PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

750 SE Emigrant Ave., Suite 150
Pendleton, OR 97801
(541) 276-8006
FAX (541) 276-4778
www.healthoregon.org/dwp

March 2, 2020

Jason Thompson, P.E.
SPF Water Engineering, LLC
300 East Mallard Drive, Suite 350
Boise, Idaho 83706

Re: New Public Water System, Plan Review #11-2020, Calico Grassy Mountain Mine, Public Water System ID #4195624
Conditional Approval

Dear Jason:

Thank you for your submittal of plan review information to the Oregon Health Authority's Drinking Water Services (DWS). On February 3, 2020, our office received construction drawings and technical specifications for the project along with water quality sample results, the plan review fee of $825, and a Land Use Compatibility Statement from Malheur County. The proposed project consists of using one existing well, drilling two new wells, construction of a 237,000-gallon raw water reservoir, a chlorination treatment system, an adsorptive media arsenic treatment system, a 13,000-gallon finished/potable water reservoir, booster pumps, and related piping and appurtenances.

Well 3 (PW-4)

The driller's log for Well 3 (MALH 2206) was reviewed by our staff hydrogeologist who found the well's construction **does not** meet Oregon Water Resources Department (OWRD) minimum construction standards, and therefore **is not approved for use**. The following comments were provided:

> The well is sealed with a combination of Portland cement and Volclay (bentonite). The cement seal extends from land surface to a depth of 40 feet below ground surface (bgs) with an adequate amount of sealant. Calculations showed 17 to 23 sacks were needed and 19 were used. The Volclay extends from 5 feet bgs to a depth of 275 feet bgs and an insufficient amount of sealant was used. Calculations showed 123 sacks of bentonite were needed and 40 sacks were used. Oregon Water Resources

> Department (OWRD) well construction standards indicate that unhydrated bentonite shall not be allowed deeper than 200 feet below land surface per OAR 690-210-0340. The well constructor identifies the six and five-eighths inch pipe as a liner. The well should have been properly cased and sealed to a depth of 275 feet with an appropriate grout. The material identified as Volclay is not an approved grout. Based on the lack of bentonite sealant, method of placement, improper casing and unapproved grout material, the well does not meet OWRD well construction standards in OAR 690-210 and is not approved for use as a Public Water System well.

Should the owners decide to reconstruct Well 3 to bring it up to current construction standards, plans must be submitted to DWS for review, and approval must be granted before beginning any work on the well per OAR 333-061-0060.

Wells 4 & 5

The proposed construction of Wells 4 & 5 was reviewed by our staff hydrogeologist who found the following:

> The estimated depth to water-bearing zone is approximately 280 feet bgs (based on well log MALH 2206). The estimated aquifer nature is confined. The estimated depth of casing seal is approximately 260 feet bgs. The casing and seal for the new Wells 4 & 5 will need to extend from land surface to a minimum of five feet into the confining layer immediately overlying the artesian water-bearing zone per OAR 690-210-0140 to -0155. If multiple water-bearing zones are encountered during the drilling process, the static water level (SWL) for each water-bearing zone should be measured to determine if separate aquifers are present. If the SWL changes between water-bearing zones, the well constructor must seal off separate water-bearing zones in order to prevent the commingling of aquifers or loss of artesian pressure.

The plans are approved with the following conditions:

1. Documentation from the Bureau of Land Management must be provided that confirms none of the prohibited sanitary hazards listed in OAR 333-061-0050(2)(a)(E) will be allowed within 100 feet of all wells used to supply drinking water, including the portions of the 100-foot setback radius around Wells 3 & 4 that are outside the permit area as shown on Sheets C105 and C106.
2. The sodium hypochlorite solution must be certified to NSF Standard 60 or equivalent.
3. The sodium hypochlorite solution storage drums must be certified to NSF Standard 61 or equivalent.

4. A test kit that measures the free chlorine residual using DPD reagent must be obtained.
5. Provisions shall be made to ensure adequate exchange and/or mixing of water in the raw water reservoir to prevent degradation of water quality per OAR 333-061-0050(6)(a)(O).
6. The overflow outlet on the treated water reservoir shall be fitted with an angle-flap valve or equivalent.
7. An application for a waiver from the construction standard in OAR 333-061-0050(6)(a)(M) that requires a drain be provided in the lowest point in the bottom of the treated water storage tank must be submitted and approved, as the drain pipe penetrates the sidewall. I have enclosed a copy of the application form.

I also have the following comments:

1. I note that the piping at the facility, including the pipe running from the wells to the mine, falls under jurisdiction of Oregon Plumbing Specialty Code. I recommend consulting with the Malheur County Building Department regarding plumbing permit requirements.
2. Should the owners decide to drill the proposed Well 7 shown in the plans, it also must go through DWS plan review and receive approval prior to drilling.
3. Regular inspections of the chlorination system will be conducted in lieu of a low-level alarm for the chlorine solution.
4. An Operation & Maintenance manual will need to be developed for the arsenic treatment system and for the water system as a whole.
5. Disposal of the backwash waste from the arsenic treatment system must follow applicable Department of Environmental Quality rules.
6. Long-term water quality sampling schedules will be determined and implemented when the wells are placed into service. Arsenic samples of the treated water will be required quarterly for a year, after which the results will be reviewed to see if a monitoring reduction can be granted.

After the new wells are drilled, please submit:

1. The well driller's reports (well logs).
2. Any well pumping test information that is collected, including static water level, pumping rate, drawdown and rate of recovery.
3. Pump information including the make/model of the well pumps and the depth the pumps are set.
4. Raw (untreated) water quality data from samples from each well tested by an Oregon certified lab, including coliform bacteria, arsenic speciation samples, and

sets of Inorganic Chemicals (IOCs), Synthetic Organic Chemicals (SOCs), and Volatile Organic Chemicals (VOCs).

Upon completion of the project, the engineer must verify in writing that construction was completed according to the submitted plans. If substantial changes are made, a set of record (as-built) drawings must be submitted. Until verification that the project was completed according to the plans is received and Final Approval has been granted for the project, the new facilities are not approved for use. If you have any questions or would like this in an alternate format, please feel free to call me at (541) 966-0900 or email at william.h.goss@state.or.us .

