UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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OFFICE OF THE
REGIONAL ADMINISTRATOR

November 30, 2011

Amy Lueders
Nevada State Director
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520

Subject: Draft Environmental Impact Statement for Clark, Lincoln, and White Pine Counties Groundwater Development Project, Nevada (CEQ # 20110176)

Dear Ms. Lueders:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. Our detailed comments are enclosed. We greatly appreciate the individual EPA extension of the comment deadline date from October 11, 2011 to November 30, 2011.

EPA acknowledges BLM's use of a "tiered" approach to implement NEPA for this project. The Draft Environmental Impact Statement (DEIS) includes a programmatic analysis of environmental effects associated with the Southern Nevada Water Authority's (SNWA) prospective future groundwater development, which is contingent upon future appropriation by the Nevada State Engineer (NSE). It is expected that once SNWA identifies specific details of the groundwater development components, it will submit additional ROW applications to BLM and, in turn, BLM will address these future site-specific components in subsequent tiered NEPA documents. We look forward to providing comments on these future NEPA documents.

The environmental impacts identified in the DEIS for the Proposed Action and Alternatives A and B are severe in magnitude, duration and scope. However, we do not believe it is appropriate, at this time, to provide a rating for the Proposed Action, as well as, Alternatives A, B, and C, which include approval of a main pipeline ROW and future pumping in Snake Valley, given that the NSE is not scheduled to make a decision on the Snake Valley water rights issue until 2019, nor has there been a final agreement between Nevada and Utah regarding the allocation of Snake Valley groundwater in this shared hydrologic basin. In contrast, we will be providing a rating for Alternatives D and E as they do not include a ROW or future groundwater pumping in Snake Valley. A decision from the NSE regarding the water rights for the basins that would be pumped under Alternatives D and E is expected early next year.

We also acknowledge that projected population growth in the Las Vegas region cannot be supported without an additional water supply, and that the region needs greater water supply reliability during emergencies and drought, and to adapt to climate change. We appreciate the wide range of alternatives which have been presented in the DEIS. Consistent with the views of the US Fish and Wildlife Service

and National Park Service, we believe that Alternatives D and E, when combined with additional demand management measures and modified for intermittent pumping needed for drought and emergencies, as proposed for Alternative C, would substantially reduce impacts identified in the DEIS and would fulfill the SNWA's need for an additional water supply. We note that the geographical extent of the ROW identified in the Lincoln County Conservation, Recreation, and Development Act of 2004, which is BLM's legislative requirement to grant a ROW, more closely matches that of Alternatives D and E.[1]

The DEIS describes extensive hydrological modification on over 5,000 square miles of Nevada and Utah - an area larger than the State of Connecticut - lowering groundwater levels and depleting aquifers, altering vegetation regimes, and eliminating high-quality habitat. According to the DEIS, the proposed action would result in regionally extensive groundwater drawdown cones, the potential loss of thousands of acres of wetlands through succession to non-wetland vegetation, and the transformation of large areas of basin shrub vegetation,[2] with repercussions on habitat carrying capacity and animal displacement on a long-term basis. Eight of the 26 highest priority wetland conservation areas designated by the Nevada Natural Heritage Program are located within White Pine County in the area of influence of the proposed project.[3] The groundwater drawdown is also predicted to affect livestock forage production, with vegetation transformed in 20% of grazing allotment acreage after 75 years, and livestock water sources irretrievably lost, contributing to potentially substantial long-term adverse economic and social effects in rural areas.

The DEIS includes a mitigation and adaptive management plan. However, in several instances, BLM acknowledges that mitigation may not be feasible or available for all locations, and states that groundwater development presumes a certain level of change to vegetation and air quality and a significant reduction in groundwater levels in some areas. BLM defers all decisions regarding mitigation to future implementation and technical stakeholder committees, to be determined by consensus. There is no specific commitment to mitigate or maintain a minimal level of ecosystem function and health included in the current mitigation and adaptive management plan.

We are also concerned with the estimated releases of wind-blown particulate matter projected for the 5,000 square mile 10-foot + drawdown area. Because no air modeling was performed, the DEIS does not provide an estimate of how these impacts will affect air quality and public health, including the ability of Provo, Salt Lake County, and Ogden, Utah and Clark County, Nevada to attain air quality standards for these pollutants. Portions of these areas already do not meet air quality standards for PM_{10}, and/or $PM_{2.5}$. Windblown dust emissions could also impair visibility conditions at Great Basin National Park.

Based on the information in the DEIS, we believe the project's indirect and cumulative impacts to aquatic resources are significant, and that an "Individual" permit (rather than a "Nationwide" general

[1] The Lincoln County Conservation, Recreation, and Development Act of 2004 states that "the Secretary of the Interior….shall establish on public land …a corridor for utilities in Lincoln County and Clark County, Nevada" and that "the Secretary shall grant to the Southern Nevada Water Authority and the Lincoln County Water District nonexclusive rights-of-way to Federal land in Lincoln County and Clark County, Nevada, for…. facilities and systems that are necessary for the construction and operation of a water conveyance system," as depicted on the accompanying map, which shows the ROW corridor ending at the Lincoln County border.

[2] The DEIS states that 5,460 acres and 8,000 acres of wetlands and meadows at 75 years and 200 years respectively, could be so affected, and 136,990 acres and almost 200,000 acres of basin shrub vegetation (at 75 years and 200 years respectively) (pps. 3.5-47 & 48).

[3] Nevada Natural Heritage Program. 2008. *2007 Nevada Priority Wetlands Inventory.* E. Skudlarek (ed.) Prepared for Nevada Division of State Parks. Carson City, Nevada.

permit) should be sought for any Clean Water Act Section 404 discharges of fill into jurisdictional waters of the U.S. The Final EIS should evaluate the ability to meet the requirements of the CWA Section 404's compensatory mitigation rule, and discuss the opportunities that may exist for compensatory mitigation in the project area.

