UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

September 7, 2018

Ms. Carly Summers
BLM Bakersfield Field Office
3801 Pegasus Drive
Bakersfield, California 93308

Subject: Notice of Intent for Potential Amendment to the Resource Management Plan for the Bakersfield Office, California, and to Prepare an Associated Supplemental Environmental Impact Statement

Dear Ms. Summers:

The U.S. Environmental Protection Agency has reviewed the above-referenced document. We appreciate the opportunity to provide our recommendations on the scope of the upcoming Supplemental Environmental Impact Statement. Our comments are provided pursuant to the National Environmental Policy Act, the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under § 309 of the Clean Air Act.

The EPA previously reviewed and submitted comments on the Draft and Final EIS for potential amendments to the RMP for the Bakersfield Planning Area on December 9, 2011 and September 26, 2012, respectively. Our comments on the Final EIS noted that many of the recommendations identified in our review of the Draft EIS had been addressed. Our Final EIS comments expressed remaining concerns that surface water and groundwater may not be adequately protected, and recommended that steps be taken to assess the potential use of hydraulic fracturing in future well drilling within the Planning Area; analyze the potential impacts to air quality, groundwater resources, and sensitive species from this use; and incorporate, into the RMP/Record of Decision, measures to avoid, minimize, or mitigate these impacts.

The NOI states that preparation of this Supplemental EIS is in response to a settlement agreement, filed with, and approved by, the U.S. District Court of the Central District of California on May 3, 2017 and that this Supplemental EIS will analyze the impacts of hydraulic fracturing technology on BLM-administered public and land and mineral estate in the Bakersfield Field Office Planning Area. Our enclosed detailed comments identify the scope of subjects that EPA recommends be included in the Supplemental Draft EIS. While our enclosed comments focus on air quality and water resources, should new findings based on this effort affect prior analyses on topics such as environmental justice, cultural resources or induced seismicity, the Supplemental Draft EIS should also include any updated analyses, revised management actions or additional stipulations for those topics, as appropriate.

EPA looks forward to working with the BLM on this project. When the Supplemental Draft EIS is released for public review, please send one hard copy and one electronic copy to the address above. If you have any questions, please contact me at (415) 972-3238 or plenys.thomas@epa.gov.

Sincerely,

Tom Plenys
Environmental Review Section (ENF-4-2)

Enclosure: EPA's Detailed Comments

US EPA DETAILED COMMENTS ON THE NOTICE OF INTENT FOR POTENTIAL AMENDMENT TO THE RESOURCE MANAGEMENT PLAN FOR THE BAKERSFIELD OFFICE, CALIFORNIA, AND TO PREPARE AN ASSOCIATED SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT, SEPTEMBER 7, 2018

Air Resources

Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through NEPA

Energy development can result in emissions of criteria air pollutants and other hazardous air pollutants (HAPs) that can cause or contribute to human health impacts or impacts to Air Quality Related Values (AQRVs) such as visibility, vegetation, water, fish and wildlife. The air quality analysis for this Supplemental Draft EIS (SDEIS) is particularly important given the large number of wells, potential use of hydraulic fracturing and the associated emissions proposed in an area where the ambient air quality is already compromised and includes areas in nonattainment for ozone and fine particulate matter. We recommend that the SDEIS consider and disclose the potential environmental effects of future oil and gas development on air quality in the Planning Area, and evaluate whether there is a need to revise management actions or develop stipulations to minimize the potential air quality impacts.

The EPA, U.S. Department of Agriculture and U.S. Department of Interior entered into a "Memorandum of Understanding (MOU) Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the National Environmental Policy Act Process" on June 11, 2011. The signatory parties agreed to follow the MOU to ensure effective and efficient air quality evaluations for NEPA documents. The MOU is applicable to the SDEIS, although the MOU's provisions were not applied to the Bakersfield Draft EIS because that document was issued within 90 days of the MOU's effective date.[1] Accordingly, EPA recommends utilizing the MOU's stakeholder process to share reasonably foreseeable development (RFD) and emissions inventory information to determine appropriate steps for the air quality analysis. The cooperative efforts undertaken by BLM's Central Coast Field Office, which has utilized the MOU to inform the air quality analysis for the Central Coast RMP Amendment and Draft EIS for Oil and Gas Leasing and Development currently under development, provide a good example of this process, and EPA looks forward to working with BLM and other federal partners to implement the MOU to inform the air quality analysis for the Bakersfield SDEIS.