Sincerely,

William Goss

William Goss, P.E.
Regional Engineer

enclosure: construction standards waiver application

c: Julie Wray, OHA–DWS, Portland, OR
Sarah Lewis, Oregon Department of Geology and Mineral Industries, Albany, OR
Ron Jacobs, Oregon Water Resources Department, Vale, OR
Jonathan Westfall, Bureau of Land Management, Vale, OR
Adele Schaffeld, Malheur County Building Department, Nyssa, OR
Nancy Wolverson, Paramount Gold Nevada Corp., Winnemucca, NV

PUBLIC HEALTH DIVISION
Drinking Water Services
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CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Continuous Disinfection

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - chlorination
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID#: 4195624
County: Malheur

☐☐PE-prepared plans not required. Reason* (see 2nd page for list of reasons):
Region 1 Plan review coordinator signature: _____ Date: _____
Region 2 Plan review coordinator signature: _____ Date: _____
☐ PE waiver recorded in tracking database?

CONSTRUCTION	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
General:				
Reason for disinfection: pre-treatment for arsenic removal, residual maintenance				
If applicable, has well construction been approved? N/A	☐	☐		
Appropriate plan review fee received? $825 rec'd 2/3/20	☒	☐		
Disinfectant (chlorine gas, hypochlorite, ozone, mixed oxidants, other): hypochlorite				
Type of feed system (electric pump, meter drive, erosion, gas): electric feed pump, Pulsatron MP model LMA2TA-VTC1-500				
Site Plan:				
Is unit to be placed upstream from storage? If not, why? injection points both upstream and downstream of arsenic tx; upstream of finished water storage	☒	☐	☐	☐
Construction Specifications:				
Sample tap prior to disinfection?	☒	☐	☐	☐
Sample tap after disinfection? see Sheet C302	☒	☐	☐	☐
Low level alarm? * - regular inspections in lieu of alarm	☐	☒	☐	☐
Proportional to flow? Endress & Hauser 10W magnetic flow meters have 4-20 mA output capability to pace chlorine feed pumps	☒	☐	☐	☐
Is chemical piping designed to prevent contamination of potable supply by backflow of untreated water or water having excessive chlorine (i.e. air gap)?	☒	☐	☐	☐
Chlorine analyzer? N/A	☐	☐	☐	☐
Is a DPD test kit to be used to check residual? * - make a condition for approval	☒	☐	☐	☐
Is there adequate contact time under all flow conditions? N/A	☐	☐	☐	☐
Are all equipment and chemicals NSF certified or equivalent? in plan notes	☒	☐	☐	☐
Contact Time Calculation:				
Maximum system flow: _____ gpm — Verified	☐	☐		
Amount of storage: _____ gallons — Verified	☐	☐		
Contact time available: _____ minutes — Verified	☐	☐		
Comments: _____				
Gas Chlorinators: N/A				
Is storage area enclosed? _____	☐	☐	☐	☐
Is storage area separated from other operating areas? _____	☐	☐	☐	☐

*See back for list of exceptions

Are provisions made for chaining cylinders? _____ ☐ ☐ ☐ ☐
Is room containing cylinders above ground? _____ ☐ ☐ ☐ ☐
Does the room have doors which open outward? _____ ☐ ☐ ☐ ☐
Is the room ventilated with air intake above exhaust? _____ ☐ ☐ ☐ ☐
If released, will gas flow into ventilation system? _____ ☐ ☐ ☐ ☐
Are ventilation and lighting switches located outside? _____ ☐ ☐ ☐ ☐
Are ventilation and lighting switches corrosion resistant? _____ ☐ ☐ ☐ ☐
Provisions made to measure weight of cylinder(s)? _____ ☐ ☐ ☐ ☐

Source of Supply: Groundwater ☒ Surface Water ☐
Any water quality problems (explain): arsenic >MCL ☐ ☐

Disinfection Profile: N/A
Has a disinfection profile been done? *-0060 (1)(e)* ☐ ☐
Does profile calculate disinfection benchmark? ☐ ☐

SDWIS Inventory Updated? ☐ ☐
If needed, update annual source sampling requirement, lead and copper six-month schedules and DBP monitoring.

If corrosion control is in use, would disinfectant not affect performance? **N/A** ☐ ☐

Conditions/Comments: Conditions: DPD free chlorine test kit must be obtained. Notes: chlorine must be applied proportional to flow; regular inspections in lieu of low chlorine solution level alarm. Solution barrels and sodium hypochlorite to be NSF certified.
Calculations:

Review by: Bill Goss Date: 3/2/20
Field visit by: _____ Date: _____

PE-prepared not required for:

- UV Treatment for smaller systems (typically NSF Class 55 A and B UV treatment)
- Arsenic treatment units – when the device is off-the-shelf and could be properly installed by a licensed plumber; and the treatment does not involve anything more complicated than installing an off-the-shelf device. For larger standardized treatment units, for example tanks filled with absorptive media, an exemption may not be appropriate.
- Chlorination systems for GW systems consisting of feed pumps with solution tanks or tablet chlorinators.
- Small Activated Carbon units for removal of organics (considerations for this include NSF Standard 61 certification on wetted equipment and media, pilot study, loading rate calculations, and sample taps. The plan review engineer cannot design these – see statement below)
- Poly storage tanks
- Pressure tanks (less than 500 gallons)
- Wells designed by a registered geologist
- Replacement of pipe of the same diameter and in the same location
- Mixing devices for reservoirs
- Other, as determined and documented by the plan review engineer. Both regional plan review coordinators must review and sign-off on this category as well. If agreement cannot be reached between the reviewing engineer and the plan review coordinators, then engineered plans are required, *or* a request for a decision can be referred to the management group.

CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Centralized Arsenic Treatment
OAR 333-061-0050(4)(b)(F)

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - arsenic treatment
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF WTR

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID#: 4195624
County: Malheur

☐ PE-prepared plans not required*.
Region 1 Plan review coordinator signature: _____ Date: _____
Region 2 Plan review coordinator signature: _____ Date: _____

CONSTRUCTION	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
General:				
Reason for installing arsenic treatment: arsenic >MCL in existing well				
Appropriate plan review fee received? $825 rec'd 2/3/20	☒	☐		
Land Use Compatibility Statement received, if required? Or check ☐ not applicable?	☒	☐		
Construction Specifications:				
Sample tap prior to treatment? see Sheet C302	☒	☐	☐	☐
Sample tap after treatment? see Sheet C302	☒	☐	☐	☐
Appropriate treatment selection based on DWS' Best Available Technologies or pilot test? Supporting data on file for Adedge Bayoxide E33 granular ferric oxide adsorptive media. Treatment code A900.	☒	☐		
NSF certification or equivalent chemicals/components (treatment units, media, tanks, resin, oxidation chemicals etc.)? _____	☒	☐	☐	☐
Treated arsenic sample received and under MCL? to be provided at start-up	☐	☐		
Capacity of treatment system compatible with system design flow? _____	☒	☐	☐	☐
Do plans: exclude bypass piping and/or are all bypasses physically separated? Indicate: ☒ bypasses not constructed ☐ bypasses physically separated**	☒	☐	☐	☐
Does PWS have O&M Manual for treatment system including time to replace media, coagulant dosage guidelines, and filter backwash procedures? condition	☐	☒	☐	☐
Are there monitoring requirements for other treatment processes such as oxidation (chlorination, ferric chloride, ozone, etc)? If yes explain: chlorination	☒	☐		
Include comment that any disposal of waste products be acceptable by Dept. of Environmental Quality? _____	☒	☐		
Outline initial arsenic monitoring requirements (quarterly during first year of operation, then if meeting MCL, reduce to once annually – no further reduction). _____	☒	☐		
SDWIS Inventory and Chemical Monitoring Schedule Change Forms Sent to DMCE (see treatment codes at end)?	☐	☐		
Does PWS blend water to reduce arsenic below MCL (if so, enter treatment code	☐	☒		

