

**WICKENDEN
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February 24, 2010

RECEIVED
FEB 26 2010
ENVIRONMENTAL PROTECTION

Alexi Lanza, P.E.
Permits Branch-Bureau of Water Pollution Control
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 89701

RE: Comprehensive Groundwater Monitoring Well Program – Ponderosa Dairy Amargosa Valley, Nye
County, Nevada
(Your letter dated Feb. 1, 2010) NV0023027

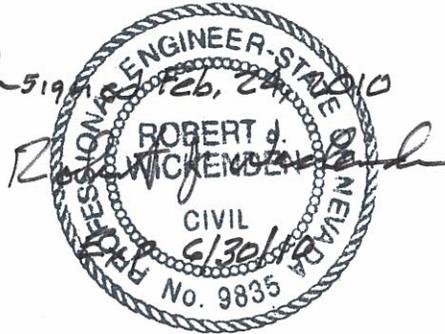
Mr. Lanza:

Enclosed for your review is the PONDEROSA DAIRY REVISED GROUND WATER MONITORING PLAN dated February 24, 2010 as referenced above. I have reviewed this plan and find that it complies with Nevada Division of Environmental Protection GUIDANCE DOCUMENT FOR DESIGN OF GROUNDWATER MONITORING WELLS, WTS-4 (Revised 1996). The above document is also consistent with, NRS 445A.660 and NAC 534. .

Sincerely,

Robert J Wickenden 5197

Robert J Wickenden





GLORIETA GEOSCIENCE, INC.

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February 24, 2010

Alexi Lanza, P.E.
Permits Branch, Bureau of Water Pollution Control
Nevada Division of Environmental Protection
901 S. Stewart St., Ste 4001
Carson City, NV 89701

RE: PONDEROSA DAIRY, NV0023027, GROUND WATER MONITORING PLAN

Dear Mr. Lanza,

Thank you for the opportunity to present this revised ground water monitoring plan for Ponderosa Dairy, NV0023027. Glorieta Geoscience, Inc. (GGI) has prepared draft proposed location and design information for five new on-site monitoring wells, including the required replacement of Monitoring Well 1 (MW-1A). The wells will be sampled for nitrate, TKN (Total Kjeldhal Nitrogen), chloride and Total Dissolved Solids (TDS). The ground water flow direction in the near vicinity of Ponderosa Dairy is to the east. Enclosed, please find the following items for your review:

1. Ponderosa Dairy Site Map with specified proposed locations of five new monitoring wells: MW-1A, MW-2A, MW-3, MW-4, and MW-5, as well as the location of Old MW-1 for plugging and abandonment
2. Ponderosa Dairy Schematic of design for MW-1A and other new monitoring wells
3. Bid Sheet for drilling and installation of five new monitoring wells
4. Bid Sheet for plugging and abandonment of Old MW-1
5. Potentiometric Surface Map constructed using April 2009 water level data

Hydrogeology of the Ponderosa Dairy Area

Ponderosa Dairy is located in the Amargosa Valley, in the Basin and Range province of the southwestern U.S. From the surface down, Ponderosa is underlain by Pleistocene basin-fill and playa lake sediments. Cenozoic limestone, basalt and volcanic rocks underlie the younger basin-fill sediments. The groundwater recharge area is to the north and east of the Dairy, in the Yucca Mountain area. Groundwater discharges at various locations to the southwest of the Dairy. Regionally, groundwater generally flows from the northeast and north towards the south and southwest (USGS, 2004). There are however, some areas where the direction of regional groundwater flow is to the west or north.

Groundwater for dairy and irrigation uses is produced from wells completed into the basin-fill deposits. As shown on the attached potentiometric surface map, groundwater beneath the dairy flows to the east and southeast. The local groundwater flow direction may be influenced by the dairy pumping its permitted water rights.

Green Water and Manure Management

Green water lagoons store water for subsequent irrigation reuse. All green water lagoons at the dairy are synthetically lined with current, state-of-the art, designs to protect water quality. The storage/settling ponds south of Barn 1 are clay lined. Since the green water lagoons and ponds store water year round and there is a constant head of water in them, Ponderosa proposes

to install monitoring wells downgradient of each green water storage lagoon. These wells will detect seepage from the synthetically lined lagoons in the unlikely event that the synthetic liner(s) leak.

