August 6, 2013

M E M O R A N D U M

TO: Todd Crutcher, P.E.
Engineering Manager, Boise Regional Office

FROM: C. Gary Carroll, P.E.
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SUBJECT: Staff Analysis for Draft Reuse Permit M-228-01 (Municipal Recycled Water)
Golden Meadows Camp, Midas Gold, Inc.

1.0 PURPOSE

The purpose of this memorandum is to satisfy the requirements of the *Recycled Water Rules*[1], IDAPA 58.01.17.400.05, for issuing wastewater reuse permits. This memorandum addresses draft wastewater reuse permit M-228-01, for the municipal treatment and reuse system owned and operated by Midas Gold, Inc. (MGI).

2.0 SUMMARY OF EVENTS

2.1 Background

MGI is conducting mineral exploration activities as part of MGI's Golden Meadows Exploration Project from summer 2012 through fall 2014 in the Stibnite-Yellow Pine Mining District in central Idaho near Yellow Pine, approximately 40 miles east of McCall.

MGI has a temporary camp for geologic staff and drillers to support exploration activities located on MGI-owned property at the old Stibnite town site. This temporary camp is currently equipped for 22 people and has been permitted for sanitary wastewater treatment and disposal through Valley County and the Central District Health Department (CDHD). Potable water for the camp is being provided through a temporary domestic well located on MGI's property. The temporary camp will be expanded in 2013 to house up to 125 people (Golden Meadows Camp). MGI is proposing to construct a packaged wastewater treatment system to treat wastewater generated by the Golden Meadows Camp and reuse the treated effluent.

2.2 Summary of Permit Application/Issuance Events

Initially, MGI proposed to construct a man camp to house up to 75 people to support their exploration activities. MGI proposed to install a wastewater disposal system that would separate the grey water (wastewater from showers, sinks, and laundry facilities) from the black water

(wastewater from toilets and the kitchen) and reuse the grey water during summer, non-freeze conditions. MGI proposed that the black water would be disposed of in a subsurface sewage disposal system (septic system).

On May 18, 2011, the Department of Environmental Quality (DEQ) received a request from MGI for a waiver from the requirement to obtain a Wastewater Reuse Permit (WRP) for these activities. DEQ determined that monitoring and oversight of these activities was needed, and that a waiver would not be granted. Consequently, MGI submitted an application for a WRP to DEQ on August 18, 2011 for a wastewater reuse system as briefly described above.

At the same time, MGI conducted a Level 1 Nutrient-Pathogen Study[2] (N-P Study) and designed a septic system for the disposal of up to 2,499 gpd of wastewater. MGI received approval of the N-P Study on July 13, 2011 and received a subsurface sewage disposal system permit on November 4, 2011 from CDHD.

Subsequently, MGI revised their plans for the man camp and increased the proposed capacity of the camp to house up to 125 people. An amended application for a new wastewater reuse permit[3] (WRP application) was received by DEQ from MGI on March 21, 2012. The WRP application was initially determined to be incomplete by DEQ and an "Incompleteness Determination" letter was sent to MGI on May 1, 2012. A Facility Plan for a Public Wastewater System and Private Municipal Wastewater Treatment Plant at Golden Meadows Camp[4], as required by the *Wastewater Rules*[5], IDAPA58.01.16 §410, was submitted to DEQ by MGI on May 1, 2012; and a response to the WRP application incompleteness determination with additional information for the WRP application was submitted to DEQ by MGI on June 8, 2012. Subsequently, DEQ determined the WRP application was complete and issued a "Completeness Determination" letter on June 18, 2012. The WRP application effective date is considered June 18, 2012. DEQ approved the wastewater system Facility Plan on December 6, 2012. On April 30, 2013, DEQ also approved the wastewater system Technical, Financial, and Managerial Capacity Report submitted by MGI. A wastewater treatment and reuse facility preliminary engineering report (PER) was submitted to DEQ by MGI for review and approval on December 12, 2012. DEQ approved the PER on June 13, 2013. MGI submitted plans and specifications for the Golden Meadows Camp Wastewater Treatment and Reuse Facility to DEQ for review and approval on April 8, 2012. DEQ has provided review comments to MGI on the original plans and specifications and on revisions to the plans and specifications. The DEQ comments on the revisions to the plans and specifications were minimal, and it is expected that the plans and specifications will be approved by DEQ soon.

The completed WRP application, and the approved wastewater facility plan, and related supporting information and documentation serve as the basis for the terms and conditions contained in the draft WRP. As required by the *Recycled Water Rules*, the draft WRP will be presented for a public comment period. After the comment period has closed, DEQ will provide written responses to all relevant comments and prepare a final WRP for MGI's wastewater reuse facilities.

3.0 PROCESS AND SITE DESCRIPTION

3.1 Process Description

3.1.1. Wastewater System

Presently, wastewater from the temporary camp is disposed of in a subsurface sewage disposal system (septic system) permitted by CDHD. The septic system is limited to a maximum flow capacity of 2,499 gallons per day (gpd) (design flow). The maximum flow capacity was deliberately selected to be less than 2,500 gpd so the septic system drainfield would not be classified as a Large Soil Absorption System (LSAS). A septic system drainfield designed for flowrates greater than 2,500 gpd is classified as a LSAS. LSASs have more design and construction requirements than a septic system drainfield designed for flowrates less than 2,500 gpd. This maximum flow limits the number of individuals housed at the camp to less than 50. The present population of the camp is maintained at 22 individuals. The camp population must be maintained at less than 25 individuals until a new public water system well is installed and approved by DEQ.

As previously stated, MGI is proposing to expand the man camp facilities (Golden Meadows Camp) to house up to 125 people during the summer operating season (May through September), which is the basis of design for the wastewater collection and treatment system. During the winter operating season (October through April), the man camp population will decrease to a maximum of 50 residents. The wastewater generated at the Golden Meadows Camp will be municipal wastewater. The average day per capita wastewater flow was originally estimated to be 50 gallons per capita per day (gpcd). However, MGI re-evaluated the per capita wastewater flow based on the installation of low-volume toilets and estimated that by using low-volume toilets, the average per capita wastewater flow would be reduced to 32.8 gpcd. MGI used peaking factors of 1.5 for maximum day flow and 2.0 for peak hour flow. The estimated anticipated wastewater flowrates for the maximum residential population of the man camp for the summer and winter operating seasons presented in Table 3-1 are based on 32.8 gpcd.

Table 3-1 – Wastewater Flows

	Summer Operating Season (max. 125 residents) (gpd)	Winter Operating Season (max. 50 residents) (gpd)
Average Day Flow (ADF)	4,100	1,640
Maximum Day Flow	6,150	2,460
Peak Hour Flow (PHF)	8,200	3,280
Maximum Month Flow[a]	5,125	2,050

[a] Average of ADF and Maximum Day Flow

MGI will construct a wastewater treatment and reuse facility to treat and dispose of the domestic wastewater generated by the camp facilities. The wastewater treatment plant (WWTP) will be designed to produce Class A recycled water for reuse or disposal per the *Recycled Water Rules*, IDAPA 58.01.17.601. MGI has elected to treat the wastewater to the Class A level of treatment in order to provide multiple reuse options and avoid the need for a National Pollutant Discharge Elimination System (NPDES) discharge permit for the East Fork of the South Fork of the

Salmon River (EFSF Salmon River). MGI also evaluated installing a LSAS and septic tanks for the subsurface disposal of all wastewater generated, but determined that a WWTP designed to produce Class A recycled water cost less than a LSAS.

The wastewater collection, treatment, and disposal (reuse) system for the Golden Meadows Camp consists of wastewater collection piping from the camp facilities in the modular buildings, a wastewater influent pumping station, a portable, packaged membrane bioreactor (MBR) WWTP, wastewater disinfection facilities, treated effluent (recycled water) storage tank, and reuse water pumping stations. A more detailed discussion of the WWTP is presented in Section 4.1.

Waste solids (biosolids) from the WWTP will be stored in a sludge holding tank. The sludge holding tank will be pumped out by a licensed hauler and will be disposed of at a licensed receiving station.

3.1.2. Wastewater Reuse Facilities

MGI is currently proposing the following options for reusing the treated wastewater:

- Camp Reuse – Toilet flushing,
- Dust Control,
- Reclamation of disturbed sites, and
- Subsurface distribution in the existing drainfield (flowrates to the drainfield cannot exceed 2,499 gpd).

In the WRP application, MGI also proposed using recycled water to supplement drilling water for exploratory drilling. In order to use recycled water for this operation, MGI would have to obtain approval from the Idaho Department of Water Resources (IDWR) Underground Injection Control (UIC) Program. After investigating this further, MGI determined that until IDWR clarifies the water quality requirements for this use, they will not consider using recycled water as drilling water for exploratory drilling. If in the future MGI decides to pursue this reuse option, the WRP will have to be modified.

3.2 Site Description

3.2.1. Location

The Golden Meadows Project wastewater reuse facility site is located primarily in the EFSF Salmon River drainage at the western edge of Idaho's Frank Church River of No Return Wilderness Area, 45 miles northeast of Cascade and 40 miles east of McCall. The nearest town is Yellow Pine (Population 32 in the 2010 census), located about 15 miles downstream on the EFSF Salmon River. The legal description of the Golden Meadows Camp is "NW1/4 of the

SW1/4 of Section 11, Township 18 North, Range 09 East." Appendix A – Topo and Wetlands Map and Figure 1-1 from the WRP Application show the location of the project.

3.2.2. Ownership

The proposed Golden Meadows Camp would be sited on patented (private) land owned by MGI and would have limited public access. The uses of recycled water for reclamation of disturbed exploratory drilling sites are on private land owned by MGI and on public lands.

3.2.3. Site Characteristics

3.2.3.1. General

The camp site is in an upland area that has been disturbed by historic mining operations (formerly the Stibnite town site) and current exploration activities. It is mostly unvegetated, slightly-sloping ground, outside of the 100-year floodplain. There is no evidence or record of floods at the Stibnite town site. A wetland delineation was completed for the area as part of exploration permitting activities. Appendix A – Topo and Wetlands Map shows identified wetlands in the Golden Meadows Project area, and Appendix C – Figure 4 from Revision 1 of the Wastewater Facility Plan shows identified wetlands in the vicinity of the Golden Meadows Camp.

3.2.3.2. Soils

Appendix A – Figure 3-1 from the WRP Application shows the soil types as typed by the U.S. Forest Service in the Golden Meadows Project area by Land Type Map Symbol. Table 3-2 presents a description of each soil type that will potentially receive recycled water, either by irrigation of reclamation areas (shown in Appendix B – Figures 2, 3, 4, and 5 of Additional Information to the WRP Application), including proposed exploration drilling areas (shown in Appendix A – Figure 3-1), or by dust control. Table 3-1 presents soil characteristics such as soil depth and soil texture, and presents the soil hydrologic type. The hydrologic soil groups are used for estimating runoff potential of soils on watersheds. Four groups are used:

- Group A – Soils having high infiltration rates, well to excessively drained sands and/or gravels. Low runoff potential.

- Group B – Soils having moderate infiltration rates, moderately to well-drained soils with moderately coarse textures. These soils have a moderate runoff potential.

- Group C – Soils having a slow infiltration rate and are more finely textured (silts and loams), and often have layers that impede downward movement of water. These soils have a high runoff potential.

- Group D – Soils having very slow infiltration rates and are mostly comprised of clay-textured soils, soils with high permanent water table, or with a restrictive layer near or on

the surface. These soils have a very high runoff potential.

Almost all of the soil types in Table 3-2 (12 out of 14) are of soil hydrologic type B, which has moderate infiltration rates and moderate runoff potential. There is one soil type (120b) that is soil hydrologic type A, which has high infiltration rates and low runoff potential. The area where this soil type occurs is in the northwest corner of the project area (see Appendix A – Figure 3-1), and does not presently have any designated proposed exploration drilling sites or reclamation sites. There is one soil type (111d) that is soil hydrologic type D, which has very slow infiltration rates and has very high runoff potential. This area is in the mountainous area to the immediate east of the Golden Meadows Camp area and the EFSF Salmon River. Appendix A – Figure 3-1 indicates that this area has proposed exploration drilling sites.

The soil in the Golden Meadow Camp area is described in more detail in the N-P Study conducted by MGI for the septic system design and approval. The N-P Study described the soils in this area as follows:

> "[The] upper portion of the soil profile generally consisted of one to three feet of highly-weathered, spent ore. The material was generally a poorly sorted, gravelly to sandy loam with some clay. In most locations, the spent ore was observed covering one to seven feet of fill. The fill material (waste rock/ore) consisted of a poorly sorted, gravelly, silty loam, with angular boulders and cobbles. The soil matrix surrounding large boulders and cobbles was typically classified as B-2 soils. What appeared to be the native ground surface was observed underlying the fill material at many locations. The native zone typically included a dark brown organic layer with roots and woody material. This zone was generally a silty clay loam with some sand and rounded cobbles. While some ponding of water from recent precipitation was noted on the ground surface, no groundwater was observed in any of the test pits." (B-2 soil texture classification is loam, silt loam, or sandy clay loam.)

Table 3-2 Summary of Soil Types in the Golden Meadows Project Area

Landtype Map Symbol	Landtype Description	Soil Depth Profile	Soil Surface Texture	Soil Sub-Surface Texture	Soil Hydrologic Group
101	Alluvial Land	40"-60"	Partially decomposed organic layer	Gravelly sandy loam	Group B
109-2	Cryoplanated Ridge Land	< 20"	Very fine sand to loam	Very fine sand to very fine sandy loam	Group B
109a	Weakly Dissected Cryoplanated Mountain Slopes	30+"	Gravelly very fine sandy loam to loam	Gravelly very fine sandy loam to loam	Group B
109b	Moderately Dissected Cryoplanated Mountain Slopes	30"-40"	Very fine sand to very fine sandy loam	Sandy loam to loam over very fine sand to sand	Group B
109d	Cryoplanated Headland	30"-40"	Very fine sand to very fine sandy loam	Sandy loam to loam over very fine sand to sand	Group B
110	Cirque Basin Land	30+"	Gravelly very fine sandy loam to loam	Gravelly very fine sandy loam to loam	Group B
110x	Scoured Cirque Basin Land	< 20"	Very fine sand to loam	Very fine sand to very fine sandy loam	Group B
111a	Weakly Dissected Glacial Trough Land	20"-30"	Gravelly sand to very fine sandy loam	Gravelly sand to gravelly sandy loam	Group B
111a-1	Weakly Dissected Glacial Trough Land	< 20"	Gravelly sand to loamy sand	Gravelly sand to sand	Group B
111b	Moderately Dissected Glacial Trough Land	25"-35"	Gravelly fine sand to fine sandy loam	Fine gravelly very fine sandy loam to fine gravelly loam	Group B
111d	Steep Rocky Glacial Headland	20" or less	Loam, sandy loam	Sandy loam or loamy sand	Group D
113	Rocky Ridge Land	< 20"	Gravelly sand to loamy sand	Gravelly sand to sand	Group B
114	Subalpine Rim Land	< 20"	Very fine sandy loam	Very fine sandy loam	Group B
120b	Moderately Dissected Mountain Slope Land	40"-60"	Loamy sand or sandy loam	Loamy sand to fine gravelly loamy coarse sand	Group A

3.2.3.3. Surface Water

The EFSF Salmon River is the major drainage in the area and bisects the Golden Meadows Project area, flowing from south to north. The tributaries in the area include Sugar Creek (north end of site), West End Creek (northeast end of site, tributary to Sugar Creek), Midnight Creek (east side of site), Fiddle Creek (west side of site), Garnet Creek (southeast side of site) and Meadow Creek (south end of site).

3.2.3.4. Ground Water and Hydrogeology

Information presented in the N-P Study indicates that in the EFSF Salmon River valley, the deeper ground water system is within fractured bedrock, and a shallow system within the alluvium follows the EFSF Salmon River and its tributaries.

