

FEDERAL ENERGY REGULATORY COMMISSION
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OFFICE OF ENERGY PROJECTS

Project No. 12966-001—Utah/Arizona
Lake Powell Pipeline Project
Utah Board of Water Resources

Eric Millis, P.E.
Utah Division of Water Resources
1594 W. North Temple, P.O. Box 14620
Salt Lake City, UT 84118-6201

Reference: Comments on Initial Study Reports and Meeting Summary

Dear Mr. Millis:

On March 11, 2011, the Utah Board of Water Resources (Utah BWR) filed an Initial Study Report describing its overall progress in implementing 22 of the 23 approved Study Plans. On March 22 and 23, 2011, Utah BWR held meetings in St. George and Salt Lake City, Utah, respectively, to discuss the Initial Study Report. On April 7, 2011, Utah BWR filed its Initial Study Report Meeting Summary (Meeting Summary) pursuant to 18 CFR § 5.15(c)(1) (3).

After reviewing the Initial Study Report and Meeting Summary, we are providing our comments in the enclosed appendices, pursuant to 18 CFR § 5.15(c)(4). None of the comments involve recommendations for modifications to the approved studies or a request for additional studies. Rather, the comments pertain to implementation of the Study Plan and content of the Initial Study Report and Meeting Summary. To the extent appropriate, please revise the Initial Study Report to clarify the studies and provide the missing information described in these appendices and include the revised studies in your license application.

Appendix A includes our comments on all of the study plans in your Initial Study Report except for archaeological and historic-era resources (Study Report 3). Comments on Study Report 3 may be found in Appendix B. This study consists of two reports previously filed with the Commission: the preliminary draft Class III study report, filed on May 20, 2010, and an addendum to the report, filed on December 21, 2010. Upon your request, we previously reviewed the preliminary draft Class III study report and

provided comments to Utah BWR's lead cultural resources contractor, Mike Polk, on July 22, 2010. The current Appendix B comments are the result of additional review of the preliminary draft Class III study and also include comments on the addendum report.

In your April 7, 2011 filing, you state that four of the ongoing studies—Air Quality, Noise, Socioeconomics and Water Resource Economics, and Visual Resources—will be modified to include additional field work and an analysis of the affects of a single-purpose natural gas pipeline to the booster pump stations as an alternative to electrical transmission lines. Natural gas-powered generators would be located at each booster pump station to power the water pumps. Your filing describes two natural gas pipeline alternatives within the Lake Powell Pipeline study area that you are considering: one that would be totally co-located with the proposed pipeline another that would be partially co-located.

For us to understand the environmental affects these two alternative natural gas pipelines, besides modifying the four studies you propose, you'll need to revise each study report to include a section on both of the alternative natural gas pipeline alignments. In Appendix C, we've attached some general guidance used by our Division of Gas Environment and Engineering to help you in revising your reports to include these gas pipeline alternatives.

If you have any questions, please contact James Fargo at 202-502-6095, or by email at james.fargo@ferc.gov.

Sincerely,

Timothy Welch, Chief
West Branch
Division of Hydropower Licensing

Enclosure: Appendix A
Appendix B

cc: Mailing List
Service List

APPENDIX A

Comments on the Initial Study Report and Meeting Summary

Study 2 – Aquatic Resources

In the Revised Study Plan, you identify the need for additional information regarding the proposed project's potential effects upon the aquatic habitat of the Sand Hollow Reservoir System, including Quail Creek Reservoir. In section 3.2.2.4 of your Study Report, you provide an affected environment description of Sand Hollow Reservoir; however you do not provide an analysis of the potential effects upon the aquatic habitat of the Sand Hollow Reservoir System, including Quail Creek Reservoir due to the transfer of water. Please provide this information.

In section 5.2 LPP Project Alignment Alternatives, you state: "... a variety of other natural resource agencies regularly study/monitor the fish and other species in the live streams of the LPP Project study area..." Please list the relevant agencies/entities that have ongoing studies and /or monitoring programs for aquatic species, objectives of the ongoing monitoring programs or studies, periodicity of the monitoring programs or studies, and the general location or water body where the monitoring programs or studies take place.

Study 4 – Geology and Soils

Section 4.4.6 of the Study Plan says that the specific geologic and soils analyses will include identifying the best methods and locations for reuse and/or disposal of waste rock and soil resulting from project construction. Table 3-13 identifies 11 potential borrow sites and 9 potential spoil sites along the Lake Powell Pipeline (LPP) alignment and 8 potential borrow and 1 potential spoil site along the Cedar Valley Pipeline (CVP) alignment. Further, in section 2.2, you assume that disposal of soils would be allowed onsite by spreading excess excavated materials in a thin layer across the pipeline right-of-way on both private and public lands. However, there is no quantification of excavation and backfill or of the acreage of potential borrow and spoil sites that would allow the reader to determine if sufficient borrow and spoil sites have been identified. Please include these estimated quantities in the revised report.

In the Initial Study Report meetings, you referred to a technical report that summarizes bedrock excavation quantities and provides the breakdown in terms of blasted, ripped, and tunneled bedrock. Please either revise the study report to include these quantities or append the technical report.

In tables 3-2 and 3-15, you summarize rock characteristics at various stations along the pipeline route, but it is not clear on the maps or in the text where the tunnels and shafts would be located and what type of bedrock is anticipated in these areas. During the Initial Study Report meeting, you stated that the rock at Lake Powell intake is competent and that coring was conducted in this area. The coring information should be included in the final report.

According to the Study Plan objectives section (section 4.2.1), mitigating or corrective measures would be identified in the Study Plan. In chapter 5, you generally describe the mitigation or corrective measures that may be needed to protect human safety and the environment during project construction, operation, and maintenance as Best Management Practices (BMPs) but don't describe these measures. Please revise the draft study report to include more detailed description of the BMPs you propose to use during Project construction, operation, and maintenance.