Land application fields are irrigated with fresh water and green water. All manure solids are collected from the corals and solids separator and composted under an approved permit from the NDEP Solid Waste Bureau. Green water is applied to the land application fields at agronomic rates in accordance with Ponderosa's approved Comprehensive Nutrient Management Plan (CNMP). Since green water is applied to the land application fields at agronomic rates, and soil sampling will be conducted according to the terms of the Discharge Permit, soil sampling will sufficiently address any potential vertical migration of nitrogen, or other regulated constituents, through the vadose zone. As such, no monitoring wells are necessary to monitor ground water quality beneath, or downgradient of, the land application areas.

Proposed Monitoring Wells

To ensure that groundwater quality is protected, in addition to the current discharge permit requirements, Ponderosa Dairy has voluntarily prepared and submitted this plan for installation and monitoring of four monitoring wells. One monitoring well will be located upgradient of the facility and three of the wells will be located downgradient of the active green water lagoons at Barns 1, 2, and 3. Monitoring well No. 1A (MW-1A) will replace MW No. 1 that has gone dry and will monitor potential seepage from the Barn 1 green water lagoon and storage ponds. Monitoring well No. 2A (MW-2A) will be located downgradient of the green water lagoons at Barn 2 and will monitor potential seepage from the Barn 2 green water lagoon. Monitoring well No. 3 (MW-3) will be located downgradient of the lined green water lagoon for Barn 3 and will monitor potential seepage from the Barn 3 green water lagoon. Monitoring well No. 4 (MW-4) will be located upgradient of the Dairy, north of Mecca Road. Monitoring well No. 5 (MW-5) will be located downgradient of the Dairy Field 5 and animal composting area. Construction of all new monitoring wells will comply with NAC 534.4351 - 4363. A map showing the locations of the proposed monitoring wells is attached.

The new proposed monitoring wells will be installed, developed, and representative ground water samples will be collected by June 30, 2010 so that the results of sample analyses will be available and submitted to your office by July 28, 2010. MW-1 Old will be plugged and abandoned, according to NAC 534.4365 during the same timeframe that the new wells are installed. The exact locations of MW-4, the up-gradient monitoring well, and the other wells will be determined based on proximity to production wells and infrastructure.

Since green water is applied to the land application fields at agronomic rates specified in the Comprehensive Nutrient Management Plan (CNMP), these four wells will serve as an early warning of potential seepage through the synthetic liners.

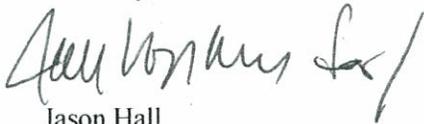
Soil Sampling of Land Application Areas

To protect ground water quality and to ensure that Ponderosa land applies green water in accordance with the requirements of its discharge permit, Ponderosa will sample and analyze soils on annually cropped land application areas every three years, or when a major change in crop rotation occurs. Ponderosa will sample and analyze soils on perennially cropped fields every five years. Soil samples will be analyzed in accordance with the permit requirements and NRCS Standard 590 for:

- Total -N
- Nitrate-N
- TKN
- Ammonia
- Total Phosphorus
- Soil pH
- Electrical conductivity
- Soil organic matter
- Potassium (K)
- Magnesium (Mg)
- Calcium (Ca)
- Sodium (Na)

Please contact me with any questions regarding this submittal at 505.983.5446 ext. 105, or Jay Lazarus at ext. 111. For any questions or comments regarding the dairy operations or discharge permit, please contact Jay Lazarus or Reddy Ganta at ext. 107.

Sincerely,



Jason Hall
Glorieta Geoscience, Inc.