The N-P study indicated that, based on a review of Well Drillers' Reports, the shallow ground water aquifer is within an unconfined coarse-grained sand and gravel unit. The N-P Study estimated a hydraulic conductivity of 125 feet per day and a hydraulic gradient of 0.05 ft/ft. The shallow ground water is found at depths ranging from ground surface at stream channels and wetlands to about 20 feet below the surface. Depth to ground water is deeper where mining materials or waste rock have been placed on the original surface. The EFSF Salmon River and its tributaries, which act as a discharge point for shallow ground water, control base water level in the valley.

Ground water in the unconsolidated surface materials on hillsides likely originates from infiltration of precipitation and ground water underflow from the granite bedrock. Shallow ground water in the glacial and alluvial materials beneath the valley floor is derived from infiltration of precipitation and shallow ground water flow from upgradient portions of the watersheds. Ground water discharge is by evapotranspiration, spring flow from numerous seeps and springs, and baseflow to the stream channels.

Previous shallow (alluvial) ground water quality characterization efforts have been performed for past mining operations. These efforts focused on specific issues, including fuel spill impacts, mine waste and mining activity impacts, potential interaction of lower-quality groundwater on Meadow Creek and the EFSF Salmon River, as well as limited background conditions. The characterization efforts have demonstrated elevated natural levels of arsenic, cadmium, iron, and antimony.

3.2.4. Proposed Wastewater Reuse Application Site Descriptions

3.2.4.1. Camp Reuse – Toilet Flushing

Recycled water will be used to flush toilets in the living quarters at the Golden Meadows Camp.

3.2.4.2. Dust Control

Recycled water would be used for the suppression of dust on roads around the site and in areas of

construction activities. These areas would primarily be on the Stibnite Road, in the camp and shop areas and gravel processing area.

3.2.4.3. Reclamation of Disturbed Sites

Appendix B – Figures 2 through 5 show the areas that have been disturbed by exploratory drilling. These sites will be reclaimed and could be hydroseeded and then irrigated using recycled water. Due to the remoteness of many of these sites, the recycled water would be hauled by truck to the proximity of each reclamation site.

3.2.4.4. Subsurface Distribution to the Existing Drainfield

The drainfield is located adjacent to the Golden Meadows Camp. Refer to Appendix A – Figure 1-2 from the WRP Application for the location.

4.0 DISCUSSION

4.1 Wastewater Facilities

4.1.1. Wastewater Collection and Treatment

The MGI wastewater facility plan and supporting documentation was approved by DEQ on December 6, 2012. As previously discussed, the facility will be designed to produce Class A recycled water per the *Recycled Water Rules* (IDAPA 58.01.17.601). The facility plan addressed issues regarding the requirements for a Class A wastewater treatment facility. Before construction of the WWTP can begin, a preliminary engineering report (PER), technical, financial, and managerial (TFM) capacity report, and plans and specifications must be submitted to DEQ for review and approval (*Wastewater Rules*, IDAPA 58.01.16 §§409, 411 and 420, and *Recycled Water Rules* IDAPA 58.01.17 §§605 and 606).

Wastewater from the Golden Meadows Camp is collected in the 2,538 gallon capacity sump of the wastewater influent pumping station (IPS). Two submersible grinder pumps (one duty, one standby) in the IPS wet well pump the wastewater influent to the WWTP.

As stated in Section 3.1.1, the wastewater treatment facility is a small, packaged MBR WWTP. The WWTP will include an influent fine-mesh rotary-drum screen, an anoxic tank, an aeration tank, a filtration tank containing the membrane modules, a disinfection system that consists of a chlorination feed system and a chlorine contact tank, and all appurtenant pumps, aeration blowers, electrical and instrumentation, and other appurtenances to make a complete and operable system. It also includes a redundancy package to supply redundant units for mechanical equipment, engine generators, and an automatic transfer switch to furnish prime power and backup power for full electrical redundancy.

Following treatment, the wastewater effluent (now Class A recycled water) will be stored in a 12,150 gallon capacity reuse water storage tank. From the tank, Class A recycled water can be

pumped via a packaged pumping station back to the man camp facilities and via a reclaimed water pump to the other reuse options. The camp facilities reuse water package pumping station consists of two pumps and a hydropneumatic tank for pressure control. Water from the recycled water storage tank can also be diverted to the drainfield for subsurface distribution.

Biosolids from the MBR WWTP will be stored in a sludge storage tank on site. The sludge will be pumped out of the tank by licensed septage hauler and hauled to a licensed septage facility or another WWTP for disposal.

Screenings and grit from the fine-mesh rotary-drum screen will be collected in a container, and hauled to and disposed of at an approved municipal solid waste landfill.

A requirement will be included in the WRP for the preparation of a waste solids management plan that addresses the storage and disposal of biosolids, grit, and screenings.

A process flow diagram for the drinking water system and wastewater system is presented in Appendix D (Appendix F of the MGI Wastewater Preliminary Engineering Report[6])

The small, packaged WWTP is considered a private municipal WWTP (IDAPA 58.01.16 §§010.59 and 455). The WWTP does not meet the operating experience requirements of IDAPA 58.01.16 §§450.03.b and 455.04.a. This will require that MGI conduct performance testing on the WWTP before any wastewater effluent is reused (average day flows no greater than 2,499 gpd can be disposed of in the septic system). It will be necessary for MGI to prepare performance test procedures and a quality assurance plan for DEQ review and approval prior to conducting the tests.

4.1.2. WWTP Design Criteria

The design criteria for the WWTP are presented in Table 4-1.

Table 4-1 – WWTP Design Criteria[a]

	Design Flow							
	Average	Peak Hour	COD	BOD	TSS	Turbidity	Total Nitrogen	Total Phosphorus
	(gpd)	(gpd)	(mg/L)	(mg/L)	(mg/L)	(NTU)	(mg/L)	(mg/L)
Influent	9,000	18,000	600	300	500	--	60	10
Effluent	9,000	18,000	<5	<5	<5	<0.2	<10	8.3[a]

[a] MGI Wastewater Preliminary Engineering Report

The WWTP is utilizing chlorine for disinfection, and will be designed for a Concentration x Contact Time (CT) of 450 mg·min/L and a minimum modal contact time of 90 minutes at peak day dry weather flow.

4.1.3. Class A Recycled Water

These design criteria meet the requirements of Class A recycled water per IDAPA 58.01.17

§§601.01, and 602.01, which are summarized in Table 4-2

Table 4-2 – Class A Treatment Requirements

Treatment Process or Constituent	Standard at Point of Compliance
Total Nitrogen	<30 mg/L <10 mg/L for ground water recharge (or as required based on analysis of ground water impacts)
Turbidity	<0.2 NTU 24-hour mean; Not to exceed 0.5 NTU
Disinfection	CT = 450 mg-min/L, measured at the end of the contact time based on total chlorine residual and a modal contact time of ≥90 minutes at peak day dry weather flow; or 5-log virus inactivation(disinfection and filtration combined
Total Coliform Organisms	2.2 total coliform organisms/100 mL 7-day mean 23 total coliform organisms/100 mL maximum in any sample
5-day BOD	<10 mg/L <5 mg/L for ground water recharge
pH	6.0 – 9.0

IDAPA 58.01.17.610.01.a requires that Class A recycled water filtration technologies be approved by and listed in the State of California Treatment Technology Report for Recycled Water. The membranes to be installed in the WWTP are Meurer Research, Inc. Bio-Cel UP-150 membranes. These membranes are listed in the October 2012 California Department of Public Health, Alternative Treatment Technology Report for Recycled Water[7]. During the facility plan review, DEQ reviewed testing reports for these membranes and operational data for other installations of the technology submitted by MGI. Performance testing of the WWTP will be required prior to reuse of the treated wastewater effluent.

Wastewater constituents and treatment process limits and monitoring requirements for the MGI WWTP Class A recycled water are shown in Table 4-3.

The total nitrogen limit proposed for the draft WRP is 30 mg/L. This limit is allowable for all Class A recycled water non-ground water recharge uses. Subsurface discharge to the existing drainfield could be considered ground water recharge, and IDAPA 58.01.17.602.01 Table 2 would require a limit of 10 mg/L, or "as required by an analysis of ground water impacts." The N-P study, referenced in Section 2.2, showed that the impact of nitrogen on ground water based on a total wastewater flow of 2,499 gpd and a concentration of 45 mg/l of total nitrogen is acceptable. Therefore, a total nitrogen limit of 30 mg/L is acceptable for all the proposed uses for the Class A recycled water. The BOD_5 limit proposed is 10 mg/L.

Table 4-3 – Class A Wastewater Constituent and Treatment Process Limits and Monitoring Requirements

Wastewater Constituent or Treatment Process	Limit	Units	Sample Type / Monitoring Frequency & Basis of Compliance
Total Nitrogen	30	mg/L	Weekly composite sample / monthly arithmetic mean
BOD_5	10	mg/L	Weekly composite sample / monthly arithmetic mean
Total coliform organisms:			
7-day mean	2.2	total coliform organisms/100 ml	Daily Grab sample / daily
Any sample maximum	23	total coliform organisms/100 ml	Daily Grab sample / daily
pH	6.0 – 9.0		Grab sample or continuous monitoring / daily
Chorine residual	Chlorine residual necessary to provide disinfection contact time ≥450 mg-min/L	mg/L	Continuously
Disinfection contact time	≥90 (at peak day flow)	minutes	Daily, calculated using daily average flowrate
Turbidity:			
24-hour arithmetic mean	0.2	NTU	In-line continuously monitoring and recording turbidimeter / continuous
Instantaneous maximum, not to exceed	0.5	NTU	In-line continuously monitoring and recording turbidimeter / continuous

4.1.3.1. Class A Recycled Water Point of Compliance and Monitoring

Compliance with the total coliform organism limit for the 7-day mean will be required to be determined from the results of the last 7-days for which analyses have been completed. "Any sample maximum" will be for any confirmed sample taken and measured.

Compliance with turbidity limits for the 24-hour arithmetic mean will be required to be based on the arithmetic mean of the continuously monitored and recorded turbidity measurement read at the end of each 15-minute period over 24 hours each day. Exceedance of the instantaneous maximum turbidity limit of 0.5 NTU will be required to be based on the arithmetic mean of continuous turbidity measurements exceeding the limit for more than five minutes.

The permitted point of compliance for complying with Class A recycled water requirements will be immediately downstream of the reuse water package pumping station and the reclaimed water

pump. The recycled water will be required to meet the total coliform, BOD_5, and total nitrogen limits at this point. The point of compliance for turbidity limits will be at the turbidimeter downstream of the membranes. The turbidimeter is to be located on the membrane permeate piping downstream of the membranes and upstream of the permeate pumps, as shown on the package wastewater treatment manufacturer's (Meurer Research, Inc.) process and instrumentation diagrams (P&IDs) in the Wastewater Facility Plan. The point of compliance for disinfection contact time and CT will be at the chlorine residual analyzer downstream of the chlorine contact tank as shown in the Process Flow Diagram in Appendix D.

4.1.3.2. Class A Recycled Water Redundancy

The Class A recycled water redundancy requirements in IDAPA 58.01.17.611.02.b requires that the WWTP have either one of the following alternative backup systems if the wastewater effluent does not comply with any one of the Class A reuse requirements listed in Table 4-2:

- Another permitted disposal option
- Adequate storage capable of storing the wastewater effluent until the wastewater effluent again complies with the Class A recycled water requirements

In addition, IDAPA 58.01.17.611.02.c requires that if the turbidity exceeds the instantaneous required value (0.5 NTU) for more than five minutes, or the chlorine residual drops below the required value for more than 5 minutes at the point of compliance, the alternative backup system must be automatically activated. Anytime either of these conditions occur, the rule requires that the occurrence be reported immediately to DEQ.

MGI's wastewater facility plan/supporting documentation addresses this. An automatic valve installed immediately downstream of the chlorine contact tank will close (automatically if turbidity or chlorine residual exceeds the respective set point; manually for other monitored parameters), and the flow will be diverted back to the IPS. At ADF, it is estimated the IPS has approximately 3.7 to 7.4 hours of storage capacity, depending on the influent wastewater flow from the camp facilities during the non-compliant period.

If additional storage time is needed, non-compliant wastewater effluent in the IPS can be pumped to the drainfield via a WWTP bypass line to the septic tanks. However, the flow to the drainfield cannot be greater than 2,499 gpd. At the wastewater ADF (4,100 gpd), this will provide approximately 14.9 hours of disposal capacity.

If the IPS is used for temporary storage of non-compliant wastewater effluent and the drainfield is used for temporary disposal of wastewater during a period of non-compliance, the storage/disposal capacity of these alternative backup systems is 18.6 to 22.3 hours.

If the wastewater effluent cannot be brought into compliance with Class A recycled water requirements in this time period, MGI proposes allowing the non-compliant wastewater effluent to flow to the reuse water storage tank for additional storage capacity. If the tank were empty, it

would provide an additional 36 hours of storage capacity. If the tank were not empty, any Class A recycled water in the tank would become non-compliant when mixed with the non-compliant effluent. Once the WWTP is producing compliant effluent, MGI will have to dispose of the non-compliant effluent, and drain, clean, and disinfect the recycled water storage tank prior to storing compliant Class A recycled water in it. MGI will also have to reuse or properly dispose of any compliant effluent produced during this process.

In order to ensure compliance with the redundancy requirements for Class A recycled water in the Recycled Water Rules, the WRP will include the following conditions:

- The O&M manual will have to include procedures for draining, cleaning, and disinfecting the reuse water storage tank if non-compliant effluent is ever stored in the tank, including procedures for the disposal of the water used to clean and disinfect the tank, and storage, reuse, or disposal of the compliant Class A recycled water during cleaning.

- A contingency plan that will have to include measures that MGI will take to reduce the wastewater influent flow from the camp facilities to maximize the storage capacity in the IPS for non-compliant effluent and disposal time to the drainfield.

The wastewater effluent can be used for all the proposed permitted uses of recycled water, as long as it meets the Class A recycled water requirements presented in Table 4-3. These uses include:

- Camp Reuse – Toilet flushing

- Dust Control

- Reclamation of disturbed sites

- Subsurface Distribution to the Existing Drainfield

4.2 Recycled Water Uses

4.2.1. Toilet Flushing in Man Camp

Class A recycled water is proposed to be used to offset the use of drinking water for toilet flushing. The PER estimates that toilets would be flushed 3.7 times per day per capita at 6 liters (1.6 gal) per flush for low flow fixtures. This equals approximately 740 gpd of recycled water required for toilet flushing for a man camp population of 125 people. During the winter, the demand and the supply (Class A recycled water) would reduce significantly. It is expected there would be a maximum crew of 50 people staying at the camp through the winter, which equates to approximately 296 gpd of recycled water required for toilet flushing.

As discussed in Section 4.1, a packaged, pressurization pumping system will be used for

pumping the Class A recycled water to the man camp facilities. The discharge pressure of this pumping system is 50 psig. This pumping system is in addition to the reclaimed water pump for pumping to the other recycled water uses.

A requirement in IDAPA 58.01.17 for using recycled water for toilet and/or urinal flushing is that only specially trained personnel be allowed access to the plumbing for maintenance and repair (i.e., licensed plumbers). Warning signage meeting the requirements of IDAPA 58.01.17, indicating that recycled water is being used for toilet/urinal flushing, will have to be mounted in restroom facilities. See Section 5.3.4.2 for more details.

4.2.2. Dust Control

MGI proposes to use recycled water for suppression of dust on roads around the site and in areas of construction activities. Class A recycled water can be utilized for dust control per the *Recycled Water Rules*, IDAPA 58.01.17.601.02.

Recycled water for this option will be pumped into a water truck via the reclaimed water pumping station. The water truck will be equipped with spray bars to apply the recycled water to the surface of roads or construction sites for dust suppression.

Warning signage meeting the requirements of IDAPA 58.01.17, indicating that recycled water is being used for dust suppression, will have to be mounted on water trucks. See Section 5.3.4.2 for more details.

A runoff control/management plan will be required and must address preventing runoff due to applying recycled water for dust control/suppression.