Current Conditions and Potential Impacts

It will be important for the SDEIS to define the current air quality baseline conditions to assess whether BLM-authorized activities would have potential regulatory or human health significance. The Planning Area includes or is near Clean Air Act (CAA) Class I Areas (e.g., Sequoia and Kings Canyon National Parks) and Sensitive Class II areas. Class I Areas are certain large national parks and wilderness areas that the CAA provides with special protection for air quality and AQRVs, including visibility. Sensitive Class II Areas are areas for which Federal Land Managers have identified air quality and/or visibility as valued resources.

The air quality analysis for this SDEIS is particularly important given regional concerns with high ozone and fine particulate matter levels. Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen existing respiratory health conditions such as bronchitis, emphysema, and asthma. Ground level ozone also can reduce lung

[1] Section X.C.2 of the MOU states, "This MOU applies to on-going NEPA analyses for which a draft NEPA document will not be issued for public review within 90 days following the effective date of the MOU."

function and inflame the lining of the lungs. Repeated exposure may permanently scar lung tissue. Particle pollution exposure has also been linked to detrimental impacts to the lungs and heart.

Recent studies have investigated the potential health impacts associated with HAPs emitted during oil and gas activities.[1][2][3][4] HAPs, also known as toxic air pollutants or air toxics, are those pollutants that cause or may cause cancer or other serious health effects, such as reproductive or developmental effects, and/or adverse environmental and ecological impacts. Multiple HAPs are known to be emitted during oil and gas activities.

With these issues in mind, the EPA recommends that the SDEIS update the evaluation of the air quality conditions and trends in the Planning Area, as well as the potential direct, indirect, and cumulative impacts from future BLM-authorized activities. We recommend that such an evaluation include the following:

- Each of the criteria pollutants and their appropriate National Ambient Air Quality Standards (NAAQS), i.e., ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead;
- AQRVs in potentially impacted Class I areas and sensitive Class II areas;
- Prevention of Significant Deterioration increment at potentially impacted Class I and Sensitive Class II Areas;
- Estimated greenhouse gas emissions that could occur under each alternative; and
- HAPs and relevant health-based risk thresholds for HAPs including acetaldehyde, benzene, ethyl benzene, ethylene glycol, formaldehyde, methanol, n-hexane, toluene, xylene (mixture), and any other compounds that the BLM identifies as potential hazardous air pollutants in the Planning Area.

General Conformity

EPA's General Conformity Rule, established under Section 176(c)(4) of the Clean Air Act, provides a specific process for ensuring that federal actions do not interfere with a state's plans to attain or maintain national standards for air quality. We recommend that the SDEIS update the general conformity applicability assessment from the previous Final EIS. If conformity is found to be applicable, the SDEIS should include a draft conformity determination for all pollutants for which relevant air basins are in nonattainment or maintenance status, and whose construction or operational emissions would exceed the applicable de minimis thresholds of 40 CFR 153.

Mitigation

The EPA recommends that the BLM identify in the SDEIS the mitigation measures (including control measures and design features) it would apply at the project level if potential adverse impacts to air quality or AQRVs on affected lands are predicted. These measures could include equipment type or

[1] McKenzie et al., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, *Environmental Health Perspectives*, April 2014.
[2] Adgate et al., Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development. *Environmental Science and Technology*, 2014.
[3] McKenzie et al., Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources. *Sci Total Environ* 424:79-87.
[4] Paulik et al., Impact of Natural Gas Extraction on PAH Levels in Ambient Air, *Environmental Science and Technology*, 2015.

design requirements, emission standards or limitations, best management practices (BMPs), dust suppression measures for unpaved roads and construction areas, add-on control technologies, and limitations on the density and/or pace of development. The EPA also recommends that the BLM identify the mechanisms it would use to ensure project-level implementation of these measures, such as lease stipulations, conditions of approval, and notices to lessees.