Cc: Nevada Division of Environmental Protection, Attn: Valerie King, Supervisor of Enforcement and Compliance, Bureau of Water Pollution Control
Glorieta Geoscience, Inc., Attn: Reddy Ganta, Sr. Agronomist/Project Manager
Ponderosa Dairy, Attn: Michael Kwiatkowski, P.O. Box 70, Amargosa Valley, NV 89020
Ponderosa Dairy, Attn: Ed Goedhart, P.O. Box 70, Amargosa Valley, NV 89020

Reference:

U.S. Geological Survey, 2004, Death Valley Regional Ground-Water flow System, Nevada and California- Hydrogeologic Framework and Transient Ground-Water Flow Model, Scientific Investigations Report 2004-5205

**Proposed MW-4
(Up-Gradient MW
to be installed within 500ft
of proposed location)**

LEGEND

- Monitoring well
- Proposed Monitoring well
- Domestic/Irrigation well
- Direction of drainage
- Direction of flow
- Area enclosed by 2 feet earthen berm
- Structural controls (ditches)

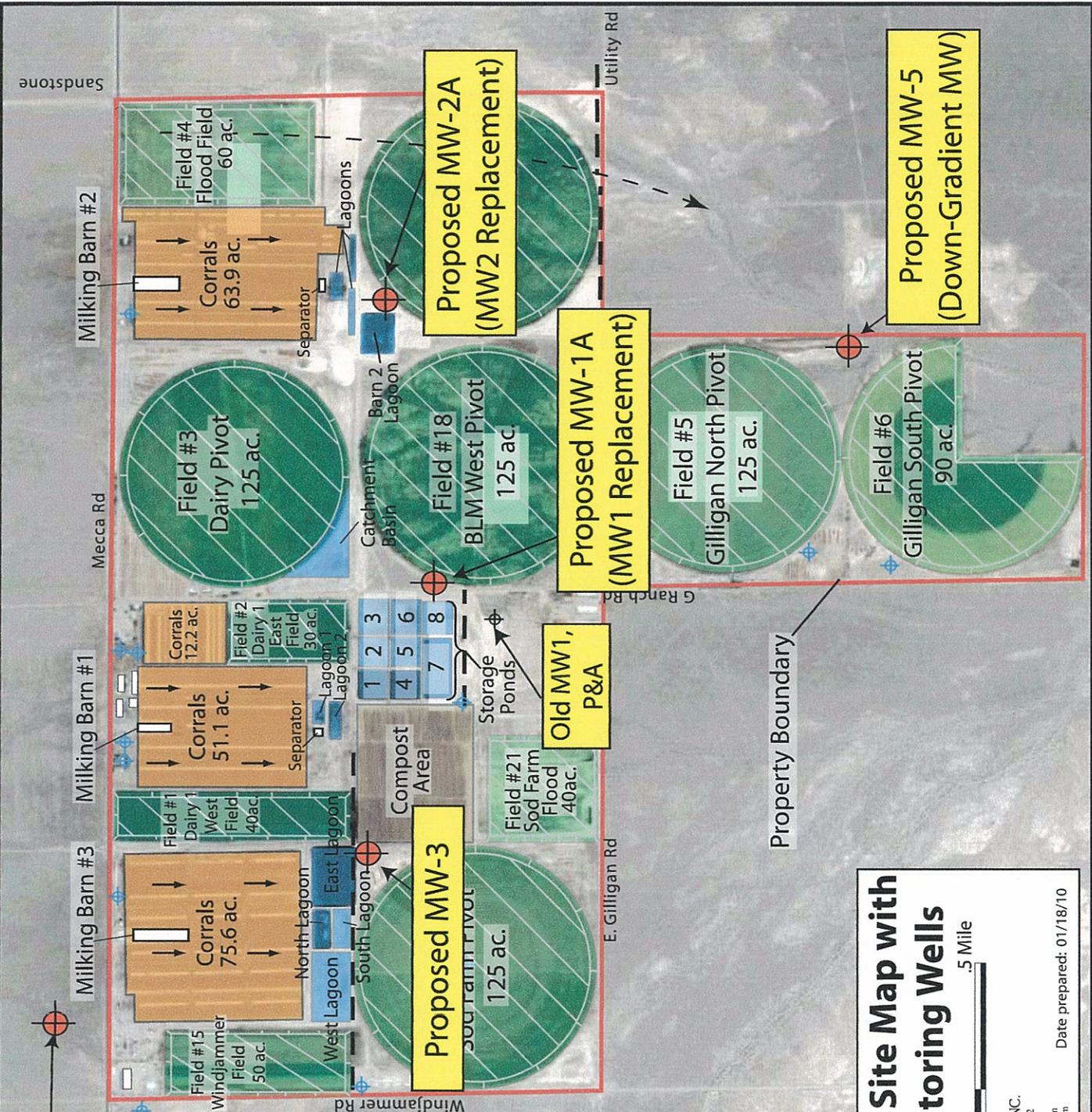


**Ponderosa Dairy Site Map with
Proposed Monitoring Wells**

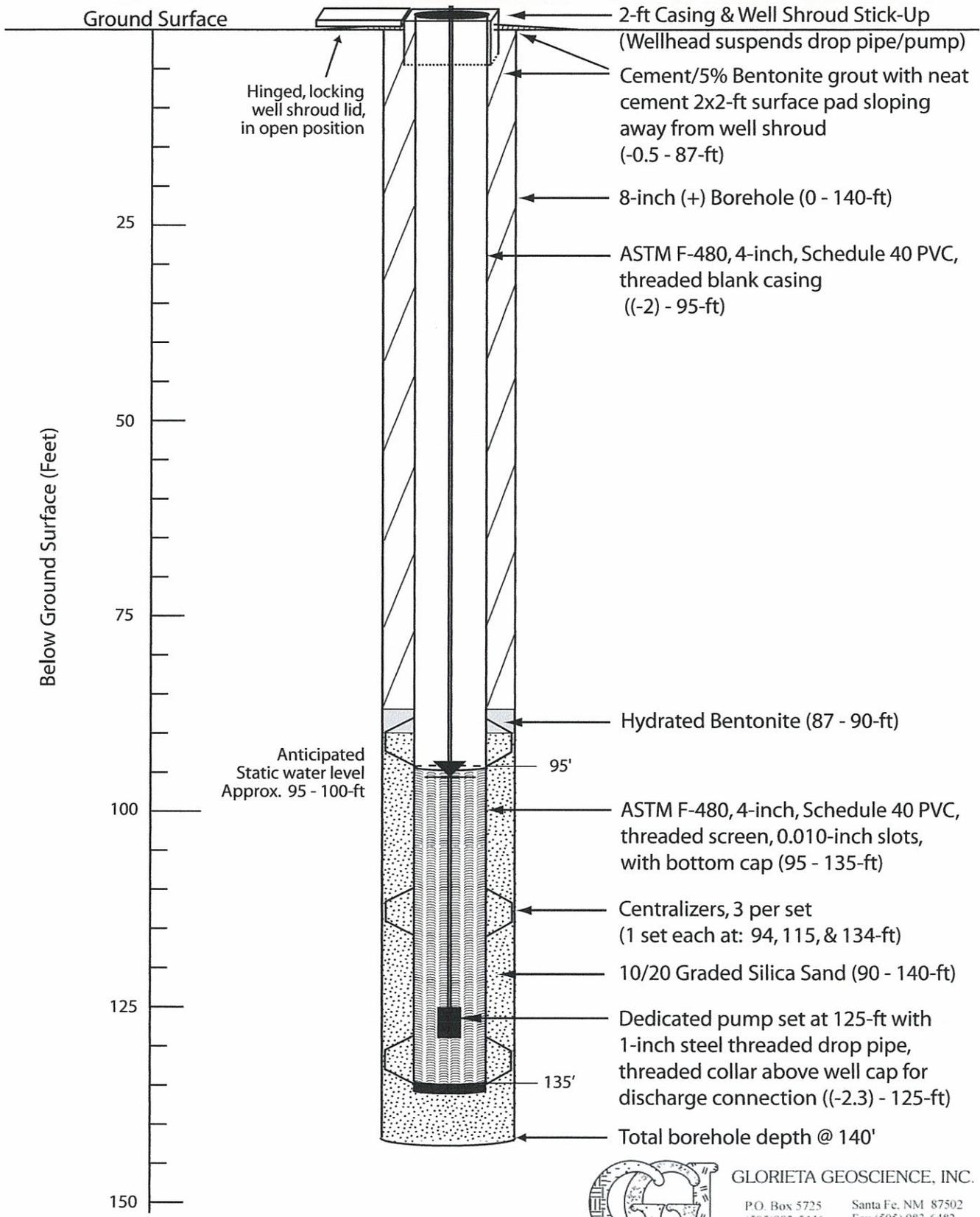


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Date prepared: 01/18/10



Ponderosa Dairy Schematic for MW-1 Replacement (MW-1A) and Four New Monitoring Wells: MW-2A, MW-3, MW-4, MW-5

