Montana Department of Natural Resources and Conservation
Water Resources Division
Water Rights Bureau

ENVIRONMENTAL ASSESSMENT
For Routine Actions with Limited Environmental Impact

Part I. Proposed Action Description

1. Applicant/Contact name and address: Signal Peak Energy, LLC
100 Portal Drive
Roundup, MT 59072

2. Type of action: Application for Beneficial Water Use Permit 40A-30049157

3. Water source name: Groundwater (Madison Group)

4. Location affected by project:

The points of diversion are two wells located in the NE Quarter of Section 14, T6N, R26E, Musselshell County. The places of use are generally located in T6N R26E and T6N R27E and are both on the surface (prep plant) and subsurface (mine) in Musselshell and Yellowstone Counties.

5. Narrative summary of the proposed project:

The Applicant proposes to divert groundwater from the Madison Formation by means of two wells located in Musselshell County and identified in the application materials as Madison Well #2 (MW2) and Madison Well #3 (MW3). An existing well, Madison Well #1 (MW1), was previously authorized a flow rate of 350 gallons per minute (GPM) up to 565 acre-feet (AF) annually under Permit No. 40A 30022892. MW1 is proposed to be used in conjunction with the two wells subject to this application, however MW1 has collapsed down hole and is currently inoperable. The Applicant plans to replace the well prior to the project completion due date for 40A 30022892. The three wells may be operated in any combination, but will not exceed an appropriation of 700 GPM up to 1,130 AF annually. MW2 is 8,713 feet deep and MW3 is 9,335 feet deep. Water will used for industrial purposes associated with coal mining operations at Bull Mountains Mine #1 and will be used from January 1 to December 31 of each year. Water will be pumped from the groundwater wells to two off stream storage reservoirs, referred to as Madison Pond #1 (MP1) and Madison Pond #2 (MP2). MP1 is a 14.6 AF existing reservoir located in the E2SENE Section 14 T6N R26E. MP2 is an 11.6 AF proposed reservoir located in the S2SWNE Section 14 T6N R26E. The estimated annual evaporation for the ponds at full capacity is 8.3 AF per year. Water is pumped to trucks for dust abatement on project roads, gravity fed from the ponds to the underground coalmine to be used for dust abatement during the mining process or will be fed to a Thickener Tank, which introduces magnetite into the process. Magnetite is used as a sorbent in the coal separation process and the coal is then conveyed from the Thickener Tank to the preparation plant, with all residual material deposited in an on-site solid waste storage facility. Wastewater from the preparation plant is filtered and re-used in a closed loop system.

In addition to the Environmental Assessment (EA) written for the mines initial well application (MW1) in October 2007, the Montana Department of Environmental Quality (DEQ) has completed multiple EAs for this coalmine project in the Bull Mountains. The DEQ wrote EAs for both air quality (Permit 3179-03) in March 2008 and the coal mining process itself (Permit # 93017) in July 2008. The most recent EA for the coalmine appears to have been prepared by the Bureau of Land Management (BLM) and completed in April 2011. EAs from both programs were reviewed and used for consideration in this analysis; however, this analysis is specifically associated to the Madison Formation groundwater source. One previous Environmental Impact Statement (EIS) for a proposed power plant associated with this project was completed in January 2003. The Roundup Power Project Final Environmental Impact Statement analyzed impacts from a proposed power generation facility that to date has not been implemented. The Applicant would need to re-submit the DEQ application as they were originally given 18 months to start the power generation project in 2003.

The DNRC shall issue a water use permit if an applicant proves the criteria in 85-2-311 MCA are met.