4.2.3. Reclamation of Disturbed Sites

According to the WRP application and additional information provided, MGI proposes to use recycled water for the reclamation of sites disturbed by exploratory drilling and for reclamation of sites disturbed by previous mining activities. Appendix A – Figure 3-2 from the WRP Application shows proposed exploratory drilling sites that would eventually be reclaimed and Figures 2 through 5 in Appendix B show the present reclamation sites. MGI proposes two different uses of recycled water for reclamation of exploratory drilling sites and previously mined areas:

- Hydroseeding reclamation sites, and
- Irrigation of reclamation sites.

The two methods are discussed below.

4.2.3.1. Hydroseeding of Reclamation sites

Hydroseeding consists of mixing the recycled water with seed and mulch to create a slurry that would be sprayed over unreclaimed, bare soil using a hydroseed machine, which creates the slurry. Appendix B – Photo 1 of Additional Information to the WRP Application shows an example of hydroseeding at the Golden Meadows Project. Due to the remoteness of many of these sites, the recycled water will be hauled by truck as close as possible to the reclamation site.

According to MGI, the purpose of using the slurry is to have it "stick" to the ground surface and eliminate runoff and loss of material. MGI estimates that the amount of water applied during hydroseeding is approximately ¼-inch. This equates to approximately 6,800 gal/ac.

Each area to be reclaimed would normally only be hydroseeded once. After the area is hydroseeded, it would continue to be irrigated with recycled water and supplemental irrigation water. Using recycled water for irrigation of reclamation sites is discussed in Section 4.2.3.2.

The low hydraulic loading of the recycled water from hydroseeding will not impact ground water. Also, the setbacks from surface waters are great enough to prevent any impacts. A runoff control/management plan must address preventing runoff from reclamation sites due to hydroseeding.

In order to evaluate the demand for recycled water by hydroseeding, it is assumed that one acre of land would be hydroseeded per month. This would result in a hydroseeding recycled water demand of about 6,800 gal per month for hydroseeding during the growing season, or approximately 34,000 gal, annually.

4.2.3.2. Irrigation of Reclamation Sites

Irrigation would occur on an ongoing basis on reclamation sites that have already been planted/hydroseeded during the growing season, which starts May 1st and continues through September 30th. Some of the reclamation sites being irrigated are part of a silviculture program to reclaim previously mined sites. In most cases, grasses and evergreen trees would be planted on the reclamation sites.

Impact sprinklers on risers mounted on hand moved laterals would be used to irrigate reclamation sites. Irrigation water (recycled water and/or supplemental irrigation water) would be stored in a portable polyethylene tank at the reclamation site and pumped to the irrigation laterals using an engine-driven, portable pump. Appendix B – Photos 2 and 3 of Additional Information to the WRP Application present an example of a typical MGI reclamation irrigation arrangement at the Golden Meadows Project. Photo 2 shows an irrigation water storage tank, hosing and portable pump, and Photo 3 shows hand moved irrigation laterals with sprinkler risers.

The recycled water will be hauled by truck to the reclamation site and the water would be transferred to an irrigation water storage tank.

DEQ establishes hydraulic loading limits for the application of recycled water on land application sites based on an irrigation water requirement, which is based on the irrigation water demand of a specific crop for specific conditions (climatic and soil conditions) and the method of applying the irrigation water. However, hydraulic loading limits are not required for Class A recycled water. In this analysis, the irrigation water requirements are being evaluated to determine the recycled water demand for the irrigation of reclamation sites.

The Irrigation Water Requirement (IWR) is estimated using the equation:

$$IWR = IR_{net}/E_i$$

where,

IR_{net} = Net Irrigation Requirement
E_i = Irrigation System Efficiency

Also,

$$IR_{net} = P_{def}$$

where,

P_{def} = Precipitation Deficit

Estimates of the P_{def} for specific crops and locations can be found on the ETIdaho 2012 – University of Idaho Evaporation and Consumptive Irrigation Water Requirements for Idaho website (ETIdaho2012)[8] (http://data.kimberly.uidaho.edu/ETIdaho/).

MGI estimated the P_{def} using the ETIdaho2012 for the McCall Station (105708). The Irrigation System Efficiency was determined using Table 4-12 of the DEQ Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater[9] (DEQ Reuse Guidance). MGI provided revised IWR based on ETIdaho2012 and the DEQ draft Guidance for Forested/Poplar Site Nutrient and Hydraulic Loading, revised July 2012[10] (draft Forested Site Reuse Guidance).

Table 4-4 presents MGI's revised estimated growing season IWR for four scenarios. Poplar trees were used because there is no species of evergreen tree in the ETIdaho2012, McCall Station data. The E_i used is 75% for hand moved laterals. Table 4-12 in the DEQ Reuse Guidance has an E_i range of 60 to 75% for stationary irrigation laterals (wheel or hand moved). Table 4-4 is a summary of Appendix B – the ET Estimates Table of Additional Information to the WRP Application.

Table 4-4 Summary of IWR Scenarios

	Description	Crop	E_i	Irrigation Flag	Month	P_{def} (mm/day)	P_{def} (in/mo)	IWR (in)	IWR (gal/ac)
Scenario 1	Established reclaimed site.	Grass pasture - low management	0.75 - hand set lateral	1	May	0.92	1.112	1.483	40,268
					June	2.88	3.370	4.493	121,991
					July	4.19	5.066	6.754	183,396
					August	3.54	4.280	5.706	154,945
					September	1.22	1.475	1.967	53,399
					Total			**20.403**	**553,999**
Scenario 2	New reclaimed site, 1st year growth, 80% exceed for P_{def}, IWR lower than established reclaimed area.	Grass pasture - low management	0.75 - hand set lateral	1	May	0.23	0.278	0.371	10,067
					June	1.85	2.165	2.886	78,362
					July	3.43	4.147	5.529	150,131
					August	2.84	3.434	4.578	124,306
					September	0	0	0	0
					Total			**13.364**	**362,866**
Scenario 3	Tree irrigation, no understory, stand 1/2 of ETIdaho.	Poplar Trees, 3rd year (0.5 x P_{def})	0.75 - hand set lateral	1	May	0.21	0.254	0.339	9,192
					June	1.72	2.012	2.683	72,856
					July	3.26	3.941	5.255	142,690
					August	2.74	3.322	4.417	119,929
					September	1.00	1.209	1.612	43,770
					Total			**14.306**	**388,436**
Scenario 4	Grass understory with trees, 50:50 from scenarios 1 and 3.	Poplar Trees, with understory	0.75 - hand set lateral	1	May	0.57	0.683	0.911	24,730
					June	2.30	2.691	3.588	97,423
					July	3.73	4.504	6.005	163,043
					August	3.14	3.796	5.062	137,437
					September	1.11	1.342	1.789	48,585
					Total			**17.354**	**471,218**

DEQ estimated the IWR using the draft Forested Site Reuse Guidance and P_{def} data from ETIdaho2012, McCall Station. DEQ used the following criteria:

- Poplar trees with understory (Grass pasture, low management),
- 80% exceedance P_{def} for poplar trees (i.e., first year growth),
- The average P_{def} for the poplar trees and the understory was weighted 40% for poplar trees and 60% for understory,
- E_i = 65%.

Table 4-5 shows the estimated IWR for the growing season months using these criteria.

Table 4-5 DEQ IWR Estimate

	Poplar Trees - 3rd year (40%) P_{def} (80% Exceedance)			Grass Pasture - Low Management (60%) P_{def}			Weighted Aveage P_{def}	Irrigation Efficiency (E_i)	IWR	
	(mm/day)	(mm/mo)	(in/mo)	(mm/day)	(mm/mo)	(in/mo)	(in/mo)		(inches)	(gal/ac)
May	1.32	40.92	1.61	0.90	27.90	1.10	1.30	0.65	0.85	23,005
Jun	1.89	56.70	2.23	2.75	82.50	3.25	2.84	0.65	1.85	50,154
Jul	6.15	190.65	7.51	4.25	131.75	5.19	6.11	0.65	3.97	107,917
Aug	4.84	150.04	5.91	3.59	111.29	4.38	4.99	0.65	3.24	88,100
Sep	0.56	16.80	0.66	1.30	39.00	1.54	1.19	0.65	0.77	20,929
Total		**455.11**	**17.92**		**392.44**	**15.45**	**16.44**		**10.68**	**290,105**

Since the primary reason for estimating the IWR for this WRP application is to evaluate if there is enough demand for the recycled water, the lowest IWR will be used to compare the IWR to the recycled water generated. The lowest IWR is the one estimated by DEQ in Table 4-5.

In order to make this comparison, the IWR needs to be converted from gal/ac-month to gallons per month. MGI has estimated that the approximate total area of reclamation sites to be irrigated is 10 acres. The minimum monthly IWR in gallons per month during the growing season using this acreage is:

	IWR (gal)
May	230,050
June	501,540
July	1,079,170
August	881,000
September	209,290
Total	**2,901,050**

The monthly volume of recycled water generated during the growing season is estimated to be as follows:

	Average Monthly Flow[a] (gal)	Maximum Monthly Flow[b] (gal)
May	127,100	151,900
June	123,000	147,000
July	127,100	151,900
August	127,100	151,900
September	123,000	147,000
Total	**627,300**	

[a] Summer Operating Season ADF = 4,100 gpd (see Table 3-1)
[b] Summer Operating Season Maximum Monthly Flow = 4,900 gpd (see Table 3-1)

The volume of recycled water that will be generated during the growing season is estimated to be much lower than the IWR for the reclamation sites. Therefore, the demand for irrigation water at reclamation sites exceeds the available amount of recycled water. In fact, supplemental irrigation water will have to be utilized each month of the growing season to meet the IWR of the vegetation.

Soils at reclamation sites to be irrigated with recycled water are primarily of soil hydrologic type B, which are characterized as having moderate infiltration rates and moderate runoff potential. There are areas in the mountainous area east of the Golden Meadows Camp area with soils classified as soil hydrologic type D, which are characterized as having very low infiltration rates and very high runoff potential. A small area in the very northwest corner of the project area has soils that are classified as soil hydrologic type A, which are classified as having high infiltration rates and low runoff potential. The area with type A soil does not have any existing disturbed areas to be reclaimed, nor does it have any designated exploration drilling sites. For more details on the soil classifications and locations, refer to section 3.2.3.2 and Appendix A – Figure 3-1.

Overall, soils at the reclamation sites to be irrigated have moderate to low infiltration rates, so, if the hydraulic loading rate is limited to the IWR, irrigation water will not infiltrate past the vegetation root zone and reach the ground water. Additionally, the recycled water will only

make up a small portion of the irrigation water applied during the months of June through August (approximately 30%, maximum) and up to, approximately, 65 to 70% in May and September. Therefore, recycled water is not expected to impact ground water.

The WRP will include a requirement for separate monthly monitoring of the hydraulic loading rate of recycled water and supplemental irrigation water at each irrigated reclamation site. The WRP will require that the monitoring results be reported in each annual report, including a comparison to the monthly IWR for each site.

The runoff potential of the soils at the reclamation sites to be irrigated is moderate to very high overall. However, the setbacks to surface waters from the reclamation sites are great enough that impacts to surface water by runoff are not expected. Nevertheless, a runoff control/management plan must address preventing irrigation runoff from reclamation sites.

4.2.3.3. Wastewater Constituents Loadings on Reclamation Sites

The estimated constituent loadings in the WWTP effluent (recycled water) during the summer season (maximum camp population) are:

	WWTP Effluent (Recycled water) Loadings	
	Summer ADF = 4,100 gpd	Summer PHF = 8,200 gpd
	(lb/day)	(lb/day)
COD	0.17	0.34
Total Nitrogen	0.34	0.68
Total Phosphorus	0.28	0.57

The estimated growing season nutrient loading rates on reclamation sites by irrigation with recycled water are 5.2 lb N/ac-yr for nitrogen and 4.3 lb P/ac-yr for phosphorus, based on an application area of 10 acres and summer ADF. The average daily COD loading rate for the growing season is estimated to be 0.02 lb/ac-day, again, based on an application area of 10 acres and the summer ADF. These values can be compared to the constituent uptake rates/limits discussed below.

The estimated growing season nitrogen uptake rates for the reclamation sites, based on Tables 13 and 14 of the draft Forested Site Reuse Guidance, range from 35 to 90 lb N/ac-yr, as shown below.

	Nitrogen Uptake	
	(lb/ac-yr)	(lb/ac-yr)
Douglas fir- planted 1 year ago	0	
Douglas fir – 3 to 25 years old, canopy covers 50% of site		55
Herbaceous understory – covers 50% of site	35	35
Total	**35**	**90**

Also, the National Resource Conservation Service (NRCS) guidance "Nutrient Uptake and Removal–Nutrients Available from Livestock Manure Relative to Crop Growth Requirements" (Appendix I, Part C)[11] (NRCS 1998) provides a general recommendations for an annual application rate of nitrogen for nongrazed, privately owned woodlands of 100 lb N/ac. This is referenced in the draft Forested Site Reuse Guidance.

The phosphorus uptake rate is estimated to be approximately 20 lb/ac-yr. This value is the phosphorus application rate recommended in NRCS 1998 for nongrazed, privately owned woodlands. This is also referenced in the draft Forested Site Reuse Guidance.

DEQ limits the COD loading to 50 lb/day-ac, which is based on maintaining aerobic conditions in the soil (DEQ Reuse Guidance).

The estimated constituent loads in the recycled water used to irrigate and hydroseed reclamation sites are significantly lower than the uptake rates and limits of the vegetation. It is not necessary to set constituent load limits in the WRP for the Class A recycled water for this reuse activity.

4.2.4. Subsurface Distribution to the Existing Drainfield

If necessary, Class A recycled water can be discharged to the drainfield by diverting the recycled water storage tank discharge to the septic system final dosing tank. As discussed in Section 3.1.1, the flow cannot exceed 2,499 gpd. The proposed water quality limits of the Class A recycled water as presented in Table 4-3, and as discussed in Section 4.1.3, are acceptable for subsurface distribution to the existing drainfield.

In addition, the N-P study, referenced in Section 2.2, showed that, based on a total wastewater flow of 2,499 gpd and a maximum phosphorus concentration of 12 mg/L, the impact of phosphorus on adjacent surface water is acceptable. The expected concentration of total phosphorus in the recycled water is 8.3 mg/L (see Table 4.1), therefore, the phosphorus levels in the recycled water discharged into the drainfield by subsurface distribution at flowrates of 2,499 gpd or less will have no negative impact on surface water.

4.2.5. Recycled Water Water Balance

A recycled water water balance was prepared to determine if, and when, the volume of recycled water produced would exceed the demand for recycled water by the recycled water uses. The water balance is presented in Appendix E.

The water balance presents recycled water production and recycled water demand for each use for each month based on anticipated wastewater flows and recycled water demands discussed in previous sections. The recycled water demand is presented in different combinations of recycled water uses. The water balance presents scenarios for ADF each month and maximum month

flow for each month. In evaluating these results, maximum month flow results can only be used for one month of the year.

Please note that the water balance includes subsurface discharge to the septic system as a means of disposing of recycled water in excess of the demand for the other three uses.

The following conclusions can be drawn from the water balance:

- In the winter operating season (October through April), recycled water demand from camp reuse (toilets) and subsurface discharge to the septic system will be able to handle the recycled water production for the ADF and the maximum month flow conditions.

- In the summer operating season (May through September), as long as recycled water can be used for irrigation and hydroseeding for the reclamation of disturbed sites, the recycled water demand is greater than the recycled water production for the ADF and the maximum month flow conditions.

- If recycled water can be used for camp reuse (toilets), dust control, and subsurface discharge to the septic system (no irrigation/hydroseeding), the recycled water demand is greater than the recycled water production for each summer operating season month for the ADF condition. However, at maximum month flow conditions, recycled water production would exceed recycled water demand by 3,491 gal in May, July, or August. This would equate to about 113 gal per day, and the reuse water storage tank would be able to absorb this excess.

- If recycled water can only be used for dust control and subsurface discharge to the septic system (no camp reuse [toilets] or irrigation/hydroseeding), the recycled water production for the ADF condition exceed demands by 1,631 gal in May, July, and August. This equates to 53 gal per day, and the reuse water storage tank would be able to absorb this excess. The recycled water production for the maximum month flow condition exceeds demands in any of the summer operating months, May through September. The maximum exceedance would be 26,431 gal in May, July, or August. This would equate to 853 gal per day. The 12,150 gallon capacity reuse water storage tank would provide storage for 14 days at 853 gal per day, not including the storage of recycled water being produced.