In section 4.6.2.2 of the Revised Study Plan (Task 2, Field Investigations), you state that coring, deep boring, geophysical testing, and observation wells are anticipated. However, the report neither includes such data nor makes reference to the result of the field investigations. Please provide this data or a reference to it.

In section 4.2.1 of the Revised Study Plan, you propose to determine where groundwater infiltration may occur into tunnel shafts or excavation trenches in sufficient quantities to require dewatering for construction, operation, or maintenance of the proposed project and to estimate how much water will need to be removed along with the means of removal. The draft study report does not include this information on groundwater infiltration into tunnel shafts or excavation trenches. Please revise the final report to include this information.

In section 4.2.1 of the Revised Study Plan, you indicate that one objective of the study would be to estimate the rock strength characteristics for foundations at pump stations and hydroelectric plant sites. The draft study report lacks this information. If rock cores were taken at these locations, the data should be provided in an appendix, and an interpretation of these data with respect to rock strength and quality should be included.

In section 4.2.1 of the Revised Study Plan, you state that one of the goals and objectives of the study is to identify permitting requirements pertaining to removal and disposal of minerals associated with pipeline excavation and/or installation. This information is missing from the draft study report. Please include this information in the revised report.

In section 4.4.6 of the Revised Study Plan, you propose to recommend mitigation measures for problems and hazards associated with geologic and soils features. The Study Plan objectives include erosion but the draft study report does not clearly define erosion potential and there is little discussion of the effects of project construction on the existing soil conditions and processes. Please revise the report to include estimates of the relative proportion of disturbed area, borrow, and spoil materials to help in this regard.

In section 4.4.6 of the Revised Study Plan, you indicate that the analyses will include estimating soil and rock strength at the Lake Powell Intake and Hurricane Cliffs facilities. There is no discussion of soil strength characteristics relative to their suitability for foundations for these facilities. Please provide this information in the revised study report.

Study 5 – Groundwater Resources

One of the Study Plan objectives identified in section 5.2.1 was to determine how groundwater resources would be quantitatively affected by recharge. Appendix A of the draft study report includes an analysis of the affects of recharge on water quality, but there is no quantitative analysis of how recharge would affect groundwater levels and aquifer hydraulic conditions at Sand Hollow Reservoir, southwestern Cedar Valley, and Hurricane Cliffs afterbay. In the introduction of Appendix A (section 5.13C.1) of the study report, you state that the report considers feasibility of groundwater recharge, with a focus on water quality and regulatory issues. The report provides potential locations for recharge facilities and the type of recharge recommended, however, there is little or no assessment of recharge capacity found in the report. Table 5.13C.5 presents advantages and disadvantages of potential recharge locations, but there is no quantification of increased groundwater, hydraulic conductivity, or pumping capacity at these locations. The report is lacking data to support the notion that recharge facilities will effectively increase pumping capacity. Please revise the study report to include a quantitative analysis of the affect of recharge on groundwater resources.

Study 6 – Land Use Plans and Conflicts

The draft study report in section 4.3.4.1 identifies cardboard, steel, plastic, asphalt, general trash, and pipe remnants as waste materials resulting from the construction of the project. Further, you state that research indicates that there is availability for disposal of all anticipated trash, including large pieces of steel, within designated facilities in Cedar City, St. George, and Page, and it appears that all of the above jurisdictions have adequate landfills and/or transfer stations that would accommodate construction waste. However, there is no quantification of construction waste or of the amount each designated facility could handle that would allow the reader to determine if the appropriate amount of waste

disposal sites have been identified. Approximate quantities of construction waste would benefit identification of potential additional impacts to the project and environment. Please revise the study report to include the quantity of construction waste materials and include the amount of trash each designated facility can handle.

Study 8 – Paleontological Resources

In Chapter 3, section 3.1, you provide the results of your literature search and state that 69 previously recorded fossil locations are located within 2 miles of the project. In section 3.2, you state that 49 new locations were identified during the ground survey. Please revise the draft study report to clarify if any of the previously recorded locations within the area could be affected by the project, discuss if those locations were re-visited in the field or re-recorded, and include those locations in tables D-1 and D-2.

While tables D-1 and D-2 in the draft study report provide brief descriptions of each paleontological location identified within the area affected by the project, very little detailed information is provided. In accordance with the Revised Study Plan, please include the following in your revised study report: (1) more descriptive information about each individual resource, (2) sensitivity classifications for each location, (3) discussions of general and specific conditions, including current disturbances identified at each location and an analysis of impacts that may occur as a result of project construction, and (4) recommendations of mitigation measures to reduce any significant impacts.

The maps of the previously recorded paleontological locations provided in appendix C depict only 43 of 58 reported locations in Utah and only 6 of 11 locations reported in Arizona. Please clarify or correct this discrepancy in your revised study report, or include maps depicting the locations of all of the previously recorded locations identified during the literature search.

In appendix D, *Paleontological Site Locality Maps*, only 24 of the 49 newly documented paleontological locations recorded in Utah and Arizona are plotted on these maps. Please include the missing maps in your revised study report and ensure that all of the locations identified in tables D-1 and D-2 (including previously recorded locations within the study area) are shown on the maps. Include a column in both tables that identifies the map number that correlates with each location. It would also be helpful if previously recorded and new locations were shown on the maps in two different colors. Please also identify on the maps the location of each of the geologic formations identified in Chapter 2 relative to the project area.

Study 10 – Socioeconomic/Water Resource Economics

The study plan refers to project costs estimated by MWH in a preliminary Opinion of Probable capital Costs (MWH 2009). This cost publication should be included as an appendix to the study report and the construction, operation, and maintenance costs should be clearly stated in the body of the report for the proposed project and each alternative analyzed. The cost estimate should be consistent with the latest pipeline estimates regarding the quantities of excavation, backfill, blasting, and ripping and should include the estimated cost of a system for controlling quagga mussels.