6. Agencies consulted during preparation of the Environmental Assessment: (include agencies with overlapping jurisdiction)

Dept. of Environmental Quality
MT. National Heritage Program Website - Species of Concern
USDI Fish & Wildlife Service Website - Endangered and Threatened Species
MT State Historic Preservation Office - Archeological/Historical Sites
USDA Natural Resources Conservation Service – Web Soil Survey
USDI Fish & Wildlife Service – Wetlands Online Mapper
MT Fish, Wildlife & Parks – MT Fisheries Information System

Part II. Environmental Review

1. Environmental Impact Checklist:

PHYSICAL ENVIRONMENT

WATER QUANTITY, QUALITY AND DISTRIBUTION

Water quantity *- Assess whether the source of supply is identified as a chronically or periodically dewatered stream by DFWP. Assess whether the proposed use will worsen the already dewatered condition.*

Determination: Not Applicable.

The source of supply is groundwater and is therefore not identified as a dewatered stream. Madison Formation groundwater is located in an aquifer approximately 8000 feet below ground surface.

Water quality *- Assess whether the stream is listed as water quality impaired or threatened by DEQ, and whether the proposed project will affect water quality.*

Determination: Not Applicable.

The source of supply is groundwater and therefore it is not listed as an impaired or threatened stream by DEQ. Madison Formation groundwater is located in an aquifer approximately 8000 feet below ground surface.

Groundwater - *Assess if the proposed project impacts ground water quality or supply. If this is a groundwater appropriation, assess if it could impact adjacent surface water flows.*

Determination: No Significant Impact.

Groundwater quantity will be diminished by up to 1,130 AF in some years; however the withdrawal of water from the Madison aquifer will not have a significant impact on water quantity. The proposed project will consist of two wells cased to 7900 feet below ground surface. The wells have open boreholes into the Madison group, to total depth below 7900 feet. The Applicant used the Theis Equation and AQTESOLV software program to estimate the radius of influence (ROI) at approximately five miles. The total estimated flux available for this 10-mile transect is 1,446 AF, about 300 AF more than the three Signal Peak wells would be authorized to appropriate. The Applicant is the only appropriator with wells completed into the Madison Formation within 20 miles of the proposed project, however this application is subject to water being legally available for Provisional Permit No. 40A 30004013, a senior appropriation authorized in 2003 for a power plant and currently owned by Bull Mountain Development CO #1 LLC. Both the Applicant and Bull Mountain Development CO #1 LLC are owned by the same parent company, and as such, appropriations from all existing water rights will be managed in coordination with each other.

Water quality sample reports from MW2 indicate this Madison Formation groundwater is not suitable for a potable water source. As such, any co-mingling of this water with shallow potable water sources could degrade the quality of the shallow water, however water used in the preparation plant remains in a closed loop system and will not affect water quality. Wastewater from the preparation plant is cycled through a two million gallon tank, pressed and filtered to be used again in a closed-loop system. Water used for dust abatement in the coalmine is either adsorbed by the coal or co-mingled with coal seam water and pumped in to a lined settling pond. Both the Madison water (2310 ppm) and the coal seam water (~1500 ppm) would be classified as containing brackish water associated with Total Dissolved Solid (TDS) concentrations. Water used on the surface roads for dust abatement has more potential to degrade surface or shallow groundwater sources, but it is reasonable to expect that this application would only occur when conditions are very dry and warrant dust suppression. The Applicant is aware of water quality issues associated to the Madison formation source and will manage water use to prevent significant impacts to shallow groundwater sources.

As stated above, the Madison group lies several thousand feet below the land surface; in addition, there are no known structural features (faults) in the area of interest to allow communication between formations at depth and the surface. The wells must be properly constructed and must conform to current design, construction and operation standards. The ponds will be managed to prevent mixing of ground and surface water; this project will not adversely affect adjacent surface water flows.

In addition to this review, a checklist EA was completed by the DEQ under Operating Permit # 93017 on July 31, 2008. It shows that there have been two distinct periods of surface water monitoring. The original mine applicant, Meridian Minerals, monitored surface waters from 1989 to 1997 and the current owner resumed monitoring in 2004. The Applicant has or currently monitors 138 springs, 19 ponds and multiple stream reaches, of which only a small portion of the springs or ponds actively flow or store water. Although impacts to surface water quality from this deep groundwater application are not expected to be significant, DEQ conditions associated with the mine permit require the Applicant mitigate any adverse effects to water chemistry caused from their mining operation.

