes and is answerable to the
18 Ute Council, and the Ute Council don't have any
19 provisions for us non-Utes to go in and raise
20 issues.

21 We can go to individual people, and they
22 are nice to us, but there is no clear-cut mandate
23 of what they have to do for us and if they have to
24 do anything. I think it's an environment justice
25 issue. I'll leave it at that.

Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107

COMMENT E

1 M. THERESA FITZGERALD

2 1028 C.R. 525

3 BAYFIELD, CO 81122

4
5 I would like to address more than the
6 EIS, the process of the public participation in the
7 EIS. The format that we see here tonight has
8 definitely excluded the public. Many of my friends
9 and neighbors refused to come because they have
10 been at this type of process before. There's no
11 give and take.

12 It's set up so that people do not talk to
13 each other, and therefore, we can never come to any
14 kind of consensus, any kind of common interest in
15 the process of coalbed methane. I feel like it's
16 been done very deliberately to exclude the public.
17 I also cannot understand how a legal EIS can be
18 published with a no-action alternative since NEPA
19 law is very clear on that point. And that's it.

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*Susan K. VanDenBerg, R.F.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107*

COMMENT F

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HEATHER SNOW
2700 C.R. 510
DURANGO, CO.
970-247-4287
email: hsnow@frontier.net

Basically, the EIS is not readable for the layman. None of the information here is for the layman to understand. So I protest, you know. It needs to be written so that everybody can understand it, and that's basically it.

Those guys with groundwater had some information regarding how water, once it leaves the aquifer, it is not going into the rivers anymore. It is going away from the Animas and La Plata rivers. That's bad. That, I understood.

I think they just better stop everything until they get more information. That's it.

*Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107*

COMMENT G

1 flaring well site. Also, I am concerned about the
2 hydrogen sulfides and methane levels that are
3 showing up in domestic well water and in different
4 parts of our community. And I, again, question
5 what levels of H2S and methane are safe for
6 infants, children, and persons with environmental
7 illness. Until we know more about what levels are
8 safe, we are the test.

9 Children do not deserve to be the test.
10 And that's about it. We must have clean water and
11 air. Everybody deserves clean air and water, land,
12 and food.

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COMMENT H

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REPORTER'S CERTIFICATE

STATE OF COLORADO)
) ss.
COUNTY OF LA PLATA)

I, Susan K. VanDenBerg, Registered Professional Reporter, Certified Shorthand Reporter, and Notary Public, States of Colorado and New Mexico, do hereby certify that the said proceedings were taken in machine shorthand by me at the time and place aforesaid and was thereafter reduced to typewritten form by computer-aided transcription under my supervision; that the foregoing is a true and correct transcript of my stenotype notes thereof.

That I am not an attorney nor counsel, nor in any way connected with any attorney or counsel for any of the parties to said action, nor otherwise interested in the outcome of this action.

IN WITNESS WHEREOF, I have affixed my signature and seal this 27 day of February, 2001.

My Commission Expires: 01-03-2003



Susan K. VanDenBerg
Susan K. VanDenBerg, R.P.R., C.S.R.
Registered Professional Reporter,
Certified Shorthand Reporter,
and Notary Public

COMMEN
T H

Susan K. VanDenBerg, R.P.R., C.S.R.
Professional Court Reporting Services
P.O. Box 3025 Durango, Colorado 81302
(970) 259-1107



REFLECT
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922
February 26, 2001

RECEIVED
FEB 27 2001
Bureau of Land Management
Durango Colorado

Regulatory Branch (200175051)

Mr. Don Englishman
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, Colorado 81301

Dear Mr. Englishman:

We are providing comments for the Draft Environmental Impact Statement (DEIS) for the Oil and Gas Development on the Southern Ute Indian Reservation. The Sacramento District's Clean Water Act regulatory authority extends to the portion of the Southern Ute reservation located in western Colorado. The portion of the reservation in New Mexico is serviced by the Albuquerque District.

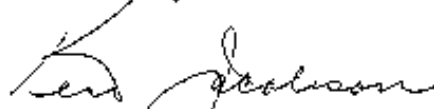
A review of the DEIS indicates that potential impacts to waters of the United States. However, we recommend that the Final Environmental Impact Statement provide the following additional information to indicate knowledge of and intent to comply with Section 404 of the Clean Water Act:

- o A statement of the definition of Waters of the United States as provided in the Federal Register, 33 CFR Part 328.3.
- o A statement that prior to the planning of any activity at or in the vicinity of a Waters of the United States, a mapping and a delineation (for wetland areas where needed) of Waters of the United States will be performed to enable planning of the project to avoid or minimize adverse impacts to the aquatic environment.
- o A statement that proposed work under the chosen development plan will avoid impacting Waters of the United States whenever practicable.
- o Acknowledgement that such work which cannot avoid discharges of fill material into Waters of the United States will be minimized, and 404 permitting from the Corps of Engineers will be sought, including 401 certification from the Environmental Protection Agency for lands within the boundary of Tribal Lands.
- o A statement that adversely impacted Waters of the United States will be mitigated per permitting requirements.

COMMENT I

Thank you for the opportunity to comment on the DEIS. If you have any questions, please write to Mr. Nick Mezei or telephone (970) 243-1199, extension 12.

Sincerely,



Ken Jacobson
Chief, Southwestern Colorado
Regulatory Office
402 Road Avenue, Room 142
Grand Junction, Colorado 81501-2563

Copy Furnished:

La Plata County, 1060 East 2nd Avenue, Durango, Colorado 81301S

COMMENT I



United States Department of the Interior

BUREAU OF RECLAMATION

Upper Colorado Region
Western Colorado Area Office

2764 Campus Drive, Suite 116
Grand Junction CO 81506-8785

835 E 2nd Avenue, Suite 300
Durango CO 81302-6475

WCD-BWalsh
LND-6.00

FEB 27 2001

MEMORANDUM

RECEIVED
FEB 28 2001
Bureau of Land Management
Durango Colorado

To: Don Englishman, San Juan Field Office, Bureau of Land Management, 15 Burnett Court, Durango, CO 81301

From: Bill Walsh, Team Leader
Land and Recreation Management Team
Resource Management Division

Subject: Review comments on the Draft Environmental Impact Statement for Oil and Gas Development on the Southern Ute Indian Reservation, Navajo Unit, Colorado River Storage Project, Colorado

The following comments are being provided by the Land and Recreation Management Team of this office. We have two general comments under the land ownership and land use categories.

The land beneath and immediately surrounding Navajo Reservoir is owned by the federal government. The Bureau of Reclamation has jurisdiction over this land and manages it for the project purposes of the Navajo Unit of the Colorado River Storage Project. Reclamation has a Memorandum of Understanding with the State of Colorado to manage the recreational use of this land which lies within Colorado and also within the Study Area of this draft EIS. It is reasonable to refer to Navajo State Park when speaking of recreation and land use, but we ask that the federal land ownership be recognized whenever speaking of land ownership within the text of the draft EIS and on Map 17.

Map 19, Existing Land Use, of the draft EIS shows the extent of the Pine River Indian Irrigation Project. We would like to point out that portions of the Florida Water Conservancy District which supplies irrigation water also falls within the draft EIS Study Area. We ask that the water conservancy district facilities be recognized as an existing land use and be included in the impact analysis of this EIS.

We have data in GIS format on the locations of the federally owned land and water conservancy district.

The Animas-La Plata Project has recently been redefined by Congressional Legislation. We ask that the first paragraph on page 3-93 of the draft EIS be changed to read:

"The Animas-La Plata Project is a water storage project that would divert flows of the Animas and San Juan Rivers for municipal and industrial uses. It also would provide for fish and wildlife preservation, recreation facilities, and a cultural resources program. The project would store water pumped from the Animas River in Ridges Basin Reservoir."

Thank you for the opportunity to review the draft EIS. Please contact me at (970) 385-6554 or hwalsh@uc.usbr.gov with any questions concerning this review and to coordinate transfer of GIS data.

COMMENT J

COMMENT J

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

3603 North Meñ Avenue
Durango, CO 81301
(970) 385-1400



RECEIVED

MAR 13 2001

Bureau of Land Management
Durango Colorado

March 9, 2001

Mr. Don Englishman, Minerals Supervisor
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, Colorado 81301

Re: Draft EIS for Oil and Gas Development on the Southern Ute Indian Reservation

Dear Mr. Englishman:

Region 5 of the Colorado Department of Transportation has reviewed the Draft Environmental Impact Statement (DEIS) for Oil and Gas Development on the Southern Ute Indian Reservation and offers the following comments.

General System Impacts

In Chapter 3-Affected Environment and Chapter 4-Environmental Consequences, all the analyses pertaining to the State Highway System and County Roads are based on 1996 traffic volumes. In our judgment, the proper base year for all analyses should be 2000. The appropriate data for this base year when projected to 2020 could affect results due to anticipated growth in the study area.

Also in Chapter 3, the projection of trips for the baseline traffic data uses an assumption that vehicle trips related to oil and gas operations will be distributed over 365 days a year. This assumption is questionable given the many factors that affect oil and gas well installation. Some of these include weather, holidays, and equipment availability. We suggest an estimate of the actual number of workdays would be more appropriate in calculating the number of vehicle trips per day associated with the proposed action.

In Chapter 4, the discussion on impacts related to traffic volume includes assumptions of various levels of impact. A significant traffic volume impact is defined as one where a 25% increase over background levels would occur. An impact is defined as an alternative with a 10% increase in traffic, and anything less than 10% would be considered to have no perceivable impact. This type of approach is also mentioned regarding accident and congestion on state highways within the study area. It is not apparent why these thresholds were selected nor how they are useful as a basis for conclusions.

Rather than present threshold criteria with no apparent basis, it would be preferable to provide traffic projections of volume, level of service and accidents in order to assess the level of impact from the proposed action. This type of information is provided in the DEIS in the form of tables for Levels of Service. The comparison of the base year and 20-year accident rates per million vehicle miles is useful and should be presented in a similar fashion.

COMMENT K

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

3808 North Main Avenue
Durango, CO 81301
(970) 385-1400



Another consideration with regard to the transportation system that should be addressed in more detail is how the U.S. 160 corridor may be affected by this action. It is noted on pg. 3-93 that this highway is the major east-west highway in southern Colorado. It is also relevant that this highway is located approximately one mile north of and parallel to the study area boundary. Due to the importance of U.S. 160 to the region and likely impacts from the proposed action, it seems prudent to assess impacts to this highway in a manner consistent to those within the reservation boundary.

Specific Locations of Transportation Impacts

In the Chapter 4 discussion on Roadway Congestion, pg. 4-162, a reference is made to the current widening of U.S. 550 north of the New Mexico State line. It would be helpful to add that this project is nearing completion. It is a safety improvement and does not add through lanes. The capacity of U.S. 550 from the state line to U.S. 160 will need to be addressed in an Environmental Assessment to determine the location and laneage appropriate to serve the projected 20 year traffic.

One specific location that warrants consideration is the intersection of State Highways 172 and 151 in the Town of Ignacio. This location has been a concern to CDOT and the Town due to existing geometric limitations. The turning radii are not sufficient for large vehicles. Therefore, the impact of the type of drilling equipment expected to negotiate this intersection should be evaluated and mitigation for adverse impacts should be considered.

In addition, the bridge on S.H. 151 over the Los Pinos River east of Ignacio is a concern due to its age and condition. It was built in 1954 and is on our list of structures for future replacement. The section on Impacts Common to All Alternatives, page 4-162, states that bridge weight limitations may require overweight drilling units to find alternative routes. This bridge needs to be evaluated with regard to its ability to accommodate the overweight units.

We appreciate the opportunity to comment on the DEIS. Please contact me at 385-1430, or Wally Jacobson of my staff at 385-1433 if you have questions.

Very truly yours,

A handwritten signature in black ink, which appears to read "Carl J. Watson". The signature is written in a cursive style.

Carl J. Watson
CDOT Region 5 Planning/Environmental Manager

CJW:wrtj

Cc: R. Reynolds, CDOT Region 5 Transportation Director
E. Perino, CDOT Region 5 Program Engineer
E. Demming, CDOT Region 5 Traffic and Safety Engineer File: via Jacobson

COMMENT K

TOWN OF IGNACIO

P. O. Box 459 • IGNACIO, COLORADO 81137
Phone: 970-563-9494 • Fax: 970-563-9498



RECEIVED

MAR 15 2001

**Bureau of Land Management
Durango Colorado**

March 14, 2001

Don Englishman, Minerals Supervisor
Bureau of Land Management
San Juan Field Office
15, Burnett Court
Durango, Colorado 81301

Re: Town of Ignacio Draft EIS of Oil and Gas Development South of the Ute Line Comment

Dear Mr. Englishman:

The Town of Ignacio wishes to formally submit this comment to the Draft Environmental Impact Statement for the proposed continued development of Oil and Gas exploration South of the Ute Line.

This comment is submitted in the spirit of attempting to initiate coordination between the numerous governments and corporations involved in the impacts associated with the continued development of the Natural Gas and Oil Fields. Many of the fields are accessed through the intersection of Colorado State Highway 151 and 172 in the middle of Ignacio.

The technical aspect of how the additional heavy truck traffic will impact the intersection referred to above and the study area is addressed in the comment submitted by Colorado Department of Transportation Environmental Manager Carl Watson. The Town requested that the Colorado Department of Transportation (CDOT) review the EIS and submit comment in the town's continued attempt at involving all affected agencies for the needs of this intersection.

Because the operational headquarters of the Southern Ute Indian Tribe is just three quarters of a mile (3/4) north of the intersection of Colorado State Highway 151 and 172 on Highway 172, most of the Tribe's membership are also heavily impacted by the heavy traffic on the intersection. We believe that the Tribe too has similar concerns and indeed the town will be discussing this issue with them in the near future.

Besides of the obvious substandard condition of the intersection for large truck traffic, there are continued safety issues as they pertain to pedestrians, elementary age school children

Page Two

Ignacio/ State Highway 151/172 Intersection
South of the Ute Line EIS Comment

accessing the elementary school just to the east of the intersection and dust due to the tons of mud dropped on the road surface by a myriad of Natural Gas field development vehicles as they traverse these two State Highway arterioles.

We are pleased to have been given the opportunity to comment on this EIS and look forward to working with any and all agencies involved to address our concerns.

Sincerely,



Balty Quintana
Town Manager

cc/ Town Board

Southern Ute Indian Tribe
Colorado Governor Owens
Colorado State Representatives
Colorado Department of Local Affairs
La Plata County Commissioners
Region 5, CDOT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8
990 16TH STREET - SUITE 300
DENVER, CO 80202-2456
<http://www.epa.gov/region08>

March 16, 2001

REF: EPR-EP

Frank Salwerowicz
Bureau of Land Management
Colorado District Office
2850 Youngfield Street
Lakewood, Colorado 80215

Bureau of Land Management
San Juan Field Office
Attn: Donald Englishman
15 Burnett Court
Durango, Colorado 81310

RE: Extension Request for Comment Period for
the Draft Environmental Impact Statement
for Oil and Gas Development on the
Southern Ute Indian Reservation (CEQ
#010015)

Dear Mr. Englishman:

We are requesting an extension of the comment period until EPA has the opportunity to review the necessary documents that were omitted from the DEIS.

Page 2-75 of the DEIS identified documents for BLM Conditions of Approval, general requirements and standard plan of operations that were to be provided in Appendix E, Environmental Protection Measures. However, Appendix E has omitted: BLM Conditions of Approval Coal-bed Methane Completions; and BLM General Requirements For Oil and Gas Operations on federal and Indian Lands. In addition, SUIT general guidelines that were not included in Appendix E are: SUIT General Well Site Conditions of Approval; and SUIT General Pipeline Right-of-way Stipulations.

The DEIS also indicated on page 2-74 that the following documents would be included in Appendix D.

- Onshore Oil and Gas Orders,
- Onshore Order #1; Approval of Operations,
- Onshore Order #2; Drilling Operations,
- Onshore Order #3; Site Security,
- Onshore Order #4; Measurement of Oil,
- Onshore Order #5; Measurement of Gas,
- Onshore Order #6; Hydrogen Sulfide Operations,
- Onshore Order #7; Disposal of Produced Water,
- Draft Onshore Order #8; Workovers and Subsequent Well Operations (includes abandonment). Currently draft status, but being used as interim guidance,
- Notice to Lessees,
- NTL-88-2-Colorado; Paying Well Determinations and Venting and Flaring Applications for Coal Bed Methane Wells, and
- NTL-91-1-MDO; Bradenhead Testing.

Section 2.9.1, Page 2-74 states, "BLM Onshore Oil and Gas Orders and Notices to Lessees will be applied as standard operating procedures to individual projects and operators and are provided in Appendix D." Although we have copies of the Onshore Orders that are listed above because they are used on federal oil and gas leases, we do not have the specific NTLs that are listed and stated by the DEIS to be included in Appendix D.

Section 2.9.1 on Page 2-74 also refers to SUTT General Well Site Conditions of Approval and General Pipeline Right-of-Way Stipulation located in Appendix D. We do not have copies of these documents, and they have also been omitted from Appendix B.

It is important to provide the public with adequate information to review the document. It is recommended that BLM cite the specific language in the reference that is used to support the DEIS. The entire document is not required to be included in the DEIS and EPA does encourage lowering paper usage. However, it is important to supply the reviewer or reader with enough information to understand the requirements or information that is being referred to in other documents. In the future BLM may want to consider posting these documents on the Internet and providing the web addresses for them. They could also be included on a CD document and hyperlinked to the appropriate website.

COMMENT M

MAR-16-01 FRI 01:58 PM

FAX NO. 3032393789

P. 05


03/16/01 FRI 10:01 FAX 303 312 8387

SUPERFUND

004

We are requesting that BLM supply EPA and others who may have requested these documents so that we the opportunity to complete our review of the DEIS. In addition, we are requesting that the comment period be extended to allow adequate time to review the documents that were missing. An additional week for review purposes after we have received a complete set of the documents omitted from the DEIS will be sufficient. If you have any questions related to the missing documents, please contact Gregory Oberley at (303) 312-7043.

Sincerely,



Cynthia Cody, Chief
NEPA Unit
Ecosystems Protection Program

San Juan Citizens Alliance

Organizing for the people and land of the San Juan Basin

March 18, 2001

Mr. Cal Joyner
San Juan Field Office Manager
Bureau of Land Management
15 Burnett Court
Durango, CO 81301

Via fax: (970) 385-1243

Dear Mr. Joyner,

The San Juan Citizens Alliance requests a 30-day extension of the public comment period for the Southern Ute Indian Tribe Draft Environmental Impact Statement. As the Alliance staff, members, and consultants review the document it has become clear that March 20 does not allow enough time to provide the level of detailed comments that the Alliance typically provides on NEPA documents. The extensive experience of the Alliance in the area of oil and gas would benefit the interdisciplinary examination of the oil and gas development in the San Juan Resource Area.

Also, it has come to our attention that other federal agencies have not received full information concerning the project nor have their concerns been met before release of the DEIS. An extension of time would benefit those agencies and the public that depends upon them for a thorough analysis as part of the EIS process.

Further, it is my understanding that the DEIS was based on an incomplete and inadequate Biological Assessment and that the Endangered Species Act consultation process has yet to be completed. The Alliance further requests that the DEIS comment period be held open until impacts, alternatives, and mitigation measures identified by the Fish and Wildlife Service are revealed to the public for analysis and comment.

Finally, the DEIS was published and provided to the public without any figures printed in the document. The lack of supporting figures has made public review of the DEIS extremely difficult and time-consuming. In order that the NEPA process is carried out in a manner that fully informs decisionmakers and the public, fully includes the public and other agencies, and avoids the need to reopen this NEPA process through contentious and costly litigation after the EIS becomes final, it is in everyone's best interests to provide reasonable time for public comment. Closing the public comment period at this time would not be consistent with your stated dedication to fully involve the public and fully comply with federal laws.

Thank you for your conscientious consideration of this request. Please call me at 970-259-3583 if I can be of any further assistance in this matter.

Sincerely yours,



Mark Pearson
Executive Director

cc: Ms. Ann Morgan

863 1/2 Main Avenue • P.O. Box 2461 • Durango, Colorado 81302 • 970-259-3583
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STATE OF COLORADO

Bill Owens, Governor
Jann E. Norton, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

March 15, 2001

Don Englishman
Minerals Supervisor
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, CO 81301

RECEIVED
MAR 19 2001
Bureau of Land Management
Durango Colorado

Re: Draft EIS for the Oil and Gas Development on the Southern Ute Indian Reservation

Mr. Englishman:

On approximately February 1, 2001, the Air Pollution Control Division received your request for a review of the Draft Environmental Impact Statement (DEIS) for the Oil and Gas Development on the Southern Ute Indian Reservation. Thank you for taking the time to inquire about air quality requirements in this area. The following information should be reviewed for its applicability to the proposed project.

Modeling Issues

In general, model selection and application appears to be reasonable for the scope and purpose of this study. There is one possible oversight that has been found. It involves stack diameters at sources on tribal lands.

Table 6-4 on pages 38-40 – “Emission Parameters for Sources on Tribal Lands Included in the Cumulative Impact Analysis” – contains systematic errors in stack diameters. The diameters are too high by a factor of twelve. This error appears to only affect existing tribal sources and not the inventories provided by the State of Colorado (Table 6-2) or the State of New Mexico (Table 6-3). In addition, this problem appears to only affect the near-field modeling (ISCST3) and not the far-field modeling (CALPUFF). For example, the stack diameters for some of the same sources in the far-field CALPUFF modeling are shown as being correct (see Tables A-1 through A-3). This suggests that the stack diameter error was corrected for the CALPUFF modeling. It's possible that the actual ISCST3 modeling has used correct stack diameters and that the error exists only in the table. The Division has

not checked the actual ISCST3 files. If it turns out that the error exists in the ISCST3 modeling, then the near-field cumulative impacts analysis estimates for these sources will not be correct (see recommendations at the end of this letter).

For near-field ISCST3 modeling, overestimation of stack diameters by a factor of 12 (while keeping stack gas exit velocities constant, which appears to be the case) could cause a dramatic increase in estimated near-field ground-level concentrations.

To illustrate the magnitude of this oversight, some exploratory modeling follows. It is based on EPA's screening-level model SCREEN3, which should tend to over estimate impacts for annual averages. Consider the Red Cedar Cox Canyon facility. According to Table 6-4, one of the engines (or perhaps a bank of engines) has a potential-to-emit of 189 tons per year of NO_x from a stack that is listed with a height of 5.8 meters, exit velocity of 37.7 m/s, and temperature of 655 K. Table 6-4 also suggests there is a nearby building with a height of 7.3 meters and width/length of 18.3 meters. If an incorrect diameter of 3.05 meters is used, SCREEN3 predicts a near-field 1-hour maximum NO_x concentration of 900 micrograms per cubic (ug/m³) meter. This is an annual average of about 72 ug/m³ assuming a scaling factor of 0.08. The value occurs at a receptor 50 meters from the source. In contrast, modeling with a correct diameter of 0.25 meters increases the 1-hour average ground-level concentration to over 13,000 ug/m³! This is an annual NO_x concentration of about 1000 ug/m³.

If the same source is modeled without building downwash, the maximum 1-hour average impact at simple terrain receptors beyond 100 meters would be about 4 ug/m³ (0.32 ug/m³ annual average) based on the incorrect diameter. In contrast, SCREEN3 suggests the 1-hour maximum would climb to about 645 ug/m³ (or a 52 ug/m³ annual average) if a correct diameter is modeled.

The results above illustrate that the use of artificially large stack diameters, while holding the stack gas exit velocity constant, can cause large decreases in the calculated near-field concentration in situations with and without building downwash.

In addition to the stack diameter issue, it's also worth noting the dramatic effect that building downwash can have on concentration levels.

The Division recognizes that it would be a huge and probably unrealistic effort to model every source in the study area in detail as part of an EIS. Despite the possible quality assurance problem with respect to stack diameters, the draft EIS clearly shows that a comprehensive effort has been made to estimate existing and future air quality. The data assembled by the EIS process has been very useful to the Division for other studies.

The Division also recognizes that current EPA modeling methods for estimating near-field NO₂ concentrations tend over predict actual NO₂ concentrations. While this is due in part to the use of allowable versus actual emissions, the real issue is that current regulatory modeling systems do not treat atmospheric chemistry realistically in the near-field.

RECOMMENDATIONS FOR FINAL EIS

1. The stack diameter issue should be addressed. Since it is difficult to accurately model every source in an EIS covering a large area, one possible solution would be to install a more comprehensive monitoring network in the study area as suggested below.

2. A more extensive monitoring network is recommended for the study area. At a minimum, it should include PSD-quality meteorological towers, NO₂, and O₃ monitors. Other pollutants should be considered as appropriate.

Visibility and Other Air Quality Related Values

This section pertains to the review of the visibility and other air quality related values (AQRVs) for the DEIS addressing Oil and Gas Development on the Southern Ute Indian Reservation.

Class I Visibility

The regional haze analysis indicates the Limit of Acceptable Change as established in the FLAG report will be exceeded by Alternatives 2 and 3 (the proposed action).

Class I Acid Deposition

The DEIS indicates the potential impacts of the proposed alternative would be below the "limit of acceptable change."

Recommendations

The potential for noticeable regional haze degradation is of concern. The agencies should ensure the protection of visibility in Mesa Verde National Park and Weminuche Wilderness Area when making a final decision on the scope of the project and conditions required during development of oil and gas wells on the Southern Ute Indian Tribal lands. The Division recommends that new development be required to meet emission rates of currently available, clean burning equipment (1.0 g/hp-hr of NO_x).

General Background and Observations

It will be appreciated that noise and dust suppression actions be taken in all appropriate phases of this work. It will be appreciated that odor suppression actions be taken in all appropriate phases of this work and operation as well.

Generally projects of this magnitude can benefit from Pollution Prevention (P2) strategies. The Colorado Department of Public Health and Environment has its own P2 team designed to identify and assist in various opportunities such as yours. I encourage you to contact Kirk Mills of the P2 team at 303-692-2977 for more information about these often cost-effective and environmentally-preferable approaches.

If you have any questions or feel as though you need more information please contact me at (303) 692-3140 or the Colorado Air Pollution Control Division's Stationary Source Program at (303) 692-3150.

Sincerely,



Mark J. McMillan
Planning and Grants Specialist
Colorado Air Pollution Control Division

Susan Murray
644 CR 216
Dgo, 81303

3-18-01

rec'd 3/19/01

Dear Mr. Englishman,

I'm writing this in response to the BLM Draft EIS. Although I am not a geohydrologist, I do have science degrees and feel that this EIS is highly impartial. The initial chapters appear to be bias toward the Oil and Gas Industry and slant comments toward further drilling and infill. My understanding of any scientific document is that it MUST be impartial, or viewed as circumspect.

The portion on water quality and movement appears to be less bias, sticking with some available studies. (There does seem to be some missing information about local water migrations in the North Valley, though.) Compiling all available information from the industry, locals and government bodies seems to be impossible. But until we can do so, I think there will large information gaps resulting in some poor choices.

Wading my way through this portion on ground water, (which is an exceedingly difficult task complicated by jargon) I've become more concerned about this most valuable resource of ours. Water is THE ultimate resource for survival. I worry that mineral rights appear to have priority over water and surface rights. I live in the Sunnyside/ Bondad area which historically has had many wells lacking mechanical integrity. Well water in the area has been grossly contaminated with thermogenic gas. People in my neighborhood have been warned not to smoke in the shower... Funny, but not amusing for those of us who live here. This direct correlation between gas wells and methane contamination has led to some remediation. But, the remediation was prompted not by good neighbor relations between gas companies and those affected, but prompted by force and the threat of litigation. These folks are not motivated in any way except by financial means. Further drilling which may be prompted by the results of this study WILL impact our water.

Methane reports and complaints are increasing as people become more educated and knowledgeable about the possibility of losing groundwater quality and quantity. Natural fractures and faults throughout the area's geologic formations tend to move gasses and fluids around. Although the Fruitland Formation is technically and probably a mostly closed system, evidence of the water table dropping worries me. There is evidence (not in this study) of migration of thermogenic gasses, along with upper water table changes in the upper Animas Valley. (Population stresses on the H₂O notwithstanding...) Changes of water table in the western part of the formation will eventually effect us, our semi arid environment cannot easily refill aquifers. A 'mostly closed system' doesn't engender confidence for those of us using upper level groundwater for our survival. Gravity works.

Correlating the BLM EIS with Oil and Gas studies doesn't make the science any stronger. It makes it highly suspect. References to informational correlation concerns me as the

industries' focus is the bottom line, no matter how many well-meaning people they hire. (Research some of Wyoming's water troubles in relation to drilling.) The BLM should be focusing on the probability of damaging our most precious resource. This document appears to dodge any correlation between the Oil and Gas Industries' drilling and the quantity and quality of our water. Some of the ground work has begun. Using this as a draft, a realistic and comprehensive analysis of oil and gas drilling affecting water quality needs to be done. As a government agency representing the people, I believe that this EIS needs to primarily focus on the future well-being of the rural population, not on the oil industries' financial pocketbook.

Thanks for your attention to this matter.

Sincerely,

Susan Murray

Mr. Walt Brown
March 20, 2001
Page 1



David R. Brown
Environmental Specialist

Amoco Production Company
Part of the BP Group
San Juan Business Unit, HSE
1660 Lincoln Street, Suite 3000
Denver, Colorado 80264

Telephone: 303-830-3241
Facsimile: 303-830-3292

March 20, 2001

Mr. Walt Brown
Bureau Of Land Management
San Juan Field Office
15 Burnett Court
Durango, Colorado 81301

RE: Comments on Oil and Gas Development On the Southern Ute Indian Reservation
Environmental Impact Statement

BP is in receipt of the draft environmental impact statement (EIS). BP has hundreds of wells and holds substantial leasehold acreage within the boundaries of the Southern Ute Indian Reservation. The EIS will have a direct affect on the ability to develop natural gas resources that are critical to the Southern Ute Indian Tribe and to the nation. We appreciate the opportunity to submit comments on the DEIS.

Overall, the DEIS is well written and provides a thorough analysis of oil and gas development within the Southern Ute Indian Reservation. We do, however, have some comments, which are provided below by subject and page number. Any suggested language changes are shown in italics.

Executive Summary

Page 3

- 1) Reference is made to the potential for drilling up to 70 injection wells for purposes of reservoir stimulation (floods) with CO₂, N, or "other fluids". While it is good that the fluid types have been left open, it is not clear that matrix stimulation of producing wells will be specifically allowed. The injection of fluids into producing wells, not only wells

drilled for purposes of injection and reservoir flooding only, should also be included in the FEIS.

Page 4

- 1) Paragraph 3 speaks to the linkage of coal fires and seeps to production activities. However, the sections which follow in the body of the report speak to isolation of the near-outcrop rock environment from producing reservoir present in the deeper portions of the basin. This appears to be an inconsistency. As such, paragraph 3 should be modified to more accurately reflect the formation - outcrop discontinuity which is described in paragraphs found on pages 3-65 and 3-66. It should perhaps also be noted that causative linkage of coal fires at outcrop to down-dip production can only be postulated if the producing wells are located within 0.5 to 1.0 miles of the outcrop. At the present time, the COGCC does not presently approve drilling in this area.

Page 8

- 1) The 3-M study is described here as being focused on " mapping, modeling and mitigating". This is not correct: 3-M refers to mapping, modeling, and *monitoring*. It is recommended these changes be made to the FEIS.
- 2) Reference to the link between coal fires and production is made again here and should be clarified as noted above.
- 3) Reference is made to the mapping and modeling aspects of the 3-M study. It is implied that this work is not yet done when in fact the mapping and modeling aspects of the study, as originally envisioned, have been completed and reported and should be cited in the FEIS.

Air Quality

BP believes that the BLM has performed an excellent analysis in attempting to quantify air quality impacts from the proposed action. These comments are intended to suggest areas where the BLM needs clarification of their analysis. They are not intended to suggest that the BLM perform any additional analyses prior to issuing a final document. Further, these comments are intended to expand what the BLM has already presented regarding the conservative nature of this analysis. BP believes it is important for the decision maker to understand the level of conservatism in this analysis and that this be considered in issuing a ROD for this EIS.

Page 3-3

- 1) A reference should be provided for the EPA 1990 MM4 modeling that was used as input to CALMET.

Mr. Walt Brown

March 20, 2001

Page 3

- 2) 3.2.4 Existing Air Quality; the first bullet item should be changed to read: ‘Exhaust emissions (primarily Carbon Monoxide (CO) and oxides of nitrogen (NOx) from existing *natural gas fired* compressor engines used in the production

of natural gas; *gasoline and diesel* vehicle tailpipe emissions of combustion pollutants (VOC, CO, NO_x, particulate matter less than ten microns in effective diameter (PM₁₀) and sulfur dioxide (SO₂).”

Page 3-4

- 1) Another bullet item should be added to address the transport of pollutants from outside the region into the region. Such transport might be the most significant source of air contaminants in the study area.
- 2) The third paragraph should be changed to read:
“The maximum *measured* pollutant concentrations ...”

Page 3-6

Table 3-1 Measured Concentrations of Regulated Air Pollutants at the SUIT Monitoring Station near Ignacio, Colorado

- 1) It is suggested that 24-hour PM₁₀ concentrations be added to the table for the years 1992 through 1996. If this data is not available, this should be noted.

Page 3-7 Regulatory Framework

- 1) In the second paragraph, a discussion of the EPA Part 71 Major Source Permitting Program should be added (Title V on Tribal Land). The EPA has been issuing such permits for the past year. These permits are being required even if the State of Colorado has issued a Part 70 Permit.
- 2) In the last paragraph, there is a discussion of the EPA proposed O₃ and PM_{2.5} standards. This discussion needs to be revised, because the EPA has rescinded these standards pending the outcome of a legal challenge. Further, if the Court upholds the standards, the EPA can immediately enforce them. However, enforcement by the State or the Tribe would be delayed until a SIP or TIP is developed.

Page 3-8

- 1) The last sentence in the first paragraph is confusing with respect to future pollutant sources and NSR. This sentence should be modified to clarify these terms. Under the CAA, NSR and PSD applies only to those sources for which a permit application has been developed regarding a cumulative analysis. Sources that have not had final engineering developed should not be included in an NSR cumulative air quality analysis, nor should sources that were included in an EIS.
- 2) In the second paragraph, it is suggested that the word “exceeded” rather than “violated” be used with respect to NO₂ increment.
- 3) In the fifth paragraph, NO₂, PM₁₀ and SO₂ should be subscripted.

Page 4-7 Air Quality and Climate

- 1) BP agrees with the conclusion the BLM reached that “No significant impacts to climate are anticipated from the implementation of the Proposed Actions or Alternatives”. However, no analysis was performed to support this statement. By this comment, BP is not suggesting that such an analysis be performed, but rather that additional language should be added to support this position. BP suggests the first sentence in the fifth paragraph be changed to read, “The air quality assessment was based on the best available engineering data and assumptions, meteorology data, and EPA dispersion modeling procedures, *as well as professional and scientific judgment*”.

Page 4-8

- 1) In the first paragraph, the sentence that states “Air quality regulations require proposed new, or modified sources (including nitrogen compressors and gas compression facilities) undergo a permit review before construction can begin” is not completely accurate. This is because on Tribal land there is no minor source-permitting program. It is recommended that this paragraph be modified to address this issue but with emphasis on the pending program the Tribe will be implementing with support of the Colorado Air Quality Division.
- 2) In the third paragraph, it is recommended that language be added regarding the manner in which the EPA establishes the concentration levels and averaging time for the NAAQS. These standards are promulgated to protect the most sensitive portion of the public.

Page 4-10

- 1) The fifth paragraph should provide the duration of the construction activities. Also, in this paragraph the SO₂ contribution from the drilling engine to the three-hour model prediction versus background data should be provided.
- 2) The sixth paragraph compares construction-modeled impacts to the NAAQS and Colorado AAQS. In reality, since all construction activities are to occur on Tribal land, Colorado AAQS are not applicable.

Page 4-11

- 1) The fourth paragraph should be modified as follows:
“The lowest emission rate represents compression engines using emerging technology which would be more difficult to guarantee during the LOP. *All of the emission cases considered are utilizing engines that have significant reductions in NO_x emissions compared to uncontrolled engines.* The maximum potential near field NO₂ concentrations were determined by multiplying maximum predicted NO_x concentrations by 0.75, in accordance with EPA methodology 40 CFR 51, Appendix W, Section 6.2.3.”

- 2) In the fourth paragraph, it should be noted that the stated emission levels are only applicable to compressor engines having a site-rated capacity of greater than 500 hp-hr.
- 3) The sixth paragraph is confusing with respect to what sources are contributing to the modeled impacts that are being compared to the PSD increment. Does this represent only Proposed Action Sources or some other subset of sources?

Page 4-12

- 1) The second paragraph should be modified to read:
“When this value is added to the assumed representative background concentration (15 ug/m³), the resulting predicted maximum total impact of 24 ug/m³ is also below the NO₂ NAAQS of 100 ug/m³ (annual). *It is important to note that this projected increase in NO₂ levels is only expected to occur at one location and should not be assumed to occur throughout the entire study area.*”
- 2) A statement should be added to the discussion of the short-term toxicity of formaldehyde noting that the scientific basis of various state standards are not known.
- 3) BP recommends that the sixth paragraph be revised in the following manner:
“Under the MEI analysis, the maximum individual cancer risk for formaldehyde would be 2.8×10^{-6} . *This incremental risk is predicted to occur at a location where the public currently does not reside.*”

Page 4-13

It is recommended that an additional bullet be added that states: “*By using typical maintenance procedures using flue gas testing to tune compressor engines, actual emissions should be substantially below potential or maximum emissions.*”

Page 4-14

In the second paragraph, it should be noted that the Tribe currently does not have a minor source permitting program. As a result, pre-construction permits may not be necessary in all cases. This will be determined as the minor source program develops.

General Comments of Cumulative AQRV Analyses

BP believes that the visibility analysis provides technical information regarding the potential visual range effects from the Proposed Action. However, when this information is used in issuing a ROD, it is very important to also consider the very conservative nature of this analysis. BP believes that it is inappropriate to consider emission levels less than 2 g/hp-hr. The following points reinforce this position in addition to what is stated on page 4-21 of the document:

- 1) The visibility range analysis is based on the assumption that background levels will remain at the 90th percentile for all days of the year. Since the calculated change in visual range is directly related to this concentration level, assuming such uniform clean

atmospheric conditions is very conservative. Since all visibility calculations are referenced to these ultra clean conditions, such projections represent the extreme in potential impacts. In reality, actual impacts on any given day will likely be less than what is projected in the Draft SUIE EIS.

- 2) This analysis was based on the CALMET/CALPUFF Model. While this model represents a substantial improvement over previous modeling tools, it has not been sufficiently tested in the manner in which it was used in this analysis. The EPA has recently proposed that this model be included as a Guideline Model.
- 3) In reviewing EPA documentation associated with CALPUFF, there are a limited number of model evaluations that have been conducted. From information in the EPA Docket, it appears that the EPA evaluated the model against the Great Plains Tracer Experiment in Norman, Oklahoma and the Savannah River Laboratory Experiment. In addition, an evaluation was conducted using the INEL Tracer Test. GTI is also aware of other model data comparisons such as CAPTEX. While these model data comparisons show that to some extent the CALPUFF model can replicate the observed data, there are a number of significant limitations in these studies. Therefore, conservative results are inherent when using the model in its present form.

The CALPUFF model is the current state-of-the-art model available for performing AQRV analysis in Class I areas and was the appropriate choice of a model for this study. Despite this, we believe the model is very conservative in applications such as this EIS. There is still some uncertainty relative to nitrate levels. The importance of this uncertainty is further supported by examining measured air quality levels in relation to changes in emissions within the region. Figures 1 and 2 present measured fine particulate levels in the Mesa Verde and Weimunich Class I areas. These figures indicate that NO_3 levels have been relatively constant over the period of record. It is important to note that during this same time period NO_x emissions, as a result of gas development, have substantially increased. This is indicated in Figures 1 and 2. Based on these findings, it is concluded that there may not be any relationship in these two Class I areas between emissions and NO_3 levels (and visibility). There are several possible explanations for this finding. First, the formation of NO_3 may be limited by both ambient O_3 levels, as well as ammonia. Very little research has been conducted in this area. In the CALPUFF modeling, the default background concentration of 10 ppb of ammonia was assumed. The assumption in the model is that ammonia concentration is uniform at this level for all hours of the year and uniform throughout the mixed layer.

