DEPARTMENT OF ENVIRONMENTAL QUALITY
Environmental Assessment

Planning, Prevention & Assistance Division
Energy Bureau

Name of Project: Martin and Kathryn Clemons
Dba Flying Y LLC
AEL-16-6433

Type of Project: Well-to-Well Ground Source Heat Pump System

Location of Project: 55 Runway Lane, Sec 6, T5S R9E

City/Town: Livingston, MT 59047 **County**: Park

Description of Project: Martin and Kathryn Clemons, dba Flying Y LLC, have applied to DEQ to finance the installation of a ground source heat pump system through the Alternate Energy Revolving Loan program. The heat pump is a Climate Master Tranquility series Water-to-Water TMW060 heat pump that would use a domestic well water as an energy source at an estimated 30 gallons per minute withdrawal. The system heats and cools a hangar and apartment in the hangar. The heat pump will discharge into a new 80-foot deep well approximately 150 feet from the corner of the airplane hangar. The loan is to finance the heat pump, well, interior equipment and all connections for the system. Applicants received rule authorization for the discharge well from the US Environmental Protection Agency, in accordance with 40 CFR 114.26, on July 28, 2011. The discharge will flow back into the aquifer from where it came. The total ground disturbance is estimated to be 3,000 square feet (150x20) on a portion of the existing dirt runway/taxi way and driveway.

Agency Action and Applicable Regulations:
DEQ has received an application under the Alternative Energy Revolving Loan Program for funding.

Summary of Issues:
There have been no environmental issues identified concerning this project.

Affected Environment & Impacts of the Proposed Project:

NS = Non-significant impacts may occur, S = Significant impacts may occur. (explain under Potential Impacts). *Include frequency, duration (long or short term), magnitude, and context for any significant impacts identified. Reference other permit analyses when appropriate (ex: statement of basis). Address significant impacts related to substantive issues and concerns. Identify reasonable feasible mitigation measures (before and after) where significant impacts cannot be avoided and note any irreversible or irretrievable*

impacts. Include background information on affected environment if necessary to discussion.

N = Not present or No Impact will likely occur. *Use negative declarations where appropriate (wetlands, T&E, Cultural Resources).*

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	[N/NS/S] POTENTIAL IMPACTS AND MITIGATION MEASURES
1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?	[NS] There will be approximately 3,000 square feet of ground disturbance for drilling of the injection well and digging of the trenches connecting the ground source heat pump to the heating system. Soils consist of Cozdome-Vendome loams, 0 to 4 percent slopes, with a well-drained typical profile of 0 to 18 inches as loam, and 18 to 60 inches of very cobbly loamy sand. There are no reclamation considerations, as the ground disturbances will be in previously disturbed locations currently being used for runways and driveways.
2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?	[NS] This well-to-well-loop geothermal system would have no ground water impacts as the water will be returned to the aquifer, and the level maintained. DNRC has been contacted regarding permits, and no new permits are required.
3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?	[NS] This project will not affect air quality. Some particulate may be generated during the well drilling and trenching for the connecting lines.
4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?	[NS] This project will have no impact on the vegetation because it is in an existing dirt runway-parking lot area.
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	[NS] This project will have no impact on fauna or fauna as it is in an existing developed area.
6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?	[N] The following species are listed as a concern for this area: Wolverine, Canada Lynx, Grizzly Bear, Great Blue Heron, Bald Eagle, Yellowstone Cutthroat Trout and Wedge-leaf Saltbush. This project will not impact the habitat of these species since it is a developed area.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] The applicant received a letter from the state Historic Preservation Office (SHPO) reporting no identified cultural property implications.
8. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will	[N]

IMPACTS ON THE PHYSICAL ENVIRONMENT	
there be excessive noise or light?	
9. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project? Will new or upgraded power line or other energy source be needed)	[NS] This project will reduce the amount of used engine oil or propane needed to heat the hangar and residence.
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?	[N]

IMPACTS ON THE HUMAN ENVIRONMENT	
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[N]
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N]
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	[NS] The project will support/create jobs by purchasing equipment and services locally.
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	[NS] The project may increase the local property tax base slightly after the first seven years of operation. The project may be eligible for state and federal tax credits, and received $8,917 in federal grant funding to complete the project.
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	[N]
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[N]
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	[N]
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the	[N]