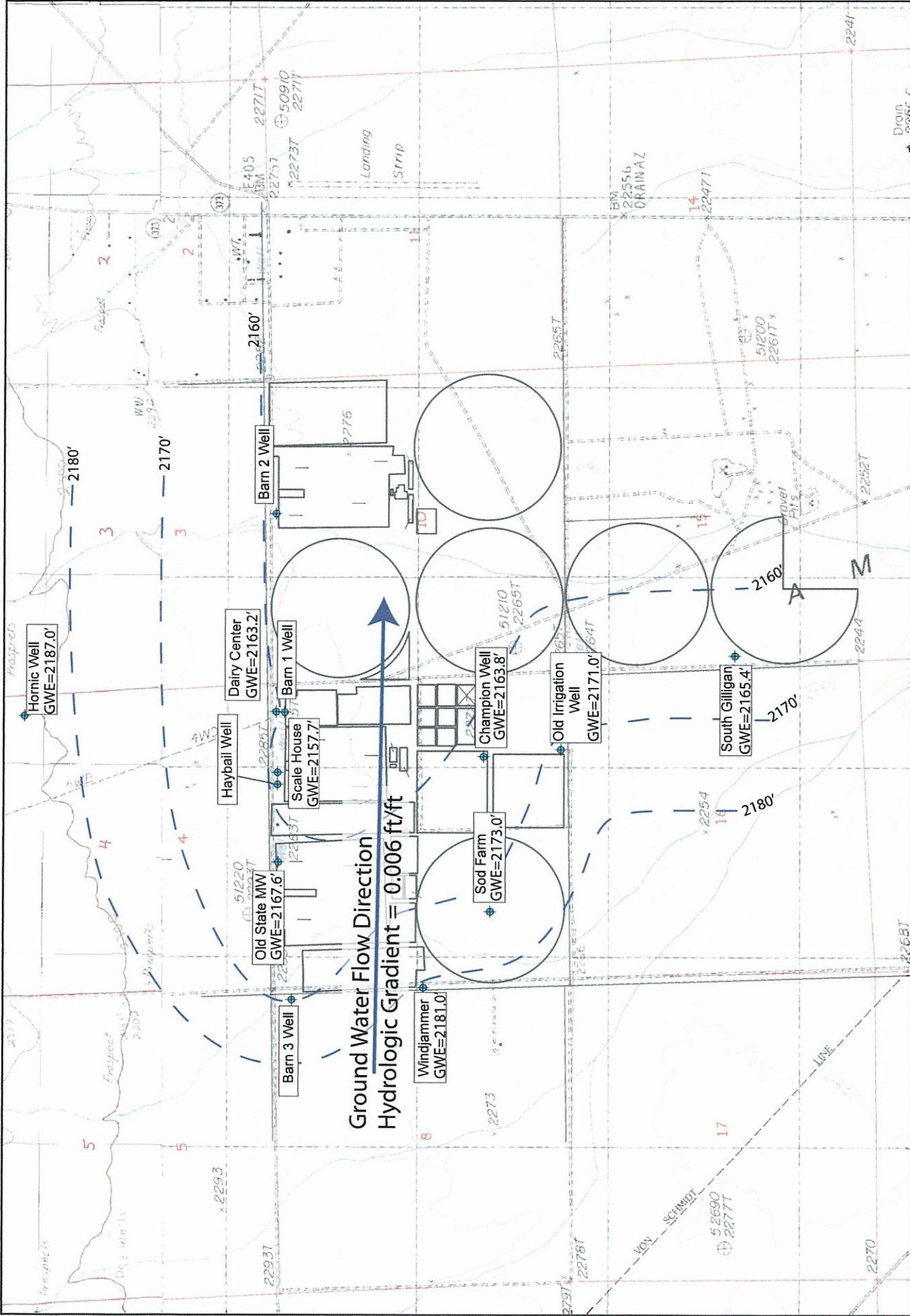


**BID SHEET FOR DRILLING AND INSTALLATION OF FIVE MONITORING WELLS,
APPROXIMATELY 140-ft DEEP EACH
Ponderosa Dairy, Nye County, Nevada**

