POTTER VALLEY COMMUNITY UNIFIED SCHOOL DISTRICT

Well Committee Update

Date: May 21, 2025

To: PVCUSD BOARD OF TRUSTEES – COMMUNITY MEMBERS

From: WELL COMMITTEE

Subject: STATUS REPORT – NEW WATER SOURCE FOR SCHOOL FACILITIES

PURPOSE: The purpose of this report is to update the School District Board of Trustees and the Community of Potter Valley of the Status of New Well Construction to serve the school district.

BACKGROUND: The school facilities are currently served with treated drinking water from a well identified as "Well No. 2". The water produced by this well is treated to meet minimum standards set forth by the California State Water Resources Control Board, Division of Drinking Water (DDW). The school's water system operator conducts quality testing and monitors daily use and reports the information to the DDW Field Operations Branch Office in Santa Rosa. A test several years ago resulted in the quantity of nitrates exceeding 10 parts per million expressed as 10 milligrams/liter (mg/l) of nitrate as nitrogen. The DDW standard is a maximum of 10 mg/l. High levels of nitrates are known to have public health risks, one of which is commonly called "Blue Baby Syndrome". It is a condition which decreases the amount of red blood cells which carry oxygen in the blood stream and results in a blue skin pigment in babies. There are other health effects in older individuals who ingest water with high nitrate content over time.

School drinking water meets all the other standards required, as documented by reports submitted to DDW. Although the nitrate constituent only exceeded the maximum allowable level once, it triggered concern about the water supply for the school facilities. The Field Office of DDW recommended that the well serving the school facilities be investigated. Consequently, funding for the investigation was established through the State's SAFER program, which is funded by the Safe and Affordable Drinking Water Fund. The program in Potter Valley is lead by California State University, Sacramento, Office of Water Programs (OWP). Funding is provided by the State Water Resources Control Board, Division of Financial Assistance (DFA). The engineering firm of GHD was engaged to conduct the studies.

The initial evaluation included filming the well casing. It was determined that the depth of well seal is only eight feet below the ground surface(bgs). That explains why the potential for nitrate levels exceeding 10 mg/l can occur. Nitrate levels are frequently elevated by percolation of nitrogen fertilizer down through the soil strata in agricultural communities.

This well is thought to be on an old submerged streambed due to its gravelly formation between 20 and 30 feet bgs. Therefore nitrate infiltration can come from lands off the school grounds and upstream.

The current State Standard for wells is to have a sanitary seal to a depth of 50 feet bgs for commercial and institutional wells. A well seal is constructed using cement and other impermeable additives to seal off the strata between the well casing and the edge of the bore hole. It is intended to prevent surface contaminants from entering the water-bearing strata. With a seal of only 8 feet bgs, the current well serving school facilities is clearly out of compliance and has a significant risk of being contaminated through accidental spillage or slowly percolating constituents.

The results of the initial evaluation lead to the need to try to find a well which will comply with current State Standards. For the past three years studies have progressed to determine a course of action to achieve a production well which complies with DDW standards.

EXISTING AND HISTORICAL WELLS ON SCHOOL PROPERTY: The well currently serving school drinking water facilities is identified as "Well No. 2". It is located east of the Bus Barn near the Ag Facilities. Maximum production is approximately 20 gallons per minute (gpm) for short periods of time (2 hours). Reliable sustained production is approximately 16 gpm.

The school initially was served by a well on the west side of the East Fork Russian River(the river) near the football field, known as Well No. 1, but the school was ordered to find a new source when water from that well was tested and was found to have some contamination. Several Test Wells were drilled in 1988 including the one currently identified as Well No. 2. One was abandoned and one was retained as an untreated source for Ag Facility Irrigation (Well No.3). There is also a well on the one acre parcel used for sheep grazing. Since it was constructed when the land was subdivided in the 1970's, it likely has a very shallow seal and would not be suitable for a replacement well.

A test boring was commissioned by GHD in 2023. It was located near the playing courts at the south end of the Junior High Wing. It was identified as test boring B-3 since several other shallower borings to understand the substrate formations were also made (B-1, B-2). In April, 2023, B-3 was extended to a depth of 120 feet bgs and encountered insufficient ground water to warrant construction of a production test well.

Due to the lack of sufficient water-bearing strata in B-3, the State DFA authorized two additional test borings. Test Boring B-4 (now near future Well No. 4) was drilled to a depth of 150 feet bgs on July 5th and 6th, 2023 and Test Boring B-5 (now near future Well No. 5) was drilled to a depth of 151 feet bgs between July 7th and July 11th, 2023. Both Borings revealed strata which could potentially produce enough water to consider further development. Both borings were backfilled and sealed to prevent surface contamination. B-4 is located near the picnic tables south of the refurbished tennis court on the east side of the river. B-5 is located between the building housing Well No. 1 and the river at the south end of the football field.

In summary the school has two wells which it currently uses:

- Well No. 2 provides potable water for school facilities and produces approximately 16 gpm as a sustained flow.
- Well No. 3 produces water used for agricultural irrigation and stock watering with unknown but limited production.

Other Historical Wells:

- Well No. 1 near the football field has been abandoned and reportedly has partially collapsed.
- Two other test wells were drilled and backfilled in 1988.
- One other well exists on the one acre parcel used as pasture and has minimal use.

Potential New Wells:

- Well No. 4 will be constructed and tested for production and water quality in July or August of 2025. If it is found to be adequate in both regards, it will become a production well to replace Well No. 2.
- Well No. 5 is a back-up concept in case Well No. 4 does not have sufficient water for a reliable supply. There is no current plan to construct it.

POTENTIAL IMPACT ON GROUNDWATER AVAILABILITY

There is concern in the community about what will happen if the Eel River Diversion is curtailed or eliminated. What groundwater will the school wells potentially use if the well construction plan is carried to completion?

Well No. 2 will no longer be used as a potable water source if Well No. 4 is successfully developed. It may serve as irrigation water for the portion of the school grounds which is currently irrigated from Well No. 2 in order to avoid using treated water for irrigation, but, in any case, its production will be significantly reduced or eliminated.

Well No. 4 will be sealed to a depth of 78 feet bgs to exclude strata nearer to the surface where bluish coloration was encountered. Soils with bluish coloration often contain iron and manganese constituents which are difficult and costly to treat. The screen interval for water production is planned to be between 108 and 128 feet bgs, where strata with potential water was encountered. Production is hoped to be sustainable at 5 gpm, but it may be less. Mineral constituents such as boron may present a quality problem, so there is no guarantee that a production well can be successfully completed. Based on the strata encountered in Test Boring No. 4, sustained production of more than 5 gpm is extremely unlikely.

Well No. 5, if constructed to augment production to sustain the potable water needs of the school, will be in similar strata as Well No. 4 and, at best, will produce a sustainable amount of 3-5 gpm.

Both test boring logs included information that leads us to believe that there is no interconnection with the river, due to the depths of water bearing units observed and the test well location being at least 100-feet from the river. This information along with the low flow pumping rates anticipated, indicates there will be no impact to the river if either or both wells are brought on line as production wells.

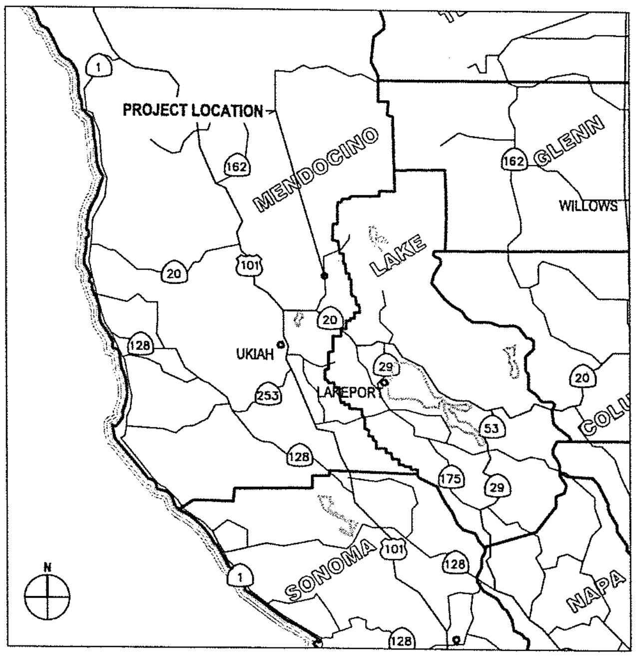
Well No. 4 is located approximately 400 feet from Main Street, approximately 400 feet from the south boundary of the school, approximately 1200 feet from the east boundary of the school and approximately 600 feet from the west boundary of the school. Typical drawdown cones of depression from wells pumped at 5 gpm in 20 feet of water-bearing strata may extend 80-120 feet radially, so potential impacts to groundwater from this well to adjoining properties are considered insignificant.