Chapter 5 of the study report presents NED analysis results. However, the summary refers to the proposed project as a pipeline project *without* the proposed pumped storage development. The section should be corrected in the final report so that the analysis of proposed project includes the pumped storage development. The analysis of how the pumped storage development affects the proposed project's economic benefits should be presented in a separately.

Chapter 6 of the study report shows an analysis of the proposed project using FERC's current cost economic evaluation approach. FERC does not assume an escalation of costs in its method. Therefore, you should revise the escalation rate to equal 0% in your revised report. Also, the revised study report should include additional justification and details on the costs included in the analysis: discount rate, avoided power costs (\$64/MWh); power operations costs (\$42/MWh); and power benefits (\$85/MWh).

In section 10.2 of the Revised Study Plan, you propose to examine information on economic development perspectives for the local area. Although population and employment by industry trends are described in chapter 8 of the draft study report, and a general description and overview of the Project Need and emerging industries is provided in sections 2.1 and 3.1, there is little description regarding the economic development perspectives of the area, regional industry growth potential, and information related to public perspectives related to the use of Colorado River water. Please add this information as you revise the report.

The Water Resource Economics section 10.6.1 of the Revised Study Plan proposes that a cost-effectiveness analysis would be provided, with supply curve frontiers and quadrant analysis, developing supply curves based on quantity supply and marginal costs. In section 2.2.1.1 of the draft study report, you indicate that alternative costs were developed with demand-supply curves and marginal costs. However, this analysis is not presented or described in the draft study report. Please include this analysis in the revised study report, including justification for the new water treatment facility cost estimates in section 4.2.

In the draft study report Chapter 5, the tables of the NED analysis are presented (table 5-1 through 5-4). A paragraph description of each of the benefit and costs line items is needed to help the reader understand the methods and assumptions inherent in this analysis.

Table 7-1 summarizes the RED analysis and the source includes both the Utah IO multipliers and the IMPLAN model. It is not clear which model you used to identify the secondary effects. Please identify which model was used to estimate the secondary effects when you revise the report.

In section 10.3 of the Revised Study Plan, you propose to ensure project consistency with state and regional water resource planning efforts. In sections 1.4 and 2.1, the draft study report states that this is one of many projects under consideration to meet southwestern Utah's growing population and water needs. However, the draft study report lacks the additional analysis on project consistency with state and regional planning efforts. Please complete this analysis in the revised study report.

In section 10.4.3 of the Revised Study Plan, you propose to address construction-related issues of project financing and cost allocation, which would be summarized in the project financial review section. In section 10.4.3 of the Revised Study Plan, you propose to include the impacts of user costs under different timing phases—who pays and when. Additionally, you propose to estimate cost allocations to each of the Districts. The draft study report lacks project financing and cost allocations to Districts, it also lacks user costs; the revised study report should provide current user costs and evaluate increased user costs associated with the project financing.

In section 10.4.3 of the Revised Study Plan, you propose to ensure an adequate review of forecasts of regional population and economic growth in southwest Utah, including an explicit review of the key economic assumptions/variables used in the forecasts. Though at the initial study report meeting you said you completed such an analysis, the report lacks such a study. Please include the study in your revised study report.

Study 12 -- Special Status Plant Species and Noxious Weeds Assessment

The revised study report describes best management practices that could be implemented to protect special-status plant species and notes that impacts from the spread of weeds can be mitigated through the development of a weed management plan. A special-status plant protection plan and weed management plan should be included in the draft license application, in coordination with all relevant local, state, and federal agencies and tribes.

Study 13 – Special-status Wildlife

The revised study report recommends that protection plans for the Utah prairie dog and Mohave desert tortoise should be prepared. These plans should be included in the draft license application, in coordination with all relevant local, state, and federal agencies and tribes.

Study 14– Transportation

In section 2.2 of the draft study report you state vehicles added to local traffic from facility, pipeline and reservoir construction would not exceed 28 vehicles per day and vehicles added to local traffic from transmission line construction would not exceed 8 vehicles per day as calculated from estimated construction spreads. However, in section 3.3.5 you state it is expected that a cumulative maximum of 120 vehicles per day would be added to the region from all construction activities associated with the LPP Project. Please clarify or correct this discrepancy when you revise the draft study report.

In the Revised Study Plan, under section 14.2.1 *Goals and Objectives*, you propose to prepare a preliminary Traffic Management Plan for the National Park Service review and approval as coordinated with local, state, and federal agencies. However, you state in section 5.1.1 of the draft study report no mitigation would be required if Best Management Practices (BMPs) are implemented during construction and operations.¹ Furthermore, you do not provide a schedule (dates, times, duration, etc.) for proposed construction activities associated with the project. Providing a preliminary Traffic Management Plan in coordination with local, state, and federal agencies would identify appropriate traffic control and safety measures, road closures, and a schedule associated with construction activities associated with the project. Please revise the study report to include a preliminary Traffic Management Plan in coordination with all relevant local, state, and federal agencies.

Study 16 – Visual Resources

As stated in the January 21, 2009, Study Plan Determination you were directed to include the Kaibab Tribe’s (Tribe) goals and objectives for the protection of visual resources that are traditional cultural properties (TCPS) that may be affected by the project. However, the Tribe’s goals and objectives were not included in your draft study

¹ BMPs would include coordination with appropriate Federal, State and local agencies to acquire required permits for traffic controls and closures, development of traffic control plans, and scheduling construction during off-peak traffic hours as necessary.

report. Please revise the study report to include the Tribe's goals and objectives for TCPs and include any landscape modification which adversely affects the traditional use of TCPs associated with the project.

Study 17 – Surface Water Quality

Your presentation of historical water quality data for Lake Powell is minimized and the reader is referred to a technical memo (Technical Memorandum 5.13, *A Review of Water Quality and Treatment Issues* [MWH, 2008]) for the complete information. Please file the Technical Memorandum 5.13 with your revised Study Report as part of this proceeding.