DIVERSION WORKS - *Assess whether the means of diversion, construction and operation of the appropriation works of the proposed project will impact any of the following: channel impacts, flow modifications, barriers, riparian areas, dams, well construction.*

Determination: No Significant Impact.

Water will be appropriated via two groundwater wells, identified in the application as MW2 and MW3. Gordon Drilling, a licensed water well driller located in Roundup, Montana, drilled the wells. MW2 is equipped with a 600 horsepower Wood Group TE 110000 submersible pump, while MW3 is equipped with a Global artificial lift installation consisting of one 450 horsepower Series 562 45-70 hertz variable frequency drive motor to power two 48-stage Series GD5-8500 CMP HSS pumps.

Sediment derived from normal construction activities on the land surface (i.e. roads, water distribution system, etc.) could migrate into the nearest surface water drainage (Unnamed Tributary to Rehder Creek) during runoff events. This tributary is an ephemeral stream, and joins Rehder Creek several miles down gradient from the project site. While some sediment associated with typical construction activities may reach the Rehder Creek drainage, the Applicant will use best available technology practices to ensure there will be no significant impacts from construction activities.

UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES

Endangered and threatened species - *Assess whether the proposed project will impact any threatened or endangered fish, wildlife, plants or aquatic species or any "species of special concern," or create a barrier to the migration or movement of fish or wildlife. For groundwater, assess whether the proposed project, including impacts on adjacent surface flows, would impact any threatened or endangered species or "species of special concern."*

Determination: No Significant Impact.

The Montana National Heritage Program lists four species as Species of Concern within Township 6 North Range 26 East. Common names for these four species are Townsend's Big-eared Bat, Greater Sage-grouse, Red-headed Woodpecker, and the Common Sagebrush Lizard. The USDI Fish & Wildlife Service Website shows that Musselshell County has one species listed as threatened; the Bald Eagle and one species listed as endangered; the Black-footed Ferret. Yellowstone County has the same two species as Musselshell County listed along with an additional endangered species: the Whooping Crane. This project is not expected to impact any threatened or endangered species as the majority of the project has been in place and operating. The Applicant has installed a 7-foot tall chain-link fence around MP1, the existing pond, and a similar design is proposed for MP2. There could be adverse impacts to bird species using the ponds, however hydrogen sulfide gas will be vented to the atmosphere and adverse impacts associated with water quality itself are not expected to be significant when contained within the lined ponds. The water can be classified as brackish, meaning it has high TDS levels, and would not be considered aesthetically pleasing to consume. The Applicant is committed to mitigating any adverse impacts to endangered and threatened species caused by the coalmine

Some short-term surface disturbance and erosion may occur during installation of the distribution system, but there is a low likelihood of adverse effects to endangered or threatened species from the short-term construction.

Wetlands - *Consult and assess whether the apparent wetland is a functional wetland (according to COE definitions), and whether the wetland resource would be impacted.*

Determination: No Significant Impact.

There are no known wetlands associated with this project. The USDI Fish & Wildlife Service – Wetlands Online Mapper has no data available for the area of interest.

Ponds *- For ponds, consult and assess whether existing wildlife, waterfowl, or fisheries resources would be impacted.*

Determination: No Significant Impact.

The project involves storing groundwater in two ponds. Due to potential water quality issues and high concentrations of hydrogen sulfide gas, the Applicant must take all necessary steps to prevent co-mingling of groundwater and surface water to protect the fisheries resource and protect wildlife and avian species from accessing the ponds. The Applicant has a 7-foot high fence around MP1 and proposes to use the same design for the proposed pond, MP2. The ponds are lined and will be managed to limit impacts to wildlife, waterfowl, or fisheries resources.

GEOLOGY/SOIL QUALITY, STABILITY AND MOISTURE - *Assess whether there will be degradation of soil quality, alteration of soil stability, or moisture content. Assess whether the soils are heavy in salts that could cause saline seep.*

Determination: No Significant Impact.