on-line)
Water System Treatment Worksheet completed to check what level operator is required? (N/A for PWSs ≤ 150 connections using only groundwater-SWSO classification is sufficient) N/A ☐ ☒
Does the system conduct corrosion control and would treatment affect performance? ☐ ☒
Conditions/Comments:

Applicable Treatment Codes for Arsenic Treatment:

INORGANICS REMOVAL	ACTIVATED ALUMINA - ARSENIC	A100
INORGANICS REMOVAL	COAGULATION - ARSENIC	A240
INORGANICS REMOVAL	ELECTRODIALYSIS - ARSENIC	A320
INORGANICS REMOVAL	PYROLUSITE FILTER - ARSENIC	A344
INORGANICS REMOVAL	MICROFILTRATION - ARSENIC	A347
INORGANICS REMOVAL	FILTERED - ARSENIC	A348
INORGANICS REMOVAL	HYPOCHLORINATION - ARSENIC	A423
INORGANICS REMOVAL	ION EXCHANGE - ARSENIC	A460
INORGANICS REMOVAL	LIME SOFTENING - ARSENIC	A500
INORGANICS REMOVAL	REVERSE OSMOSIS - ARSENIC	A640
INORGANICS REMOVAL	PH ADJUSTMENT, PRE - ARSENIC	A742
INORGANICS REMOVAL	GRAN FERRIC HYDOXIDE - ARSENIC	A900
INORGANICS REMOVAL	GRAN TITANIUM OXIDE - ARSENIC	A901
INORGANICS REMOVAL	FERRIC CHLORIDE COAG - ARSENIC	A902
INORGANICS REMOVAL	BLEND FOR DILUTION OF ARSENIC	ABLND

Review by: Bill Goss Date: 3/2/20
Field visit by: _____ Date: _____

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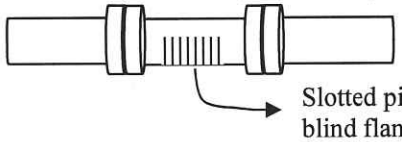
* **ENGINEERED PLANS WAIVER**: Update waiver database accordingly at: DWS\Technical Services\Plan Review\Tracking\waiver requests.mdb

**Approved physical separations of bypasses include a removed spool or blind flanges with slotted pipe or other "air gap" provision (see example below). Valves and "double block-and-bleed" systems are not adequate.



Slotted pipe with blind flanges on both ends bolted to pipe ends (also fitted with blind flanges) maintains bolt alignment while allowing any leakage that may potentially develop from corrosion of blind flanges to escape.

PUBLIC HEALTH DIVISION
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CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Finished Water Storage
OAR 333-061-0050(6)

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - raw wtr reservoir
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID#: 4195624
County: Malheur

☐☐PE-prepared plans not required.
Region 1 Plan review coordinator signature: _____
Region 2 Plan review coordinator signature: _____
☐ PE waiver recorded in tracking database?

	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
Appropriate plan review fee received? *Amount* $825 rec'd 2/3/20	☒	☐		
Land Use Compatibility Statement or equivalent submitted? _____	☒	☐		
Site Plan:				
Geologic evaluation submitted? *(a)(B)* _____	☐	☒		
Foundation adequate (undisturbed soil, bedrock, etc.)? *(a)(B)* Foundation design to be done by tank installer.	☐	☐		
Provisions for a fence or other vandal deterrence? *(a)(P)* secure facility	☒	☐	☐	☐
Construction Specifications:				
What is the maximum operating volume capacity? 237,000 gallons				
Of what material is the storage facility made? *(a)(A)* steel				
If redwood, are continuous chlorination provisions made? *(a)(E)* N/A	☐	☐	☐	☐
If redwood, is there a reinforced concrete base? *(a)(E)* N/A	☐	☐	☐	☐
If concrete, is sufficient reinforcement supplied? *(a)(E)* N/A	☐	☐	☐	☐
If steel, does it meet AWWA standards? *(a)(C)* D103-9 in specs	☒	☐	☐	☐
If partially below ground, are footing drains provided? *(a)(G)* N/A	☐	☐	☐	☐
If fire hydrants are provided, is storage sized appropriately? *(a)(H)* _____	☒	☐	☐	☐
Is there a watertight roof? *(a)(I)* _____	☒	☐	☐	☐
Is there a screened vent? *(a)(L)* Sheet M104	☒	☐	☐	☐
Is there a drain to daylight? *(a)(M)* _____	☒	☐	☐	☐
Is there a flap valve at the end of the overflow? *(a)(M)* _____	☒	☐	☐	☐
Are overflow and drain a common pipe? *(a)(M)* _____	☒	☐	☐	☐
Are there separate inlet/outlet pipes? *(a)(O)* _____	☐	☒	☐	☐
If a single inlet/outlet pipe, is there sufficient mixing? (e.g., diffusers, tracer study, hydrodynamic study...) *(a)(O)* none shown - make a condition	☐	☒	☐	☐
Is the storage volume baffled for contact time enhancement? *(a)(R)* _____	☐	☒	☐	☐
If so, to what degree?				