In section 4.2.2.1.1, *Pipeline Flushing*, you propose that pipeline flushing would discharge the flushed water into the LPP Project forebay reservoir above Hurricane Cliffs. However, in the subsequent paragraph, you state that it is anticipated that standard operating procedures for the project would include measures to divert flows generated from flushing operations away from surface water bodies, to settling tanks and/or retention/percolation basins. Please clarify why the LLP Project forebay reservoir would be used to flush the pipe.

Study 18 – Surface Water Resources

In section 18.4.2 of the Revised Study Plan, you propose to evaluate effects of the proposed project on storage in the Lake Powell, Quail Creek, and Sand Hollow reservoirs. However, Quail Creek and Sand Hollow reservoirs were not included in the study report. Please include the effects of the project on storage in Quail Creek and Sand Hollow reservoirs in the revised study report.

Section 18.2.1 of the Revised Study Plan requires you to determine which standard construction procedures should be used to protect crossings of streams and washes. In section 5.1 of the draft study report, you propose to use best management practices during construction but you do not describe what these practices would include. Please provide specific example of the best management practices you propose in the revised study report.

Study 19 – Water Supply and Climate Change

In section 19.6.3 of the Revised Study Plan, you indicate that the CRSS model will be used to simulate effects of the LPP diversion, as well as the effects of all reasonably foreseeable projects included in the CRSS model. It is not clear from the discussion in 102Chapter 4 of the Climate Change portion of the draft study report what other

foreseeable projects are considered in the analysis other than the LPP. Please revise the study report to identify the other foreseeable projects used in the CRSS model.

In section 19.6.5 of the Revised Study Plan, you say that you will estimate the cost of alternatives for existing and potential future supplies. The draft study report lacks this analysis. Please revise the study report to include an evaluation of the cost of alternatives.

Study 20 – Wetlands and Riparian Resources

The revised study plan required development of a conceptual mitigation and restoration plan, including description of mitigation for all impacts to wetlands and riparian vegetation. Although you include best management practices in the draft study report, it does not include sufficient detail to evaluate the efficacy of the measures. Therefore, include a detailed wetlands and riparian resources mitigation plan in the draft license application, in coordination with all relevant local, state, and federal agencies and tribes.

Study 21 – Wildlife Resources

The revised study plan requires development of a mitigation plan to document mitigation measures identified to avoid, minimize or reduce impacts on wildlife resources. Although you include best management practices in the draft study report, it does not include sufficient detail to evaluate the efficacy of the measures. Therefore, include a detailed wildlife mitigation plan in the draft license application, in coordination with all relevant local, state, and federal agencies and tribes.

APPENDIX B

General Comments

For ease of review, consolidate both the May and December 2010 draft Class III study reports into a single hard-copy document with attached appendices (can be separate volumes) and distribute hard copies, including three copies to the Commission, for final review. Site record forms do not need to be included with report and can remain as separate CD files.

The Study Reports contain project area maps depicting the Area of Potential Effects (APE) and General Land Office (GLO) and historic maps. Appendix K also provides site location maps. However, to enable us to better understand the distribution and overall status of cultural resources sites within the APE, please revise the study report to include a single set of color APE maps that depicts all previously recorded sites, newly recorded sites, GLO sites, land ownership, proposed alignments (one color), alternative alignments (another color), outer APE lines, National Register of Historic Places (National Register) eligibility, and any other information that would be of importance. This will allow us to get a comprehensive view of the APE with all of the necessary components. Also integrate the information from the Kaibab Reservation.

Specific Comments

The specific comments below are made on the May 2010 Class III study report (in the CD associated with appendices A, F, and G), but also apply to similar corresponding sections in appendix J, and in other similar report narrations in other appendices. Further, they also apply to the November 2010 addendum, particularly how individual National Register evaluations were undertaken (including how integrity was assessed and used in the evaluations), archaeological testing that may have been undertaken at any of the sites, summaries of existing impacts observed at each site, etc.

The Abstract provided in the May 2010 Study Report states that 445 sites were recorded in both Utah and Arizona, with 302 sites located in Utah and 143 sites in Arizona. However, section 5.2.1 states that 308 sites were recorded in Utah. This would bring the total count (excluding sites on the Kaibab-Paiute Indian Reservation) to 451, not 445. Further, the last paragraph in section 6.2 states, “there are 446 total sites.” Please clarify or correct site counts and revise the draft study report to ensure that all site counts are consistent throughout the entire document.

The last paragraph in section 1.5 states,, “This effort continued August 2110.” This sentence is incomplete. Please revise the draft study report to complete this statement and re-check all text for similar irregularities.

While the Glen Canyon Dam National Recreation Area and the Grand Staircase-Escalante National Monument are discussed in section 3.3.2, section 3.3.3 does not discuss the Pipe Springs National Monument. Please revise the study report to address this property.

In section 4.4, you generally discuss how the site records and reports from the file search were used to make recommendations or determinations, and you describe five categories that were used in the report: eligible or not eligible (consultant recommendation), NR eligible or NR ineligible (formal determinations), and unevaluated. However, these classifications are not consistent with the categories used in tables 5-1 and 5-3. No sites are either listed as “NR eligible” or “NR ineligible” and instead the terms “Determined Eligible” and “Determined Not Eligible” are used. Additionally, this section requires more discussion of what remains to be done regarding determining National Register eligibilities (i.e., once informal recommendations have been made, then you will first submit your informal National Register recommendations to the respective land management agency (federal or state) for concurrence, then resubmit the National Register recommendations to the Utah and Arizona State Historic Preservation Officers (SHPO) for concurrence). If the SHPOs prefer that the Commission submit the National Register-eligibility recommendations for concurrence, that is also acceptable. Also, please consult with each of the federal land management agencies to identify their protocols with regard to National Register-eligibility determinations. Please revise the draft study report to use consistent terminology with regard to National Register eligibility classifications and also add more discussion in this section on the proportion of sites that have been formally evaluated for inclusion in the National Register versus those that have not been formally evaluated. Finally, add a column to tables 5-1 and 5-3 that provides the dates of any formal determinations of eligibility. If possible, please include documentation of these formal determinations (e.g., copies of previous SHPO concurrence letters, etc.) in a consultation appendix.

