



September 16, 2016

Blaine County Planning & Zoning Commission
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Subject: Camp Rainbow Gold Preliminary Water and Wastewater System Design and Approvals

Blaine County Planning & Zoning Commission:

The proposed Camp Rainbow Gold summer camp in Blaine County will require a public water system and a decentralized, on-site septic system for wastewater treatment and disposal. SPF Water Engineering has worked with the Camp Rainbow Gold project design team to conduct preliminary investigations and designs for the development of these systems. This letter provides an overview of the water and wastewater systems and is to be included with the Conditional Use Permit application. The purpose of this letter is threefold:

1. To briefly describe the water and wastewater systems and the preliminary design efforts.
2. To explain the South Central Public Health District (SCHD) and the Idaho Department of Environmental Quality (IDEQ) approvals and requirements for these types of systems.
3. To request that water and wastewater system approvals and permits be considered "Conditions of Approval" for the Conditional Use Permit (CUP).

Water System

The proposed Camp Rainbow Gold water system will supply potable water for the camp facilities, including interior fire sprinklers. The camp water system meets the requirements for classification as a transient, non-community public water system, as it will not regularly serve at least 25 of the same people over six months per year. The camp is anticipated to operate approximately 5 months per year. Maximum population on-site at any given time will be 200 persons.

A preliminary layout of the water system infrastructure is included with the Master Site Plan. The system is planned to consist of a well, well house with flow meter and chlorine dosing, storage tanks, booster pump station, distribution pipe network, and service lines to the individual camp facilities. Cisterns may be required also to meet fire flow demands. Above ground storage tanks, if necessary, will be screened from view with berms and vegetation or housed within a building.

A detailed narrative of the water system can be found in the Camp Rainbow Gold Facility Plan included with the CUP application. The Facility Plan includes analysis of the anticipated water demands, water supply, water rights, water quality, and the conceptual system design. This document has been submitted to IDEQ to initiate the design review and approval process. Subsequent submittals to IDEQ will include a Preliminary Engineering Report (PER) and Plans & Specifications as required for approval of a public water system. IDEQ has up to 42 days to review and respond to each submittal. The PER is performed prior to well construction and development and includes a well site evaluation and well

engineering report. Plans & Specifications typically follow test pumping of the well and include a final design of the pumping, measurement, treatment, and distribution systems.

Wastewater System

The proposed wastewater system will provide collection, conveyance, treatment, and disposal of the camp's sewer flows. The system is planned to consist of a gravity sewer collection system, two lift stations, septic tanks with dosing chambers and duplex pumps, and pressurized drainfields. A conceptual layout of the wastewater system facilities is shown in the Master Site Plan.

Based on a maximum camp population of 200 persons and an estimated 50 gallons per person per day, the peak daily demand is anticipated to be 10,000 gallons per day (gpd). This type of system qualifies it as a large soil absorption system (LSAS) with the daily demand in excess of 2,500 gpd. LSAS's have additional and more restrictive requirements than smaller individual subsurface disposal systems. The enhanced LSAS requirements include but are not limited to:

- A level I Nutrient Pathogen (NP) Evaluation is required (Not typically required for standard individual septic systems unless located in a nitrate priority area)
- IDEQ reviews all studies and submittals and must give approval to the local health district prior to issuance of the septic permit.
- The drainfield must be pressurized to provide even distribution to laterals
- Redundant, alternating drainfields
- Increased horizontal separation to features of interest such as surface water or wells
- Increased vertical separation to limiting layers such as groundwater, bedrock, or unsuitable soils

Because of these enhanced requirements, substantially more time and expense is required for the analysis, design and approval of an LSAS over standard septic systems. The septic permit is issued only after IDEQ acceptance of the level I NP evaluation, PER, Plans & Specifications, Technical Financial Managerial, and Operation & Maintenance Manual. As with the water system, IDEQ has 42 days to review and respond for most submittals, but the level I NP evaluation may take longer because review is subcontracted to a third party. A level II NP evaluation may also be required based on the findings of the level I NP evaluation. Certain submittals may be combined but the overall process can up to a year or longer. Groundwater monitoring for determination of high groundwater and hydraulic conductivity is another major time factor and is discussed further in the following paragraphs.

Geotechnical Investigation

A geotechnical investigation was performed by Sun Valley Geotech in August, 2016. The test pit locations and descriptions have been included with the CUP application submittal. Test pits were advanced at fourteen (14) locations across the site from depths of 6.5 to 9.5 feet. Bob Erickson of SCHED was present to inspect the soil strata and suitability for septic drainfields. Soils consist generally of a layer of topsoil with organic material, sandy silt and underlying sands and gravels. USDA soil classes range from A-2a (more permeable) to B-1 and B-2 (less permeable). These soils are considered suitable for septic drainfields according to IDAPA 58.01.03 Individual/Subsurface Sewage Disposal Rules.