Well No. 5, if constructed, would be approximately 100 feet north of the south boundary of the football field and 150 feet east of the west boundary. With the limited production anticipated in similar shallow water-bearing strata, it is unlikely that water level interference would occur in offsite wells to the school grounds.

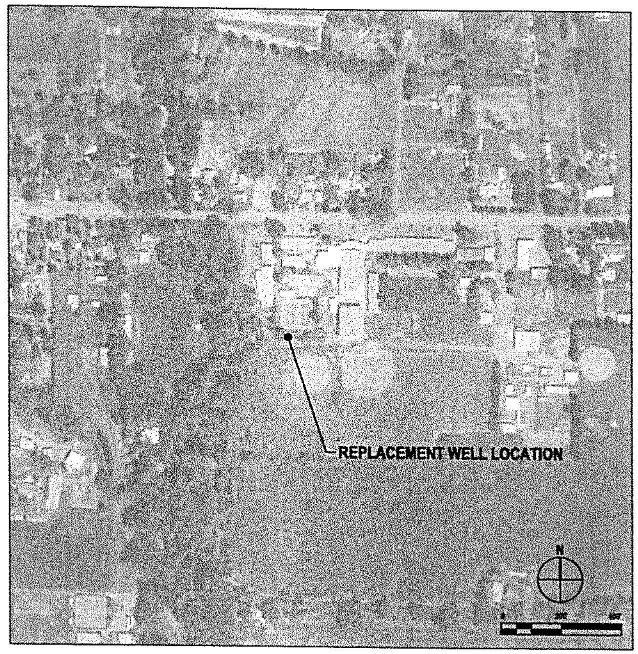
The attached Google Earth Photo shows the locations of the wells discussed in this report.

POTTER VALLEY SCHOOL REPLACEMENT WELL

FEBRUARY 2025



AREA MAP



LOCATION MAP

SHEET INDEX

SHEET NUMBER	SHEET TITLE	SHEET DESCRIPTION
1	G-001	TITLE SHEET AND VICINITY MAP
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4	C-002	HYDROLOGIC BORING LOG REPORTS
5	C-101	WELL SITE PLAN
6	C-201	WELL CONSTRUCTION PROFILE

PRELIMINARY

No.	Issue	Checked	Approved	Date

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Designer C GOLDEN · Design Check R CRAWFORD · Project Director A LYNCH

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Bar is one inch on original size sheet

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Client: UNIVERSITY ENTERPRISES INC.
Project: POTTER VALLEY SCHOOL REPLACEMENT WELL
Title: TITLE SHEET AND VICINITY MAP

Project No. 12577382 · Date 2/21/2025 · Scale AS SHOWN · Size ANSI D · G-001 · Sheet 1 of 6

Plot Date: 21 February 2025 - 4:01 PM · Plotted By: Taylor Bell

GENERAL SITE NOTES

1. ALL WORKMANSHIP, MATERIALS, AND CONSTRUCTION SHALL CONFORM TO THE STATE OF CALIFORNIA CODE OF REGULATIONS, LATEST EDITION.
2. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK. ANY DISCREPANCY DISCOVERED BY CONTRACTOR IN THESE PLANS OR ANY FIELD CONDITIONS DISCOVERED BY CONTRACTOR THAT MAY DELAY OR OBSTRUCT THE PROPER COMPLETION OF THE WORK PER THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY UPON DISCOVERY. SAID NOTIFICATION SHALL BE IN WRITING.
3. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY: THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONTRACTOR FURTHER AGREES TO HOLD HARMLESS, INDEMNIFY AND DEFEND THE OWNER, THE ENGINEER AND THEIR CONSULTANTS, AND THE COUNTY, AND EACH OF THEIR OFFICERS, EMPLOYEES AND AGENTS.
4. THE CONTRACTOR SHALL MAINTAIN REASONABLE ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION.
5. UNDERGROUND OBSTRUCTIONS, NOT SHOWN ON THESE PLANS, MAY BE ENCOUNTERED. THOSE SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AND THE CONTRACTOR IS CAUTIONED THAT THE OWNER, THE ENGINEERS, AND DISTRICT ASSUME NO RESPONSIBILITY FOR ANY OBSTRUCTIONS EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL COOPERATE WITH ALL UTILITY COMPANIES WORKING WITHIN THE LIMITS OF THIS PROJECT.
6. ALL LANDSCAPING AND UTILITIES OR OTHER COUNTY OWNED OR PRIVATE IMPROVEMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED IN KIND OR AS DIRECTED BY THE WATER COMPANY OR ENGINEER.
7. ALL DISTANCES SHOWN ON THE DRAWINGS ARE BASED ON HORIZONTAL AND VERTICAL MEASUREMENTS.
8. WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF THE WORK, DETAILS SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
9. EROSION CONTROL MEASURE SHOWN HERE ARE THE MINIMUM RECOMMENDED. THE CONTRACTOR SHALL ADHERE THE BMP (BEST MANAGEMENT PRACTICES) FOR THE PROJECT SITE APPROPRIATE TO THE PHASE OF CONSTRUCTION AND THE TIME OF YEAR.
10. IF CONTAMINATED SOIL IS ENCOUNTERED DURING CONSTRUCTION, CONTRACTOR SHALL NOTIFY THE ENGINEER. AFTER CONTAMINATED SOIL IS ENCOUNTERED (OIL, PETROLEUM, HYDROCARBONS, SMELLS OR ODORS, OIL SHEET AT THE SURFACE), ALL CONTAMINATED SOILS WILL BE STOCKPILED ON AND COVERED WITH 10 MIL PLASTIC SHEETING.
11. ALL EXCESS MATERIAL FROM THE PROJECT SHALL BE DISPOSED OF AT A LOCATION APPROVED BY THE ENGINEER.
12. CONTRACTOR SHALL RESTORE OR REPLACE ANY DAMAGED SURVEY MONUMENTS RESULTING FROM HIS OPERATION AND SHALL BEAR ALL COSTS OF SUCH REPLACEMENT.
13. UPON COMPLETION OF THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL LEAVE THE PROJECT AREA FREE OF DEBRIS AND UNUSED MATERIAL.
14. NO SMOKING ANYWHERE ON THE SCHOOL CAMPUS AT ALL TIMES.

EROSION CONTROL NOTES

1. AT A MINIMUM, THE CONTRACTOR SHALL EMPLOY THE FOLLOWING BEST MANAGEMENT PRACTICES (BMP'S) AS DESCRIBED IN THE CURRENT CALIFORNIA STORMWATER BMP HANDBOOK FOR CONSTRUCTION (WWW.CASQA.ORG):

   EC-1 SCHEDULING
   EC-2 PRESERVATION OF EXISTING VEGETATION
   EC-4 HYDROSEEDING
   SE-1 SILT FENCE
   SE-5 FIBER ROLLS
   SE-10 STORM DRAIN INLET PROTECTION
   WE-1 WIND EROSION CONTROL
   NS-8 VEHICLE EQUIPMENT AND FUELING
   NS-10 VEHICLE & EQUIPMENT MAINTENANCE
   TC-1 STABILIZED CONSTRUCTION ENTRANCE/EXIT
   TC-3 ENTRANCE/OUTLET TIRE WASH
   WM-1 MATERIALS DELIVERY AND STORAGE
   WM-2 MATERIAL USE
   WM-3 STOCKPILE MANAGEMENT
   WM-4 SPILL PREVENTION AND CONTROL
   WM-5 SOLID WASTE MANAGEMENT
   WM-8 CONCRETE WASTE MANAGEMENT
   WM-9 SANITARY/SEPTIC WASTE MANAGEMENT