We also understand that there is strong opposition to the project by several tribes. We encourage BLM, as the lead Federal agency, to continue its formal government-to-government consultation with the appropriate Nevada and Utah tribal leaders, in accordance with Executive Order 13175 of November 6, 2000, "Consultation and Coordination with Indian Tribal Governments."

We have rated the DEIS as "2" - Insufficient Information. While we commend BLM for the well organized and detailed information in the DEIS, there is a need for evaluation of the effects of groundwater drawdown of less than 10 feet, characterization of the deep carbonate aquifer and its interaction with shallower alluvial aquifers, and a quantitative air modelling analysis to determine the potential for exceedences of the National Ambient Air Quality Standards and/or visibility impairment to the Great Basin National Park. For the mitigation and adaptive management plan, we recommend that specific ecosystem health objectives be identified so that the nature and magnitude of impacts that would be deemed acceptable and allowed to occur can be disclosed. The probable effectiveness of the mitigation strategy as a whole in preserving key environmental attributes and ecosystem functions in the region should be assessed in the Final EIS (FEIS).

Alternatives D and E propose shorter rights-of-way (ROW) and would avoid drawing down groundwater in the ecologically sensitive Snake Valley, thereby reducing adverse effects. These alternatives would result in significant environmental degradation, but at a lesser magnitude than the Proposed Action and Alternative A and B. We have rated Alternatives D and E as Environmental Objections (EO) (See the enclosed "Summary of Rating Definitions").

EPA recommends that BLM design and select a preferred alternative ROW, that would, at minimum, avoid and minimize adverse impacts to the most vulnerable surface and groundwater resources, especially those in regionally significant spring complexes located in Spring and Snake Valleys and Great Basin National Park, those affecting tribes, and those associated with areas designated to protect rare plant communities and protected species. EPA appreciates the opportunity to provide input on this ROW and groundwater development project. We would welcome the opportunity to work with BLM, SNWA and other resource agencies to develop an approach that achieves the project purpose/need and maximizes aquatic resource protection.

We are available to discuss our comments and the recommendations included in our attached detailed comments. If you have any questions, please call me at (415) 947-8702 or have your staff contact Laura Fujii, our lead NEPA reviewer for this project, at (415) 972-3852. Please send two hard copies and two CDs of the FEIS to this office (Mail Code: CED-2) at the same time it is made available to the public.

Sincerely,

/s/

Jared Blumenfeld

Enclosures: Summary of EPA Rating Definitions
EPA's Detailed Comments

cc: Penny Woods, BLM Nevada State Office
Rosey Thomas, BLM Ely District Office
Phil Rhinehart, BLM Southern Nevada District
Verlin Smith, BLM Utah State Office
Paul Summers, BLM National Operations Center
Damian K. Higgins, FWS Nevada Fish and Wildlife Office
Michael Jewell, US Corps of Engineers, Sacramento District
Jason Gibson, US Army Corps of Engineers, Bountiful Office, Sacramento District
Amy Defreese, FWS Utah Ecological Services Office
Boyde Clayton, Deputy State Engineer, Utah Division of Water Rights
Andy Ferguson, Superintendent, Great Basin National Park
David Nawi, Department of Interior
Patricia Mulroy, Southern Nevada Water Authority
Jason King, Nevada State Engineer
Amos Murphy, Confederated Tribes of the Goshute Reservation
Alvin Marques, Ely Shoshone Tribe
Virginia Sanchez, Duckwater Shoshone Tribe

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE CLARK, LINCOLN, AND WHITE PINE COUNTIES GROUNDWATER DEVELOPMENT PROJECT, NEVADA & UTAH, NOVEMBER 30, 2011.

Impacts on Groundwater Resources

EPA has substantial concerns regarding the magnitude and extent of impacts identified in the Draft Environmental Impact Statement (DEIS) as a result of future long-term groundwater extraction for the Proposed Action. The effects of the Proposed Action include:

- **Long-term irreversible flow reductions and drying up of perennial water sources** (p. 3.3-113, p. 4-2). The DEIS predicts that a decrease or loss of flow to 44 perennial springs, 212 total springs, and 80 miles of perennial streams would occur after 75 years, and to 57 perennial springs, 305 total springs and 112 miles of perennial streams after 200 years.[1]
- **Loss of thousands of acres of wetlands through succession** (large-scale reductions or change in wetland vegetation to non-wetland vegetation). The DEIS predicts impacts to 5,460 acres of wetlands after 75 years and over 8,000 acres of wetlands after 200 years (p. 3.5-48). This change of wetland vegetation to non-wetland vegetation is unlikely to be reversed, since pumping would reduce the source of water that sustains hydric (wetland) soils, resulting in long-term drying of hydric soils that could permanently reduce the ability of these soils to support wetland vegetation (p. 3.4-22). "Because of the very long time frames, and potential vegetation community changes over large geographic areas, the effects are considered irreversible within any reasonable time frame (likely more than 500 years)"(p. 4-2).
- **Long-term reductions or compositional change in phreatophytic[2] vegetation** (p. 4-2). The DEIS predicts that approximately 137,000 acres of basin shrubland will change after 75 years, and 191,500 acres of basin shrubland will change after 200 years (p. 3.5-48). The DEIS states that these vegetation effects "are considered irreversible within any reasonable time frame (likely more than 500 years)"(p. 4-2).
- **Permanent extraction of groundwater in storage within the aquifers** (as evidenced by the formation of regionally extensive drawdown cones) (p. 4-2). The DEIS notes that these impacts would be irretrievable. Using Proposed Action 200 year maps of drawdown areas and Google Earth Pro, we calculated that the area of 10-foot or greater drawdown covers over 5,000 square miles.
- **Permanent impacts from surface subsidence caused by future groundwater pumping** (p. 3.2-32). The DEIS estimates that up to 525 square miles could experience subsidence exceeding 5 feet after 200 years (p. 3.2-48) (and 781 square miles cumulatively, p. 3.2-52) for the proposed action. Subsidence can result in damage to roads and highways, fences, buildings, pipelines, canals and utility systems (p. 3.18-69). Damage can include cracked walls and foundations, warped fences and utility poles, ruptured pipelines, broken canals, and deep fissures through roadways.
- **Irreversible commitment of resources important to wildlife.** The DEIS states that the loss or long-term reduction or degraded quality of wetlands and phreatophytic vegetation would be an irretrievable commitment of resources. This reduction or adverse change in habitat quality could