- If the recycled water can only be used for camp reuse (toilets) and subsurface discharge to the septic system (no dust control or irrigation/hydroseeding), the ADF and maximum month flow conditions recycled water production exceeds demands in May through September. The maximum month exceedance is 26,691 gal in May, July, and August for the ADF condition, and 51,491 gal in May, July, or August for the maximum month flow condition. 51,491 gal per month is the worst case condition and equates to 1,661 gal per day. The 12,150 gallon capacity reuse water storage tank would provide storage for 7 days at 1,661 gal per day, not including the storage of recycled water being produced.

The occurrence of the conditions of monthly recycled water production exceeding monthly recycled water demands discussed above are improbable, because during the summer operating season, reclamation sites will have to be irrigated. During the summer, irrigation of reclamation site s may discontinue for a few days at a time, but certainly not for a month at a time. Nevertheless, the WRP will include the requirement that MGI address this possibility in a Contingency Plan in the Plan of Operation.

5.0 WASTEWATER REUSE PERMIT

The following sections outline the terms of the draft WRP.

5.1 Facility Information – WRP Section 2

The Facility Information for the draft WRP includes the information shown below on the type of recycled water, wastewater treatment processes, the location of the facility, the facility mailing address, and the facility contact information (responsible official).

- Type of recycled water: Municipal, Class A
- Method of treatment: Membrane Bioreactor WWTP, chlorine disinfection
- Facility location address: Stibnite, Idaho. On the Stibnite Road (FS 412), approximately 15 miles east of Yellow Pine.
- Facility geographic location: T18N, R9E, part of Sections 23, 10, 11, 12, 13, 14, and 15
  T19N, R9E, part of Section 35
- Facility mailing address: 405 S 8th Street, Suite 21
  Boise, ID 83702
- Facility contact information: Responsible Official: Rocky Chase, Regulatory Affairs Manager
  Telephone: (208) 901-3601
  Email: chase@midasgoldinc.com

Section 2 of the draft WRP also lists information presented below on the ground water and the nearby surface water (including beneficial uses).

- Ground water: Depth to ground water: 20 feet (in EFSFSR and Meadow Creek Valley, deeper where mining materials and waste rock have been placed on the original ground surface.

  General ground water flow direction: Parallel to the direction of Meadow Creek in the valley floor, toward Meadow Creek on the valley sides.

  Beneficial uses: Nearby drinking water supply well.

- Nearby surface water(s) and beneficial uses:

  - East Fork of the South Fork Salmon River (EFSFSR) (between Sugar Creek and Meadow Creek). Beneficial uses: cold water biota, primary contact recreation.
  - Sugar Creek (including West End Creek). Beneficial uses: cold water biota, primary contact recreation.
  - West End Creek. Beneficial uses: cold water biota, primary contact recreation.
  - Unnamed Creek. Beneficial uses: cold water biota, primary contact recreation.
  - Midnight Creek. Beneficial uses: cold water biota, primary contact recreation.
  - Fiddle Creek. Beneficial uses: cold water biota, primary contact recreation.
  - Garnet Creek. Beneficial uses: cold water biota, primary contact recreation.
  - EFSFSR (Above Meadow Creek). Beneficial uses: cold water biota, primary contact recreation.

5.2 Compliance Schedule for Required Activities – WRP Section 3

The draft WRP includes seven (7) compliance activities:

- CA-228-01 – Wastewater Treatment Plant Performance Testing
- CA-228-02 – Plan of Operation
- CA-228-03 – Quality Assurance Project Plan
- CA-228-04 – Submit a Wastewater System Classification Worksheet to DEQ

- CA-228-05 – Utility User Agreement

- CA-228-06 – Schedule a Permit Renewal Pre-Application Workshop with DEQ

- CA-228-07 – Submit a Permit Renewal Application to DEQ

Compliance Activity CA-228-01, as it appears in the draft WRP, requires that MGI conduct performance testing of the completed WWTP to demonstrate that the WWTP will perform according to the WWTP design criteria in the plans and specifications and the Class A recycled water performance criteria in IDAPA 58.01.17 §§601 and 602. The requirements for WWTP performance testing is discussed in Section 4.1.1. A WWTP Performance Testing Plan Report must be submitted to DEQ for review and approval. DEQ approval must be obtained before beginning the WWTP performance testing. Following the completion of the WWTP performance testing, the results must be compiled in a report and submitted to DEQ for review and approval. No discharge of Class A recycled water for reuse will be allowed until the WWTP performance testing has been completed and conditionally approved by DEQ.

Compliance Activity CA-228-02, as it appears in the draft WRP, MGI must submit to DEQ for review and approval a Plan of Operation (PO) within six months of permit issuance. The PO must reflect current operations and incorporate the requirements of the WRP and applicable items in the Plan of Operation Checklist in the DEQ Guidance. The draft WRP requires that the following is included in the PO:

- A wastewater system Operation and Maintenance Manual (O&M Manual). This O&M Manual must address the wastewater treatment facilities and the recycled water facilities, including the subsurface discharge system.

- A list of the manufacturers' recommended spare parts to be stored at the Golden Meadows project site (included in the O&M Manual), and verification of a stockpile of these recommended spare parts at the project site.

- A contingency plan for 1) reducing the wastewater influent flow from the camp facilities to maximize the storage capacity in the wastewater influent pumping station for non-compliant effluent and disposal time to the septic system, and 2) the occurrence of the conditions of monthly recycled water production exceeding monthly recycled water demands. The necessity of a contingency plan as part of the PO is discussed in Sections 4.1.3.2 and 4.2.5.

- A wastewater solids management plan. This is discussed is Section 4.1.1.

- An odor control/management plan.

- A runoff control/management plan. The necessity of a runoff control/management plan is discussed in Sections 4.2.2, 4.2.3.1, and 4.2.3.2.

Compliance Activity CA-228-03, as it appears in the draft WRP, requires that MGI submit a Quality Assurance Project Plan (QAPP) to DEQ within six months of permit issuance. The QAPP must incorporate all monitoring and reporting required by the WRP.

Compliance Activity CA-228-04, as it appears in the draft WRP, requires that MGI submit a completed wastewater system classification worksheet to DEQ. The worksheet can be found at http://www.deq.idaho.gov/media/762664-ww-treatment-plant-classification-worksheet.pdf.

Compliance Activity CA-228-05, as it appears in the draft WRP, requires MGI to develop a Utility User Agreement, which must be submitted to DEQ for review and approval. The Utility User Agreement must state that the user understands the origin of the recycled water and the concept of irrigation water requirement and runoff management for applying the Class A recycled water. The Utility User Agreement must be signed by each employee of all contractors and any other personnel not directly employed by MGI who utilize Class A recycled water for dust suppression and/or reclamation.

Compliance Activity CA-228-06, as it appears in the draft WRP, requires that MGI schedule a permit renewal pre-application meeting with DEQ one year prior to the expiration date of the WRP if MGI intends to continue wastewater reuse activities after the WRP expiration date. The pre-application meeting will allow MGI to discuss any proposed modifications to the wastewater reuse activities and discuss any issues that may occur during the permitting cycle. DEQ will also address the requirements for the permit renewal application that is required by Compliance Activity CA-228-07.

Compliance Activity CA-228-07, as it appears in the draft WRP, requires that MGI submit a complete permit renewal application package to DEQ 180 days prior to the expiration date of the WRP. The permit renewal application package must fulfill the requirements specified at the pre-application workshop identified in CA-228-06.

5.3 Permit Limits and Conditions – WRP Section 4

5.3.1. Management Unit Descriptions – WRP Section 4.1

The draft WRP has one management unit (MU) for the entire project site (4514 acres). All permitted types of reuse are allowed in the one MU. It is not feasible to have multiple MUs for the irrigation and hydroseeding of each reclamation sites, because the number of the reclamation sites will increase over the WRP cycle, which would require a modification of the WRP each time a new reclamation site was added under the Recycled Water Rules. In addition, dust suppression utilizing reuse water will occur over several roads and construction sites and it is not feasible to assign multiple MUs for dust suppression because these will also change throughout the WRP cycle.

5.3.2. Hydraulic Loading Limits on Reclamation Sites – WRP Section 4.2

The growing season hydraulic loading limit for each reclamation site is the irrigation water requirement. The hydraulic loading rates for hydroseeding and irrigation are discussed in Section 4.2.3.1 and 4.2.3.2, respectively.

5.3.3. Constituent Loading Limits – WRP Section 4.3

The Class A recycled water does not have any loading limits for nitrogen, phosphorus, or COD, at this time. The constituent loading limits are discussed in Section 4.2.3.3.

5.3.4. Management Unit Buffer Zones, Fencing and Warning Signs, Posting and Labeling Requirements – WRP Section 4.4

5.3.4.1. Management Unit Buffer Zones

The draft WRP does not have any buffer zone requirements for Class A recycled water per IDAPA 58.01.17.602.02, Table 3.

5.3.4.2. Fencing, Posting, and Labeling Requirements

The draft WRP states that no fencing is required for the Class A recycled water unless specified in the DEQ approved plans and specifications.

The draft WRP requires that at any areas of use of Class A recycled water the public and MGI, or other, personnel be notified that the water is recycled water and is not safe for drinking or human contact. The draft WRP requires signs to be posted that must state “Caution: Recycled Water - Do Not Drink”, or equivalent signage in both English and Spanish.

The draft WRP has incorporated several posting and/or identification requirements for Class A recycled water.

- The provisions of IDAPA 58.01.17.603.01.a.i through 58.01.17.603.01.a.iii have been incorporated for all Class A recycled water buried pipe, including service lines, valves, and other appurtenances. This section requires purple piping (Pantone 521, 522, or equivalent) be used for distribution of Class A recycled water. The section also includes requirements for identification tape installed with purple pipe.

- The provisions of IDAPA 58.01.17.603.01.b.i have been incorporated for all exposed and aboveground facilities at pumping facilities. This section requires purple pipe (Pantone 521, 522, or equivalent) and also has posting/labeling requirements.

- The provisions of IDAPA 58.01.17.603.01.b.ii have been incorporated for Class A

recycled water facilities such as, but not limited to, control panels and wash-down or blow-off hydrants on water trucks, hose bibs, and temporary construction services. This section also requires warning labels.

5.3.5. Other Specific Permit Limits and Conditions – WRP Section 4.5

The draft WRP lists the allowable uses of the recycled water discussed in Section 4.2.

- Irrigation of reclamation sites
- Hydroseeding of reclamation sites
- Dust suppression on roads on the site and construction areas
- Toilet flushing, where only trained maintenance personnel have access to the plumbing for repair
- Subsurface distribution to the existing drainfield

The draft WRP defines the growing season as May 1st to September 30th of each year and restricts irrigation to the growing season.

The draft WRP lists the treatment requirements and wastewater constituent limits for Class A recycled water per IDAPA 58.01.17.602.01, Tables 1 and 2. Table 4-3 presents the values for the treatment requirements and the wastewater constituent limits that are required in the WRP.

The draft WRP requires that the wastewater treatment facility and reuse system be operated by personnel that hold valid wastewater operator licenses issued by the Idaho Bureau of Occupational Licenses at the proper operator classification level as required in IDAPA 58.01.16.203, and are properly trained to operate and maintain the system.

The draft WRP has concentration limits and treatment process limits and requirements for the Class A recycled water as required in IDAPA 58.01.17 §§601.01 and 602.01 Tables 1 and 2. There are concentration limits for total nitrogen, BOD_5, total coliform, and pH, and treatment limits and requirements for turbidity and disinfection. Refer to Table 4-3 for these requirements.

Other conditions required in the draft WRP, Section 4.5 include:

- Standby power – Standby power with sufficient capacity capable of operating the treatment and distribution works must be provided and maintained at all times.
- Runoff control/management plan – MGI must manage the reuse sites in accordance with an approved runoff control/management plan, required by Compliance Activity CA-228-

04.

- Ground Water Protection – The activities authorized by this permit must be conducted in accordance with IDAPA 58.01.11, "Ground Water Quality Rule."

- Construction plans and specifications –Pursuant to Idaho Code §39-118, IDAPA 58.01.16, and IDAPA 58.01.17, detailed plans and specifications shall be submitted to DEQ for review and approval prior to construction, modification, or expansion of any wastewater treatment, storage, conveyance structures, or reuse facility. Inspection requirements shall be satisfied and within 30 days of completion of construction and the permittee shall submit as-built plans or a letter from an Idaho Professional Engineer certifying the facilities or structures were constructed in substantial accordance with the approved plans and specifications.

- Flow measurement calibration/verification – Flow measurement devices used to directly or indirectly measure wastewater and supplemental irrigation water flows must be calibrated or verified annually. Calibration/verification of flow measurement devices must be done in accordance with the device manufacturer's specifications and with the permittee's QAPP.

- Backflow prevention and testing requirements – Backflow prevention is required to protect potable water systems, surface water, and ground water from unauthorized discharge of wastewater.

- Records retention requirements – All records generated by MGI to meet the requirements of the WRP must be retained for the duration of the permit, including administrative extensions, plus 2 years.

5.4 Monitoring – WRP Section 5

The monitoring provisions of the draft WRP are included in Section 5. These requirements are needed to assess and establish ongoing compliance with the draft WRP. Many of the monitoring requirements are required for Class A recycled water and are listed in Table 4-3. Additional wastewater constituent monitoring required in the draft WRP are as follows:

- BOD_5, total nitrogen, total phosphorus, total suspended solids (TSS), total dissolved solids (TDS), and volatile dissolved solids (VDS) in the WWTP influent.

- Total phosphorus, TSS, TDS, VDS in the WWTP discharge (wastewater effluent/Class A recycled water) after the disinfection contact tank.

The draft WRP also includes flow monitoring requirements, which consist of the following:

- WWTP influent flow

- Class A recycled water flow from the Class A recycled water storage tank to the man-camp for toilet flushing.

- Class A recycled water flow from the Class a recycled water storage tank for dust suppression and irrigation/hydroseeding of reclamation sites.

- Wastewater flow to the drainfield.

- Class A recycled water flow, or off-spec wastewater flow from the WWTP to the drainfield.

5.5 Reporting – WRP Section 6

Section 6 of the draft WRP contains the annual reporting requirements for the reuse system. The annual report must include the following:

- A brief interpretive discussion of all required monitoring data. The discussion must address data quality objectives, validation, and verification; permit compliance; and reuse facility environmental impacts.

- Results of the required monitoring as described in Section 5 of the WRP. If MGI monitors any parameter for compliance purposes more frequently than required by the WRP, the results of this monitoring must be included in the calculation and reporting of the data submitted in the annual report. The report must present all monitoring data in organized data summary tables to expedite review.

- Status of all work described in Section 3 of the WRP.

- Results of all backflow testing, repairs, and replacements required by the WRP.

- Discussion of major maintenance activities such as major equipment replacement, and wastewater treatment and reuse facility maintenance.

- A summary of all noncompliance events that occurred during the reporting year.

- All laboratory analytical reports, chain of custody forms, and crop yield documentation.

- The parameters listed below, along with the calculations and observations related to the parameters.

    - Recycled water loading rate for irrigation of each reclamation site.

- Recycled water loading rate for hydroseeding of each reclamation site.
- Supplemental irrigation water loading rate for irrigation of each reclamation site.
- Supplemental irrigation water loading rate for hydroseeding of each reclamation site.
- Total hydraulic loading rate for irrigation of each reclamation site.
- Total hydraulic loading rate for hydroseeding of each reclamation site.
- Irrigation water requirement (IWR) for each reclamation site.
- Identify all disturbed sites being reclaimed and associated acreages with maps delineating site locations.
- Description of all vegetation types for each reclamation site.
- Recycled water flow volume for dust suppression
- Recycled water flow volume for man-camp usage (toilets)
- Recycled water flow volume distributed to the drainfield
- Flow volume of non-compliant recycled water discharged to the drainfield

5.6 Site Maps – WRP Section 10

Section 10 of the draft WRP includes a vicinity map and a facility map for the facility.