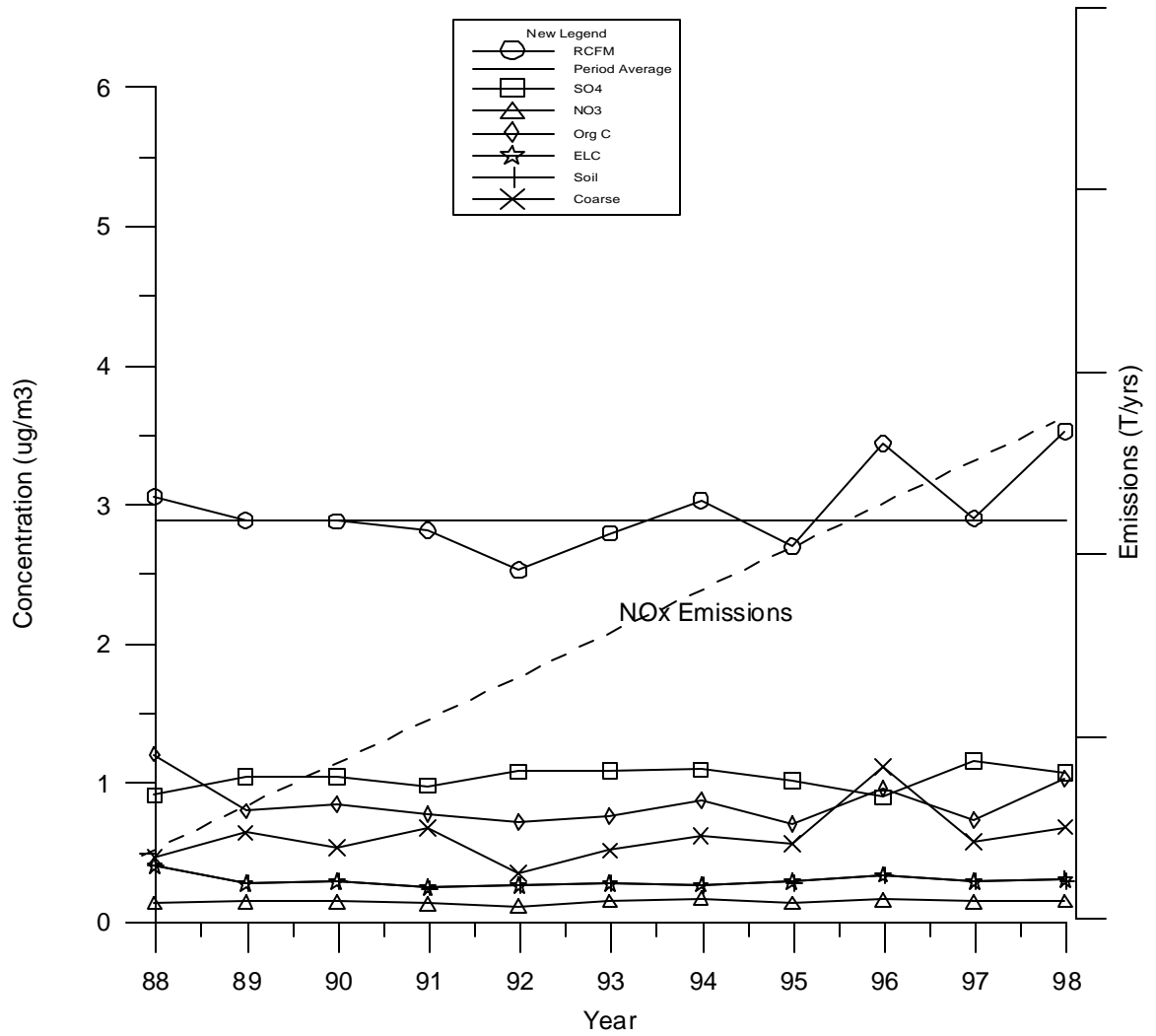


Figure 1. Plot of annual average particulate species at the Mesa Verda National Park

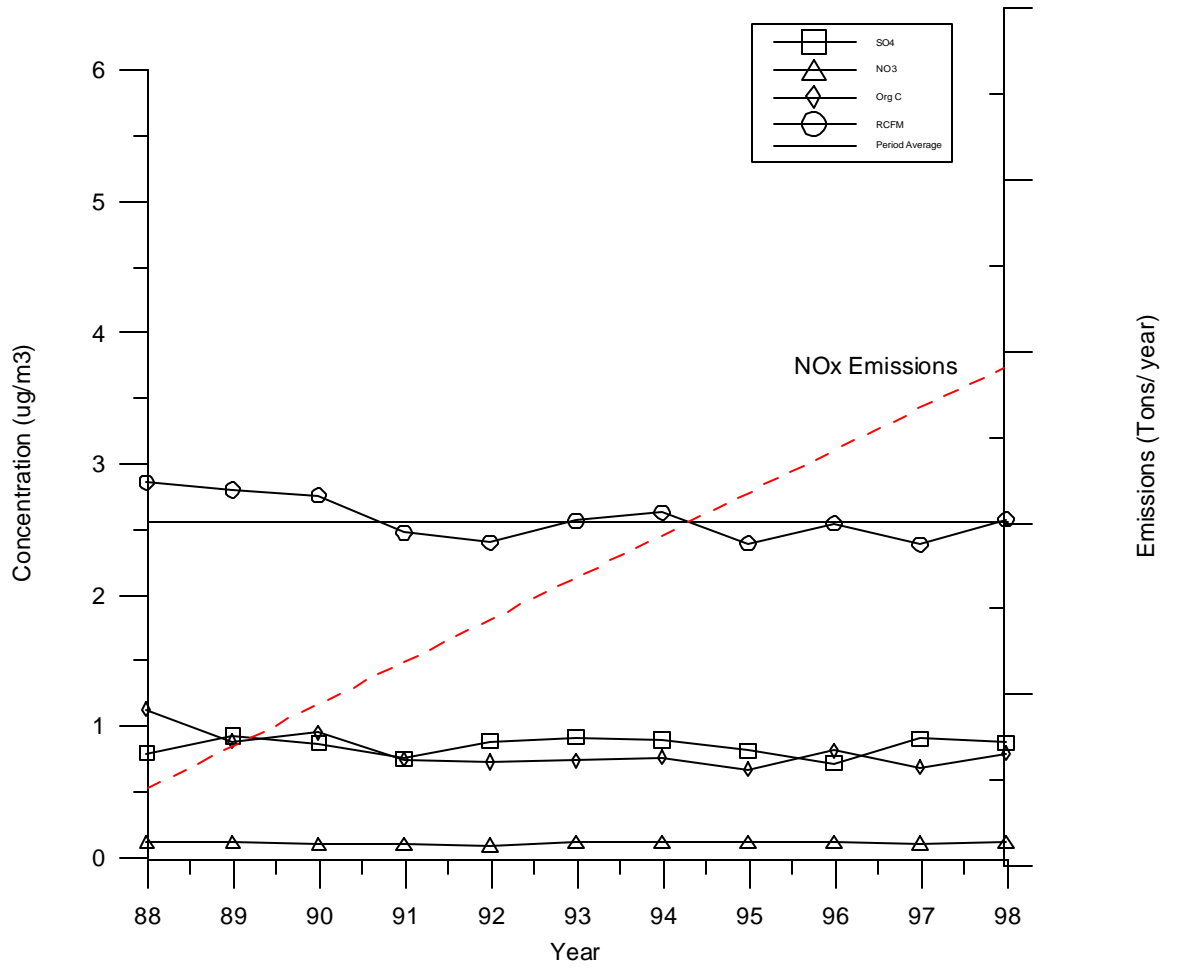


Figure 2. Plot of annual average particulate species at the Weminuche Wilderness Area

Based on this empirical information that correlates NO_x emissions to changes in NO₃ levels, NO_x control strategies may have little benefit to overall air quality levels in these two Class I areas. This is compelling data that supports the issuance of a ROD with an emission limit of not less than 2 g/hp-hr.

- 4) The far field modeling was conducted to answer the question, "What will the change in visual range be as a result of the Proposed Action in combination with all other sources that are not reflected in the background measurements?" As previously stated, calculation of the estimated change in visual range background measurements represents an average over multiple years of measurements (approximately 10 years). Because the IMPROVE PM samplers only operate twice a week, developing a composite average is necessary to develop a robust statistical average.

The data used in the analysis included samples collected through 1997. In the context of a cumulative EIS analysis, the use of such average background data is very problematic with respect to emission inventories. In the cumulative analysis, sources are included in the modeling if their impacts are not included in the background measurements. The problem is that by using multiple years of background data, the distinction between what sources are included in the background data becomes blurred and the potential exists for double-counting impacts through modeling and background measurements. In the context of the Draft SUT EIS analysis, there was double-counting of sources in the permitted, but not constructed, category. The background measurements used reflect conditions through 1997, while the emission inventory used in the modeling reflects sources in the permitted, but constructed, category beginning in 1995. Thus, sources that either became operational or terminated their operating permits between 1995 and 1997 have impacts that are double-counted in this analysis. The absolute magnitude of this double-counting is not known; but, based on previously presented empirical data that found no correlation between emissions to NO₃ air quality, this double-counting of emissions in the model will add to the overall conservatism.

Page 4-20

In the second paragraph, NO_x should be NO₃.

Page 4-22 Mitigation Summary

First bullet

The installation of larger pipelines may not reduce overall field compression needs. CBM production is at substantially lower reservoir pressures than conventional production and, consequently, more compression is needed. Thus, simply increasing the size of the pipeline may not affect overall compression needs.

Second bullet (NSCR Catalyst), third bullet (Lean Combustion) and fourth bullet (Selective Catalytic Reduction)

These mitigation opportunities are already included in the compressor engines studied in this document. Thus, these are no longer methods for additional mitigation.

Page 4-24 NOx Emissions “Cap and Trade”

Based on these comments, BP believes that the BLM is correct to reject a NOx cap and trade program.

Biological Resources

Page 4-39:

The seventh bullet states “clean up spills of petroleum products or produced water in an appropriate manner as soon as possible to minimize damage to plant materials”. This statement requires more flexibility. While hydrocarbon spills require immediate mitigation, there are cases of produced water spills where clean-up may not be necessary. While some CBM water could reach levels of 20,000 mg/L of total dissolved solids (TDS), much of the water from our production ranges from 3,000 TDS to 7,000 TDS. Many spills of produced water to land can have limited effects considering volume, location and the infrequent nature of the incidents at the same location. It is suggested adding an additional sentence that would read: *“Produced water spills will take into account the volume of water, TDS concentrations of the water spilled, and the land-use on which the spill occurred.”*

Geology, Minerals, Soils

As a general comment, ongoing studies associated with 3M and the monitoring being conducted by the SUT is sufficient to address these concerns. In addition, the Application for Permit to Drill (APD) process provides a mechanism for site specific and case-by-case assessment of individual well sites and their impact, if any, on these resource concerns.

Water Resources

Page 3-40

The discussions of the Kirtland and Tertiary formations need to include the occurrence of thin, discontinuous coals. The use of mud and density logs to identify coals in the Fruitland formation has shown thin, discontinuous coals and gas kicks within tertiary formations.

Page 3-55

Map 15 presents all water well locations and other information presumably based on records of the State Engineer’s Office (SEO). The SEO records are permits only. They may or may not

have been drilled and there could be wells that are not recorded. It is important that the FEIS indicate that some limitations exist with SEO records.

Pages 3-55 and 3-56

There are several other papers, which would add support to the section. "Hydrogeology of the Animas Valley", Paul Oldaker, 1992, Kernoude, *et al.* (referred to later), are papers on each unit in the basin. Brogden, *et al.*, 1976 (referred to later) is the first data for the reservation. Stone, *et al.*, 1976 (New Mexico Bureau of Mines) is probably the most complete data compilation in the basin. These may have been used, but we would suggest they be referenced in the bibliography.

Page 3-56

Paragraph 1 describes that pre-Cretaceous rocks contain waters with salinities too high to be used as aquifers. Note that the Fruitland is Cretaceous and that this wording implies Fruitland waters could be used as aquifer waters. This paragraph should be revised to stipulate that rocks older than the Animas Formation contain waters which are generally too saline to be considered as principal aquifers - the notable potential exceptions being where they are within 0.5 to 1.0 miles of outcrop.

Table 3-14

The tertiary formations and the Picture Cliffs sandstone are identified as having a calcium-bicarbonate type. For the tertiary formations, this is true near the surface where an oxidized system is in place. However, deeper depths will go to a sodium-bicarbonate type. Generally, the Picture Cliffs sandstone is a sodium-chloride or sodium-bicarbonate type. It is suggested this change be made to the FEIS.

Page 3-64

Water produced from Cretaceous formations has yielded high TDS water, but also has yielded low TDS water near the outcrops. This should be mentioned in the FEIS.

Page 3-65

- 1) A 1991 paper by Mr. Paul Oldaker is referred in the first full paragraph. Mr. Oldaker also compiled much of this information in a 1987 report to Amoco. It is recommended that Mr. Oldaker's report to Amoco in 1987 be referenced in addition to the 1991 paper.
- 2) The closing line of paragraph 1 describes that the 3-M study will model the hydrology of the Fruitland. This work has already been done by Applied Hydrology Associates, was made publicly available in December of 2000, and should be referred to as being complete in the FEIS.

Mr. Walt Brown
March 20, 2001
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Page 3-67

There appear to be two earlier reports on isotopes that should be included. One is Mr. Dudley Rice's report on the Reservation for the BIA which was authored in 1987. In addition, a USGS report authored by Chafin in 1995 should also be referenced.

Page 3-71

In Table 3-16, flows should be reported in cubic feet per second and barrels per day, since all three units are used.

Page 3-74

The historical gas and oil seepage in the basin show that "baseline" hydrocarbon concentrations in surface water may have been significant. These should be included in the historical water quality discussion of the area.

Page 4-115

The second bullet on this page refers to carbon isotopic analysis where methane in water is greater than 1 mg/L. It should be noted that the infill order raised this threshold to 2.0 mg/L due to concerns about whether enough gas would be present in a sample containing 1.0 mg/L to perform isotopic analysis. It is recommended that this threshold be incorporated into the FEIS to be consistent with the infill order issued by the Colorado Oil and Gas Commission.

Surface Water

Page 4-127

A reference is made to Section 404 of the Clean Water Act for activities crossing surface waters. A reference should also be made to Section 401 certification for activities crossing surface waters within the boundaries of the Southern Ute Indian Reservation.

Page 4-128

The first bullet item on this page refers to reclaiming roads not necessary and completing revegetation. It should be emphasized that the Tribe directs any reclamation. Consequently, it is suggested that the phrase, "*As directed by the SUIT*, reclaiming roads....." be inserted into this mitigation item.

Page 4-128

The sixth bullet refers to routine inspections of facilities, pipelines, and well sites to determine erosion problems, sedimentation, spills, or leaks that require corrective action. It should be pointed out that if proposed facilities exceed more than five acres, regular inspections are required under stormwater management plans that must be developed for that project. It is

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March 20, 2001
Page 14

suggested that the stormwater regulations be incorporated by reference as the basis for this requirement.

Page 4-128

The seventh bullet refers to “all flow and injection lines would be removed and any buried transmission lines would remain in place” in reference to non-productive wells. It is recommended that the reference to “removing all flow and injection lines” be worded with more flexibility. Leaving these lines in place after abandonment is not considered a safety or environmental hazard and would eliminate surface disturbance that is necessary for removing the lines. We would recommend that the phrase be re-worded to state: *“All flow lines, injection lines and transmission lines would remain in place unless conditions dictate the removal of such lines as directed by the Southern Ute Indian Tribe.”*

Land Use and Ownership

As a general comment, it should be noted that both private and Tribal lands within the study area are subject to environmental review processes. Fee land activities are regulated both by the County and the Colorado Oil and Gas Commission. On Tribal lands, the Tribe, the BIA and the BLM work concurrently on evaluating proposed oil and gas activities. Coupled with the mitigation presented in this category and the oversight by the number of agencies, depending upon land ownership, a program is in place to thoroughly evaluate environmental affects of project proposals.

Cultural Resources

We concur with the findings presented in the mitigation portion of the analysis. Avoidance of cultural sites, identified as part of the field surveys on Tribal lands, has been applied over the years and has been very successful in minimizing impacts.

Thank you for considering our comments.

Sincerely,

Dave Brown
Environmental Specialist

March 16, 2001

RECEIVED
MAR 20 2001
Bureau of Land Management
Durango Colorado

Mr. Don Englishman
BLM Environmental Protection
Specialists
San Juan Public Land Center
15 Burnette Court
Durango, Colorado 81301

Re: **Comment on Draft Environmental Impact Statement**
Dated October, 2000 For the Southern Ute Indian Tribe

Dear Mr. Englishman:

This firm represents numerous surface owners and local government entities throughout the Rocky Mountain Region in connection with issues concerning mineral development. The above-referenced draft EIS fails to consider a reasonable cost-effective alternative in drilling operations which would significantly lessen the environmental impact of drilling.

There is no consideration in the draft EIS of pitless drilling alternatives. Wells can be drilled without reserve pits at a cost which is less than drilling them with reserve pits. The advantages of using pitless drilling equipment on the rigs are as follows:

- **Footprint** – smaller footprint with little surface disturbance; reduces delay in reclamation, avoids subsidence of reclaimed surface and minimizes erosion.
- **Water** – reduces water consumption by sixty percent.
- **Traffic** – reduces truck traffic by fifty to seventy-five percent; fewer water trucks, fluid disposal trucks and equipment to drill and reclaim pits; mitigates traffic danger, road use, air pollution and noise.
- **Wildlife** – reduces danger to wildlife and livestock.
- **Waste** – minimizes waste product disposal.

1501 Broadway, Suite 1600
DENVER, CO 80202
303 292 9021 fax 303 296 6347
<http://www.astrellalaw.com>

The benefits to the operator include the following:

- Pit Construction – eliminates cost of digging, segregating soil, lining, flagging and fencing.
- Pit Reclamation – eliminates pit dewatering, fluid disposal, reclamation, and subsidence correction.
- Archeological – reduces archeological costs where applicable.
- Water – reduces water hauling costs.

There are several service companies which can provide pitless drilling equipment and services, or can work with local drilling contractors to design such equipment for their rigs.

For more information on this subject, please feel free to contact me or one of the following individuals.

Reginald Wiemers
Wiemers Engineering
1131 E. Otero Place
Littleton, Colorado 80122
Phone: 303-298-1600

Eldon Ohlmann
Environmental Motion LLC
11667 US Hwy. 34
Greeley, Colorado 80634
Phone: 970-352-4363
Cell: 970-396-9714

Very truly yours,


Lance Astrella

LA:dlg

TO: Don Englishman, Minerals Supervisor
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, CO 81301
970-385-1346

From: Carl Weston
3905 Hiway 550
Durango, CO 81303
970-247-9594
E-Mail: crweston@mindspring.com

RECEIVED
Signed: *Bob Estelle*
Date: *3/20/01 2:45 pm*

Subject: Public Comment
Oil And Gas Development
On The Southern Ute Indian Reservation
Environmental Impact Statement

I have resided and owned property within the Southern Ute Reservation boundaries for 33 years at SW 1/4, SW 1/4, SECT 31, T33N, 9W.

My comments on this EIS are inadequate and severely circumscribed because of the limited time allowed to study such a voluminous document that took six years to compile. Full semester college courses use smaller texts than this EIS. Technical jargon has no ordinary explanation that would provide the average citizen with an education level of high school plus two years, with an understanding of the impact being described. For example, "Maximum direct CO impacts during operation were predicted to be nearly 159 ug/m³ (1 hour) and 110 ug/m³ (8 hour)". Now what the hell are the health effects of living next door and down wind to that? with a pre-existing cardiac condition? during weather inversion conditions?

At a minimum, an additional month is requested to study this issue.

One of my stronger concerns is for the cumulative and synergistic impacts of localized air pollution under the least favorable meteorological conditions, especially in confined watershed topography. EPA has said that there are no monitoring facilities on the S.U. Reservation that would measure those conditions. There is little point in comparing three alternatives, none of which can determine the localized (health) impacts on contiguous neighbors. Human respiration is a continuous vital process. It cannot be intermittent with a minimum number of adequate hours or days, like a tourist's view of the scenery.

The lack of adequate localized monitoring facilities raises the issue of where and how non-Indian residents of the Reservation can effectively seek remedial action of unsatisfactory or non

compliant air quality impacts. Where in this EIS is this level of mitigation addressed? It would appear to belong in the environmental justice section.

This EIS continually and extensively uses the term "ambient" to describe air quality standards without defining how uniform the air quality is within the area to which the term applies, or whether the "ambient" air quality can be statistically manipulated by including or excluding topography with greater or lesser levels of pollution. It would appear that the lower terrain of watershed courses should be specific separate "ambient" measurement areas, particularly since most of these areas are where residential development is concentrated. It also appears to be the preferred area for location of compressor stations. It is the area where inversion weather conditions most concentrate air pollution, especially at night.

Adjusting residential exposure levels for "time away from home" is disingenuous sophistry. Elderly and pollution vulnerable residents are those most likely to be continuously confined at home. Human beings cannot be quantitatively or qualitatively measured as some statistical aggregate organic mixture like algae. They are as vulnerable to pollution impacts as the weakest, and most impaired, single individual, for the shortest period of time necessary to negatively impact human physiology at any age or stage of human existence, from unborn or newborn to frail elderly. Estimates of pollution impacts should be addressed using that standard.

Wetland mitigation should have wetland avoidance as the first and highest priority. Wetlands created by produced or diverted water should not be eligible as "replacement" mitigation unless the sustaining water source can be legally and physically assured in perpetuity.

There are a number of issues cited as "not been mapped", "not been formally studied", "difficult to quantify", etc.. These issues should be collated and categorized so the public can see and evaluate where the greatest number of unknown, ignored and unexamined issues lie.

To be continued (contingent on extended comment deadline)





IBR4DM30.4DUR1PO:
WHurley@BORGGroup
wise

To: denglish@BLM
cc: BHarrill@BIA, karringt@BLM
Subject: Comments, SUIT Oil & Gas DEIS [Virus checked]

03/20/01 04:00 PM

Mr. Englishman:

The following are my comments on the SUIT Oil & Gas Draft EIS (SUIT DEIS).

General:

Throughout, the SUIT DEIS makes reference to the Animas-La Plata Project (ALP). However the most recent reference to the ALP is 1996. The configuration of the ALP has changed considerably since 1996, and what is contained in the SUIT DEIS is a mischaracterization of the present ALP. In particular relevance to the SUIT DEIS Study Area is the elimination of irrigation features and a reservoir on Southern Ute lands, and replaced by various other scenarios of water use. I suggest using the more recent ALP Final Supplemental Environmental Impact Statement of July 2000, and Record of Decision of September 2000 to describe the interface between Oil and Gas development on Southern Ute lands and the Animas-La Plata Project.

Cultural Resources:

The following pertain mostly to the cultural resources sections and Appendix K. In general, I found the sections and Appendix to be very well done and comprehensive. It makes optimum use of the available data to describe the cultural environment and potential impacts.

However, the SUIT DEIS concludes that significant impacts to cultural resources should be prevented based upon mitigation and avoidance (pp ES-2, ES-10 (Table ES-1), Table 2-2 (pp 2-31,32)) . It is not adequately demonstrated how this can be accomplished, in light of the fact that under the Preferred Alternative almost three times as many sites would be present than under the No Action Alternative. Page 4-170 incorrectly states that in cases where impacts to archaeological sites are unavoidable, "no adverse effect" determinations can be made through data recovery (and therefore there are no significant impacts). Under 36 CFR 800, an "adverse effect" can not be made "not adverse" through data recovery.

In regard to Traditional Cultural use/cultural affinity of the Study Area, the DEIS is very incomplete. It relies almost exclusively on Reclamation's ethnographic study conducted for the ALP (pp 3-110 and 3-111, unreferenced, and p 4-174) to describe what traditional cultural properties are in the study area and what the impacts may be. While there is some applicability, the ALP ethnographic study results should not be construed to be representative of the entire Southern Ute Indian Reservation. The DEIS indicates that it is likely that other Tribes (than Southern Ute) claim affinity to archaeological sites in the study area but no consultation has been initiated, as is required. I suggest conducting an ethnographic study/consultation with the Tribes (including identifying Culturally Important Plant areas described in Sections 3.3 and 4.3) for the Final EIS.

Appendix K:

Many of the above comments apply to corresponding sections of Appendix K.

More specifically:

Page K-3:

No formal section 106 consultations have been undertaken because of the "programmatic" nature of oil and gas development. To the contrary, I suggest that it would be expected that consultation would have

occurred and a Programmatic Agreement Document in preparation for a project of this scale.

The document refers to the ALP as an "Irrigation project". See general comment, above.

K-26:

Under Special Status Cultural Resources, add that Ridges Basin (La Plata County), along the northern boundary of the SUIR, has been determined eligible as a National Register District, but is outside of the oil and gas leasing and development area. Northern Arizona University has completed a seven-volume series on Ridges Basin and the surrounding area, which has some relevance to the Study Area. It will be provided to the BLM/BIA (or their consultants) upon request.

K-27,28:

Reclamation has completed a Jicarilla Apache Ethnobotany study relevant to the Study Area (and relevant to the Culturally Important Plants subject matter), which will be provided to the BLM/BIA (or their consultants) upon request.

K-32-42, and elsewhere:

Reclamation has conducted a number of recent investigations in the southeastern corner of the Study Area (at Navajo Reservoir), which were not referenced. They will be provided to the BLM/BIA (or their consultants) upon request.

K-72:

The NHPA section cites an obsolete version of 38 CFR 800. The data recovery exception to the criterion of adverse effect no longer exists. Under present regulations, adverse effects can be "resolved" through data recovery, but they remain adverse. This places the conclusions of this section (on K-73) and the section on Criteria for Significant Impacts (on pages K-74 and K-75) in doubt.

K-80, K-81:

The potential impacts described for the Animas-La Plata Project are in error. The study cited (Chenault 1998) was for an irrigation component of the ALP that has since been eliminated. I suggest using the impacts analysis provided in the July 2000 FSFES. The cultural resources analysis report is forthcoming and will be provided to the BIA/BLM (or their consultants) if requested.

Thank you for the opportunity to comment on the SUIT DEIS. Please incorporate my views into the public/agency review process.

Warren F.X. Hurley
Archaeologist
USDI Bureau of Reclamation
Western Colorado Area Office

Calvin Joyner, Director
San Juan Field Office
Bureau of Land Management
15 Burnett Court
Durango, Colorado 81301

March 27, 2001

RE: Comments on the Southern Ute Indian Tribe Oil and Gas Program Draft Environmental Impact Statement

Dear Mr. Joyner,

The San Juan Citizens Alliance (Alliance) and the Oil and Gas Accountability Project (OGAP) file these comments jointly with the hope that you will review them and take action to ensure that current NEPA Process for the Southern Ute Indian Tribe Oil and Gas Program will be completed in accordance with the high standards and legal requirements that guide your work. Unfortunately, the DEIS does not meet these standards and requirements. Fortunately, the give and take of the NEPA Process does allow the shortcomings to be remedied by withdrawing the current DEIS and releasing a new DEIS for public and interagency review. The many reasons for requesting withdrawal of the DEIS are detailed below.

Introduction

The Draft EIS does not meet basic tenants of NEPA's requirement that BLM release an interdisciplinary document that encourages public participation and input. As detailed below, the document was released in incomplete form, without maps, graphs, and charts. The failure to provide printed maps is illustrative of the large gaps in information and analysis that characterize the DEIS.

The range of alternatives is not reasonable and does not include a no action or any alternative that seek remediation of known problems. The need for additional wells is not demonstrated. Mitigation measures are listed to "include, but are not limited to," with no indication what mitigation measures will normally be required to address impacts on a programmatic level.

Plain English and full revelation of impacts are not provided. The lack of candor, unsupported data, and unreadable language that characterize this EIS are illustrated by excerpts related to water impacts:

As the conditions that must be met to produce an impact are many and quite complex, the potential impacts identified are not quantified. DEIS at 4-108 (Groundwater impacts).

There currently are no known surface water data for streams in this area that can be used for the establishment of baseline water quality or quantity conditions, including concentrations of PAHs or hydrocarbons in surface water or sediment. DEIS at 4-126.

Annual flow in the rivers in the northern San Juan Basin totals over one million acre-feet per year. (Maynes, 2000, pers[onal]. comm[unication].). DEIS at 4-111.

For example, a watershed comprising both Tribal and non-Tribal coal land could contain contaminants in receiving surface waters, with no definitive transport pathway that leads to a point source. DEIS at 4-116.

These are not isolated examples. Omission and obfuscation characterize this DEIS.

At many times, there are discrepancies between the CD-ROM and the printed version, leaving the reader to wonder which of the two versions of the DEIS was intended for release. These comments cite the page numbers that correspond to the printed copy that was provided.

Simply put, it is impossible for this DEIS to be reworked into a legally sufficient Final EIS without release for public and agency comment. The Alliance and OGAP request that the responsible officials in the BLM and BIA uphold the public trust by shifting agency resources from permitting additional wells and expeditiously rework this DEIS into a document that can be released for public comment and that meets basic NEPA requirements.

Further permitting of wells and other facilities is not legally possible until this long-delayed NEPA Process is completed. As alleged in the pending federal lawsuit, any wells permitted without the completion of this NEPA Process are illegal. Further, any further drilling is highly likely to be in flagrant violation of the Endangered Species Act consultation requirements and the prohibitions on harm and habitat modifications. A shift in resources to this NEPA Process that began in 1995 would ultimately produce better decisions, more efficient and orderly production, an informed public (Indian and non-Indian residents), a better environment, and would save resources now dedicated to litigation.

Public Involvement

The single public hearing discouraged involvement of public. NEPA requires agencies to design public processes that attract public participation. Whether intentional or negligent, BLM has not made the efforts required by CEQ regulations to take affirmative steps to encourage public involvement. Many people have said that they would not attend an open house that provided no opportunity to hear from the agencies or the general public.

Further, the hearing was not promoted with the vigor that a decision of this magnitude demands. Some people complained that they had a very difficult time finding the meeting. There were no signs directing people into the area of the Sky Ute Casino where the meeting was held.

An open house was held, but no formal public hearing was held as was stated at page 5-10 of the DEIS. There was no presentation by the responsible agencies. Attendees could ask questions of the agency personnel, but the answers were not recorded. The BLM personnel present lacked the interdisciplinary character required by NEPA. A court reporter sat in one corner of the room taking statements. A worse method for encouraging public participation would be difficult to design. A better method for insulating decisionmakers from public sentiment is difficult to imagine.

Only approximately 15 people attended the open house. In the past, hundreds of people have attended well-publicized public hearings on oil and gas issues in this area. It is exactly the

public concerns and the public outrage that decisionmakers like Area Supervisor Cal Joyner and State Director Ann Morgan must understand in order to make a fully informed decision. Unfortunately, this DEIS allows the oil and gas shop to continue to operate insulated from interdisciplinary staff analysis and public involvement that NEPA requires.

Plain English – Readability

The public was not provided with maps and charts designed to aid understanding and which sometimes provided key information. When maps were requested, people were referred by the agencies to the CD-ROM. Even federal agency personnel had problems handling CD-ROM versions of the maps. Basically, a DEIS that has been in the works since 1995 was released by the federal agencies to the public in 2001 unfinished and incomplete.

It should be noted that the BLM made special effort to provide printed maps to Travis Stills in his capacity as attorney for the San Juan Citizens Alliance. The maps that were provided to a single attorney are not particularly readable or helpful for wide public understanding. Many of the maps are utterly unreadable due the choice of colors used for the legends, especially those detailing land and mineral ownership patterns. see: Map 2, 17, 18. Pale yellows are used throughout the maps, rendering the maps nearly unreadable and blurring distinctions that use of color keys is supposed to accentuate. All of the maps are dated September, 1999, and were a full year and a half old upon release, making them unreliable sources of information. It is not entirely clear who was provided with a fully printed version. A serious breach of the public trust occurs when agencies provide only select persons with full copies of a NEPA document.

Most importantly, the general public had no easy access to the maps, charts, and diagrams that made text understandable and which were sometimes the only source of particular types of information in the document. The DEIS needs to be reprinted and released in a form accessible to the general public that NEPA is designed to inform and involve. The comment period needs to be re-opened to allow public comment based on a complete and reliable printed document.

Purpose and Need

The purpose and needs section of the DEIS fails to meet the mandatory requirement that EISs “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” 40 CFR 1502.13. The DEIS neither attempts to describe the purpose nor the need for implementing the proposed action – the intensification of the gas development program. As described below in the comments on the lack of alternatives, it is quite likely that more wells and enhancement techniques are not necessary to full and efficient production of gas resources. It is also quite likely that accelerated production will have disproportionate benefits among the various interests involved. What is certain is that the underlying purpose and need for more has not been stated with specificity and accuracy.

The DEIS does partially restate the purpose of preparing the EIS. A much more accurately statement of the purpose of an EIS is provided by the regulations:

The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the

ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. Agencies shall focus on significant environmental issues and alternatives and shall reduce paperwork and the accumulation of extraneous background data. Statements shall be concise, clear, and to the point, and shall be supported by evidence that the agency has made the necessary environmental analyses. An environmental impact statement is more than a disclosure document. It shall be used by Federal officials in conjunction with other relevant material to plan actions and make decisions.

40 CFR 1502.1. Unfortunately, this DEIS fails to meet the NEPA purposes at almost every turn.

The DEIS does recognize that a central purpose of an EIS in a checkerboard reservation such as the SUR must be to inform SUIT, BIA, BLM and other decisionmakers. DEIS 1-4-5. However, there is no recognition of an equally important purpose, to inform allottees, non-Indian residents living within the reservation, and others who might be interested in the environmental impacts of the oil and gas development. The lack of attention to public information purpose of NEPA is reflected in nearly every aspect of the DEIS. This type of sheltered approach to NEPA documentation is now uncommon in most federal programs, yet it continues to characterize the federal oil and gas program. The lack of commitment to public involvement and environmental protection is well known throughout the otherwise responsible and responsive federal agency employees who, like the Alliance and OGAP, are seeking to bring the oil and gas program into compliance with even the most basic of requirements of federal law.

The lack of attention to the diversity of opinions within the Tribal membership and among allottees is consistent with the legacy of abuse of tribal members by a Department of the Interior focused on oil and gas production. The lack of attention reflects the oil and gas program's insulation from the interdisciplinary mandates that apply to all federal activities. This NEPA process must involve everyone, especially tribal citizens and allottees, of the impacts and the full range of alternatives that includes no action and remediation. The DEIS does recognize that private CBM development may damage Tribal Coal Only Lands, yet no mitigation or protections are contemplated for Coal Only lands. DEIS at 1.4. The historic preference of DOI for energy production over the legitimate concerns of environmental and resource protections is evident throughout the document. DEIS at 1.4. The legacy of the federal oil and gas program's failure to take NEPA purposes seriously must not extend past the current DEIS. A new DEIS must be released that implements the NEPA purposes.

Scope

The Alliance has requested a San Juan Basin-wide EIS since the late 1980s. In response to lawsuits and requests, three programmatic NEPA Processes are underway throughout the basin – two in the San Juan Field office (SUIT EIS, Northern EIS), and one in the Farmington, New Mexico Field Office. Instead of the current inefficient and segmented approach, these EISs should be prepared and released as one basin-wide EIS that discloses the full impacts of the 20,000 existing wells and the potential 20-40,000 wells that are being contemplated basin-wide.

In response to the Alliance request for a basin-wide EIS, the SUIT DEIS reports that the study must be focused on the reservation. DEIS at 2.3.3. Yet, the very next section recognizes

the possibility of leasing on the eastern portion of the Reservation. DEIS at 2.3.4. The reason for not analyzing the potential development in the eastern portion is that the “Tribe has no current plans for development.” *Id.* The conflicting rationale in the DEIS reveals that focus on the SUI reservation issues is a mere pretense for avoiding a basin-wide EIS since the SUI DEIS itself covers only about sixty-one percent of the Reservation acreage. DEIS at Figure 1.

Another possible reason for limiting the study area to the Western half of the Reservation is that it omits the downwind half of the reservation. Anyone who has studied air quality issues is familiar with the fact that the Northeastern United States is heavily impacted by industrial activity in the Ohio River Valley – which is downwind and to the west. Here, the impacts of deposition and other downwind phenomenon are being ignored because of the limited scope of the EIS.

The best, and only legal, way to address the cumulative impacts of the oil and gas development in the San Juan Basin is to make the scope of the study match the scope of the activity that extends across the San Juan Basin. The cumulative impacts of air emissions, water discharges, pipeline requirements, wildlife impacts and any number of other actions simply cannot be disclosed and analyzed in several artificially segmented DEIS’s.

Memorandum of Understanding

The DEIS recognizes in two paragraphs that it has contracted with the Colorado Oil and Gas Conservation Commission “to conduct hearings and review BLM jurisdictional matters affecting Indian lands” and that any decision of the “COGCC that is not protested by the BLM is deemed to be a decision of the BLM.” DEIS at 1.5.2. Yet, despite Alliance requests and lawsuits, the BLM has committed resources and regularly makes these decisions without NEPA compliance.

Similarly alarming, none of the Memoranda of Understanding have been subjected to NEPA analysis for consideration of alternatives, disclosure of impacts, or public input. Mere mention of the MOUs in this document does not cure this serious defect. The MOUs must be subjected to full NEPA consideration and this programmatic NEPA process is the appropriate time and place to do so. Further, all activities that have been illegally contracted to the COGCC or which have been approved through the improper and illegal COGCC/BLM contracts must halt pending NEPA compliance.

The fact that at least five of the seven members of the COGCC have strong ties to production companies or actually draw paychecks from the oil and gas industry compound the lack of public involvement and disclosure that characterize the oil and gas program under review in this DEIS. Certainly, numerous trusts, whether owed to Indian Tribes, allottees, or the general public, have been breached by the illegal arrangements with an industry-dominated COGCC. The effective result is that federal responsibilities have been given over to the oil and gas industry itself under MOUs. Even if the BLM and BIA decisionmakers could properly enter into these MOUs, their actions must be first subjected to NEPA analysis.

Existing Rights, Agreements, and Necessary Agency Actions

The existing rights that are being analyzed in the DEIS are discussed in the general and the abstract. DEIS at 1.6. However, all of the existing rights under examination already contain a variety of leases and stipulations that must be disclosed before a full examination of impacts

and alternatives can be examined. The necessity for such an examination is consistent with the recent opinion that explains the effect of leases in relationship to Colorado common law and the statutory authority granted to COGCC and Colorado County governments. Of course, similar to the preemption arguments forwarded by the COGCC and industry groups in the state litigation, the general rule of law is that the federal authority preempts conflicting state laws. Without an articulation of the rights involved, a reasoned analysis cannot follow.

Alternatives

Reasonably Foreseeable Development Scenario

Neither Section 2.2 of the DEIS nor Appendix C provide a description of the Reasonably Foreseeable Development Scenario (RFD Scenario). RFDs form a central role in any federal oil and gas program. Instead of an RFD scenario, the DEIS relies upon vague references to “known resource conditions” that provide no evidence that the DEIS is based on sound data and information.

The DEIS states that due to “known resource conditions, such as production rates and water disposal issues” not every 320 acre spacing unit would require a second producing CBM well. DEIS at 2-6. Yet, these “known resource conditions” are not revealed in the DEIS and are not set out in a manner that delineates where well densities would be double and where they would not.

Absolutely no “known resource conditions” were discussed concerning conventional wells. For enhancement projects, the DEIS is based on an unsupported industry estimate. Little additional data was provided, except for a statement of “professional judgment.” DEIS at 2-6. The RFDs and the reasonableness of the alternatives that flow from them are not supported by data in this DEIS. The RFDs have the appearance of being industry wish lists, converted by the DEIS prepares into “alternatives.” The DEIS is fatally flawed because it lacks detailed description of the alternatives and the RFDs that the alternatives are based upon.

“No Action” Alternative Requires Examination of No New Wells and Facilities

The decision not to address a development moratorium reveals the lack of serious attention to the NEPA process by BLM and BIA when it comes to oil and gas development. The unsupported parade of horrible consequences reveal a biased approach to the NEPA process with more drilling as the predetermined outcome. DEIS at 2.3.1 The alternatives are based on an unsupported assumption that more drilling is needed, skipping entirely the real possibility that no further wells are needed to extract the conventional and CBM gas.

The BLM has concluded in other documents that the current intensity of wells is enough to recover all gas in place.

The infill well spacing of 160 acres will recover the gas over a 20 to 40 year period, whereas the 320 acre spacing would require 100+ years to recover the same amount of gas.

Attachment 1 (Section VI., excerpted from BLM Technical Analysis of Infill Drilling Interim Criteria, as provided to La Plata County by John Pecor on July 7, 2000). Thus, BLM has

documented the fact that more wells are not needed to recover the gas, but that the economics drives the number of wells. A commitment to develop mineral resources in an economic and environmentally sound manner must consider how well the current level of development will recover resources across a the heterogeneous geology of the region. A no action alternative must be included that discloses the very real possibility that unnecessary capital investment would cause inefficient production and may benefit some production participants at the expense of others.

If in fact the proposal for more wells is driven by economics, there needs to be a competent economic analysis that uses accepted methods to reveal whether it is economic to drill technically unnecessary wells. Uncontroverted expert testimony was provided to the Colorado Oil and Gas Commission that revealed the Commissioners relied strictly on industry's financial data to reach the conclusion that intensified drilling is supportable. The COGCC decision to allow more wells has not been opened to NEPA scrutiny until now. BLM's adoption of the COGCC decision cannot stand until the need for more wells has been fully disclosed and examined.

The DEIS's hyperbolic rejection of no further drilling alternatives is irrelevant to the need to consider the economic and environmental ramifications of a no action alternative that assumes no further drilling is necessary. DEIS at 2.3.1. Without full consideration of a "no action" alternative, this DEIS is nothing but an meaningless paperwork exercise.

Fruitland Formation Eighty-acre Well Density

The lack of analysis of eighty-acre spacing is equally flawed. DEIS at 2.3.4. The Alliance agrees that competent analyses will demonstrate that eighty-acre spacing is not practical or expected. Yet, industry representatives have publicly expressed its desire to move to eighty-acre spacings and the COGCC director has acknowledged that economics might make eighty-acre spacing attractive. In order to make the EIS a working document that informs decisionmakers and the public, the data and reasoning behind the conclusion that eighty-acre spacing is not practical or expected needs to be fully disclosed and support by data that demonstrates that unnecessary drilling is being driven by uneconomical and environmentally destructive accelerated production that will reap financial rewards to select development proponents.

Reasonable Range of Alternatives

The proposal to drill 350 additional wells cannot be used as the legally required "no-action alternative." The cagey description of the increase drilling alternative fails to reveal that CBM infill development has been ongoing since at least 1993 without NEPA analysis that considers cumulative impacts of 160 acre spacing. BLM has approved dozens of 160 acre-spaced CBM wells under cookie cutter EAs. The proposition that "current spacing will include some infill development as operators test the viability" can only be read as an intentional attempt to evade NEPA review that is provided fully in an EIS. DEIS at 2.4.1.

Current management direction was approved under a ten year old Environmental Assessment that did not consider or reveal many of the impacts of the oil and gas program, especially the fledgling coalbed methane technology. Since this is the first time that this program will be exposed to full public and interagency review required by NEPA, the details of

Alternative 1 must be disclosed fully in this DEIS without reliance on the 1990 EA.

The “viability and merits” of drilling more wells under Alternative 2 is based on “engineering studies” that are not revealed in the DEIS alternative discussion. DEIS 2.3.2. Again, increased production, recovery and “economic return to the lessor/royalty owner” are not based on supporting data in the DEIS. Further, it is quite possible that the conclusion of increased economic return to the lessor and royalty owner is not economically sound. But, there is no methodology and no data to review to assess the true economic implications of the proposal. It is quite likely that accelerated production will require unnecessary and unwise use and depletion of capital, labor, and natural resources. Yet, there is no analysis in the DEIS that addresses this central question regarding viability and merits of more drilling.

Alternative 3 improperly lumps the “injection of nitrogen, carbon dioxide, or other fluids into the Fruitland Formation” onto the increased drilling alternative presented in Alternative 2. The consequences and advantages of these enhancement methods must be revealed independently of the other two increased drilling alternatives. One cannot make a reasoned decision on this DEIS whether or not enhancement could be used in lieu of additional drilling. Further, it may be possible, but undeterminable on this DEIS, that some wells could be plugged and abandoned, rendered unnecessary by technological innovations. It could also be possible that these injection methods are so objectionable that they should not be used under any circumstances. Again, Alternative 3 was designed in a manner that prevents determination of these serious questions.

Alternative 3, in addition to being the agency preferred alternative, could be appropriately labeled “appropriate maximum impacts alternative.” Perhaps the most impacting alternative will eventually be chosen. But, NEPA requires development and presentation of a full range of alternatives. Perhaps when faced for the first time with a full range of choices laid out in a NEPA document, the relevant decisionmakers will no longer prefer the maximum impact alternative. This DEIS needs to be pulled back and reissued with a full range of alternatives for public and agency comment. A record of decision based on the range of alternatives and analysis in this DEIS does not meet the ordinarily high standards required of federal agencies.

The Alternatives Analysis Framework Reflects Flawed Alternatives

Several distinct activities are lumped together in the alternatives, preventing a reasoned analysis of the impacts of each activity. The following are among the distinct categories of activity that need distinct consideration:

- CBM wells in the Fruitland Formation
- Conventional gas wells in the Pictured Cliffs Formation
- Conventional gas wells in the Mesaverde Formation
- Conventional gas wells in the Dakota Formation
- Conventional gas wells in the Gallop Formation
- Other reasonably foreseeable conventional and non-conventional development

Further, the following are examples of alternative production techniques that have not been compared for efficacy or for the associated impacts:

Drilling More Wells Closer Together

Enhanced Production Techniques
Cavitation
Hydraulic Fracturing
Carbon Sequestration
Use of Industrial Exhausts as Sources of Carbon Dioxide
Recompletion
Directional Drilling
Low Profile Electric Pumps
Bioremediation Techniques

The impacts for the following categories of facilities that may be necessitated by expanded or accelerated production have not disclosed:

Additional dispersed treatment facilities
Additional field compression
Expansion and modification of central delivery points
Expansion and modification of central treatment facilities
Expansion and modification of central compression facilities.