2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MINIMIZE EROSION AND PREVENT THE TRANSPORT OF SEDIMENT TO SENSITIVE AREAS.
3. SUFFICIENT EROSION CONTROL SUPPLIES SHALL BE AVAILABLE ON-SITE AT ALL TIMES TO DEAL WITH AREAS SUSCEPTIBLE TO EROSION DURING RAIN EVENTS.
4. MINIMIZE DISTURBANCE OF EXISTING VEGETATION TO THAT NECESSARY TO COMPLETE THE WORK.
5. THE CONTRACTOR SHALL MAKE ADEQUATE PREPARATIONS, INCLUDING TRAINING & EQUIPMENT, TO CONTAIN SPILLS OF OIL AND OTHER HAZARDOUS MATERIALS.
6. ACTIVITIES SUCH AS VEHICLE WASHING ARE TO BE CARRIED OUT AT AN OFF-SITE FACILITY WHEREIN THE WATER IS DISCHARGED INTO A SANITARY SEWER.
7. THE CONTRACTOR SHALL PROVIDE COVERED WASTE RECEPTACLE FOR COMMON SOLID WASTES AT CONVENIENT LOCATIONS ON THE JOB SITE AND PROVIDE REGULAR COLLECTION OF WASTES.
8. THE CONTRACTOR SHALL PROVIDE SANITARY FACILITIES OF SUFFICIENT NUMBER AND SIZE TO ACCOMMODATE CONSTRUCTION CREWS AND ENSURE ADEQUATE ANCHORAGE OF SUCH FACILITIES TO PREVENT THEM FROM BEING TIPPED BY THE WEATHER OR VANDALISM.
9. APPROPRIATE STORAGE AND DISPOSAL OF WATER FROM PURGING OPERATIONS SHALL BE EXERCISED IN THE EVENT THAT ACCUMULATED WATER MUST BE REMOVED FROM A WORK LOCATION.
10. COVERED AND SECURED STORAGE AREAS FOR POTENTIALLY TOXIC MATERIALS SHALL BE PROVIDED. ALL HAZARDOUS MATERIAL CONTAINERS SHOULD BE PLACED IN SECONDARY CONTAINMENT.
11. VEHICLE AND EQUIPMENT & MAINTENANCE SHOULD BE PERFORMED OFF-SITE WHENEVER PRACTICAL.
12. SOIL STOCKPILES SHALL BE COVERED, AND LOCATED AT LEAST 50 FEET AWAY FROM DRAINAGE CHANNELS AND STORMWATER SYSTEMS.
13. CONTRACTOR MUST ENSURE THAT THE CONSTRUCTION SITE IS PREPARED PRIOR TO THE ONSET OF ANY STORM.
14. ALL SEDIMENT DEPOSITED ON PAVED SURFACES SHALL BE SWEPT AT THE END OF EACH WORKING DAY, AS NECESSARY OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. A STABILIZED CONSTRUCTION ENTRANCE MAY BE REQUIRED TO PREVENT SEDIMENT FROM BEING DEPOSITED ON PAVED ROADWAYS.
15. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN ACCORDANCE TO THEIR RESPECTIVE BMP FACT SHEET UNTIL DISTURBED AREAS ARE STABILIZED.
16. THIS PLAN MAY NOT COVER ALL THE SITUATIONS THAT ARISE DURING CONSTRUCTION DUE TO UNANTICIPATED FIELD CONDITIONS. VARIATIONS MAY BE MADE TO THE PLAN IN THE FIELD SUBJECT TO THE APPROVAL OF OR AT THE DIRECTION OF THE OWNER'S REPRESENTATIVE.
17. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIX ANY DEFICIENCIES INDICATED BY THE OWNER'S REPRESENTATIVE TO PREVENT EROSION AND CONTROL SEDIMENT.
18. PRIOR TO FINAL ACCEPTANCE ALL DISTURBED AREAS OF THE SITE SHALL BE PERMANENTLY STABILIZED WITH HYDROSEED BY CONTRACTOR AND TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE REMOVED AS DIRECTED.

ABBREVIATIONS

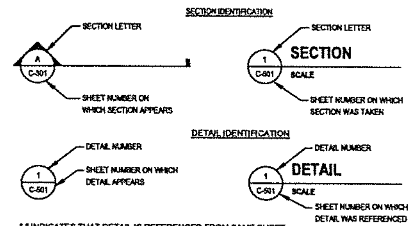
APN	ASSESSORS PARCEL NUMBER
AWWA	AMERICAN WATER WORKS ASSOCIATION
BGS	BELOW GROUND SURFACE
BMP	BEST MANAGEMENT PRACTICE
DIA	DIAMETER
DWG	DRAWING
(E)	EXISTING
FT	FEET
(F)	FUTURE
GPM	GALLONS PER MINUTE
ID	INSIDE DIAMETER
MAX	MAXIMUM
MIN	MINIMUM
(N)	NEW
OD	OUTSIDE DIAMETER
OH	OVERHEAD
PL	PROPERTY LINE
TYP	TYPICAL

LEGEND

EXISTING

W-1	WELL LOCATION
— — —	PROPERTY LINE
— NPW —	(E) NON-POTABLE WATER / IRRIGATION LINES
— S —	(E) SEPTIC LINES
— w —	(E) WATER LINES
○	(E) WELL

SYMBOLS



"-" INDICATES THAT DETAIL IS REFERENCED FROM SAME SHEET.
"VAR" INDICATES THAT DETAIL IS REFERENCED FROM MULTIPLE SHEETS.

DRAWING DESIGNATION

C - 1 0 1
DESIGNATION — INDIVIDUAL DRAWING NUMBER

DESIGNATION	DISCIPLINE
G	GENERAL
C	CIVIL
S	STRUCTURAL
E	ELECTRICAL

NUMBER	SHEET TYPE
000	GENERAL
100	PLANS
200	ELEVATIONS
300	SECTIONS
400	LARGE SCALE VIEWS
500	DETAILS
600	SCHEDULES AND DIAGRAMS
700	CODE COMPLIANCE FORMS

PRELIMINARY

No. Issue Checked Approved Date
Author T BELL Drafting Check R CRAWFORD Project Manager M DUNNE
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Bar is one inch on original size sheet 0 1"

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Project POTTER VALLEY SCHOOL REPLACEMENT WELL
Title GENERAL NOTES, LEGEND, AND ABBREVIATIONS
Size ANSI D

Project No.	Date	Scale	Sheet
12577382	2/21/2025	AS SHOWN	G-002 2 of 6

WELL CONSTRUCTION, WELL DEVELOPMENT, AND TESTING SPECIFICATIONS

DESCRIPTION

DRILL, SAMPLE, AND TEST THE WELL. WORK INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

1. DRILL BOREHOLE SUFFICIENT TO GET TO THE TOTAL ANTICIPATED DEPTH, AS DIRECTED BY THE PROJECT ENGINEER/GEOLOGIST.
2. KEEPING A WRITTEN LOG OF STRATA ENCOUNTERED DURING DRILLING AND A WRITTEN DAILY RECORD OF WORK PROGRESS, CREW PRESENT, AND EQUIPMENT AND MATERIALS USED.
3. COLLECTING CUTTINGS REPRESENTATIVE OF STRATA ENCOUNTERED BY THE DRILLING AT LEAST EVERY 5 FEET AND AT MAJOR LITHOLOGY CHANGES OR AS DIRECTED BY THE PROJECT ENGINEER/GEOLOGIST.
4. DRILLING A MINIMUM 10-INCH DIAMETER BOREHOLE TO A DEPTH DETERMINED BY THE PROJECT ENGINEER/GEOLOGIST (ANTICIPATED 130 - 150 FEET).
5. SEPARATING DRILL CUTTINGS AND DEVELOPMENT SEDIMENT FROM ASSOCIATED LIQUIDS AND SPREADING THEM ON THE APPROVED DISPOSAL SITE OR AS DIRECTED BY THE PROJECT ENGINEER/GEOLOGIST.
6. PROVIDING AND INSTALLING MATERIALS FOR THE WELL PER PLANS AND WITH ANY MODIFICATIONS REQUIRED BY THE PROJECT ENGINEER/GEOLOGIST.
7. DEVELOPING THE WELL BY AIR LIFTING AND/OR MECHANICAL SURGING.
8. PERFORMING A 24-HOUR PUMP TEST.
9. OBTAINING AND ANALYZING SAMPLES OF WATER FOR WELL.
10. RESTORING THE WELL SITE TO ITS ORIGINAL CONDITION.
11. FURNISHING LOGS AND DAILY RECORDS TO THE PROJECT ENGINEER/GEOLOGIST.
12. OTHER WORK AS REQUIRED.

NOTIFICATION

PROVIDE THE PROJECT ENGINEER/GEOLOGIST 24 HOUR WRITTEN ADVANCE NOTICE PRIOR TO PERFORMANCE OF SPECIFIC OPERATIONS AS FOLLOWS:

1. STARTING DRILLING OPERATIONS AT THE SITE.
2. STARTING CONSTRUCTION OF THE WELL.
3. STARTING WELL DEVELOPMENT.
4. STARTING PUMP TEST.