The EPA recommends that the SDEIS include an updated map of the residential locations and production well locations to assist in determining the potential for exposure to air pollutants. To protect human health, the EPA recommends specifying and implementing an oil and gas surface occupancy buffer from occupied structures such as homes, schools and office buildings. The buffer or "setback" distance should be sufficient to minimize the potential for public health impacts associated with exposure to the following: near-field criteria pollutants; HAPs emissions and any other potential toxic emissions such as hydrogen sulfide releases; and potential emissions associated with well blowouts or other explosive events. Setbacks can be an effective health protection tool because they provide an opportunity for emitted air pollutants to disperse before entering an area where they could affect human health. They also provide extra time to warn residents of any unintended releases or emissions. We recommend the setback distances be informed by the following factors:

1. The near-field modeling results for this SDEIS or similar projects that have been demonstrated to be relevant. We recommend the setback buffer ensures that people are not exposed to air pollution levels exceeding the NAAQS or other health based thresholds.
2. Whether mitigation measures and BMPs are being required to reduce risks to nearby residents and other building occupants. Examples of risk reduction mitigation may include: requiring closed-loop drilling and completion; prohibiting reserve pits or produced water ponds; using lower emitting engine technology; capturing emissions from tanks, separators, and glycol dehydrators; and implementing stringent fugitive vapor controls.
3. The composition of the Planning Area's oil and gas resources. For example, certain conditions may indicate the need for a larger setback buffer, including oil and gas resources with high HAPs content, higher explosive potential, or high sulfur or hydrogen sulfide content.
4. Any current State of California established minimum setback distance from occupied structures.

Surface Water Resources, Including Wetlands

Surface Water Characterization

The EPA recommends that the SDEIS describe, and update as necessary, the current water quality conditions for surface waterbodies within the Planning Area, including intermittent, perennial, and ephemeral streams, rivers, lakes, reservoirs, and surface water drinking water resources. We recommend comparing existing conditions to existing water quality standards or other reference conditions and presenting associated water quality status and trends.

The EPA also recommends that the SDEIS include maps addressing water and soil resources. We recommend providing a map of waterbodies within and downstream of the Planning Area that includes the following:

- perennial, intermittent and ephemeral waterbodies;

- waterbody segments classified as water quality impaired or threatened under Clean Water Act (CWA) Section 303(d);
- waterbodies considered not impaired by the California State Water Resources Control Board (CSWRCB); and
- waterbodies that have not yet been assessed by the CSWRCB for impairment status.

We also recommend that a table be provided, or updated as necessary, to identify the designated uses of waterbodies and the specific pollutants of concern, where applicable. In addition, descriptions or maps of topography and soils, specifically steep slopes and fragile or erodible soils near surface waters and intermittent and ephemeral channels, would further inform current conditions and future management decisions.

Surface Water Impacts

We recommend that the SDEIS analyze potential impacts associated with oil and gas well development, including drilling and production and potential spills and leaks from pits, evaporation ponds, and pipelines. The potential impacts of stormwater runoff from well pads and other production infrastructure should also be analyzed. Wastewater disposal methods that involve surface discharge should be described as well as their chemical characteristics, potential impacts and the applicable regulatory framework and requirements.

We recommend that the BLM analyze potential impacts to impaired waterbodies within or downstream of the Planning Area, including waterbodies listed on the most recent EPA-approved CWA Section 303(d) list and coordinate with the appropriate California Regional Water Resources Control Board if there are identified potential impacts to impaired waterbodies (to avoid causing or contributing to the exceedance of water quality standards). Where a Total Maximum Daily Load (TMDL) exists for impaired waters in the area of potential impacts, we recommend that pollutant loads comply with the TMDL allocations for point and nonpoint sources. Where new loads or changes in the relationships between point and nonpoint source loads are created, we recommend that the BLM work with the appropriate California Regional Water Resources Control Board to revise TMDL documents and develop new allocation scenarios that ensure attainment of water quality standards. Where TMDL analyses for impaired waterbodies within, or downstream of, the Planning Area still need to be developed, we recommend that proposed activities in the drainages of CWA impaired or threatened waterbodies be either carefully limited to prevent any worsening of the impairment or avoided where such impacts cannot be prevented.