[1] Table 3.3.2-22 (p. 3.3-186); Table 3.5-20 (p. 3.5-65)

[2] Phreatophytes are deep rooted trees and shrubs that obtain a dependable water supply from the saturated soil water table, maintaining water status that is largely independent of soil water derived from incident precipitation.

affect habitat carrying capacity, cover, breeding sites, foraging areas, and animal displacement on a long-term basis (p. 4-2).

- **Long-term impacts to agriculture due to loss of vegetation/forage production.** The DEIS identifies long-term risks to the agricultural sector in the rural areas through potential effects on grazing, irrigation and well development costs, and streams and seeps that serve as livestock water supplies (p. ES-60). Of the 730,000 acres of grazing allotments in the region of study, 20% (142,975 acres) could experience plant species composition change after 75 years, and 27% (200,080 acres) could change after 200 years (p. 3.12-42). Livestock could damage remaining water sources (wetland meadows and phreatophyte areas that typically surround them) due to overuse of the remaining available water sources. The DEIS states that the reductions to flow or quality of springs and perennial streams would be an irretrievable, and potentially irreversible, loss of water sources for livestock (p. 4-3).
- **Impacts to water resources within Great Basin National Park (GBNP)**. The DEIS indicates that Proposed Action pumping could reduce flows in two springs and two streams within the GBNP that contain game fish or nongame native fish species (p. 3.7-46).
- **Potential water quality impacts.** The DEIS acknowledges that flow changes can potentially be accompanied by changes in water quality (p. 3.3-113). Based on our professional experience, a new flow regime, as a result of depressurization from increased groundwater drawdown, could lead to intrusion of brackish water from other formations or nearby aquifer systems. Water quality of the regional carbonate aquifer, shallower alluvial aquifers, and surface waters could be adversely affected by an increase in total dissolved solids (TDS).

The proposed project covers an extremely large area consisting of the southern and central portions of eastern Nevada and western portions of Utah. The study area for water resources encompasses 35 hydrographic basins and over 20,000 square miles, an area slightly larger than the combined land area of Maryland, Delaware, New Jersey, and the District of Columbia.[3] More than 5,000 square miles within this area would be subject to groundwater drawdown of greater than 10 feet. The full area of effects of the proposed project can be expected to be even greater. The DEIS used a regional groundwater model with a grid size of 1 kilometer, which is too coarse to accurately simulate effects to springs, surface water features, and vegetation in areas where groundwater is near the surface, thus likely underestimating impacts. In addition, the DEIS does not contain sufficient analysis to characterize the connectivity between the regional carbonate aquifer and basin fill alluvial aquifer.

Recommendations

1. Design and select an alternative that achieves the project purpose and need, maximizes aquatic resource protection, and reduces long-term environmental impacts. Given the severe and irreversible impacts on ecosystems and groundwater supply, and the potential groundwater drawdown air quality impacts cited in the DEIS, EPA recommends that BLM design and select a preferred alternative right-of-way (ROW) that would, at minimum, avoid and minimize adverse impacts to the most vulnerable surface and groundwater resources, especially those in regionally significant spring complexes located in Spring and Snake Valleys and Great Basin National Park, those affecting tribes, and those associated with areas designated to protect rare plant communities and protected species. We believe that Alternatives D and E, if combined with additional aggressive demand management measures[4] and modified to support only intermittent pumping needed for

[3] U.S. Census Bureau at http://quickfacts.census.gov/qfd/index.html

[4] For example, full cost pricing, comprehensive metering, new development impact fees, and gray water reuse.

drought and emergencies, as proposed for Alternative C, would substantially reduce impacts and fulfill Southern Nevada Water Authority's (SNWA) need for an additional water supply. We note that the geographical extent of the ROW identified in the Lincoln County Conservation, Recreation, and Development Act of 2004, which is BLM's legislative requirement to grant a ROW, more closely matches that of Alternatives D and E.[5]

2. Conduct additional analysis to better characterize and predict large-scale long-term impacts. Below, we identify information needs which we believe are important for informed decision-making.

Characterize the carbonate aquifer interactions with alluvial aquifers and develop local groundwater flow models. Prior to the approval of any groundwater extraction, EPA recommends the BLM conduct additional investigations (e.g., aquifer testing, monitoring well installation and sampling, geochemical and water quality analysis) to better characterize the deep carbonate aquifer and its interactions with shallower aquifers in the affected region. We also recommend developing local groundwater flow models, when appropriate, to better predict the impacts of regional groundwater extraction on specific groundwater and surface water features.

Identify nearby saline aquifer systems. Existing saline aquifer systems that have the potential to be hydrologically connected to the carbonate aquifer should be identified throughout the project area to identify potential water quality issues, especially in areas where groundwater extraction may have effects on flow regimes which could lead to impacts to water quality. Suggestions for gathering this information include the following:

- If data are not currently available, conduct open hole (including gamma ray) logs to better understand the geology and water chemistry. These logs can assist with defining semi-confining units in the strata. Pickett Plot analysis (cross plot/pattern recognition of Archie Equation);[6] can provide a basic appraisal of the water's sodium chloride (NaCl) equivalency, which is often comparable to TDS;
- Investigate availability of Department of Energy geologic sequestration surveys for the project area. These surveys specifically identify saline aquifers.