6.0 RECOMMENDATIONS FOR ISSUANCE OF THE PERMIT

Based on review of applicable state rules, staff recommends that DEQ issue the draft WRP, M-228-01, for a public review and comment period.

TRIM Record 2013AGH742

REFERENCES

1. IDAPA. 2011. "Recycled Water Rules." Idaho Administrative Code. IDAPA 58.01.17

2. Midas Gold, Inc. March 2011. "Level One Nutrient Pathogen Study, Golden Meadows Exploration Camp."

3. Midas Gold, Inc. March 2012. "Recycled Water Permit Application and Engineering Report" and Supporting Documentation

4. Midas Gold, Inc. June 2012. "Facility Plan for the Public Wastewater System and Private Municipal Wastewater Treatment Plant and Golden Meadows Camp – Revision 1" and Supporting Documentation.

5. IDAPA. 2009. "Wastewater Rules." Idaho Administrative Code. IDAPA 58.01.16

6. Midas Gold, Inc. December 2012. "Preliminary Engineering Report for the Public Wastewater System and Private Municipal Wastewater Treatment Plant and Golden Meadows Camp."

7. California Department of Public Health, Division of Drinking Water and Environmental Health. October 2012. *Alternative Treatment Technology Report for Recycled Water*.

8. Kimberly Research and Extension Center, University of Idaho, Moscow, Idaho. "Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho (ETIdaho2012)." *http://data.kimberly.uidaho.edu/ETIdaho/*. Accessed numerous times, 2012 and 2013.

9. DEQ (Idaho Department of Environmental Quality). September 2007. *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater*.

10. DEQ (Idaho Department of Environmental Quality). July 2012. "Draft Guidance for Forested/Poplar Site Nutrient and Hydraulic Loading."

11. Charles H. Lander, David Moffitt, and Klaus Alt. February 1998. "Nutrients Available from Livestock Manure Relative to Crop Growth Requirements," Appendix I, "Nutrient Uptake and Removal." Resource Assessment and Strategic Planning Working Paper 98-1, U.S. Department of Agriculture, National Resource Conservation Service. *http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/rca/?&cid=nrcs143_014175*.

APPENDICES

Appendix A

Recycled Water Permit Application and Engineering Report

- Topo and Wetlands Map
- Figure 1-1 – Vicinity Map
- Figure 1-2 – Proposed Camp Facilities and Borrow Area
- Figure 3-1 – Project Soils (Forest Land Types)
- Figure 3-2 – Surface Water Features

Appendix B

Additional Information for Recycled Water Permit Application and Engineering Report

- Figure 2 – West End Prospect
- Figure 3 – Yellow Pine Prospect
- Figure 4 – Hanger Flats Prospect
- Figure 5 – Camp Area Prospect
- Reclamation Photos – Photo 1
- Reclamation Photos – Photo 2
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Appendix C

Revision 1 of the Wastewater Facility Plan

- Figure 4 – Identified Wetlands

Appendix D

Wastewater Preliminary Engineering Report

- Appendix F – Process Flow Diagram

Appendix E

Recycled Water Water Balance Spreadsheets

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Recycled Water Permit Application and Engineering Report

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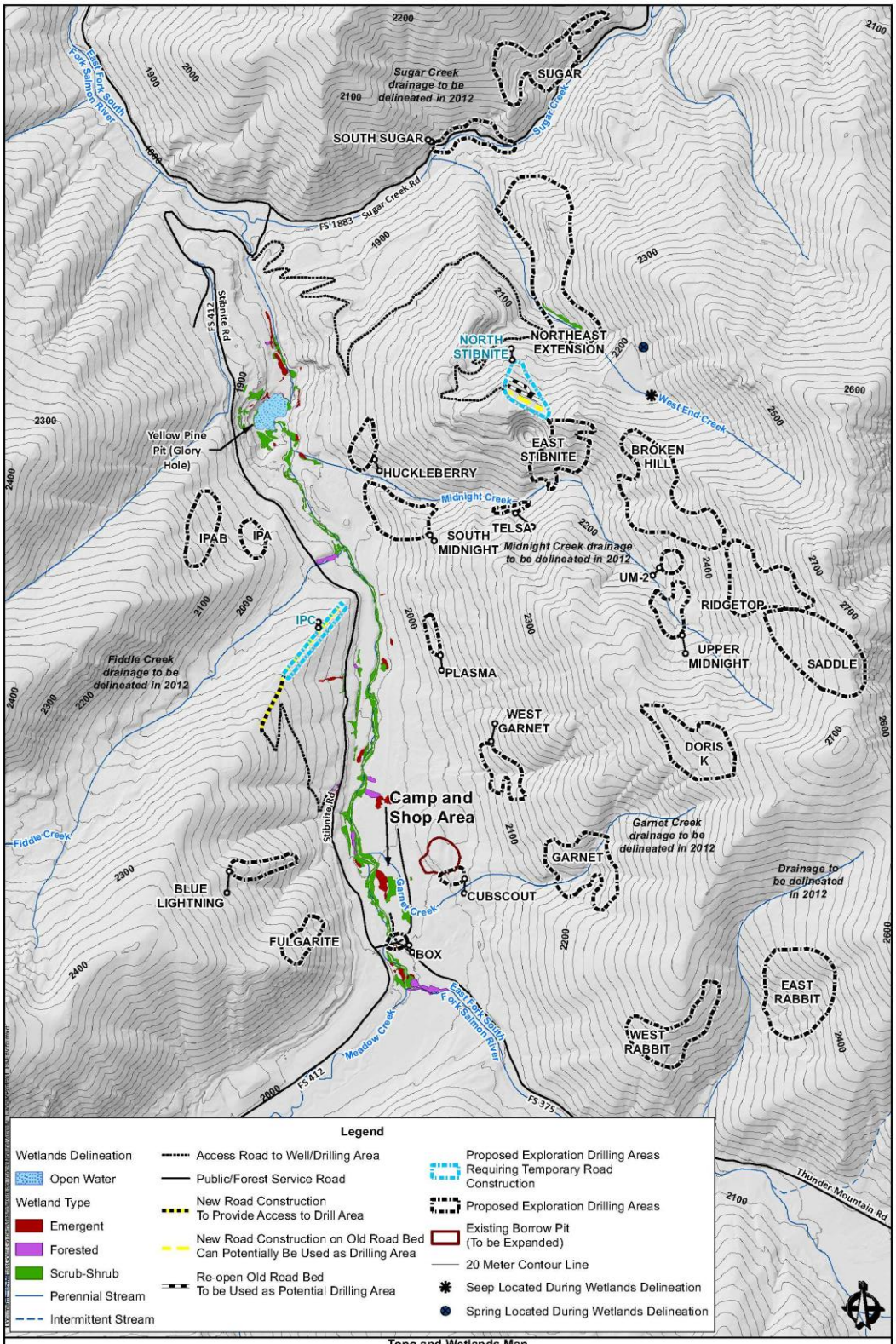


Imagery: 2011 NAIP 1 meter resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: Bureau of Land Management (BLM); US Census Bureau; Payette National Forest

Map Date: March, 2012
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Topo and Wetlands Map
Recycled Water Permit Application - Engineering Report
Golden Meadows Project

Note: Wetlands delineation conducted in August through September, 2011. The delineation was not completed for all the areas that are part of the proposed action area.

0 1,400 2,800
Feet

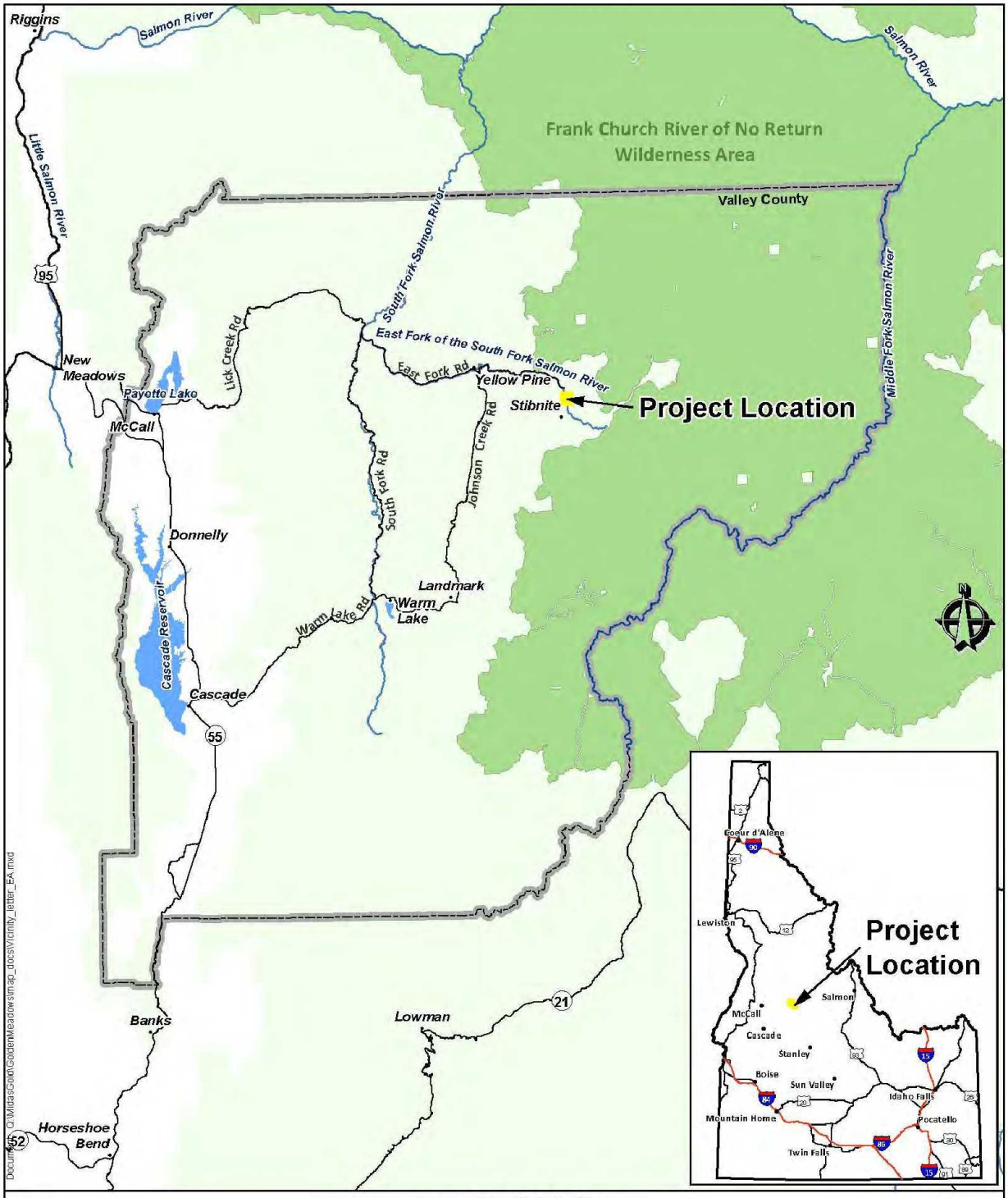
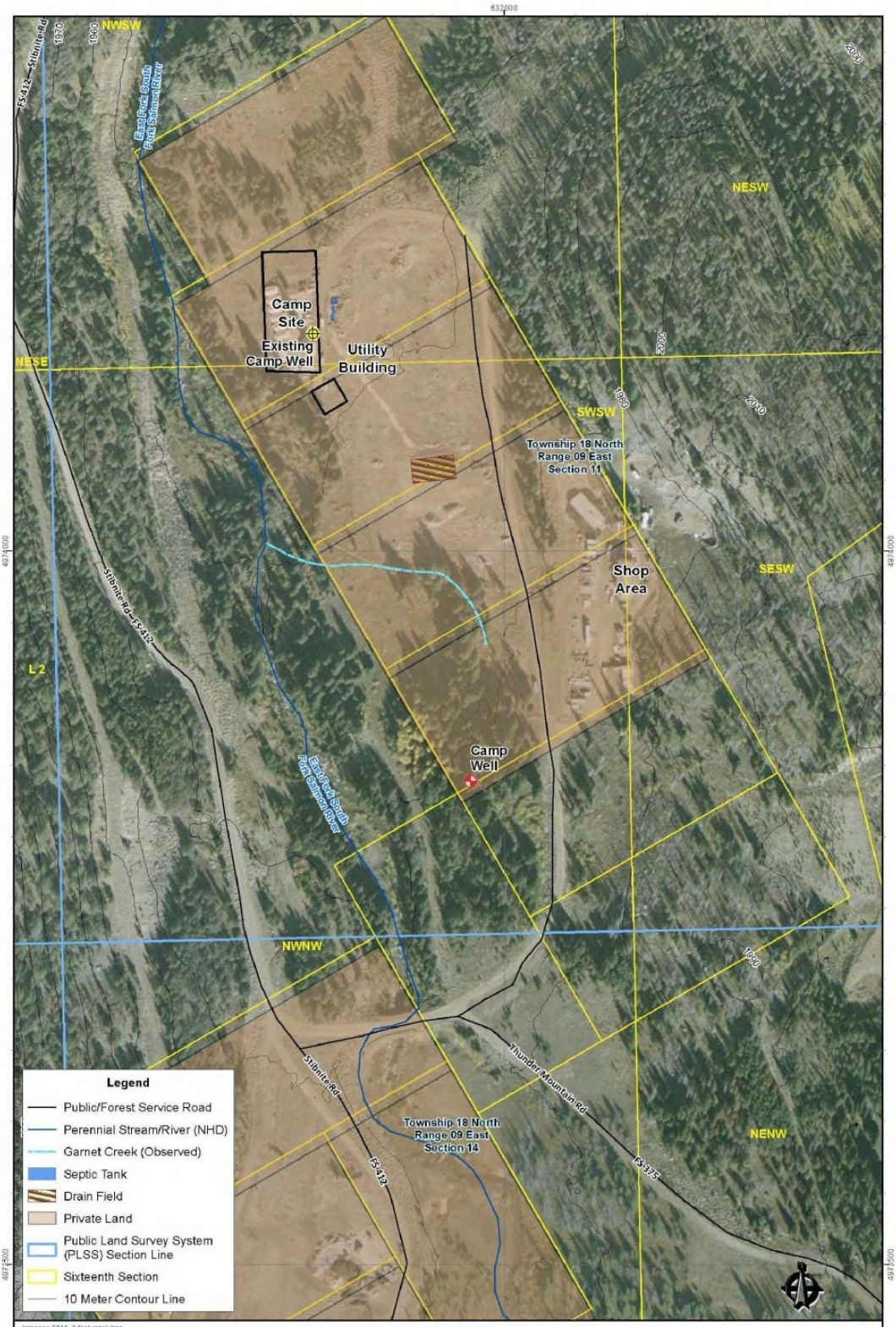


Figure 1-1. Vicinity Map
Recycled Water Permit Application - Engineering Report
Golden Meadows Project

Data Sources: USGS; BLM; State of Idaho Geospatial Clearinghouse (INSIDE Idaho); US Census Bureau; Payette National Forest; Midas Gold

Map Date: January, 2012
NAD 83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