Flawed Assumptions Render the DEIS Arbitrary and Capricious

In addition to the omission or disregard of important areas of analysis, the assumptions used throughout the DEIS are unreasonable, arbitrary and capricious. One needs only read the DEIS to understand that the analysis bears little relationship to known resource characteristics and likely development scenarios:

For analysis purposes in this EIS, potential conventional well development was considered to occur equally throughout the Conventional Well Area, **although it is likely that actual development sites would be concentrated** in areas with higher production potential and would be controlled by the spacing limitations of the targeted formation and field.

DEIS at 2-11. Further, the DEIS state that the “fairway probably already contains a sufficient number of CBM wells to efficiently drain the CBM spacing units there.” DEIS at 2-11. Even though these clear distinctions are made in the DEIS and other agency documentation, there is no alternative that reflects a distinct and identifiable reason to address a development scenario that includes no new drilling in many if not all areas.

It is unclear whether any development will be allowed in the fairway region, and if it is how “go/no-go” decisions will be decided at the APD level. The DEIS states that “for analysis purposes in this EIS, CBM well development was considered to occur in all three areas, but with a much lower rate of infill development in the fairway.” DEIS at 2-12. Map 3 has no green areas to reflect any development in the fairway. Yet, review of Map 4 shows no deviation in drilling intensity between the fairway and non-fairway areas. The DEIS itself suggests that this DEIS has little to no basis in fact or structured alternatives, but is an arbitrary and capricious attempt to satisfy NEPA requirements by producing a large stack of paper that is devoid of the disclosures and reasonable alternatives that lie at the heart of the NEPA process.

The impacts analysis is a similar exercise in paperwork, lacking informed on-the-ground analysis of the area. Instead of reasoned analysis based on observation and study, a statistical methodology was developed that treats development inside the town of Ignacio the same as the development in the more remote and less populated areas of the Reservation. More false assumptions ignore the well established premise that intensified development will not be uniform across the study area: “Under Alternative 1, the present 320-acre well spacing was used as the development window for evaluation of impacts, even though it is predicted that some of the 81 CBM wells developed under this alternative would be infill wells.” DEIS 2-13.

Appendix D provides no further real world support for the impacts methodology other than touting the power of geographical information systems (GIS) “to map, display and analyze impacts.” DEIS at D-1. The normal pad sizes, access road size and flowline requirements are completely unsupported and appear to be drawn from whole cloth. Nowhere is there an analysis of existing pads, best management practices, or enforceable mitigation measures that suggest the data fed into the powerful GIS system is reliable. Even the most powerful electronic gadgets are susceptible the old adage, “garbage in, garbage out” (GIGO). Perhaps these gadgets even invite improper use of computer reports instead of analysis that is substantiated by on-the-ground analysis. Federal land management agencies have historically shunned the former in favor of the latter.

The ability to make estimates of the specific areas that will be impacted is available through various sources, especially the locations provided by the COGCC orders that set the spacing and locations of wells. Of course, this NEPA Process must examine all aspects of the spacing, location and siting of wells. The spacing and location has been established with some certainty by the COGCC, but the federal agencies and the Tribe retain the power and discretion to alter these decisions based on the information provided in this NEPA Process. The only step that requires information that is not absolutely certain at the time this programmatic EIS is the exact “siting” of wells within the 20 acre drilling window.

This DEIS should be pulled and the assumptions matched against observations and enforceable management practices. Again, the maps that accompany the description of the assumptions are either absent or unreadable due to lack of readable legends. The DEIS should then be released again for public and agency comment.

The Alternatives are too Overlapping and Narrow to Allow Clear Comparisons

The Comparison of Alternatives bears out the problems with overlapping and unclear alternatives. The alternatives, as presented, are simply so confused that the DEIS fails to reveal the individual and cumulative impacts of any specific activity. The NEPA process is designed to provide analysis of a range of alternatives that aid understanding of the public and decisionmakers. Instead, the alternatives presented in this DEIS confuse and obfuscate the cause of the impacts due to the omission of no action alternative. The comparison of the impacts is done within a range three alternatives that provide varying levels of increased intensity of CBM, conventional gas, and enhanced production methods.

Astonishingly, nowhere in the EIS is the intensity of unconventional wells varied, all three alternatives, even the no-action alternative, assume development of 269 conventional wells. DEIS at Table 2-1, page 2-5. There can be no clearer example of a lack of adherence to the alternatives analysis that is required by NEPA. 40 CFR 1502.14. A new DEIS with a range of alternatives is needed that isolates each activity, varies the intensity, examines impacts, and

compares the impacts to each other and the no action alternative.

Further, there should be a range of “remedial alternatives” that looks past “no action” and reveals and considers methods that should be used to identify and remedy current problems. County advisor Warren Holland testified under oath to the COGCC that it may be necessary to plug and abandon some wells that are causing unacceptable impacts. The methods that have been or will be used to extinguish coal fires must be revealed and the impacts disclosed. These remedial actions are foreseeable and the impacts and range of available alternatives must be disclosed in this DEIS. If not, a full EIS may be necessary whenever remedial actions are required of lessees. This EIS is the proper time to examine alternatives to the current development program that is plagued by real problems.

Alternative stipulations, mitigation measures, and conditions of approval alternatives were not offered. Only the intensity of development was varied. Requiring conditions of approval or altering lease stipulations are the central methods for controlling the intensity of impacts. Yet the DEIS lacks examination of alternative methods to impose mitigation measures. 40 CFR 1502.14(f). Inclusion of these mitigation measures by reference in the alternatives analysis reflects the lack of serious consideration of adopting specific and binding mitigation measures. DEIS 2-73 to 2-75.

Instead, a mitigation strategy, including mitigation of cumulative impacts, is deferred to the APD stage. While this may be proper for some aspects of the mitigation measures, the agencies must recognize that deferring the consideration of all mitigation measures to the APD stage without specific consideration at this stage may require completion of full EISs at the APD stage. There will be no ability to tier to a broader EIS analysis of cumulative effect of various mitigation measures.

Disclosure of the cumulative and synergistic impacts of various mitigation measures that are necessary for widespread problems such as air and water pollution as well as habitat impacts require landscape level strategies that are not proper for analysis at the APD level. Subsequent delays and inefficiencies will result from delaying the inevitable full EIS on mitigation measures if these deficiencies are not resolved.

Affected Environment

The absence of serious Environmental Justice issues is consistent with the well-documented history of abuses that involve resources extraction on Indian Reservations. The DEIS must prepare a full analysis of the Environmental Justice issues that surround the SUIT oil and gas development.

In addition to the recognized minority populations, there is an abundance of low income people in the study area that independently trigger the requirement for an environmental justice analysis. The low-income analysis is separate and distinct from the analysis of minorities. Unfortunately, the single, cursory paragraph examination of environmental justice issues lumps low income and minority into the same category.

No disproportionate negative impact on Southern Ute Indian, Hispanic, or other low income communities is expected.

DEIS at 1.7 (emphasis added). Low income communities are quite common throughout the study area and the intensified oil and gas program threatens to diminish the wealth that is held in

the form or land and home ownership.

This “no impact conclusion” is also contrary to information provided in the socioeconomic section that clearly demonstrates that the non-White populations within the study area compose a higher proportion of the general population (19%) than in other areas of Colorado (5-10%) and more than La Plata County Generally (10%). DEIS at Table 3-33. The location of disposal facilities, processing plants, compressors, and other facilities must be analyzed to determine whether these types of facilities are being located in a manner that disproportionately affects non-White or low income communities in the study area.

Further, the study area was arbitrarily and capriciously expanded to examine employment statistics from a five-county area. DEIS at 3-136. This unsupported alteration in scope of the DEIS hides fact that oil and gas employers hire disproportionate numbers of people from outside the study area, particularly from New Mexico. Comparison of the expanded scope of the socioeconomic section and the minimized scope of the environmental impacts section reveals a thematic defect in the DEIS: manipulation of the scope of this NEPA Process to avoid and hide controversial issues.

The list of preparers does not reflect any expertise in carrying out an environmental justice analysis. Cultural resources, archeology and traditional economic analyses hardly substitute for persons experienced in carrying out the analysis of the current situation or impacts as they relate to the relatively new field of environmental justice.

A full analysis of the existing minority and low-income communities is required before a conclusion can be made on whether the impacts are disproportionate. No such analysis exists in this or any other NEPA document that the Alliance or OGAP is aware of.

Other descriptions are similarly flawed in both scope and detail. The threatened and endangered species descriptions in section 3.3.4.2 rely heavily on the Biological Assessment (BA) in Appendix F. However, Fish and Wildlife Service rejected the BA as being cursory and without adequate information. The lack of reliable and complete information in the description of TES species requires the DEIS to be taken back, completed, and released for comment.

The current location of wells is presented from 1996 data with a direction that readers obtain the current information from the COGCC. DEIS at 3-47. Approximately 160 wells have been drilled on Tribal land that are not represented on the map. Presenting five year old well location data in a DEIS is inexcusable when the BLM has such easy access to the raw data. It is not enough that the DEIS suggests a place where the information exists. It is the purpose of the NEPA process to present this type of central information about the existing program, not a program that existed five years before release of the DEIS.

The “confined aquifer theory” presented at DEIS 3-65 has been widely repudiated. It has been widely accepted that the Fruitland formation is in communication with other aquifers, particularly Pictured Cliffs. Further, fissures and other pathways create an interconnected subsurface aquifer with communication between the Fruitland and the surface likely in many places. The lack of formal evaluation of data concerning impacts on surface drainage and runoff patterns near the outcrop is an inexcusable neglect of an important controversy that has surrounded CBM production since its inception. DEIS at 3-66.

The groundwater contamination analysis continues to drag the red herring of biogenic and thermogenic gas sources as a determinant of the source of methane gas that has contaminated groundwater, drinking water wells and which has been documented to kill off vegetation by completely saturating the soil. DEIS 3-68. Contrary to the theory that biogenic origins suggest non Fruitland methane, “Data from the San Juan Basin in Colorado Provide the

best evidence for secondary biogenic gas generation.” Coalbed Methane, Scientific Environmental and Economic Evaluation, ed. Mastalerz, Kluwer Academic Publishers, 2000, page 95. “Secondary biogenic gases are generated after burial, coalification, and subsequent uplift and erosion along basin margins.” Id. Continued reliance on “biogenic” sources to scapegoat local residents for the methane contamination of their own water wells is capricious and must not continue in this DEIS.

Planned uses that were outlined in the Purposes and Needs section of the Final Environmental Impact Statement for the Animas La Plata must be revealed and analyzed in this DEIS. DEIS at 3-93. The purposes of the current reservoir proposal and the plans for increased drilling may conflict or at least require harmonization with the golf courses, residential developments and other activities put forward as the reason for building a dam in Ridges Basin.

Traffic levels are discussed in general background terms and as specific trip volumes by oil and gas activity. DEIS at 3.7. The separate methodologies provide the reader no way to understand the proportion of traffic that is directly related to oil and gas activities. Oil and gas traffic is one of the most controversial aspects of the program, yet the verbose and disjointed descriptions in the DEIS prevent the reader from understanding the amount of traffic generated by the oil and gas program in context of overall traffic levels.

The DEIS claims that because “this EIS is programmatic and specific impact zones are not identified at this time” and thus consultation under the National Historic Preservation Act will not be carried out. DEIS at 3-105. Both premises are arbitrary and capricious. First, the fact that this NEPA process is programmatic heightens the need for expert agencies (State Historic Preservation Officer, Federal Advisory Council on Historic Preservation, Ute Tribes, Other Tribal Governments) to be consulted regarding the direction of the program. Second, the likely location of wells have been identified within specificity of approximately 20 acre spacing windows through orders set out by the COGCC and subsequently adopted by the BLM and Tribe. To say that “impact zones are not identified” is simply false. In order to carry out a lawful NEPA Process, NHPA consultation must be conducted during this NEPA process.

Plain English is sacrificed in the section describing visual impacts. DEIS at 3.9. The description of the small structures provides an example: “The structures are subordinate to the characteristic landscape in foreground views (300 feet to 0.25 mile) and are unnoticeable to the casual observer in middleground (0.25 to 1 mile) and background (1 to 5 miles) views.” DEIS at 3-123. Description of larger structures is equally problematic: “Other solid geometric structures such as the meter house, pump jack, condensate tank, on-site water storage tank, and covered produced water pit also are prominent in immediate foreground views, but due to their solid mass they are still noticeable to the casual observer in foreground views.” DEIS at 3-123. Visual impacts are a controversial aspect of development that deserves careful attention in the DEIS. The visual impact of “solid geometric structures” can have a concrete result: severely damage home values. Much of the tourist economy of the area depends on scenic viewsheds. The DEIS must be rewritten in a form that the general public and decisionmakers can understand.

The scope of description of the effected environment in the socioeconomic section is limited to economic benefits of the proposed actions. Nowhere are socioeconomic costs of the production activities analyzed. The industry is notorious for touting tax revenues while downplaying impacts during public meetings. It is quite alarming that the DEIS takes the same tone.

The DEIS does identify that development causes unacceptable and illegal noise levels throughout the project area. DEIS at 3.11. The DEIS also recognizes that there is no reasoned

approach to the persistent problem of noise. DEIS at 3-163. However, the DEIS does not acknowledge that the residents hold quiet enjoyment in very high regard. The description of the current situation ignores the loud cries of people who once enjoyed a quiet rural landscape that is being invaded by a cacophony of industrial noises at industrial levels.

The description of hazardous and non-hazardous wastes cannot ignore disclosure and examination of the amounts and types of wastes simply because they are exempt from the Resource Conservation and Recovery Act. The Colorado State Office of the BLM has this information available from other NEPA documents prepared for other oil and gas activities, but for some reason, such detailed information was not included in this EIS. see Attachment 2 (OGAP Comments Submitted to EPA, incorporated in full and reasserted for these NEPA comments) There is no revelation that some companies experienced 145 spills in 2000 and expect over 100 spills in 2001. Other spills and releases that are part of doing business also need to be described in a revised DEIS that is released for public comment.

Pipeline safety is a serious consideration that is not given appropriate attention. The discussion of the legal requirements is helpful. However, the section does not describe the location of existing pipelines, especially in relation to houses. DEIS at 3.11. Describing the existing pipelines infrastructure is a critical feature of the NEPA Process that requires a new DEIS be released for public comment.

The serious issues of gas seeping from the surface and the underground coal fires are glossed over. No mention is made of the need to buy people's homes and tear them down due to gas seeps. These two categories of impacts are serious, controversial, and deserve disclosure and analysis in a new DEIS. It is not enough to simply state: "The SUIIT is currently evaluating the characteristics of the fires and options for extinguishing them. County emergency response personnel also have been notified of the locations of the fires." DEIS at 3-174. The characteristics of these fires and the alternatives must be disclosed in this NEPA process.

This NEPA Process cannot be completed with a DEIS that explains away known impacts through a pattern of unproven historical anecdotes, active neglect, and incomplete studies. Real analysis and thorough disclosure of current problems must take place before this NEPA Process is completed and especially before the program is expanded.

Environmental Consequences

The impacts analysis is seriously flawed in both structure and scope. These flaws flow directly from the inadequate range of analysis. However, the inadequacies are compounded by inexplicable deletions of important analyses of even those alternatives that are presented. This is most evident in the cumulative impacts analysis which fails to examine the impacts of Alternatives 1 and 2.

Cumulative Impacts Analysis

There is no cumulative impacts analysis for Alternatives 1 and 2.

Alternative 1 and 2 were not specifically analyzed

DEIS at 4-6. Instead,

Cumulative impacts, which **consider the Agency-and-Tribal-Preferred Alternative in conjunction with other significant future developments** in and near the Study Area, including oil and gas development projects, are summarized **for each environmental resource**.

DEIS at 4-1 (emphasis added). In contrast, the NEPA regulations require the EIS to provide

discussions of the environmental effects of alternatives including the proposed action. The comparisons under [the alternatives section] will be based on this discussion.

40 CFR 1502.15(d)(emphasis added). Instead, the DEIS only provides discussion of the proposed action, leaving no possibility for comparison of cumulative impacts across alternatives.

What little cumulative impacts analysis that is provided is cursory, encyclopedic and provides little information. The severance of the cumulative impacts analysis from the resource-based comparison of alternatives renders the analysis inaccessible to most readers and makes both analyses incomplete and for purposes of NEPA. The Air Quality section (DEIS at 4.2) does include a cumulative impacts analysis as part of the assessment of the resource, but unfortunately it is also limited to the preferred alternative.

The complete absence of cumulative effects analysis of two of the three alternatives makes very clear that the DEIS has been reduced to a mere paperwork exercise, designed to rationalize and support the preferred alternative. Compounding the problem, the DEIS lacks analysis of indirect effects. 40CFR 1508.8(b). Despite the identification of numerous significant cumulative impacts (DEIS at 4-280), there is no way for the public or decisionmakers to base a reasoned decision on a comparison of the level of impacts across alternatives. The “hard look” required by NEPA is simply absent.

These comments continue by providing resource-specific comments that correspond to the resource categories used in Chapter 3.

1. **Climate & Air Quality**

Comparison of alternatives cannot be accomplished by simply stating the impacts of the preferred alternatives and concluding the other alternatives “would be less.” These are the climate and air quality impacts analyses, in toto for alternatives 1 and 2:

4.2.3 Alternative 1 - Continuation of Present Management

Potential air quality impacts would be less than those described in Section 4.2.5 Alternative 3 -Enhanced Coalbed Methane Recovery below.

4.2.4 Alternative 2 - Coalbed Methane Infill Development

Potential air quality impacts would be less than those described in Section 4.2.5 Alternative 3 -Enhanced Coalbed Methane Recovery below.

DEIS at 4-9. The comparison of impacts needs to be made across alternatives to meet even the basic requirements of NEPA.

Mitigation measures were avoided and delayed under the premise that “the appropriate level of control would be determined and required by the applicable air quality regulatory agencies during the preconstruction permit process.” DEIS at 4-22. Unfortunately, many of the facilities considered in the DEIS do not require permitting by any air quality regulatory agency. Similarly, monitoring requirements are absent and the DEIS incorporates statements that “[t]he **Bureau could continue to cooperate** with existing visibility and atmospheric deposition impact monitoring programs” and that “[b]ased upon future recommendations, **operators could be required to cooperate** in the implementation of a coordinated air quality monitoring program.” DEIS at 4-25. These statements simply defer the decision to later dates.

If the DEIS and ROD adopt the limited analysis provided here, each APD will thus be required to examine the cumulative impacts of the oil and gas program, perhaps requiring a full EIS for each APD. The tiering concept should be used to make permitting more efficient by adopting appropriate emission mitigation measures with the ability to show need to deviate at the APD stage.

These other aspects must also be considered in a new DEIS:

- a. What is the cumulative effect of CBM development on pre-drilling air quality?
- b. How much and what percent of the legally allowable emissions does the CBM development create in the area?
- c. Identify and quantify the unregulated substances the proposed wells would release into the air.
- d. To what extent would the proposed CBM development preclude future emissions by other sources?
- e. What is the cumulative impact of CBM emissions on nearby residents?
- f. How long do the air quality impacts remain after each impacting phase of production?

2. **Vegetation and Wetlands**

The narrative description of impacts fails to give details on amounts and locations of specific problems associated with noxious weeds and wetlands. But contrary to statements in other parts of the DEIS, the analysis in this section was “[b]ased on estimates of likely locations of wells and right-of-way construction, direct impacts from surface disturbances on vegetation types of the Study Area. . .” DEIS at 4-32. There is no description of how these “likely locations” were located, but it reveals that an inconsistent approach, at best, was used in other parts of the DEIS. The result is that most activities are inappropriately shielded from proper scrutiny.

Like other mitigation measures, those presented for vegetation are generic, lack analysis for efficacy, and are not imposed as requirements. Other issues that need to be addressed include:

- a. What has been and what will be the cumulative impact of CBM development on the quantity and severity of noxious and nuisance weeds?
- b. Vegetation has been killed by methane seeps and related effects such as saturated and heated soils. What are the current impacts and the predicted impact of reasonably foreseeable CBM development scenarios.
- c. What impacts to vegetation from emissions and discharges from each phase of

- production (including illegal dumping of wastes) have occurred.
- d. What level of cumulative impacts can be reasonably anticipated to occur across the various development scenarios.

3. **Hazardous Substances**

- a. Please reveal and analyze the cumulative effects of the “Hazardous” and “Extremely Hazardous” federally controlled substances that are being used and produced in coalbed methane production in rural-residential areas.
- b. What quantities of listed controlled substances and other carcinogens have been and will be released by coalbed methane development -- per well drilled, per year and cumulatively -- in order to drain the formation to the expected total recovery.
- c. At 160 acre spacing, what will be the cancer risk and cumulative exposure levels of people and animals to carcinogenic emissions from -- 1) well drilling/completion; 2) well operations including compressors, and 3) well maintenance?
- d. The hazardous substances at issue include, but should not be limited to, the following hazardous substances that have been confirmed as potentially utilized or produced during construction, drilling, production, and reclamation operations (Extremely hazardous Substances are bolded):

1,1,1-trichloroethane, 4-4 methylene, 1,2,4-trimethylbenzene, Acetone, Acrylamide, Aluminum, Aluminum Oxide, Ammonium bisulfate, Ammonium hydroxide, Ammonium nitrate, Ammonium persulfate, Ammonium sulfate, Arsenic, Barium, Basic zinc carbonate, Benzene, Cadmium, Calcium hydroxide, Carbon disulfide, Carbontetrachloride Chromium, Coal Tar Pitch, Copper, Cumene, Cyclohexene ethylbenzene, Dianiline, Diathonolamine, Dodecylbenzenesulfonic acid, Ethylene diamine tetra, Glycol ethers, formaldehyde, Isobutyl alcohol, Lead, Manganese, Mercury, Methanol, Methyl ethyl ketone, Methyl ter-butyl ether, Nitrogen Dioxide, Nitroloriacetic acid, n-hexane, Napthalene, Nickel, Ozone, PAHs(polynuclear aromatic hydrocarbons), POM (Polycyclic organic matter), Potassium hydroxide, Propylene Radium 226, Selenium, Sodium Hydroxide, Sodium nitrate, Sulfur dioxide, Sulfur trioxide, Tetraethyl lead, Toluene, Uranium, VOC, xylene (m-, o-, & p-), Zinc, Zirconium nitrate, Zirconium sulfate, benzene formaldehyde.

see: Glenwood Springs Resource Area Oil and Gas Leasing DSEIS, June, 1998 Addendum at 15-23; and at L-3.

- e. Please disclose the amount of each chemical that is released during each cavitation and during each type of hydraulic fracturing.
- f. Please analyze the chemical sensitivity risks, toxic exposure risks and cancer risks for each of the following groups of residents: adult residents who work outside the home, adult residents who work at home, children who attend school outside the home, children who do not attend school outside the home, and workers who spend at least eight hours a day working on and around wells.

4. **Wildlife and Fisheries**

The incomplete analysis that characterizes this DEIS includes disclosure of effects on wildlife. The central feature of coalbed methane production is the removal and disposal of enormous quantities of water from the Fruitland Formation. Yet, the DEIS reveals that:

The removal of water from the Fruitland Formation could affect some wildlife, particularly if wooded riparian areas are impacted. At this time, **there have been no specific studies of the impact of moving Fruitland Formation water to the Mesa Verde Group** and other places, but have not been formally studied and so cannot be estimated at this time. (sic)

DEIS at 4-42. The lack of study of the impacts to wildlife caused by this central feature of coalbed methane development must be revealed and released in a new DEIS.

Tables 4-9, 4-11 and 4-13 reveal how much impacts will result from the three alternatives. The comparisons are useful in that it reveals that the difference in disturbed acreage between courses of action. For example, Alternative 1 will “disturb” as much as 12.9% of the winter concentration areas while Alternative 3 will disturb a full 33.29% of the elk winter concentration area within the study area. This analysis does lack a comparison to a true “no action” alternative that reveals the amount of impact that would result from continued production from existing wells. Such a comparison is made in Table 4-52, but as described below, the data is not reliable and the source and description of the data is inadequate or omitted from the discussion.

However, the insertion of numbers related to regional range without an analysis of percent impacted distorts the analysis presented in the elk and deer tables. The regional range numbers form an important component of a cumulative impact analysis that reveals how much of the regional summering and wintering areas are already impacted by oil and gas and other activities. Unfortunately, they are presented out of context in a manner that minimizes the level of impacts on elk and deer habitat by oil and gas and other activities throughout the region. The arbitrary inclusion of total habitat in the area must be accompanied by an analysis of the level of current and reasonably foreseeable impacts for the regional habitat.

Again, the Elk and Deer analysis is based upon estimates of likely locations of proposed well pads, roads and pipelines.” DEIS at 4-42. These types of estimates need to be refined and based on better data, but their use here shows that it is not necessary to apply study area-wide assumptions that ignore the actual situation.

The reasonable range of mitigation measures for wildlife have never been fully revealed in a NEPA document that has met public scrutiny. This DEIS cannot rely upon a decade old Environmental Assessment that federal agencies acknowledge is insufficient and out of date.

In addition to analysis of the effects on elk and deer habitat, the following issues need to be addressed:

- a. Address the issue of habitat fragmentation from doubling the number of wells, well pads, and access roads for wildlife (game and non-game) species.
- b. How many additional elk will die in: a mild winter, an average winter, a severe winter? This question is based on the statement that “level of disturbance plays a critical role in over winter survival for elk and deer?” DEIS 4-43

- c. How will the stability and size of the regional elk herd be impacted by denser conventional gas and CBM development?
- d. How will the stability and size of the regional deer herd be impacted by denser conventional gas and CBM development?
- e. How will the migratory bird species that use the study area be impacted by denser conventional gas and CBM development?
- f. Describe how this NEPA process satisfies requirements of the Migratory Bird Treaty Act and if it does not, please release a new DEIS that does.
- g. Describe the cumulative effects of dispersed industrial development of CBM on the various ecosystem types.
- h. What are the cumulative impacts of CBM development on the interrelationship and interdependence among ecosystem types.

5. **Threatened and Endangered Species**

The DEIS indicates that “[t]he BLM is engaged in formal consultation with the USFWS regarding potential impacts from oil and gas development activities on the Reservation.” DEIS at 4-44. The DEIS does properly recognize consultation is required at both the programmatic and the site specific levels. DEIS at 4-61. However, the BA that was published in this DEIS was returned to BLM because it lacked the information required for FWS to begin consultation. Similarly, the BLM should withdraw this DEIS and present the public with a complete, useful and legal DEIS.

The data presented in Table 4-52 that analyzes disturbance to biological resources is not compatible with the numbers presented in Table 4-8 through Table 4-13 that discuss impacts on deer and elk habitat. While the numbers cannot be reconciled based on information in the DEIS, it becomes apparent that the impacts on Bald Eagle habitat has been grossly underestimated by reliance on acreage data that approximate vegetative removal numbers and not actual impacts to the species and its use of habitat. Tables 4-14 through 4-16 also presents an analysis that is based upon denuded acreage, not the actual area impacted by the activity.

The analysis of cumulative impacts to biological resources and TES species must extend past an analysis of those areas that will be denuded by oil and gas development. It must extend to those areas affected by oil and gas development as is properly done in Tables 4-9, 4-11 and 4-13. Anything less avoids disclosure of impacts. In the NEPA context this is not allowed. In the context of the Endangered Species Act, such omissions could result in illegal harm to protected animals or fish.

The “significance” criteria for TES species would allow various forms of illegal “take” to occur without a finding of significance in this DEIS. By definition, section 9 of the ESA prohibits “take” of a species. By not complying with the section 7 duty to consult, the agencies are also violating section 9’s “take” prohibition. Under section 9 of the ESA, it is unlawful for anyone to “take” a threatened or endangered species of fish or wildlife. 16 U.S.C. § 1538(a)(1)(B) & (G). Congress broadly defined “take” in the ESA to mean “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.” 16 U.S.C. § 1532(19). The term “harm” is further defined to include “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.” 50 C.F.R. § 17.3; Babbitt v. Sweet Home Chapter of Communities for a Greater Oregon, 515 U.S. 687, 706 (1995). This prohibition extends to threatened species as

well. 16 U.S.C. § 1538(a)(1)(G); 50 C.F.R. § 17.31(a). Courts have held that future injury to a protected species constitutes "take." An imminent threat of harm to a listed species is a violation of section 9 of the ESA. Yet, the DEIS only characterizes a direct loss of individuals or critical habitat as significant.

In response to a recent FOIA request, the BLM revealed that no section 7 consultation has been prepared for the San Juan Resource Area's coalbed methane program. Attachment 3 at page 3, #8. (BLM Response to Alliance FOIA Request). It is quite likely that "take" has been committed by employees in the Durango BLM Office by knowingly issuing permits that have not been subject to ESA consultation requirements, permits which likely result in section 9 "take" of protected species.

The question of whether or not any responsible persons will be held civilly or criminally liable for ESA violations is beyond the scope of this DEIS. However, the questions of whether issuance of illegal permits will cease and whether the oil and gas program will comply with the ESA are appropriate questions. Based on the following statement in the DEIS, it appears that the oil and gas program will continue to violate the Endangered Species Act:

Current BIA and Tribal standard conditions of approval are designed to protect federal threatened and endangered species by not allowing actions that would result in a "jeopardy opinion" under Section 7 of the ESA.

DEIS at 4-76. Designing conditions of approval to avoid a "jeopardy opinion" is not enough.

Once the FWS lists a species as threatened or endangered, all federal agencies have an **affirmative duty to carry out programs for the recovery** of those listed species. Section 7(a)(1) provides in relevant part:

[A]ll other federal agencies shall in consultation with and with the assistance of the Secretary, utilize their authorities in the furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 1533 of this title.

16 U.S.C. § 1536(a)(1)(emphasis added). Through the ESA, Congress intended to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved [and] to provide a program for the conservation of such endangered species and threatened species." 16 U.S.C. § 1531(b). The ESA defines "conservation" as "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary." 16 U.S.C. § 1532(3); Carson-Truckee Water Conservancy Dist. v. Clark, 741 F.2d 257, 261-62 & n. 3 (9th Cir. 1984). Because the DEIS is void of evidence of any attempt to fashion approvals and actions to promote conservation or recovery efforts, the oil and gas program under scrutiny in this DEIS also violates section 7(a)(1) of the ESA.

The following questions related to TES must be addressed:

- a. What is the cumulative impact of: a) selenium levels, including selenium contributed by road dust and erosion; and 2) each of other hazardous substances emitted or discharged.
- b. FWS has documented that heightened selenium levels have caused cross-beak

- birth defects in southwestern willow flycatchers in Colorado. Have these impacts been researched here?
- c. Southwestern willow flycatchers have been documented in the study area, but the DEIS does not reveal this information. The lack of revelation must be corrected and full surveys must be conducted.
 - d. How are to the endangered and threatened fish, mammal and bird species that depend on the riverine habitats downstream from CBM development impacted, 1) by water use, 2) by increased water pollution?
 - e. What steps are being taken to recognize and avoid impact impacts due to instream depletions? Are any of these steps mandated?
 - f. Describe how CBM development can aggravate the condition of the local species and those downstream that have been identified as struggling or at risk of requiring protections provided by listing as threatened or endangered.
 - g. What is the impact on known and potential southwestern willow flycatcher and eagle roosts, habitat, breeding, and nesting sites from die-off of cottonwood-willow riparian habitat that is directly and indirectly caused by oil and gas development.
 - h. Will the responsible agencies consult with the Fish and Wildlife Service to ensure that the decision on the application is consistent with the Endangered Species Act, especially sections 7 and 9?

6. **Geology and Minerals**

The time frame of the study does not match the time frame of the program. Table 4-17 reveals the amount of gas that will be produced during the next 20 years. This arbitrary cutoff ignores the fact that once drilled, wells are expected to be in place for 30-40 years at which time, the wells will presumably be abandoned, plugged and the area fully reclaimed. The analysis of the impacts on geology and minerals requires that the DEIS disclose the amount of gas production over the full life of the project. The failure to include this data renders the analysis in the DEIS arbitrary. Since the BLM knows that no additional gas will be recovered, only that recovery time will be accelerated (Attachment 1) the preparation of this section appears openly capricious, designed to justify decisions already made to intensify and accelerate production without full disclosure of the consequences.

This DEIS fails to seriously address hydrogen sulfide potential by merely suggesting that a monitoring program will be put in place. DEIS at 4-79. Hydrogen sulfide is a deadly gas, one of the most deadly gases associated with oil and gas development. An analysis of all injuries and deaths that have been associated with hydrogen sulfide must also be included. The extent of hydrogen sulfide seeps that have been documented, that are suspected, or that are reasonable foreseeable must be presented in a new DEIS that is then released for public comment.

Loss of coal resources has been documented from underground coal fires that the Southern Ute Tribe has been unable to extinguish. cursory mention of data from 1995 and revelation that for three new fires, “no estimates have been made of the extent of the fires,” are not a sufficiently serious examination of a serious problem. DEIS at 4-81. The statement that the “Tribe is working with a consultant to put out the fires” DEIS at 4-81 is simply not sufficient and contradicts public statement that the Tribe’s actual efforts to put out the fires have been unsuccessful and have been halted.

The lack of study and information presented in the DEIS is contrary to the fact that these coal fires have been a serious concern for years. The cause of the fires have also been “under investigation” for years. The lack of completed studies is indicative of the experimental nature of coalbed methane development. Without completed studies on serious geological problems, expansion at this time is simply irresponsible and uninformed. NEPA may not prohibit irresponsible decisions, but uninformed decisionmaking is exactly what the current NEPA process must eliminate. Dependence on the industry-conducted 3-M project does not provide the independent analysis that is required under NEPA. The DEIS’s heavy reliance on the industry-conducted 3-M Study also runs afoul of the NEPA contracting regulations. 40 CFR1506.5(c).

- a. The Speed of Depletion is a crucial economic consideration that must be studied and revealed :
 - i. What are the economic benefits of delaying recovery in light of likely future hydrocarbon fuels shortages that will likely increase prices of CBM over the next 50 years of expected natural gas supply availability?
 - ii. Describe the full production projections of the program especially the time expected to reach abandonment pressures and the amount of gas that will be recovered under each alternative and a new “no more wells” alternative.
 - iii. By how much will accelerated removal of water from the coalbeds cause poorly understood sub-surface ecosystem changes.
 - iv. How will accelerated desorption and migration of methane gas from the coal impact the amount of gas ultimately recoverable from the coal seam.
 - v. What subsurface ecosystem changes will occur in each geological formation due to CBM development?

7. Soils

As with many of the other impacts, deferral of full NEPA study until the APD stage should be anticipated to result in full and careful on-site examination of soil type and impacts. Supplemental programmatic EISs will be required from time to time as such data collection reveal cumulative impacts that are were not subjected to full NEPA analysis in this document. Such foreseeable future delays could be avoided at this stage by doing the required soils field work and analysis in a new programmatic DEIS that is released for public comment.

For those fortunate few that were provided with maps, Map 14 does clearly display that the areas of high to severe erosion potential are distributed widely throughout the study area and that this information is not conveyed in the text on 4-88. The heavy concentrations in the southwest corner, and especially surrounding the Animas River near Bondad are of critical concern due to the increase in disturbed soil and contaminated soil runoff into the Animas River.

The DEIS does not compare impacts to soil that result from various alternative mitigation that reduce the amount of disturbed soil. These measures include requiring standards and guidelines that address: 1) minimum ground disturbance; 2) the maximum interim reclamation; 3) construction methods; 4) reclamation methods, and 5) other measures designed to protect and conserve soils in the area. No impacts are anticipated based on “ an approved reclamation plan” but the DEIS does not disclose what such a plan would look like. DEIS at 4-92.

The use of an unsupported 5% urban development loss for prime farmland from other

portions of Colorado as a significance trigger is arbitrary. DEIS at 4-95. The industry has often compared its impacts to urban sprawl as a political tactic. The use of such a comparison in a rural area has no demonstrated use and appears to be taken directly from the industry's lobbying messages.

In addition to the concerns that received a glance instead of the required "hard look" the following soil and agricultural impacts need to be addressed in a new DEIS that is released for public scrutiny:

- a. Describe likely and proven causes of known methane-saturated soil and the long term cumulative effect on affected soils of various levels of methane (and other CBM substance) contamination.
- b. What amount of topsoil will be contaminated by production related activities?
- c. How will irrigated soils downstream from CBM production be affected by CBM wastes that are released to the air and water and find their way back into the irrigation water supply?
- d. Since there is a history of illegal dumping, what are the residual impacts of past and foreseeable legal and illegal dumping and releases.
- e. What is the quantity of topsoil that has been and that will be lost to erosion related to construction and 50 years of operations of well pads, roads and other related oil and gas activities?
- f. What additional mitigation measures that will be required for areas of high and severe erosion that were identified in the DEIS?
- g. Estimate the number of acres that have been and will be impacted or will be removed from livestock grazing, other agricultural uses, and gardening uses due to well pads, roads, methane saturated soils, and other aspects of infill drilling.
- h. How many acres of federal public lands would the wells being considered in the application denude?
- i. Organic farming, personal use gardening, and production for local distribution through farmers markets is ongoing and is growing importance in the local area. Describe the effect of CBM production on the availability of lands for use in household gardens and commercial production of certified organic foods.

8. **Water**

The cursory discussion of impacts of hydraulic fracturing are without any support or data. (DEIS at 4-98). The single paragraph that discusses the impacts of hydrofracturing downplay the serious and often undisclosed nature of fracturing fluids. The BLM has released a summary of materials used during fracturing processes. See Attachment 2. Further, like most other processes, many different alternative fracturing packages exist. Halliburton, one of the most prolific fracing companies provides a range of "products" some of which are touted to reduce environmental impacts. According to Halliburton:

Data used to determine the appropriate fluid system includes:

- Friction pressure determination of the various fluid systems
- Fluid rheology at a variety of temperatures
- Conductivity for the various fluid systems

- Compatibility of the fluid with the formation
- Compatibility of the fluid with the components
- Environmental properties of the fluid systems
- Gel break properties and conditions

Attachment 4 (Halliburton Web Document). No such data, nor even the mention that this type of data may be important, is included in the DEIS. It is quite likely that the responsible federal agencies have never given the hydraulic fracturing process a “hard look.”

The Halliburton advertisement confirms that the range of materials that may be included in the fracturing fluids is extensive. The online Halliburton ad describes the “complete line of fluid system additives for use during fracturing. . .” see Attachment 4 at page 3. Although one of the leading industry providers of field services touts the need to analyze a wide range of alternatives depending on system used and formation encountered, the DEIS contains no examination of the industry-professed range of alternatives, although such impacts analysis is required by law. A new DEIS must be released for comment that discloses and analyzes the range of alternatives and impacts that area associated with hydraulic fracturing.

Similarly, the disclosure of impacts related to cavitation is lacking and even absent. The lack of real disclosure and analysis is evinced by the attachment of an addendum from a New Mexico Environmental Assessment concerning cavitation at Appendix O. Such summary revelation does not satisfy the “hard look” required by NEPA.

There has been some indication that field service operators are pursuing a hybrid between hydraulic fracturing and cavitation. If this is occurring, it must be revealed in this NEPA process.

The DEIS simultaneously describes and downplays the possibility that water will be impacted by poorly designed wells, poorly completed cement jobs, mechanically unsound wells, old wells, and poorly constructed cathodic protection wells. DEIS at 4-98,99 The descriptions of the foreseeable problems and the severity of impacts, should they occur, is not revealed. Instead, the DEIS hides the type and intensity of potential problems behind a veil of bureaucratic doublespeak: “However, as impact would occur only if the governing regulators (federal agencies or COGCC) failed to protect the resource, the impact is not quantifiable.” DEIS at 4-99. The federal agencies simply cannot move forward under the arbitrary and capricious presumption that underfunded and understaffed agencies will somehow “protect the resource.” This is especially serious since the COGCC has moved resources from inspection and enforcement and toward permitting and drilling workloads. Attachment 5 (Excerpt of COGCC Monthly Report). The NEPA process is designed to force agencies to reveal the activities and impacts that are being proposed. This DEIS does not reveal such impacts.

Industry representatives have testified under oath before the COGCC that disposal of produced water from additional wells will outstrip current injection well capacity. This directly contradicts the statement in the DEIS at 4-101 that no new disposal wells will be needed. It also ignores the fact that industry continues to apply for new disposal wells on fee lands.

No mention is made that water disposed in the Simon Land and Cattle disposal well has been shown to cause water seeps at the Hickerson Hot Springs. This serious problem of disposed water causing formation water to surface nine miles away in the Animas Valley must be revealed and considered.

Further, EPA has brought enforcement actions against operators for overpressurizing and overfilling disposal wells in the region. The environmental consequences of overfilling and

overpressurizing must be revealed. One problem of overpressurization is that additional fractures may be created by disposal wells. It is quite possible that the theoretical disposal characteristics simply do not exist or have been altered by 15 years of experimental and sometimes illegal operations.

Abandonment may present “little potential” for contamination, but it is the purpose of the DEIS to describe such potential and the impacts involved. DEIS at 4-108. Similarly, the comparison of alternatives does little to reveal differential impacts of drilling additional wells. The DEIS merely states that “it is assumed that the potential impact on groundwater resources would be slightly greater than under Alternative 1.” DEIS at 4-108. The DEIS must reveal, not assume, the differences in impacts across alternatives.

The analysis of nitrogen and carbon dioxide injection does recognize that fracturing is a possibility, DEIS at 4-109, yet the DEIS does not reveal how injection pressures will be regulated or monitored to ensure that these injection processes will not result in undesired formation and near-formation fracturing.

The impacts summary relies upon personal communications for measurable data and on 3M model runs that were expected to be carried out in 2000, before the release of the DEIS. For example, the basis for the Janowaick calculations, not personal communications with the authors, must be revealed in the DEIS so that the basis for the assumptions and analyses can be understood and examined if necessary. DEIS at 4-111.

The mitigation measures for water do include some measurable detail, but since the impacts analysis lacks any such detail, it is impossible to determine the sufficiency of the mitigation measures. Again, there is no indication whether and when these mitigation measures would be implemented.

These or issues related to groundwater have not been addressed in the DEIS and require specific attention:

- a. Reveal and analyze the independent reservoir engineering studies that support the industry and agency conclusions that each formations' capacity to accept additional produced water had been/would be exceeded.
- b. Describe the depletion/recharge dynamics for the coal formation over a time-frame that includes full groundwater recharge after CBM development is completed.

9. **Surface Water**

Stormwater discharges from well pads and roads are identified as “potential impacts” but the type and intensity of these “potential impacts” are not disclosed. EIS at 4-117-118. The sedimentation and contamination of rivers and streams is a major problem that requires serious scrutiny.

Amounts of water use are examined in some detail, but the DEIS does not delve into the associated impacts on area fish and wildlife, irrigation users, and area water bodies. The DEIS only characterizes the uses as small “relative to perennial stream flow in the basin.” DEIS at 4-119. The localized and cumulative impacts of water use according to actual current sources and relative to actual impacts must be revealed. Foreseeable sources and impacts must also be included in a DEIS that meets NEPA requirements.

Evaporation ponds are identified as a method for disposing of produced water, but there

is no analysis of the impacts that result from evaporating water that is not clean enough for direct disposal. DEIS at 4-121. What contaminants are released during evaporation process that disposes water into the air where that water is too contaminated for direct stream disposal? What becomes of the contaminants that evaporate with the water? What is eventually done with the contaminants that remain in the evaporation pit?