SITE PROTECTION

1. CONTRACTOR TO COMPLY WITH ALL RESTRICTIONS SET BY POTTER VALLEY UNIFIED SCHOOL DISTRICT, INCLUDING ALLOWABLE WORK HOURS, ALLOWABLE DAYS ON SITE, AND ANY REQUIRED BACKGROUND INFORMATION DOCUMENTS. CONTRACTOR MUST WORK WITH AND ACCEPT AN ONSITE ESCORT SHOULD THE SCHOOL DISTRICT ASSIGN ONE.
2. KEEP THE WORKSITE FREE AND CLEAN OF ALL RUBBISH AND DEBRIS.
3. PROVIDE PROTECTIVE BARRIERS AND OTHER SAFETY PROTECTION NECESSARY TO PROTECT THE PUBLIC AND WORKERS.
4. PROTECT ALL EXISTING FENCES, WALLS, BUILDINGS, TREES, AND LANDSCAPING DURING THE PROGRESS OF THE WORK. IN THE EVENT OF DAMAGE TO SUCH PROPERTY, IMMEDIATELY RESTORE THE PROPERTY TO A CONDITION EQUAL TO ITS ORIGINAL CONDITION AND TO THE SATISFACTION OF THE PROJECT ENGINEER/GEOLOGIST. THIS PROVISION INCLUDES DAMAGE TO SURFACE AND SUBSURFACE UTILITIES.
5. THE DRILLER SHALL COMPLY WITH ALL APPLICABLE NOISE ORDINANCES. OPERATIONS NOISE TO BE KEPT TO A MINIMUM AND PROPER NOISE ARRESTORS AND MUFFLERS ARE REQUIRED. NOISE REDUCTION MEASURES ARE REQUIRED DUE TO THE CLOSE PROXIMITY TO BUILDINGS.
6. TO MINIMIZE FUGITIVE DUST STANDARD CONSTRUCTION DUST CONTROL MEASURES ARE REQUIRED. THESE MEASURES INCLUDE BUT ARE NOT LIMITED TO:
   - 6.1. COVERING STOCKPILES OF LOOSE MATERIAL WHEN NOT IN IMMEDIATE USE.
   - 6.2. LIMITING CLEARING, GRADING, EARTHMOVING, AND EXCAVATING TO TIMES WHEN THE AVERAGE WIND SPEED FOR ONE HOUR IS LESS THAN 20 MILES PER HOUR.
   - 6.3. LIMITING CONSTRUCTION SITE VEHICLE SPEED TO LESS THAN 15 MILES PER HOUR ON EXPOSED SOILS.
7. AFTER COMPLETION OF THE WORK, REMOVE FROM THE PREMISES AND WORK AREAS ALL MATERIALS, TOOLS, DEBRIS, AND DRILL CUTTINGS AND LEAVE IN A CONDITION ACCEPTABLE TO THE PROJECT ENGINEER/GEOLOGIST.

CONTAMINATION AND DISINFECTION

1. PERFORM OPERATION IN A SUCH A MANNER AS TO PREVENT THE INTRODUCTION OF CONTAMINANTS INTO THE WELL AND SURROUNDING AQUIFER.
2. KEEP TOOLS, CASINGS, PUMPS, AND OTHER ELEMENTS CLEAN.
3. PROTECT WATER SUPPLY FROM CONTAMINATION.
4. WHEN INSTALLING THE SANDPACK, DISINFECT SAND BY APPLICATION OF 1/2 POUND OF 70 PERCENT HYPOCHLORITE OR APPROVED EQUIVALENT, PER CUBIC YARD OF SANDPACK INSTALLED IN THE HOLE. APPLY DISINFECTANT IN LIQUID SOLUTION DURING SANDPACK PLACEMENT TO ASSURE COMPLETE DISINFECTION.
5. BEFORE FINAL CAPPING, DISINFECT WELL BY A CHLORINE SOLUTION IN ACCORDANCE WITH AWW A100, APPENDIX E, METHOD A OR B. AFTER INTRODUCTION OF CHLORINE SOLUTION, TURN PUMP ON AND OFF TO SURGE WELL AND MIX CHLORINE SOLUTION INTO WELL WATER. LEAVE MIXED CHLORINE SOLUTION IN WELL FOR 24 HOURS AND THEN PUMP UNTIL CHLORINE RESIDUAL IS BELOW 5 PPM. DISINFECT ANY TOOLS OR ITEMS INTRODUCED INTO WELL AFTER DISINFECTION.
6. THE PROJECT ENGINEER/GEOLOGIST MAY REQUIRE THAT MATERIALS AND/OR EQUIPMENT BE CLEANED AND DISINFECTED IF, IN THEIR SOLE OPINION, THE OPERATION IS INTRODUCING CONTAMINANTS INTO THE WELL OR SURROUNDING AQUIFER.

DISPOSAL OF MATERIAL

1. LOCATE AN ACCEPTABLE DISCHARGE POINT FOR THE DISPOSAL OF ALL WATER DURING DEVELOPMENT AND TESTING. DRILLER IS RESPONSIBLE FOR PROPERLY DISPOSING OF ALL WATER RESULTING FROM ALL OPERATIONS IN ACCORDANCE WITH ALL APPLICABLE LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS, INCLUDING THE REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) GENERAL WAIVER FOR SPECIFIC TYPES OF DISCHARGE, ORDER NO. R3-2018-0088.
2. PROVIDE PIPE FOR THIS DISCHARGE AND PROVIDE A MEANS OF SEPARATING GRAVEL, SAND, AND/OR SILT FROM THE DISCHARGE WATER STREAM.
3. SPREAD AND LEVEL CUTTINGS PRODUCED DURING DRILLING ON SITE AS SPECIFIED BY THE PROJECT ENGINEER/GEOLOGIST AND POTTER VALLEY UNIFIED SCHOOL DISTRICT.

LOST HOLES

1. IF THE PROJECT ENGINEER/GEOLOGIST DETERMINES THAT THE HOLE IS LOST DUE TO NEGLIGENCE, INCOMPETENCE, OR MALPRACTICE ON THE PART OF THE CONTRACTOR OR THEIR PERSONNEL, OR TO THE USE OF DEFECTIVE OR UNSUITABLE EQUIPMENT, WE WILL IMMEDIATELY NOTIFY THE CONTRACTOR IN WRITING OF THEIR DECISION AND ORDER THE HOLE ABANDONED.
2. IF A HOLE DOES NOT MEET THE REQUIREMENTS SET HEREIN, OR IF THE CONTRACTOR FAILS TO DRILL A HOLE TO THE DEPTH SPECIFIED BY THE PROJECT ENGINEER/GEOLOGIST WITHIN THE SCOPE OF THE CONTRACT, THE HOLE WILL BE DECLARED ABANDONED.
3. ANY HOLE THAT CANNOT BE CORRECTED TO THE REQUIRED TOLERANCE FOR ALIGNMENT WILL BE DECLARED ABANDONED. THE CONTRACTOR, AT THEIR OWN EXPENSE, MUST FILL AND PLUG THE HOLE(S) ACCORDING TO THE MOST RESTRICTIVE LOCAL, STATE AND/OR FEDERAL REGULATIONS AND IN ACCORDANCE WITH WELL ABANDONMENT. CONTRACTOR MUST DRILL A NEW HOLE AT AN ALTERNATE SITE IN THE IMMEDIATE AREA APPROVED BY THE PROJECT ENGINEER/GEOLOGIST.
4. CONTRACTOR WILL NOT BE PAID FOR ANY FOOTAGE DRILLED OR FOR OTHER OPERATIONS PERFORMED IN ANY HOLE ABANDONED BECAUSE OF DEFECTS.