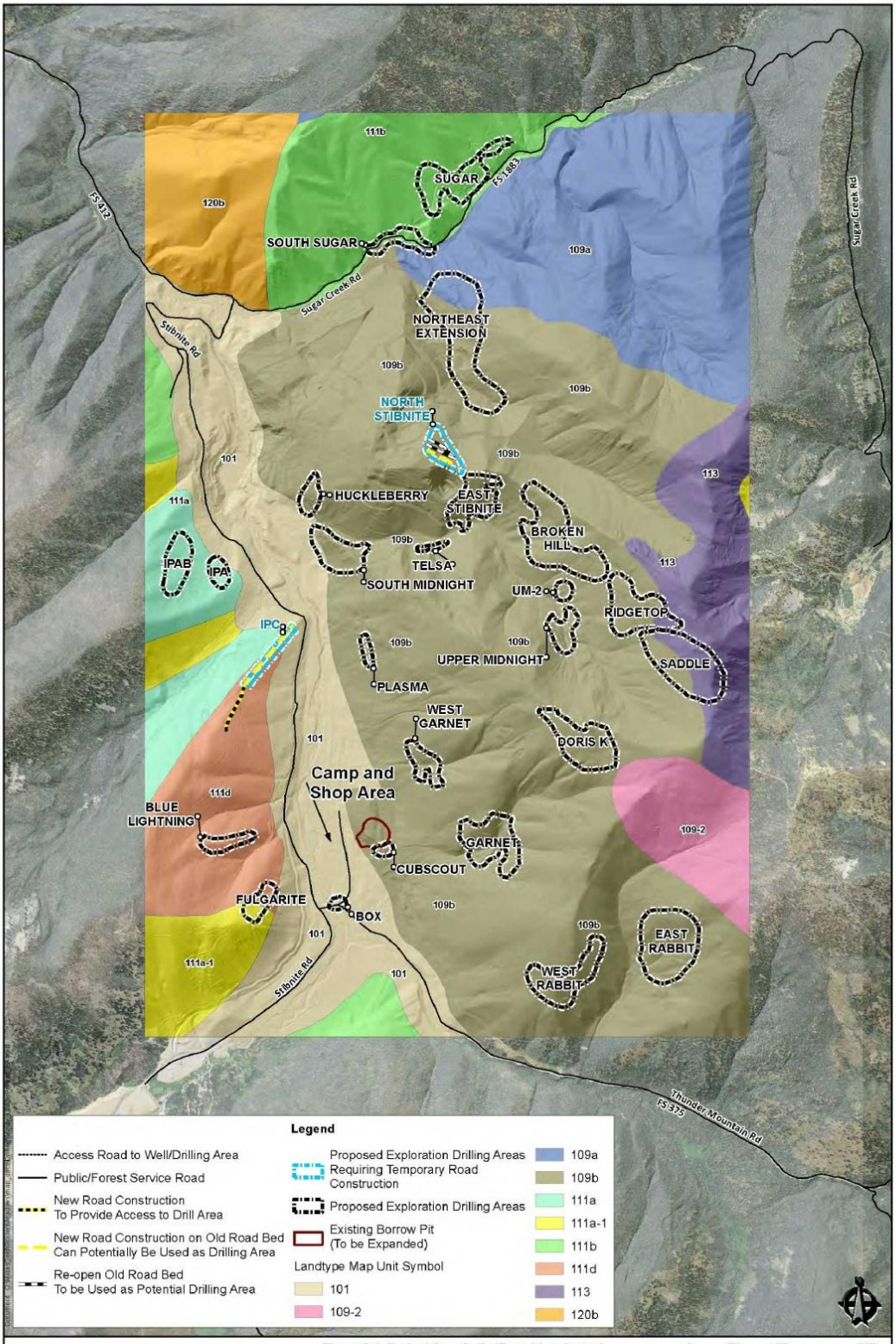
0 5 10
Miles



Imagery: 2011 1 foot resolution
Source: Midas Gold, Inc.
Topography: From LiDAR/Imagery flight, Flown June, 2009; C.I. = 2m;
Imagery Resolution = 1/3 m
Source: Midas Gold
Other Data Sources: Bureau of Land Management (BLM); USGS; Payette National Forest

Map Date: March, 2012
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 1-2. Proposed Camp Facilities and Borrow Area
Recycled Water Permit Application - Engineering Report
Golden Meadows Project



Imagery: 2011 NAIP 1 meter resolution - USDA/NRCS Digital Gateway
Topography: From LiDAR/Imagery flight, Flown June, 2009, C.I. = 2m; Source: Midas Gold
Other Data Sources: Bureau of Land Management (BLM), US Census Bureau, Payette National Forest (soils - landtype dataset)

Map Date: March, 2012
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 3-1. Project Area Soils (Forest Landtypes)
Recycled Water Permit Application - Engineering Report
Golden Meadows Project

0 850 1,700 3,400
Feet

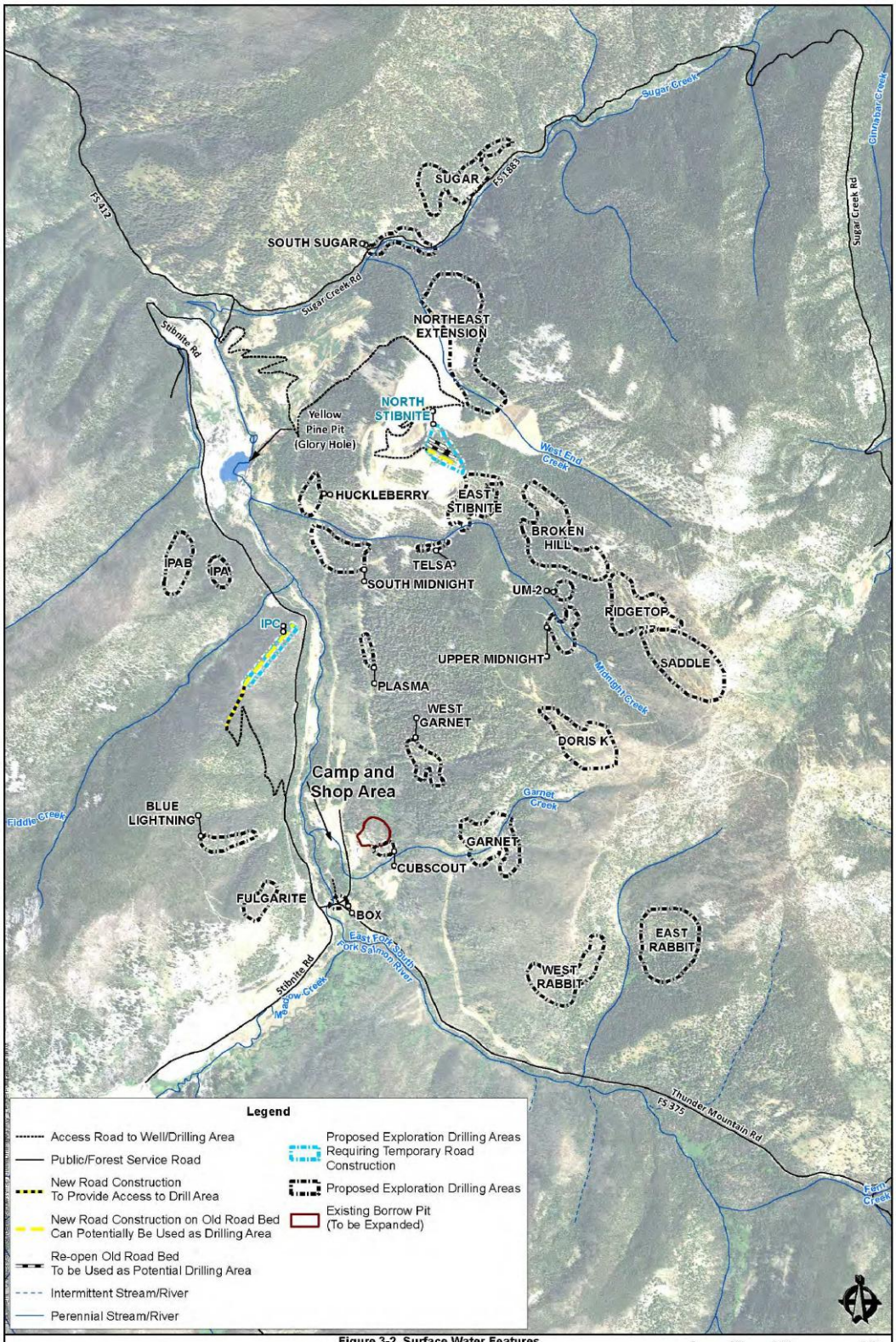


Figure 3-2. Surface Water Features
Recycled Water Permit Application - Engineering Report
Golden Meadows Project

Imagery: 2011 1 foot resolution
Source: Midas Gold, Inc.
Other Data Sources: Bureau of Land Management (BLM); US Census Bureau; Payette National Forest; USGS

Map Date: March, 2012
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

APPENDIX B

Additional Information for Recycled Water Permit Application and Engineering Report

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- Reclamation Photos – Photo 3
- IWR Table

Map Date: June, 2012

Imagery: June 2011 1/3 meter resolution
Topography: From LiDAR/Imagery flight, Flown June, 2009;
C.I. = 2m; Imagery Resolution = 1/3 m
Source: Midas Gold

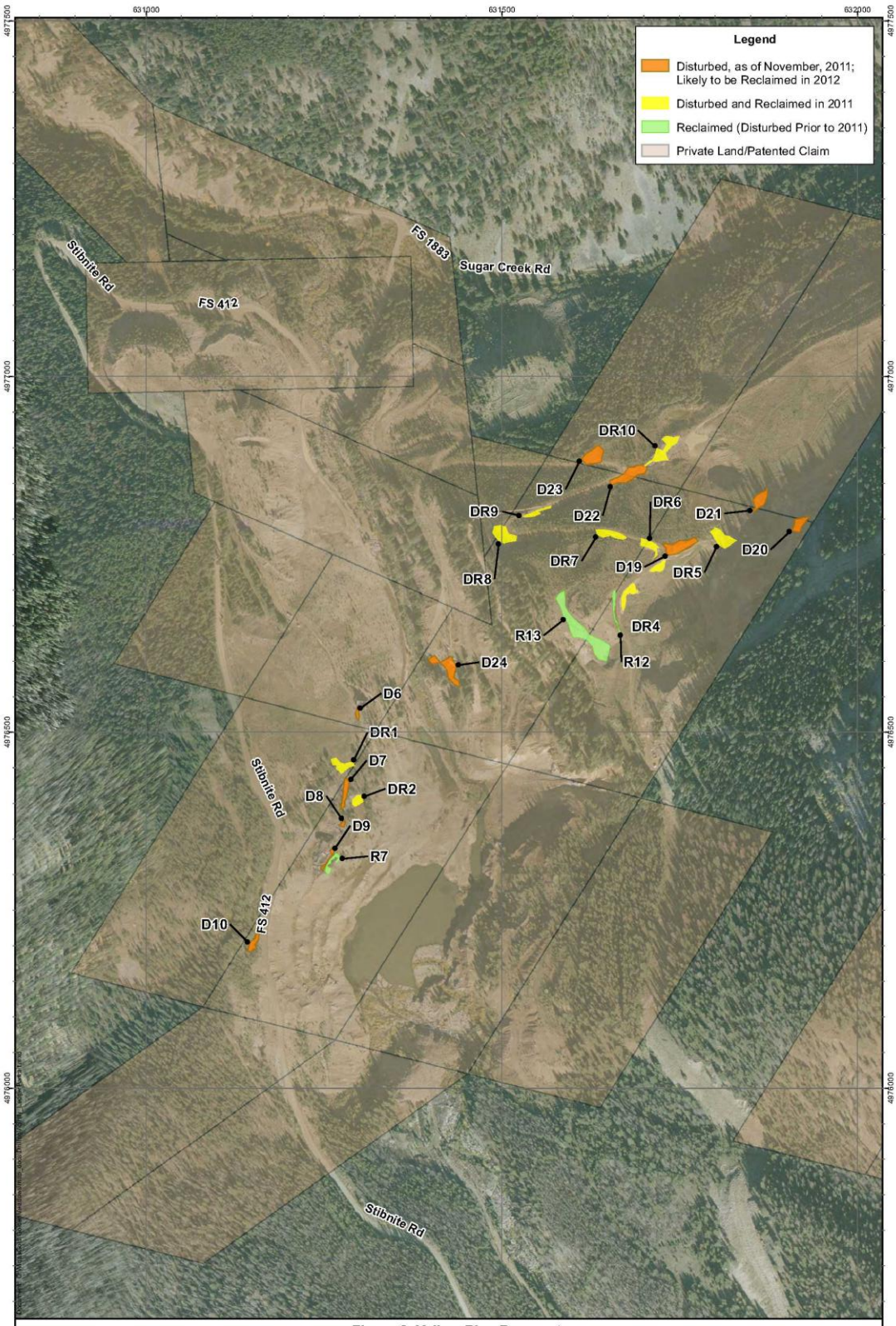
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 2. West End Prospect
Midas Gold, Golden Meadows

Note: Map reflects disturbance through mid-November, 2011

0 50 100
Meters

0 200 400
Feet



Map Date: June, 2012

Imagery: June 2011 1/3 meter resolution
Topography: From LIDAR/Imagery flight, Flown June, 2009;
C.I. = 2m; Imagery Resolution = 1/3 m
Source: Midas Gold

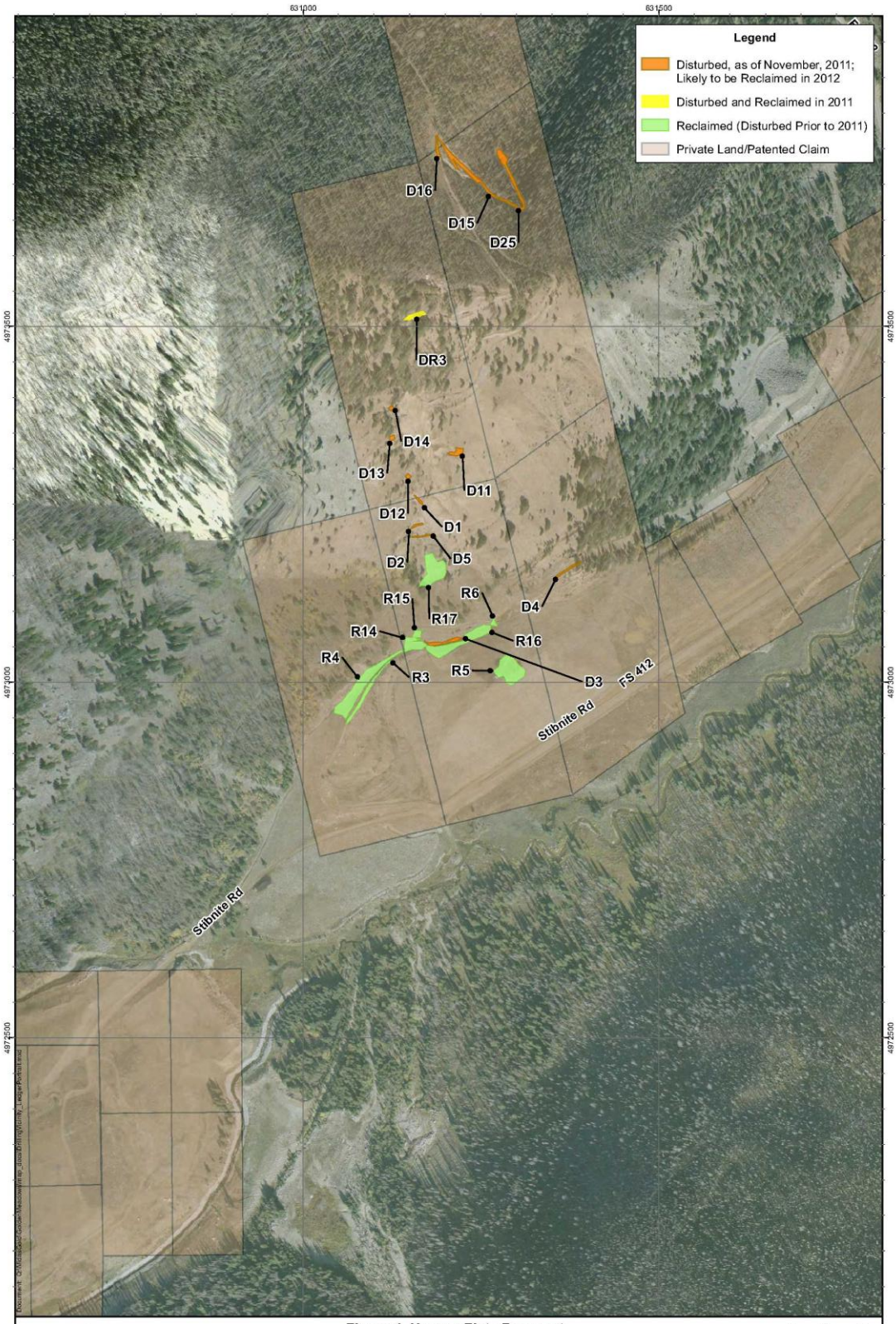
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 3. Yellow Pine Prospect
Midas Gold, Golden Meadows