Surface Water Mitigation

Contaminants from surface events such as spills, pit and pipeline leaks, and nonpoint source runoff from surface disturbance have the potential to enter and impact surface water resources if these events occur in proximity to waterbodies. If surface activities are set back from the immediate vicinity of surface water, wetlands, and designated source water protection zones, this provides an opportunity for accidental releases to be detected and remediated before impacts reach water resources. If accidental releases are not detected, the setback provides a safety factor and some possibility of natural attenuation occurring. Setbacks also help prevent nonpoint source pollutants such as sediments from impacting surface waters.

The RMP will include a range of oil and gas lease stipulations as determined by the BLM to be necessary to protect certain resources in the Planning Area from potential impacts associated with oil and gas development activities. Accordingly, the EPA recommends that the BLM consider including setback distances that could be required through leasing stipulations such as No Surface Occupancy (NSO) for perennial waters including lakes and reservoirs, intermittent and ephemeral streams, steep slopes, and impaired waters within the Planning Area. The EPA recommends the following minimum NSO setbacks:

- Minimum 100-foot NSO setback from slopes greater than 30%;
- Minimum 500-foot NSO setback for flowing waters (rivers and streams) or 100-year floodplain, whichever is greater;
- Minimum 500-foot NSO setback for lakes, ponds and reservoirs, wetland and riparian areas and springs;
- Minimum 750-foot NSO setback for 303(d) impaired waters;
- Minimum 1,000-foot NSO setback for special or significant waters; and
- Minimum 100-foot NSO setback for intermittent and ephemeral streams.

In addition, we recommend that the BLM consider NSO lease stipulations within Areas of Critical Environmental Concern or other valued areas where important aquatic resources may be impacted.

Wetlands, Riparian Areas and Floodplains

We recommend that the SDEIS update, as necessary, inventories and maps of existing wetlands and waters of the U.S. within the Planning Area, including waters that are regulated under the CWA and wetlands that are protected under Executive Order 11990 - Protection of Wetlands (May 24, 1977). We suggest including information on the location, type and extent of these waters.

We recommend that the BLM include analyses of potential impacts to wetlands and riparian areas that could occur at the project level, including impacts associated with the following:

- Activities sited within waters;
- Activities in areas adjacent to waters that could affect stream structure, instream habitats and channel stability;
- Activities in areas adjacent to waters that could alter sediment supply and result in deposition of fine sediments on the streambed, including in spawning habitats;
- Activities in areas adjacent to waters that could affect riparian vegetation and habitat corridors; and
- Activities in areas adjacent to waters that could affect water quality and aquatic biota.

BLM-authorized activities in the Planning Area, including oil and gas development have the potential to cause changes in hydrology due to surface disturbance, compaction and increased run-off. These changes in hydrology may result in stream structure failure and additional sediment loading of wetlands and riparian areas. We recommend that the SDEIS analyze methods, and update information as needed, to protect wetlands, riparian areas and floodplains, and include:

- Delineation and marking of seeps, springs and wetlands on maps and on the ground prior to project level development to ensure identification of these resources.

We recommend including a list of potential avoidance measures, mitigation requirements and BMPs that may be applicable at the project level for construction, oil and gas well drilling and production activities to prevent adverse impacts to these aquatic resources. These measures could include limited stream crossing or access points, silt fences, detention ponds and other stormwater control measures.

Public Drinking Water Supply Sources

Public Drinking Water Supply Source Characterization

To ensure that public drinking water supply sources (e.g., surface water sources, including groundwater under the direct influence of surface water sources, and groundwater sources) are protected from potential impacts associated with BLM-authorized activities in the Planning Area, it is important to identify where these sources are located. Therefore, the EPA recommends that the SDEIS include an updated map that delineates source water protection areas for public water supply wells and surface water intakes (streams, rivers, and reservoirs). We also recommend identifying reservoirs that are drinking water sources. Once these resources are identified, we recommend that the document include an updated analysis of the potential impacts to drinking water sources.