3. Develop a regional groundwater framework for use of the regional carbonate aquifer. We urge the Bureau of Land Management (BLM) to work with Cooperating Agencies, Nevada State Engineer, SNWA, and other water right applicants to build on current regional groundwater studies[7] to develop a collaborative regional groundwater management framework to guide groundwater use to ensure: 1) efficient long-term sustainable use of the alluvial and deep carbonate-rock aquifers, and 2) avoidance of adverse impacts to third parties and surface and groundwater quality and quantity. For example, the management framework could define a regional groundwater coordination and collaboration process to address use of interconnected aquifers, public participation in groundwater

[5] The Lincoln County Conservation, Recreation, and Development Act of 2004 states that "the Secretary of the Interior….shall establish on public land …a corridor for utilities in Lincoln County and Clark County, Nevada" and that "the Secretary shall grant to the Southern Nevada Water Authority and the Lincoln County Water District nonexclusive rights-of-way to Federal land in Lincoln County and Clark County, Nevada, for…. facilities and systems that are necessary for the construction and operation of a water conveyance system," as depicted on the accompanying map, which shows the ROW corridor ending at the Lincoln County border.

[6] U.S. EPA Underground Injection Control Program (1988). *Survey of Methods to Determine Total Dissolved Solids Concentrations.*

[7] For example, US Geological Survey Basin and Range Carbonate-Rock Aquifer System Report and regional Aquifer System Analysis Program for the Great Basin Region, p. 3.3-31.

use decisions, and research needs. The Final EIS (FEIS) should identify any efforts that are occurring towards these goals.

Mitigation Measures and Adaptive Management

Overview

The DEIS and its appendices identify various mitigation measures, including Best Management Practices (BMPs) from the BLM Ely District's Management Plans that are applicable to the project; applicant-committed environmental protection measures that SNWA has agreed to; and additional mitigation measures that were developed for specific resources (p. ES-20). Many of the applicant-committed environmental protection measures, contained in Appendix A of the Conceptual Plan of Development (Appendix E of the DEIS), address impacts during the construction phase. Regional water-related effects from groundwater pumping are addressed via existing agreements, including the stipulated agreements between Department of Interior agencies and SNWA, and via an adaptive management plan.

Based on the summary included on pages A-38 through A-45 of the Conceptual Plan of Development Appendix A, the measures included in the stipulated agreements largely address monitoring, data sharing, and reporting. The adaptive management plan (p. A-46) provides a framework for the adaptive management strategy and, in addition to the monitoring and reporting specified in the stipulated agreements, identifies environmental goals, introduces the concepts of environmental indicators and early warning thresholds, and discusses implementation of the adaptive management plan, which sets out a process by which BLM will consider adaptive management measures to mitigate observed effects.

Concerns

Our concerns regarding the adaptive management plan are: (1) the lack of specific ecosystem health objectives and disclosure of the levels of impact that would be deemed acceptable and allowed to remain; and (2) lack of an assessment of the probable effectiveness of the mitigation strategy, as a whole, in preserving key environmental amenities and ecosystem functions regionally.

The DEIS acknowledges permanent unmitigable impacts. The DEIS states that groundwater development presumes some level of change to vegetation (p. 3.3-121), air quality (p. 3.1-37), and a significant reduction in groundwater levels in parts of Snake Valley. Therefore, not all impacts would be avoided by the 3M (mitigation) plan (p. 3.3-121, 3.5-47). The DEIS also states that considering the regional scale of the predicted drawdown and number of perennial water sources identified that could be affected, mitigation may not be feasible or available for all locations (p. 3.3-122). It is not clear what magnitude or extent of impact will be permitted, as the environmental goals of the adaptive management plan are very vague and do not define what constitutes an “unreasonable adverse effect.” The stipulated agreements imply that no effects at all will be allowed on Federal Resources within Great Basin National Park, and no “unreasonable adverse effects” to Federal Resources elsewhere (p. 12 of 14, Exhibit A of Stipulation for Spring Valley). Because some level of change to vegetation will be allowed (and perhaps facilitated by a potential adaptive management measure to conduct large-scale seeding to assist in vegetation transition, p. A-56), it is important to convey what scale of landscape conversion will be permissible.

Additionally, NEPA requires that an EIS discuss mitigation measures with "sufficient detail to ensure that environmental consequences have been fairly evaluated."[8] An essential component of this discussion is an assessment of whether the proposed mitigation measures can be effective.[9] We acknowledge that the DEIS attempts to convey effectiveness of each proposed mitigation measure and the residual impacts that would occur after mitigation. However, the DEIS does not evaluate the probable effectiveness of the mitigation strategy, as a whole, in preserving regional ecosystem functions. Because of the large magnitude and scale of potential impacts, it is critical that an evaluation of regional mitigation effectiveness be included in the programmatic-level impact assessment and not deferred to future tiered NEPA analyses.

The adaptive management plan defers future decision-making regarding impact assessment and mitigation to the personnel comprising the technical working groups, which must reach consensus, and to an executive committee which, if no consensus is reached, can appeal to the Nevada State Engineer's Office. The effectiveness of this dispute resolution process in ensuring mitigation measures are implemented is not clear or discussed. There do not appear to be binding commitments on the parties to ensure a certain level of mitigation occurs or habitat function is maintained if disagreements cannot be resolved.