IMPACTS ON THE HUMAN ENVIRONMENT	
project add to the population and require additional housing?	
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N]
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N] An application was made to the State Historical Preservation Office (SHPO). According to SHPO records, there have been no previously recorded cultural resource sites in the area, and that a resource inventory is unwarranted so that the project could proceed.
21. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	[NS] The project will be an example of a changing attitude towards the use of alternative energy and new technology. This project would be a benefit.
22(a). PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	[N]
22(b). PRIVATE PROPERTY IMPACTS: Is the agency proposing to deny the application or condition the approval in a way that restricts the use of the regulated person's private property? If not, no further analysis is required.	[N]
22(c). PRIVATE PROPERTY IMPACTS: If the answer to 21(b) is affirmative, does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives. The agency must disclose the potential costs of identified restrictions.	[N]

23. Description of and Impacts of other Alternatives Considered:

There are no significant environmental impacts associated with this project. In fact, the project has the benefit of reducing conventional energy consumption in Montana and the need for developing new energy sources.

A. No Action:

The no action alternative would include the continued use of conventional fossil fuel based energy consumption.

B. Approval with modification: Not applicable

24. Summary of Magnitude and Significance of Potential Impacts:

There are no significant environmental impacts associated with this project.

25. Cumulative Effects: None

26. Preferred Action Alternative and Rationale:
The Preferred Action Alternative is to approve the project and install the energy saving measures.

Recommendation for Further Environmental Analysis:

[ ] EIS [ ] More Detailed EA [N] No Further Analysis

Rationale for Recommendation:

27. Public Involvement: None

28. Persons and agencies consulted in the preparation of this analysis: DEQ Staff, Montana Natural Heritage Program (http://mtnhp.org/SpeciesOfConcern/?AorP=a), the well driller's report (A&L Drilling), and Google Maps. No comments were received during the internal comment period. The draft EA was posted on DEQ's intranet site September 25 – October 5, 2015.

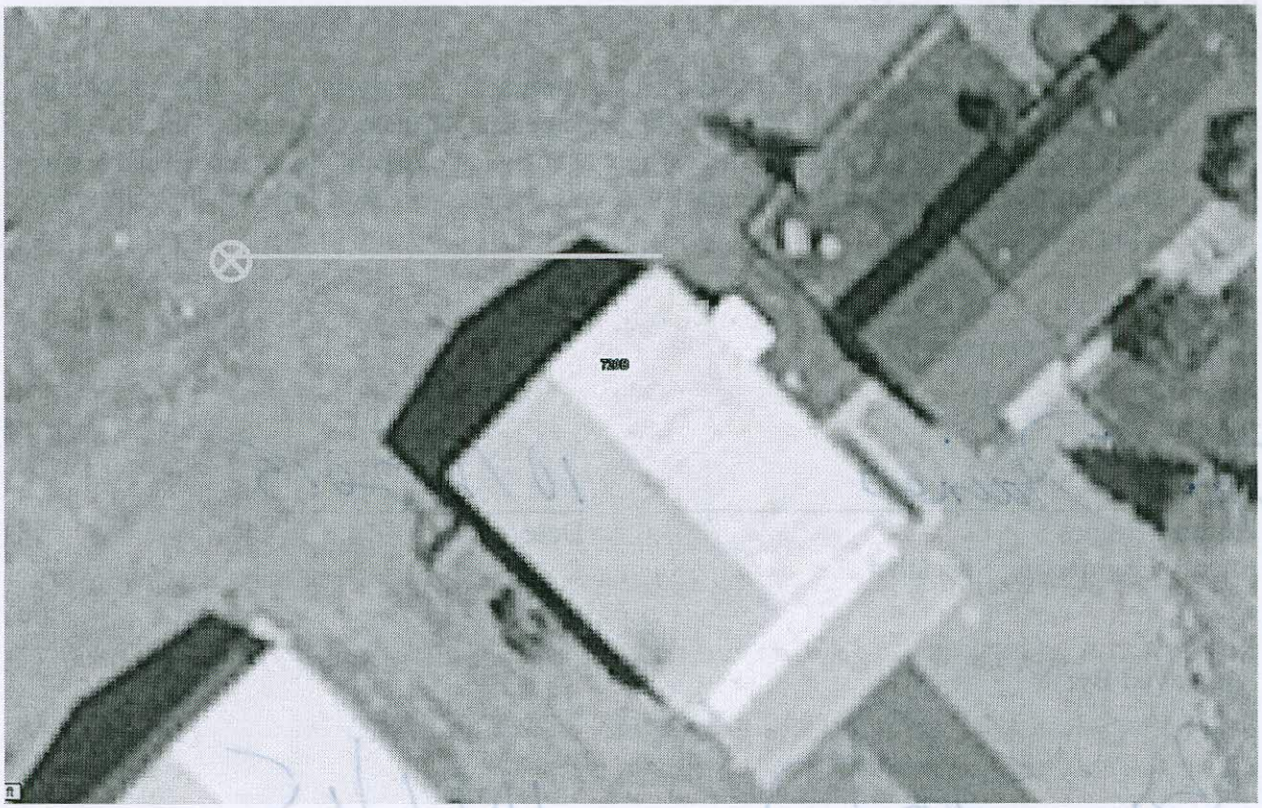
EA Checklist Prepared By:

Howard Haines — Date: 10/6/2015
Energy Engineering Specialist

Approved By: KM

Brian Spangler — Date: 10/6/15
Renewable Energy and Planning Supervisor

USDA Soil Map for 55 Runway Lane, Livingston MT



The pipe lines are yellow, with the re-injection well as a yellow X. Soils consist of Cozdome-Vendome loams, 0 to 4 percent slopes, with a well-drained typical profile of 0 to 18 inches as loam, and 18 to 60 inches of very cobbly loamy sand.

Park County Area, Montana

720B—Cozdome-Vendome loams, 0 to 4 percent slopes

Map Unit Setting

- *National map unit symbol:* 589t
- *Elevation:* 4,700 to 5,000 feet
- *Mean annual precipitation:* 12 to 14 inches
- *Mean annual air temperature:* 43 to 45 degrees F
- *Frost-free period:* 90 to 120 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Cozdome and similar soils:* 65 percent
- *Vendome and similar soils:* 20 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Cozdome

Setting

- *Landform:* Alluvial fans, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Parent material:* Loamy alluvium over sandy and gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

- *Ap - 0 to 3 inches:* loam
- *Bw - 3 to 8 inches:* sandy loam
- *Bk1 - 8 to 16 inches:* gravelly sandy loam
- *2Bk2 - 16 to 60 inches:* extremely gravelly loamy sand

Properties and qualities

- *Slope:* 0 to 4 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Runoff class:* Very low
- *Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
- *Depth to water table:* More than 80 inches

- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 30 percent
- *Available water storage in profile:* Low (about 4.0 inches)

Interpretive groups

- *Land capability classification (irrigated):* 3e
- *Land capability classification (nonirrigated):* 3e
- *Hydrologic Soil Group:* A
- *Ecological site:* Silty (Si) 9-14" p.z. (R044XS339MT)

Description of Vendome

Setting

- *Landform:* Alluvial fans, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Parent material:* Sandy and gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

- *A - 0 to 8 inches:* loam
- *Bw - 8 to 11 inches:* loam
- *Bk1 - 11 to 18 inches:* loam
- *2Bk2 - 18 to 60 inches:* very cobbly loamy sand

Properties and qualities

- *Slope:* 0 to 4 percent
- *Depth to restrictive feature:* More than 80 inches
- *Natural drainage class:* Well drained
- *Runoff class:* Very low
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Calcium carbonate, maximum in profile:* 20 percent
- *Available water storage in profile:* Low (about 4.2 inches)

Interpretive groups

- *Land capability classification (irrigated):* 3e
- *Land capability classification (nonirrigated):* 4e

- *Hydrologic Soil Group:* B
- *Ecological site:* Shallow to Gravel (SwGr) 9-14" p.z. (R044XS338MT)

Minor Components

Sixbeacon

- *Percent of map unit:* 8 percent
- *Landform:* Alluvial fans, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Ecological site:* Shallow to Gravel (SwGr) 9-14" p.z. (R044XS338MT)

Meadowcreek

- *Percent of map unit:* 5 percent
- *Landform:* Channels on alluvial fans, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Concave
- *Across-slope shape:* Concave
- *Ecological site:* Subirrigated (Sb) 9-14" p.z. (R044XS343MT)

Cetrack

- *Percent of map unit:* 2 percent
- *Landform:* Alluvial fans, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Convex
- *Ecological site:* Silty (Si) 9-14" p.z. (R044XS339MT)

From the Montana Fish, Wildlife and Parks website, Endangered Species for this township and range: Wolverine, Canadian Lynx, Grizzly Bear, Bald Eagle, Great Blue Heron, Yellow Cutthroat Trout, and Wedge-leaf Saltbush. Accessed September 19, 2015.