The USDA-NRCS Web Soil Survey indicates the dominant soil in the area of the wellheads is either the Shambo loam with 2 to 8 percent slopes or the Doney-Cabba-Macar loam with 4 to 15 percent slopes. The rating for both soil units says they are well-drained and have a moderately high to high capacity to transmit water. Representative Sodium Adsorption Ratios for all soil units are low and indicate a low ratio of sodium to calcium and magnesium, and therefore no issues with saline seep are expected.

Some short-term surface disturbance and erosion will likely occur with the installation of the distribution system. Long-term effects will depend upon management, but proficient conservation practices will minimize any potential impacts to soil quality or stability.

VEGETATION COVER, QUANTITY AND QUALITY/NOXIOUS WEEDS - *Assess impacts to existing vegetative cover. Assess whether the proposed project would result in the establishment or spread of noxious weeds.*

Determination: No Significant Impact.

Normal weed management will be used to control noxious weeds potentially invading disturbed areas; therefore, no spread of noxious weeds will be associated with this application. It is the responsibility of the property owner to control noxious weeds on their property.

AIR QUALITY - *Assess whether there will be a deterioration of air quality or adverse effects on vegetation due to increased air pollutants.*

Determination: No Significant Impact.

Air quality will not be impacted by well operations; this project will utilize electric motors to drive the pumps. High levels of hydrogen sulfide gas have been observed at the surface while water diversion is

occurring, but dissipation into the atmosphere will resolve dangerous concentrations that would be associated with low areas in a confined space environment. Air quality personnel from DEQ recommend the Applicant install signage and limit employee access to ensure a safe working environment. The wells are located on private land, with limited access to the public. DEQ finalized Air Quality Permit 3179-03 on 5/13/2008. As such, there are emission limitations, testing & monitoring requirements, notification of development and general conditions in place for air quality protection associated with mine operations.

This project would also have emissions and air pollutants associated with construction activities of the pond and distribution works; they would be expected to have short-term effects to air quality.

HISTORICAL AND ARCHEOLOGICAL SITES - *Assess whether there will be degradation of unique archeological or historical sites in the vicinity of the proposed project if it is on State or Federal Lands. If it is not on State or Federal Lands simply state NA-project not located on State or Federal Lands.*

Determination: No Significant Impact.

The Applicant's place of use does include surface lands owned by both federal and state entities, but the mine use for these lands is generally subsurface. In the previous application process for Provisional Permit No. 40A 30022892 (MW1), the State Historic Preservation Office believed there was a low likelihood cultural properties would be impacted because of the initial Madison well (MW1); a cultural resource inventory was unwarranted at that time (October 2007). The wellheads associated with this application would affect the same general area because they are located in the same quarter section and in close proximity to MW1. Mining activities will generally disturb the sub-surface area and associated building facilities have been previously utilized for mine operation.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AND ENERGY - *Assess any other impacts on environmental resources of land, water and energy not already addressed.*

Determination: No Significant Impact.

No additional impacts are anticipated at this time. The Applicant can use best available technology and conservation practices when implementing the project.

HUMAN ENVIRONMENT

LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS - *Assess whether the proposed project is inconsistent with any locally adopted environmental plans and goals.*

Determination: No Significant Impact.

No locally adopted environmental plans or goals are known at this time. The proposed project is consistent with typical coal mining practices.

ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES - *Assess whether the proposed project will impact access to or the quality of recreational and wilderness activities.*

Determination: No Significant Impact.

The source of water for this project is Madison Formation groundwater located at great depth; the proposed action will not impact recreational activities in the area.

HUMAN HEALTH - *Assess whether the proposed project impacts on human health.*

Determination: No Significant Impact.