Recommendations

The adaptive management strategy and plan should be further developed. There should be a clear articulation of the minimum desired environmental conditions to be preserved in the project areas, perhaps drawn from goals present in the Ely District's Resource Management Plan, as well as a discussion of the impacts that will be allowed to remain, expressed in terms of large-scale habitat and ecosystem functioning.

The FEIS should include an evaluation of the adaptive management plan and the likelihood that minimum desired environmental conditions can be achieved with the adaptive management plan as outlined in the DEIS (Appendix A of Appendix E and in the stipulated agreements). Assessment of the local and regional effectiveness of the adaptive management plan should be consistent with Council on Environmental Quality (CEQ) guidance that states that "to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed."[10]

Additional recommendations for the project mitigation/adaptive management plan include:

- Expand the mitigation/adaptive management plan to include the entire project area.
- Identify the environmental indicators that were selected for monitoring from the Spring Valley and Delamar, Dry Lake, and Cave Valley's biological and hydrologic monitoring plans (p. A-49).
- Identify specific management decision points which would trigger action, including management alternatives and mitigation measures that would be implemented should a threshold be exceeded. Appropriate decision points could include observed ecologically harmless reductions in spring

[8] Methow Valley 490 U.S. at 352
[9] Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1381 (9th Cir. 1998)
[10] Council on Environmental Quality, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18026 (1981), Question 19b.

flows or wetland vegetation. The commitments to specific mitigation actions should be clearly identified in the adaptive management plan.

- Identify funding sources for the long-term mitigation and adaptive management plan.
- Identify mechanisms for public disclosure of the analysis and management decisions.
- Describe the roles of BLM, other local, State, and federal agencies, the public and other stakeholders in the adaptive management process.
- Implement additional monitoring to ensure the following are included:
  - Spring and surface water flow monitoring;
  - Additional aquifer testing with monitoring wells located in the alluvial and carbonate aquifers, with monitoring of surface water response;
  - Geochemical and water quality analysis of surface water, alluvial groundwater and carbonate bedrock groundwater to help determine interconnection between aquifers;
  - Installation of shallow piezometers to monitor shallow groundwater near springs, seeps, streams, and active evapotranspiration (ET) areas;
  - Deeper piezometers or monitoring wells to monitor fault or fracture flow if fault or fracture flow is the source of surface water; and
  - Ecological monitoring to assess population and health of plant and animal species dependent on surface water features.

Air Quality

The DEIS estimates substantial windblown fine and coarse particulate emissions[11] that could occur as a result of change and/or loss of vegetation coverage due to groundwater pumping. While the DEIS makes no statement as to the significance of these emissions, EPA believes it is possible that these emissions could have significant impacts on local and regional air quality. However, because no air quality modeling was performed, no conclusions can be made regarding the severity of these emissions in relation to the National Ambient Air Quality Standards (NAAQS) for particulate matter 10 microns or less (PM_{10}), or for particulate matter 2.5 microns or less ($PM_{2.5}$). A thorough analysis of air quality impacts is essential because of the magnitude of these emissions and their potential to affect public health in communities in and near the project area.[12] These emissions also could interfere with the ability of Provo, Salt Lake County, and Ogden City, Utah, as well as Clark County, Nevada, to attain the PM_{10} and $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS). Portions of these areas are currently not meeting these health-based standards for PM_{10}, and/or $PM_{2.5}$.

EPA believes that the air quality analysis is insufficient to evaluate and disclose potential impacts to air quality and public health. Additionally, EPA disagrees with the DEIS' conclusion that particulate matter will decrease significantly during downwind transport and that only a very small fraction of wind erosion emissions from the cumulative project area is expected to be transported into Salt Lake County, Utah (p. 3.1-60). Under high wind conditions, dust plumes extending more than 100 miles are not

[11] According to the DEIS, depending on the alternative selected, particulate emissions associated with groundwater drawdown are projected to be up to 34,742 tpy for PM_{10} and up to 3,474 for $PM_{2.5}$ (buildout + 200 years) (p. 3.1-48). Compare to the no build option (PM_{10} emissions of up to 6011 tpy, and $PM_{2.5}$ emissions of up to 601tpy (+ 200 years)). Cumulative emissions from existing, proposed, and reasonably foreseeable construction projects and groundwater pumping would be up to 39,512 tpy for PM_{10}, and 3,951for $PM_{2.5}$ after 200 years of pumping (p. 3.1-69).

[12] Recent research has linked exposure to relatively low concentrations of particulate matter with premature death. Those at greatest risk are the elderly and those with pre-existing respiratory or heart disease. Particulate matter air pollution is especially harmful to people with lung disease such as asthma and chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema (http://www.epa.gov/region9/air/owens/qa.html).

uncommon in this region, and are readily visible on satellite imagery.[13] Therefore, significant increases in disturbed soil areas 75 to 100 miles west and southwest of the Provo, Ogden City, and Salt Lake County nonattainment areas have the potential to increase the frequency and severity of high wind NAAQS violations. The severity of such events has already, on one occasion, reached the significant harm level for PM_{10} (PM_{10} of 605 µg/m3 on March 30, 2010, in Salt Lake County).

Recommendations

Conduct a quantitative modeling analysis and compare results to the NAAQS to provide a complete assessment of project air quality impacts. We believe this information is needed now and should not be deferred to subsequent tiered NEPA documents. A quantitative modeling analysis would provide the BLM the ability to accurately disclose air quality impacts, including cumulative impacts, and to inform mitigation. We recommend the modeling analysis include the Wasatch Front area because of the history of PM_{10} and $PM_{2.5}$ exceedances caused by windblown dust from areas west of Salt Lake City.