1) Effective volume _____
2) Estimated contact time _____
3) Contact time from tracer study *(a)(R)* _____

Was a tracer study performed? *(a)(R)* N/A	☐	☐	☐	☐
If used for contact time, is there a flow meter or equivalent on the effluent line? *(a)(S)* N/A	☐	☐	☐	☐
If used for contact time, do plans: exclude bypass piping and/or are all bypasses physically separated? Indicate: ☐ bypasses not constructed ☐ bypasses physically separated*	☐	☐	☐	☐
Is there a water level indicator? level sensor	☒	☐	☐	☐
Is there an access manhole? *(a)(J)* _____	☒	☐	☐	☐
If manhole is only access, is there an internal ladder? *(a)(K)* both manhole and ladder at roof hatch	☐	☐	☐	☐
Is the tank disinfected after construction and bacti sampling planned? *(10)*	☒	☐	☐	☐
Is there a lockable watertight lid with curbing? *(a)(J)* Sheet M104	☒	☐	☐	☐
Is there a silt stop at the outlet piping? *(a)(N)* Sheet M104	☒	☐	☐	☐

Pressure Tanks:

Is it installed above normal ground surface? *(b)(A)* _____	☐	☐	☐	☐
Is bypass piping provided? *(b)(B)* _____	☐	☐	☐	☐
If used for contact time, do plans: exclude bypass piping and/or are all bypasses physically separated? Indicate: ☐ bypasses not constructed ☐ bypasses physically separated *	☐	☐	☐	☐
If it is greater than 1000 gallons, is there a manhole & water sight glass? *(b)(C)* _____	☐	☐	☐	☐
Is there a drain, pressure gauge, and air blow-off valve? *(b)(D)* _____	☐	☐	☐	☐
Is there means for adding air? *(b)(D)* _____	☐	☐	☐	☐
Are there switches to control pumps? *(b)(D)* _____	☐	☐	☐	☐
Is the tank constructed of steel? *(b)(E)* _____	☐	☐	☐	☐
If not, is it NSF 61 certified? *(b)(E)* _____	☐	☐	☐	☐
Is the tank disinfected after construction and bacti sampling planned? *(10)*	☐	☐	☐	☐
Is tank designed to withstand at least 150% of maximum system pressure? *(b)(E)* _____	☐	☐	☐	☐

After Construction:

Were appropriate bacti samples conducted and results submitted? _____	☐	☐	☐	☐

Conditions/Comments: Needs provisions for mixing due to common inlet/outlet pipe.

***Reason(s) PE-prepared plans are not required is because* (check all that apply):**

- ☐ Poly storage tank
- ☐ Supplied by a subcontractor who will provide PE-prepared plans
- ☐ Pressure tanks less than 500 gallons
- ☐ Other (If this category is utilized, then both plan review coordinators must sign form prior to review. See rule interpretation on Portland's shared drive at I:\Procedures & Rule Interpretations\Rule Interpretations for further details.)

Review by: Bill Goss Date: 3/2/20
Field visit by: _____ Date: _____

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CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Finished Water Storage
OAR 333-061-0050(6)

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - finished wtr reservoir
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID#: 4195624
County: Malheur

☐☐PE-prepared plans not required.
Region 1 Plan review coordinator signature: _____
Region 2 Plan review coordinator signature: _____
☐ PE waiver recorded in tracking database?

	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
Appropriate plan review fee received? *Amount* $825 rec'd 2/3/20	☒	☐		
Land Use Compatibility Statement or equivalent submitted? _____	☒	☐		
Site Plan:				
Geologic evaluation submitted? *(a)(B)* geotech. report done by Golder Associates	☐	☒		
Foundation adequate (undisturbed soil, bedrock, etc.)? *(a)(B)* tank will be installed on concrete slab, 1500 psf max bearing pressure	☒	☐		
Provisions for a fence or other vandal deterrence? *(a)(P)* secure facility	☒	☐	☐	☐
Construction Specifications:				
What is the maximum operating volume capacity? 13,000 gallons				
Of what material is the storage facility made? *(a)(A)* stainless steel				
If redwood, are continuous chlorination provisions made? *(a)(E)* N/A			☐	☐
If redwood, is there a reinforced concrete base? *(a)(E)* N/A			☐	☐
If concrete, is sufficient reinforcement supplied? *(a)(E)* N/A			☐	☐
If steel, does it meet AWWA standards? *(a)(C)* N/A - stainless steel			☐	☐
If partially below ground, are footing drains provided? *(a)(G)* N/A			☐	☐
If fire hydrants are provided, is storage sized appropriately? *(a)(H)* N/A			☐	☐
Is there a watertight roof? *(a)(I)* _____	☒	☐	☐	☐
Is there a screened vent? *(a)(L)* Sheet C304	☒	☐	☐	☐
Is there a drain to daylight? *(a)(M)* Sheet C304	☒	☐	☐	☐
Is there a flap valve at the end of the overflow? *(a)(M)* make a condition	☐	☒	☐	☐
Are overflow and drain a common pipe? *(a)(M)* Sheet C304	☐	☒	☐	☐
Are there separate inlet/outlet pipes? *(a)(O)* Sheet C304	☒	☐	☐	☐
If a single inlet/outlet pipe, is there sufficient mixing? (e.g., diffusers, tracer study, hydrodynamic study...) *(a)(O)* N/A			☐	☐
Is the storage volume baffled for contact time enhancement? *(a)(R)* _____	☒	☐	☐	☐
If so, to what degree?				

1) Effective volume _____
2) Estimated contact time _____
3) Contact time from tracer study *(a)(R)* _____

Was a tracer study performed? *(a)(R)* N/A	☒	☒	☐	☐
If used for contact time, is there a flow meter or equivalent on the effluent line? *(a)(S)* N/A	☒	☒	☐	☐
If used for contact time, do plans: exclude bypass piping and/or are all bypasses physically separated? Indicate: ☐ bypasses not constructed ☐ bypasses physically separated*	☒	☒	☐	☐
Is there a water level indicator? _____	☒	☐	☐	☐
Is there an access manhole? *(a)(J)* 24" manhole in sidewall, no roof hatch	☒	☐	☐	☐
If manhole is only access, is there an internal ladder? *(a)(K)* N/A	☒	☒	☐	☐
Is the tank disinfected after construction and bacti sampling planned? *(10)*	☒	☐	☐	☐
Is there a lockable watertight lid with curbing? *(a)(J)* N/A	☐	☒	☐	☐
Is there a silt stop at the outlet piping? *(a)(N)* inlet/outlets through sidewall	☒	☐	☐	☐

Pressure Tanks:

Is it installed above normal ground surface? *(b)(A)* _____	☐	☐	☐	☐
Is bypass piping provided? *(b)(B)* _____	☐	☐	☐	☐
If used for contact time, do plans: exclude bypass piping and/or are all bypasses physically separated? Indicate: ☐ bypasses not constructed ☐ bypasses physically separated *	☐	☐	☐	☐
If it is greater than 1000 gallons, is there a manhole & water sight glass? *(b)(C)* _____	☐	☐	☐	☐
Is there a drain, pressure gauge, and air blow-off valve? *(b)(D)* _____	☐	☐	☐	☐
Is there means for adding air? *(b)(D)* _____	☐	☐	☐	☐
Are there switches to control pumps? *(b)(D)* _____	☐	☐	☐	☐
Is the tank constructed of steel? *(b)(E)* _____	☐	☐	☐	☐
If not, is it NSF 61 certified? *(b)(E)* _____	☐	☐	☐	☐
Is the tank disinfected after construction and bacti sampling planned? *(10)*	☐	☐	☐	☐
Is tank designed to withstand at least 150% of maximum system pressure? *(b)(E)* _____	☐	☐	☐	☐

After Construction:

Were appropriate bacti samples conducted and results submitted? _____	☐	☐	☐	☐

Conditions/Comments: Tank to be fabricated by Superior Steel Products, Caldwell Idaho. 12-foot diameter and 16-feet high to top of sidewall. Overflow outlet to have flap valve or equivalent.