The Applicant has provided water quality analysis for MW2, which includes physical parameters (ph, specific conductance, temperature, etc) measured in both the field and the lab. The analysis also included various chemical constituents tested for in the lab. Field measured water temperature was 165.4ºF, but was noted to have cooled before the temperature reading was recorded. TDS levels from MW2 are reported to be 2,310 mg/L, a concentration that would be classified as brackish water (1500-5000mg/L). Reference materials suggest that the acceptable aesthetic level for human drinking water is 500 mg/L. Fluoride and radionuclide concentrations exceed DEQ-7 Maximum Contaminant Levels. Total iron and dissolved and total manganese concentrations exceed secondary DEQ-7 Maximum Contaminant Levels. The Applicant is aware that Madison Formation groundwater is not a potable water source to be used for human consumption.

As mentioned above, the Applicant also measured high concentrations (1,000 ppm) of hydrogen sulfide gas detected at a hole in the discharge line approximately 300 feet from the wellhead. Concentrations of 1000 ppm are lethal to humans. Readings taken approximately 1 foot from the hole had lower concentrations of 40 PPM and the gas will be vented to the atmosphere to reduce the toxicity and flammable hazards that would be associated with hydrogen sulfide gas accumulating in low areas of a confined space. Air quality personnel at DEQ recommend adequate signage and limited access to areas with potentially high hydrogen sulfide concentrations. The Applicant is aware of potential danger from hydrogen sulfide gas and water quality issues; proper employee safety precautions will be followed to prevent significant adverse impacts to human health.

PRIVATE PROPERTY - *Assess whether there are any government regulatory impacts on private property rights.*
*Yes___ No_**X**__ If yes, analyze any alternatives considered that could reduce, minimize, or eliminate the regulation of private property rights.*

Determination: No Significant Impact.

No governmental regulatory impacts are known at this time.

OTHER HUMAN ENVIRONMENTAL ISSUES - *For routine actions of limited environmental impact, the following may be addressed in a checklist fashion.*

Impacts on:

(a) *Cultural uniqueness and diversity?* **None.**

(b) *Local and state tax base and tax revenues?* **Additional project expansion and coal production from the mine could equate to increased tax revenues for both local and state entities.**

(c) *Existing land uses?* **None.**

(d) *Quantity and distribution of employment?* **None.**

(e) *Distribution and density of population and housing?* **None.**

(f) *Demands for government services?* **None.**

(g) *Industrial and commercial activity?* **Increased industrial activity from additional coal production.**

(h) *Utilities?* **Increased electrical consumption to operate pumps.**

(i) *Transportation?* **None.**

(j) *Safety?* **See human health section above.**

(k) *Other appropriate social and economic circumstances?* **None.**

2. *Secondary and cumulative impacts on the physical environment and human population:*

Secondary Impacts - No secondary impacts have been identified.

Cumulative Impacts – It is expected that future wells completed in the Madison Formation under the Bull Mountains would experience increased competition for available water; however, the coalmine is currently the only unique entity using this deep source of supply for at least 20 miles in any direction.

3. *Describe any mitigation/stipulation measures:*

There are mitigation/stipulation measures in place for the mine permit, air quality permit and federal land use permit. Conditions will be applied to this permit authorization to require recordation of all water diverted for the project.

4. *Description and analysis of reasonable alternatives to the proposed action, including the no action alternative, if an alternative is reasonably available and prudent to consider:*

No action alternative: Deny the application. This alternative would result in none of the benefits being realized by the Applicant.

PART III. Conclusion

1. *Preferred Alternative*

The preferred alternative is the proposed alternative, assuming the Applicant will adhere to all conditions of the permit authorization.

2. ***Comments and Responses***

No comments or responses have been received at this time.

3. ***Finding:***
*Yes___ No_**X**__ Based on the significance criteria evaluated in this EA, is an EIS required?*

If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action:

None of the identified adverse effects of impacts are significant as defined in ARM 36.2.524.

As mentioned above, there have been multiple environmental assessments previously written for this Bull Mountain coalmine project. To date, the only significant impact determination was associated with a proposed power plant project that was never implemented.

Name of person(s) responsible for preparation of EA:

Name: Douglas D. Mann
Title: Water Resources - LRO
Date: 3/30/2012