Refine the emissions estimates by establishing an appropriate site-specific emissions factor. The particulate emissions predicted in the DEIS are high, yet may contain significant uncertainty. We understand that no emissions factor exists for estimating emissions from this source (loss of vegetative cover as a result of dewatering) and that BLM used the most applicable emissions factors. However, we believe an emission factor could be developed based on site-specific geologic conditions that would generate a more accurate emissions estimate for use in the air quality model. We recommend BLM's air quality analysts consult with windblown dust experts from the Nevada research community, for example, experts from the University of Nevada, and/or Clark County, whom we are aware have done extensive wind-blown dust studies, to develop site-specific emissions factors.

Document analytical approach in Air Quality Modeling Protocol. EPA recommends that the approach used to analyze and predict air quality impacts be documented in an Air Quality Modeling Protocol. This Protocol would provide a "roadmap" for how the air analysis would be conducted and the results presented, describe the model to be used, model settings, modeling boundaries, and important model inputs such as meteorology, background data, and emission inventories. The Protocol should consider potential increases in frequency and/or intensity of wind events resulting from climate change. The Protocol should also generally describe the standards and thresholds to which the air impact results will be compared. We recommend that a Draft Air Quality Modeling Protocol be circulated among the relevant stakeholders, including EPA, for comment and discussion.

Site a particulate matter monitoring location between project area and Salt Lake City. We recommend at least one of the particulate matter monitoring locations be sited in a location between the project area and Salt Lake City, Utah, in consultation with EPA and the Utah Division of Air Quality.

Identify and Commit to Implementation of Mitigation Measures. EPA recommends BLM ensure implementation of reasonable mitigation and control measures and design features through all appropriate mechanisms. We suggest inclusion of a list of mitigation measures that BLM could

[13] See Painter, Thomas H. et al. (2010), Response of Colorado River runoff to dust radiative forcing in snow. *Proceedings of the National Academy of Sciences*, vol. 107 no. 40 17125-17130; and Painter, Thomas H. et al. (2007), Impact of disturbed desert soils on duration of mountain snow cover. *Geophysical Research Letters*, Vol. 34, L12502

apply in the event future air quality monitoring shows there to be an adverse impact to air quality in or nearby the project area as a result of groundwater pumping.

Wetlands and Aquatic Resources Impact Assessment

Wetlands

As stated above under "Impacts on Groundwater Resources," we are very concerned with the magnitude of predicted impacts on wetlands and meadows, and on hydric soils as a result of groundwater pumping. Hydric soils are formed under conditions of water saturation, flooding, or ponding, and are commonly associated with riparian areas, wetlands, springs, and seeps. Hydric soils are rare in the region due to the arid climate (p. 3.4-6).

Because the project construction is expected to involve the discharge of fill into jurisdictional waters of the U.S., the DEIS acknowledges that a Clean Water Act (CWA) Section 404 permit will be required (either Nationwide or Individual permits, p. 1-10). EPA believes that the direct, indirect and cumulative impacts to aquatic resources warrant the evaluation of this project under an Individual permit process pursuant to CWA Section 404. We do not believe a Nationwide permit is appropriate for this ROW project.

Permit applicants must comply with EPA's CWA Section 404(b)(1) Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR Part 230)(Guidelines). As proposed, the project will likely result in significant degradation to waters of the U.S., could violate water quality standards, may result in jeopardy of endangered species, and may not be mitigable – each an independent criterion under the 404(b)(1) Guidelines that would prohibit issuance of a Section 404 permit. Under the Guidelines, the U.S. Army Corps of Engineers (Corps) cannot permit a discharge of dredged or fill material into waters of the U.S. that is not the least environmentally damaging practicable alternative (LEDPA). Additionally, regulations require a mitigation plan consistent with the *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (40 CFR Part 230). The mitigation measures discussed in the DEIS and stipulated agreements are primarily monitoring measures. Compensatory mitigation for lost acres of waters of the U.S. may be needed. Such losses may, in fact, be unmitigable, given the potential need for thousands of acres of created waters of the U.S. and compensatory wetlands.

Recommendations

Select a preferred alternative that fulfills the project purpose and need with fewer long-term environmental impacts. For example, Alternative D predicts wetlands impacts at just over a quarter of the acreage compared to the Proposed Action after 75 years of pumping. Modification of this alternative to include additional aggressive demand measures and to support only intermittent pumping, could further reduce these impacts.

Seek an Individual Permit. The BLM and project proponent should seek an Individual CWA Section 404 permit. The FEIS should describe the status of the CWA Section 404 permit application and consultation with the Corps and include:

- *Findings of the official jurisdictional determination.* An official jurisdictional determination of the extent of Waters of the United States (waters) subject to Section 404 of the CWA has not been verified by the Corps.

- *Demonstration of compliance with the Guidelines.* The FEIS should include an analysis demonstrating compliance with EPA's 404(b)(1) Guidelines (40 CFR 230).
- *A mitigation plan consistent with the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (40 CFR Part 230).

Aquatic Biological Resources

The analysis of impacts to aquatic habitat from groundwater pumping in the DEIS focused on perennial springs and streams located within the 10-foot drawdown contour (p. 3.7-34). Consequently, it does not fully address the ephemeral and intermittent aquatic systems that are critical to the health and stability of arid ecosystems, especially in the Mojave and Great Basin Deserts. Because of this omission, we believe the assessment of impacts to aquatic biological resources is incomplete.

Recommendation

Identify and evaluate impacts to all aquatic biological resources, including those utilizing ephemeral and intermittent systems. The FEIS should expand the aquatic biological resources evaluation to capture potential effects on the habitat of the many ephemeral and intermittent streams and washes. We recommend adding these intermittent and ephemeral habitats to the impact indicators and quantifying these impacts in Table 3.7-18. We recommend taking an ecosystem approach in the effects analysis that stresses the relationships between organisms and their environment. Include a narrative that provides a clear picture of how watersheds and ecological conditions would shift over the life of the project.