In section 4.5.2, it is not clear if any subsurface archeological testing (i.e. shovel tests) was undertaken on documented sites to determine depth of deposits or site integrity. If such testing was undertaken, it is not discussed and the tested sites are not identified. If testing was not undertaken, there is no discussion of why not. Please revise the draft study report to identify which sites were tested, which were not, and provide a rationale. It would be helpful if tested sites were identified in tables 5-1 and 5-3. Please also add a column addressing the results of geoaicheological report where subsurface observations were made on some sites.

In section 5.2.1, you state that there were 308 sites documented within the APE in Utah (206 prehistoric, 50 historic non-linear, 34 multi-component, and 18 historic linear). This conflicts with what is mentioned in the Abstract, which states that 302 sites were identified (see above comment). Additionally, table 5-1 depicts a total of 312 sites (some of these comprise multiple smaller sites). We subtracted the sites that could not be relocated in the field (14 sites) and were still unable to verify site counts. Additionally, when assigning these resources to the four categories, our counts are not consistent with those identified in the report. As mentioned above, please revise the draft study report to clarify site counts and types and add a column to table 5-1 and table 5-3 to clearly identify which sites are prehistoric, historic non-linear, historic linear, and multi-component resources. Ensure that references to site counts throughout the document (including appendices B and C) are consistent and that all numbers are correct.

In section 5.2.1, you state that sites were analyzed for their archaeological integrity, but integrity is not further discussed in the document. Section 4.5.2 also states that condition and integrity were assessed for each site. Please revise the draft study report to provide this information and describe how integrity was assessed and considered during National Register evaluation. This should also be discussed as part of section 5.2.4 (eligibility recommendations discussion). It would also be helpful if you would add a column to table 5-1 and table 5-3 to provide a brief description of site integrity (e.g., excellent, good, fair, and poor, with definitions).

In tables 5-1 and 5-3, it would be helpful if you would add another column to designate what component the respective sites contains, based on presence of diagnostic artifacts. For example, if site contains middle Archaic projectile points, Pueblo II ceramics, or nineteenth century bottle glass, then the respective components (and dates) should be listed in this column. If no diagnostics are found on site, then the column for that respective site should say something such as, “unidentified prehistoric”, etc. In your revisions to the draft study report, please include this information in the two tables.

Also in tables 5-1 and 5-3, you use the terms surface scatter and lithic scatter. In your revisions to the draft study report, please explain or clarify the difference between these two types of properties. Also, if the site is truly a surface manifestation, this should be listed as such in the column that addresses geoarcheology (see above comment).

In table 5-1, for site 42KA6804, you mention that a lanceolate point (presumably Paleo Indian) was identified. Please revise the draft study report to clarify why this site is considered not eligible for the National Register.

In section 5.2.2, you provide a discussion of the prehistoric sites identified in each of four study areas in Utah. Please revise your draft study report to include tables that

synthesize site information and a corresponding general map. Having this information will help the reader get a better understanding of what types of site there are and how they are distributed throughout the area. Perhaps you could color-code high, medium, and low dense areas on a map as well.

Section 5.2.4 provides a discussion of National Register eligibility of identified sites. However, in order for us to better understand recommendations that have been made, please revise your draft Study Report to describe in more detail your reasoning for how sites were determined as either ineligible or eligible for inclusion in the National Register. For example, characteristics such as sites only having surface manifestations, low artifact density (quantify), lack of diagnostics or features could be used to determine that such sites are not eligible, while other sites with depth of deposits (use geoaarcheological information), high artifact densities, presences of features, and diagnostics would be reasons for other sites to be considered eligible. Also use the existing information about site-specific eligibility determinations that are noted in the site record forms. Keep in mind that the corresponding site tables should have the same elemental information. This section, and the corresponding site-specific information, will be vital for you to make your case to the respective land managers, SHPOs, and the Commission about which sites are or are not eligible. This also applies to sites located in Arizona and on the Kaibab-Paiute Indian Reservation. Finally, do not only rely on criterion D for prehistoric sites because the pending ethnographic information could be applied to some of the aboriginal occupations that make some of the “prehistoric” sites eligible under criterion A. Some discussion on this should be added in this section as well.

In section 5.3.2, you state that 143 cultural resource sites were identified in Arizona (excluding Kaibab-Paiute Indian Reservation lands). Table 5-3 only lists 107 resources, and we counted 105 from appendix C (Page Area – 24, Johnson – 34, Pipe Springs – 28, Vermilion Cliffs – 19). Please revise the draft study report to clarify or correct site counts.

Table 5-3 contains a site description column. However, the artifacts contained at Arizona sites should be quantified as they are in table 5-1 involving Utah sites. Please revise the draft study report to ensure that both site tables in the two states are the same. For example, there is no geoaarcheological column in table 5-3.

Section 5.3.5 provides a discussion of National Register eligibility of identified sites in Arizona. Please revise the draft study report to describe in more detail your reasoning for how sites were determined as either ineligible or eligible for inclusion in the National Register, as in section 5.2.4.

Section 6.2 provides a description of the methodology used to analyze project-related impacts to identified sites. As with sections 5.2.4 and 5.3.5, there is a lot of decision-making resting on this part of the report. Although analytical criteria are used to back up the site impact methodology, it would be useful to provide a generalized APE map that depicts areas where recorded site densities are highly correlated with areas thought to contain a high probability of buried cultural deposits relative to the project alignments. Please include such a map when you revise the draft study report. Also, please add a discussion about other project effects related to visual, audible, and air quality factors to sites within the 2-mile -wide corridor from the APE center line. You may need to note that additional information from the ethnographic reports will need to be considered, and that other resource sections (e.g., air quality, aesthetics) also will address these effects on cultural resources.