Further, these following issues and questions need to be addressed:

- a. Quantify the increased sediment and chemical runoff for all aspects of production including the effects of pits, produced water, run-off from pads, erosion due to roads, and vegetation impacts.
- b. What amount of what pollutants does CBM contribute to the downstream river systems?
- c. What effects do the pollutants created by CBM production and operations have on the quality of surface waters?
- d. Have any CBM operator violations in the United States resulted in diminished water quality? If so, please describe the incidents.
- e. Are the state and federal enforcement mechanisms sufficient to prevent, discover and prosecute illegal activities related to increased well densities?
- f. Are there any unpublished studies, especially any studies done by the Bureau of Land Management, that suggest that river flows may be affected by dewatering the formation?
- g. How are the Animas, Florida, Pine, Piedra, La Plata, and San Juan Rivers being affected by oil and gas operations?
- h. What are the “best management practices” that will protect surface water quality and quantity?

10. **Drinking Water**

In addition to the passing mention of drinking water in the ground water and surface water analysis, the impacts to drinking water need to be analyzed separately and distinctly. Such analysis must consider the following:

- a. What are the results of monitoring/tracking water quality trending in known contaminated drinking water wells?
- b. Describe the dynamics of groundwater recharge on drinking water quantity and quality, (esp. when depleted by CBM development), for each geologic formation commonly used for domestic water by residents.
- c. Describe those aquifers that are currently draining into the Fruitland Formation.

11. **Land Use and Ownership**

In contrast to other analyses that provide general statements with no quantification, the analyses of land impacts relies almost entirely on numbers with no general or specific analysis of impacts. And, similar to some of the analyses of wildlife, the impacts are limited to those areas that are denuded or occupied by oil and gas operations. This section provides little to no information for the public and the decisionmakers to understand the impacts of the various alternatives. The following must be addressed and open for public comment during this NEPA process:

- a. In what manner will the industrial character of oil and gas development change

- the rural quality of life in the project area?
- b. What are the specific impacts on rural quality of life that are unavoidable? DEIS 4-158.
 - c. What is the cumulative effect on real estate prices in areas where CBM wells have been drilled? Please examine using sensitivity analyses that include distance from well, visibility, amount of vegetation, and noise barriers among other factors.
 - d. What are the cumulative effects on real estate prices in areas subject to CBM development due to stigmatization of rural communities as dispersed industrial zones where surface owners have little legal or regulatory protection?
 - e. Using accepted economic methods, please disclose the whether increased well densities are economic in relation to land use impacts and environmental damage.
 - f. Please disclose all economic impacts of increased well drilling.

12. **Recreation**

The economy of the region is heavily dependent on tourism. Local residents identify recreation as one of the most attractive aspects of living in the area. The fact that no designated recreation area will be drilled does not reveal the type and intensity of impacts. The impacts on the following aspects of recreation must be addressed:

- a. What are the direct and cumulative impacts of all reasonable alternatives on the types of recreation engaged in by residents?
- b. What are the direct and cumulative impacts of all reasonable alternatives on visitor recreation, including economic impacts?
- c. What are the direct and cumulative impacts of all reasonable alternatives on development on hunting and fishing?

13. **Transportation**

The transportation analysis is of little to no practical value because it assumes increased traffic will occur evenly throughout the study area and the study period. As discussed in other portions of the DEIS, the area is not homogeneous, but ranges from dirt roads with low maintenance standards to paved United States highways. Impacts that are negligible on US Route 550 can be devastating when they occur on a single stretch of dirt road. There is no disclosure of the serious impacts faced by the Town of Ignacio caused by a heavy concentration of oil and gas traffic through the middle of town.

Even though the DEIS anticipates that some of the bridges will not accommodate the overweight drilling units, neither the weight of such drilling rigs nor the location of such bridges are disclosed. DEIS at 4-162. Such foreseeable impacts must be revealed in this NEPA process.

The reliance on numbers and statistics conceal the qualitative impacts on people and the area roads. The public and decisionmakers must be informed of both the actual impacts and the scope of the impacts. A mix of numbers and narrative is essential to full disclosure. The transportation section is a good example of where this DEIS uses one at the exclusion of the other, resulting in dozens of pages of uninformative text that reduce this NEPA process to a mere paperwork exercise. The following issues are among those that must be revealed in this NEPA process:

- a. A comprehensive review of road impacts, including secondary effects is needed to understand the cumulative impacts of the proposed CBM development on the roads and residents and should include:
 - i. Engineering review of projected impacts of "typical" CBM vehicles & traffic as measured on a variety of roads types and locations.
 - ii. Correlation of road use-related revenues to anticipated operation, maintenance and repair costs.
- b. What further reviews (and conclusions) have been completed re: total generation of fugitive dust on unpaved roads.
- c. What are the results from studies that have gauged and quantified fugitive dust impacts to date and how would the operation and maintenance of the proposed wells aggravate existing problems.
- d. What are the results/conclusions of previous fugitive dust measurements and:
 - i. What determinations have been arrived at related to compliance with Clean Air Act (PM-10, PM2.5, haze, etc.) and Clean Water Act - and how have those conclusions been verified?
 - ii. What policies, regulations and/or agency oversight have been implemented to mitigate these impacts - and with what quantified/verifiable results to date?
- e. What are the impacts of CBM vehicular traffic on "highway" safety? State how the statistical conclusions have been verified as relevant to the actual condition in the study area..

14. **Cultural Resources**

Most of the ground disturbance for the preferred alternative will occur in areas of

moderate to high sensitivity and would impact an estimated 179 sites. DEIS at 4-176. The DEIS proper reveals that “[t]he available inventory data indicate that no cultural resources within the Study Area have actually been listed on the National Register, but many are undoubtedly eligible.” and that “It may be impossible to completely avoid all cultural or historic properties regardless of which alternative is selected. . .” DEIS at 4-170. Yet, these foreseeable impacts are characterized as insignificant, presumably because they are only a small portion of the rich archeological “regional resource base.” DEIS at 4-176. The arbitrary variation of the scope of the study to a unstated “regional” area renders the conclusions capricious, at best.

Impacts to cultural resources cannot be fully disclosed until the oil and gas program is subjected to consultation and scrutiny under the National Historic Preservation Act and other applicable laws. Measures for avoidance of impacts to important historical values and their context must be done now while program-level alternatives remain open that will likely not be available at the project specific level. Even if alternatives remain available, unpredicted project delay may be caused while alternatives are preserved during a supplemental EIS process that considers cumulative impacts.

15. Visual Resources

The visual resources section is generic and does not provide useful information on the impacts of the current project. The methodology relies entirely upon a mathematic model that is not useful in understanding anticipated impacts on actual characteristics of the area. The following must be revealed in this NEPA process:

- a. Evaluate the direct, indirect, and cumulative impacts of proposed CBM operations on rural communities according to the visual sensitivity of the residents.
- b. What is the direct, indirect, and cumulative impact of flaring on nearby residents and on the viewsheds?
- c. What are the direct, indirect, and cumulative impacts of CBM on the tourist experience?
- d. How long will visual impacts remain after abandonment pressures are reached?
- e. What are the cumulative effect of proposed CBM development on federal and state visual resource standards and objectives?
- f. What are the cumulative impacts of proposed CBM development on the viewsheds from various recreation use categories of federal public lands, including concentrated developed, dispersed roaded, backcountry, and wilderness?

16. Social and Economic Effects

All economic determinations must include consideration of the health, safety, welfare, and environmental costs and impacts caused by increased development. Merely considering selected financial and economic benefits of drilling and operations ignores and violates requirements to ensure production is carried out economically and in the public interest. Economic costs are totally absent from the economic analysis.

The DEIS relies upon outdated estimates, especially a flat gas price of \$2.00/mcf, that may have been reasonable in 1997, but which were outdated at the time this DEIS was released

in 2001. The boom/bust nature of energy development that is reflected in the obsolete economic assumptions must also be taken into account. The following must be included in this NEPA process:

- a. The spacing and the actual drilling of a gas well has real and perceived impacts on the rural character and on the quality of life of residents. Either type of impact has real effects on social and economic values that must be considered, including:
 - i. Pride in the neighborhood community and security in one's home are important factors to determine well-being. How much impact on social services (crime control, welfare, counseling, mental health services) is expected as a result of creating industrialization in rural neighborhoods and destroying the security people feel in controlling their homes.
 - ii. Investment in a home that is often the most significant investment a resident will make in his or her life. By how much will real estate subject to development of the formation deteriorate in value (or deviate from upward trends) by alternative?
- b. The effect on La Plata County, SUIT, and Colorado tax revenues must be analyzed.
 - i. What will be the cumulative impacts as a portion of the tax base of accelerated recovery on County and State tax revenues over the next 50 years assuming constant tax rates and an reasonable range of increased gas price scenarios. That is, how does accelerated development exacerbate boom and bust nature of oil and gas development?
 - ii. What will be the affect of CBM development on property tax collections within the lands affected by development of the formation, including those lands along the outcrop.

17. **Noise**

Noise is one of the most often complained about impacts. Doctors and area residents have testified under oath that serious health effects are caused by excessive and uncontrolled variations in noise caused by oil and gas operations. COGCC hearing transcripts of June 2000. The DEIS does not investigate or reveal these serious health threats and affects. Instead, these noise impacts are presented as "annoyances" that are handled on a case by case basis. Electing to handle noise sources on a case by case basis does not alleviate the need to reveal the range of direct human health impacts of noise. Whether annoying or harmful, the impacts of noise must be revealed in this NEPA process.

18. **Explosions**

Wells, pipelines and all types of facilities have the potential to explode and cause great death and destruction. The explosion impacts and their likelihood must be revealed in this NEPA process, including the following:

- a. Several recent news reports have detailed death and destruction that can result from explosions related to oil and gas development.

- b. Please statistically estimate, based on industry averages, the expected number of deaths, explosions, injuries, etc. that will be caused by CBM development.
- c. Please estimate the number of people who are at risk of injury or death should any one or a number of CBM facilities explode.
- d. Please describe the various explosion risks and their likelihood based on historical industry averages.

Conclusion

The Draft Environmental Impact Statement for Oil and Gas Development on the Southern Ute Indian Reservation has failed to demonstrate that expanded drilling is necessary to achieve efficient and economic development of oil and gas resources. Expansion without explanation would violate federal law and various trust responsibilities of the federal government. Even assuming that more wells or new enhancement procedures were necessary, the DEIS does not provide the information necessary to make a reasoned decision whether or not the expansion is worth the damage to people and the environment. Even where such information is provided, it is provided in a manner that is inaccessible to most, sometimes all, readers. The DEIS simply does not satisfy even the most basic requirements of NEPA. The Alliance requests that the responsible agencies rework this DEIS into a document that reveals alternatives and impacts, informs the public, and provides decisionmakers with a full range of alternative courses of action to help guide the oil and gas program.

Sincerely,

Mark Pearson
Director
San Juan Citizens Alliance

Gwen Lachelt
Director
Oil and Gas Accountability Project

TO: Don Englishman, Minerals Supervisor
Bureau of Land Management
San Juan Field Office
15 Burnett Court
Durango, CO 81301
970-385-1346

RECEIVED

Signed: RD Estelle

Date: 3/27/01

From: Carl Weston
3905 Hiway 550
Durango, CO 81303
970-247-9594
E-Mail crweston@mindspring.com

Subject: Public Comment
Oil And Gas Development
On The Southern Ute Indian Reservation
Environmental Impact Statement

I have resided and owned property within the Southern Ute Reservation boundaries for 33 years at SW 1/4, SW 1/4, SECT 31, T33N, 9W.

My comments on this EIS are inadequate and severely circumscribed because of the limited time allowed to study such a voluminous document that took six years to compile. Full semester college courses use smaller texts than this EIS. Technical jargon has no ordinary explanation that would provide the average citizen with an education level of high school plus two years, with an understanding of the impact being described. For example, "Maximum direct CO impacts during operation were predicted to be nearly 159 ug/m³ (1 hour) and 110 ug/m³ (8 hour)". Now what the hell are the health effects of living next door and down wind to that? with a pre-existing cardiac condition? during weather inversion conditions?

At a minimum, an additional month is requested to study this tome.

One of my stronger concerns is for the cumulative and synergistic impacts of localized air pollution under the least favorable meteorological conditions, especially in confined watershed topography. EPA has said that there are no monitoring facilities on the S.U. Reservation that would measure those conditions. There is little point in comparing three alternatives, none of which can determine the localized (health) impacts on contiguous neighbors. Human respiration is a continuous vital process. It cannot be intermittent with a minimum number of adequate hours or days, like a tourist's view of the scenery.

The lack of adequate localized monitoring facilities raises the issue of where and how non-Indian residents of the Reservation can effectively seek remedial action of unsatisfactory or non

compliant air quality impacts. Where in this EIS is this level of mitigation addressed? It would appear to belong in the environmental justice section.

This EIS continually and extensively uses the term "ambient" to describe air quality standards without defining how uniform the air quality is within the area to which the term applies, or whether the "ambient" air quality can be statistically manipulated by including or excluding topography with greater or lesser levels of pollution. It would appear that the lower terrain of watershed courses should be specific separate "ambient" measurement areas, particularly since most of these areas are where residential development is concentrated. It also appears to be the preferred area for location of compressor stations. It is the area where inversion weather conditions most concentrate air pollution, especially at night.

Adjusting residential exposure levels for "time away from home" is disingenuous sophistry. Elderly and pollution vulnerable residents are those most likely to be continuously confined at home. Human beings cannot be quantitatively or qualitatively measured as some statistical aggregate organic mixture like algae. They are as vulnerable to pollution impacts as the weakest, and most impaired, single individual, for the shortest period of time necessary to negatively impact human physiology at any age or stage of human existence, from unborn or newborn to frail elderly. Estimates of pollution impacts should be addressed using that standard.

Wetland mitigation should have wetland avoidance as the first and highest priority. Wetlands created by produced or diverted water should not be eligible as "replacement" mitigation unless the sustaining water source can be legally and physically assured in perpetuity.

There are a number of issues cited as "not been mapped", "not been formally studied", "difficult to quantify", etc.. These issues should be collated and categorized so the public can see and evaluate where the greatest number of unknown, ignored and unexamined issues lie.

To be continued (contingent on extended comment deadline)

ADDENDUM to COMMENTS 3-27-01

Access road construction, 2.6.4.1 explains why there is such a destructive sediment load entering the Animas River in side drainages from the west on the S. Ute Reservation. EPA has updated both point and non-point source water quality requirements (storm drainage) for construction sites since the 1978 manual cited in this section. Where, when, and how is the Storm Water Pollution Prevention Plan required by EPA under

Sect. 402 of the Clean Water Act incorporated into routine access road construction, and maintenance? Logically it should be a routine part of the EA prerequisites for APD approval. Construction activities are addressed in E-1 Common Mitigation Measures limiting them to dry conditions but maintenance activities are not. Where access roads come to be used for additional wells and/or other ancillary equipment, modifications caused by access road maintenance and wet weather damage, i.e. rutting by heavy vehicles, should have compliance monitoring that is spelled out in the SWPP and a BLM or Tribal process for enforcing it. To date, construction plans appear to lack any engineering modification contingencies for worst case seasonal weather conditions or for year round wet weather use by heavy equipment vehicles. Heavy depositing of mud on the nearest all-weather public roads because of access road construction and maintenance deficiencies is apparently not addressed, despite the mud and siltation damage to public road surfaces, culverts, and ditches, and resulting migration of sediment into stream courses. Such heavy mud displacement also often carries a big load of noxious weed seeds and plants. Heavy trucks often use chains to negotiate these deficient access roads. They then drive on public roads with the chains on, damaging the surface while looking for a convenient place to remove the chains and dump the mud load on the public road surface. The heavy construction equipment for building these access roads is frequently unloaded on the nearest piece of dry, level public road. This does more damage to public roads than the total regular use by heavy vehicles.

2.8.3.7 APD approval- The concurrence letter from B.I.A. to address U.S.F.W.S. consultation requirements appears grossly inadequate to assure that U.S.F.W.S. survey and consultation requirements are up to date, timely and seasonally relevant, and complete. This appears to be a huge opportunity to "pass the buck" among agencies without guaranteeing compliance.

Cavitation activity impacts have been appended to this EIS as an apparent after-thought. Does this mean that all of these impacts will be addressed in all future cavitation operations, whether conducted as an initial drilling operation, or as a subsequent production stimulation procedure? Since I initially raised these issues, There are still unresolved issues. The cavitation process appears to be evolving. Water injection of 1000 bbls. or more has been incorporated into the process. This would seem to result in less complete incineration of coal fines but the flaring process still occurs. What temperature ranges are these coal fines exposed to? How much heat does it take to release tars, volatile compounds, etc. from coal fines. Does such "cooked" coal and/or "cooking" residue continue to disintegrate when buried on site, often without regard to the depth of the surface water table? Heavy metal pollutants were "expected to fall out within the 2.88 acre well location", then what? What happens with dust containment watering? What happens if there is a heavy rainfall? What happens if a heavy snowfall is plowed

off the well pad into the nearest storm drainage course? Are "cooked" coal fines on surrounding foliage totally benign? when washed off with water? Recent cavitation activity near Bondac has revealed that the process does NOT have to be conducted at night. Will this change in procedure become a required mitigation of impacts on nearby residences? How will required mitigation be enforced on subsequent cavitations not associated with the initial drilling APD or where the original APD was silent on the cavitation process?

These comments are concluded under protest because of insufficient time to study the EIS in depth.

Carl Weston 3/24/01



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
<http://www.epa.gov/region08>

April 2, 2001

REF: EPR-EP

Bureau of Land Management
San Juan Field Office
Attn: Donald Englishman
15 Burnett Court
Durango, Colorado 81310

RE: Comments for the Draft Environmental
Impact Statement for Oil and Gas
Development on the Southern Ute Indian
Reservation (CEQ #010015)

Dear Mr. Englishman:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4321, et seq., and Section 309 of the Clean Air Act, the Region 8 office of the Environmental Protection Agency (EPA) has reviewed the referenced Oil and Gas Development Draft Environmental Impact Statement (DEIS) for the Southern Ute Indian Tribe (SUIT). This letter transmits our rating on the preferred alternative.

Since we received the additional documents that we requested, we have completed our review of the DEIS. The attached comments identify six major issues that we have with the document. There are many missed opportunities for mitigation that would dramatically reduce impacts to environmental resources such as wetlands and threatened and endangered species. In addition, the DEIS did not thoroughly analyze the possible impacts that could result from methane migration. The range of alternatives could be easily expanded by incorporating different mitigation possibilities to reduce environmental impacts. The cumulative impacts analysis did not include past impacts to wetlands and threatened and endangered species.

We would like to recognize BLM for the work on the air analysis section of the DEIS and the Air Quality Technical Support Document. We appreciate BLM's responses to our requests for additional information and analysis for the impacts analysis.



Summary of Alternatives

- Alternative 1 is the no action alternative. The no action development would continue to allow activity to complete the oil and gas development based on 1 well per 320 acre unit.
- Alternative 2 proposes to change the well spacing within the study area from 1 well per 320 acre unit to 2 wells per 320 acre unit. Since the study area has nearly developed the entire project area for 1 well per 320 acres, this alternative would effectively double the number of wells.
- Alternative 3 includes the well spacing change of alternative 2 and also incorporates the proposal for the enhanced recovery of coal-bed methane. This is identified as the Preferred Alternative in the DEIS.

Review and Rating of the Preferred Alternative

It is EPA policy to provide a general rating specifically on the Preferred Alternative and individually rate all alternatives if necessary. The Preferred Alternative or Alternative 3 receives a rating of **EO-2** (environmental objections, insufficient information). A full description of EPA's EIS rating system is enclosed.

The rating of EO results from unacceptable projected impacts to 171 acres of wetlands; the possible threats to federally threatened and endangered species (TES) including protection to bald eagle active nesting areas from temporary drilling and construction in addition to routine well service activity. Our EO rating could easily be addressed if mitigation requirements identified in our attached comments and the Biological Assessment were required in the final EIS and Record of Decision (ROD).

Our rating of 2 for insufficient information is due to lack of additional information that would help identify cumulative impacts to wetlands and TES. The significance of losing an additional 171 acres of wetlands without knowing how many acres have been previously lost due to oil and gas development will not be fully understood until the full cumulative impact has been identified. The DEIS points out that inventory information for federal and state TES in addition to SUIT species of concern has not been collected.

Two important reasons for preparing a programmatic EIS are to identify, before development takes place, likely environmental impacts to different resources and develop the appropriate general standard mitigation measures to reduce those impacts. The DEIS is very comprehensive in providing information on anticipated impacts. However, it misses many opportunities to recommend or require mitigation procedures that would reduce environmental impacts.

Page 4-6 of the document describes two distinct types of mitigation that can be discussed in a programmatic DEIS. The first type is a site specific requirement that may only be appropriately applied at the Application Permit to Drill (APD) level such as a specific drilling pad location requirements. The second type of mitigation is a general application that would be

implemented to protect a resource. An example of this would be no surface occupancy for a sensitive habitat area that has been identified in the programmatic EIS. Although the DEIS located many existing type one mitigation requirements, many opportunities to identify and require the general mitigation measures were overlooked.

Since we have reviewed and commented on the preliminary draft EIS last summer, many of our comments reflect previous issues. However, we currently have a more complete document including the Biological Assessment and as a result we may now have additional comments that were not identified during our review of the preliminary draft. If you have any questions or concerns regarding the attached comments or the rating, please contact Gregory Oberley of my staff at (303) 312-7043.

Sincerely,

Cynthia Cody, Chief
NEPA Unit
Ecosystems Protection Program

Enclosures

SUIT DEIS Comments
EPA Rating System for DEISs

cc: Jim Rhett, BLM Colorado District Office
Elaine Suriano, EPA-OFA

**COMMENTS ON THE SOUTHERN UTE INDIAN TRIBE DRAFT ENVIRONMENTAL
IMPACT STATEMENT FOR OIL AND GAS DEVELOPMENT**

MAJOR ISSUES

Mitigation Opportunities

Two important reasons for preparing a programmatic EIS are to identify, before development takes place, likely environmental impacts to different resources and develop the appropriate general standard mitigation measures to reduce those impacts. The DEIS is very comprehensive in providing information on anticipated impacts. However, the discussions have missed many opportunities to require mitigation procedures that would reduce environmental impacts.

As was stated on page 4-6 under Mitigation Planning, there are two types of mitigation that can be discussed in the DEIS. The first type is a site specific requirement that may only be appropriately applied at the Application Permit to Drill (APD) level such as a specific drilling pad location. The second type of mitigation is a general application that would be implemented to protect a resource.

The DEIS heavily relies on site specific standard procedures currently available in different documents that are referenced or available in the appendix for mitigation. The mitigation measures in those documents are generally the first type of mitigation measure and because of that, they are referred to only as possible or suggested measures and are selected when the APD is reviewed and approved.

While it is appropriate to identify the site specific mitigation possibilities, the second type of mitigation measures also need to be discussed and selected during the programmatic EIS process. The programmatic EIS is a great opportunity to outline and require general mitigation measures that will help reduce impacts. For example, programmatic EISs are the perfect venue to determine sensitive TES areas that need protective mitigation such as no surface occupancy requirements or to map out valuable and highly functioning wooded riparian wetlands that are to be avoided. Some of these excellent mitigation measures are suggested in the Biological Assessment found in Appendix G. However, the DEIS does not go on to clearly state if they are to be considered as a required mitigation measure in the programmatic EIS process.

We would prefer to see general mitigation requirements concerning threatened and endangered species and wetlands that are specific to reducing impacts that have not only been identified in the DEIS but that may occur in the future. The language in the DEIS does not provide BLM or SUIT the ability to assure that these resources will be adequately protected during the proposed future oil and gas development. We request that the final EIS include such general mitigation measures that provide adequate authority to ensure no

losses of Federally Threatened and Endangered Species (TES) and wooded riparian wetlands.

Wetlands

The DEIS needs to identify the 404 permit process (nation wide or site specific) that will be used by operators to allow construction activities in wetland areas. The projected 171 acres of maximum wetlands loss is considered a significant impact. Although 171 acres is a projected maximum, we have serious concerns about the commitment to avoid impacts to wetlands on a project by project basis. 40 CFR §1508.7 states "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" Each individual wetland road or pipeline crossing might be considered a minor impact but the cumulative loss of 171 acres identified in the DEIS for the proposed action is significant and would not be considered minor by the US Army Corps of Engineers or by EPA.

Although page 4-40 summarizes possible mitigation measures for reducing wetland impacts, the programmatic EIS needs to provide mitigation measures that will eliminate or significantly reduce impacts to wetlands. The potential loss of 171 acres of wetlands is unacceptable and there needs to be a comprehensive discussion in the DEIS concerning wetland avoidance requirements that will reduce the wetland losses.

BLM has not met the requirements found in 40 CFR §1502.14(f), §1502.16(h), and §1508.14 which declare that the mitigation measures must cover the range of impacts of the proposal. Therefore the DEIS must look at a range of mitigation that would include requirements that would eliminate wetland impacts. The statement on page 4-40 "avoid wetland impacts to the fullest extent without compromising the intent of the project" does not meet the intent of the CEQ regulations or Executive Order 11990. At a minimum, the operator should be required to demonstrate that additional wetland impacts cannot be avoided.

Since oil and gas development is not a new activity within the study area, there should be existing monitoring information from past development that would provide BLM and SUIT with approaches that would reduce wetland impacts. For example roads and pipelines already exist in almost every section within the study area due to 2 wells being present in each section. As a result, roads and utility corridors do not need to be constructed in wetlands to achieve the intent of the project. In addition, newer technologies such as placing pipelines under wetlands by using boring technologies rather than trenching could provide additional impact reductions as well as providing relief to operators from the 404 permitting process. The discussion could also look at developing temporary road crossings using portable and re-useable bridges to

span smaller wetland areas for heavy equipment to access drilling sites. There are a lot of newer technologies available for placing pipelines and utilities to reduce impacts to wetlands. None of these available and widely used technologies were discussed in the DEIS.

Threatened and Endangered Species

We are especially concerned about potential impacts to federal TES (Threatened and Endangered Species) and the lack of required measures to avoid the loss of species. The DEIS is clear that potential impacts could occur but it is vague as to how BLM, BIA and SUIT will provide the necessary mitigation requirements to avoid loss of habitat or species. The DEIS has identified a number of TES that without general mitigation requirements could be impacted by the proposed future oil and gas development. Similar to the wetland discussion above, there were no general mitigation measures that are required in the DEIS that would prevent TES losses. Section 4.3.3.9 **Mitigation Summary** on page 4-76 does not provide for the general mitigation measures that would be applied to critical habitat areas for federal TES. This section refers the reader to Biological Assessment in Appendix G for mitigation measures for individual federal TES. However, the **Mitigation of Impacts** sections under individual TES in the Biological Assessment do not imply any of these measures would be required. Most programmatic EISs have requirements for no surface occupancy during nesting or for critical habitat and other requirements that would apply to TES species.

Methane Seepage

It is well understood that methane can be produced by decaying organic material in soil and shallow subsurface. To imply in the DEIS that areas of concern for methane seepage in the San Juan Basin is anything but the result of migration from gas production zones is misleading and delays addressing the problem. Methane generation from domestic septic systems are rarely considered to be a problem elsewhere in the country and certainly methane contamination is not the widespread issue that has been identified in the San Juan Basin. Methane seepage resulting from decaying natural organic material in surficial aquifers should not be expected to be a greater problem than is observed in other areas outside the San Juan Basin.

The DEIS does not propose specific methane seepage monitoring even when it has already been determined that impacts exists from prior oil and gas development. Instead the DEIS relies completely on the referenced 3M Study which is being conducted outside the study

area. We would suggest that BLM and the SUIT develop and implement an additional monitoring program that will provide site specific information for the study area concerning impacts from methane seepage into drinking water aquifers and seepage into buildings. Outside the reservation boundaries the Colorado Oil and Gas Conservation Commission (COGCC) has required operators to sample nearby drinking water wells in order to determine if drilling and production have impacted the aquifer, or if there was a pre-existing methane seepage problem. Similar procedures need to be implemented on SUIT lands in order to provide landowners with information and the ability to gain access to compensation for impacted sources of drinking water. In many situations where oil and gas production has impacted drinking water wells, the operators are responsible for replacing that resource. The requirements and site specific approval documents that are provided in the DEIS do not address situations when a landowner loses their well to methane seepage.

In addition, new monitoring information may provide for adaptive management approaches to methane seepage problem that would address methane migration impacts during the course of the proposed oil and gas development. Coupled with the results and recommendations of the 3M study, new monitoring information needs to be integrated into future oil and gas development requirements.

Range of Alternatives

Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable". Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint, using common sense, rather than simply desirable from the standpoint of the applicant.

Although the purpose and need of the document were not well identified in the DEIS, we are assuming these goals are to develop additional gas resources on the SUIT lands in order to provide additional income (Page 2-7, Section 2.3). There are also certain constraints that have been identified within the discussion of the alternatives not selected. SUIT is not considering: development on the eastern portion of the reservation; an 80 acre well spacing; or a moratorium on oil and gas development.

Based on the purpose and need and the constraints, considerable room remains to discuss additional alternatives beyond those identified in the DEIS. Alternatives which are based on additional mitigation of environmental impacts would easily meet the purpose

and need of the project and identify a broader range of environmental impacts and mitigation opportunities.

For example the DEIS could discuss an alternative that would provide greater relief of impacts to wetlands and endangered species. Riparian woodlands and critical habitat for TES (including buffer zones) could be identified and construction activity in these areas could be eliminated through locating utility and road corridors outside sensitive habitats. Extracting mineral resources within critical habitat areas could be accomplished through directional drilling from existing well pads and serviced by existing roads and utilities.

Cumulative Impacts

40 CFR Section 1508.7 identifies cumulative impacts to include the incremental impact of the action added to impacts of other past, present and reasonably foreseeable future actions. The DEIS has not included discussion of past impacts for many of the resources on tribal lands such as wetlands, TES, critical wildlife habitat, surface water, vegetation and ground water.

We are very concerned that the DEIS does not identify the amount of wetlands within the study area or the reservation that have already been lost to oil and gas development as well as other construction activities. Without this information it is not possible to determine the true significance of the potential loss of an additional 171 acres of wetlands.

The total surface disturbance of prior oil and gas activities was also left out of the DEIS cumulative impacts discussions. This information is necessary to give a complete picture of vegetation and critical habitat losses. Without past activity impacts it is difficult to determine the cumulative impact of oil and gas development on SUIT lands.

SPECIFIC COMMENTS

(DEIS, Page ES-9, Table ES-1) The table does not include significant wetland impacts that have been identified in the main body of the DEIS.

(DEIS, Pages 2-56) The discussion of cavitation is not descriptive enough of the procedure to understand the impacts due to flaring and dispersal of coal fines residue on nearby vegetation and soil. Appendix O has a very good description and should be referenced in this section. The DEIS should also determine if the mitigation measures described in Appendix O, which are required by BLM of operators located in New Mexico, will be required on tribal land.

(DEIS, Pages 2-73, 2-74, 2-75 Section 2.9) The text in this section states "Mitigation and approval conditions for individual APDs will be tiered off the protection measures and mitigation presented in this EIS and modified for site-specific conditions." The DEIS needs to reference what those mitigation and protection measures are that mitigation in APDs will be tiered to for site specific conditions.

In addition, the DEIS needs to be reviewed for the accuracy of the references to other documents. Documents in this section were either missing from the Appendices or do not exist. BLM Onshore Oil and Gas Orders and Notice to Lessees were not provided in Appendix D. In addition, the SUIT General Well Site Conditions of Approval document was not found in Appendix D. It is also understood that the BLM documents listed on page 2-75 do not exist.

(DEIS, Page 3-67 Section 3.5.1.3 Methane Contamination) Map 15 referenced in this section does not depict the location of the areas of concern for methane seepage. Please revise Map 15 to distinctly show these areas.

(DEIS, Page 3-68, 3-69) The list of possible vertical pathways for methane migration should also include a statement that identifies that combinations of the listed pathways could occur. This section could also discuss the possibility of hydro-fracturing as a possible source of fractures for vertical migration. EPA is currently conducting a nationwide study to determine if hydraulic fracturing for coal-bed methane production could be contaminating drinking water sources. Serious drinking water contamination problems in Alabama have been associated with hydro-fracturing coal beds in methane production zones.

(DEIS, Page 4-6, Section 4.1.4 Cumulative Impact Analysis) This section states that past impacts are important to being able to determine cumulative impacts. Unfortunately, DEIS does not identify past impacts to wetlands and vegetation. It appears that BLM recognizes the importance of this information but did not include it in the DEIS.

(DEIS, Page 4-38, Section 4.3.1.7 Impacts Summary) There are no cumulative impacts identified, discussed or analyzed in this section for wetlands, vegetation or noxious weeds. This is very

important information that is required in order to be able to determine the full impact of the proposed oil and gas development.

(DEIS, Page 4-39, Section 4.3.1.8 **Mitigation Summary**) For invasive species this section should refer to Section 2 of Executive Order 13112. Wetland mitigation must also incorporate wetland protection measures found in Executive Order 11990 Section 2(a).

Other wetland mitigation efforts that could be incorporated are: temporary bridge crossings for temporary roads, directional boring, and completely avoiding highly functioning wooded riparian areas. Re-fueling, maintenance, and storage areas should also include berms and liners to protect against spills contaminating soil that will be eventually washed into streams no matter what the distance is from the waterway.

(DEIS, Page 4-58, Section 4.3.2.8 **Mitigation Summary**) Activity in wooded riparian areas should be avoided. Programmatic mitigation measures should provide protection for these valuable habitat areas to insure no loss of TES.

(DEIS, Page 4-64, Section 4.3.3.4 **Potential Impacts Specific to TES Species**) The southwestern willow flycatcher is not discussed in the section under federally listed species. The DEIS should not solely rely on percentage of lost habitat area when evaluating impacts to this species. Information on the minimum patch size of wooded riparian habitat for this species may be more important to determine the true impacts of additional development.

(DEIS, Page 4-76, Section 4.3.3.9 **Mitigation Summary**) Although possible mitigation measures are identified in the Biological Assessment in Appendix G, the DEIS does not clearly state if the general measures directed at protecting TES habitat will be required.

The mitigation measures identified in the DEIS and Biological Assessment must be implemented in order to avoid jeopardy opinion under Section 7 of the Endangered Species Act. The use of standard no surface occupancy and prohibiting construction activity to protect TES critical habitat and nesting areas is widely used in BLM programmatic EISs. This approach must be incorporated into this EIS in order to provide adequate protection of federal, state TES and SUIT species of concern.

The Biological Assessment recommends the following for the southwestern willow flycatcher. "Surveys should be conducted in areas of suitable breeding habitat during the appropriate season (late May through mid July) each year prior to initiation of site-specific project activities each year to determine presence or absence of the southwestern willow flycatcher and to determine if

nesting is occurring in the Study Area; if so, then no surface disturbing activities would be allowed from late May through mid July. Disturbances should be minimized in areas of dense wooded riparian vegetation since it provides nesting habitat for the southwestern willow flycatcher." These recommendations must be adopted in the EIS and ROD.

AIR QUALITY ANALYSIS

General Comment

EPA finds that the air quality analysis, in the draft EIS and the Technical Support Document, is exceptionally well written with thorough information on modeling methodologies and results.

Specific Comments

(Air Quality Technical Support Document, page 43) Flat terrain vs. Complex terrain modeling. EPA understands the complexity of performing near-field air dispersion modeling without the knowledge of where compressor stations may be located and what their emission characteristics would be. However, under stable atmospheric conditions, emissions from combustion sources can concentrate in low-lying areas such as the Animas River Valley. For the residents living within the Reservation, EPA recommends that one modeling run be done for CO and NO_x impacts to the Bondad area from the following three existing compressor stations: Amoco High Flume, Vastar 8, and Red Cedar Bondad. Since CO data is missing for the Ignacio air monitoring station, this modeling effort would help to describe the existing air quality on the Tribal lands.

(Air Quality Technical Support Document, page 11) forth paragraph, last sentence. Recommend that a statement be added to this paragraph stating that the emissions from the proposed action of adding 118,000 hp of gas compression was not included in the Phase I increment analysis (performed by the State of Colorado).

(DEIS, page 4-10 last paragraph) Recommend that a "safe-distance setback" be established for drilling rigs so that SO₂ concentrations will not exceed Colorado's 3-hr standard at nearby residences.

(DEIS, Tables 4-1, 4-2, 4-3, 4-4) The presentation of PSD Class I increment impacts along with visibility impacts and lake impacts by analyzing the effects of mitigating NO_x emissions from compressors is very beneficial to the public and the decision-maker. Even though BLM does not have jurisdiction for air emissions on Tribal lands, the decision-maker can recommend (not commit to) mitigation based on the environmental impacts and the public comments concerning impacts.

(DEIS, Table 4-3) This table presents information showing the least number of days of visibility impacts occurs with a 1.0 gr/hp-hr emission rate for compressors. EPA encourages the decision-maker to recommend the lowest emission rate in the ROD since the newly promulgated Regional Haze Rule will require states to develop plans to reduce visibility impacts in Class I areas. In addition, additional development of oil and gas will likely occur in the San Juan Basin during the next 20 years, and the impacts of this new development will be in addition to those occurring from the Proposed Action.

Responses to Comment “A” from Laurie Domler, National Park Service

A1 As stated in the DEIS (page 4-11; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery):

Maximum direct NO₂ impacts during operations were predicted based on assumed NO_x emissions from reasonably foreseeable CBM recovery wells, injector well and pipelines compressor engines. However, given the uncertain and preliminary nature of potential development, three different NO_x emissions rates were used: 1.0 grams per horsepower-hour (g/hp-hr; which reflects currently available, clean burning equipment), 1.5 g/hp-hr (which reflects recently permitted equipment), and 2.0 g/hp-hr (which reflects historically permitted equipment). The highest emission rate represents compression engines using proven technology which would ensure this level of control could be continuously achieved. The lowest emission rate represents compression engines using emerging technology which would be more difficult to guarantee throughout the LOP [20-year “life of project”].

In addition, the DEIS stated (page 2-38; Chapter 2; 2.7 COMPARISON OF ALTERNATIVES; Summary of Resource Comparisons): “Air Quality - Significant impacts on air quality are not anticipated with the development of any of the three alternatives.”

The DEIS also stated (page 4-7; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.1 Issues, Impact Types, and Criteria):

Air pollution impacts are limited by state, tribal and Federal regulations, standards, and implementation plans established under the Clean Air Act and administered by the applicable air quality regulatory agency (including the SUIT, the CDPHE-APCD or the EPA). ... Air quality regulations require proposed new, or modified existing, air pollutant emission sources (including nitrogen injectors and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the applicable air quality regulatory agencies have the primary authority and responsibility to review permit applications and to require emission permits, fees and control devices, prior to construction and/or operation. In addition, the U.S. Congress (through the Clean Air Act Section 116) authorized local, state and tribal air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than Federal requirements. Additional site-specific air quality analysis would be performed, and additional emission control measures (including a BACT analysis and determination) may be required by the applicable air quality regulatory agencies to ensure protection of air quality resources.

The Bureau of Land Management, Bureau of Indian Affairs, and the Southern Ute Indian Tribe (SUIT) performed a detailed air quality impact assessment for the DEIS, as required under the National Environmental Policy Act (NEPA). This Act requires that potential environmental

consequences of a Proposed Action and Alternatives be analyzed and disclosed to the public and other interested parties before a decision either denying, approving, or approving with stipulations of alternate activities.

The U.S. Environmental Protection Agency (EPA) has separate authority and responsibility for regulating air pollutant emissions under the Clean Air Act. EPA may delegate some of these authorities and responsibilities to state, tribal, regional, and/or local air quality regulatory agencies (as specified in legally binding “implementation plans”). Even when some activities have been delegated, however, EPA retains oversight responsibility to ensure that all Federal Clean Air Act requirements are implemented, or to withdraw such delegation and implement those requirements itself. EPA and authorized air quality regulatory agencies have the primary authority and responsibility to regulate air pollutant emissions, including determination of the “best available control technology [BACT] for reducing NO_x emissions.”

Finally, the land management decision process is made under statutory authority separate from either the NEPA analysis, disclosure, commenting, and response requirements, or the Clean Air Act regulatory process. Federal land management agency decisions must ensure continued compliance with all local, state, tribal and Federal air quality laws, statutes, regulations, standards, and implementation plans. These agencies also have discretionary authority to include operational stipulations in a “record of decision” to limit unnecessary and undue environmental impacts. Since no significant air quality impacts were identified in the DEIS for any Alternative under the three analyzed emission rate scenarios, however, there is no basis that “compressor emission rates for this project should be held to less than 1.0 g/hp-hr.”

The Respondent should contact the applicable air quality regulatory agency directly, to request that nitrogen injectors and gas compression facilities be permitted at an emission rate less than 1.0 g/hp-hr.

A2 As stated in the DEIS (pages 4-16 through 4-18; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.7 Cumulative Impacts):

Since the Alternative 3 (Proposed Action) and cumulative emission sources constitute many small sources uniformly spread out over a very large area, discrete visible plumes are not likely to impact the mandatory Federal PSD [Prevention of Significant Deterioration] Class I areas, but the potential for cumulative visibility impacts (increased regional haze) is a concern. Regional haze degradation is caused by fine particles and gases scattering and absorbing light. Potential changes to regional haze are calculated in terms of a perceptible ‘just noticeable change’ (1.0 deciview) in visibility when compared to background conditions.” Further, “It should be noted that a 1.0 deciview change is not a ‘just noticeable change’ in all cases for all scenes. Visibility changes less than 1.0 deciview are likely to be perceptible in some cases, especially where the scene being viewed is highly sensitive to small amounts of pollution. Under other view-specific conditions, such as where the sight path to a scenic feature is less than the

maximum visual range, a change greater than 1.0 deciview might be required to be a 'just noticeable change.'

However, this NEPA analysis is not designed to predict specific visibility impacts for specific views in specific mandatory Federal PSD Class I areas based on specific project designs, but to characterize reasonably foreseeable visibility conditions that are representative of a fairly broad geographic region, based on 'reasonable, but conservative' emission source assumptions. This approach is consistent with both the nature of regional haze and the requirements of NEPA. At the time of a preconstruction air quality permit application, the applicable air quality regulatory agency may require a much more detailed visibility impact analysis. Factors such as the magnitude of deciview change, frequency, time of the year, and the meteorological conditions during times when predicted visibility impacts are above the 1.0 deciview threshold (as well as inherent conservatism in the modeling analyses) should all be considered when assessing the significance of predicted impacts.

Table 4-3 (page 4-18; "Predicted Visibility Impacts in Mandatory Federal PSD Class I Areas - Number of Days Above a 1.0 Deciview "Just Noticeable Change") identified potential daily changes in visibility (reconstructed extinction) based on IMPROVE PM_{2.5} (fine particulate matter) samplers operating at Mesa Verde National Park and the Weminuche Wilderness Area during 1997. Potential impacts were reported ranging from no days predicted to exceed 1.0 deciview at either area under Alternative 1 (No Action) under all analyzed NO_x emission rates, to one day at the PSD Class I Weminuche Wilderness Area and up to three days at the PSD Class I Mesa Verde National Park under Alternative 3 (Proposed Action) at an assumed 2.0 g/hp-hr NO_x emission rate. Listings of the complete 365-day analyses for Alternative 3 (Proposed Action) was printed in the "Air Quality Impact Assessment Technical Support Document" (Earth Tech 2000), and complete tabular listings for all analyses (including all three Alternatives under three different assumed emission rate scenarios) were available to the public during the DEIS review period.