PRODUCTS

1. DRILLING FLUIDS
   - 1.1. NO DRILLING FLUIDS WILL BE REQUIRED OR PERMITTED.
2. WELL CASING
   - 2.1. 5-INCH OUTSIDE DIAMETER SCH 40 PVC OR APPROVED EQUIVALENT, FABRICATED IN LENGTHS NOT LESS THAN 10 FEET.
3. SAND PACK
   - 3.1. SAND FOR PACKING THE TEST WELL MUST BE OF HIGH UNIFORMITY.
   - 3.2. THE TYPE, SIZE GRADATION, AND UNIFORMITY OF THE SAND MUST BE DETERMINED AND APPROVED PRIOR TO INSTALLATION BY THE PROJECT ENGINEER/GEOLOGIST DEPENDING ON FIELD CONDITIONS DETERMINED BY THE PILOT BOREHOLE.
   - 3.3. ALL SAND PACK MATERIAL MUST BE SILICA, HARD, ROUNDED, WATERWORN, AND WASHED CLEAN OF SILT, SAND, DIRT, AND FOREIGN MATTER.
   - 3.4. CRUSHED GRAVEL/SAND WILL NOT BE ACCEPTED.
4. BENTONITE SEAL
   - 4.1. BENTONITE COATED PELLETS MUST BE APPROVED FOR DRINKING WATER SYSTEMS AND APPROVED BY THE PROJECT ENGINEER/GEOLOGIST PRIOR TO INSTALLATION.
   - 4.2. BENTONITE COATED PELLETS MUST BE HYDRATED BY POTABLE WATER AND HAVE A 12 HOUR HYDRATION PERIOD.
5. WATER
   - 5.1. ASSUME WATER IS NOT AVAILABLE FROM EXISTING SYSTEM. CONTRACTOR MUST MAKE THEIR OWN ARRANGEMENTS TO TRANSPORT WATER TO THE SITE. WATER SHOULD BE OF DRINKING WATER QUALITY AND FREE OF SUSPENDED MATERIAL AND OTHER DELETERIOUS SUBSTANCES.

EQUIPMENT

1. EQUIPMENT MUST BE OF THE PROPER TYPE AND IN GOOD CONDITION TO ASSURE THAT THE WORK CAN PROCEED WITHOUT INTERRUPTION, AND PROVIDES THE DRILLING OF A PLUMB AND STRAIGHT WELL.
2. DRILLING EQUIPMENT, INCLUDING COLLARS AND/OR COUPLINGS, MUST BE OF SUFFICIENT SIZE, STRENGTH, AND DESIGN TO MAINTAIN PLUMBNESS AND ALIGNMENT IN DRILLING THE WELL TO ITS MAXIMUM DEPTH.

LOGGING AND RECORDS

1. KEEP A WRITTEN LOG OF STRATA ENCOUNTERED DURING DRILLING AND A WRITTEN DAILY RECORD OF WORK PROGRESS, CREW PRESENT, AND EQUIPMENT AND MATERIALS USED. WORK PROGRESS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   - 1.1. ACCURATE DEPTHS, THICKNESS, AND THE NATURE OF STRATA PENETRATED.
   - 1.2. DRILLING RATES BASED ON A PER HOUR BASIS.
   - 1.3. WATER LEVELS AND DEPTHS OF ENCOUNTERED WATER.
   - 1.4. OTHER INFORMATION AS REQUIRED BY THE PROJECT ENGINEER/GEOLOGIST.
2. REPORT PROGRESS ON ALL PHASES OF THE WORK INCLUDING, BUT NOT LIMITED TO, PLACEMENT OF THE CASING, SCREEN, SAND PACK, ANNULAR SEALS, WELL DEVELOPMENT, AND TESTING RECORDS.
3. DAILY RECORDS SHOULD INDICATE ALL QUANTITIES OF MATERIALS USED.
4. FILE WITH THE PROJECT/GEOLOGIST A COMPLETED WELL COMPLETION REPORT (WCR), CONSISTING OF SUFFICIENT INFORMATION FOR SUBMITTALS AS REQUIRED BY THE DEPARTMENT OF HEALTH SERVICES OR OTHER STATE AGENCIES.

DRILLING

1. DRILL THE BOREHOLE FOR THE PURPOSE OF CHARACTERIZING THE GEOLOGIC MATERIALS ENCOUNTERED AT THE WELL SITE TO PROVIDE DATA ON AQUIFER MATERIAL AND HYDRAULIC PROPERTIES NECESSARY FOR SELECTION OF PROPER WELL DEPTH, SCREENED INTERVAL(S), SLOT OPENING SIZE(S), AND SANDPACK SIZE.
2. BOREHOLE TO BE A MINIMUM OF 10-INCHES IN DIAMETER.
3. THE PROJECT ENGINEER/GEOLOGIST RESERVES THE RIGHT TO INCREASE THE DEPTH OR DIAMETER OF THE BOREHOLE BASED ON CUTTING MATERIALS ENCOUNTERED.
4. A REPRESENTATIVE SAMPLE OF CUTTING MATERIALS TO BE COLLECTED AT EACH CHANGE IN STRATA OR AT LEAST EVERY 5 FEET. SAMPLES TO BE LABELED AND STORED IN A MINIMUM OF QUART-SIZED, WATERPROOF CONTAINERS THAT ARE STORED IN A MANNER TO PREVENT BREAKAGE OR LOSS.
5. IN THE EVENT OF BOREHOLE COLLAPSE PRIOR TO COMPLETION OF THE WELL, TAKE WHATEVER STEPS NECESSARY TO REOPEN THE HOLE. ANY SUCH REMEDIAL ACTION MUST BE CONDUCTED AT CONTRACTOR'S EXPENSE, WITH APPROVAL OF THE PROJECT ENGINEER/GEOLOGIST.

WELL CONSTRUCTION

1. WELL CASING AND SCREEN BASED ON FINAL BORING LOG PROVIDED BY THE PROJECT ENGINEER/GEOLOGIST.
2. WELL CASING SHOULD BE INSTALLED TO THE TARGET DEPTH. INSPECT POSITION OF WELL CASING TO ENSURE CASING IS CENTERED IN BOREHOLE WITH A MINIMUM ANNULAR SPACE OF 2-INCHES. SUPPORT THE WELL CASING IN SUCH A WAY AS TO HOLD IT IN PLACE DURING PLACEMENT OF ANNULAR MATERIALS.
3. DISINFECT AND PLACE SANDPACK UNIFORMLY AROUND INTO THE BOREHOLE ANNULUS AS SHOWN ON WELL PROFILE.
   - 3.1. SANDPACK TO BE PLACED USING PROCEDURES THAT MINIMIZE SEGREGATION OR BRIDGING OF SANDPACK. USE A SOUNDING LINE OR EQUIVALENT METHOD TO CONTINUOUSLY MONITOR SANDPACK LEVEL AND TO DETECT BRIDGING. SANDPACK IS NOT TO BE STORED DIRECTLY ON THE GROUND OR IN CLOSE PROXIMITY TO POTENTIALLY CONTAMINATING MATERIALS.
4. INSTALL BENTONITE SEAL WITH THE INDICATED THICKNESS FROM THE PROJECT ENGINEER/GEOLOGIST (MINIMUM 2 FEET) AND ALLOW SUFFICIENT TO HYDRATION TIME (MINIMUM OF 12 HOURS).
5. ALL TOPS AND BOTTOMS OF FILTER PACK AND BENTONITE SEALS ARE TO BE MANUALLY TAGGED AND RECORDED.
6. SANDPACK TO BE DEVELOPED BY SWABBING THE WELL SCREEN WITH A DUAL SWAB FOLLOWED BY SURGING AND PURGING THE WELL WITH A SURGE BLOCK UNTIL THE WATER PRODUCED IS CLEAN AND CLEAR.
7. A TEMPORARY SUBMERSIBLE PUMP CAPABLE OF PRODUCING UP TO 15 GPM AT APPROXIMATELY 80 FEET TOTAL DYNAMIC HEAD TO BE PROVIDED BY THE CONTRACTOR AND USED FOR DEVELOPMENT AND WATER QUALITY TESTING. A DIGITAL DATA LOGGER (TRANSDUCER) TO BE ATTACHED TO THE PUMP DURING DEVELOPMENT ACTIVITIES TO RECORD WATER LEVELS DURING DEVELOPMENT AND TESTING ACTIVITIES.
   - 7.1. MANUAL WATER LEVELS TO BE TAKEN AT A MAXIMUM OF 30 MINUTE INTERVALS DURING DEVELOPMENT AND WATER QUALITY TESTING ACTIVITIES. MANUAL WATER LEVEL MEASUREMENTS ARE TO BE RECORDED WITH CORRESPONDING TIME AND FLOW RATE MEASUREMENT.
8. THE SPECIFIC SPECIFIC CAPACITY OF THE WELL TO BE CALCULATED USING THE FOLLOWING EQUATION:

   SC (GPM/FT) = Q/S

   WHERE,
   Q = FLOW RATE (GPM)
   S = DRAWDOWN (FT)
9. CONTINUE DEVELOPMENT AS LONG AS THE WELL'S SPECIFIC CAPACITY INCREASES 5% OR MORE FOR ONE HOUR OF ACTIVE DEVELOPMENT.
   - 9.1. PUMPING RATE WILL BE MEASURED WITH A CALIBRATED FLOW METER WITH A TOTALIZER AND A GATE VALVE AT THE DISCHARGE LINE FOR ACCURATE MEASUREMENT AND CONTROL OF THE FLOW RATE.
   - 9.2. DEVELOPMENT WILL BE CONSIDERED COMPLETE ONCE WATER IS TURBIDITY FREE (NTU<10) FOR A CONTINUOUS PUMPING PERIOD OF ONE (1) HOUR AT A MINIMUM OF 10 GPM.
   - 9.3. IF, IN THE OPINION OF THE ENGINEER/GEOLOGIST, THE WELL HAS NOT BEEN FULLY DEVELOPED, THE CONTRACTOR WILL BE REQUIRED TO PERFORM ADDITIONAL DEVELOPMENT AND/OR CHEMICAL TREATMENT UNTIL THE WELL IS FULLY DEVELOPED. CHEMICAL TREATMENT SHALL BE PERFORMED ONLY AS AUTHORIZED BY THE PROJECT ENGINEER/GEOLOGIST.
10. AFTER COMPLETION OF WELL DEVELOPMENT, PERFORM A 24-HOUR PUMP TEST NO SOONER THAN 72-HOURS AFTER DEVELOPMENT. SEE PUMP TEST FOR SPECIFICATIONS.
11. A SAMPLING PORT ON THE DISCHARGE LINE WILL BE USED TO OBTAIN WATER QUALITY SAMPLES AND SHOULD BE EASILY ACCESSIBLE.
12. WATER GENERATED DURING THE INITIAL DEVELOPMENT AND TESTING ACTIVITIES TO BE DISCHARGED IN ACCORDANCE WITH DISPOSAL OF MATERIAL.
13. WATER QUALITY SAMPLES WILL BE COLLECTED BY THE PROJECT ENGINEER/GEOLOGIST'S REPRESENTATIVE AT THE END OF PUMP TESTING FOR LABORATORY ANALYSIS.
14. UPON COMPLETION OF WELL CONSTRUCTION, CASING TO STICK UP TWO (2) FEET ABOVE GRADE AND CAPPED TO PREVENT DEBRIS FROM ENTERING THE WELL.

PUMP TESTING

1. PUMP TEST TO CONSIST OF UP TO 8 HOURS OF STEP DRAWDOWN TESTING FOLLOWED BY UP TO 16 HOURS OF CONSTANT RATE TESTING, TOTALING 24 HOURS.
2. ENGINEER TO PROVIDE A PRESSURE TRANSDUCER TO BE ATTACHED TO THE SUBMERSIBLE PUMP DURING THE PUMP TESTING TO RECORD WATER LEVELS. CONTRACTOR TO TAKE MANUAL MEASUREMENTS DURING TESTING TO PROVIDE CALIBRATION AND REDUNDANCY TO THE TRANSDUCER.
   - 2.1. MANUAL MEASUREMENTS TO BE TAKEN AT THE FOLLOWING INTERVALS:

TIME SINCE PUMPING STARTED/STOPPED OR CHANGE IN PUMPING RATE	
0-15 MIN:	1 MINUTE
15-60 MIN:	5 MINUTES
60-120 MIN:	20 MINUTES
120+ MIN:	1 HOUR

3. PUMPING RATES WILL BE MEASURED WITH A CALIBRATED FLOW METER WITH A TOTALIZER AND A GATE VALVE AT THE DISCHARGE LINE FOR ACCURATE MEASUREMENT AND CONTROL OF THE FLOW RATE.
4. STEP DRAWDOWN TESTING TO CONSIST OF A MINIMUM NUMBER OF THREE (3) FLOW RATES TO DETERMINE THE WELL'S SPECIFIC CAPACITY.
   - 4.1. THE RANGE OF DISCHARGE FLOW RATES TO BE WITHIN A MAXIMUM RATE OF 25 GPM, OR THE MAXIMUM CAPACITY OF THE WELL, AND THE STEPS ANTICIPATED TO BE CONDUCTED ARE AT 2 GPM, 5 GPM, AND 10 GPM. THE MAXIMUM PUMPING RATE IS ACHIEVED WHEN THE GROUNDWATER DRAWDOWN WITHIN THE WELL IS STABLE AND NO LESS THAN 5 FEET ABOVE THE DEPTH OF THE TEMPORARY SUBMERSIBLE PUMP OR ITS MINIMUM NET POSITIVE SUCTION HEAD, WHICHEVER IS GREATER.
   - 4.2. PUMP EACH RATE FOR APPROXIMATELY 2 HOURS, OR UNTIL THE WATER LEVEL HAS STABILIZED FOR AT LEAST 1 HOUR. MAXIUM TIME FOR TOTAL STEP DRAWDOWN TEST IS LIMITED TO 8 HOURS.
5. CONSTANT RATE TESTING TO CONSIST OF 16 HOURS OF PUMPING AT THE MAXIMUM RATE OF 10 GPM OR THE MAXIMUM CAPACITY OF THE WELL FOLLOWED BY 2 HOURS OF OBSERVED RECOVERY.

WELL ABANDONMENT

1. SHOULD THE INITIAL BOREHOLE OR THE WELL BE REQUIRED TO BE ABANDONED AT ANY TIME, ABANDONMENT IS TO BE PERFORMED AS REQUIRED BY CALIFORNIA WATER WELL STANDARDS AND LOCAL COUNTY REQUIREMENTS.
   - 1.1. REMOVE DEBRIS AND OBSTRUCTIONS.
   - 1.2. PERFORATE CASINGS.
   - 1.3. REMOVE PORTIONS OF CASINGS IF REQUIRED.
   - 1.4. FILL WELL WITH APPROVED FILLER MATERIAL.
   - 1.5. SEAL AQUIFERS WITH IMPERMEABLE SEAL MATERIAL IF INTERCHANGE OF WATER WILL CONTAMINATE AN AQUIFER.
   - 1.6. SEAL TOP 25 FEET OF WELL WITH IMPERVIOUS SEAL MATERIAL.
   - 1.7. REMOVE THE TOP 5 FEET OF CASING AND WELL SEAL. SEAL WELL AS REQUIRED FOR WELLS IN URBAN AREAS, AND BACKFILL THE HOLE.
   - 1.8. FINISH GRADE TO MATCH SURROUNDING AREAS.

PRELIMINARY

No.	Issue	Checked	Approved	Date

Author T BELL — Drafting Check R CRAWFORD — Project Manager M DUNNE
Designer C GOLDEN — Design Check R CRAWFORD — Project Director A LYNCH

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Bar is one inch on original size sheet
0 1"

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Client UNIVERSITY ENTERPRISES INC.

Project POTTER VALLEY SCHOOL REPLACEMENT WELL

Project No. 12577382 | Date 2/21/2025 | Scale AS SHOWN

Title WELL CONSTRUCTION, DEVELOPMENT, AND TESTING SPECIFICATIONS

Size ANSI D | C-001 | Sheet 3 of 4

Plot Date: 21 February 2025 - 4:51 PM Plotted By: Taylor Bell Filename: \\GHDnet\ghd\US\Santa Rosa\Projects\561\12577382\Digital_Design\ACAD\Sheets\Test Well Sheets\12577382-GHD-00-DWG-C-001.dwg

Project Name: PVUSD Exploration Boring	Project No.: 12577382	Boring No: B3
Drilling Method: Hollow Stem Auger (7-3/4")	Date Started: 7/5/2023	Time: 9:15 AM
Drilling Company: Cascade Drilling Inc.	Date Completed: 7/6/2023	Time: 1:00 PM
C57 Number: 780357	Total Depth: 150.5'	Corresponds to Well No.: NA
Logged By: Ryan Crawford	Water Level (bgs) first / last: 6.5/23	
Latitude/Longitude: 39.3200, -123.1059	Ground Surface Elevation (ft msl): 950' (Google Earth)	
Boring Location: Potter Valley HS	Surface Conditions: Grassy (Irrigated)	