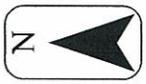
Tasks and Materials	Estimated Quantity	Units	Unit Price	Total Price
DRILL ONE BORING, NO LESS THAN 8-INCH DIAMETER, TO 140-FT BELOW GROUND SURFACE (bgs)				
Using hollow stem auger, or air-rotary method with a temporary surface conductor. (Drill cutting samples collected every 5 ft and/or split spoon every 10 ft)	140	Lin. Ft		
INSTALL ONE 140-FT MONITORING WELL				
Install 40 feet of ASTM F-480, 4-inch ID, sch. 40, threaded PVC screen, 0.010 mill slot, with bottom cap. Install centralizers (3 per set) at top, middle, and bottom. Land casing ~5 ft above boring total depth, approx. 135 ft bgs	40	Lin. Ft		
Install 100 feet of ASTM F-480 blank, 4-inch ID, sch. 40, threaded PVC casing with 24-in. stick up (above ground surface)	100	Lin. Ft		
Install well cap with capacity to suspend drop pipe/pump	1	Each		
Install 10/20 silica sand from 140 - 90 ft (50 feet) via tremie pipe (approximately 0.3 cu.ft. per lin. ft), settle filter pack via surging or bailing inside well screen	50	Lin. Ft		
Install 1/4" bentonite pellet seal from 90 - 87 ft (3 feet) and hydrate pellets after placement (approximately 0.3 cu.ft. per lin. ft)	3	Lin. Ft		
Install cement/5% bentonite grout via tremie (approximately 0.3 cu.ft. per lin. ft) from 87 ft to ground surface (87 feet)	87	Lin. Ft		
SURFACE COMPLETION & DEVELOPMENT				
Set steel monitoring well shroud: 6x6-inch square or 6-inch (nominal) diameter, with hinged, locking lid. Shroud in open position should be set with exactly the same stick up height as the top edge of the well casing.	1	Each		
Set concrete pad at well surface: minimum 2x2-ft x 4-inch thick, sloping away from well head	1	Each		
Development time (air lifting or wireline bailer)	8	Hours		
Bollards	4	Each		
SET DEDICATED PUMP				
Furnish 1/2 hp pump with shroud and set at 125-ft bgs	1	Each		
Approx. 130-ft of 1-inch threaded steel drop pipe, with threaded collar above well cap for temporary discharge pipe connection when purging and sampling well.	130	Lin. Ft		
135-ft of electrical wire rated for pump size and depth	135	Lin. Ft		
SUBTOTAL FOR ONE 140-FT MONITORING WELL DRILL, INSTALL AND DEVELOP				
Mob/Demob	1	Lump Sum		
Steam Cleaner	1	Lump Sum		
TOTAL ESTIMATED COST FOR FIVE WELLS (not including NVGRT):				

**BID SHEET FOR PLUGGING AND ABANDONMENT OF ONE MONITORING WELL,
APPROXIMATELY 95-ft DEEP
Ponderosa Dairy, Nye County, Nevada**

Tasks and Materials	Estimated Quantity	Units	Unit Price	Total Price
<p>PER NAC 534.4365, PLUG AND ABANDON ONE 4-INCH DIAMETER MONITORING WELL FROM 95-ft BELOW GROUND SURFACE (bgs) TO GROUND SURFACE</p> <p>Install cement/20% bentonite grout into 4-in well via tremie pipe (approximately 0.1 cu.ft. per lin. ft) from 95-ft bgs to ground surface (95 feet)</p>	95	Lin. Ft		
<p>REMOVE SURFACE COMPLETION</p> <p>Remove steel monitoring well shroud stick up and well casing stick up above existing well pad. Leave well pad in place for future protection of aquifer water quality.</p>	1	Each		
<p>Mob/Demob</p>	1	Lump Sum		
<p>TOTAL ESTIMATED COST FOR P&A ONE WELL (not including NVGRT): _____</p>				



Ponderosa Dairy Potentiometric Surface Map



2009 DTW measurements
 Well DTW measured by Dairy staff, 4/22/09
 surface elev. estimated from 1:24k scale USGS
 topo quadrangle, CI=10'



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