Public Drinking Water Supply Source Mitigation

To ensure public drinking water supply sources are fully protected from potential impacts associated with oil and gas leasing, EPA provides the following recommended NSO language:

> Drinking Water Supply Watersheds[1] - NSO within any of the following areas as deemed appropriate by the BLM:
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> - The entire watershed;
> - Local Source Water Protection Planning Areas where delineated by the State or community; or
> - Source Water Assessment Areas delineated by the State.

If the above Drinking Water Supply Watersheds NSO is not deemed feasible by the BLM, we recommend, at minimum, that the Supplemental Final EIS protect surface water sources by including a 1000-foot NSO setback on both sides of the river or stream, for 10 miles upstream of the intake. For lakes and reservoir sources, this would include a 1000-foot NSO around the waterbody. The EPA also recommends that the BLM include a commitment in the Final Supplemental EIS and Record of Decision to provide notice to lessees regarding these important areas in the Planning Area.

Groundwater Resources

Groundwater Resource Characterization

The Planning Area may include important areas of alluvial aquifer recharge. Shallow aquifers are more susceptible to contamination because a contaminant introduced at the surface may more rapidly enter the system, and there is little intervening soil to adsorb the contaminants before they reach the groundwater. To ensure that future BLM-authorized activities are protective, it is important to identify and

[1] Includes surface water supply watersheds, sole source aquifers, and the protection zones around wells and springs.

characterize both the existing and potential groundwater drinking water resources in the Planning Area. We recommend that the SDEIS include or update, as necessary, the following information:

- A description of all aquifers in the Planning Area, noting which aquifers are Underground Sources of Drinking Water (USDWs). Federal Safe Drinking Water Act regulations define a USDW as an aquifer or portion thereof: (a)(1) which supplies any public water system; or (2) which contains a sufficient quantity of groundwater to supply a public water system; and (i) currently supplies drinking water for human consumption; or (ii) contains fewer than 10,000 mg/l total dissolved solids; and (b) which is not an exempted aquifer (See 40 CFR Section 144.3);
- Water quality and water yield information for each aquifer, if available;
- Generalized maps depicting the location of sensitive groundwater resources such as municipal watersheds, source water protection zones, sensitive aquifers, and recharge areas;
- Descriptions and locations of groundwater use (e.g., public water supply wells, domestic wells, springs, and agricultural and stock wells); and
- A map and discussion of proposed oil and gas wells, existing producing wells, and nonproducing wells in the area including their status (e.g., idle, shut-in, plugged, and abandoned), if available.

Please contact the California Division of Oil, Gas and Geothermal Resources for all oil and gas well information and the CSWRCB for water well information.

Groundwater Impacts, Monitoring and Mitigation

The EPA recommends that the SDEIS describe potential impacts to the quality and quantity of groundwater related to resource extraction and oil and gas production. Potential impacts include those associated with the following: leaks and spills; production and disposal of produced water or processing waters; use of pits, underground injection control (UIC) wells, infiltration basins and evaporation ponds; production wellbore integrity; closure requirements; pipeline use; and impacts associated with re-stimulation and abandonment of existing wells.

The EPA also recommends that the SDEIS discuss measures that the BLM will require at the leasing, field-wide plan of development, or Application for Permit to Drill (APD) stage to minimize the potential for these impacts to occur and how the operations will be monitored to determine if the mitigation measures are effective. Appropriate groundwater protection measures can vary depending on hydrologic conditions and the presence of drinking water resources. We recognize that regulations and guidance documents exist to guide the BLM and the operator in protecting water resources during oil and gas development and production operations (e.g., BLM Gold Book, Onshore Order #2, State regulations, etc.). We recommend that the SDEIS discuss how groundwater would be protected according to existing regulations and guidance. In addition, we note that, in many cases, existing regulations and guidance leave much of the decision-making regarding water resource protection to determinations by the authorized officer on a well-by-well basis. We recommend that the BLM utilize the NEPA analysis and RMP revision process to streamline or add consistency to these decisions where possible. For example, an understanding of hydro-geological features can help to identify critical elements of well design that will likely be necessary to achieve effective protection of USDWs at the APD stage. In other cases, adequate information may exist at the RMP stage to identify stipulations that will apply to future leases, such as for protection of existing public and private drinking water supply wells.