Groundwater varied greatly across the site as expected from the influence of irrigation and the East Fork Big Wood River. When groundwater was encountered, levels ranged from 3-feet to 7-feet.

Groundwater was not encountered in the upland areas north of East Fork Road or at Test Pits #5 and #6. North of East Fork Road, test pits show greater depths of group B soils above anticipated high groundwater. These areas are expected to be the most suitable for the septic drainfields. Pending the results of seasonal groundwater monitoring and the level I NP evaluation, other locations such as in the areas of Test Pits #5 and #6 may also be suitable and would reduce construction and long term pumping costs.

Piezometers were installed at Test Pits #'s 1, 2, 4, 5, 11, and 15 to monitor groundwater. Groundwater monitoring will continue throughout the coming year to determine seasonal variations.

Level I Nutrient Pathogen Evaluation

A Level I NP evaluation is required by IDEQ and SCHD for LSAS's, such as the proposed camp's wastewater system. The goal of the Level 1 NP evaluation is to ascertain that the treatment system effluent will not cause adverse impacts to waters of the state, including surface water and groundwater resources. Nitrate loading from the system may not exceed an increase of 1 mg/L at the critical boundary (may be groundwater, surface water, or property boundary). Nitrates may not exceed 10 mg/L in total per drinking water standards. The project site is not in a nitrate priority area.

SPF hydrogeologists began conducting the Level 1 NP evaluation in accordance with DEQ and SCHD requirements. The IDEQ Level 1 NP evaluation nitrogen mass-balance spreadsheet was used to predict the nutrient and pathogen movement through the subsurface. Due to the current lack of available data, the preliminary results of the evaluation are inconclusive. More field data is needed to replace assumptions for the mass-balance spreadsheet parameters. Depending on how conservative we are with one or a combination of assumptions, the system may be shown to be above or below the acceptable limits. However, if conservative (worst case scenario) assumptions prove to reflect actual conditions, other measures can be taken to create a viable system such as the additional pretreatment or the lowering of dosing rates/increase of drainfield footprint.

Conceptual Wastewater System Design

The wastewater system will include a gravity sewer pipeline collection system which will generally flow from east to west. The collection system will consist of PVC mainlines and laterals, sewer manholes, and cleanouts. A small lift station is anticipated to be required for the recreation center to lift flows to the mainline.

A mainline lift station is planned at the west end of the site to pump flows to the septic/treatment tanks and drainfield. Lift stations will be equipped with duplex pumps, controls, high and low water alarms, and connections for back-up generators. Overflow tanks may be installed to provide additional storage volume for unexpected high flows or pump failures.

The septic tanks will be sized to accommodate peak hourly flows and are planned to be installed north of East Fork Road as shown in the Master Site Plan. The tanks will contain dosing chambers and small pumps to pressurize the drainfield laterals and evenly distribute flows. Standard perforated drainfield

laterals are being considered as well as shallow drip tubing with pressure regulating emitters. A shallow dripfield may allow for additional effective soil depths and better distribution in sloped areas. Again, pending results of the level I NP evaluation, the system may require additional treatment such as aerobic, recirculating tanks. Lagoons are not being considered as a possible treatment measure and will not be a part of the wastewater system.

Summary & Conclusion

SPF Water and the Camp Rainbow Gold project design team have initiated the design and permitting process for the camp's water and wastewater systems. Test pits and a geological evaluation were conducted for the sizing and location of septic drainfields; a level I NP evaluation was begun to estimate the nitrate level increase from sewage disposal; water rights, water quality, and water supply were evaluated for the design of the water system. Wetlands evaluations, avalanche and wildfire studies were conducted as well. These studies were essential to the conceptual design and site evaluation of the proposed camp.

Results of testing and analysis to date are favorable for the project. We are confident that sensible design solutions exist to provide clean water, fire protection, and wastewater disposal to the proposed summer camp. State regulations (as enforced by IDEQ and SCHD) exist to ensure that new water and wastewater facilities will not negatively affect the public or environment. Considerable time, effort, and cost is needed to design these site specific systems and acquire permitting. These efforts would be wasted should the CUP be denied. It is for this reason that we are requesting any water and wastewater system permitting and approvals be considered, at a maximum, "Conditions of Approval" for the purposes of the CUP.

We feel an obligation to the Camp Rainbow Gold organization and to its donors to use resources responsibly. This obligation was echoed by the public at two neighborhood meetings and many expressed their wishes that as much funding as possible go directly to care and support for the children. The Camp Rainbow Gold team has honored this desire by providing only the essential/due diligence design of the camp's technical systems prior to CUP approval. The remaining design efforts will follow CUP approval as it will be necessary to gain the required permitting and provide properly functioning facilities. Approval of the CUP will not influence or diminish these requirements.

Respectfully Submitted,

Justin Leraris, PE
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File: 1287.0010