The last paragraph in section 6.2 states that 12 sites were not relocated during the Utah inventory. This is consistent with what is shown in table 6-5. However, table 5-1 indicates that 13 sites were not relocated. It appears that section 6.2 and table 6-3 are missing site 42KA3415, which is shown as not being relocated in table 5-1. In your revisions to the draft study report, please clarify or correct.

In section B.11 of appendix B, the first paragraph states that one of the purposes of the appendix is to provide the results of a Class III pedestrian inventory in Utah and that the results “have been divided into two smaller reports, Appendices B and C of the main LPP Report.” This leads one to believe that appendix B contains the results of the survey in Utah and that the appendix is identified as a “Survey Report.” However, the appendix does not provide any discussion of the Class III field inventory results at all and instead is focused on methodology and the results of the literature review. Please revise appendix B of your Study Report to provide a more detailed discussion of the results of the Utah inventory. This appendix should discuss, at a minimum, how individual National Register evaluations were undertaken (including how integrity was assessed and used in the evaluations) and provide summaries of existing impacts observed at each site. The main body of the Class III report would then provide a summary of these results.

Figure B.3-3 is missing from section B.3.2.10 of appendix B. Please include this figure in your revised study report.

The heading for section C.1.2 of appendix C implies that this section addresses linear resources and their associated features only, but the first paragraph discusses historic trash scatters. Are these the eight historic-era sites that were identified? Please clarify in your revised study report or perhaps change the heading to reflect that this section addresses all historic-era resources, including non-linear ones.

As with Appendix B, please revise appendix C to discuss, at a minimum, how individual National Register evaluations were undertaken (including how integrity was assessed and used in the evaluations) and provide summaries of existing impacts observed at each site. The main body of the Class III report would then provide a summary of these results.

Appendix I provides the results of geoarcheological studies undertaken at 58 sites within the project APE. However, there is no discussion of how these sites were selected for assessment. Please revise this appendix of your study report to discuss criteria that were used to determine which sites were assessed.

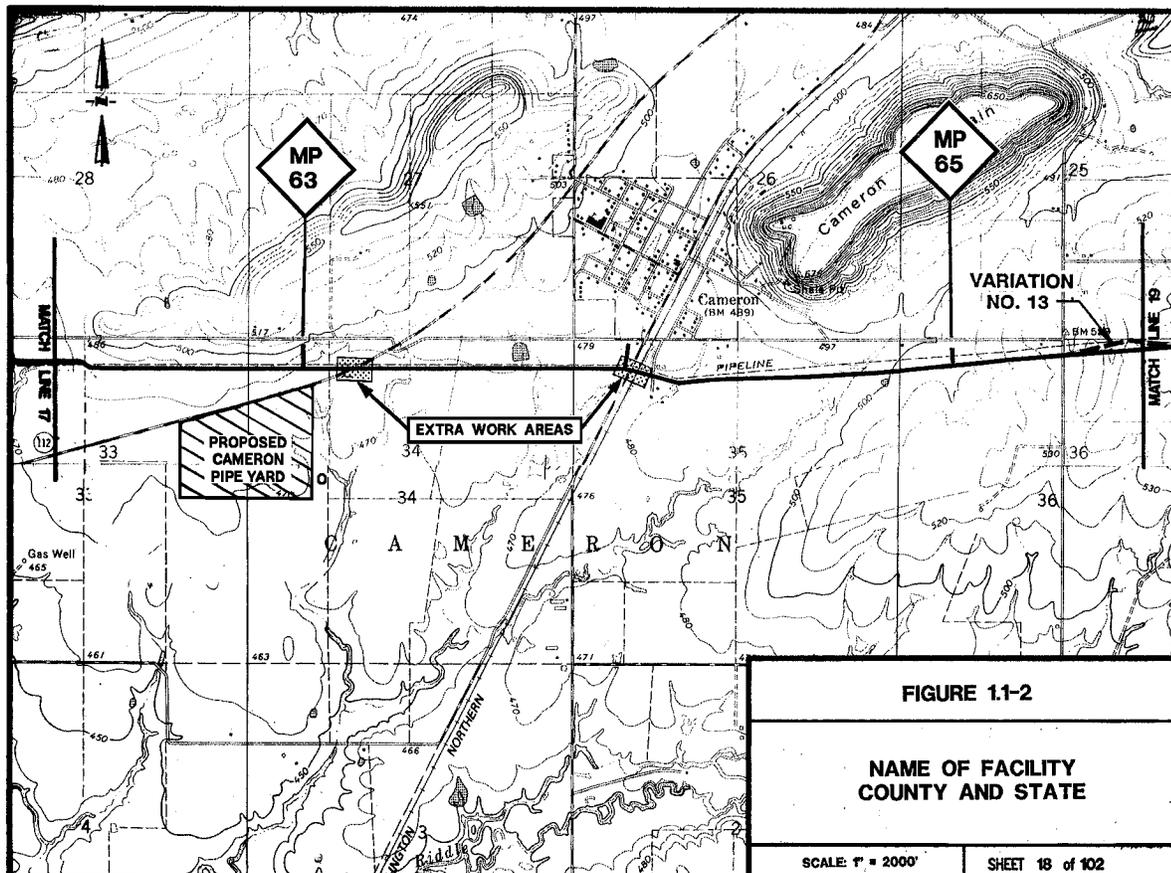
While appendix J provides a discussion of sites identified within the APE on the Kaibab-Paiute Indian Reservation, this appendix should discuss how many new sites were recorded versus how many were previously recorded, discuss how individual National Register evaluations were undertaken (including how integrity was assessed and used in the evaluations), and provide summaries of existing impacts observed at each site. Please provide this information in your revised Initial Study Report. The main body of the Class III report would then provide a summary of these results.