Note: Map reflects disturbance through mid-November, 2011

0 50 100
Meters

0 200 400
Feet



Map Date: June, 2012

Imagery: June 2011 1/3 meter resolution
Topography: From LIDAR/Imagery flight, Flown June, 2009;
C.I. = 2m; Imagery Resolution = 1/3 m
Source: Midas Gold

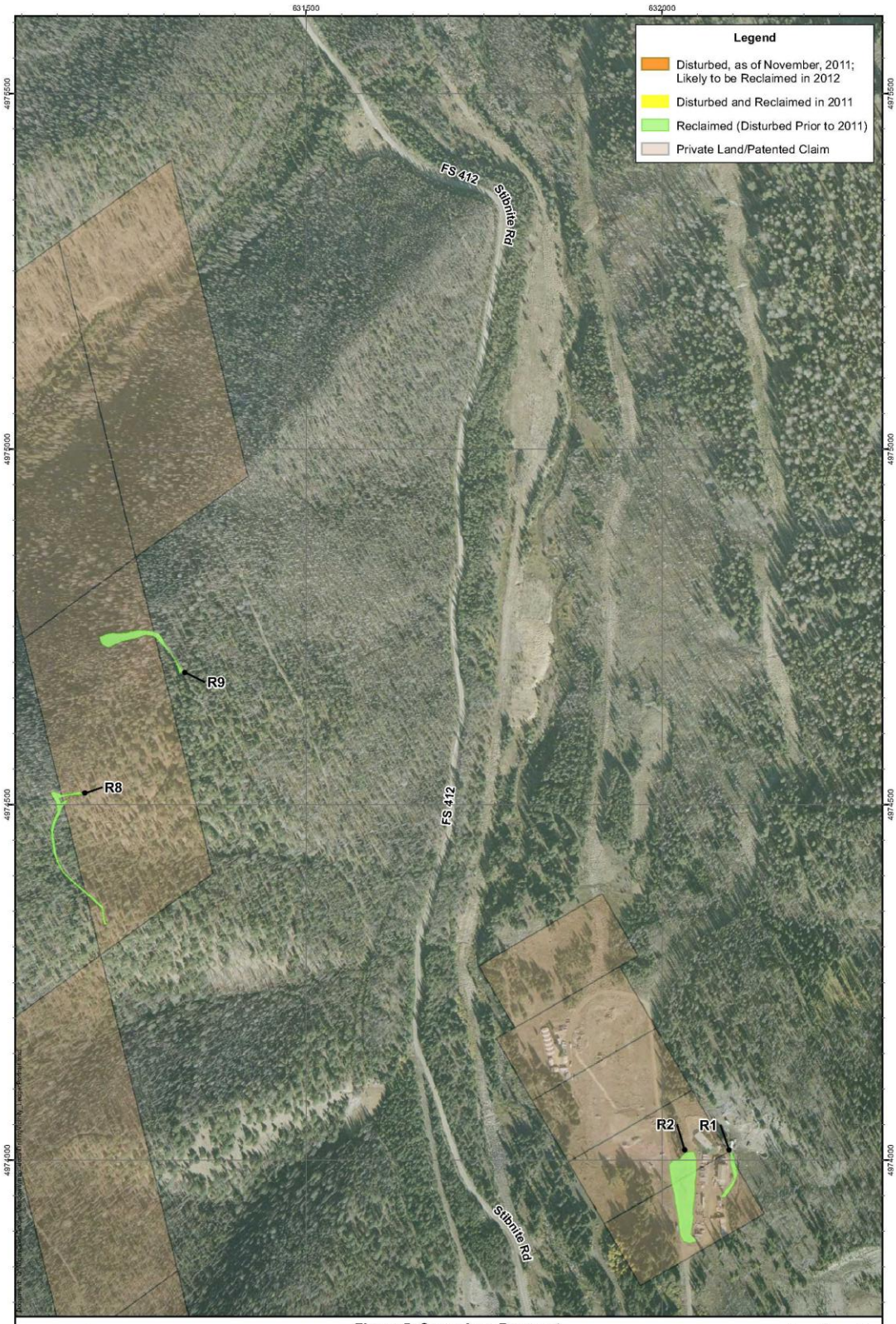
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 4. Hangar Flats Prospect
Midas Gold, Golden Meadows

Note: Map reflects disturbance through mid-November, 2011

0 50 100
Meters

0 200 400
Feet



Map Date: June, 2012

Imagery: June 2011 1/3 meter resolution
Topography: From LIDAR/Imagery flight, Flown June, 2009;
C.I. = 2m; Imagery Resolution = 1/3 m
Source: Midas Gold

NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 5. Camp Area Prospect
Midas Gold, Golden Meadows

Note: Map reflects disturbance through mid-November, 2011

0 50 100
Meters

0 200 400
Feet

Reclamation Photo 1 – Hydroseeding

Reclamation Photo 2 – Example of a typical MGI reclamation irrigation arrangement at the Golden Meadows Project

Reclamation Photo 3 – Example of hand moved irrigation laterals with sprinkler risers at a typical MGI reclamation site

Midas Gold Recyled Permit Application
ET Estimates

Station **105708 McCall**

Ei		0.75	hand sets		
Crop	Grass Pasture Low Management	Pdef (mean)	Pdef	IWR	Scenero 1 for established reclaimed site with reclamation grasses. Assume pasture grass low management for Etidaho
Irrigation Flagged	1	(mm/day)	(in/mo)	(in/mo)	
May		0.92	1.11228	1.48304	
Jun		2.88	3.3696	4.4928	
Jul		4.19	5.06571	6.75428	
Aug		3.54	4.27986	5.70648	
Sep		1.22	1.47498	1.96664	
				20.40324	

Ei		0.75	hand sets		
Crop	Grass Pasture Low Management	Pdef (80% Exceed	Pdef	IWR	Scenario 2 for new reclaimed site, 1st year growth, used 80% Exceed for Pdef, assume IWR would be lower than established reclaimed area
Irrigation Flagged	1	(mm/day)	(in/mo)	(in/mo)	
May		0.23	0.27807	0.37076	
Jun		1.85	2.1645	2.886	
Jul		3.43	4.14687	5.52916	
Aug		2.84	3.43356	4.57808	
Sep		0	0	0	
				13.364	

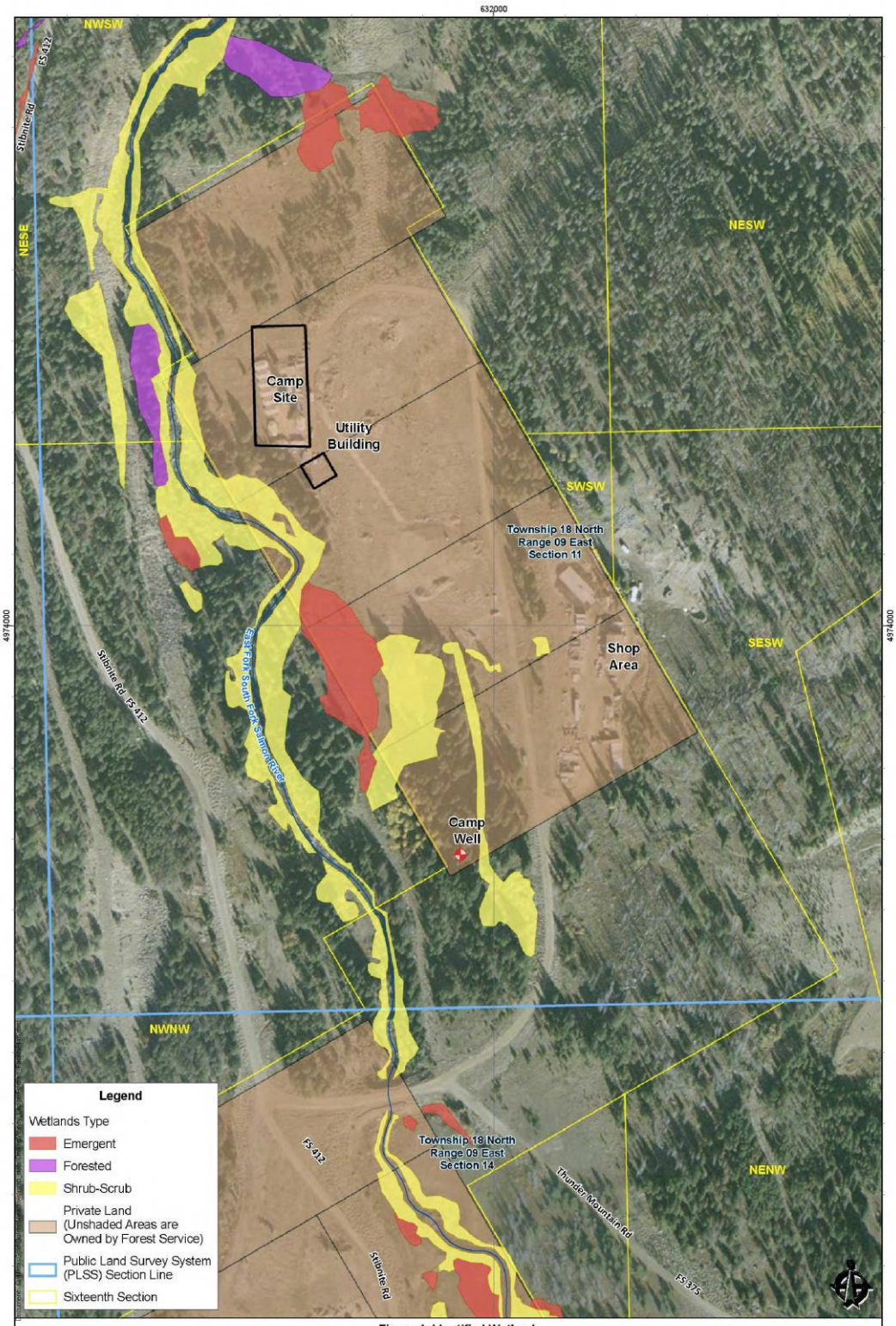
Ei		0.75	hand sets		
Crop	Poplar Trees 3rd year (0.5*Pdef)	Pdef	Pdef	IWR	Scenario 3 - For tree irrigation assuming no understory and assume stand 1/2 that of poplar trees in ETIdaho
Irrigation Flagged	1	(mm/day)	(in/mo)	(in/mo)	
May		0.21	0.25389	0.33852	
Jun		1.72	2.0124	2.6832	
Jul		3.26	3.94134	5.25512	
Aug		2.74	3.31266	4.41688	
Sep		1.00	1.209	1.612	
				14.30572	

Ei		0.75	hand sets		
Crop	Trees with understory	Pdef	Pdef	IWR	Scenario 4 - Grass understory with trees reclamatino area, assumes 50:50 from scenarios 1 and 3.
Irrigation Flagged	1	(mm/day)	(in/mo)	(in/mo)	
May	(50:50 with pasture grass)	0.565	0.683085	0.91078	
Jun		2.3	2.691	3.588	
Jul		3.725	4.503525	6.0047	
Aug		3.14	3.79626	5.06168	
Sep		1.11	1.34199	1.78932	
				17.35448	

APPENDIX C

Revision 1 of the Wastewater Facility Plan

- Figure 4 – Identified Wetlands



Imagery: 2011 1/3 meter resolution
Source: Midas Gold, Inc.
Other Data Sources: Bureau of Land Management (BLM), US Census Bureau, Payette National Forest, USGS, HDR Engineering, Inc.

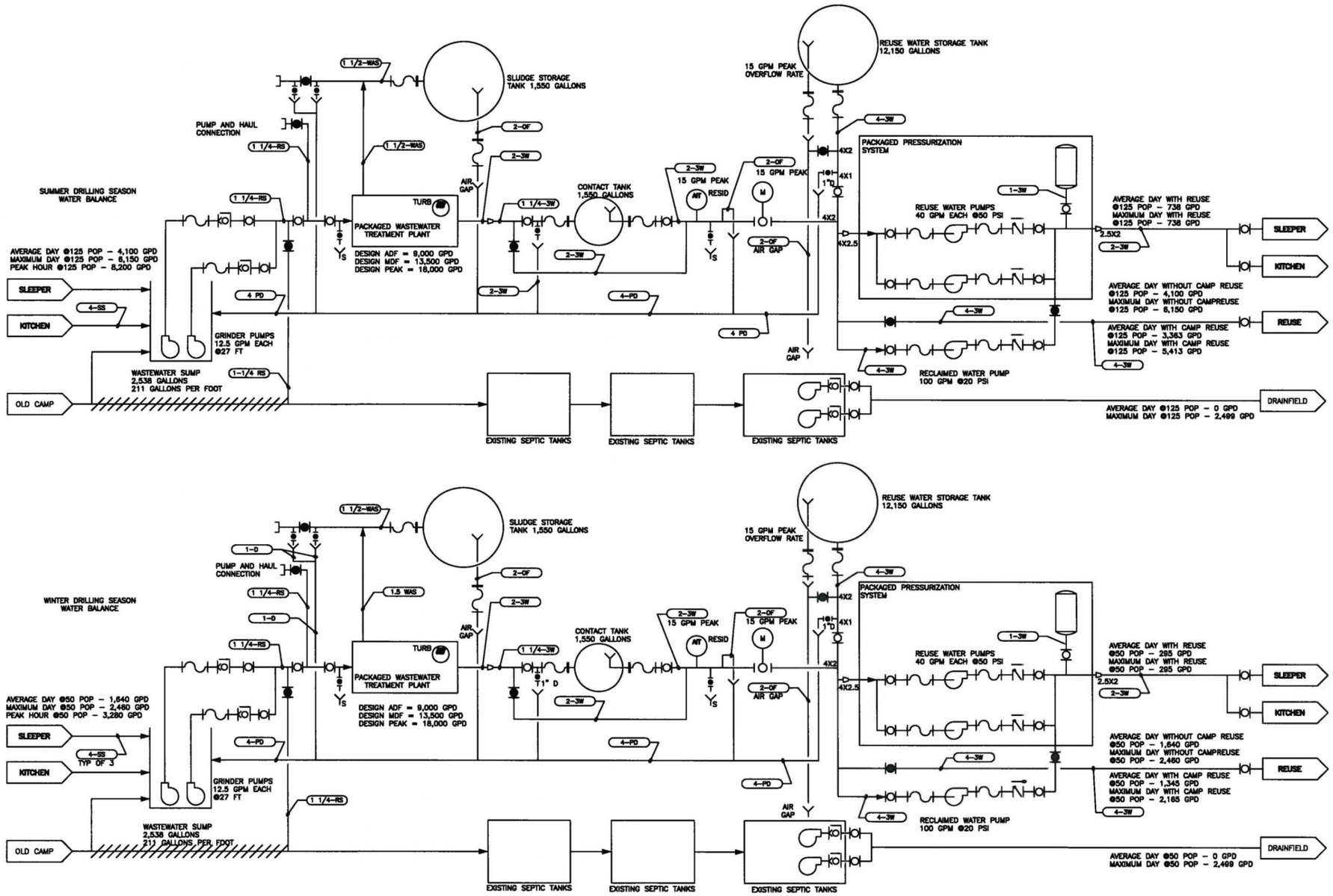
Map Date: March, 2012
NAD83, UTM 11N, Horizontal and Vertical Units are Meters, North is UTM Grid North

Figure 4. Identified Wetlands
Facility Plan for the Public Waste Water System
and Private Municipal Waste Water Treatment Plant
at Golden Meadows Camp, Idaho
Note: Wetlands delineation conducted in August through September 2011.