The EPA recommends that the BLM consider and disclose potential groundwater protection, monitoring and mitigation measures, including:

- BMPs and measures such as water reuse, closed loop drilling, lining of evaporation ponds, monitoring of water quality and water levels, closure and monitoring of tailings ponds, reserve pits and evaporation ponds;
- Setback stipulations, such as a minimum 500-foot NSO setback, to minimize the potential for impacts to potential drinking water resources, including domestic water wells and public water supply wells. Setbacks are effective health and environmental protection tools because they provide an opportunity for released contaminants to attenuate before reaching a water supply well. They may also afford an opportunity for a release to be remediated before it can impact a well, or for an alternate water supply to be secured.
- A mitigation plan for remediating future unanticipated impacts to drinking water wells, such as requiring the operator to remedy those impacts through treatment, replacement or other appropriate means;
- A general production well schematic that depicts the following: casing strings; cement outside and between the various casing strings; and the relationship of the well casing design to potentially important hydro-geological features such as confining zones and aquifers or aquifer systems that meet the definition of a USDW. Discuss how the generalized design will achieve effective isolation of USDWs from production activities and prevent migration of fluids of poorer quality into zones with better water quality; and
- Abandonment procedures for sealing wells no longer in use to reduce the potential for inactive wells to serve as the conduits for fluid movement between production zone(s) and aquifer(s). This is particularly important in cases where existing wells do not have surface casing set into the base of USDWs and lack sufficient production casing cement.

Water Management and Water Resource Monitoring

Water Management

Water demand associated with oil and gas development can be substantial and has the potential to impact environmental resources. We recommend that the SDEIS update, as necessary, and include within the scope of analysis a general discussion of the following:

- A range of estimated water demand per well developed in the Planning Area (based on RFD, predicted well depths, formation characteristics, and well designs, as well as hydraulic fracturing operations, if used);
- Possible sources of water for oil and gas development; and
- Potential impacts of the water withdrawals (e.g., drawdown of aquifer water levels, reductions in stream flow, impacts to groundwater dependent ecosystems, impacts on aquatic life, wetlands, springs and other aquatic resources).

With respect to produced water from oil and gas development, the EPA recommends that the SDEIS include a general discussion of how flow back and produced water will be managed, including:

- Estimated volume of produced water per well (this could be presented as a range given the variability from well-to-well);

- Options and potential locations for managing the produced water (i.e., UIC wells, evaporation ponds, treatment and reuse);
- Possible target injection formations, formation characteristics and depth of any UIC wells; and
- Potential impacts of produced water management.

The EPA also recommends that the RMP include BMPs to encourage operators to consider recycling produced water for use in well drilling and stimulation. Such a practice would decrease the need for water withdrawals and for produced water management and disposal facilities, thereby minimizing the associated impacts.

Water Resource Monitoring

The EPA recommends that the SDEIS incorporate an updated discussion of how water quality monitoring in the Planning Area would be conducted at the project level prior to, during, and after anticipated development to ensure detection of any impacts to surface water or groundwater resources resulting from oil and gas exploration and production, including private well monitoring. A recent example of a surface and groundwater quality monitoring plan is the "Water Quality Monitoring Plan" developed by the BLM for the Monument Butte Oil and Gas Development Project Final EIS.[7]

To protect surface water and groundwater resources, the SDEIS should include a requirement for fracture monitoring. Fracture monitoring can be accomplished with Tiltmeter Monitoring and/or Microseismic Monitoring. The purpose of these monitoring techniques is primarily to locate the vertical extent of the newly created fractures and verify that the vertical extent of fracturing does not reach any aquifers. In the absence of groundwater modeling to determine the distance from the well at which impacts may occur, the EPA recommends that the BLM adopt a requirement for monitoring to occur in private wells within one mile of an oil and/or gas project area. This monitoring will help assure mitigation measures are adequate and that water resources are being fully protected.

[7] Under "Documents" please see Final EIS, Appendix H: http://go.usa.gov/xqjTJ