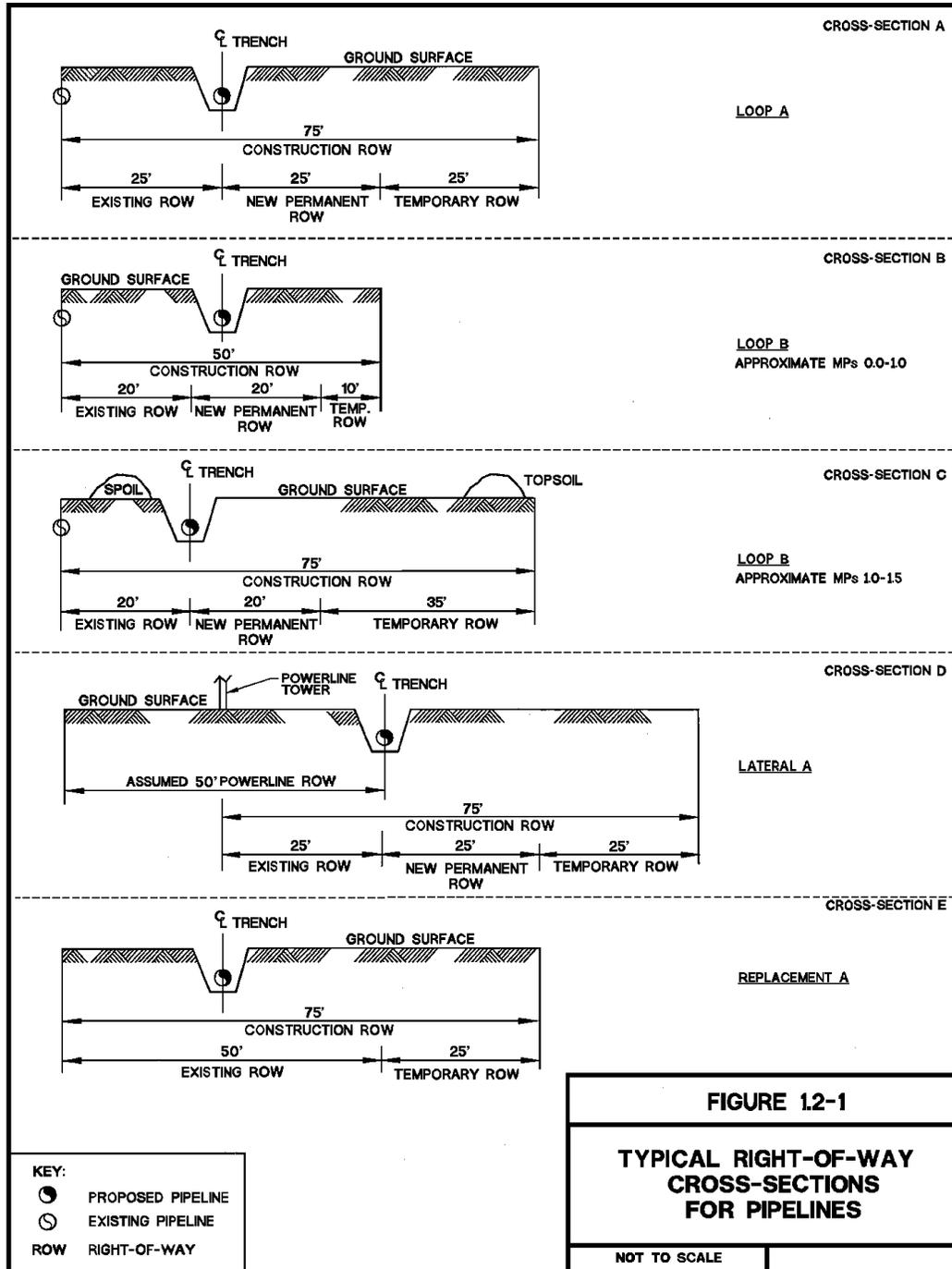
APPENDIX C

Lake Powell Gas Pipeline Resource Requirements Guidance

Provide a map showing the location of all pipeline and aboveground facilities. All pipeline segments, aboveground facilities (including block valves, drip tanks, communications towers, etc.), pipe storage yards, extra work/staging areas, contractor yards, and access roads need to be clearly and accurately shown on current original 1:24,000/1:25,000 scale USGS 7.5-minute series topographic maps or maps of equivalent detail, and 1:6,000-or-greater scale aerial photographs or photo-based alignment sheets that are preferably not more than 1 year old.

For pipeline segments, clearly show the pipeline centerline with integer mileposts identified, covering at least a 0.5-mile-wide corridor. Milepost markers must be shown clearly and accurately on the maps and photos since mileposts are used to locate and describe site-specific impacts, mitigation measures, and recommendations. In some cases it may be helpful to identify mileposts at 0.5-mile intervals, especially if there are numerous features of concern along the route. The maps, aerial photographs, or photo-based alignment sheets must clearly show on which side of the water pipeline the gas pipeline would be placed. The alignment sheets should also show right-of-way widths and extra work spaces (see Figures 1.1-2 and 1.1-3).





Alignment sheets should include a landowner line list with milepost (survey station) locations of property boundaries. It is also helpful to include the actual property outline to assist with routing concerns, and also to show locations or outlines of wetlands. Finally, a diagrammatical representation of the construction right-of-way showing the

width and beginning and end points of each extra work area as well as right-of-way widths should be included.

The extent of land requirements/disturbance must be clearly defined to determine the impacts associated with a project. Clearly make the distinction between land requirements for construction (temporary impact) and operation (permanent impact) of the project facilities.

In addition to the construction and permanent right-of-way requirements, include land requirements for extra work/staging areas for the project (e.g., road, railroad, waterbody, and wetland crossings; areas of steep side slope; areas at the beginning and end of each pipeline segment for contractor mobilization/demobilization; pipe and contractor storage yards, new or modified access roads; pull-back areas for horizontal directional drills; etc.).