Reason(s) PE-prepared plans are not required is because **(check all that apply):**

- ☐ Poly storage tank
- ☐ Supplied by a subcontractor who will provide PE-prepared plans
- ☐ Pressure tanks less than 500 gallons
- ☐ Other (If this category is utilized, then both plan review coordinators must sign form prior to review. See rule interpretation on Portland's shared drive at I:\Procedures & Rule Interpretations\Rule Interpretations for further details.)

Review by: Bill Goss Date: 3/2/20

Field visit by: _____ Date: _____

PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Wells

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - well #3 MALH 2206
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID# *: 4195624
County: Malheur

☐ SRF project? If so, include SRF project number in conditional approval letter's header. _____

*If New System – MUST Go Through Capacity Assessment

If RG- or PE-prepared plans not required:
Region 1 Plan review coordinator signature: _____ Date: _____
Region 2 Plan review coordinator signature: _____ Date: _____
☐ PE waiver recorded in tracking database?

	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
General:				
Appropriate plan review fee received? Amt:$825 rec'd 2/3/20	☒	☐		
Land use compatibility statement or equivalent submitted? _____Not required ☐	☒	☐		
Water right permit required? Yes☒/No☐ Submitted Permit G-18337	☒	☐		
BEFORE CONSTRUCTION (before well is drilled)				
Site Plan:				
* Is land use around well for 100 feet controlled by water supplier? A small portion of the 100' setback area is outside the permit boundary.	☐ ☐	☒ ☒	☐	☐
* If not, has an easement or construction waiver been obtained? Documentation needed from BLM that no sanitary hazards will be allowed within 100' of wells				
Is sewage disposal prohibited within 100' of the well? _____	☒	☐	☐	☐
Are all other setbacks in OAR 333-061-0050 (2)(a)(E) met? _____	☒	☐	☐	☐
Is there a roadway within 100' of well site? _____	☒	☐	☐	☐
Is site prone to flooding? _____	☐	☒	☐	☐
Well evaluation request sent to DWS geologist? Date sent: 1/24/20	☒	☐		
Surface water within 500' of well? (include water body name in well eval request)	☐	☒	☐	☐
Recommendations regarding pump test sent?	☐	☒		
Construction specifications provided by DWS geologist? (e.g., casing\seal placement; doesn't apply if well already exists) N/A	☐	☐		
Well construction approved? (attach well evaluation and proposed design) see below	☐	☒		
Is corrosion control performed and would source affect performance?N/A				
Water Master copied on site plan? N/A				
Well log:				
Is well log provided? MALH 2206	☒	☐		
Is thickness of casing at least 0.25"? 0.25"	☒	☐	☐	☐
Is there an annular cement grout seal around the casing? _____	☒	☐	☐	☐

'Well evaluation request' for **as-built** construction sent to DWS geologist (including, for existing well without plan review approval, site plan showing land ownership, sanitary hazards, and surface water within 500 feet of well)? _____ ☒ ☐

Does the seal meet construction recommendations of DWS geologist? (attach well log) Seal is inadequately constructed, well is not approved for use. ☐ ☒

Was well pumped to stress aquifer, and if so when? - Date: 11/28/89 - 21/1/89 ☒ ☐

The duration of the stress test: 83 hrs

Depth interval(s) of well screen: 280-300, 340-360 feet

Pumping rate: 145 gpm

Confined aquifer: Yes☒/No☐

Drawdown: 47 feet

Specific yield: 3.1 gpm/ft drawdown

Intakes (number and size of screens/perf) two 6" wire wound screens w/ 0.030" slots

Wellhead Plans:

Is a reinforced concrete slab provided around well (not if pitless)? see sheet M100	☒	☐	☐	☐
Does casing extend 12" above the slab? _____	☒	☐	☐	☐
Is a watertight sanitary seal provided? _____	☒	☐	☐	☐
Provision made for disinfection? If 'yes', complete disinfection checklist. _____	☒	☐	☐	☐
Are provisions made for measuring water level? air line	☒	☐	☐	☐
Is a sample tap provided? _____	☒	☐	☐	☐
Can the output of well be pumped to waste? to evap. pond	☒	☐	☐	☐
Is there a flow meter provided on the pump discharge? Badger M2000 or equiv.	☒	☐	☐	☐
Is the concrete slab properly drained? floor drain to evap. pond	☒	☐	☐	☐
Is the pump house heated, lockable, lighted (if not small) etc.? _____	☒	☐	☐	☐
Is well house constructed to allow pump removal? _____	☒	☐	☐	☐
Is a casing vent with a screened return bend provided (not if pitless)? _____	☒	☐	☐	☐

SDWIS Inventory Updated? ☐ ☐

Note that NSF 42 and NSF 53 include NSF 61, so if the system installed a sed filter that is NSF 42, that would be acceptable.

CHEMICAL ANALYSIS RECEIVED:

Bacteriological	Yes	☐	No	☒	N/A	☐	Inorganic	Yes	☒	No	☐	N/A ☐
VOC	Yes	☐	No	☒	N/A	☐	Radiological	Yes	☐	No	☐	N/A ☒
SOC	Yes	☐	No	☒	N/A	☐						

Conditions/Comments: Well also shown as "PW-4" on plans. Well is not approved for use due to inadequate construction. Water right permit G-18337.

Review by: Bill Goss Date: 3/2/20

Field visit by: _____ Date: _____

PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Wells

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - proposed well #4
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID# *: 4195624
County: Malheur

☐ SRF project? If so, include SRF project number in conditional approval letter's header. _____

*If New System – MUST Go Through Capacity Assessment

If RG- or PE-prepared plans not required:
Region 1 Plan review coordinator signature: _____ Date: _____
Region 2 Plan review coordinator signature: _____ Date: _____
☐ PE waiver recorded in tracking database?