However, after the DEIS air quality impact assessment was completed, the USDA Forest Service, USDI National Park Service, and the USDI Fish and Wildlife Service published their "Final FLAG Phase I Report" (Federal Register, Vol. 66 No. 2, dated January 3, 2001), providing "a consistent and predictable process for assessing the impacts of new and existing sources on AQRVs," including visibility. For example, the FLAG report states "A cumulative effects analysis of new growth (defined as all PSD increment-consuming sources) on visibility impairment should be performed," and further, "If the visibility impairment from the proposed action, in combination with cumulative new source growth, is less than a change in extinction of 10% [1.0 deciview] for all time periods, the FLMs will not likely object to the proposed action."

Although the FLAG procedures were primarily designed to provide analysis guidance to Clean Air Act PSD permit applicants, the following revised Table 4-3 uses the "Final FLAG Phase I Report" procedures for this NEPA analysis:

TABLE 4-3
Predicted Visibility Impacts in Mandatory Federal PSD Class I Areas
(Number of Days Predicted to Equal or Exceed a 1.0 Deciview “Just Noticeable Change”)

NO_x Emission Rate Scenario	Mandatory Federal PSD Class I Sensitive Area	ALT 1 No Action	ALT 2 CBM Infill	ALT 3 Proposed Action
1.0 g/hp-hr	Mesa Verde Nat'l Park	0	0	0
	Weminuche Wilderness	0	0	0
1.5 g/hp-hr	Mesa Verde Nat'l Park	0	0	0
	Weminuche Wilderness	0	0	0
2.0 g/hp-hr	Mesa Verde Nat'l Park	0	0	0
	Weminuche Wilderness	0	0	1

Based on multiple iterations of the non-steady state CALPUFF dispersion-modeling system, including the CALMET meteorological model, for three different development Alternatives, each with three different assumed compressor engines NO_x emission scenarios, *no* day was predicted to equal or exceed the 1.0 deciview “just noticeable change” level at Mesa Verde National Park Mandatory Federal PSD Class I Area, and only a single day (based on January 19, 1990, meteorology conditions) was predicted to reach the 1.0 deciview “just noticeable change” level at the Weminuche Wilderness Mandatory Federal PSD Class I Area (at a predicted level of 1.083 deciview). Given the numerous “reasonable, but conservative” assumptions applied throughout this analysis (which may actually compound one another), these projected impacts represent an upper estimate of potential air quality impacts which are unlikely to actually occur.

A3 As clearly stated in the DEIS (pages 4-13 through 4-14; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery):

When reviewing the predicted near-field (Proposed Action) impacts, it is important to understand the “reasonable, but conservative” assumptions made regarding potential resource development. In developing this analysis, there is uncertainty regarding ultimate development (i.e., number of wells, equipment to be used, specific locations). The analysis was also based on a reasonably-foreseeable-development scenario, including several conservative assumptions:

- Maximum measured background criteria air pollutant concentrations were assumed to occur at all locations in the region throughout the LOP.
- All emission sources were assumed to operate at their reasonably foreseeable maximum emission rates simultaneously throughout the LOP. Given the number of sources included in this analysis, the co-probability of such a scenario actually occurring over an entire year (or even 24-hours) is small. While this assumption is typically used in modeling analyses, the resulting

predicted impacts will be overstated.

- All proposed natural gas wells were assumed to be fully operational (no dry holes), and remain operating (no shut ins) throughout the LOP.
- The total proposed injector well and pipeline compression engines (nearly 118,000 hp) were assumed to operate at their rated capacities continuously throughout the LOP (no phased increases or reductions). In reality, compression equipment would be added or removed incrementally as required by the well field operation, compressor engines would operate below full horsepower ratings, and it is unlikely all compressor stations would operate at maximum levels simultaneously.
- Total predicted short-term air pollutant impact concentrations were assumed to be the sum of the first maximum background concentration, plus the maximum cumulative modeled concentrations, which actually occur under very different meteorological conditions and are not likely to coincide.
- Preliminary PM-10 and SO₂ modeling analyses were performed in order to identify and apply the physical geometry for maximum potential impacts in the final analyses.
- The HAP [Hazardous Air Pollutant] analyses assumed all equipment would operate simultaneously at the maximum emission levels continuously throughout the LOP.

Given these numerous “reasonable, but conservative” analysis assumptions, which may actually compound one another, the predicted impacts represent an upper estimate of potential air quality impacts which are unlikely to actually be reached. However, even applying these “reasonable, but conservative” analysis assumptions, most predicted impacts are below applicable regulatory limits, and the scientific evidence is not compelling that reasonably foreseeable significant adverse impacts would occur.

It is important to note that before actual development could occur, the applicable air quality regulatory agencies (including the state, tribe, or EPA) would review specific air pollutant emissions preconstruction permit applications, which examine potential projectwide air quality impacts. As part of these permits (depending on source size), the air quality regulatory agencies could require additional air quality impacts analyses or mitigation measures. Thus, before development occurs, additional site-specific air quality analyses would be performed to ensure protection of air quality.

Similar interpretive qualifying statements were included in the DEIS regarding the predicted cumulative impacts (pages 4-20 through 4-22; Chapter 4; 4.2 AIR QUALITY AND CLIMATE;

4.2.7 Cumulative Impacts)

The Respondent's insistence that potential visibility impacts be compared to a change of extinction threshold of five percent (0.5 deciview, or "½ of a just noticeable change") is inconsistent with the "Final FLAG Phase I Report" cumulative visibility impact analysis procedures published on January 3, 2001. Although the FLAG agencies "are not likely to object" to a single-source visibility impact less than 0.5 deciview, they have clearly stated "If the visibility impairment from the proposed action, in combination with cumulative new source growth, is less than a change in extinction of 10% [1.0 deciview] for all time periods, the FLMs will not likely object to the proposed action." None of these agencies have suggested that the 0.5 deciview threshold apply to a cumulative analysis as stated by the Respondent.

Therefore, based on the "Final FLAG Phase I Report" cumulative visibility impact analysis presented in Comment Response A-2 above (where there would not be any "just noticeable change" in visibility at Mesa Verde National Park), and since no air quality standards or PSD increments were predicted to be exceeded in the Mesa Verde National Park area under any Alternative or NO_x emission rate scenario, it is unclear why the Respondent "does not believe that the Executive Summary statement (page ES-7) that 'Potential air quality impacts would not be significant ...' can be supported."

A4 As stated in the DEIS (page 4-9; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery): "No violations of applicable state, tribal or Federal air quality regulations or standards are expected to occur as a result of direct, indirect, or cumulative CBM development-related air pollutant emissions (including construction and operation)."

For the single day (based on January 19, 1990, meteorology) predicted to exceed the 1.0 deciview "just noticeable change" threshold at the Mandatory Federal PSD Class I Weminuche Wilderness Area, 38 percent of the predicted total 1.083 deciview change was based on existing (Alternative 1 - No Action) sources. Therefore, 62 percent of the predicted impact would be due to Alternative 3 (Proposed Action) sources alone.

Although it is possible that individual impacts could occur due to either Alternative 1 (No Action) or Alternative 3 (Proposed Action) sources alone, it is more likely that each hourly modeled impact would be a mixture of both source groups, or, given specific meteorological conditions, that neither source group would impact a specific sensitive-receptor area at the same time.

A5 Please see Comment Responses A1 and A2.

A6 Back in 1997, the USDI National Park Service was provided copies of the Near- and Far-field Air Quality Modeling Protocols before the DEIS air quality impact assessment was

initiated. In addition, the analysis team talked with USDI National Park Service representatives to identify those parameters which could impact Mesa Verde National Park, and would therefore be analyzed in the DEIS. Until Comment A-6 was received, the only parameters the USDI National Park Service identified were consumption of the PSD Class I increment and potential regional haze (visibility) impacts within Mesa Verde National Park.

Had the USDI National Park Service provided ozone and sulfur dioxide monitoring data at that time, it would have been considered for inclusion in Chapter 3 (Affected Environment) of the DEIS. However, ozone and sulfur dioxide monitoring data were reported in the DEIS (page 3-6; Table 3-1 Measured Concentrations of Regulated Air Pollutants at the SUIT Monitoring Station near Ignacio (in $\mu\text{g}/\text{m}^3$)).

The DEIS also stated (page 3-4; Chapter 3; 3.2 AIR QUALITY AND METEOROLOGY; 3.2.4 Existing Air Quality):

The most complete air quality monitoring data available within the Study Area are from the SUIT station near Ignacio (Table 3-1), which has provided continuous measurements since 1987, and are considered to be the best available representation of background air pollutant concentrations throughout the Study Area (SUIT 1997-98). These data are used in the air quality impact analysis to define background conditions, affected by existing sources inside and outside the Reservation.

The maximum pollutant concentrations recorded at Ignacio are well below applicable National Ambient Air Quality Standards (NAAQS) for most pollutants, although hourly concentrations of ozone approaching the federal standard have been observed occasionally.”

Although potential sulfur dioxide emissions from the Proposed Action and Alternatives would be minimal (occurring only due to trace levels of sulfur in the diesel fuel used by heavy equipment during construction), maximum sulfur dioxide impacts within Mesa Verde National Park were predicted to be 0.04 (3-hour), <0.01 (24-hour), and <0.01 (annual) $\mu\text{g}/\text{m}^3$, as reported in the DEIS (page 4-15; TABLE 4-1 Predicted Mandatory Federal PSD Class I Area Cumulative Impacts (in $\mu\text{g}/\text{m}^3$); Alternative 3 (Proposed Action)). These values are very small when compared with the applicable PSD Class I increments (25, 5, and 2 $\mu\text{g}/\text{m}^3$, respectively), and infinitesimal when compared with the applicable Colorado and National Ambient Air Quality Standards (695, 365, and 80 $\mu\text{g}/\text{m}^3$, respectively). Potential impacts in the PSD Class I Weminuche Wilderness Area were predicted to be even less.

As stated in the “Air Quality Impact Assessment Technical Support Document” (page 5; Dames and Moore 2000):

VOC [Volatile Organic Compounds; precursors to ozone formation] emissions resulting from the proposed development will be negligible, because no natural gas liquids (NGL) will be produced. In addition, the natural gas produced is

almost pure methane and ethane (see Table 2-1), which are not considered VOC's by EPA, because these compounds do not participate in photochemical formation of ozone.

Without a rigorous source-receptor transport analysis, it is unknown why "Mesa Verde National Park has been detecting a steady increase in growing season ozone and sulfur levels since the mid 1990's." However, large sulfur dioxide emission sources directly upwind, and private-motor-vehicle use by the 600,000–700,000 visitors to the Park annually, are potential sources of increased ozone and sulfur levels observed in Mesa Verde National Park.

A7 The EIS analyzes impacts on adjacent land that may be affected by the proposed action or Alternatives (please see Section 4.13, CUMULATIVE IMPACT ASSESSMENT). The EIS Study Area (Figure 1-1) was determined to be the cumulative-impact-assessment area for most resources. Assessments of air quality and socioeconomic impact take place over a larger Study Area, however, because their impacts are more far reaching.

A8 There is no NPS land next to the Study Area. With the exception of air quality impacts, gas development activities in the San Juan Basin should not impact NPS land. Viewshed impacts on Mesa Verde National Park are not predicted to be significant (please refer to Section 4.2).

DEIS comments also help to establish whether additional issues have emerged since the initial scoping effort. When additional issues are identified, we analyze them and address them in the final EIS. If these issues were to present significant new information or circumstances not previously addressed, we would consider reissuing the DEIS. Our analysis of comments, however, suggests that the scoping issues remain contemporary, and that no new, significant issues have been presented through comment on the DEIS.

A9 Although Mesa Verde National Park (the Park) is about two miles away from the western edge of the Study Area, the area of proposed oil and gas development is approximately 20 miles east of the Park. Impacts on Park land are addressed in Sections 3.2.5, Regulatory Framework; 3.3.4.1 TES Plant Species; 3.4.1.3, Stratigraphy; 3.8.3, Archaeological and Historical Sites; 4.2, Air Quality and Climate; and Section 4.13.2.3, Future Oil and Gas Development on nontribal Lands.

The EIS presents detailed analyses of dust, drilling, and production equipment emissions (including impacts on Mesa Verde's Class I Air Designation), as well as other air-quality-related impacts (see Sections 3.2 and 4.2 on Air Quality). Potential air quality impacts are also presented in Sections 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery; 4.2.7, Cumulative Impacts; 4.2.2, Impacts Common to All Alternatives; 4.2.5, Alternative 3 Enhanced Coalbed Methane Recovery; 4.2.8, Mitigation Summary; 4.6.1.2, Impact Types; 4.6.9, Unavoidable Adverse Impacts; and 4.13.3.1, Air Quality.

Noise (Section 4.11) does not impact Mesa Verde. Gas development and operation activities would occur at a distance of 20 miles or more from Mesa Verde National Park.

Night lighting is not an issue. The Hogback, other geographic features, and sheer distance from Mesa Verde NP provide effective screening.

Viewshed Impacts are disclosed in Sections 3.2, 3.9, 4.2, and 4.9.

Wildlife impacts are disclosed in Sections 3.3 and 4.3 and in Appendix G, Biological Assessment. The Biological Resources Section and the Biological Assessment have been revised to more thoroughly describe impacts on Biological Resources. There should be no or very limited interaction between activities in the Study Area and wildlife that inhabit the National Park.

Ground water and surface water quality impacts within the San Juan River hydrologic system are presented in Sections 3.5, 4.5, and 4.13.3.4. The mitigation and “Best Management Practices” presented in Section 4.5 should adequately protect soils and minimize erosion. There is no hydrological connection between downbasin activities in the Study Area and hydrological regimes in Mesa Verde National Park.

Oil and gas production activities on the Southern Ute Reservation do not measurably affect traffic volumes on Highway 160. Most gas industry traffic flows between the Study Area and the Aztec-Farmington areas south of the Study Area. There is very limited, if any, gas industry traffic between Mesa Verde NP and Hesperus.

Responses to Comment “B” from Noah Volz, Individual

B1 Technical evidence regarding reservoir characteristics presented during COGCC hearings (Case 112, DOCKET 004-AW-05, 06) demonstrates that additional production wells are needed for the maximum recovery of the CBM gas reserves in the Fruitland Formation of the Ignacio-Blanco oil and gas field.

B2 The coal bed methane reserves in the Fruitland Formation of the Ignacio-Blanco field are expected to remain economic for approximately 30 to 60 years. Each well begins to produce immediately after completion.

A typical coalbed methane well in La Plata County will pay \$277,000 in *ad valorem* taxes to the County and \$85,000 in State severance taxes, according to data presented to the COGCC by a consortium of operators in the large infill application of 2000 (Case 112, DOCKET 004-AW-05, 06). Over a 30-year average well life, this equals approximately \$12,000 per year for use of 2.5 acres.

B3 Development of a single oil or gas well requires 6 months to a year. This period includes identifying an appropriate location, land surveying, conducting archaeological and endangered-species surveys, approval of appropriate permits and rights-of-way, constructing access road and well pads, well drilling and completion, and connection to a gas-gathering pipeline, as described in Chapter 2.8.

Well development is assumed to occur over a 20-year period. This acknowledges that all the wells envisioned in the RFD would not be developed simultaneously due to physical factors, such as rig availability, as well as economic and strategic factors.

B4 We believe that the Alternatives are responsive to the EIS Purpose and Need, which is to evaluate tribal gas development options and to meet the intent of NEPA to inform decision makers and the public of the reasonable Alternatives and their environmental consequences.

Responses to Comment “C” from Sage Remington, Southern Ute Grassroots Organization

C1 The public meeting used an “open house” format. There was no formal agency presentation, but an interdisciplinary team of agency specialists was available to describe all aspects of the DEIS and solicit public comments. The meeting format was designed to provide for one-on-one interaction between agency officials and the public. After many years of conducting public-involvement processes for both large and small projects, we have found that the open house format is the most engaging and least intimidating format for the public. It offers an opportunity for us to discuss and more fully explore the issues with concerned individuals.

Responses to Comment “D” from Balty Quintana, Ignacio Town Manager

D1 According to the CDOT, a work plan is being developed for this intersection. The work plan is not yet final, but will probably involve installing a traffic light, improving the turning radius, and increasing the weight capacity of the road surface.

Responses to Comment “E” from Carl Weston, Individual

E1 For a programmatic EIS such as this, Federal regulations require at least a 60-day public-review period from the date the EPA notice appears in the Federal Register. We provided a comment period of 75 days, from January 5, 2001, until March 20, 2001, and accepted all late comments.

E2 Please see the response to Comment C1.

E3 Environmental Justice (Executive Order No. 12898, February 1994), is “intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority communities and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment.”

EPA guidelines (CEQ 1998) for evaluating the potential adverse environmental effects of projects require specific identification of minority populations when either: 1) a minority population exceeds 50 percent of the population of the affected area, or 2) a minority population represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit, as a whole.

Oil and gas development on the Southern Ute Indian Reservation should not affect human health in area communities—minority, low-income, or otherwise—and will not discriminate against minority or low-income communities in hiring or any other matters.

An extensive effort has been made to give all interested parties access to public information and to provide opportunities to participate in the review process for the project. Please refer to Chapter 5 for a description of the public-notification process.

No specific group, minority or otherwise, is affected discriminatorily by oil and gas development on the reservation. The tribe’s development of its resources is obviously most beneficial to itself, but we believe the local economy also benefits, in the form of well-paying jobs and tax income to La Plata County. The EIS will be made available to all interested parties for review and comment, to ensure that the analyses and conclusions regarding environmental justice and all other issues are comprehensive and reasonable.

Responses to Comment “F” from M. Theresa Fitzgerald, Individual

F1 Please see response to Comment C1.

F2 Analysis of a No Action Alternative is required by NEPA regulations, 40 CFR 1502.14 (d); in this case, “no action” represents continuation of the existing management program.

Responses to Comment “G” from Heather Snow, Individual

G1 Some sections could be a bit complex due to the scientific nature of the topics. We have made numerous revisions to the FEIS to make it a clearer document.

G2 Comment noted. Ms. Snow understood the concepts we conveyed at the public meeting.

G3 We have strived to ensure that the information presented in the EIS is that which is needed to make informed decisions regarding future oil and gas development on the Southern Ute Reservation.

Responses to Comment “H” from Darsi Olsen, Individual

H1 The 3M study does not address hydrogen sulfide occurrence in the Fruitland Formation, but, rather, addresses whether or not 160-acre well spacing would affect methane seepage at the outcrop.

Please note that hydrogen sulfide seeps are a natural phenomenon along the Fruitland outcrop.

To date, the BLM’s outcrop-monitoring program has confirmed some increases in hydrogen sulfide concentrations in the soil gas along the Fruitland outcrop on the Southern Ute Indian Reservation. North of the Southern Ute Indian Reservation, we have not observed increases in hydrogen sulfide concentrations.

The occurrence of hydrogen sulfide is difficult to predict. Given its historic occurrence along the outcrop, it is also difficult to determine if CBM development is responsible for all recently observed occurrences of hydrogen sulfide. The BLM continues to monitor for hydrogen sulfide along the Fruitland outcrop.

H2 The EPA is responsible for establishing National Ambient Air Quality Standards for air pollutants considered harmful to public health and the environment in areas where the general public has access (“ambient” locations). The primary standards set limits to protect public health, including the health of “sensitive” populations (such as asthmatics, children, and the elderly). The secondary standards set limits to protect public welfare, including protection against decreased visibility or damage to animals, crops, vegetation, and buildings. To date, the EPA has established these standards for six air pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter (in two size ranges), and sulfur dioxide. In addition, the U.S. Congress (in the Clean Air Act, Section 116) authorized local, state, and tribal air quality regulatory agencies to establish air quality standards as stringent as, or more (but not less) stringent than, the Federal standards.

The DEIS listed these standards in Table 3-2 (page 3-10; Applicable Ambient Air Quality Standards and PSD Increment Values (in $\mu\text{g}/\text{m}^3$)).

There are no applicable Federal, Colorado, or New Mexico Ambient Air Quality Standards for ethylene, methane, or BTEX (benzene, toluene, ethylbenzene, and xylene), although the EPA is working with state, local, and tribal governments to reduce emissions of 188 HAPs (including the BTEX chemicals) in the environment. These HAPs are known or suspected to cause cancer or other serious health effects, such as reproductive effects, birth defects, or other adverse environmental effects.

Since the produced natural gas would be nearly pure methane and ethane, no significant BTEX emissions would occur due to the Proposed Action or Alternatives, although CBM recovery wells and injector well and pipeline compressor engines would emit small amounts of formaldehyde. Maximum formaldehyde (also a listed HAP) impacts were described in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced

Coalbed Methane Recovery).

Neither ethylene nor methane is classified as a HAP or has demonstrated toxic health effects, although both chemicals are explosive at high concentrations.

H3 Please refer to the discussions in Chapters 3 and 4 concerning hydrogen sulfide. Since the produced natural gas would be nearly pure methane and ethane, with little or no sulfur, no significant hydrogen sulfide emissions would occur due to the Proposed Action or Alternatives.

Although there are no Federal or Colorado Ambient Air Quality Standards for hydrogen sulfide, the State of New Mexico has established a hydrogen sulfide standard of 0.010 ppm (1-hour average, not to be exceeded more than once per year).

In addition, hydrogen sulfide was removed from EPA's HAP list in 1991, but it is extremely toxic at concentrations above 300 parts per million (ppm), and the ability to smell it (a "rotten egg" odor) is lost in 2 to 15 minutes at 100 to 150 ppm. The Occupational Safety and Health Administration (OSHA) has established a Permissible Exposure Limit of 10 ppm (averaged over an 8-hour work shift), and a Short Term Exposure Limit of 15 ppm (15-minute average).

For any proposed Federal and Indian Oil and Gas Leases where formations would be penetrated that are known (or that could reasonably be expected) to contain concentrations of hydrogen sulfide of at least 100 ppm in the gas stream, BLM Onshore Oil and Gas Order No. 6 (Hydrogen Sulfide Operations) identifies uniform national requirements and minimum standards of performance expected from operators in order to protect public health and safety, as well as personnel essential to maintaining control of the well.

Please also see Comment Response H2.

Responses to Comment “I” from Ken Jacobsen, US Army Corps of Engineers

I1 We have made the suggested revision in Chapter 4, Section 4.5.2.8.

I2 Please see response to Comment I1.

I3 Please see response to Comment I1.

I4 Please see response to Comment I1.

I5 Please see response to Comment I1.

Responses to Comment “J” from Bill Walsh, USDI Bureau of Reclamation

J1 We have modified Section 3.6.2 and annotated Map 17 in the FEIS to reflect the Federal land status of Navajo Reservoir.

J2 We have expanded the description of the Florida Water Conservancy District (FWCD) in Section 3.6.4.6. Benefits associated with the FWCD include irrigation for agriculture and livestock grazing, recreation, and flood control. Flood control is not impacted by oil and gas development, and is beyond the scope of this EIS. Although the FWCD is not specifically mentioned in Chapter 4, impacts on irrigation, agriculture, livestock grazing and recreation in the Study Area were analyzed throughout Section 4.5.2 (Surface Water) and Section 4.6 (Land Use and Ownership). The result of these analyses, as described in both the DEIS and FEIS, is that we predict the impacts on these resources to be insignificant.

J3 We have modified Sections 3.6.5.3 and 4.13.2.7 in the FEIS to reflect the current status of the Animas-La Plata Project.

Responses to Comment “K” from Carl Watson, State of Colorado, Department of Transportation

K1 Information obtained from CDOT and the La Plata County Road and Bridge Dept. this year (2001) indicates that background traffic has increased on the roads within the Study Area since 1996. The predicted amount of oil and gas traffic related to the three Alternatives in the EIS, however, has not changed. Therefore, the result of comparing the predicted amount of oil and gas traffic to year 2000 traffic data would be that the relative intensity of the impacts would be even less than the intensity of the impacts based on 1996 data. The use of 1996 traffic data results in a “reasonable, but conservative” analysis that presents the maximum intensity of transportation impacts from the predicted amount of oil-and-gas-related traffic. For this reason, year 2000 traffic data were not used in the preparation of the FEIS.

K2 Section 3.7.5 presents the assumptions used for projecting trips for the baseline traffic data. Both installation and maintenance trips are assumed to be distributed randomly throughout the year. For the purpose of the study, daily service trips are computed by estimating the actual number of workdays required for each well type per year, then dividing by 365. We believe that the 365-day assumption used in the study is appropriate, rather than a standard 260-day work year, since the well production and service industry truly works 365 days per year to produce and maintain gas flows.

K3 The 10 and 25 percent thresholds of significance presented in Section 4.7.1.1 are based on the professional judgement and expertise of the preparers of the EIS. It is important to note that the transportation analysis of the three EIS Alternatives predicts a maximum traffic volume increase of only 6 percent on any potentially impacted highway in the Study Area (Sections 4.7.4, 4.7.5, 4.7.6 and 4.7.7). Using the significance criteria in Section 4.7.1.1, these predicted traffic volume increases are defined as having no perceivable impact. This determination is justified, because a 6 percent traffic volume increase would not necessitate any highway upgrades or modifications, unless the increase were from truck traffic alone, which is not the case for this project.

K4 These projections are presented in sections 4.7.4, 4.7.5, and 4.7.6. Neither traffic accident rates nor the number of accidents are expected to increase as a result of any of the three Alternatives considered (Section 4.7.7.3). Projected increases in traffic volumes are not anticipated to create additional hazards or vehicle conflicts. Additionally, substantial amounts of tribal land are off limits to the average person, minimizing further the chance of encounter.

K5 US Hwy.160 is north of and runs parallel to the Study Area boundary, but does not receive much of the gas industry traffic associated with development on the Reservation. Most of the gas industry traffic accesses the portion of the Ignacio Blanco Field in the Study Area from the Aztec, Farmington, and Bloomfield areas. Based on the analysis presented in Section 4.7,

however, it can be assumed that even if all the potential oil and gas traffic related to any of the three EIS Alternatives used Highway 160, the associated traffic volume increase would not be more than 6%. No perceivable impact would result from a 6% traffic volume increase, as described in Comment Response K3.

K6 We have revised Section 4.7.2.2 to indicate that this project is nearing completion.

K7 According to CDOT, the plan to improve this intersection is nearly complete. CDOT Traffic and Safety Engineer Ed Deming has meet with local residents and the Ignacio planning commission to discuss adding a traffic signal to the intersection and changing current parking spacing on the east side of the intersection, to improve the turning radii. Residents are in favor of increasing the turning radii and installing the conduit for future installation of a traffic signal. The weight-bearing capacity of the intersection may be increased, as well.

K8 According to Carl Watson of the CDOT, this bridge is not scheduled for replacement. The CDOT is currently developing a proposal to reconstruct the bridge, however, in order to make it more structurally sound. Funding for this project should be available in 2002.

Responses to Comment “L” from Balty Quintana, Town Manager, Ignacio

L1 The traffic analysis concludes that about 66% of the traffic volume associated with the Alternatives in the EIS would use State Highways 140 and 550 (Section 4.7.1.1). Most of the traffic associated with potential oil and gas development would originate from south of the Study Area (e.g., Farmington) and would not pass through this intersection.

L2 Please see Comment Response K7.

L3 Please see Comment Response K7.

L4 According to Carl Watson of the CDOT, this intersection is currently the subject of a Traffic/Safety Project, and CDOT has met with local residents and the Ignacio city planner to discuss signalizing the intersection, with the objective of making it safer for all pedestrians. Residents favor increasing the turning radii and installing conduit for future installation of a traffic signal. The weight-bearing capacity of the intersection may be increased, as well. The issue of dust near this intersection is a CDOT responsibility. As noted in Comment Response K3, the maximum increase of traffic volumes as a result of any of the three EIS Alternatives is 6 percent. This potential increase is considered to have no perceivable impact.

Responses to Comment “M” from Cynthia Cody, US Environmental Protection Agency

M1 The requested information was transmitted to the EPA on 3/21/01. The transmittal letter documented the verbal agreement between BLM and EPA that EPA would submit comments within one week of receiving the requested information.

M2 We have revised Section 2.9.2 and Appendix E in the FEIS in response to this comment.

M3 Please see the response to comment M2. The DEIS was made available on the Internet at <ftp://ftp.co.blm.gov./pub/sutedrafeis/pdfs/>. This site has been updated and now includes the FEIS and its revised references and appendices. Both the DEIS and FEIS were/are available on CD, as indicated in the “Dear Reader” letters that were sent to all parties on the mailing list before distribution of both the DEIS and FEIS.

M4 Please see response to comments M1 and M2.

Responses to Comment “N” from Mark Pearson, San Juan Citizens Alliance

N1 The BLM and the SJCA agreed during a 3/20/01 phone conversation that the SJCA would submit its comments by 3/30/01.

N2 Please see response to comments M1, M2, and M3.

N3 Consultation with the United States Fish and Wildlife Service was in progress when the DEIS was issued, and the DEIS contained a complete wildlife impact analysis for public review. USFWS consultation will be completed before the issuance of the Record of Decision for this EIS. The final Biological Assessment is included in Appendix G. The wildlife impacts and mitigation disclosed in the final Biological Assessment and the FEIS do not differ significantly from the impacts and mitigation disclosed in the DEIS.

N4 The DEIS was published with printed figures in the document. The BLM underestimated the number of printed copies that would be requested. Consequently, some readers received the DEIS as a printed document with an enclosed compact disc containing electronic versions of the figures. The BLM did offer to print the figures if requested and copies of the DEIS and all figures were available at the San Juan Public Lands Center. While this may have made the review more time consuming for some parties, the BLM made every effort to meet the public’s needs related to the DEIS. The comment period for the DEIS was 75 days. The DEIS was also available on the Internet at <ftp://ftp.co.blm.gov/pub/sutedrafeis/pdfs/>. This site has been updated and now includes the FEIS. Both the DEIS and FEIS were/are available in their entirety on CDs. Please also see Comment Response M3.

Responses to Comment “O” from Mark McMillan, State of Colorado, Air Pollution Control Division

O1 You identified an error in the emission stack diameters listed in Table 6-4 of Volume I - Emissions Inventory and Near-field Analysis of the Air Quality Impact Assessment Technical Support Document (page 38, Emission Parameters for Sources on Tribal Lands Included in the Cumulative Impact Analysis). This error involved a unit-of-measure conversion factor for the emission source stack diameters. The erroneous values were used only in the carbon monoxide and nitrogen dioxide near-field production phase analyses, and not the near-field construction, near-field formaldehyde, or any of the far-field modeling analyses.

The correct emission parameters for sources on tribal land (including the emission stack diameters) have been revised in Table 6-4 of the “Air Quality Impact Assessment Technical Support Document” (pages 38 through 40; Dames and Moore 2000). In addition, the carbon monoxide and nitrogen dioxide near-field production phase impacts were reanalyzed, based on the correct emission stack diameter values. The correct results are somewhat higher than the erroneous values reported in Dames and Moore (2000).

Specifically, the maximum total (background plus modeled) cumulative carbon monoxide values were predicted to range between 4,376 to 5,530 $\mu\text{g}/\text{m}^3$ (1-hour) and between 2,931 to 3,651 $\mu\text{g}/\text{m}^3$ (8-hour), compared to the values reported in Dames and Moore (2000): between 3,637 to 5,562 $\mu\text{g}/\text{m}^3$ (1-hour) and between 2,912 to 2,929 $\mu\text{g}/\text{m}^3$ (8-hour). These revised values are still well below the applicable carbon monoxide NAAQS of 40,000 $\mu\text{g}/\text{m}^3$ (1-hour) and 10,000 $\mu\text{g}/\text{m}^3$ (8-hour), respectively.

The maximum cumulative annual nitrogen dioxide values varied, based on the three different assumed compressor engines’ NO_x emission scenarios, and have been revised in Tables 6-6 through 6-8 of the “Air Quality Impact Assessment Technical Support Document” (pages 49 through 51; Dames and Moore 2000). Revised isopleths of the predicted annual average nitrogen dioxide concentrations are also provided for Figures 6-3 through 6-5 (pages 52 through 54; Dames and Moore 2000).

The correct values range as follows: 31.2 to 37.6 $\mu\text{g}/\text{m}^3$ for the 1.0 g/hp-hr scenario (which reflects currently available, clean-burning equipment); 31.9 to 38.7 $\mu\text{g}/\text{m}^3$ for the 1.5 g/hp-hr (recently permitted equipment), and 32.6 to 39.8 $\mu\text{g}/\text{m}^3$ for the 2.0 g/hp-hr (historically permitted equipment).

As stated in Dames and Moore (2000), these maximum modeled cumulative air quality impacts are above the nitrogen dioxide PSD Class II increment of 25 $\mu\text{g}/\text{m}^3$. Since this air quality impact assessment is not a regulatory PSD increment consumption analysis, these results are presented for disclosure purposes only. Given the reasonable but conservative nature of the modeling analysis, the speculative nature of the programmatic EIS, and the likely inclusion of existing emission sources that are not subject to the PSD program, it is unlikely that actual exceedances of the nitrogen dioxide PSD Class II increment would occur.

The maximum total (background plus modeled) annual cumulative nitrogen dioxide values (depending on the assumed compressor engines NO_x emission scenario) range from 46.3 to 54.9 µg/m³, still well below the applicable nitrogen dioxide NAAQS of 100 µg/m³.

O2 Please see Comment Response O1.

O3 Please see Comment Response O1.

O4 As described in Comment Response A1, Federal land management agency decisions must ensure continued compliance with all local, state, tribal, and Federal air quality laws, statutes, regulations, standards, and implementation plans, as required by Section 176(c) of the Clean Air Act. These agencies also have discretionary authority to include operational stipulations in a “record of decision,” based on oil and gas lease terms (Section 6) that require the lessee, within the lease rights granted, to take measures deemed necessary by the lessor for the conduct of operations in a manner that minimizes adverse impacts on air quality, as well as other resources. This may include requirements for post-approval air quality monitoring.

As stated in the DEIS (page 4-25; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.8 Mitigation Summary-Monitoring):

The need for, and the design of, additional monitoring could include the involvement of the EPA Region VIII Federal Leadership Forum and applicable air quality regulatory agencies. Based upon future recommendations, operators could be required to cooperate in the implementation of a coordinated air quality monitoring program.

Please also see Comment Response A1.

O5 The need for, and specific design of, additional monitoring would be determined in the Record of Decision, after the NEPA environmental analysis process is completed. It is likely, however, that any required air quality mitigation measures (including monitoring) would be based on the uncertainty that the Proposed Action or Alternatives may proceed without causing “significant, adverse” air quality impacts.

As stated in the DEIS (page 4-9; 4.2 AIR QUALITY AND CLIMATE; 4.2.1 Issues, Impact Types, and Criteria):

Air quality regulations require proposed new, or modified existing, air pollutant emission sources (including nitrogen injectors and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the applicable air quality regulatory agencies have the primary authority and

responsibility to review permit applications and to require emission permits, fees and control devices, prior to construction and/or operation.

They can also require pre- and post-construction monitoring. The type of “more extensive monitoring network” recommended by the Respondent is best required through the air pollutant emission source permitting process. The Respondent should contact the applicable air quality regulatory agency directly, to request that “PSD-quality meteorological towers, NO₂, and O₃ monitors” be required before issuing an air pollutant emissions permit.

O6 Please see Comment Responses A1 and A2.

O7 Noise and dust impacts and mitigation measures are presented in Section 4.2., Section 4.11, Section 4.13.3.1, and Section 4.13.3.10. Odor was not considered to be an issue because the natural gas that would be produced under any of the Alternatives is “sweet” (does not contain sulfur compounds), so no objectionable odors are likely to occur.

O8 The San Juan District Office of the BLM is aware of the existence of the P2 team and will contact it as appropriate.

Responses to Comment “P” from Susan Murray, Individual

P1 The DEIS analyzes, as a minimum, continuation of current permitted drilling and other drilling and infill drilling Alternatives because these are legally permissible activities that will occur in some manner and degree on the Southern Ute Indian Reservation under existing oil and gas leases. The Alternatives follow NEPA guidelines and reflect management strategies that address the tribe’s goal to develop and manage its resources for the benefit of tribal members.

P2 The BLM and BIA believe that the risk of new CBM wells contaminating drinking water sources in the Study Area is extremely small. In most cases of thermogenic methane contamination in shallow, domestic-water wells, the offending gas well has been an old, poorly constructed, conventional gas well. Many older wells did not have casing cemented to surface, so gas could migrate up the outside of the casing and then into the shallow aquifer system. All newer wells must be cemented to surface. This practice blocks the connection between the producing formation and overlying shallow aquifers and significantly reduces the potential for new wells to contaminate the shallow groundwater with methane.

The BLM and the COGCC require operators to inspect the bradenhead pressures of their wells annually. This practice helps identify potential sources of methane contamination, and the operators are required to remediate any mechanical issues immediately. This monitoring and remediation process provides for additional protection measures for shallow aquifers.

P3 The Fruitland Formation has sustained enormous pressures over the millennia because it is a confined aquifer system. There have been hundreds of wells drilled in the Fruitland Formation in Colorado. None of these wells has reported a nonartesian water level. This means that the Fruitland Formation is truly confined, not a “mostly closed system.”

Decreasing water levels in shallow aquifers can be linked to changes in land use. As more and more shallow domestic wells are drilled, the depletion of the shallow aquifers is accelerated. As more irrigated, agricultural land is converted to subdivisions, a major source of recharge is removed from the system. The effect will be overdrafting the shallow aquifers, with associated decreases in the water table.

As noted above, the Fruitland Formation has excess or artesian pressures maintained by the overlying Kirtland Shale and the underlying Lewis Shale. In other words, these shales effectively separate the underground water systems. The water levels in the shallow aquifer are independent of what is occurring in the Fruitland Formation.

Fractures in the Cretaceous rocks are ubiquitous. These fractures do not form a continuous network, however, where fluids can migrate thousands of feet vertically in an efficient manner. Evidence for this is the artesian pressure in the Fruitland Formation.

If fractures were an effective route for water and/or gas to migrate, there would be no artesian

pressure in the Fruitland Formation, and the gas resource would be significantly less. Faults in the Upper Cretaceous rocks are extremely rare in the San Juan Basin. Quite often faults that are evident in the Mesaverde Formation do not extend up into the Fruitland Formation or Kirtland shale. To date, no faults have been identified that could be a route for water and/or gas to migrate into or out of the Fruitland Formation.

P4 Section 4.5 presents the effects of CBM gas development on surface and groundwater. Mitigation measures developed to protect water are described in Section 4.5.1.8.

Responses to Comment “Q” from David R. Brown, Amoco Production Company/BP

Q1 Injection of fluids into producing wells for matrix stimulation is addressed in Section 2.8.5.1. In addition, Sections 4.4 and 4.5 discuss stimulation of producing wells.

Q2 The 3M study concluded that a regional discontinuity between the Fruitland formation in the center of the San Juan Basin and the outcrop of the Fruitland formation is not required in order to obtain a match between historical data sets. A local discontinuity may be present in the Valencia Canyon area.

Q3 The recommended change has been made globally in the FEIS.

Q4 See response to comment Q-2.

Q5 The FEIS has been revised to reflect the current status of the 3M Study. The three Ms in the 3M Project stand for Mapping, Modeling, and Monitoring. The Colorado Geological Society open-file report on the Mapping was issued in July, 2000. The Modeling studies prepared with BLM, SUIT, and COGCC oversight were issued in January 2001. The Monitoring of soil vapor tubes and monitor wells by the BLM, SUIT, and COGCC is ongoing. Additional monitoring locations will be constructed over the next several years.

Q6 As described in the “Air Quality Impact Assessment Technical Support Document” (Earth Tech 2000): “The MM4 data set of 1990 was prepared by the EPA for use in modeling studies, to supplement observations in data sparse areas (NCDC, 1995),” including the complete technical reference “National Climatic Data Center (NCDC), 1995. MM4 - 1990 Meteorology Data, Federal Building, 151 Patton Avenue, Asheville, NC 28801-5001.”

Q7 These changes will be incorporated into the Final EIS.

Q8 The following sentence has been added to the Final EIS:

“■ transport of air pollutants from emission sources located outside the Reservation.”

Q9 As previously stated in the DEIS (page 3-4; Chapter 3; 3.2 AIR QUALITY AND METEOROLOGY; 3.2.4 Existing Air Quality): “The maximum pollutant concentrations recorded at Ignacio are well below applicable National Ambient Air Quality Standards (NAAQS) for most pollutants, although hourly concentrations of ozone approaching the federal standard

have been observed occasionally.”

However, Table 3-1 (page 3-6; Measured Concentrations of Regulated Air Pollutants at the SUI Monitoring Station near Ignacio (in $\mu\text{g}/\text{m}^3$)) includes both short- and long-term average data, therefore the recommended change in the third paragraph is not appropriate.

Q10 Table 3-1 (Measured Concentrations of Regulated Air Pollutants at the SUI Monitoring Station near Ignacio (in $\mu\text{g}/\text{m}^3$)) has been revised to include the most recent data available. PM_{10} data, however, are not available after 1996.

Q11 The following sentence will be appended to the second paragraph:

“Recently, EPA Region 8 began issuing Major Source Permits for sources located on tribal lands regardless of previous permitting by the CDPHE-APCD.”

Q12 On February 27, 2001, the Supreme Court upheld EPA’s authority to set new 8-hour ozone and fine particulate matter ($\text{PM}_{2.5}$) ambient air quality standards, stating that the Clean Air Act “unambiguously bars cost considerations” when EPA sets air quality standards, but that EPA can consider costs when directing the applicable air quality regulatory agencies on how to implement the new standards. The Court further directed EPA to revise its previously proposed methods to implement these new ambient air quality standards, but the statements in the DEIS are correct. Therefore, no revision is necessary in the Final EIS.

Q13 The referenced sentence will be revised as follows: “Finally, an analysis of cumulative impacts due to all existing sources, and the permit applicant’s sources, is also required to demonstrate that applicable ambient air quality standards will be complied with during the operational lifetime of the permit applicant’s operations.”

Q14 Although “exceeded” may describe the situation better, “violated” and “violation” are direct quotes from the referenced document. Therefore, no revision is necessary in the Final EIS.

Q15 These changes will be incorporated into the Final EIS.

Q16 These changes will be incorporated into the Final EIS.

Q17 As stated, the sentence indicates that the Clean Air Act requires that new proposed, or modified, air pollutant emission sources undergo a permit *review* before construction begins.

This does not mean to imply all sources (regardless of size or type) must *obtain* a permit before construction begins. The review may determine that a proposed source would emit air pollutants below an established *de minimis* level, therefore no further permitting would be required.

With respect to emission sources on tribal land, the EPA is responsible for regulating air pollutant emissions until such time that EPA formally delegates that responsibility to a recognized tribal air regulatory authority through an approved Tribal Implementation Plan. Therefore, no revision is necessary in the Final EIS.

Please also see Comment Response Q28.

Q18 Please see Comment Response H2.

Q19 The referenced sentence will be revised as follows:

These SO₂ emissions would be temporary, occurring only during the limited 36-day construction period at each well location. The maximum modeled concentrations (including representative background values of 57 and 23 µg/m³, respectively) would be nearly 702 µg/m³ (3-hour) and 133 µg/m³ (24-hour).