Summarize the construction and restoration techniques to be used for the project. For pipelines, the description should include:

- Procedures for marking (e.g., flagging) the construction right-of-way and extra work/staging areas;
- Procedures for clearing, trenching, stringing, welding, hydrostatic testing, backfilling, and restoration;
- Procedures for disposing of timber, slash, and rock;
- Excavation depths and depth of cover over the pipeline, including identification of any areas where the pipeline would be buried deeper than usual (e.g., streams, agricultural fields with drain tiles, etc.); and
- Pipeline construction schedule by segment, including approximate start date and duration for overall construction/restoration.

Place special emphasis on describing the construction and restoration techniques to be used in the following areas:

- Rugged topography - Describe side slope construction techniques, width of the construction right-of-way, erosion control and revegetation procedures, and the milepost locations where the construction technique would be used.
- Residential areas - Describe the specific construction mitigation techniques (e.g., reduced construction right-of-way, stove-pipe or drag-section

techniques, etc.).

- Active croplands - Describe how drain tiles would be identified and repaired if damaged during construction. Also describe the methods of topsoil segregation, procedures for minimizing soil compaction and removing rock, and special construction techniques that would be used for orchards or other specialty crops.
- Road crossings - Describe the methods for crossing federal, state, and local roads. If roads would be open cut, describe the duration of construction and how access would be maintained along the road.
- Blasting - Describe blasting procedures.
- Wetlands - Describe construction techniques (e.g., standard, push/pull, boring, directional drill) that would be used.
- Waterbodies - Describe construction techniques for waterbody crossings, including major or sensitive waterbodies.

Provide a general description of the operation and maintenance practices for the project, including federal, state, and local regulations and guidelines which would be followed. Identify the number of additional operational personnel that would be hired because of the project.

For pipelines, include a description of the type and frequency of gas leak and cathodic protection surveys, aerial inspections, and right-of-way maintenance. For right-of-way maintenance practices, include the time of year for maintenance activities, the permanent right-of-way width that would be maintained in a grassy condition, and whether herbicides would be used.

Identify all necessary federal, regional, state, and local permits and consultation required for the project (in addition to the FERC Certificate of Public Convenience and Necessity) and provide the following information:

- The name of the permitting/approval agency and the name and telephone number of the person contacted;
- Type of permits/approvals or consultation;
- The current status of the permits/approval filing (e.g., estimated schedule for permit filing, date of actual filing, and date permit/approval was granted

or is anticipated); and

- Environmental mitigation requirements specified in the permit or proposed in the permit application.
- Provide copies of all approved permits with this Resource Report. Table 1.6-1 is an example of a summary of this information for a project in New York State.

Provide the names and addresses of all affected landowners and towns, communities, and local, state, and federal governments and agencies involved with the project. Affected landowners include property owners directly affected (i.e., crossed or used) by the proposed activity, adjacent landowners, residences within 50 feet of project work areas, residences within one-half mile of proposed compressor stations, and property owners within the area of proposed storage fields. Indicate that a good faith effort will be made to notify all affected landowners.

Provide summary information for environmental resources affected and predicted impacts. Prior to a formal pipeline application, it is acceptable to use existing desktop resources (e.g., National Wetland Inventory maps, USGS topographic maps, aerial photography, etc.).

Resources to consider include, but are not limited to, the ones in the table below.

TABLE 1

Environmental Factors That May Be Considered for Analysis

| Environmental Factor | Unit ^a | Preferred Route |
|--|-------------------|-----------------|
| Total length | (mi) | |
| Type of right-of-way: | | |
| New right-of-way | (mi) | |
| Adjacent to existing pipeline right-of-way (e.g., loop) | (mi) | |
| Adjacent to other existing rights-of-way (i.e., powerline, road, etc.) | (mi) | |
| Right-of-way requirements: | | |
| Construction right-of-way | (ac) | |
| Permanent right-of-way | (ac) | |
| Wetlands: | | |
| Forested wetlands | (mi) | |
| Scrub-shrub wetlands | (mi) | |
| Wetland complexes | (no.) | |
| Waterbodies: | | |
| Total perennial waterbodies | (no.) | |
| Major river crossings (>100 feet) | (no.) | |
| Designated natural and scenic rivers | (no.) | |
| Significant fisheries | (no.) | |
| Ponds/lakes | (no.) | |

TABLE 1

Environmental Factors That May Be Considered for Analysis

| | |
|---|-------|
| Federally listed endangered or threatened species: | |
| Habitat | (mi) |
| Species | (no.) |
| Cultural resources: | |
| National Historic Landmarks | (no.) |
| NRHP-listed properties | (no.) |
| Unlisted/potentially eligible properties | (no.) |
| Land use: | |
| Forest | (mi) |
| Agricultural | (mi) |
| Open (e.g., recreation, historic districts, etc.) | (mi) |
| Residential | (mi) |
| Commercial/Industrial | (mi) |
| Other (i.e., recreation, historic districts, etc.) | (mi) |
| Residences: | |
| Within 50 feet of construction work area | (no.) |
| Federal land: | |
| National Forests | (mi) |
| Bureau of Land Management | (mi) |
| Indian reservations | (mi) |
| Other (i.e., wilderness areas, parks, flood storage control land, etc.) | (mi) |
| State land: | |
| State forest/parks | (mi) |
| Wildlife management areas | (mi) |
| Other (i.e., parks, open space, etc.) | (mi) |
| Trails: | |
| National Trails (i.e., Appalachian Trail, etc.) | (no.) |
| Other (i.e., snowmobile, hiking, biking, etc.) | (no.) |
| Recreation or other designated land use areas: | |
| Ballfields, campgrounds, landfills, quarries, etc. | (mi) |
| Paleontological resource sites | (no.) |

^a Unit may be miles or feet depending on the length of the alternative considered.