ROW Construction Effects

While the most significant adverse impacts will occur as a result of long-term groundwater extraction, there will also be direct impacts resulting from pipeline construction and construction of well pads, distribution pipelines and electrical transmission lines. EPA has the following recommendations for reducing or avoiding impacts from ROW construction and operation and improving the analysis and disclosure of impacts in the FEIS.

Recommendations

1. ***Evaluate effects from construction support areas and construction water supply pumping.*** Construction support areas and related areas could have significant impacts, such as the proposed construction support area adjacent to Lower Meadow Wash near Caliente (p. 3.7-22). Construction would also require one water supply well every 10 miles with the capability of delivering between 5.5 and 8.7 million gallons of construction water for each pipeline mile (p. 3.3-74). The DEIS does not disclose the potential effects of this construction pumping on groundwater, wetlands and aquatic resources since it defers identification of these effects to a future Construction Water Supply Plan (p. 3.3-74). The FEIS should state whether pumping for the construction water supply was included in the existing groundwater modeling and projected impacts to water and aquatic biological resources.
2. ***Use existing ROWs to avoid and minimize new disturbance.*** The DEIS assesses the potential environmental effects of four localized ROW alignment options. Each option involves a selected segment of the main pipeline or power line alignments, and alignment within existing transportation utility corridors to reduce new disturbance (Table 2.10-5, p. 2-121). When

selecting a preferred alignment, EPA recommends use of existing transmission lines and utility corridors whenever possible to avoid and reduce new disturbance, especially effects on water and aquatic resources and areas of special concern.

3. ***Expand the dust control measures and ensure implementation occurs across the entire project area.*** The DEIS references requirements for a Dust Control Plan that details dust suppression methods to reduce emissions (p. 3.1-19). Given the projected substantial PM_{10} and $PM_{2.5}$ emissions, the FEIS should include specific assurances that the Dust Control Plan would be implemented across the entire project area, not just within the Clark County, Nevada nonattainment area.

4. ***Avoid further impacts to CWA Section 303(d) listed waterbodies.*** The proposed project presents a variety of unquantified threats to the quality of waters found throughout the study area. Short-term threats include those associated with potential erosion and other construction-related impacts from what is likely to be a lengthy, multi-phased project buildout. The Muddy River, Trout Creek, Cottonwood Creek, Hay Meadow Reservoir, Nesbitt Lake, Echo Canyon Reservoir, Cold Springs Reservoir, Duck Creek and Comins Reservoir are on the CWA Section 303(d) list as impaired waterbodies. The FEIS should demonstrate that the proposed project will not further impair the above waterbodies and will not increase pollutants from stormwater runoff, nuisance flows and groundwater drawdown.

5. ***Modify project elements to avoid Areas of Critical Environmental Concern.*** As currently designed, project elements would be located in the BLM Coyote Springs Area of Critical Environmental Concern (ACEC) and the Kane Springs ACEC, both of which were designated to protect the desert tortoise (p. 3.14-4). We recommend BLM work with SNWA on project design modifications to avoid the potential adverse effects of the project components on these ACECs.

6. ***Develop spring flow mitigation measures that avoid contributing to the drawdown impact.*** Proposed mitigation for reduced groundwater flows to Shoshone Ponds in Spring Valley is to improve an existing well or drill a new well to pump water from the same aquifer to maintain the flow to the ponds. This mitigation measure would cause an incremental increase in groundwater drawdown (p. 3.3-121). EPA recommends avoidance of the adverse impact through reduced pumping, relocation of water supply diversion wells, or other feasible measures that will not contribute to the underlying groundwater drawdown impact.

Energy Consumption and Greenhouse Gas Emissions

Section 3.1 of the DEIS estimates the quantity of water delivered via the proposed pipeline and the corresponding amount of energy required for each alternative. Using Alternative A as an example, the DEIS estimates it will take 74.4 continuous megawatts of power to deliver 114,000 acre-feet per year of water (p. 3.1-39). This equates to an energy intensity of 17,500 kilowatt hours per million gallons (kWh/MG). For comparison, Electric Power Research Institute (EPRI) estimated national averages for energy intensity ranging from 700 to 1,800 kWh/MG, depending on water use and customer sector.[14] This would make the water delivered by the proposed project ten to twenty five times more energy intensive than the national average. Even when compared to southern California, known for the high energy intensity of its water supply at 8,900 kWh/MG, the proposed project is nearly twice as energy intensive.[15] The DEIS indicates power requirements associated with operation of the pipeline could be

[14] *California's Water – Energy Relationship*, California Energy Commission, CEC-700-2005-011-SF, November 2005
[15] Ibid

partially offset by electricity generation from hydro-turbines at pressure reducing stations and solar panels to the maximum extent possible, but does not commit to these emission reductions. Greenhouse gas (GHG) emissions estimates are provided in Section 3.1 for indirect emissions associated with the electricity necessary to operate the proposed project (p. 3.1-34). These estimates are based upon the electricity necessary for pumping and ancillary equipment associated with extraction and transportation of groundwater to the Las Vegas area. They do not appear to include indirect GHG emissions associated with the power necessary to operate the water treatment (107 million gallons per day) and wastewater treatment plant(s). Similarly, the GHG emissions estimates do not appear to include the power necessary for: (1) providing the treated water locally via the existing water distribution system, or (2) collecting the resulting wastewater for treatment and final discharge.

A GHG emissions estimate is provided for construction-related emissions, including pipeline, power line and facilities construction, and construction transportation and maintenance vehicles (Table 3.1-8, p. 3.1-17). These estimates do not appear to include consideration of: (1) worker commuting, which can be considerable for linear developments such as pipelines and power lines, or (2) pumping of groundwater for use during construction.