DEPTH	RECOVERY	SAMPLE NUMBER	USCS SYMBOL	SOIL DESCRIPTION [Soil type, Color, Percentages (0,0,0) fines, sand, gravel, Grain Size, Plasticity, Roundness, Other]	COLOR	MOISTURE	CONSISTENCY	GRAPHIC SYMBOL	WELL CONSTRUCTION DETAILS	WELL CONSTRUCTION DESCRIPTION (well and annular space materials, and depth intervals)
0			OH	0-3 Organic Silt (100,0,0) Medium Plasticity	Dark Brown	Moist	Firm			No Well Construction
2										Boring Abandoned Via Tremmie Grout
4			ML	3-9' Sandy Silt (20,30,0) Fine Sand, Low Plasticity	Light Brown	Moist	Hard			
6						Wet	Hard			
8				(20,10,0)						Finished Water
10			ML	9-18' Silt (100,0,0)	Light Brown	Moist	Hard			
12										
14										
16										
18			GW	18-28' Sandy Gravel with Silt Fine Rounded Gravel (<1"), Fine Sand	Brown/gray Grey	Wet	Loose			Well bearing zone from 18-28'
20				(30,30,40)						
22				Coarsening ~ 1"						
24						Moist	Medium Dense			
26	18"	1		Fining ~ #16"						
28			CL	28-42' Silty Clay (95,5,0) Fine Sand	Light Brown	Moist	Firm			
30										
32				Red Mottling						
34										
36	16"	2		Few fine gravel (85,0,5)			Hard			
38										
40										
42			GC	42-54' Clayey Gravel Fine to Coarse Rounded to Angular Gravel, Fine to Coarse Sand	Grey Blue	Moist	Soft to Firm			
44										
46	18"	3								
48										
50				Finingy						
52										
54				Grades to CL						
56	18"	4	CL	54-57' Silty Clay (80,4,1) Fine Gravel, Fine Sand	Light Grey Blue	Moist	Soft			
58			SP	57-61' Poorly Graded Sand with Silt (12,85,3) Fine to Medium Sand	Light Blue	Wet	Loose			
60	12"	5								
62			GC	61-79' Clayey Gravel (50,30,20) Fine Angular Gravel, Fine Sand	Fine Brown Dark Brown	Moist	Hard			Sieve Analysis
64										
66										
68			SP/ GC	Sand Lense						
70										
72	18"	6		Fine Rounded Gravel						
74										
76										
80			SW	79-81' Well Graded Sand with Silt (20,70,10)	Dark Grey	Wet				

DEPTH	RECOVERY	SAMPLE NUMBER	USCS SYMBOL	SOIL DESCRIPTION [Soil type, Color, Percentages (0,0,0) fines, sand, gravel, Grain Size, Plasticity, Roundness, Other]	COLOR	MOISTURE	CONSISTENCY	GRAPHIC SYMBOL	WELL CONSTRUCTION DETAILS	WELL CONSTRUCTION DESCRIPTION (well and annular space materials, and depth intervals)
82	18"	7	GC	81-86' Clayey Gravel (42,10,95)	Gray Blue	Wet	Firm			
84										
86										
88			CL	86-107' Lean Clay (88,9,3) Few Gravel	Gray Blue	Moist	Firm			
90	12"	8		Cobble/Gravel Lense 6"	Gray Blue	Wet				
92										
94										
96										
98										
100	18"	9		Increased Gravel from 98-104' (50,5,15) Submucked to Subangular Fine to Coarse Gravel	Gray Blue	Moist	Firm			
102										
104										
106			GM	107-120' Silty Gravel (30,55,5) Fine to Coarse Sand Fine to Coarse Rounded Gravel Cobble in Shoe	Brown/gray Grey	Wet	Medium Dense			Significant Water Bearing Zone from 107-123'
110	12"	10								
112				Fining (50,25,25)						
114										
116										
118				Coarsening (gravel)						
120										
122	12"	11		(117,30,53)						Sieve Analysis
124										
126										
128										
130	6"	12		125-135' Partially Cemented Sandstone, Friable	Gray	Moist	Dense			
132										
134										
136	18"	13		135-150' Clayey Gravel (33,37,30) Fine to Coarse Sand Fine to Coarse Gravel	Grey Red-Blue	Moist to Wet	Dense			Sieve Analysis
138										
140										
142										
144										
146										
148										
150	6"	14	SP	150-155.5' Poorly Graded Sand (Weathered Bedrock?)	Grey Red-Blue	Moist	Very Dense			
152				Boring terminated at 150.5' bgs groundwater measured at 93.3' at 10:45 AM 7/10/23						
154										
156										
158										
160										

PRELIMINARY

No.	Issue	Checked	Approved	Date
Author	T BELL	Drafting Check	K CRAWFORD	Project Manager	M DUNKE	
Designer	C GOLDEN	Design Check	R CRAWFORD	Project Director	A LYNCH	

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Client: UNIVERSITY ENTERPRISES INC.

Project: POTTER VALLEY SCHOOL REPLACEMENT WELL

Project No.: 12577382

Date: 2/21/2025

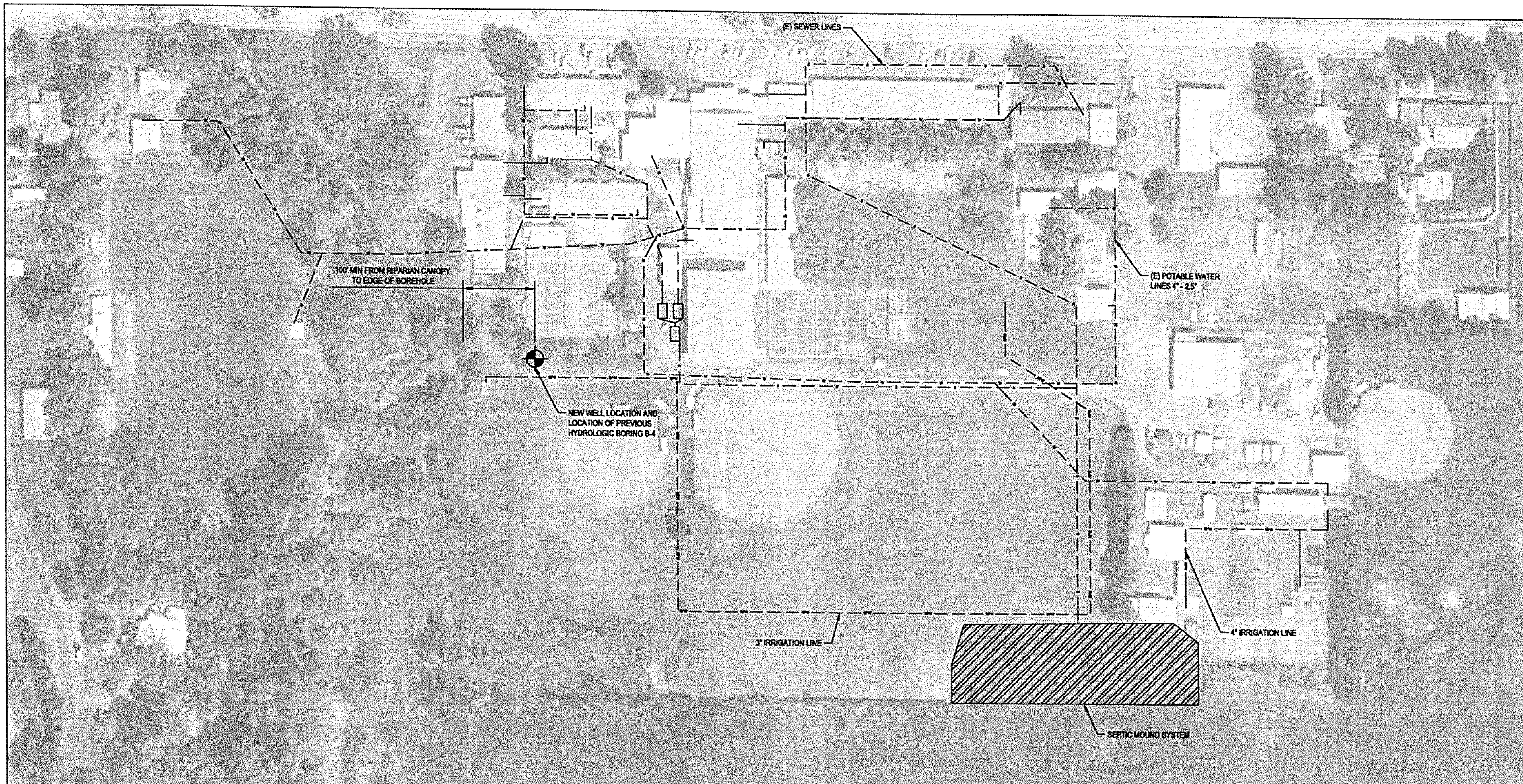
Scale: AS SHOWN

Title: HYDROLOGIC BORING LOG REPORTS

Size: ANSI D

Sheet: C-002 4 of 6

Plot Date: 21 February 2025 - 4:01 PM
Printed By: Taylor Bell
Filename: \\Ghdnet\ghd\US\Santa Rosa\Projects\58\12577382\Digital_Design\CAD\Sheets\Test Well Sheets\12577382-GHD-58-DWG-C-001.dwg



1 SITE PLAN
SCALE

0 60' 120'