	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
General:				
Appropriate plan review fee received? Amt:$825 rec'd 2/3/20	☒	☐		
Land use compatibility statement or equivalent submitted? _____Not required ☐	☒	☐		
Water right permit required? Yes☒/No☐ Submitted Permit G-18337	☒	☐		
BEFORE CONSTRUCTION (before well is drilled)				
Site Plan:				
Is land use around well for 100 feet controlled by water supplier? A small portion of the 100' setback area is outside the permit boundary.	☐ ☐	☒ ☒	☐	☐
If not, has an easement or construction waiver been obtained? Documentation needed from BLM that no sanitary hazards will be allowed within 100' of wells				
Is sewage disposal prohibited within 100' of the well? _____	☒	☐	☐	☐
Are all other setbacks in OAR 333-061-0050 (2)(a)(E) met? _____	☒	☐	☐	☐
Is there a roadway within 100' of well site? OK - confined aquifer	☒	☐	☐	☐
Is site prone to flooding? _____	☐	☒	☐	☐
Well evaluation request sent to DWS geologist? Date sent: 1/24/20	☒	☐		
Surface water within 500' of well? (include water body name in well eval request)	☐	☒	☐	☐
Recommendations regarding pump test sent?	☐	☒		
Construction specifications provided by DWS geologist? (e.g., casing\seal placement; doesn't apply if well already exists) see well eval. form	☒	☐		
Well construction approved? (attach well evaluation and proposed design) _____	☒	☐		
Is corrosion control performed and would source affect performance?N/A				
Water Master copied on site plan? Yes, Ron Jacobs in Vale				
Well log:				
Is well log provided? _____	☐	☐		
Is thickness of casing at least 0.25"? _____	☐	☐	☐	☐
Is there an annular cement grout seal around the casing? _____	☐	☐	☐	☐

'Well evaluation request' for **as-built** construction sent to DWS geologist (including, for existing well without plan review approval, site plan showing land ownership, sanitary hazards, and surface water within 500 feet of well)? _____ ☐ ☐

Does the seal meet construction recommendations of DWS geologist? (attach well log) _____ ☐ ☐

Was well pumped to stress aquifer, and if so when? - Date: _____ ☐ ☐

The duration of the stress test: _____ hrs

Depth interval(s) of well screen: _____ feet

Pumping rate: _____ gpm

Confined aquifer: Yes☐/No☐

Drawdown: _____ feet

Specific yield: _____ gpm/ft drawdown

Intakes (number and size of screens/perf) _____

Wellhead Plans:

Is a reinforced concrete slab provided around well (not if pitless)? see Sheet M101	☒	☐	☐	☐
Does casing extend 12" above the slab? _____	☒	☐	☐	☐
Is a watertight sanitary seal provided? _____	☒	☐	☐	☐
Provision made for disinfection? If 'yes', complete disinfection checklist. _____	☒	☐	☐	☐
Are provisions made for measuring water level? water level sensor, Sheet M101	☒	☐	☐	☐
Is a sample tap provided? _____	☒	☐	☐	☐
Can the output of well be pumped to waste? to evap. pond	☒	☐	☐	☐
Is there a flow meter provided on the pump discharge? _____	☒	☐	☐	☐
Is the concrete slab properly drained? _____	☒	☐	☐	☐
Is the pump house heated, lockable, lighted (if not small) etc.? _____	☒	☐	☐	☐
Is well house constructed to allow pump removal? roof hatch	☒	☐	☐	☐
Is a casing vent with a screened return bend provided (not if pitless)? _____	☒	☐	☐	☐

SDWIS Inventory Updated? ☐ ☐

Note that NSF 42 and NSF 53 include NSF 61, so if the system installed a sed filter that is NSF 42, that would be acceptable.

CHEMICAL ANALYSIS RECEIVED:

Bacteriological	Yes	☐	No	☐	N/A	☐	Inorganic	Yes	☐	No	☐	N/A	☐
VOC	Yes	☐	No	☐	N/A	☐	Radiological	Yes	☐	No	☐	N/A	☒
SOC	Yes	☐	No	☐	N/A	☐							

Conditions/Comments: Documentation needed from BLM that no sanitary hazards will be allowed within 100' of wells

Review by: Bill Goss — Date: 3/2/20

Field visit by: _____ — Date: _____

PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

CHECKLIST FOR WATER SYSTEM PLAN REVIEW

Wells

Name of System: Calico Grassy Mountain Mine
Name of Project: new PWS - proposed well #5
Plan Review#: 11-2020
Design's Engineer: Jason Thompson, PE w/ SPF Wtr

Date Plan Received: 2/3/20
Date Plan Reviewed: 3/2/20
PWS ID# *: 4195624
County: Malheur

☐ SRF project? If so, include SRF project number in conditional approval letter's header. _____

*If New System – MUST Go Through Capacity Assessment

If RG- or PE-prepared plans not required:
Region 1 Plan review coordinator signature: _____ Date: _____
Region 2 Plan review coordinator signature: _____ Date: _____
☐ PE waiver recorded in tracking database?

	Plan Review Y	Plan Review N	Field Visit Y	Field Visit N
General:				
Appropriate plan review fee received? Amt:$825 rec'd 2/3/20	☒	☐		
Land use compatibility statement or equivalent submitted? _____Not required ☐	☒	☐		
Water right permit required? Yes☒/No☐ Submitted Permit G-18337	☒	☐		
BEFORE CONSTRUCTION (before well is drilled)				
Site Plan:				
Is land use around well for 100 feet controlled by water supplier? see Sheet C107	☒	☐	☐	☐
If not, has an easement or construction waiver been obtained? N/A	☐	☐		
Is sewage disposal prohibited within 100' of the well? _____	☒	☐	☐	☐
Are all other setbacks in OAR 333-061-0050 (2)(a)(E) met? _____	☒	☐	☐	☐
Is there a roadway within 100' of well site? _____	☐	☒	☐	☐
Is site prone to flooding? _____	☐	☒	☐	☐
Well evaluation request sent to DWS geologist? Date sent: 1/24/20	☒	☐		
Surface water within 500' of well? (include water body name in well eval request)	☐	☒	☐	☐
Recommendations regarding pump test sent?	☐	☒		
Construction specifications provided by DWS geologist? (e.g., casing\seal placement; doesn't apply if well already exists) see well eval. form	☒	☐		
Well construction approved? (attach well evaluation and proposed design) _____	☒	☐		
Is corrosion control performed and would source affect performance?N/A				
Water Master copied on site plan? Yes, Ron Jacobs in Vale				
Well log:				
Is well log provided? _____	☐	☐		
Is thickness of casing at least 0.25"? _____	☐	☐	☐	☐
Is there an annular cement grout seal around the casing? _____	☐	☐	☐	☐

'Well evaluation request' for **as-built** construction sent to DWS geologist (including, for existing well without plan review approval, site plan showing land ownership, sanitary hazards, and surface water within 500 feet of well)? _____ ☐ ☐