Recommendations

Commit to power sources that reduce GHG emissions. EPA recommends that the project design incorporate hydro-turbines and other renewable energy sources to off-set emissions from electricity generation needed to power the project. The FEIS should describe and commit to all feasible measures that will reduce GHG emissions.

Discuss GHG emissions of linked activities. The discussion of GHG emissions should acknowledge emissions from worker commuting, pumping of groundwater for use during construction, and the emissions from water treatment, distribution, and wastewater collection, treatment, and disposal.

Impacts to Tribal Trust Resources

At least 13 tribes have expressed concerns regarding impacts to water resources, including concerns about the loss of water and tribal water rights, springs drying up or experiencing reduced flow, and the impacts to plants and animals of subsistence and cultural importance. The DEIS indicates that tribes feel that threats to the viability of the springs and everything that relies on them would affect the entire basis for the Native American culture in the Great Basin (p. 3.17-19). We are aware that the Ely and Duckwater Shoshone Tribes have filed protest in the pending Nevada State Engineer water rights hearings, and the Confederated Tribes of the Goshute Reservation submitted resolutions in opposition of the project to both BLM and the Nevada State Engineer, as has the National Congress of American Indians, and the Intertribal Council of Nevada which represents 26 tribes in Nevada.

The analysis in the DEIS with regard to Indian Tribes does not appear to have fully considered the unique characteristics of tribal communities that might render the forecasted flow reductions in springs and streams more significant to this population. It concludes that impacts to water resources would affect Native American traditional values, "but that given the regional scale of the predicted drawdown, and the number of identified water sources that could be affected, it may not be feasible to effectively mitigate impacts to all of the potentially affected water sources" (p. 3.17-19). Additionally, the DEIS states that the effectiveness of mitigation measures on potential effects on Native American traditional values is unknown (3.18-70).

Recommendation

Characterize pumping effects on tribal drinking water security, patterns of subsistence gathering, and tribal communities. The FEIS should make a greater effort to characterize the project's groundwater pumping effects in relation to drinking water security and tribal patterns of subsistence consumption of fish, vegetation, or wildlife (CEQ 1997, p. 3).[16] The analysis should include an evaluation as to whether traditional uses and trust resources are affected, and the nature and degree of impact on the physical and social structure of the community (CEQ 1997, p. 9), based on input received during BLM's government-to-government consultations. Additional resources and methodologies are available to assist in this analysis.[17] The FEIS should also identify additional mitigation measures to address tribal impacts.

Water Conservation and Efficiency

Construction of the main pipeline ROW and associated groundwater development and pumping is intended to support projected growth in the Las Vegas region, as well as greater stability of the water supply for the existing population of that region, in the face of drought and climate change. Due to uncertainties regarding the perennial yield of the groundwater basins, interconnection with other hydrographic basins, and the effects of changing climate and drought, as well as the magnitude of the adverse environmental impacts that would result from the proposed project, it makes sense that water conservation and water use efficiencies – key components of supply and demand management – are explored and implemented prior to development of irreplaceable groundwater resources. Innovative and aggressive water supply and demand management is essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health.

Recommendations

Allocate project water only after implementation of integrated supply and demand management program. We recommend the FEIS demonstrate that all reasonable measures to address the Las Vegas region's demand for water have been explored, and that a comprehensive and integrated demand management program, including water conservation, efficiency, and reuse components, has been, or will be, implemented. For instance, full cost pricing, metering, impact fees, and gray water reuse are all areas that SNWA should consider to reduce water usage. Although we recognize that the Las Vegas region has made great strides in water conservation in recent years, the DEIS does not discuss the quantity of water that may still be available as a result of additional water conservation measures. EPA believes innovative and aggressive water supply and demand management is essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health, and should be considered during decision-making regarding development of new water sources.

[16] Council on Environmental Quality. "Environmental Justice, Guidance under the National Environmental Policy Act" 12/10/97. Available: http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf

[17] See Harris, S. and B. Harper. 1999. "Appendix D. Environmental Justice in Indian Country: Using Equity Assessments to Evaluate Impacts to Trust Resources, Watersheds and Ecocultural Landscapes". *Proceedings Document. Environmental Justice: Strengthening the Bridge Between Economic Development and Sustainable Communities.* Available from the Environmental Biosciences Program, Medical University of South Carolina, Charleston, SC: http://www.iiirm.org/publications/Articles%20Reports%20Papers/Environmental%20Justice/papero~1.pdf

Describe water use efficiency, conservation, and reuse management measures to maximize efficient use of scarce water supplies. We recommend a list of feasible supply and demand management measures, such as full cost pricing, comprehensive metering, development impact fees, and gray water reuse, be provided in an appendix to serve as a resource for SNWA, Clark and Lincoln Counties, as well as other users of the carbonate-rock aquifer, the Nevada State Engineer, and water right applicants who wish to maximize the efficient use of scarce water supplies. Aggressive supply and demand management measures have been shown to significantly reduce per capita water use. This appendix could describe the full range of tools available to water users to improve water quality and reuse, maximize water use efficiencies, balance supply and demand, and avoid and minimize adverse effects to third parties, the environment, and other beneficial uses.

Describe links between water use, urban development, infrastructure, and water policy. Consider integration into project design and management. Efficient water use can be enhanced through development design, infrastructure, and drinking water policies. We recommend the FEIS discuss the linkages between water use and these factors and describe potential mechanisms to support water use efficiencies. We recommend the FEIS provide a short discussion of who could best implement the identified mechanisms. The following reports may be of assistance as a starting point for the evaluation:

- *Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies.* EPA Publication 230-R-06-001, EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bps-lmit.com.

- *Protecting Water Resources with Higher-Density Development*. EPA publication 231-R-06-001. EPA National Service Center for Environmental Publications, (800) 490-9198 or nscep@bps-lmit.com.