N

PRELIMINARY

No.	Issue	Checked	Approved	Date

Author T BELL — Drafting Check R CRAWFORD — Project Manager M DUNNE
Designer C GOLDEN — Design Check R CRAWFORD — Project Director A LYNCH

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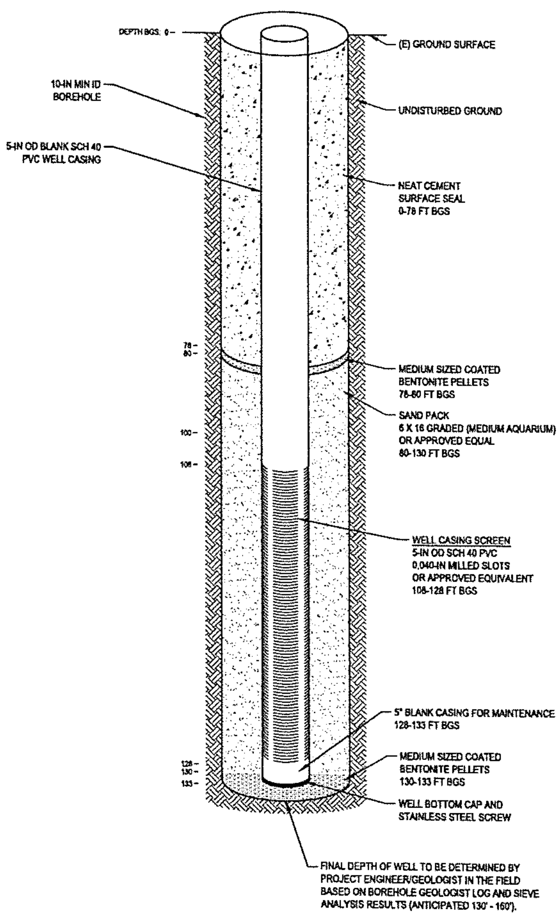
Client UNIVERSITY ENTERPRISES INC.
Project POTTER VALLEY SCHOOL REPLACEMENT WELL
Title WELL SITE PLAN

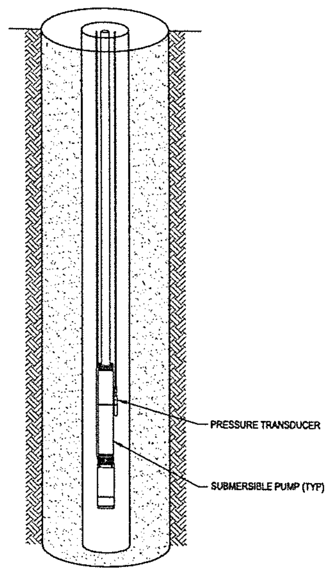
Project No.	Date	Scale
12577382	2/21/2025	AS SHOWN

Size ANSI D
C-101
Sheet 5 of 6

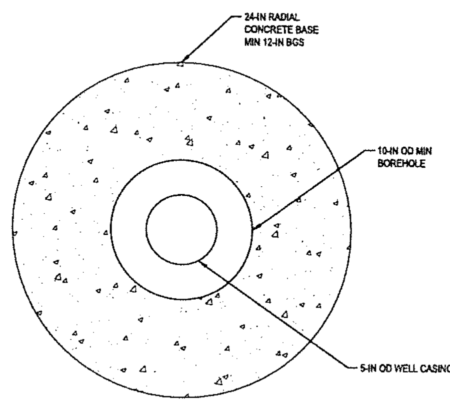
Plot Date: 21 February 2025 - 4:02 PM   Plotted By: Taylor Bell


DEPTH BGS. 0
(E) GROUND SURFACE
10-IN MIN ID BOREHOLE
UNDISTURBED GROUND
5-IN OD BLANK SCH 40 PVC WELL CASING
NEAT CEMENT SURFACE SEAL 0-78 FT BGS
78
80
MEDIUM SIZED COATED BENTONITE PELLETS 78-80 FT BGS
100
SAND PACK 6 X 16 GRADED (MEDIUM AQUARIUM) OR APPROVED EQUAL 80-130 FT BGS
108
WELL CASING SCREEN
5-IN OD SCH 40 PVC
0.040-IN MILLED SLOTS
OR APPROVED EQUIVALENT
108-128 FT BGS
5" BLANK CASING FOR MAINTENANCE 128-133 FT BGS
128
130
133
MEDIUM SIZED COATED BENTONITE PELLETS 130-133 FT BGS
WELL BOTTOM CAP AND STAINLESS STEEL SCREW
FINAL DEPTH OF WELL TO BE DETERMINED BY PROJECT ENGINEER/GEOLOGIST IN THE FIELD BASED ON BOREHOLE GEOLOGIST LOG AND SIEVE ANALYSIS RESULTS (ANTICIPATED 130' - 160').

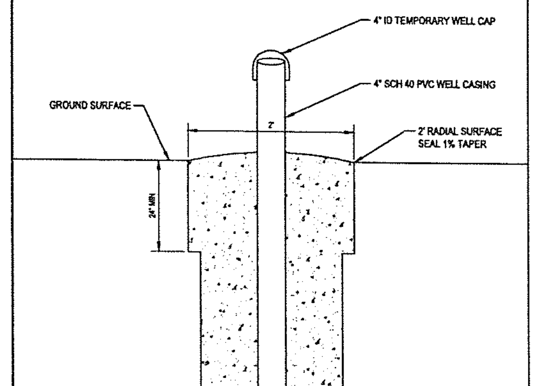
1 WELL PROFILE VIEW — VERTICAL: 1" = 20' HORIZONTAL: N.T.S.



2 TEMPORARY PUMP AND TRANSDUCER SETUP — VERTICAL: 1" = 20' HORIZONTAL: N.T.S.



3 TEMPORARY WELLHEAD SEAL DETAIL — 6" = 1'



4 SURFACE COMPLETION DETAIL — NOT TO SCALE

GENERAL NOTES

CONCRETE:

1. ALL WORK TO CONFORM TO THE REQUIREMENTS OF THE FOLLOWING PUBLICATIONS:
   - 1.1. ACI "BUILDING CODE REQUIREMENTS FOR UNREINFORCED CONCRETE" (ACI 318-LATEST EDITION).
   - 1.2. "ACI "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES" (ACI 350-LATEST EDITION).
2. NEAT CEMENT TO CONSIST OF A MIXTURE OF A 94 POUND SACK OF PORTLAND CEMENT MACHINE-MIXED WITH A MAXIMUM OF 6 GALLONS OF WATER PER SACK OF CEMENT. BENTONITE UP TO 5 PERCENT BY WEIGHT OF CEMENT (4.7 POUNDS PER 94 POUNDS OF PORTLAND CEMENT) MAY BE USED TO REDUCE SHRINKAGE. IF BENTONITE IS ADDED TO NEAT CEMENT, ADDITIONAL WATER MAY BE ADDED ACCORDING TO THE FOLLOWING TABLE:

MIXTURE	WATER RATIO (gal/bag of cement)	MINIMUM DENSITY (lbs/gal)
NO BENTONITE	6.0	15.0
1% BENTONITE (0.9 lbs)	6.0	15.0
2% BENTONTIE (1.9 lbs)	6.5	14.7
3% BENTONTIE (2.8 lbs)	7.2	14.4
4% BENTONTIE (3.8 lbs)	7.8	14.1
5% BENTONTIE (4.7 lbs)	8.5	13.8

3. CEMENT FOR NEAT CEMENT TO BE A STANDARD BRAND "PORTLAND CEMENT TYPE II", MEETING THE REQUIREMENT OF ASTM C-150.
4. ADDITIVES TO REDUCE PERMEABILITY OR CONTROL SETTING TIME MUST MEET ASTM STANDARD C494/C494M-04
5. NEAT CEMENT MUST BE ALLOWED TO SET A MINIMUM OF 24 HOURS. DRILLING, DEVELOPMENT, OR PUMP OPERATION IS PROHIBITED DURING THE TIME CEMENT IS SETTING.

PRELIMINARY

No.	Issue	Checked	Approved	Date

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Designer C GOLDEN — Design Check R CRAWFORD — Project Director A LYNCH

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Client UNIVERSITY ENTERPRISES INC.
Project POTTER VALLEY SCHOOL REPLACEMENT WELL
Title WELL CONSTRUCTION PROFILE
Size ANSI D

Project No.	Date	Scale	Sheet
12577382	2/21/2025	AS SHOWN	C-201

Plot Date: 21 February 2025 - 4:22 PM — Plotted By: Taylor Bell