Q20 As described in the DEIS (page 4-8; 4.2 AIR QUALITY AND CLIMATE; 4.2.1 Issues, Impact Types, and Criteria):

This analysis was prepared solely under the requirements of NEPA, in order to assess and disclose reasonably foreseeable impacts to both the public and the Bureau decisionmaker before a Record of Decision is issued. Due to the preliminary nature of the programmatic NEPA analysis, it should be considered a “reasonable, but conservative” upper estimate of predicted impacts. Actual impacts at the time of development (subject to air pollutant emission source permitting) are likely to be less.

Given this “programmatic” nature, specific source locations are not known. Since it is possible that an actual source could be situated just within the tribal boundary, the predicted impacts could occur outside the Reservation, and comparison to Colorado Ambient Air Quality Standard is appropriate. Therefore, no revision is necessary in the Final EIS.

Q21 As stated in the DEIS (page 4-11; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery):

Maximum direct NO₂ impacts during operations were predicted based on assumed NO_x emissions from reasonably foreseeable CBM recovery wells, injector well

and pipelines compressor engines. However, given the uncertain and preliminary nature of potential development, three different NO_x emissions rates were used: 1.0 grams per horsepower-hour (g/hp-hr; which reflects currently available, clean burning equipment), 1.5 g/hp-hr (which reflects recently permitted equipment), and 2.0 g/hp-hr (which reflects historically permitted equipment). The highest emission rate represents compression engines using proven technology which would ensure this level of control could be continuously achieved. The lowest emission rate represents compression engines using emerging technology which would be more difficult to guarantee throughout the LOP.

The use of compressor engines with uncontrolled NO_x emissions is simply not reasonably foreseeable, therefore, no revision is necessary in the Final EIS.

Q22 As stated in the “Air Quality Impact Assessment Technical Support Document” (page 30; Dames and Moore 2000):

Table 6-1 presents NO_x, CO and formaldehyde emissions data for Alternative 3. This table represents the maximum level of development and presents emissions for the three compressor engine NO_x emission scenarios considered in this analysis (1.0, 1.5 and 2.0 g/hp-hr). These emission rates reflect potential emissions. It has been shown that the use of a maintenance program to routinely verify proper engine tuning will result in substantially lower emissions.

It should be noted that the assumed level of NO_x control cannot be achieved on all sizes of engines. At the present time, it is difficult to achieve this level of NO_x control on engines of less than 500 horsepower output.

In developing the air quality impact assessment, we determined that assuming a minimum compressor size of 500 horsepower is reasonably foreseeable. Therefore, no revision is necessary in the Final EIS.

Q23 The comparisons of predicted air quality impacts presented on pages 4-11 through 4-12 of the DEIS (Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery) to the PSD Class II increments are for that Alternative’s sources alone. The comparisons of predicted air quality impacts presented on pages 4-14 through 4-16 of the DEIS (Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.7 Cumulative Impacts) to the PSD Class I increments are for that Alternative’s and other existing or reasonably foreseeable sources combined.

It should be noted, however, that these comparisons are *not*, in any way, intended to be complete regulatory PSD Increment Consumption Analyses, but simply assessments indicating the increment would not be exceeded by either the maximum direct emission sources alone, or the total cumulative emission sources combined. Many of the potential air pollutant emission

sources were analyzed at their maximum assumed emission levels; actual emissions and their related air quality impacts are typically less. In addition, the analysis did not attempt to determine which of the cumulative sources are legally subject to the PSD increment-consumption regulations. At the time of a preconstruction air quality permit application review, the applicable air quality regulatory agencies may require a much more detailed PSD Increment Consumption Analyses.

Q24 The following “reasonable, but conservative” assumption listed on page 4-13 of the DEIS (Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery) sentence will be changed as follows:

- Maximum measured background criteria air pollutant concentrations were assumed to occur at all locations in the region throughout the LOP. In addition, the maximum predicted air quality impacts would occur only in the vicinity of the anticipated emission sources. Actual impacts would be less further away from the predicted points of maximum.

Q25 As stated in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery): “Since neither the CDPHE-APCD nor EPA have established HAP standards [including formaldehyde], predicted 8-hour HAP concentrations were compared to a range of 8-hour state maximum Acceptable Ambient Concentration Levels (AACL; EPA 1997a).”

The state’s AACL’s were gathered by the National Air Toxics Information Clearinghouse (NATICH) in 1997. NATICH was an information service offered by the EPA, in conjunction with the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) organizations, to collect, classify, and disseminate toxic-air-pollutant information submitted by state and local air regulatory agencies. Although EPA has replaced NATICH with the Technical Air Toxics Website (www.epa.gov/ttn/atw/index.html), EPA no longer maintains the 8-hour state AACL lists.

Q26 As stated in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery): “The maximum formaldehyde concentration was predicted to occur at 320 m (less than one-quarter mile) adjacent to a compressor station; as the distance from the emission source increases, the predicted concentrations decrease rapidly.”

Given this “programmatic” nature of the air quality impact assessment, specific source and receptor (residence) locations are not known. However, based on the “reasonable, but conservative” analysis assumptions applied, any residences ultimately located within 320 m of a compressor station could experience these maximum potential formaldehyde impacts. Therefore,

no revision is necessary in the Final EIS.

Q27 As referenced in Comment Response Q21, given the uncertain and preliminary nature of potential development, three different NO_x compressor-engine emissions rates were used: one reflecting historically permitted equipment; one reflecting recently permitted equipment; and a third reflecting currently available, clean-burning equipment. The highest emission rate represents compression engines using proven technology that would ensure this level of control could be continuously achieved. The lowest emission rate represents compression engines using emerging technology that would be more difficult to guarantee throughout the LOP. “Using typical maintenance procedures using flue gas testing to tune compressor engines” would indeed lower potential emissions. However, the use of flue gas testing to tune compressor engines continually throughout the 20-year life of project (LOP) is simply not reasonably foreseeable. Therefore, no revision is necessary in the Final EIS.

Q28 As stated in the DEIS (page 3-7; Chapter 3; 3.2 AIR QUALITY AND METEOROLOGY; 3.2.5 Regulatory Framework):

The Clean Air Act directs the EPA to promulgate the Tribal Authority Rule, establishing tribal jurisdiction over air emission sources on both trust and fee lands within the exterior boundaries of Indian reservations. Pursuant to this rule, the SUIIT has submitted a “Treatment as a State” application to the EPA. This application requests the EPA treat the SUIIT in the same manner as a state for the purposes of Clean Air Act Section 105 grants and to formally recognize the SUIIT as an affected state when permits are written for sources within 50 miles of the Reservation boundaries (per 40 CFR 70.8 and 71.2). Affected state status would allow the SUIIT to review these permits and supply comments to applicable air quality regulatory agencies which have emission source authority.

As a result of the Tribal Authority Rule, the SUIIT has the option to develop an Operating Permits Program under Title V of the Clean Air Act. A delegation of authority would allow the SUIIT to write permits for air pollutant emission sources located within the Reservation boundary, including sources located on fee land. At the present time, this program is in the developmental stages and an evaluation has shown that such a program is economically feasible. The CDPHE-APCD has also claimed jurisdiction over air emission sources on fee land within the Reservation exterior boundary, and has issued some air pollutant emissions permits, but has not received formal Title V permitting authority from EPA for these sources. In late 1999, the SUIIT and the CDPHE-APCD signed an agreement to jointly develop an air quality program for the Reservation. The agreement specifies formation of a joint tribal-state commission, but details of the program are under development. The EPA has expressed an intent to support the joint program. However, if the EPA does not authorize a delegated authority plan, then EPA is obligated to limit emissions from air pollutant emission sources

located within the Reservation through a formal Federal Implementation Plan.

For several years before 1998 (at which time EPA issued the Tribal Authority Rule allowing tribes to be treated in the same manner as states for purposes of administering some Clean Air Act programs), CDPHE-APCD had issued permits to nontribal air pollution sources located on fee land. The EPA had (and continues to have) authority to regulate tribal air pollutant emission sources.

The State of Colorado and the Southern Ute Indian Tribe signed their historic agreement in December, 1999, to establish a joint Tribal/State Commission to set standards for the air quality program and rules and regulations pertaining to all land within the exterior boundaries of the Reservation. The Commission would be composed of three members appointed by the tribe and three members appointed by the Governor. Additionally, the tribe would receive authority from the EPA to administer air regulatory programs under the Clean Air Act. Because of the unique, intergovernmental nature of this program, both the tribe and the Colorado General Assembly enacted legislation last year (2000) to create the Commission and implement the Agreement. However, requisite Federal legislation must be in place by December 2001, or the agreement automatically terminates.

Until EPA delegates authority to SUIT under the Clean Air Act to issue permits for air pollutant emission sources located within the Reservation boundary, the Respondent is correct that “the Tribe currently does not have a minor source permitting program.”

Q29 You have cited several reasons why the air quality impacts predicted in the DEIS represent an upper estimate of potential air quality impacts that is unlikely actually to be reached, based on “reasonable, but conservative” analysis assumptions.

As stated in the DEIS (page 4-7; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.1 Issues, Impact Types, and Criteria):

Potential air quality impacts from potential CBM development were analyzed and reported in Section 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery and in Section 4.2.7 Cumulative Impacts. This analysis was prepared solely under the requirements of NEPA, in order to assess and disclose reasonably foreseeable impacts to both the public and the Bureau decisionmaker before a Record of Decision is issued. Due to the preliminary nature of the programmatic NEPA analysis, it should be considered a “reasonable, but conservative” upper estimate of predicted impacts. Actual impacts at the time of development (subject to air pollutant emission source permitting) are likely to be less.

In addition, the visibility-impact assessment has been revised, as described in Comment Response A2. Regarding the basis for analyzing three different compressor engine NO_x emissions rate scenarios, please also see Comment Response A1.

The Respondent should contact the applicable air quality regulatory agency directly, to request that nitrogen injectors and gas compression facilities not be permitted at an emission rate less than 2.0 g/hp-hr.

Q30 The entire visibility impact analysis has been revised in the Final EIS.

Q31 The referenced sentence will be revised as follows:

“■ Reduce Compression Requirements. This would reduce the need for overall LOP compression by limiting the need for injection and pipeline compressors.”

Q32 The fifth sentence in the second paragraph of Section 4.2.8 Mitigation Summary (DEIS page 4-22) will be revised as follows: “A variety of potential emission reduction measures (BLM 1999) are available to limit NO_x and other pollutant emissions.”

Q33 No change has been made to the text in this section. Produced water spill remediation would be handled on a case-by-case basis.

Q34 We are not aware of any peer-reviewed, published literature that identifies coals in the Upper Kirtland Shale or the shallower Tertiary formations. There are reports of thin, lenticular coals in the lower Kirtland Shale. There are also reports of nonassociated gas produced from the Tertiary Nacimiento Formation. This gas has been identified as having an origin from deeper, kerogen-rich source rocks, such as the Fruitland Formation.

Q35 We agree. The FEIS includes language describing the limitations of the water wells records. Water wells shown on Figure 15 have been permitted by the State Engineers Office. Although nearly all these wells have presumably been drilled, some may not have been installed. There are also an unknown number of unpermitted shallow water wells in the Study Area.

Q36 Although these papers contain relevant information, their indirect role in the development of the EIS does not warrant a reference.

Q37 Fruitland formation water quality is sufficient, in some locations, to make it a usable source for drinking water and livestock watering at distances farther than 0.5 to 1.0 miles from the outcrop. No EIS changes are necessary.

Q38 We did not modify the FEIS in response to this comment, because the suggested change

would not affect the impact analysis.

Q39 You have identified an error in the text of the DEIS. We have modified the text of the FEIS to reflect the data in Table 3-14, which accurately displays the TDS ranges for the Cretaceous formations within the Study Area.

Q40 Please see Comment Response Q36.

Q41 Agree. At the time the draft was issued, the modeling reports were not yet completed. Now that these reports have been issued, the references will be updated to show that work is finished.

Q42 Please see Comment Response Q36.

Q43 Average annual runoff in a watershed is, by convention, expressed in acre-feet of water. River discharge, measured at a gauging station, is expressed in cubic feet per second. This section is consistent with convention.

Q44 The text notes that there is a lack of information to determine baseline levels of hydrocarbons in surface water. While published and anecdotal accounts of gas seeps in the Pine River and Texas Creek (outside the Study Area) are available, there are no accounts of oil seeps that we know of. Additionally, the information available does not allow us to determine the “significance” of the gas seeps, related to baseline surface-water hydrocarbon levels in the Study Area. It is very likely that the methane seeping into the Pine, Animas, and other creeks along the outcrop volatilizes from the water by the time the rivers enter the SUIT Indian Reservation. Again, this precludes ascribing the term “significant” to baseline hydrocarbon levels in surface waters in the Study Area.

Q45 The referenced 1 mg/l threshold applies to wells associated with ECBM projects. The referenced infill order applies to Fruitland Coal seam wells drilled on fee land within the Southern Ute Indian Reservation. The 1 mg/l threshold for isotopic analysis is based on BLM policy resulting from research associated with the Tiffany ECBM Project, which found that explosive levels of methane can occur from concentrations of 1 mg/l or greater in water. The BLM believes that this policy is still valid, and no changes have been made in the FEIS in response to this comment.

Q46 The referenced statement has been revised in Section 4.5.2.8 of the FEIS.

Q47 Please see Comment Response Q46.

Q48 Please see Comment Response Q46.

Q49 Please see Comment Response Q46.

Responses to Comment “R” from Lance Astrella, Astrella and Rice PC, Attorneys at Law

R1 Contained systems have been used and will continue to be used in applicable situations, to protect resources. These site-specific determinations are applied on a case-by-case basis and are attached as conditions of approval of APDs.

Responses to Comment “S” from Carl Weston, Individual

S1 Potential direct and cumulative air quality impacts were analyzed in order to determine if significant impacts would occur due to the Proposed Action or Alternatives (as reported in the DEIS pages 4-8 through 4-22; Chapter 4; 3.2 AIR QUALITY AND CLIMATE; sections 4.2.2 Impacts Common to All Alternatives, 4.3 Alternative 1 - Continuation of Present Management, 4.2.4 Alternative 2 - Coalbed Methane Infill Development, 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery, 4.2.6 Impacts Summary, 4.2.7 Cumulative Impacts, and 4.2.9 Unavoidable Adverse Impacts).

These potential impacts are based on an understanding of the: existing conditions (as reported in the DEIS pages 3-3 through 3-6; Chapter 3; 3.2 AIR QUALITY AND METEOROLOGY; 3.2.4 Existing Air Quality); anticipated meteorological conditions, air pollutant emissions, and state-of-the-art air pollutant dispersion modeling (as reported in the Air Quality Impact Assessment Technical Support Document (2000), prepared by Dames and Moore, and Earth Tech); and the predicted maximum direct and cumulative air quality impacts.

The predicted impacts were compared to applicable air quality health and welfare standards, PSD increments, and other scientifically based impact thresholds, to determine the significance of potential air quality impacts.

For example, regarding “Maximum direct CO impacts during operation,” both the EPA and the State of Colorado have established primary Ambient Air Quality Standards for carbon monoxide (CO) to protect public health, including the health of “sensitive” populations (such as asthmatics, children, and the elderly), at concentrations of 40,000 $\mu\text{g}/\text{m}^3$ (averaged over one hour) and at 10,000 $\mu\text{g}/\text{m}^3$ (averaged over eight hours).

As stated in the DEIS (page 4-11; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery):

The maximum direct CO impacts during operation were predicted to be nearly 159 $\mu\text{g}/\text{m}^3$ (1-hour) and 110 $\mu\text{g}/\text{m}^3$ (8-hour). When these values are added to the assumed background concentration of 2,300 $\mu\text{g}/\text{m}^3$, they become nearly 2,459 $\mu\text{g}/\text{m}^3$ (1-hour) and 2,410 $\mu\text{g}/\text{m}^3$ (8-hour), demonstrating compliance with the applicable CO NAAQS of 40,000 $\mu\text{g}/\text{m}^3$ (1-hour) and 10,000 $\mu\text{g}/\text{m}^3$ (8-hour), respectively.

What this means is that there would not be any significant “health effects of living next door and down wind ...” of the Proposed Action or Alternatives “with a pre-existing cardiac condition ...” “during weather inversion conditions ...” even based on the “reasonable, but conservative” analysis assumptions applied in the DEIS.

S2 Mr. Weston and the BLM agreed during a 3/21/01 phone conversation that Mr. Weston would submit any additional comments by 3/30/01.

S3 One of the most fundamental purposes of evaluating potential air quality impacts under NEPA is to compare both the direct and cumulative impacts of Alternative proposals, before a decision is made to approve or deny a specific activity. This “pre-decisional” comparison *cannot* be made based on monitoring data alone. That is why the DEIS used state-of-the-art air pollutant dispersion modeling (calculated on an hourly basis), along with an entire year of historically observed meteorological conditions, as well as “reasonable, but conservative” air pollutant emissions assumptions, in order to determine potential significant air quality impacts, including both “localized (health) impacts” and regional environmental impacts.

S4 As described in the DEIS (page 1-9; Chapter 1; 1.7 ENVIRONMENTAL JUSTICE): “The purpose of [Executive Order 12898]...is to identify and address, as appropriate, disproportionately high or adverse human health and environmental effects of programs, policies, or activities on minority or low income populations.”

Given this “programmatic” nature of the air quality impact assessment, specific source and receptor (residence) locations are not known. Based on the intensive air quality impact analysis performed throughout the entire modeling domain, however, no disproportionate negative air quality impact on minority or low-income populations is expected to occur under the Proposed Action or Alternatives.

Regarding “where and how non-Indian residents of the Reservation can effectively seek remedial action of unsatisfactory or non compliant air quality impacts,” please also see Comment Responses A1 and Q28.

S5 The term “ambient” simply means “areas where the general public has access.” National and state Ambient Air Quality Standards are applicable in these locations, whereas within the physical boundary of a business, Occupational Safety and Health Administration (OSHA) workplace standards apply.

The entire modeling domain, including “lower terrain of watershed courses,” the mountainous Weminuche Wilderness Area, and all the rolling terrain in between, was compared to the “ambient” standards, based on a full year of meteorological conditions (including “inversions”).

S6 The DEIS presented two different potential incremental cancer risks for the maximum predicted formaldehyde concentrations, based on the unit risk factor developed by EPA, as reported in its “Integrated Risk Information System Database.” The EPA procedures do not assume separate potential unit risks based on age. The Maximally Exposed Individual (or MEI) analysis was *not* adjusted for “time away from home.” It was based on continuous exposure of the maximum predicted impact (a very conservative assumption) for the entire 20-year operational period of a typical well. EPA’s procedures do include an adjustment for period of residence and “time away from home” for the Most Likely Exposure (MLE) analysis, however.

Finally, as stated in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery) for both the MEI and MLE analyses:

... the predicted incremental cancer risks for the inhalation pathway all fall below or at the lower end of the 1×10^{-6} to 100×10^{-6} threshold range. Given the conservative nature of these analyses, the predicted exposures are likely to overstate actual exposures, and the potential incremental cancer risks would not be significant.

S7 Wetlands mitigation involves avoidance to the fullest extent possible, without compromising the intent of the project (Section 4.3.1.8). Permanent wetlands would be created, if required, as wetland-replacement mitigation, through consultation with the Army Corps of Engineers.

S8 We believe that collating these terms would not add to public or decision-maker understanding of the proposed action or the Alternatives. In cases where information is not mapped or studied, it is either because related studies or inventories are not available, or the information does not contribute substantively to our understanding of the issues. In instances where we state that something is difficult to quantify, it refers to our description of effects that are either not quantifiable or are most effectively described qualitatively.

S9 Please see response to comment S2.

Responses to Comment “T” from Warren Hurley, USDI, Bureau of Reclamation

T1 The FEIS has been updated as appropriate to reflect the current status of the Animas-La Plata Project.

T2 We agree that site protection measures will vary by Alternative, depending on the site density. However, site avoidance and mitigation is the routine treatment for historic properties in all Alternatives. Where complete avoidance is not possible, testing and data recovery will be conducted. Please refer to the archaeological-mitigation summary in Section 4.8.9 of the DEIS. This standard for archaeological protection is demonstrated by past practice. Well pads and pipeline rights-of-way have routinely been relocated to avoid archaeological sites. In some instances, where well pads could not be located in the drilling window, either the well was directionally drilled from outside the window or was not drilled at all. Pipelines are rerouted around archaeological sites. We recognize that for some APDs, site avoidance and data recovery may not be feasible site protection measures, and other treatment approaches will be required.

T3 We agree with this statement and have changed the text in Chapter 4 and Appendix K to reflect the fact that although adverse effects may be “resolved” through data recovery, they are still considered adverse.

T4 It is the intention of the tribe and the BIA to use avoidance as the first mitigative measure in preserving archaeological sites, as well as areas containing culturally important plants. All of the plant species outlined in Section 3.3.2.3 are surveyed during project-specific on-sites at the APD level, and their avoidance or other means of mitigation is outlined in the Biological Assessment for the individual project. Please refer to Sections 4.3.1.8 and 4.8.9 of the EIS. Please also see Comment Response T6.

T5 Appendix K has been revised as appropriate.

T6 We agree, and we are conducting formal consultation under Section 106 with the tribes and SHPO. The consultation process will be a factor in deciding if a programmatic-agreement document should be developed.

T7 Appendix K has been revised in response to this comment.

T8 Appendix K has been revised in response to this comment.

T9 Comment noted.

T10 The studies referred to in this comment are in an area of the Southern Ute Indian Reservation where there is no planned oil and gas development.

T11 These conclusions were based on the version of 36 CFR 800 that was in effect at the time of writing, before the CFR's July 2000 revision. We agree with the statement that, under the new revision, adverse effects may be "resolved" through data recovery but remain adverse. We have modified the text accordingly. The conclusion of this section—that "Determinations of adverse effect are expected to be warranted only rarely, if at all"—is still valid, however.

T12 We agree, and the EIS and Appendix K have been modified to reflect the current status of the Animas-La Plata Project.

Responses to Comment “U” from Mark Pearson/Gwen Lachelt, San Juan Citizens Alliance/Oil and Gas Accountability Project

U1 The DEIS was published with printed figures in the document. Unfortunately, the BLM underestimated the number of printed copies that would be required to satisfy the public demand. As a result, some reviewers received the DEIS as a printed document with an enclosed compact disc containing the electronic versions of the figures. The BLM did offer to print the figures, if requested, and made every effort to meet the public’s needs. The comment period for the DEIS was 75 days.

U2 Please see the response to comment B2. The remediation of known problems does not drive the formulation of Alternatives. Where problems exist, they are addressed on an ongoing basis by the BIA, BLM, SUIT, and other appropriate Federal, state, or local agencies and remediated. The EIS, consistent with its Purpose and Need, analyzes strategic approaches to the tribe’s development of its oil and gas resources.

We have revised the FEIS, Section 1.3, to address the need for additional wells. Evidence supporting the need for infill development has been presented to the BLM and the COGCC, including the production curves presented in Figures 2-3, 2-4, and 2-5. The BLM and the COGCC have independently determined that up to four wells per section for each producing formation are needed to recover the oil and gas resources contained in the Ignacio-Blanco Field.

We have revised the mitigation measures to be more definitive. These measures would be applied, as appropriate, at the site-specific level as stipulations when a project is approved.

U3 Differences in pagination between the CD-ROM and the printed version of the DEIS arose because of difficulties encountered when converting the *WordPerfect* electronic files of the DEIS to a PDF format. This conversion did not alter any of the text, figures, or tables included in the DEIS. Both versions of the document were intended for release.

U4 The public meeting used an “open house” format. The meeting format was designed to provide for one-on-one interaction between agency officials and the public. We have found that this format is the most engaging and least intimidating one for the public. We believe it provides us the best opportunity to discuss and more fully explore the issues with concerned individuals. Please also see Comment Response C1.

U5 The DEIS was published with printed figures in the document. Unfortunately, the BLM underestimated the number of printed copies that would be required to satisfy the public demand resulting in some parties receiving the DEIS as a printed document with an enclosed compact disc containing the electronic versions of the figures. The BLM did offer to print the figures if requested. Please also see Comment Response U1.

The maps were drafted in September 1999, but for the most part the types of information displayed in the maps—particularly physical, jurisdictional, and biological information—does not change so rapidly as to render the maps unreliable.

U6 We have revised Section 1.3 (Purpose and Need), to further clarify the purpose and need for the proposed action and the EIS. Additionally, we have revised Section 1.3 to state clearly that the purpose of additional wells is to extract oil and gas efficiently from the Ignacio-Blanco Field. The merit of individual infill and ECBM projects will be analyzed at the permit stage. Please also see the response to Comment U-2. We're unsure of the driving issue behind the question of "disproportionate benefits." The tribe's desire to manage its resources in a businesslike manner is undertaken to benefit its economic-development interests.

U7 We have revised Section 1.3 (Purpose and Need) to clarify that the EIS informs the public, in addition to the BLM, BIA, and SUIT. The Federal Register Notices, scoping records, public meeting minutes, and the mailing list are examples of the BLM's commitment to disclose the environmental impacts of oil and gas development on the Southern Ute Indian Reservation to all stakeholders in the process. We believe the BLM has met all the applicable regulatory requirements in fulfilling this commitment.

U8 The BLM, BIA, and SUIT's elected Tribal Council operate on a government-to-government basis. The Tribal Council is legally charged with policymaking on behalf of the tribe. By example, the proposed action represents the tribe's goal to pursue economic development of its CBM gas resources. The Federal agencies take this direction from the representative tribal body, the Tribal Council, which is elected and governs according to the tribal constitution, and which is clearly and legally responsible for directing the development of tribal mineral resources.

We can only assume that the desires and interests of the tribe are represented by their elected governing Council, and that the Council represents the diversity of tribal opinions.

No mitigation is proposed for Tribal Coal Only land because the tribe has decided that extraction of coal bed methane takes precedence over protecting the coal resource from the minor impacts that occur due to CBM gas development by current methods..

U9 The Study Area was selected for several reasons and in consideration of the need to focus on tribal gas-development issues. This focus, we believe, helped to sharpen the analysis and to avoid the dilution that would result from further expanding the analysis area. The selection of the Reservation boundary for the Study Area also reflects the need to address tribal sovereignty and the vastly different legal and jurisdictional issues associated with oil and gas development on and off tribal land. Chapter 1 describes the rationale for selecting the EIS Study Area.

Oil and gas development is a high priority for the tribe, and there are many areas of potential oil

and gas development that probably would not have residential development.

The SUIIT does not plan to develop the eastern portion of the Reservation (see Chapter 1, Section 1.4) which, thereby, was excluded from the EIS. The area's omission from the Alternatives is in no way related to air quality issues. In fact, the eastern part of the Reservation was included in the Air Quality model.

The cumulative impacts of air emissions, water discharges, pipeline requirements, and wildlife have been analyzed in Chapter 4 of the DEIS.

U10 Interagency agreements between the State and BLM are outlined in memorandums of understanding that establish clear and consistent procedures and policies for review and evaluation of proposed well spacing, pooling, and field rule requests. These administrative matters establish government-to-government working protocols that are not subject to NEPA analysis and decision making. Nor are the orders that approve an optional well per 320-acre spacing unit subject to NEPA, since the orders per se do not approve actual development. The orders simply establish that two wells per 320-acre unit are required within parts of the Study Area, to produce the CBM gas resource most efficiently. For development actually to proceed at the increased spacing, NEPA must first be completed, if a suitable NEPA analysis has not already been prepared.

U11 Memorandums of Understanding that establish government-to-government working protocols are outside the scope of NEPA analysis and agency decision making. In terms of the product of governmental cooperation, the spacing orders established by the COGCC and BLM were the subject of numerous public forums and formal hearings, including the following:

- Public forum, Ignacio Colorado, October 6, 1998.
- Public forum, Durango Colorado, October 7, 1998.
- Mark West local public forum, Ignacio Colorado, October, 7 1999.
- Ignacio public hearing, April 4, 2000.
- Durango public hearing, April 5, 2000.

U12 Please see the responses to U10 and U11.

U13 The rights of the lessee are outlined in Section 1.6 of the EIS. All leases issued in the Study Area permit surface occupancy, and the Alternatives are built around these terms. Colorado law does not apply to development of tribal resources.

U14 We respectfully disagree. Chapter 2 and Appendix C both contain accurate descriptions of the Reasonably Foreseeable Development (RFD) scenario for oil and gas development on Southern Ute tribal land. Chapter 2 also presents a detailed description of three oil and gas

development Alternatives.

Generally speaking, the RFD assumes that, with the exception of the “fairway” area, the tribe and industry would develop all vacant well windows (please refer to Section 2.2 for a detailed description of the RFD). While this probably overestimates the number of wells that would ultimately be developed over the next 20 years, such an assumption provides a conservative margin of error for the purpose of investigating and analyzing programmatic management strategies and their consequences.

U15 An Alternative that prohibits any further CBM development represents a “straw” Alternative at best and does not address the Purpose and Need for this EIS. Some level of development is already approved through previous NEPA documents, and existing lease holders have a contractual right to explore, develop, and produce oil and gas on their lease holdings. More appropriate, at the APD submittal stage a “no action” (no drilling) Alternative is examined in detail, alongside Alternatives that would allow for well development.

The BLM has concluded that providing for a second well per 320-acre spacing unit is the most efficient spacing for CBM gas development of the Fruitland formation in the Study Area. A scenario that provides for steady state production over the next hundred years would outstrip the useful life of the gas production and transportation infrastructure, effectively rendering CBM gas extraction uneconomical, or far less economical than the current development trajectory. Incremental production curves resulting from infill production and enhanced CBM gas production are presented in Figure 2-3, 2-4, and 2-5.

U16 The BLM and BIA identified but dismissed from detailed consideration an Alternative that addressed infilling Fruitland Formation production to four wells per 320-acre spacing unit (Section 2.3.4). Production and reservoir characteristics, as they are currently understood, indicate that this well density is not optimal for the prevention of waste and maximization of ultimate recovery. The Alternative was eliminated from further detailed consideration because it is not practical or expected. If knowledge of reservoir conditions (performance) were to change, the examination of 80-acre spacing would be addressed in a subsequent programmatic NEPA document, before development at that density could proceed.

U17 Because this programmatic EIS addresses an ongoing program, it is correct to portray “no action” as the continuation of current management. This treatment of the No Action Alternative is described in the Council on Environmental Quality’s Memorandum to Agencies titled “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” which was published in the 46 Federal Register 18026 (Mar. 23, 1981), as amended.

We disagree that the statement at Section 2.4.1 is an intentional attempt to evade NEPA review. The EIS text notes that spacing orders allowing two wells per 320-acre spacing unit have been issued within the Reservation, initially for experimental purposes. This statement sets the stage

for the full analysis of the No Action Alternative, as presented in Chapters 2, 3 and 4 of the DEIS.

U18 While the 1991 EA is referenced, the No Action Alternative is fully analyzed, and the Alternative's projected environmental consequences are presented in the EIS.

U19 Infill development has been the subject of intensive feasibility studies that were fully scrutinized during COGCC and BLM technical reviews. An analysis of these feasibility studies is beyond the scope of this EIS, because the BLM and COGCC have already determined, from a reservoir-engineering standpoint, that infill wells are necessary to develop the Ignacio-Blanco Field in an efficient manner, and have issued the applicable spacing orders independently and before this EIS. The analysis of the need for infill wells to develop oil and gas reservoirs fully is a technical-engineering exercise, independent of the NEPA process. In addition, it is important to note that the decisions allowing up to four wells per section for each producing formation in the Ignacio-Blanco Field were made before the DEIS was issued. Analysis of the potential impacts of development under the approved, existing spacing orders for the Ignacio-Blanco Field is the focus of the EIS.

The economic viability of each infill well or ECBM project is determined at the permitting stage. The technical need for infill wells for development of coalbed methane in a large part of the Study Area has been previously determined by the BLM, through review of technical evidence and formal hearings in accordance with memoranda of understanding between the BLM and COGCC. The data presented at the hearings and the findings and orders of the BLM are a matter of public record and are available through the COGCC and the BLM. Because of the volume of information involved and the public availability, those data, findings, and orders are incorporated in the FEIS by reference in Section 1.3

U19A The statement in Section 2.4.2 that "The increase in wells would allow accelerated production of the resource, increase recoveries of the gas in place, and increase economic return to the lessor/royalty owner." is supported by the economic-impact analysis of Alternative 2 in Section 4.10 of the DEIS; the testimony presented during the COGCC administrative technical reviews held in 1996, 1998, and 2000 (see the response to U19); the findings and orders issued by the BLM and COGCC following those hearings; and the industry and tribe's decisions to develop wells at the increased density.

U20 The analysis of Alternative 3 in the DEIS discloses the incremental impacts of combining Alternative 2 and ECBM recovery techniques. This is a reasonable approach because ECBM without infill wells is not considered a practical scenario. ECBM is a relatively high-capital-investment technique that, to date, is considered economic only where a single well cannot produce gas adequately in a 320-acre unit. The incremental impacts of ECBM are segregated for analysis, but injection of gases does not represent a substitute for increased density of wells, so it

was not analyzed separately as an Alternative to Alternative 2.

U21 For all intents and purposes, the environmental consequences of conventional development of the Pictured Cliff, Mesa Verde, and Dakota formations are the same. Thus the environmental consequences of conventional well production are presented with no further distinction between development of the three formations. On the other hand, there are potential differences between conventional and CBM gas development; therefore, the two extraction methods are analyzed and contrasted, where appropriate, in the EIS.

U22 The DEIS discusses and analyzes impacts from:

- Enhanced Production Techniques, Including CO₂ Sequestration (Chapters 2,3 and 4)
- Cavitation (Sections 2.8.5.1, 4.5.1.3 and 4.12)
- Hydraulic Fracturing (Sections 2.8.5.1, 4.4.1.3 and 4.5.1.3)
- Recompletion (Sections 2.8.5.1 and 4.5.1.3)
- Directional Drilling (Sections 2.8.4.4 and 4.6.3.2)

Use of Industrial Exhausts as Sources of Carbon Dioxide (CO₂ and ECBM is addressed in Section 2.8.5.4) CO₂ is a Fruitland CBM production byproduct of ample quantity to be used as an ECBM gas.

Bioremediation is a method of reclaiming contaminated soil, not a production technique.

Drilling more wells closer together is discussed as an Alternative considered but not analyzed in detail (See Comment Response U16) because it is not generally a feasible means of mitigation for anticipated development, due to the shallowness of the coal, the need to pump water efficiently from the bottom of the well, and the widespread nature of development.

The use of low-profile tanks and other production facilities to minimize visual impacts is a mitigation measure included in Section 4.9.8. Pump selection will vary from one drill site to another, depending on a number of variables, including the amount of water to be pumped, the type of well completion, and proximity to residential sites and other sensitive resources.

U23 Compressor and treatment facility disturbance are not factors because expansion of these facilities would occur almost entirely within the existing disturbance areas—if needed (Section 4.1.3.2).

The need for expansion and modification of central delivery points is addressed in Sections 4.4.2 and 4.8.3.1.

U24 The referenced statement is based on a maximum-disturbance premise. We have revised

the section to indicate that conventional well development is considered to be distributed evenly throughout the Study Area on any open drilling windows and to have maximum possible impacts per each resource analyzed. This methodology estimates impacts conservatively for each resource, despite uncertainty concerning actual development locations. Since sites are likely to be developed only in areas with higher production potential, the actual impacts are likely to be less than predicted in the maximum-disturbance-scenario analysis.

U25 The fairway probably already contains a sufficient number of CBM wells to drain the CBM resource efficiently, so infill is not expected to be economic there(Section 2.5.2). For analysis purposes, development was considered to occur in the fairway and in the Fruitland formation near outcrop zone but at a much lower rate than in the main Study Area. “No new drilling in many if not all areas” is not a viable Alternative because existing leases and spacing orders would allow infill drilling in the Study Area.

U26 Map 3 shows available 320-acre drilling windows. The fairway area has been fully developed at 320-acre spacing, so no available windows appear on the map. Map 4 shows available 160-acre windows. The fairway area has numerous available 160-acre infill development windows, but, as noted in Comment Response U25, “for analysis purposes, development is considered to occur in the fairway and in the Fruitland formation near outcrop zone but a much lower rate than in the main Study Area.” .

U27 Please see Comment Responses U24 and U26.

U28 Pad size, access road, and flowline requirements are based on the average size of disturbance for similarly constructed wells. The average-disturbance factor is based on years of experience over literally hundreds of wells, and is the minimum needed to accommodate drilling and associated equipment safely. Additionally, Section 2.5.3 and Appendix D describe how the analysis conservatively works with this factor by literally double-counting impacts where, in fact, we know they will not occur.

U29 We respectfully disagree. Decisions on well spacing are beyond the scope of this EIS (please see Comment Response U19 also). The information regarding existing spacing, location, and siting of wells is available and has been used throughout the DEIS as the basis for the impact analysis of the Alternatives. The EIS analyzes the potential impacts of development under the existing, approved spacing for the Ignacio-Blanco Field. Based on this analysis, determinations on how development would occur under these spacing orders will be documented in the Record of Decision for the EIS.

Well spacing has been established for fee mineral estate by orders issued by the COGCC and for tribal mineral estate by the BLM, following technical review of gas-reservoir data for the

Ignacio-Blanco field. The Respondent correctly notes that siting of wells within 20-acre well windows is reserved until an APD is filed.

U30 The assumptions used in the EIS analysis are, in our opinion, logical, reasonable and based on quantifiable field observations (Please see Comment Responses U-24, U-27, U-28 and U-29). The methodology for impact determination results in a conservative estimate of impacts, by effectively double-counting impacts in instances when more than one resource is represented within a well window. This impact assessment methodology is described in Appendix D of the EIS. The maps in the EIS, we believe, adequately portray and disclose the Proposed Action and Alternatives. The maps and figures have been revised to reflect information current as of August, 2001.

U31 Please see response to comment U17.

U32 Development of 269 wells is programmatically approved under the existing EA for gas development on the Reservation and is not the subject of decisionmaking in this EIS. NEPA analysis will be conducted for each individual well before approval. Alternatives 2 and 3 include this baseline of conventional development, treating it as a constant across all Alternatives, which it is.

Development of conventional wells on nontribal leases is outside the scope of this EIS. Development of both conventional and CBM wells on nontribal leases generally is within the jurisdiction of the COGCC (except where the operations are conducted by the tribe), not within the jurisdiction of Federal agencies, and would not require NEPA compliance.

U33 Please see the response to comment U-2. From a practical standpoint, the full Alternatives analyzed in this EIS are not built around each individual environmental issue and alternative approach to addressing the single issue. To do so would result on tens if not hundreds of Alternatives with little if any differentiation between each, and little if any relationship to the Purpose and Need for the study. The Alternatives are built around strategic themes and include extensive mitigation approaches.

Remediation of known problems is ongoing and has been the focus of interagency and industry cooperation for more than a decade. For example, a description of the approach used to extinguish coal fires on the Reservation is presented in the Geology and Minerals section of the EIS. These efforts are independent of the need to prepare an EIS. Drilling and production issues are analyzed and documented at length throughout the EIS (reference, for example, Section 4.5.1.3, and Section 4.5.1.8).

U34 The leasing stipulations were established before development of this EIS, and energy

development is bound by the stipulations contained in existing leases across the Study Area. Existing energy leases are binding; varying of lease stipulations is not an available option, nor does it address the Purpose and Need for the EIS.

The mitigation measures and conditions of approval in the EIS are taken from the “Best Management Practices” of the BLM, BIA, and the oil and gas industry. Additional mitigation measures are developed, analyzed, and disclosed in the DEIS, where necessary, to address the potential environmental consequences of the Alternatives. The inclusion of mitigation measures by reference is done to minimize the physical size of the DEIS.

It's not in the best interest of this analysis to analyze and discuss at length less effective or ineffective mitigation approaches. Here, we've attempted to put forth the most effective mitigation measures.

U35 Mitigation measures are not deferred to the APD stage, they are applied at both the programmatic and site-specific project level. The EIS states:

Section 4.1.5, Mitigation Planning

General mitigation consists of measures or techniques included as a project-wide basis as part of the Agency-and-Tribal-Preferred Alternative or alternatives. Specific mitigation includes measures that pertain to a particular resource and these are described within the resource sections. A number of standard mitigation measures currently exist that have been developed by SUIT, BIA, and BLM. These standard agency mitigation measures are provided in Appendix E. In addition, resource specialists develop mitigation measures for specific resources and projects, as needed and where appropriate. The impacts remaining after applying mitigation measures are considered residual, unavoidable impacts of the Agency-and-Tribal-Preferred Alternative or alternatives.

Mitigation measures are implemented by BIA, BLM, and tribal personnel. The BLM is responsible for mitigating downhole and surface operations directly related to downhole operations. The BIA is primarily responsible for surface impacts, including pipeline rights-of-way, and works with the BLM to monitor and mitigate surface impacts of downhole operations. tribal specialists, in addition, work with Federal employees to monitor activities and to mitigate potential impacts on the Reservation.

U36 The mitigation measures outlined in this EIS are global measures designed to address programmatic issues across the Study Area. The mitigation measures, when taken as a whole, represent the management requirements that apply to continued development of gas resources on the Reservation. We point out that additional measures would be developed and applied on a site-specific basis, as the need arises.

U37 We do not believe there is an environmental-justice issue arising from the Alternatives contemplated in this EIS, nor are we aware of any history of abuses, well documented or otherwise, of tribal or nontribal residents within the reservation. The population of the Southern Ute Indian Tribe is centralized in and around Ignacio—a relatively small area, compared with the Study Area as a whole. There are no scattered communities on reservation land. The tribal members, individually and as a whole, have benefited, and will greatly benefit, from oil and gas production in terms of per capita, annual cash dividend payments, new schools, new tribal government buildings, a community center, etc.

U38 Low-income communities are *not* common throughout the Study Area, nor are they differentially singled out as the targets for development. On tribal land, the tribal members' homes are centralized in and around Ignacio. There are no scattered communities on tribal land.

U39 See Comment Response U38.

U40 The oil and gas industry hires and maintains operations in an area that is greater than just the Southern Ute Reservation. The five-county area was selected for evaluation of socioeconomic impacts because it covers the population that could reasonably be expected to be employed in, or otherwise economically affected by, gas-industry activities on the Southern Ute Indian Reservation land.

U41 Tribal members benefit from oil and gas production providing per capita payments, yearly cash dividends, a new tribal school, new buildings for government functions, a new community center, and a chance for tribal financial security in perpetuity. Others residing on the reservation have not been unjustly singled out as bearers of the brunt of CBM development. Development has proceeded, and will proceed, according to strict spacing rules that can result in conflict from time to time with individual land owners. In such cases the tribe or others operating on tribal leases attempt to arrive at equitable solutions to the issues at hand. But in no cases are minorities or economically disadvantaged persons being singled out as populations that would bear the consequences of CBM development.

U42 Please see Comment Response U38.

U43 We have developed and submitted a second draft of the Biological Assessment to the U.S. Fish and Wildlife Service (USFWS) for review. Formal consultation with the USFWS will be completed before issuing a Record of Decision for this Project. This is consistent with the working protocols established between the two agencies.

U44 The fact that wells have been drilled within the Study Area in the last 5 years does not change the impacts analysis and conclusions in the DEIS. The FEIS contains updated information regarding existing wells.