APPENDIX D

Wastewater Preliminary Engineering Report

- Appendix F – Process Flow Diagram



MIDAS GOLD

MIDAS GOLD INC.
405 S. 8TH STREET, STE. 201
BOISE, IDAHO 83702

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: H. FENSKE
DWN BY: E. SWING
CKD BY: C. CLAYWATER
PLOT SCALE:
PLOT DATE: 11/28/2012
DATE: 11/28/2012
HDR PROJECT NUMBER: 189063
SIZE: ANSI B

HDR

HDR ENGINEERING INC.
412 E. PARKCENTER BLVD.
BOISE, ID 83706

GOLDEN MEADOWS PROJECT
CITY OF CASCADE, IDAHO
WWTP AND REUSE FACILITY

PROCESS FLOW DIAGRAM AND WATER BALANCE

SHEET
P-1

APPENDIX E

Recycled Water Water Balance Spreadsheets

M-228-01 MIDAS GOLD WWRU PERMIT

Reuse Water Balance

Wastewater Generated

Summer = May - Sep; Winter = Oct - Apr

Month	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		ANNUAL
GPCD	32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		
Population (people)	50		50		50		50		125		125		125		125		125		50		50		50		
	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	**(gal)**
ADF	1,640	50,840	1,640	45,920	1,640	50,840	1,640	49,200	4,100	127,100	4,100	123,000	4,100	127,100	4,100	127,100	4,100	123,000	1,640	50,840	1,640	49,200	1,640	50,840	974,980
Max Day Flow (PF = 1.5)	2,460	76,260	2,460	68,880	2,460	76,260	2,460	73,800	6,150	190,650	6,150	184,500	6,150	190,650	6,150	190,650	6,150	184,500	2,460	76,260	2,460	73,800	2,460	76,260	1,462,470
PHF (PF = 2.0)	3,280	101,680	3,280	91,840	3,280	101,680	3,280	98,400	8,200	254,200	8,200	246,000	8,200	254,200	8,200	254,200	8,200	246,000	3,280	101,680	3,280	98,400	3,280	101,680	1,949,960
Max Mo Flow	2,000	62,000	2,000	56,000	2,000	62,000	2,000	60,000	4,900	151,900	4,900	147,000	4,900	151,900	4,900	151,900	4,900	147,000	2,000	62,000	2,000	60,000	2,000	62,000	1,173,700

Wastewater Reuse

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Low Flow Toilets (Q = 1.6 gpf; 3.7 flushes/d/capita)	296	9,176	296	8,288	296	9,176	296	8,880	740	22,940	740	22,200	740	22,940	740	22,940	740	22,200	296	9,176	296	8,880	296	9,176	175,972
Dust Control (3 days/week)	0	0	0	0	0	0	0	0	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	0	0	0	0	0	0	240,000
Reclamation	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	
Irrigation (10 acres)	0	0	0	0	0	0	0	0	0.847	230,063	1.847	501,534	3.975	1,079,177	3.245	880,991	0.771	209,292	0	0	0	0	0	0	2,901,056
Hydroseeding		0		0		0		0		6,800		6,800		6,800		6,800		6,800		0		0		0	
Reclamation Total		0		0		0		0		236,863		508,334		1,085,977		887,791		216,092		0		0		0	2,901,056
TOTAL		9,176		8,288		9,176		8,880		307,803		578,534		1,156,917		958,731		286,292		9,176		8,880		9,176	3,317,028

REUSE: CAMP REUSE (TOILETS), RECLAMATION, & DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**41,664**		**37,632**		**41,664**		**40,320**		(180,703)		(455,534)		(1,029,817)		(831,631)		(163,292)		**41,664**		**40,320**		**41,664**	(2,342,048)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		0		0		0		0		0		0		0		0	0

REUSE: CAMP REUSE (TOILETS), & RECLAMATION, NO DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**41,664**		**37,632**		**41,664**		**40,320**		(132,703)		(407,534)		(981,817)		(783,631)		(115,292)		**41,664**		**40,320**		**41,664**	(2,102,048)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		0		0		0		0		0		0		0		0	0

REUSE: CAMP REUSE (TOILETS), & DUST CONTROL, NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**41,664**		**37,632**		**41,664**		**40,320**		**56,160**		**52,800**		**56,160**		**56,160**		**52,800**		**41,664**		**40,320**		**41,664**	**559,008**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		0		0		0		0		0		0		0		0	0

REUSE: CAMP REUSE (TOILETS), NO DUST CONTROL, & NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**41,664**		**37,632**		**41,664**		**40,320**		**104,160**		**100,800**		**104,160**		**104,160**		**100,800**		**41,664**		**40,320**		**41,664**	**799,008**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		**26,691**		**23,331**		**26,691**		**26,691**		**23,331**		0		0		0	0

M-228-01 MIDAS GOLD WWRU PERMIT
Reuse Water Balance

Wastewater Generated
Summer = May - Sep; Winter = Oct - Apr

Month	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		ANNUAL
GPCD	32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		
Population (people)	50		50		50		50		125		125		125		125		125		50		50		50		
	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	**(gal)**
ADF	1,640	50,840	1,640	45,920	1,640	50,840	1,640	49,200	4,100	127,100	4,100	123,000	4,100	127,100	4,100	127,100	4,100	123,000	1,640	50,840	1,640	49,200	1,640	50,840	974,980
Max Day Flow (PF = 1.5)	2,460	76,260	2,460	68,880	2,460	76,260	2,460	73,800	6,150	190,650	6,150	184,500	6,150	190,650	6,150	190,650	6,150	184,500	2,460	76,260	2,460	73,800	2,460	76,260	1,462,470
PHF (PF = 2.0)	3,280	101,680	3,280	91,840	3,280	101,680	3,280	98,400	8,200	254,200	8,200	246,000	8,200	254,200	8,200	254,200	8,200	246,000	3,280	101,680	3,280	98,400	3,280	101,680	1,949,960
Max Mo Flow	2,000	62,000	2,000	56,000	2,000	62,000	2,000	60,000	4,900	151,900	4,900	147,000	4,900	151,900	4,900	151,900	4,900	147,000	2,000	62,000	2,000	60,000	2,000	62,000	1,173,700

Wastewater Reuse

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Low Flow Toilets (Q = 1.6 gpf; 3.7 flushes/d/capita)	296	9,176	296	8,288	296	9,176	296	8,880	740	22,940	740	22,200	740	22,940	740	22,940	740	22,200	296	9,176	296	8,880	296	9,176	175,972
Dust Control (3 days/week)	0	0	0	0	0	0	0	0	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	0	0	0	0	0	0	240,000
Reclamation	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	
Irrigation (10 acres)	0	0	0	0	0	0	0	0	0.847	230,063	1.847	501,534	3.975	1,079,177	3.245	880,991	0.771	209,292	0	0	0	0	0	0	2,901,056
Hydroseeding		0		0		0		0		6,800		6,800		6,800		6,800		6,800		0		0		0	
Reclamation Total		0		0		0		0		236,863		508,334		1,085,977		887,791		216,092		0		0		0	2,901,056
TOTAL		9,176		8,288		9,176		8,880		307,803		578,534		1,156,917		958,731		286,292		9,176		8,880		9,176	3,317,028

REUSE: RECLAMATION, & DUST CONTROL, NO CAMP REUSE (TOILETS)

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**50,840**		**45,920**		**50,840**		**49,200**		(157,763)		(433,334)		(1,006,877)		(808,691)		(141,092)		**50,840**		**49,200**		**50,840**	(2,166,076)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		0		0		0		0		0		0		0		0	0

REUSE: RECLAMATION, & NO CAMP REUSE (TOILETS), & NO DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**50,840**		**45,920**		**50,840**		**49,200**		(109,763)		(385,334)		(958,877)		(760,691)		(93,092)		**50,840**		**49,200**		**50,840**	(1,926,076)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		0		0		0		0		0		0		0		0	0

REUSE: DUST CONTROL , NO CAMP REUSE (TOILETS), & NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (ADF)		**50,840**		**45,920**		**50,840**		**49,200**		**79,100**		**75,000**		**79,100**		**79,100**		**75,000**		**50,840**		**49,200**		**50,840**	**734,980**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (ADF)		0		0		0		0		**1,631**		0		**1,631**		**1,631**		0		0		0		0	0

M-228-01 MIDAS GOLD WWRU PERMIT
Reuse Water Balance

Max Mo Flow

Wastewater Generated
Summer = May - Sep; Winter = Oct - Apr

Month	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		ANNUAL
GPCD	32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		
Population (people)	50		50		50		50		125		125		125		125		125		50		50		50		
	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	**(gal)**
ADF	1,640	50,840	1,640	45,920	1,640	50,840	1,640	49,200	4,100	127,100	4,100	123,000	4,100	127,100	4,100	127,100	4,100	123,000	1,640	50,840	1,640	49,200	1,640	50,840	**974,980**
Max Day Flow (PF = 1.5)	2,460	76,260	2,460	68,880	2,460	76,260	2,460	73,800	6,150	190,650	6,150	184,500	6,150	190,650	6,150	190,650	6,150	184,500	2,460	76,260	2,460	73,800	2,460	76,260	1,462,470
PHF (PF = 2.0)	3,280	101,680	3,280	91,840	3,280	101,680	3,280	98,400	8,200	254,200	8,200	246,000	8,200	254,200	8,200	254,200	8,200	246,000	3,280	101,680	3,280	98,400	3,280	101,680	1,949,960
Max Mo Flow	**2,000**	**62,000**	**2,000**	**56,000**	**2,000**	**62,000**	**2,000**	**60,000**	**4,900**	**151,900**	**4,900**	**147,000**	**4,900**	**151,900**	**4,900**	**151,900**	**4,900**	**147,000**	**2,000**	**62,000**	**2,000**	**60,000**	**2,000**	**62,000**	1,173,700

Wastewater Reuse

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Low Flow Toilets (Q = 1.6 gpf; 3.7 flushes/d/capita)	296	9,176	296	8,288	296	9,176	296	8,880	740	22,940	740	22,200	740	22,940	740	22,940	740	22,200	296	9,176	296	8,880	296	9,176	175,972
Dust Control (3 days/week)	0	0	0	0	0	0	0	0	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	0	0	0	0	0	0	240,000
Reclamation	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	
Irrigation (10 acres)	0	0	0	0	0	0	0	0	0.847	230,063	1.847	501,534	3.975	1,079,177	3.245	880,991	0.771	209,292	0	0	0	0	0	0	2,901,056
Hydroseeding		0		0		0		0		6,800		6,800		6,800		6,800		6,800		0		0		0	
Reclamation Total		0		0		0		0		236,863		508,334		1,085,977		887,791		216,092		0		0		0	2,901,056
TOTAL		9,176		8,288		9,176		8,880		307,803		578,534		1,156,917		958,731		286,292		9,176		8,880		9,176	3,317,028

REUSE: CAMP REUSE (TOILETS), RECLAMATION, & DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**52,824**		**47,712**		**52,824**		**51,120**		(155,903)		(431,534)		(1,005,017)		(806,831)		(139,292)		**52,824**		**51,120**		**52,824**	(2,143,328)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		0		0		0		0		0		0		0		0	0

(Note: ANNUAL uses ADF)

REUSE: CAMP REUSE (TOILETS), & RECLAMATION, NO DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**52,824**		**47,712**		**52,824**		**51,120**		(107,903)		(383,534)		(957,017)		(758,831)		(91,292)		**52,824**		**51,120**		**52,824**	(2,102,048)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		0		0		0		0		0		0		0		0	0

(Note: ANNUAL uses ADF)

REUSE: CAMP REUSE (TOILETS), & DUST CONTROL, NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**52,824**		**47,712**		**52,824**		**51,120**		**80,960**		**76,800**		**80,960**		**80,960**		**76,800**		**52,824**		**51,120**		**52,824**	**559,008**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		**3,491**		0		**3,491**		**3,491**		0		0		0		0	0

(Note: ANNUAL uses ADF)

REUSE: CAMP REUSE (TOILETS), NO DUST CONTROL, & NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**52,824**		**47,712**		**52,824**		**51,120**		**128,960**		**124,800**		**128,960**		**128,960**		**124,800**		**52,824**		**51,120**		**52,824**	**799,008**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		**51,491**		**47,331**		**51,491**		**51,491**		**47,331**		0		0		0	0

(Note: ANNUAL uses ADF)

M-228-01 MIDAS GOLD WWRU PERMIT
Reuse Water Balance

Max Mo Flow

Wastewater Generated
Summer = May - Sep; Winter = Oct - Apr

Month	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		ANNUAL
GPCD	32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		32.80		
Population (people)	50		50		50		50		125		125		125		125		125		50		50		50		
	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	**(gal)**
ADF	1,640	50,840	1,640	45,920	1,640	50,840	1,640	49,200	4,100	127,100	4,100	123,000	4,100	127,100	4,100	127,100	4,100	123,000	1,640	50,840	1,640	49,200	1,640	50,840	**974,980**
Max Day Flow (PF = 1.5)	2,460	76,260	2,460	68,880	2,460	76,260	2,460	73,800	6,150	190,650	6,150	184,500	6,150	190,650	6,150	190,650	6,150	184,500	2,460	76,260	2,460	73,800	2,460	76,260	1,462,470
PHF (PF = 2.0)	3,280	101,680	3,280	91,840	3,280	101,680	3,280	98,400	8,200	254,200	8,200	246,000	8,200	254,200	8,200	254,200	8,200	246,000	3,280	101,680	3,280	98,400	3,280	101,680	1,949,960
Max Mo Flow	**2,000**	**62,000**	**2,000**	**56,000**	**2,000**	**62,000**	**2,000**	**60,000**	**4,900**	**151,900**	**4,900**	**147,000**	**4,900**	**151,900**	**4,900**	**151,900**	**4,900**	**147,000**	**2,000**	**62,000**	**2,000**	**60,000**	**2,000**	**62,000**	1,173,700

Wastewater Reuse

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Low Flow Toilets (Q = 1.6 gpf; 3.7 flushes/d/capita)	296	9,176	296	8,288	296	9,176	296	8,880	740	22,940	740	22,200	740	22,940	740	22,940	740	22,200	296	9,176	296	8,880	296	9,176	175,972
Dust Control (3 days/week)	0	0	0	0	0	0	0	0	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	4,000	48,000	0	0	0	0	0	0	240,000
Reclamation	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	in/mo	gal/mo	
Irrigation (10 acres)	0	0	0	0	0	0	0	0	0.847	230,063	1.847	501,534	3.975	1,079,177	3.245	880,991	0.771	209,292	0	0	0	0	0	0	2,901,056
Hydroseeding		0		0		0		0		6,800		6,800		6,800		6,800		6,800		0		0		0	
Reclamation Total		0		0		0		0		236,863		508,334		1,085,977		887,791		216,092		0		0		0	2,901,056
TOTAL		9,176		8,288		9,176		8,880		307,803		578,534		1,156,917		958,731		286,292		9,176		8,880		9,176	3,317,028

REUSE: RECLAMATION, & DUST CONTROL, NO CAMP REUSE (TOILETS)

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**62,000**		**56,000**		**62,000**		**60,000**		(132,963)		(409,334)		(982,077)		(783,891)		(117,092)		**62,000**		**60,000**		**62,000**	(2,166,076)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		0		0		0		0		0		0		0		0	0

(Note: ANNUAL uses ADF)

REUSE: RECLAMATION, & NO CAMP REUSE (TOILETS), & NO DUST CONTROL

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**62,000**		**56,000**		**62,000**		**60,000**		(84,963)		(361,334)		(934,077)		(735,891)		(69,092)		**62,000**		**60,000**		**62,000**	(1,926,076)

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		0		0		0		0		0		0		0		0	0

(Note: ANNUAL uses ADF)

REUSE: DUST CONTROL , NO CAMP REUSE (TOILETS), & NO RECLAMATION

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Excess WW Generated (Max Mo)		**62,000**		**56,000**		**62,000**		**60,000**		**103,900**		**99,000**		**103,900**		**103,900**		**99,000**		**62,000**		**60,000**		**62,000**	**734,980**

	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gpd)	(gal/mo)	(gal)
Discharge to Septic System	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	2,499	77,469	929,628

		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)		(gal/mo)	(gal)
Final Excess WW Generated (Max Mo)		0		0		0		0		**26,431**		**21,531**		**26,431**		**26,431**		**21,531**		0		0		0	0

(Note: ANNUAL uses ADF)