Does the seal meet construction recommendations of DWS geologist? (attach well log) _____ ☐ ☐

Was well pumped to stress aquifer, and if so when? - Date: _____ ☐ ☐

The duration of the stress test: _____ hrs

Depth interval(s) of well screen: _____ feet

Pumping rate: _____ gpm

Confined aquifer: Yes☐/No☐

Drawdown: _____ feet

Specific yield: _____ gpm/ft drawdown

Intakes (number and size of screens/perf) _____

Wellhead Plans:

Is a reinforced concrete slab provided around well (not if pitless)? see Sheet M102	☒	☐	☐	☐
Does casing extend 12" above the slab? _____	☒	☐	☐	☐
Is a watertight sanitary seal provided? _____	☒	☐	☐	☐
Provision made for disinfection? If 'yes', complete disinfection checklist. _____	☒	☐	☐	☐
Are provisions made for measuring water level? water level sensor, Sheet M102	☒	☐	☐	☐
Is a sample tap provided? _____	☒	☐	☐	☐
Can the output of well be pumped to waste? to evap. pond	☒	☐	☐	☐
Is there a flow meter provided on the pump discharge? _____	☒	☐	☐	☐
Is the concrete slab properly drained? _____	☒	☐	☐	☐
Is the pump house heated, lockable, lighted (if not small) etc.? _____	☒	☐	☐	☐
Is well house constructed to allow pump removal? roof hatch	☒	☐	☐	☐
Is a casing vent with a screened return bend provided (not if pitless)? _____	☒	☐	☐	☐

SDWIS Inventory Updated? ☐ ☐

Note that NSF 42 and NSF 53 include NSF 61, so if the system installed a sed filter that is NSF 42, that would be acceptable.

CHEMICAL ANALYSIS RECEIVED:

Bacteriological	Yes	☐	No	☐	N/A	☐	Inorganic	Yes	☐	No	☐	N/A	☐
VOC	Yes	☐	No	☐	N/A	☐	Radiological	Yes	☐	No	☐	N/A	☒
SOC	Yes	☐	No	☐	N/A	☐							

Conditions/Comments: _____

Review by: Bill Goss

Date: 3/2/20

Field visit by: _____

Date: _____

New Water System Capacity Requirements
Check List

Water System Name: CALICO GRASSY MOUNTAIN MINE Plan Review # 11-2020
County: MALHEUR PWS ID# 41: 95624

Control Point	Application	Yes	No	Not Required
(1) Plan Review completed – plans approved or conditionally approved. Cannot use water until #7	Community, NTNC, TNC	☐	☐	☐
(a) Land Use Compatibility Statement signed and dated by local land use authority – approved	Community, NTNC, TNC	☒	☐	☐
(b) Copy of water right permit G-18337	Community, NTNC, TNC	☑	☐	☐
(c) Required water quality testing completed and reviewed by DWP- meet MCLs, treatment, performance requirements	Community, NTNC, TNC	☐	☐	☐
(d) Water use meters included in the construction plans and specifications- installed	Community	☐	☐	☒
(2) Engineering master plan/feasibility study initiated by the new water system – engineer identified	Community	☐	☐	☑
(3) Designated operator meets minimum certification requirements. Management/ownership identified	Community, NTNC, TNC	☐	☐	☐
(4) Water management and conservation plan submitted for inspection, or a statement from the new water system that the water management and conservation is not required – OWRD concurrence	Community	☐	☐	☒
(5) Copy of water rate structure and financial plan reviewed by OECD or PUC – meet minimum requirements	Community	☐	☐	☒
(6) On site construction review completed – no deficiencies or deficiencies noted	Community, NTNC, TNC	☐	☐	☐
(7) Capacity Assessment report of deficiencies completed – report sent to water system, w/final plan review approval	Community, NTNC, TNC	☐	☐	☐

Completed by: _____ Date Completed: _____

Capacity Assessment Report of Deficiencies

Water System Name: _____ PWS ID#: 41_____

Plan Review Deficiencies

Master Plan/Feasibility Study Deficiencies

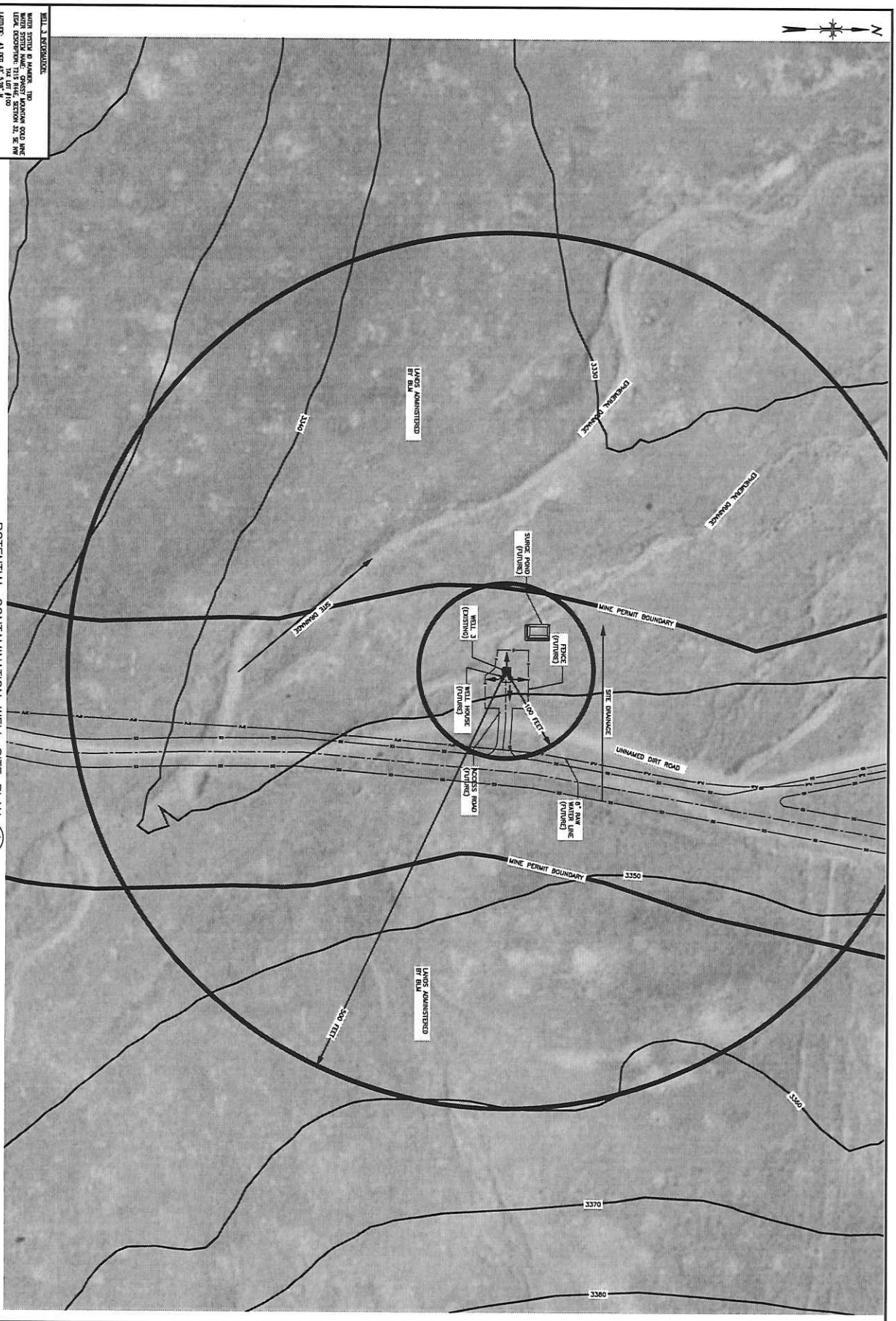
Operator Certification/Management/Ownership Deficiencies