U45 The confined-aquifer theory is a fundamental concept in the field of hydrogeology, and has not been “widely repudiated.” Specific to the Fruitland Formation, the data collected by numerous workers and published in peer-reviewed journals support the conclusion that the Fruitland Formation is a confined aquifer. While it appears that the Fruitland and Pictured Cliffs Formations are hydraulically interconnected, these formations are confined by the Kirtland Shale and the Lewis Shale. The data support the conceptual model presented in the DEIS, where the Fruitland Formation is an unconfined aquifer near the outcrop and confined about 2 miles from it. If the Fruitland Formation were in hydraulic communication with shallower aquifers deeper in the basin, there would be much less artesian pressure in the Fruitland, as the water pressures would have bled off into the shallow aquifers.

The concept of fissures, fractures, and faults providing conduits for flow between the Fruitland Formation and shallow aquifers is not supported by the data. If there were significant transport between the Fruitland Formation and the shallow aquifers, artesian pressures would not be contained down to the Mesa Mountain area, over 15 miles from the recharge areas located along the northern basin rim.

The 3M Hydrologic Modeling Study has shown that the vertical leakage of water out of the Fruitland Formation into the overlying Kirtland Shale is extremely small. In fact, the calibrated 3M model matched pressure data and recharge estimates with a zero-leakance term. Although recharge is estimated, it was well within the range of published values for semi-arid regions. An increase in the leakance term would require higher recharge values. Significant flow between the Fruitland Formation and the shallow aquifers would require unrealistically high recharge values.

Regarding the effects of CBM development on the surface drainage and runoff patterns at the outcrop, the EIS notes that evidence to date indicates that groundwater levels along the outcrop are decreasing.

The text has been revised to describe impacts observed at Soda Springs and possible impacts at other unmapped springs along the outcrop, within the SUIT Reservation. The text also notes that in the outcrop areas north of the SUIT Reservation, surface water impacts are not tied to the CBM development within the reservation, but to the development north of the reservation.

U46 Secondary biogenic gases can be generated at the Basin margins if sufficient immature organic matter remains after burial. This is unlikely to explain biogenic methane that suddenly appears in water wells, because the rate of exhumation of the outcrop is an extremely different rate (erosion rate) and because the water wells are generally too far from the outcrop to be affected by a basin margin process. While the biogenic origins can be ascribed to localized areas along the outcrop, most of the gas in the Fruitland Formation in the deep basin is of thermogenic

origin. Therefore, when methane with a biogenic signature is found in a shallow well miles from the outcrop, it is more likely to be shallow biogenic gas, not Fruitland-sourced methane.

There are many reports of shallow water wells containing methane before CBM development. The natural occurrence of methane in shallow wells should not be overlooked when evaluating the cause(s) or source(s). Biogenic methane found in water wells, however, very often has a likely domestic source nearby, such as a barnyard or septic field.

BLM has studied the biogenic vs. thermogenic origin of methane in shallow wells for years. Although not conclusive by any means, classifying methane as either biogenic or thermogenic is the best indicator we have of determining methane sources. Published literature has shown that the stable-isotope ratios can be related to biogenic vs. thermogenic sources, as well as the thermal maturity of the coal. Thus the use of biogenic testing/typing is not capricious, but is a reasonable scientific method for identifying contamination sources in this basin, and it is well supported by the empirical data.

We also note that where thermogenic gas has been found in shallow water wells, BLM and COGCC take steps to identify and remediate development-related sources.

U47 Because the details of all municipal and industrial development associated with the Animas-LaPlata project are not known, it is not possible to harmonize the Southern Ute EIS project with offshoots of the Animas-LaPlata project. The DEIS is intended to address impacts on the current landscape and any foreseeable developments, and cannot speculate on impacts on all potential development scenarios through the life of the project.

U48 Traffic-volume impacts are addressed extensively in Section 4.7, and Tables 4-37, 4-38, and 4-39 illustrate the proportion of gas-industry use of roads relative to total traffic levels for each of the three Alternatives.

U49 Native American consultation has commenced for this programmatic project, and will continue at the site-specific project stage.

U50 We believe that Sections 3.9 and 4.9 (Visual Resources) are understandable, and that these sections accurately and reasonably describe the visual-effects issues, affected environment, and environmental consequences.

U51 There are no reputable (peer reviewed) studies or even reasonable data on “socioeconomic costs of the production activities analyzed,” so there are no surrogate estimates of dollar costs to assign to impacts. Economic costs with no assigned quantitative value are addressed qualitatively in the EIS.

U52 The EIS analyzes and discloses noise impacts from the Alternatives. Noise will be controlled in accordance with all applicable regulations. The tribe has implemented noise mitigation and will continue to consider mitigation of site-specific noise impacts on a case-by-case basis, as described in Section 4.11.7.

U53 Please see the following Comment Responses U73 through U78. Operators are required by strict Federal and state regulations to prevent, report, and mitigate such events, thus it is inappropriate to speculate on such events in this EIS.

U54 A description of the existing pipeline infrastructure is not included in this EIS because the main pipeline system is already in place. If new pipelines were proposed, they would be subject to a project-specific NEPA analysis. We believe that publication of the existing pipeline infrastructure would not add value to the decision-making process in this EIS. While operators would openly disclose pipeline locations at a landowner's request, most of the pipelines related to the proposed Alternatives are located on tribal, not private, land.

U55 The DEIS is concerned with effects associated with oil and gas development within the boundaries of the SUIIT reservation. The described seeps are observed far north of the Study Area, on the Pine River (the northern basin). The DEIS discloses that methane seeps apparently increase due to CBM development along the outcrop within the reservation. Development in the Study Area is unlikely to affect the outcrop outside the SUIIT reservation.

There is evidence that coal fires are started at the outcrop, well above the pre-development water table. There is also evidence that coal fires are part of the outcrop history before CBM development; the description of coal fires and their history has been expanded in Sections 3.4.2.1 and 3.12.8. This information points to the difficulty of determining the cause of coal fires that were observed after CBM development began in the basin, as well as the difficulty of characterizing them.

Gas development within the SUIIT reservation will not affect the outcrop in areas north of it, with the possible exception of the Ridges Basin area.

Surface ownership along the Fruitland outcrop within the reservation is limited to the SUIIT, along with a few private individuals. Private surface ownership on the Fruitland outcrop is less than 500 acres, in remote areas and very rugged terrain. Immediately north of the SUIIT reservation, the land is owned by the Bureau of Reclamation and the State of Colorado. There are no residences or major structures in areas known to seep methane within the SUIIT reservation. Because the SUIIT owns the land affected by methane seepage along the outcrop, it can effectively control future development. Land ownership also allows the SUIIT to reduce any serious risks associated with coal fires within the reservation. No houses are threatened by the existing coal fires on the reservation.

U56 The EIS conclusions are based on a thorough analysis of all the known and foreseeable impacts related to the proposed action and the Alternatives, using the best available information.

U57 and U58 Direct, indirect, and cumulative impacts on the environment should be analyzed for the proposed action and each Alternative, if any, to the extent necessary to determine if the impacts are significant. The cumulative-impact approach for this EIS was to determine, first, if there were significant impacts from the proposed action on the affected environment, after application of mitigation measures. The rationale for this approach is described in more detail in Section 4.1.4, Cumulative Impact Analysis. In addition, Section 4.13, Cumulative Impact Analysis, has been expanded to provide a more detailed analysis of the three Alternatives presented in the EIS.

U59 NEPA requires that Federal Agencies evaluate the potential for “significantly affecting the quality of the human environment” of a Proposed Action and Alternatives, before a decision is made to proceed with a selected activity. For those actions from which no significant impact is anticipated, the Federal Agency may conduct an “Environmental Assessment,” and if no significant impacts are found, then the Agency can issue a “Finding of No Significant Impact” and a “Decision Record” and proceed with the activity. When the likelihood of a significant impact is unknown, however, the Federal Agency must prepare an “Environmental Impact Statement” to analyze and disclose any significant impacts of the Proposed Action or Alternatives, before a decision is made to approve or deny the specific activity.

In evaluating potential air quality impacts from a Proposed Action or Alternatives, the analysis may focus on the Alternative with the greatest potential for air quality impacts (for example, the Alternative with the most potential development), and if that analysis demonstrates no significant impacts are likely, then any other Alternative with less potential for air quality impacts would also not have any significant air quality impacts.

The DEIS is correct in stating that the potential air quality impacts from Alternative 1 (Continuation of Present Management) and Alternative 2 (Coalbed Methane Infill Development) “would be less than those described in Section 4.2.5 Alternative 3 -Enhanced Coalbed Methane Recovery below.” We do not expect either of these Alternatives to have any significant adverse air quality impacts.

U60 Potential mitigation measures were *not* “avoided and delayed” in the DEIS. Numerous potential air quality mitigation measures were clearly listed on pages 4-22 through 4-25 of the DEIS (Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.8 Mitigation Summary).

As described in Comment Response A1, the requirements under NEPA for environmental impact analysis, disclosure, commenting, and response are separate from either the land management

decision process (“record of decision”) or the Clean Air Act regulatory process. Federal land management agency decisions must ensure continued compliance with all local, state, tribal, and Federal air quality laws, statutes, regulations, standards, and implementation plans. These agencies also have discretionary authority to include operational stipulations in a “record of decision” to limit potential environmental impacts. Since no significant air quality impacts were identified in the DEIS for any Alternative in the three analyzed emission-rate scenarios, however, there is no basis for incorporating additional mitigation measures.

Requirements for reviewing and authorizing specific air pollutant emission sources under the Clean Air Act (“permitting”) are the responsibility of the EPA (either directly or through oversight of delegated authority to applicable air quality regulatory agencies). The Respondents should contact the EPA (or the applicable air quality regulatory agency) if they believe required air pollutant emissions permits are not being administered correctly.

Please also see Comment Responses O4 and O5.

U61 The Respondent’s assertion that “each APD will thus be required to examine the cumulative impacts of the oil and gas program, perhaps requiring a full EIS for each APD” is erroneous.

As clearly stated in the DEIS (page 1-4; Chapter 1; 1.3 PURPOSE AND NEED), one of the goals of the DEIS is:

- “To provide a programmatic NEPA document from which to tier future site-specific environmental analyses of development proposals.”

In fact, pages 1-10 through 1-11 of the DEIS (Chapter 1; 1.8 AUTHORIZING ACTIONS) detail just how site-specific environmental impact assessments would be required, once a lessee or operator submitted an APD, and how that analysis would be tiered to the Final programmatic EIS.

U62 As stated in the DEIS (page 4-9; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery): “No violations of applicable state, tribal or Federal air quality regulations or standards are expected to occur as a result of direct, indirect, or cumulative [emphasis added] CBM development-related air pollutant emissions (including construction and operation).”

U63 Since the air quality Study Area is classified as either “attainment” or “unclassifiable” for all criteria pollutants, and all HAP emissions would be below EPA’s National Emission Standards for Hazardous Air Pollutants (NESHAPS) *de minimis* level (10 tons per year for each individual HAP), there are no “legally allowable” emission limits in the area.

U64 No “unregulated substances” would be released into the air from the Proposed Action or Alternatives that would have a significant direct or cumulative impact on air quality.

U65 As stated in the DEIS (page 2-38; Chapter 2; 2.7 COMPARISON OF ALTERNATIVES; Summary of Resource Comparisons): “Air Quality - Significant impacts on air quality are not anticipated with the development of any of the three alternatives.”

Therefore, based on the detailed air quality impact analysis described in the DEIS, the Proposed Action or Alternatives could proceed without precluding other emission sources, either already accounted for in Chapter 3 - Affected Environment, or reasonably foreseeable emission sources included in the cumulative-impact assessment.

Of course, there is no scientific or legal basis for analyzing potential air quality impacts from unforeseen (not anticipated) “future emissions by other sources.”

U66 We expect no significant impacts on air quality with the development of any of the three Alternatives, either directly or in combination with other reasonably foreseeable emission sources included in the cumulative-impact assessment.

Potential cumulative air quality impacts were presented in detail in the DEIS (pages 4-12 through 4- 22; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; Section 4.2.7 Cumulative Impacts). Given the “programmatically” nature of this air quality impact assessment, however, specific cumulative impacts at specific residence locations can not be determined.

U67 The maximum potential air quality impacts predicted during construction would not occur once the limited 36-day construction period is complete at each well location. Similarly, the maximum potential air quality impacts predicted during operation would not occur after the 20-year LOP.

U68 The statement, “based on estimates of likely locations of wells...” describes the fact that we know the locations of well windows and the vegetative characteristic of each window, which, in turn, allows for quantification of impacts. Quantification of the extent of weed infestations, on the other hand, is difficult because of the patchy and fluctuating occurrence of such infestations. It is sufficient to say that weeds can be a problem wherever soil is disturbed, and that it is BIA and tribal policy to control weeds aggressively.

U69 Although the spread of noxious weeds can result from construction and production phases of any of the Alternatives, the application of the mitigation measures in Section 4.3.1.8 would significantly lower the potential rate of spread. The BIA and tribe require operators to control noxious weeds in project areas and to use seed that is certified free of noxious-weed seed for

reclamation.

U70 Current vegetation die-offs due to methane seeps stemming from CBM development on the SUIIT Reservation are limited to relatively small areas (several acres or less) situated directly on the Fruitland outcrop. The outcrop through the western portion of the Study Area averages about ¼ mile wide, and about 16 miles of outcrop is within the Study Area. The coalbeds make up about 25% of the Fruitland Formation, and methane seeps with associated die-offs have been observed only directly over coalbed outcrops. Methane seeps occur in only about 50% of the coalbeds, or less. Therefore, the maximum affected area would be approximately ½ square mile, or 320 acres (.25 miles wide x 16 miles long = 4 square miles x .25 x .50 = ½ square mile). Assuming all coalbeds can seep methane at rates sufficient to kill the overlying vegetation, then a maximum of 1 square mile, or 640 acres, could be affected in the Study Area.

U71 There are no demonstrated vegetation impacts from emissions related to compressors and pumping units. Emission rates are minimal and distributed over a wide area (Section 4.2). No other discharges occur under normal operating conditions. All produced water is piped or trucked offsite and reinjected, or evaporated in lined ponds. The BLM, BIA, and tribe are not aware of illegal dumping. Illegal dumping occurring in the future would be a matter of investigation and prosecution, but is not an issue that drives the Alternatives analyzed in this EIS.

U72 Cumulative impacts are discussed in detail in Section 4.13.

U73 A “Hazardous Materials Summary” has been included in the FEIS as Appendix P. Any potential impacts, including cumulative impacts, from hazardous materials related to the Project are expected to be insignificant, because of the strict regulations governing the transportation, use, and storage of hazardous materials.

U74 Sections 3.12.4, 3.12.5, 4.5.1.3 and 4.12.2 have detailed descriptions of the handling, storage, transportation, and use of hazardous and nonhazardous materials and wastes, as well as descriptions of the management of potential and actual spills of wastes or chemicals associated with the Project.

U75 Since the produced natural gas would be nearly pure methane and ethane, no significant HAP emissions would occur during construction or operation, although CBM recovery wells, injector wells, and pipeline compressor engines would emit small amounts of formaldehyde. Please also see Comment Response H2.

As described in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery) and detailed in the “Air Quality Impact

Assessment Technical Support Document” (pages 55 through 60; Dames and Moore 2000), the construction and operation of potential well development (assumed to occur on 160-acre spacing) would not exceed short-term HAP Acceptable Ambient Concentration Levels, nor exceed long-term incremental cancer risk thresholds.

U76 The Clean Air Act established National Ambient Air Quality Standards for the following chemicals, compounds, and groups of compounds, and their potential impacts on air quality were specifically analyzed in the DEIS (pages 3-2 through 3-9; Chapter 3; 3.2 AIR QUALITY AND METEOROLOGY; and pages 4-7 through 4-25; Chapter 4; 4.2 AIR QUALITY AND CLIMATE): carbon monoxide, lead (including tetraethyl lead), nitrogen dioxide, ozone (including VOC precursors), particulate matter, and sulfur dioxide.

As also stated in the DEIS, since the produced natural gas would be nearly pure methane and ethane, no significant HAPs emissions (including BTEX; benzene, toluene, ethylbenzene, and xylene [ortho-, meta-, or para-xylene]) would occur during construction or operation of the Proposed Action or Alternatives. However, CBM recovery wells, injector wells, and pipeline compressor engines would emit small amounts of formaldehyde (a listed HAP). Maximum formaldehyde impacts were described in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery).

None of the following chemicals, compounds, and groups of compounds are listed as a HAP by the Clean Air Act: acetone, aluminum (or aluminum compounds; including aluminum oxide), ammonium bisulfate, ammonium hydroxide, ammonium nitrate, ammonium *peroxydisulfate* (a.k.a. ammonium persulfate), ammonium sulfate, barium (or barium compounds), calcium hydroxide, copper (or copper compounds), iso-butyl alcohol, potassium hydroxide, sodium hydroxide, sodium nitrate, sulfur trioxide, 1,2,4-trimethyl benzene, zinc (or zinc compounds, including “basic zinc carbonate”), zirconium nitrate, or zirconium sulfate.

The following chemicals, compounds, and groups of compounds are listed as HAPs by the Clean Air Act, but *none* would be emitted above EPA’s National Emission Standards for Hazardous Air Pollutants (NESHAPS) *de minimis* level (10 tons per year for each individual HAP). Therefore no significant air quality impacts would occur from these HAPs during construction or operation of the Proposed Action or Alternatives.

The following HAPs classifications were obtained from EPA’s “Health Effects Notebook for Hazardous Air Pollutants” (www.epa.gov/ttn/atw/hapindex.html):

- acrylamide - EPA has classified acrylamide as a Group B2, probable human carcinogen of medium carcinogenic hazard.
- arsenic (and arsenic compounds) - EPA has classified inorganic arsenic as a Group A, human carcinogen of high carcinogenic hazard.
- cadmium (and cadmium compounds) - EPA has classified cadmium as a Group B1, probable

human carcinogen of medium carcinogenic hazard.

- carbon disulfide - EPA has classified carbon disulfide as a Group D, not classifiable as to human carcinogenicity, due to a lack of adequate data.
- carbon tetrachloride - EPA has classified carbon tetrachloride as a Group B2, probable human carcinogen of low carcinogenic hazard.
- chromium (and chromium compounds) - EPA has classified chromium (VI) as a Group A, human carcinogen of high carcinogenic hazard, and chromium (III) as a Group D, not classifiable as to carcinogenicity in humans.
- cumene - EPA has not classified cumene with respect to potential carcinogenicity.
- glycol ethers - No information is available on the carcinogenic effects of the glycol ethers in humans. EPA has not classified the glycol ethers for carcinogenicity.
- n-hexane - No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.
- manganese (and manganese compounds) - No information is available regarding the carcinogenic effects of manganese in humans, and animal studies have reported mixed results. EPA has classified manganese as a Group D, not classifiable as to carcinogenicity in humans.
- mercury (and mercury compounds) - EPA has classified inorganic mercury and methyl mercury as Group C, possible human carcinogens, and elemental mercury as Group D, not classifiable as to human carcinogenicity.
- methanol - No information is available on the carcinogenic effects of methanol in humans or animals. EPA has not classified methanol with respect to carcinogenicity.
- methyl ethyl ketone - EPA has classified methyl ethyl ketone as a Group D, not classifiable as to human carcinogenicity.
- methyl *tert*-butyl ether - No information is available on the carcinogenic effects of methyl *tert*-butyl ether in humans or animals. EPA has not classified methyl *tert*-butyl ether with respect to potential carcinogenicity.
- naphthalene - EPA has classified naphthalene as a Group D, not classifiable as to human carcinogenicity.
- nickel (and nickel compounds) - EPA has classified nickel refinery dusts and nickel subsulfide as Group A, human carcinogens. EPA has classified nickel carbonyl as a Group B2, a

probable human carcinogen.

- POM (polycyclic organic matter; a.k.a. polynuclear aromatic hydrocarbons, or PAH; including Coal Tar Pitch - Organic compounds with more than one fused benzene ring, and which have a boiling point greater than or equal to 100° C. EPA has classified benzo(a)pyrene (a component of polycyclic organic matter) as a Group B2, probable human carcinogen of medium carcinogenic hazard.
- Radionuclides (including radium 226 and uranium) - EPA has classified radium as a Group A, human carcinogen, however EPA has not classified radon or uranium for carcinogenicity.
- selenium (and selenium compounds) - EPA has classified elemental selenium as a Group D, not classifiable as to human carcinogenicity, and selenium sulfide as a Group B2, probable human carcinogen.
- 1,1,1-trichloroethane (a.k.a methyl chloroform) - EPA has classified 1,1,1-trichloroethane as a Group D, not classifiable as to human carcinogenicity, based on no reported human data and inadequate animal data.

None of the following “hazardous substances” are chemicals, compounds, and groups of compounds listed in the “Handbook of Chemistry and Physics” (published annually by the CRC Press, Inc. Boca Raton, Florida): Cyclohexene ethylbenzene, Dianiline, Diathonolamine, Dodecylbenzenesulfonic acid, Ethylene diamine tetra, 4-4 methylene, Nitroloriacetic acid, Propolene, or benzene formaldehyde (although potential impacts from the separately listed HAPs, benzene and formaldehyde, were analyzed in the DEIS as described above).

The following similarly named chemicals, compounds, and groups of compounds are *not* listed as HAPs by the Clean Air Act: cyclohexene, dichloroacetic acid, dodecylbenzene sulfonic acid, ethylenediamine tetraacetic acid (EDTA), nitrilotriacetic acid (NTA), and propylene.

The following similarly named chemicals, compounds, and groups of compounds are listed as HAPs by the Clean Air Act, but *none* would be emitted above EPA’s National Emission Standards for Hazardous Air Pollutants (NESHAPS) *de minimis* level (10 tons per year for each individual HAP). Therefore no significant air quality impacts would occur from these HAPs during construction or operation of the Proposed Action or Alternatives.

The following HAPs classifications were obtained from EPA’s “Health Effects Notebook for Hazardous Air Pollutants” (www.epa.gov/ttn/atw/hapindex.html):

- aniline -EPA has classified aniline as a Group B2, probable human carcinogen of low carcinogenic hazard.
- chloroacetic acid - No information is available on the carcinogenic effects of chloroacetic acid in humans. EPA has classified chloroacetic acid as a Group D, not classifiable as to human carcinogenicity.

- diethanolamine - No information is available on the carcinogenic effects of diethanolamine in humans or animals. EPA has not classified diethanolamine for carcinogenicity.
- ethylbenzene - EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.
- 4,4-Methylenebis(2-chloroaniline) (MBOCA) - EPA has classified MBOCA as a Group B2, probable human carcinogen of medium carcinogenic hazard.
- 4,4-Methylenedianiline (MDA) - No information is available on the carcinogenic effects of MDA in humans. EPA has not classified MDA for carcinogenicity.
- 4,4-Methylenediphenyl isocyanate (MDI) - No information is available on the carcinogenic effects of MDI in humans or animals. EPA has not classified MDI for carcinogenicity.
- propylene oxide - EPA has classified propylene oxide as a Group B2, probable human carcinogen of low carcinogenic hazard.

U77 Please refer to Appendix P for the approximate quantities of various substances, including hazardous materials, potentially used or produced on a per-well basis.

U78 The DEIS presented two different potential incremental cancer risks for the maximum predicted formaldehyde concentrations, based on the unit risk factor developed by EPA, as reported in its “Integrated Risk Information System Database:” the Maximally Exposed Individual (or MEI) and the Most Likely Exposure (MLE) analysis. The EPA procedures do not assume separate potential unit risks based on age, but the incremental cancer risks are dependent on distance and duration of exposure (e.g., “work outside the home” or “work inside the home”). EPA has developed a good description of how risks from hazardous air pollutants are assessed, titled “Risk Assessment for Toxic Air Pollutants: A Citizen’s Guide” (www.epa.gov/tn/atw/3_90_024.html).

As stated in the DEIS (page 4-12; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery) for both the MEI and MLE analyses:

...the predicted incremental cancer risks for the inhalation pathway all fall below or at the lower end of the 1×10^{-6} to 100×10^{-6} threshold range. Given the conservative nature of these analyses, the predicted exposures are likely to overstate actual exposures, and the potential incremental cancer risks would not be significant.

U79 Oil and gas development on the Southern Ute Reservation affects the nearby outcrop groundwater flow system in the Indian Creek Area. CBM wells in the Indian Creek Area

intercept the 37 acre-ft/yr of groundwater that would normally discharge into the Animas River or Basin Creek. This produced water is disposed of by injection into deep formations or evaporation ponds. The effects of this loss of surface water flow are discussed in Appendix G - the Biological Assessment.

U80 The Colorado Division of Wildlife and SUIT provided the game range maps that are the sources of wildlife range data (Sections 3.3.3.1 and 3.3.3.2). Wildlife range descriptions are presented in Table 3-6 and wildlife range is displayed in Map 7.

The current wildlife range disturbance estimate is based on the analysis of existing range in relationship to the location of available well windows. The methodology is described in detail in Section 4.13.3.2.

U81 Table 4-52 presents the amount of habitat, by range type, within the Study Area. The percentages given in the Table are the percentage of each habitat impacted, not the absolute amount of each habitat disturbed in relationship to the entire Study Area. Therefore, we believe the comparison does not water down effects. The cumulative-effects section also describes wildlife effects north of the Study Area, thus broadening the analysis to include the full range of habitat that may be affected by CBM gas development activities in the northern San Juan Basin

U82 We have located the area of impact down to a 20-acre well window. The actual location of impact within the well window is not known until onsite reviews are conducted at the point that APDs are filed. This is consistent with staged NEPA and the level of detail appropriate to the programmatic decisions addressed in this EIS.

U83 Mitigation measures are based on what we consider to be the most effective mitigation approach. We have not listed measures considered to be partially effective or ineffective because doing so would add little to the public's understanding of the proposed action and its impacts. Wildlife mitigation measures are presented in Section 4.3.2.8. These measures were developed specifically for this EIS but in some cases overlap mitigation that may have been presented in 1991. Where overlap occurs, it is simply because the majority of mitigation is time tested and has become a standardized tool for impact avoidance or reduction. One such example is avoidance of wetlands.

U84 The causes and extent of habitat fragmentation are discussed in Sections 4.3.2.3 through 4.3.2.7 and in Section 4.13.3.2.

U85 The statement reflects the fact that elk do not react positively to human disturbance. The physiologic and behavioral responses of wildlife are summarized in studies referenced in Section

4.3.2.3 of the EIS. The CDOW does not maintain a time series database that correlates winter mortality to meteorological variables.

U86 and U87 The habitat-disturbance effects of CBM development within the Study Area can be predicted with some degree of confidence. We cannot predict quantitatively, however, the effects of habitat disturbance on deer and elk mortality.

U88 Section 4.3.2.6 describes impacts on songbirds and waterfowl known to frequent the Study Area. Also, please see the response to U89.

U89 The Migratory Bird Treaty Act (MBTA) does not apply to the programmatic actions analyzed in this EIS. The guidelines established by the MBTA would apply at such time as an APD is filed and site-specific, NEPA-compliant documentation and field siting of well facilities are conducted for individual actions. The general mitigation measures outlined in Section 4.3.2.8 present the overall guidelines to be used for gas developments in various habitats. Additional specific mitigation is established at the project level to address site-specific issues as they arise.

U90 These effects are described in Section 4.13.3.2. and Table 4-52.

U91 The interdependence and interrelationships between ecosystems are determined by natural ecosystem dynamics and do not change. If the question is how CBM development affects various ecosystem components, please refer to Chapter 4 in its entirety.

U92 We have drafted the final Biological Assessment based on previous comments and resubmitted it for U.S. Fish and Wildlife Service (USFWS) review and concurrence. We will complete formal consultation with the USFWS before issuing a Record of Decision for this Project. This is consistent with the working protocols established between the two agencies.

U93 Table 4-52 should not match the statistics presented in Table 4-8 through Table 4-13, because Table 4-52 presents cumulative-impact statistics from both Federal and non-Federal wells, whereas the other tables present statistics from wells under Federal jurisdiction only. Sections 4.1.3.2 and 4.1.4. present the methods of calculating surface disturbance.

U94 Section 4.13, Cumulative Impact Assessment and Appendix G, Biological Assessment, have been revised in the FEIS to provide a more detailed analysis of cumulative impacts on biological resources and TES species.

U95 The Biological Assessment is presented in Appendix G.

The significance criteria presented in Section 4.3.3.1 explain that impacts would be considered significant if there were a loss of an individual plant or animal, or a loss of critical habitat of such species. There is nothing in this statement that implies that various forms of illegal take of Threatened or Endangered (T&E) species would be allowed in violation of Section 9, ESA requirements. Nor is anything described in the proposed action that would imply intention to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” Threatened or Endangered wildlife or plants.

The Biological Assessment and formal USFWS Biological Opinion address the potential adverse consequences of the proposed action and the ways in which impacts can be removed or minimized. The consultation process, and conclusions reached, eliminate illegal taking as a consequence of this programmatic action. Additionally, further analysis and consultation, if warranted by the results of the site-specific Biological Assessment, would take place when individual projects were proposed. We have rewritten Section 4.3.3.1 to more clearly state the broader definition of “take” presented in the ESA.

U96 Biological Assessments have been prepared for all Federal actions on the Reservation. The determinations reached in the BAs would not suggest that a taking is occurring. The USFWS is consulted in instances when a “may affect” determination is reached.

U97 We have rewritten Section 4.3.3.9 to state that “...conditions of approval are designed to protect Federal threatened and endangered species to ensure that actions are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of (its) habitat.”

This EIS conforms with ESA and ESA procedural requirements. Please refer to the Biological Assessment in Appendix G.

U98 This EIS conforms with species conservation recovery efforts. Please refer to the Biological Assessment, Appendix G, and in particular the USFWS Biological Opinion. Additionally, the BLM and BIA would develop biological assessments and tailor management practices to conform with species conservation recovery efforts when developing site-specific projects.

U99 Water sampling in the Pine, LaPlata, and Animas Rivers indicates that selenium levels are low and well within State water quality standards (Section 3.5.2.4). Section 3.5.2.4 presents a discussion of selenium levels and their sources in local riverine systems; none of the sources are

related to gas well development and production. Direct and indirect impacts on surface waters within the Study Area related to implementation of the Alternatives are expected to be negligible (please reference Section 4.5.2.7 and Biological Assessment of the effects of the proposed action on razorback sucker and Colorado pikeminnow).

In terms of the effects of disposal water, the geologic setting is not favorable for significant interaction to occur between injected disposal water and surface streams, because of the relative depth of the injection formations and low permeability of the Kirkland shale that directly overlays the formations.

The potential for direct impacts on surface water quality is a function of surface water runoff and erosion control and management practices. The mitigation measures presented in Section 4.5.2.8 and Appendix E are designed to prevent erosion from entering area streams, and therefore to minimize the risk of metal-bearing sediments reaching stream channels.

Regarding the effects of road dust, particulate matter would be controlled by application of water and/or chemical dust suppressants (Section 4.2.5), and thus would not be expected to contribute selenium to stream courses, if indeed selenium were present in the road dust.

U100 There are no studies of cross-beak birth defects specific to the Study Area that we know of. No processes associated with CBM well construction and production would contribute to increased selenium levels.

U101 The Biological Assessment makes note of the fact that individual willow flycatchers were found near Pastorius Reservoir in the north central region of the Study Area in 1995. Surveys will be conducted in suitable habitat before any construction activities, to determine the presence or absence of the willow flycatcher (Biological Assessment, Appendix G).

U102 Please refer to the Biological Assessment (Appendix G).

U103 The Biological Assessment presents a quantification of instream water depletions. These depletions may adversely affect the Colorado pikeminnow and razorback sucker. Mitigation designed to offset these adverse effects will be developed during consultation required by Section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531 et seq.). Any such mitigation would be implemented in accordance with the USFWS Recovery Implementation Program for the San Juan River.

U104 CBM development, like numerous other activities in the Study Area, such as irrigation and domestic water consumption, contributes to depletions of surface water that would otherwise be available as instream flows. EIS Sections 4.3.2.3 and 4.3.3.3, and the Biological Assessment

describe how CBM development may affect local and downstream fish species, and the mitigation that would reduce or minimize potential impacts.

U105 The effects of CBM development on eagle and southwest willow flycatcher are described in the Biological Assessment and Sections 4.3.3.3 and 4.3.3.4. Mitigation in wooded riparian and wetland habitats includes avoidance of such habitats whenever possible (Section 4.3.1.8). If wetland avoidance is not possible, the BIA would consult with the Army Corps and the USFWS regarding mitigation options and obtain any necessary approvals.

U106 The responsible agencies consult at two stages, first for this programmatic EIS (see Appendix G, Biological Assessment), and again at the site-specific project stage if the results of the site-specific biological assessment trigger further consultation.

U107 The 20-year life of the project is not arbitrary; it is based on reasonable, foreseeable future development associated with the project. Although many wells may produce longer than 20 years, many others would be plugged and abandoned in that time frame. Given the changes in oil and gas markets, projection beyond 20 years is not practical.

The DEIS discloses the expected increased gas production associated with three Alternatives over the next twenty years. With each scenario, there is a significant increase in incremental gas production over the current production. For example, with no infill development (Alternative 1), there is an incremental increase in CBM production of 920 Bcf. With infill development (Alternative 2), the incremental CBM increase is 1,182 Bcf. The Preferred Alternative (Alternative 3) yields an incremental increase of 1,304 Bcf over the next 20 years.

The BLM's assessment of the need for infill wells in the Fruitland shows that infill development is required to produce the additional gas; it is not a justification for acceleration of production.

A typical engineering practice is to design pipelines, wells, and associated equipment for a 20- to 30-year project life. After this period, pipelines, wells, and equipment may require large investments to replace and repair. At such a point in the gas field's production life, an operating company is faced with a scenario in which the production has dropped dramatically, and declining production may force the abandonment of the wells and pipelines, rather than the choice of investment to replace and repair. If an operator cannot make a reasonable rate of return on his investment for replacing and repair of the infrastructure, he would leave a significant amount of gas in place that could not be recovered economically. Given these conditions, the BLM concluded that downspacing is necessary to optimize, not accelerate, recovery of the gas resource.

U108 Please see Comment Responses H1, H2 and H3.

U109 As noted in response to Comment U-55, coal fires have been a natural occurrence along the Fruitland outcrop for many years before CBM development. Stating that CBM development is the cause of all new coal fires may not be accurate.

At least one new coal fire has started very near the surface, well above the water table, and beyond any effects of CBM development.

The SUIIT spent over \$1,000,000 to test a technology for extinguishing coal fires. This is a significant investment to mitigate a possible CBM impact. Although this attempt was unsuccessful, the SUIIT is still open to new technologies for extinguishing coal fires. The BLM and SUIIT spend at least 6 days every month monitoring the Fruitland outcrop. The monitoring is intended to identify new coal fires and monitor the magnitude on the surface of known coal fires. Estimating the subsurface extent of coal fires is not feasible.

SUIIT land ownership covers almost the entire Fruitland outcrop on the reservation. Therefore, exposure to hazards associated with any CBM-induced coal fire can be minimized.

U110 The 3-M study is not an industry-conducted project. Industry was asked to provide data and invited to participate in the technical working sessions. Funding, supervision, and technical direction for the 3-M project came from the COGCC, BLM, and SUIIT. The actual modeling was conducted by an independent, third-party contractor.

U111 The economics of resource recovery has been studied and presented in the EIS. Please refer to Section 4.10.

U112 There are no foreseeable economic benefits associated with delaying recovery. Gas prices have increased, but recent analyses indicate that the prices of today will remain relatively stable for years to come. These prices would support development of the resource, only if this development can use the existing gathering infrastructure. Leaving gas for future recovery is not viable. Production rates would be too low to support the cost of drilling new wells and installing new gathering infrastructure.

U113 Production projections are presented in Figure 2-3.

U114 Accelerated water removal from the Fruitland Formations would not affect the subsurface ecosystem.

U115 More efficient desorption and migration of methane associated with the proposed action would lead to an increase of 1.3 Tcf recoverable reserves.

U116 There would be no subsurface-ecosystem changes in overlying formations, due to the impermeable nature of the Kirtland shale. The Pictured Cliffs Formation, underlying the Fruitland Formation, would be partially dewatered with free gas in places. The Fruitland Formation would be dewatered, with free gas emplaced in the coalbeds and in some of the intervening sand and mudstone.

U117 Existing soil conditions are discussed in Section 3.4.3. Impacts to soils were analyzed and discussed in Section 4.4.2. Map 13 shows the soil types in the Study Area. Specific examination of soil type and potential impacts will be done on a case-by-case basis when individual projects are proposed. This staged approach to NEPA documentation and project planning is more efficient, avoiding unnecessary surveys at the programmatic level when the locations of specific activities are still unknown. Full NEPA study at the APD stage would involve full and careful on-site examination of soil type, impacts, and mitigation. The EIS emphasizes “Best Management Practices” (BMPs) to mitigate soils impacts.

U118 Please see the response to comments N4, U3, and U30, and Table 4-18 in the DEIS. In addition, the DEIS at Section 4.4.2.3 (Impacts Common to All Alternatives), states:

In areas where soils have high to severe erosion potential (Map 14) and are unstabilized, disturbance could result in accelerated erosion to the extent that damage to facilities and roadways may occur. The soils with high to severe erosion potential (Map 14) generally occur in broad portions of the south-central to southwestern regions as well as the eastern third of the Study Area. Slope instability or mass wasting could damage facilities and possibly cause hazardous situations. No specific areas of slope instability or failure have been identified in the Study Area; however, the potential for instability typically exists where slopes are greater than 30 percent. Such steep slopes do occur in the Study Area, typically encompassing the area of the near outcrop zone and within two miles west of the near outcrop zone. Project activities should have minimal effect on slope stability because surface disturbance on slopes in excess of 30 percent would be avoided where possible. Where such disturbances cannot be avoided, mitigative measures required by SUIT, BIA, and BLM through the APD authorization process would be implemented to reduce erosion and protect watershed resources.

U119 These mitigation approaches are properly adapted at the site-specific project level. Additionally, we believe that the standard operating procedures that call for minimizing ground disturbance, reclaiming disturbed areas adjacent to roads and well pads, using well construction methods that protect soils, and utilizing Best Management Practices, together provide an effective management approach, and, as such, there is no need to examine alternatives to these

mitigative procedures in this document. The soils Mitigation Summary (Section 4.4.2.8, pg. 4-95) outlines Federal legislation regarding the protection of soils and prime farmland as well as the relevant authorizing agencies. The standard mitigation measures outlined in Onshore Order No. 1 (download from <http://www.co.blm.gov/oilandgas/oilgas.htm>) and standard SUI/BIA conditionals of approval provide additional measures to reduce environmental impacts from oil and gas activities. Appendix E includes existing environmental-protection measures related to the Study Area.

U120 The use of the referenced significance criteria is neither unsupported nor arbitrary. The 5 percent threshold of significance was based on studies of predicted losses of prime farmland acreage due to urban development in other portions of Colorado, because there are no studies available that analyze loss of prime farmland from oil and gas development activities. Regardless of the significance threshold, the maximum of 3/10 of 1 percent of prime farmland that would be impacted as a result of the preferred Alternative is clearly insignificant. This small amount of predicted disturbance of farmland is due to the tribe's policy of avoidance of such resources.

U121 Methane seeps are both natural and man-made. The man-made ones are linked to CBM development in the Study Area. The long-term effects of methane-saturated soil are unknown. Historic seeps in the region (Archuleta and La Plata Counties, Colorado) are natural, and vegetation does not grow over them as long there is an active emission of methane. Given the persistent nature of these natural seeps, the man-made seeps may persist indefinitely.

U122 The most likely cause of topsoil contamination associated with production-related activities would be accidental releases of petroleum products and produced water or other hazardous materials. Because industry follows diligent operating procedures, however, such accidental releases should be rare and very localized, and therefore not quantifiable. Also, the minimal number of wells anticipated in this area and the application of mitigative measures and monitoring would render the loss of topsoil minimal. No data are currently available regarding the depth of possible soil contamination, making it impossible to determine volumes.

U123 Irrigated soils downstream are not affected because there are no anticipated releases of CBM produced water, and air emissions consist solely of gases and minimal amounts of particulate matter.

U124 It is unclear from the comment what has been or would be dumped and released. The BLM, BIA, and tribe are unaware of any illegal dumping, therefore they have no data to disclose. If a situation arose when dumping occurred, actions would be taken to clean up the site.

U125 This is not quantifiable. The BLM, BIA, and SUIT require implementation of Best Management Practices (BMPs) to reduce the impacts on topsoil. Examples of these measures include stockpiling and reuse to minimize the loss of topsoil. Other measures are listed in Section 4.4.2.8 and Appendix E of the EIS.

U126 Additional mitigation measures required to minimize erosion are evaluated on a case-by-case basis and could include the use of larger culverts and gabion (stone) fencing.

U127 Maximum potential impacts on prime farmland are presented in Table 4-19. Livestock-grazing impacts are addressed in Section 4.6.6.2. Acreage used for gardening would not be impacted. The 3M Study does not provide a quantification of methane-saturated soils.

U128 Federal land will not be crossed to access tribal land, therefore there will be no impact.

U129 None of the project Alternatives involve removal or loss of land currently used for organic farming, personal-use gardening, or production for local distribution. Personal-use gardening and production for local distribution are very limited in the Study Area, and, according to the Colorado Dept. of Agriculture, there are no certified organic licensees within the Study Area.

U130 and U131 As displayed in Table 3-50 of the DEIS, the hydraulic fracturing (“fracing”) fluids referred to here are listed in the broad category of Resource Conservation and Recovery Act (RCRA) exempt wastes. They are also addressed in Chapter 2, Section 2.8.5.2. Fracing in the Fruitland formation is a straightforward process of mixing a fracing fluid of fresh water, sand, and a small amount of gel to hold the sand in suspension. Some operators add a small amount of formic acid or hydrochloric acid, to break down clays that may be present in the wellbore. The extensive monitoring efforts to date by BLM and COGCC have shown no elements of these compounds in any of the water tested. To expand these references, a more comprehensive list has been added to Appendix P.

U132 We have expanded the discussion of cavitation in Section 2.8.5.1. The hybrid fracturing process referred to has not been encountered to date, nor has any operator indicated interest in using a hybrid.

U133 The effects of poorly cemented wells, as well as the ongoing monitoring and mitigation programs, are described in detail in Chapter 4: 4.5.1.3 Impacts Common to All Alternatives, Production Phase. In the Study Area, 100% of the pipelines and compressor stations are cathodically protected through the use of an impressed-current system. Cathodic-protection wells are limited and do not pose a threat to groundwater. There is little known use of cathodic

protection on producing wells in the Study Area.

U134 BLM has no jurisdiction over COGCC utilization of staff. BLM places a high priority on ensuring that the drilling and completion of wells is in compliance with all regulations and policies. Problems and deviation from these regulations and policies are corrected immediately. All bradenhead reports are reviewed annually, and those conditions that fall outside acceptable standards are remediated immediately.

U135 The DEIS states that, based on current water production and capacity, the current number of disposal wells should be able to handle future water disposal. Section 2.8.5.3 also indicates that very few, if any, additional disposal facilities would be necessary. These conclusory statements are based on current water production and injection well capacity information.