Water Management and Conservation Plan Deficiencies

Water Rate Structure and Financial Plan Deficiencies

Sanitary Survey Deficiencies

Completed by: _____ Date Completed:_____



POTENTIAL CONTAMINATION WELL SITE PLAN (A)
SCALE: 1:600

REVISIONS		
ITEM	DESCRIPTION	DATE
0	FINAL PERMIT SET	7/31/19

VERIFY SCALE
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING

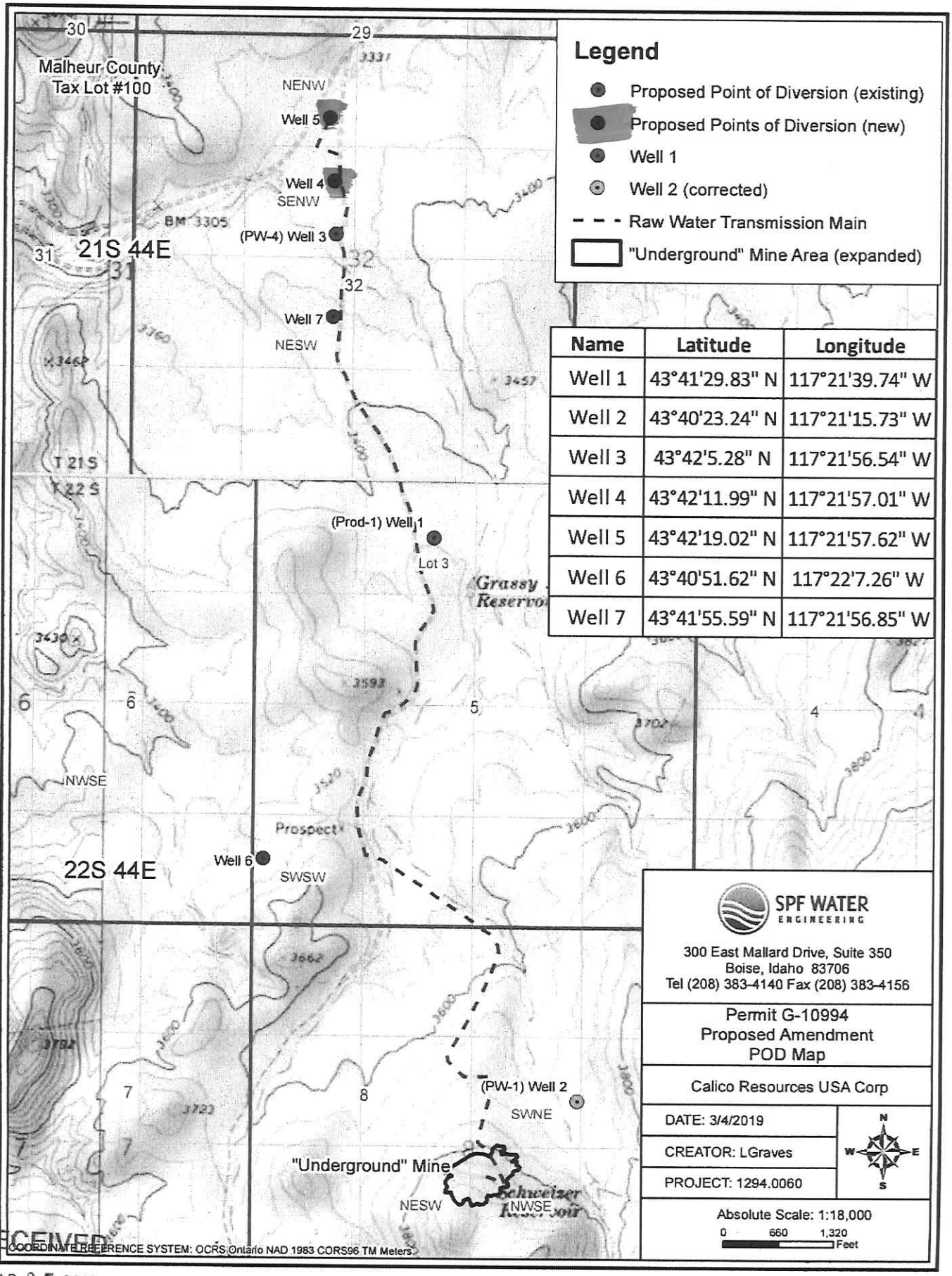
PROJECT: 1294.0050
DESIGNED: EH/SM/JL
DRAWN: JL/SM/KN
CHECKED: JT

C105

GRASSY MOUNTAIN GOLD MINE WATER & SEWER
CALICO RESOURCES USA CORP.

WELL 3 (PW-4) POTENTIAL CONTAMINATION MAP

SPF WATER ENGINEERING
300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156



Name	Latitude	Longitude
Well 1	43°41'29.83" N	117°21'39.74" W
Well 2	43°40'23.24" N	117°21'15.73" W
Well 3	43°42'5.28" N	117°21'56.54" W
Well 4	43°42'11.99" N	117°21'57.01" W
Well 5	43°42'19.02" N	117°21'57.62" W
Well 6	43°40'51.62" N	117°22'7.26" W
Well 7	43°41'55.59" N	117°21'56.85" W

P:\1294\PROJECTS\M Inu R Projects\P Projects\Paramount Gold_1294\0060_Water Rights\PROJECTGIS\ArcMap_Projects\PMT POD Map (8 x11).mxd

RECEIVED
MAR 27 2019
OWRD

13157