U136 This situation occurs north of the Study Area. The hypothesized cause-and-effect relationship between the effects observed at Hickerson Hot Springs and operation of the Simon Land and Cattle Co. disposal well, although strong circumstantially, has not been proved conclusively. In reviewing the remaining injection wells, no unacceptable effects have been detected as a result of their operation.

U137 The EPA indicates that the violation has been corrected (the well was plugged back and is injecting at a different interval), and that the cause of the injection-pressure increase was operational (downhole mechanical) in nature. The reservoir was not fractured, nor was its capacity exceeded. The EPA monitors all injection wells closely, to ensure that reservoir capacities and pressure are not exceeded.

U138 The potential impacts of wells that are not properly plugged and abandoned would be similar to those associated with an improperly cemented well, as described in Chapter 4, Section 4.5.1.3. The effects of drilling additional wells are well documented throughout the DEIS, as are the actions required to mitigate any impacts.

U139 Injection pressures of injection gas would be controlled to stay well below formation parting pressure (Section 4.5.1.6). Little, if any, potential exists for the vertical migration of methane, nitrogen, or carbon dioxide from the Fruitland Formation, due to the injection process (Section 4.5.1.6). Section 4.5.1.8 also describes the monitoring efforts that would be used to ensure that injection pressure are maintained within approved limits.

U140 We have added the appropriate references to Section 4.5.1.7.

U141 These mitigation/monitoring measures are either part of ongoing programs, have recently been implemented, or are to be implemented as an outcome of this EIS.

U142 This information is available from the EPA, because disposal of produced water is permitted on a well-by-well basis under the EPA's Underground Injection Control program. Each injection well must have specific reservoir-engineering studies conducted, and rigorous well tests performed, to validate the operational parameters of injection rates, pressures, and operational life of the well. We are unaware of any issues associated with the injection wells in the Study Area, therefore analysis of reservoir-engineering studies is not required in this EIS.

U143 Given the rapid groundwater responses observed on SUIT land associated with the onset of CBM development, it is likely that Fruitland hydrology would be reestablished to pre-development conditions. Reestablishing pre-development conditions, however, is likely to take more than 200 years. Recharge of the coalbeds requires a fairly small volume of water, because the coal porosity is about 1%.

U144 Any such quantification would be inappropriate speculation, but sedimentation and contamination will be minimized by the use of Best Management Practices (BMPs). Impacts of sedimentation and contamination on rivers and streams should not be significant if BMPs are used.

U145 The cumulative impact of water depletions is presented in Section 4.13.3.4, as well as the overall direct and indirect effects of CBM development on surface water in Sections 4.5.2.3 through 4.5.2.6. Site-specific, localized impacts cannot be assessed on a well-by-well basis, because the water source for each well is unknown at this time. Water sources needed for well construction are identified in conjunction-specific project proposals and associated water issues analyzed in site-specific environmental analyses at the same time.

U146 The evaporation pits dispose of produced water, which contains some entrained methane (approximately 1.0 to 2.0 mg/l). As noted in the DEIS, about 5% of produced water is disposed through permitted evaporation ponds. This amounts to about 5,100 barrels per day. Assuming the entrained methane volatilizes from the water when the water is placed in the pond, about 1.7 to 3.6 pounds of methane/day are discharged to the atmosphere. This is equivalent to 40 to 80 standard cubic feet of methane per day.

Methane is degraded in the atmosphere by ultraviolet light, eventually broken down into water and carbon dioxide.

Minerals dissolved in the water are not volatilized. They remain in the pond, and the precipitated solids are disposed of according to the terms of the permit.

U147 These amounts cannot be quantified. Use of Best Management Practices addresses erosion, sedimentation, and contamination concerns in a highly effective manner, minimizing these potential environmental consequences.

U148 No pollutants are discharged to the surface water system from the drilling phase or production phase at the well. Produced water is not discharged to surface water, nor are any drilling fluids.

U149 Section 4.5 includes a detailed analysis of impacts on surface water. The greatest potential for such impacts is from construction of roads, pipelines, and well pads that change surface-flow dynamics, causing channelization and increased erosion. Implementation of the mitigation and Best Management Practices described in the EIS for the control or containment of surface-water runoff during construction and abandonment activities is predicted to reduce surface-water-quality impacts to an insignificant level.

U150 Operations in the San Juan Basin are not analogous to the Black Warrior Basin in Alabama or the Powder River Basin in Wyoming. Any comparisons between these CBM operations and surface-water impacts that may occur from San Juan Basin operations are not valid.

U151 There's no relationship between illegal activities and an increase in well densities. The various gas regulatory agencies, BLM, BIA, EPA, SUIT, and the State all monitor gas development and production carefully. Violations, should they occur, would be dealt with appropriately.

U152 The results of BLM reports, as well as published studies like the 3M project, are incorporated in the Biological Assessment and throughout the text of the EIS. A more rigorous study is underway to address CBM development in areas north of the SUIT reservation. Studies to date show hydrologic relationships between CBM development and area rivers, although any related impacts are not predicted to be significant. Section 4.5.2.7 states:

Extended over the 20-year period covered by this EIS, the expected annual maximum water use requirement for well construction and stimulation associated with Alternative 2 is 25 acre-feet/year (Table 4-23). The expected annual maximum water use requirement for Alternative 3 is 27 acre-feet/year. The water use requirement for Alternative 1 would be less, approximately 18 acre-feet/year. Because water for drilling and stimulation would be acquired from existing irrigation sources, although it is possible that some water may be acquired from

local streams, ponds and formations, significant well construction related water depletion impacts are not anticipated.

Additionally, the 3M Study estimates that CBM gas production within the Study Area will intercept approximately 37 acre-feet of Fruitland Formation water that would normally discharge into the Animas River. This amount of water is not presently measurable in-stream and is not anticipated to significantly impact fish habitat or agricultural use.

For comparison purposes, the average annual runoff in the Animas River near Cedar Hill, New Mexico (2.5 miles upstream from the Colorado-New Mexico state line) for period 1934 to 1996 was 671,700 acre-feet (USGS 1996). The 3M (Monitoring, Mapping, and Mitigation) project will continue to monitor the situation and report to the participating agencies, the public, and the Fish and Wildlife Service any changes, particularly increases, in the calculated depletion.

Section 4.13.3.4 states:

No significant cumulative impact on water resources is expected as a result of past and projected oil and gas development on the Reservation. Future development of oil and gas resources, both within the Study Area and elsewhere in the San Juan Basin of Colorado, would utilize produced water and fresh water obtained by permit or commercially. The total volume of fresh water needed for all oil and gas development in the Colorado portion of the San Juan Basin is estimated to be approximately 81 acre-feet per year, or three times the 27 acre-feet per year needed for the Agency-and-Tribal-Preferred Alternative. Additionally, approximately 155 to 200 acre-feet per year of instream flow will be lost to the riverine system due to interception of Fruitland Formation recharge into the Pine, Florida, Piedra, and Animas Rivers by producing CBM wells along the Fruitland outcrop north of the Study Area and in the Indian Creek area. Thus, the amount of water that would be consumed through construction or lost through depletion would total approximately 280 acre feet per year over the life of the field.

U153 Please see the responses to Comments U-148, U-149, and U-152.

U154 Best Management Practices include routing access roads to minimize erosion, containing all drilling fluids at the well site, disposal of saline produced water into deep formations and lined evaporation ponds, revegetating disturbed soils, and constructing crossings (pipeline and road) according to current regulations in a manner that minimizes stream channel disturbance.

U155 Entrained-methane concentrations in groundwater in those areas potentially affected by incompletely cemented gas wells appear to be decreasing following gas well remediation efforts,

according to the 1998 study on domestic wells in proximity to remediated gas wells.

U156 Ground water depletions associated with CBM production are restricted to the Fruitland and Pictured Cliffs Sandstone. These formations are hydraulically separated (confined) from the overlying Animas, Nacimiento, San Jose, and Ojo Alamo Formations, which are the primary drinking water aquifers within the San Juan Basin. The Kirtland Shale that overlies the Fruitland Formation and underlies the shallower drinking water aquifers contains nearly 1,000 feet of impermeable strata that effectively separates the Fruitland Formation from the shallower aquifers. The only ground water depletion impacts on domestic water supplies are limited to those few wells that are located immediately on the Fruitland and Pictured Cliffs Sandstone outcrop areas, as described throughout the EIS.

There are no ground water depletions from development of conventional oil and gas reservoirs in the Study Area. This is because the conventional oil and gas reservoirs are deeper and hydraulically separated from the domestic water supply aquifers by several thousand feet of impermeable shales, mudstones, and other impermeable strata.

U157 The Pictured Cliffs Formation is a source of water for CBM wells and adds to the overall amount of produced water in some wells.

U158 We respectfully disagree. *Direct* impacts on land use resulting from the proposed Alternatives are related primarily to physical restrictions and loss of agriculture, livestock grazing, timber production, wildlife habitat, and recreational areas. Visual impacts and depreciation of land value also could also directly affect surface owners. *Indirect* impacts consist of activities that impinge on existing uses, such as dust and noise from traffic that may affect residential areas, and water contamination that could affect existing agricultural or residential uses. Impacts resulting from each of these activities are presented in Sections 4.2, 4.5, 4.6, 4.7, and 4.11.

Section 4.6 describes and quantifies the range of direct and indirect impacts that could result from the proposed activities, including (1) loss of land or land value, including potential agricultural, rangeland, and forest production; (2) displacement of recreational land; (3) effects on applicable regional plans, adopted policies, goals, or operations of communities or government agencies; and (4) land-use incompatibility with residential, recreational, commercial, and government/public areas.

U159 Potential changes of the rural quality of life in the Study Area are well documented throughout the EIS, and are primarily related to aural and visual impacts. Given the tribe's commitment to mitigating impacts on these resources, and because oil and gas development would take place primarily on tribal land that is not available for rural residential development, only slight changes are predicted in the rural quality of life in the Study Area.

U160 Section 4.6.9 (Unavoidable Adverse Impacts) states:

Unavoidable adverse effects include long-term impacts on existing agricultural, grazing, and timber resource lands resulting from the long-term removal of land from these uses for CBM and conventional well facilities, including access roads. Unavoidable short-term impacts would include dust, noise, traffic, and visual effects from facility construction and operations on existing residential and recreational areas. The industrial character of project facilities and activities would slightly change the rural quality of life currently afforded in rural residential areas, including impacts on residences which are located on non-Indian lands within the exterior boundaries of the Reservation.

U161 A La Plata County study is underway to determine the cumulative effect on real estate prices of oil and gas development. The study is not complete and there are no preliminary conclusions to share now.

Section 3.10, however, presents information that shows how real estate values in La Plata County continue to increase, with almost no exceptions. For example, the number of residential properties assessed in La Plata County grew from 12,769 in 1990 to 15,833 in 1996, an increase of 23 percent over 6 years. The assessed value of those nonvacant residential properties increased by nearly 50 percent, from \$126.4 million to over \$189.1 million.

U162 Please see Comment Response U161.

U163 We believe that Sections 3.6, 3.10, 4.6, and 4.10 use accepted methods to quantify and disclose the direct and indirect economic and physical impacts on various categories of land in the Study Area. The conclusion of these analyses is that increased well densities are economic.

U164 Please refer to Sections 3.6, 3.10, 4.6 and 4.10.

U165 No impacts resulting from implementation of the Alternatives (Table 4-34) are predicted to occur in designated recreation areas.

U166 Most of the land in the Study Area is either privately or tribally owned, and is not available for visitor recreation. Therefore the impacts of any of the Alternatives on visitor recreation and tourism are predicted to be minor, as described in Section 4.13, Cumulative Impact Assessment.

U167 In general, only tribal members can hunt and fish in the Study Area. Section 4.3.2 describes impacts on hunting and fishing.

U168 Although the proposed Alternative would result in an increase in traffic volume of about two to six percent above naturally occurring background volumes, there is no indication that this would lead to a heavy concentration in the town of Ignacio, or any measurable change from current gas-industry-related traffic levels, which are two to six percent of current traffic levels (Section 4.7). Most of the activity associated with each of the Alternatives would occur west of Ignacio; most of the traffic would be between Farmington, NM, and the SUI Reservation, and on Reservation roads.

U169 Bridges that may not accommodate overweight drilling units are CR 105 and CR 122 over the La Plata River in the west, and two bridges on CR 334 over Allison Ditch in the east (Section 3.7.1). The weight of trucks hauling drilling rigs varies, depending on the type of rig and number of axles, but does not exceed 120-130,000 pounds; this weight is distributed across the length of the hauling unit.

Overweight units require permits from the CDOT that outline the appropriate route to take, in order to avoid bridges that cannot accommodate the weight of the unit. The tribe stipulates that operators and contractors abide by these permits. Additionally, rig movement associated with the preferred Alternative does not involve any of the above-mentioned bridges: the first two are outside the development area, and the last two have several alternate routes nearby.

U170 CDOT and the La Plata County Road and Bridge Department are responsible for road maintenance. We assume that the funds collected for registration fees, oversize/overweight permits, and fuel use taxes are sufficient to cover these costs. With OS/OW permits costing \$400-800 annually per vehicle, fuel tax at 20 cents/gallon, and registration fees of \$2,300 per year per vehicle, owners and operators of vehicles required to pay these fees are contributing thousands of dollars annually to public-roadway maintenance budgets.

U171 Maximum potential air quality impacts of fugitive-dust emissions from vehicle use on unpaved roads during the 36-day construction period at each well location (based on a “reasonable, but conservative” assumption that up to four well sites could be developed concurrently within one-half mile of each other) were reported in the DEIS (pages 4-9 through 4-10; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery). These construction-related impacts would not be significant. Other cumulative fugitive-dust impacts (e.g., during operation) would be less.

U172 The DEIS analyzed the potential direct and cumulative air quality impacts from a number of construction and operation air pollutant emission sources (including fugitive dust) and

determined there would be no significant air quality impacts. To the extent that existing fugitive-dust impacts are represented by the background concentration values reported in Chapter 3 (Affected Environment), they were included in the air quality impact assessment. Please also see Comment Response U117.

The environmental impact analysis process required under NEPA is to “be analytic rather than encyclopedic” (40 CFR 1502.2(a)). No survey of “studies that have gauged and quantified fugitive dust impacts on date” was performed. The Respondents should contact the applicable air quality regulatory agency directly if they believe current air quality impacts from fugitive dust are violating applicable air quality standards.

U173 As reported in Table 3-1 of the DEIS (page 3-6; Measured Concentrations of Regulated Air Pollutants at the SUIT Monitoring Station near Ignacio (in $\mu\text{g}/\text{m}^3$)), background PM_{10} measurements have all been well below applicable Ambient Air Quality Standards. Without knowing the size distribution of the sampled particulate matter, no conclusions can be reached regarding the new $\text{PM}_{2.5}$ Ambient Air Quality Standards. Since the Study Area is classified “attainment” or “unclassifiable” for all criteria pollutants (including particulate matter), EPA and the CDPHE-APCD apparently agree that fugitive-dust impacts are below applicable Ambient Air Quality Standards. In addition, based on EPA’s “rural fugitive dust policy,” air quality regulatory agencies are not required to implement control strategies for windblown dust or agricultural activities within “attainment” or “unclassifiable” areas.

Please also see Comment Response U172.

U174 Most accidents occur where the roadway causes vehicles to interact in conflicting movements, such as a lane merge or intersection. An increase in the accident rate would be expected if the number of such locations were expected to increase (Section 4.7.2.3). Since none of the Alternatives involve the construction of new public roadways or require any new intersections, traffic accident rates are not expected to increase under any of the three Alternatives.

U175 Impacts on archaeological sites, whether eligible or not, are predicted to be insignificant because of the tribe’s commitment and proven ability to avoid impacts on cultural resources, by using site-specific project planning.

U176 The Southern Ute Tribe’s cultural-resource policy has always been avoidance of any archaeological sites. Additional mitigation has rarely been necessary. Please also see Comment Response U49.

U177 We believe the Study Area-specific methodology used accepted techniques to analyze

visual impacts of the three Alternatives reasonably and accurately.

U178 Please refer to Tables 4-44, 4-45, and 4-46 for a comparative analysis of visual impacts on residential areas of each of the Alternatives.

U179 Flares are usually lit in conjunction with well completion and testing, as discussed in Chapter 2. The text in Chapter 2 under the subheading Flaring and Testing has been rewritten to clarify the circumstances under which flaring occurs.

The impacts of flaring on residents and viewsheds have not been quantitatively studied, so no data are available on this subject. The direct impact of flaring on nearby residents and viewsheds is primarily the addition of a flare (flame) to the field of view. The impact of the flame on a viewer depends on many variables, such as the gas-production rate and content, the wind speed and direction, the existence of visual barriers, the visual surroundings, the proximity of the viewer to the flare, and the intensity of daylight or moonlight. Most wells are flared only when a cavitation completion is in progress.

Because of the isolated and short-term nature of flaring activities, any associated direct and cumulative impacts are predicted to be insignificant.

U180 Please see the response to comment U166.

U181 43 CFR 3162.3-4 requires that a well which is incapable of production in paying quantities be promptly plugged and abandoned, in accordance with the approved surface operating plan. Therefore visual impacts will remain until reclamation, including revegetation, is completed after abandonment pressures are reached. The revegetation time will vary according to the environmental setting: a sagebrush or grassy area can revegetate completely in one growing season. Disturbances of heavily wooded areas will take longer to revegetate, but visual impacts in such areas can be substantially unnoticeable in 10 to 20 years after reclamation is completed.

U182 Please refer to Section 4.13.3.8 for the presentation of cumulative visual impacts. Federal and State visual resource management standards and/or objectives do not apply to tribal land. The comprehensive mitigation presented in Section 4.9.8, however is designed to minimize the visual impacts of CBM development in the Study Area.

U183 No impacts are predicted in the referenced land-use categories. There are no Federally designated recreation land-use categories on tribal land, nor are there requirements or methodologies to analyze visual impacts on any such land outside the Study Area.

U184 Evaluations of health, safety, welfare, and environmental impacts are in specific subsections of Chapter 4. Health and safety are evaluated in 4.13. The welfare of the Southern Ute Indian Tribe and its members is evaluated in terms of cultural benefits, financial benefits (such as jobs), and social services. The welfare of other population subgroups is considered in terms of financial impacts of increased jobs and services provided by taxing authorities. The environmental impacts for which substantive data were available for disclosure and evaluation are addressed under specific resources (e.g., groundwater, soil, air quality) in Chapter 4.

Economic evaluation of production was carried out to quantify the potential financial benefits to the Southern Ute Indian Tribe and to County and State collections/programs, via taxes. There is no requirement that production of tribal resources be carried out economically or in the interest of the general (nontribal) public, so long as it conforms to applicable Federal statutes. The Federal government's trust responsibility to a tribe requires that the BIA and BLM assist the tribe in developing resources in the its best interest.

U185 The prices used were reasonable when the analysis was done. The calculations were conservative in estimating the potential benefits of development, and therefore are still valid. If prices remain higher than modeled throughout the life of the project, then the economic benefits to all parties could be higher, while any potential negative impacts would be unaffected by price fluctuations. Higher prices could be partially offset, however, by higher costs or by production delays due to competition of this area with other oil and gas producing areas for capital, labor, and equipment.

U186 a i): No substantial negative impact on social services is expected. As described in Chapter 4, development of tribal land would be most evidenced by increased prosperity of the tribe, resulting in positive social and cultural effects and less need for social services such as crime control, welfare, and counseling. Most of the infillable tribal land is not close to nontribal homeowners.

U186 a ii) There is no study to date regarding the impacts of development of tribal gas resources on real estate. Because housing on the Southern Ute Reservation is concentrated around Ignacio, it is unlikely that development of tribal resources would significantly impact real estate prices.

U187 b i) The infill and ECBM programs described in Alternatives 2 and 3 are intended primarily to add additional recoverable resources, not to accelerate development.

U187 b ii) CBM development on the land affected by the development should increase personal property tax collections (taxes on equipment on locations), as well as taxes on gas produced. Both types of taxes are collected on property owned by nontribal companies. There is no development on tribal land along the outcrop, so there would not be any impact on taxes from

this land.

U188 Section 4.11 presents a thorough analysis of potential noise impacts from the three Alternatives analyzed in the EIS, as well as numerous noise mitigation measures.

U189-U192 It is impossible to estimate these expected numbers, since there are no sources of relevant industry data available. A historical review of local papers, including the *Durango Herald*, *Farmington Daily Times*, and the *Four Corners Business Journal*, did not reveal any incidences involving CBM gathering lines, but one incident involving construction on another operator's well site did end in a fatality. Tribal CBM operations include daily well-site safety meetings, and stringent safety standards are strictly adhered to, making them as safe as other construction-related operations. If an explosion should occur, the gas supply to the area would be terminated, which would help confine it to a small area. Furthermore, most of the development within the Study Area would be in areas of low population density, lowering the probability of human injury in the unlikely event of an incident.

Several methods are used to protect pipelines from the most likely causes of failure, including:

- Cathodic protection systems,
- Leak detection systems,
- Line surveys, and
- Inspection and testing of valves and overpressure devices.

According to Mike Boland of Red Cedar Gathering Company, one hundred percent of Red Cedar's pipelines are cathodically protected through an impressed-current system.

The Office of Pipeline Safety (OPS) works with the oil and natural gas pipeline industries to improve safety and environmental protection in cost-effective ways. Currently, the primary regulatory basis for achieving these safety goals is the set of regulations embodied in Title 49 of the Code of Federal Regulations Parts 190-199 (Oct. 1, 2000). The Federal pipeline safety regulations: (1) ensure safety in design, construction, inspection, testing, operation, and maintenance of natural gas and hazardous-liquid pipeline facilities, and in the siting, construction, operation, and maintenance of LNG facilities; (2) set parameters for administering the pipeline safety program; (3) require pipeline operators to implement and maintain anti-drug and alcohol-misuse prevention programs for employees who perform safety-sensitive functions; and (4) delineate requirements for onshore oil pipeline response plans.

The regulations are written as minimum performance standards, setting the level of safety to be attained and allowing the pipeline operators discretion in achieving that level. In addition, pipeline companies perform many discretionary activities over and above the regulations to achieve these goals.

Responses to Comment V from Carl Weston, Individual

V1 Please see our response to Comment S-1.

V2 Please see Comment Responses E1 and S2. Also, the Respondent was granted and verbally agreed (on 3/21/01) to a 10-day extension, which provided a total of 85 days to comment on the DEIS.

V3 Please see our response to Comment S-3.

V4 Please see our response to Comment S-4.

V5 Please see our response to Comment S-5.

V6 Please see our response to Comment S-6.

V7 Please see response S-7. Mitigation primarily involves total avoidance of wetlands (Section 4.3.1.8). Produced water is disposed of through injection wells and evaporation ponds and is not available for wetland creation, due to high levels of total dissolved solids.

V8 Please see Comment Response S8.

V9 Please see Comment Response V2.

V10 Under 40 CFR 122, the EPA requires operators to prepare stormwater management plans for prevention of discharges from any facilities disturbing more than 5 acres. Compliance with these plans is required of the operators by the EPA.

V11 We agree, weed seed can be dispersed by wildlife, livestock, wind, and vehicles using county and reservation roads. The tribe and BIA are committed to an aggressive program of weed control.

V12 While some operators may carry out these practices, it is the intention of the tribe to ensure that all operators and contractors operate in a manner that minimizes wear and tear on public

roads. This includes removing chains and unloading equipment on access roads, rather than on public roads. This is not always possible, but all attempts are made to do so.

V13 We expect no significant air quality impacts at those limited well locations where cavitation (air and/or water injection surging cycles, followed by flaring of the produced gas and coal fines) is employed over a 10- to 15-day period during well completion and testing.

Although the DEIS examined potential air quality impacts during an assumed 36-day well construction period (3-day well pad and resource road construction; 8-day rig up, drill, and rig down; and 25-day well completion and testing), the DEIS did not specifically assess potential air quality impacts from optional cavitation procedures. The description of the potential air quality impacts of a similar cavitation operation was included in Appendix O of the DEIS. *(Note: The information presented in Appendix O in the DEIS has been incorporated into the text of the FEIS, in Sections 2.8, 3.2 and 4.2. Appendix O now contains oil and gas well spacing order information for the FEIS.)*

The quantity of air pollutants released during a total 60-hour cavitation flaring period (distributed over 10 to 15 days; assuming 1 to 2 hours flaring for each of 20 to 30 cavitation cycles) may be assumed to be less than the 168-hour total testing flaring period (distributed over 7 days), as analyzed in the DEIS. The potential emissions of inhalable particulate matter (PM₁₀) from the total testing flaring represent only 0.2 percent of the total potential PM₁₀ emissions during the entire 36-day well-construction period. Emissions of other pollutants due to flaring are minimal when compared to the applicable Ambient Air Quality Standards.

Even if all potential construction PM₁₀ impacts reported in the DEIS included the same distribution of toxic air pollutants reported in Appendix O of the DEIS for coal fines (an absurdly conservative assumption), potential metal concentrations would be well below safe thresholds reported by the EPA, the American Conference of Governmental Industrial Hygienists (ACGIH), and the Toxicology Excellence for Risk Management (TERA) nonprofit organization, per the following table.

Metal	Maximum Total PM₁₀ Concentration (µg/m³)^{1/}	Coal Fines Metal Proportions (ppm)^{2/}	Maximum Metal Concentration (µg/m³)	EPA Standard (µg/m³)^{3/}	ACGIH Threshold Limit Value (µg/m³)^{3/}	TERA “Safe” Concentration Value (µg/m³)^{4/}
Barium	77.4	160	0.124	n/a	n/a	1.2
Copper	77.4	14	0.011	n/a	n/a	2.4
Lead	77.4	12	0.009	1.5	n/a	1.5
Manganese	77.4	23	0.018	n/a	50	0.05
Mercury	77.4	<1 [Trace]	<0.001	n/a	100	n/a
Nickel	77.4	3	0.002	n/a	100	0.2
Selenium	77.4	1.8	0.001	n/a	200	0.5

Sources:

^{1/} Oil and Gas Development on the Southern Ute Indian Reservation DEIS; CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES; AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery; October 2000. Total predicted PM₁₀ 24-hour concentration of 127.6 µg/m³ minus maximum observed background concentration of 50.2 µg/m³ yields a maximum direct modeled impact of 77.4 µg/m³.

^{2/} Oil and Gas Development on the Southern Ute Indian Reservation DEIS; Appendix O; June 2000 Addendum; Environmental Assessment for the Payee #221 Natural Gas Well Site Project by Coleman Oil and Gas, Inc (NM-070-97-3222).

^{3/} U.S. Environmental Protection Agency; Health Effects Notebook for Hazardous Air Pollutants (www.epa.gov/ttn/atw/hapindex.html).

^{4/} Toxicology Excellence for Risk Management (TERA); Utility Emissions and the Toxic Release Inventory; Cincinnati, OH; August 1999 (tera.org/news/cinergy%20report%20in%20adobe.pdf); TERA “safe” concentrations are the applicable Threshold Limit Values adjusted for nonoccupational exposure by dividing by an uncertainty factor of 420, accounting for sensitive individuals and continuous exposure.

Notes:

1) Lead is the only metal for which the EPA has established a National Ambient Air Quality Standard; the EPA has not classified barium or copper compounds as Hazardous Air Pollutants.

2) As clearly stated in the DEIS, “Given these numerous ‘reasonable, but conservative’ analysis assumptions, which actually may compound one another, the predicted impacts represent an upper estimate of potential air quality impacts which are unlikely to actually be reached” and “the scientific evidence is not compelling that reasonably foreseeable significant adverse impacts would occur.”

V14 Please see Comment Response V2.

Responses to Comment W from Cynthia Cody, US Environmental Protection Agency

W1 The Record of Decision (ROD) will establish the mitigation that is required as a condition of approval for the selected Alternative.

W2 We have rewritten the EIS and Biological Assessment to establish mitigation requirements firmly. These requirements would be adopted in the ROD, after Section 7 consultation with the USFWS has been completed. For clarification, mitigation specific to individual projects would be applied at a point in the process when individual projects are analyzed in a project EA and site-specific Biological Assessment. This second level of analysis, in contrast with the programmatic level, provides the assurance that mitigation measures are applied to specific proposals in the future. Site-specific NEPA analysis would tier to the FEIS and associated ROD.

W3 Under the proposed Alternatives, if construction activity were to occur in wetland areas, compliance with site-specific COE 404 Permits would be required of all operators. As described in the EIS, wetlands in the Study Area are generally associated with areas of wooded riparian vegetation. This vegetation type tends to occur in relatively small areas that are easy to avoid because of their size. In all cases, wetlands will be avoided preferentially when locations for individual projects are determined (Section 4.3.1.7). This will not only preserve wetlands but also several other resources, such as culturally important plants, TES, water, and soils. The 171-acre total potential wetland impact is an estimate of maximum potential impact without mitigation. It assumes that every wooded riparian area is a wetland, which it is not, and that every acre would be impacted, rather than avoided. Actual wetland impacts should be significantly less and mitigated by the terms of the COE 404 permit.

W4 Under the proposed Alternatives, if construction activity were to occur in wetland areas, compliance with site-specific COE 404 Permits would be required of all operators. Wetlands in the Study Area are situated within areas of wooded riparian vegetation. About 171 acres of this vegetation type could potentially be disturbed by the Preferred Alternative. Wooded riparian vegetation tends to occur in relatively small areas that will be avoided preferentially when locations for individual projects are determined (Section 4.3.1.7 and 4.3.1.8). It should be noted that the 171 acres is a worst-case disturbance scenario, and most of that 171-acre area is actually wooded riparian vegetation. Only a small percentage of the wooded riparian vegetation would qualify as wetlands.

W5 Whether wetlands can be avoided would be determined on a project-specific basis. Where this is not possible, individual NEPA documents would describe which Alternatives were considered and the reasons why the wetland area cannot be avoided. Compliance with these regulations would be handled at the APD stage and be assessed in consultation with the Army COE.

The mitigation measures presented in Section 4.3.1.8 are fully consistent with the CEQ regulations and EO 11990. Alternatives are not required to eliminate impacts in their entirety. That would be our goal at the outset, but we also realize that, as projects are implemented, some impacts may be unavoidable.

W6 Site-specific planning will determine whether wetlands can be avoided entirely or whether other mitigation approaches would have to be adopted. We cannot state with certainty at a programmatic level, absent site-specific proposals, that a particular resource would not be impacted. We can anticipate that some additional roads and pipelines would be needed to access new well sites. It is incorrect to assume that existing roads are, in all cases, adequate to access new sites and therefore, wetlands would not be involved.

W7 The revised Biological Assessment (Appendix G) addresses mitigation measures for individual threatened or endangered species. These measures, after Section 7 consultation with the USFWS has been completed, would be incorporated as requirements in the Record of Decision.

W8 Methane in shallow aquifers comes from various sources, some naturally occurring and some man-made. There are reports of methane in shallow water wells before CBM development, and outside the region of conventional gas development. The source of the methane in these wells has been postulated as biogenic methane, based on the methane isotopic composition.

The origin of this methane is either a local source (shale beds rich in organic matter within the aquifer system) or a deeper one, such as the Fruitland Formation. Methane transport from the Fruitland Formation to the shallow aquifer system may be explained by the following mechanism. Fruitland coals are saturated with respect to methane at pre-development reservoir pressures. There has been a dynamic flow system near the outcrop (6-8 miles from the outcrop into the basin). This flow system may carry oxygenated water with nutrients needed by bacteria to generate additional methane within the coalbeds. Excess methane will be released as a free-phase gas, because the coal is already saturated. The free gas migrates through the overlying Kirtland Shale via tortuous channels, as a Light Non-Aqueous Phase Liquid (LNAPL). This mechanism is independent of CBM development.

Given the high artesian pressures in the Fruitland Formation before CBM development, and the distinct water-chemistry difference between the Fruitland Formation and the shallow basin aquifers, there is little evidence that methane from the Fruitland Formation is entrained in water migrating from deep to shallow aquifers. If there was significant leakage from the Fruitland Formation to shallow aquifers, there would be lower pressures in the Fruitland, and a Fruitland water-chemistry signature in the shallow aquifers.

CBM development increases the amount of free-phase methane in the Fruitland coals, and may increase the transport of methane into the shallow aquifers of the basin. Given the complex

characteristics of two-phase flow, it is impossible to determine the actual pathways from the Fruitland Formation to the shallow aquifers. In shallow water wells within the historic conventional gas development area, thermogenic methane is prevalent, and the BLM is requiring well testing to ensure that offending gas wells are identified and fixed.

W9 The Southern Ute Indian Tribe is investigating new management approaches. These include studies to mitigate surface seeps at the outcrop within the Reservation, as well as continuing to identify gas wells that may be methane sources to shallow aquifers.

W10 We have revised the Purpose and Need section of the EIS.

W11 We believe mitigation measures in the DEIS and FEIS would avoid impacts or reduce them to an insignificant level for these areas and species. Riparian areas and critical habitat for Threatened and Endangered Species are identified in the DEIS (Section 3.3.2.1, Vegetation Types, the Biological Assessment/Appendix G, and throughout Chapter 4). Directional drilling would be used where appropriate, as described in Section 2.8.4.4. Existing well pads and roads would be used wherever possible, as described throughout Chapters 2, 3, and 4 of the EIS.

W12 The discussion of past impacts on the referenced resources is contained in Chapter 3, Affected Environment. In fact, this is the basis for discussions of the affected environment. The Chapter 3 introduction has been revised to indicate that past impacts were considered in the description of the affected environment.

W13 Historically, the SUIT Department of Energy and Minerals has worked closely with the SUIT Department of Natural Resources in an attempt to preserve and protect sensitive areas, such as wetlands. There is little doubt that wetland areas have been impacted to some degree in the past as a result of pipelines crossing rivers. However, appropriate 404 permits were obtained, and mitigation developed in conjunction with the Army COE.

W14 The cumulative-impacts section of the FEIS includes a description and estimation of the surface disturbance related to oil and gas development to date.

W15 We have rewritten Section 2.8.5.1 to describe more fully cavitation procedures and impacts from flaring.

W16 Any required mitigation measures will be incorporated in the Record of Decision.

W17 Please see Comment Response M2.

W18 Section 3.5.1.3 has been revised in response to this comment, and a new map (Map 28) has been included in the FEIS, showing the locations of the critical Study Areas in La Plata County, Colorado.

W19 Methane may migrate along a combination of these pathways from deeper reservoirs to shallow aquifers.

The published literature on fracture propagation does not support the hypothesis that hydro-fracturing creates vertical pathways from the deep gas reservoirs to the shallow aquifers. Published articles on fracture propagation in coal shows that for 50% of the cases, fractures do not penetrate overlying and underlying shale beds. For the other 50% of the cases, the fractures in overlying shale typically do not extend more than a few feet into the shale (W.P. Diamond, 1987).

W20 Past impacts on the vegetation types in the Study Area are described in Table 4-52 and Section 4.13. Wetlands are a subset of the wooded riparian vegetation type, which has seen a maximum of 200 acres of disturbance to date. The tribes follows a policy of wetland avoidance.

For the purpose of this EIS, we have not completed wetland mapping because collection of that data would not add substantively to the programmatic evaluation and planning accomplished by this EIS. Actual project planning involves site-specific wetlands mapping and avoidance. That is the point in our staged decision-making process when the information is critical, and the point when mitigation is applied.

W21 Cumulative effects on these resource elements or impact indicators are addressed in Section 4.13 and Table 4-52. There is no hard and fast inventory of the total number of acres impacted by noxious weeds, nor a quantitative indication of how gas field development has impacted that total to date. It is the policy of the SUI and BIA, however, to control noxious weeds on the Reservation aggressively. Weed control is a specific condition of approval for oil and gas activities on the Reservation (please refer to Appendix E).

W22 The tribe and BIA conduct an aggressive program of weed control. Operators are required to control noxious weeds in project areas, and seed used for reclamation must be certified free of noxious-weed seed. (See Appendix E.)

All individual projects are designed to meet the intent of Executive Order 11990. When this is not possible, individual NEPA documents will describe which Alternatives were considered and the reasons why the wetland area cannot be avoided. Compliance with these regulations would

be handled at the ROW permitting or APD stage.

We have rewritten the wetlands mitigation in Section 4.3.1.8 to reflect the intent of Executive Order 11990 more clearly.

Executive Order 13112 is directed broadly at the Federal agencies, particularly the research component. We follow the guidelines of EO 13112 in carrying out the weed control program on the Reservation. General guidelines that apply to all resource programs include invasive-species monitoring, prevention of introduction of invasive species, noxious-weed treatment, and site reclamation using native-seed mixture, as specified in EO 13112, Section 2. We have added this direction to Section 4.3.1.8.

W23 The tribe and BIA avoid “highly functioning” wooded riparian areas wherever possible. These are of special concern to the tribe, as many culturally important vegetation species (i.e., cottonwood, willows) grow in them. As necessary, the use of temporary bridges or directional boring would be considered to avoid impacting wetlands. It is the policy of the tribe to use liners or lined berms for refueling, maintenance, and storage areas, to protect against spills. This mitigative measure would be outlined in the operator’s ECBM Environmental and Safety Contingency Manual, as discussed in Section 4.12. Spill prevention plans are incorporated into all applicable oil and gas development permits.

W24 As discussed in Section 4.3.1.7, “Wooded riparian vegetation tends to occur in relatively small areas that could be preferentially avoided when locations for individual projects are determined.” Avoidance is the first line of mitigation. Please refer to Section 4.3.1.8. Also refer to the Biological Assessment (Appendix G).

W25 We have rewritten Section 4.3.3.4 to include a discussion of potential willow flycatcher impacts. Please refer also to the Biological Assessment (Appendix G). At the programmatic scale of analysis addressed in this EIS, it is difficult to ascertain overall species impacts, but broad management guidelines are presented. Potential impacts on individual birds and their habitat would be identified and mitigated in response to site-specific project proposals.

W26 The Record of Decision will establish the mitigation requirements.

W27 The mitigation established in this EIS, as determined by the ROD, would be implemented at the site-specific project level. Numerous mitigation approaches can and will be used, ranging from site avoidance (moving a well pad to another location within a well window, or applying a variance that places the well outside the window), to timing limitations that prohibit construction during certain critical times of year, to outright cancellation of activities where they may result in a taking under Section 9 of ESA. Site-specific biological assessments would be conducted when

proposals are advanced, and consultation with the USFWS would proceed if “may affect” determinations are reached.

W28 These survey measures are outlined in the Biological Assessment and would be adopted in the ROD, after Section 7 consultation with the USFWS is completed.

W29 As described on pages 43 and 46 of the Air Quality Technical Support Document (Dames and Moore 2000):

The purpose of this analysis is to determine if the assumed development activity could occur without causing significant adverse air quality impacts. A logical approach is to determine if this result can be achieved for a flat terrain scenario. If violations were predicted for this case, then a modification of the project would be necessary. To ensure that this question is answered in a reasonably conservative manner, all new compressor stations were analyzed at the maximum stage of potential development, assuming that all sources were operating simultaneously at potential or permitted emissions. This is a very unlikely scenario in real life.

Given the preliminary and speculative nature of the programmatic EIS, it is appropriate that the near-field analysis did not incorporate terrain features. There is no site-specific information available regarding development locations or equipment. Since air pollutant dispersion modeling is very sensitive to the emission source locations relative to terrain features, the use of hypothetical locations would be misleading to the public and decision makers. If a site-specific development proposal is developed, detailed emission source information, locations and terrain features could then be assessed (i.e., further detailed analysis at the time of permitting by the appropriate air regulatory agency).

In addition, the following Regulatory Default Options of the ISCST3 model were applied:

- Use final plume rise
- Use stack-tip downwash
- Use buoyancy-induced dispersion
- Use calms processing routine
- Do not use missing data processing routine
- Use default wind profile exponents
- Use default vertical potential temperature gradients
- Use “upper bound” values for super squat buildings
- Do not use exponential decay for Rural Mode

If the EPA is concerned about potential specific CO and NO_x impacts on the Bondad area from existing compressor stations, we can provide copies of the non-steady state, complex terrain CALMET/CALPUFF modeling input parameters used in the DEIS far-field air quality impact

assessment to your air quality modeling staff.

W30 The reference in the Air Quality Technical Support Document (Dames and Moore 2000) to the State of Colorado's Phase I Nitrogen Dioxide PSD Increment Consumption Analysis in Southwest Colorado (CDPHE 1999), which demonstrated NO₂ increment levels had not been exceeded, was made to indicate that responsible air quality regulatory agencies could perform such an analysis.

This reference followed the statement,

Modeling was conducted [for the DEIS] to demonstrate that the assumed development would not exceed the NO₂ PSD Class II increment. The intent of this analysis was not to conduct a rigorous PSD increment consumption analysis, but rather to provide an indication that the increment would not be exceeded as a result of the assumed development (including all Alternatives). It is beyond the regulatory authority of BLM to conduct a PSD increment consumption analysis.

It would be inappropriate for the State of Colorado to conduct a rigorous PSD increment consumption analysis including the hypothetical 118,000 hp of gas compression assumed in the programmatic DEIS. Such analyses must be legally defensible, based on Federal and State legislation and regulations, as well as on specific Attorney General's opinions and decisions.

W31 As stated in the DEIS (page 4-10 through 4-11; Chapter 4; 4.2 AIR QUALITY AND CLIMATE; 4.2.5 Alternative 3 - Enhanced Coalbed Methane Recovery):

The maximum short-term (3- and 24-hour) SO₂ emissions would be generated by drilling rigs and other diesel engines used during rig-up, drilling, and completion operations (sulfur is a trace element in diesel fuel). These SO₂ emissions would be temporary, occurring only during the limited construction period at each well location. The maximum modeled concentrations (including representative background values) would be nearly 702 µg/m³ (3-hour) and 133 µg/m³ (24-hour).

Therefore, predicted short-term SO₂ concentrations would be slightly above the restrictive Colorado SO₂ Ambient Air Quality Standards of 695 µg/m³ (3-hour) and well below 365 µg/m³ (24-hour). The 3-hour SO₂ National Ambient Air Quality Standard (1,300 µg/m³) is less stringent. Given the conservative assumptions used in the 3-hour modeling analysis, and the limited spatial applicability of the Colorado standard, significant impacts are unlikely to occur, even when compared to the more restrictive standard.

Given the "programmatic" nature of the DEIS, specific source locations are not known. Although it is possible that an actual source could be located where the 3-hour Colorado Ambient Air Quality Standard would be applicable, given that SO₂ emissions would occur only

during the limited 36-day construction period at each well location, as well as the conservative assumptions used in the 3-hour modeling analysis, it would be inappropriate to establish a “safe-distance setback” based on a $7 \mu\text{g}/\text{m}^3$ exceedance of Colorado’s 3-hour SO_2 standard modeled in a programmatic DEIS. Therefore, no revision is necessary in the Final EIS.

W32 Please see Comment Response U60.

W33 As America’s primary air quality regulatory agency, with oversight responsibility of all local, state, and tribal air quality regulatory agencies, EPA could establish a NO_x emission limit of 1.0 g/hp-hr for compressor engines nationally.

If additional development of oil and gas were to occur in the San Juan Basin during the next 20 years which requires that a Federal decision be made (beyond the development addressed in the DEIS), additional visibility-impact assessments would be conducted as part of those future NEPA analyses.

In addition, EPA and the applicable air quality regulatory agencies will be implementing the Federal Regional Haze regulations, designed to achieve the National Visibility Goal of “the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory [PSD] Class I Federal areas which impairment results from manmade air pollution.”

Please also see Comment Response A2.