NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

TEST PLAN

TITLE: **Pump Test of Individual Screens in NC-EWDP-22S**	**Revision: 0** **Date: 07-30-03** **Page: 1 of 10**
TEST PLAN NUMBER: **TPN-9.1**	**SUPERSEDES:** **New Document**
APPROVAL 7-31-03 **Project Manager** **Date**	**CONCURRENCE** Dale Hammerle 7/31/03 **On-Site Geotechnical Representative** **Date** Dale Hammerle for John Campanella 7/31/03 **Principal Investigator** **Date** 7/31/03 **Project Quality Assurance Officer** **Date**

1.0 INTRODUCTION

Refer to WP-9, *Tracer Testing Plan for Nye County's Independent Scientific Investigations Program*, for the background, purpose, and objectives of this test.

2.0 WELL INFORMATION (NC-EWDP-22S)

Elevation:	2849.24 ft ± amsl
Water static fluid level:	2378 ft amsl (471.24 ft to fluid)
6 5/8-in. steel casing set at (6.05-in. ID)	1190.1 ft
5-in. PVC schedule 80 set at (4.768-in. ID)	515 ft
5-in. x MP55 casing x-over set at	515 ft
MP55 casing set at (2.25-in. ID)	1185.81 ft

3.0 WESTBAY® COMPLETION INFORMATION (NC-EWDP-22S)

Screen	Screen Interval (ft)	Measurement Port (ft)	Pumping Port (ft)
1	521.5 – 581.3	559.6	569.8
2	661.2 – 760.6	742.6	752.9
3	880.2 – 980.0	960.1	970.4
4	1140 – 1180	1148.0	1158.3

* As reported in Westbay completion report.

4.0 EQUIPMENT LIST

4 – 30-psia stand alone modules (SAMs)

1 – 250-psia SAM

4 – MOSDAX probes

1 – Myers S100-40submersible pump or alternative (determined by principal investigator [PI])

1 – 4-in.10-hp 3-Phase 460 Volt submersible motor or alternative (determined by PI)

1 – 2-in. Water meter with totalizer

1 – 1-in. Water meter with totalizer

1 – 160-psi pressure gauge

1 – 2-in. Gate valve

1 – Barrel for rate monitoring

1 – Stop Watch

2 – 500-ft (minimum) well sounders

510 ft – 2 in. galvanized steel tubing and associated pup joints to land pump

Miscellaneous 2- and 1-in. fittings and nipples for surface equipment

Associated dataloggers for SAMs and MOSDAX probes

Scientific Notebook

5.0 PROCEDURE

1. Obtain water levels from each screened interval in all piezometers wells with sounder following Nye County technical procedure TP-9.9, *Measurement of Groundwater Levels*.

5.1 Install Equipment and Instruments for Screen 1 Pump Test

2. Install SAMs in NC-EWDP-22PA and NC-EWDP-22PB piezometers following TP-9.2, *Borehole Instrument Calibration and Field Procedures*.
   a. Run 30-psia gauges approximately 25 ft below water table (approximately 500 ft bgs and approximately 24 psia on gauges) in the shallow and deep screen in each piezometer.
   b. Set data logger to obtain pressure and temperature readings every 60 seconds from SAMs. The final frequency of data collection is at the discretion of the PI.
   c. Monitor background pressure readings for a minimum of 48 hours or a minimum time as determined by the PI prior to the hydraulic test.

3. Open the pumping port for Screen 1 on NC-EWDP-22S and record a manual water level measurement in the Scientific Notebook.

4. Install MOSDAX probes with centralizers in NC-EWDP-22S in Screens 2, 3 and 4.

   a. Set data logger to obtain pressure and temperature readings every 60 seconds from MOSDAX probes. The final frequency of data collection is at the discretion of the PI.
   b. Monitor background pressure readings for a minimum of 48 hours or a minimum time as determined by the PI prior to the hydraulic test.

5. Pick up Myers S100-40 or equivalent submersible pump and 10 hp motor.
   a. Tape on 250 psia SAM gauge as close as physically possible to the top of the pump. The gauge should be placed less than 7 ft above the pump's intake (pump length is 5 ft).
   b. Record the distance between the midpoints of the pump's intake and the gauge in Scientific Notebook.
   c. Protect gauge with spider centralizer.

6. Run submersible in hole on 2-in. galvanized steel tubing carefully to avoid damaging the MOSDAX probe cable. Tape SAM cable to steel tubing above and below each tubing collar.

7. Set bottom of pump at 3 ft above the top of the 5 in. x MP55 crossover to maximize the available drawdown for the submersible pump.

8. Hook up 2-in. discharge line and 2-in. water meter. Make sure water meter is in a straight run of pipe at least 3 ft away from any upstream or downstream flow disturbance such as bends or valves and upstream of the control gate valve. Place 160 psi pressure gauge upstream of the gate valve.
   a. Set up for barrel volume test.
   b. Note volume on flow meter in Scientific Notebook.

c. Photograph the discharge piping and erosion control measures for regulatory documentation.

9. Conduct Screen 1 Pump Test. Make sure probes and data loggers are working, and generator is fueled and running properly. Reset MOSDAX and SAM probes to obtain a pressure reading every 10 seconds. The final frequency of data collection is at the discretion of the PI.

10. Fully open flow control gate valve and start up pump.
    a. Pump rate should be approximately 40 to 50 gpm.
    b. Monitor drawdown on laptop connected to the Westbay datalogger and pinch back with surface valve if required.
        i. A maximum 100 psi of pressure upstream of the control valve should be sufficient to maintain fluid over the pump.
    c. Pump test well for approximately 12 hr. with the actual pumping time being at the discretion of the PI.
        i. Barrel test rate every 1 hr. during daylight, and every 2 hr. during the night.
        ii. The operation of probes and data loggers should be checked at least hourly when qualified personnel are on location.
        iii. If SAMs are non-functioning, obtain pressure (water level) manually with a well sounder every minute for the first 10 minutes, followed by every 10 minutes for next 100 minutes, and then every 100 minutes through end of pump period.
        iv. Obtain pumping rate from water meter on same schedule after the first 10 minutes.
        v. Record pumping rate and pressure information in Scientific Notebook.
    d. After completion of the desired pump time,
        i. Shut in pump.
        ii. Monitor recovery with probes for approximately 4 hrs.

11. Pull pump and all probes in NC-EWDP-22S.

12. Close the pumping port for Screen 1.

5.2 Install Equipment and Instruments for Screen 2 Pump Test

13. Open the pumping port for Screen 2 and record manual water level measurement in the Scientific Notebook.

14. Install MOSDAX probes without centralizers in NC-EWDP-22S in Screen 1 and with centralizers in Screens 3 and 4.
    a. Collect background data as described in steps 2b and 4b.

15. Run in submersible pump and 250 psia SAM gauge and hook up 2-in. discharge line, 2-in water meter, 160 psi pressure gauge and gate valve as described in steps 5-8.

5.3 Conduct Screen 2 Pump Test

16. Pump test Screen 2 in NC-EWDP-22S by repeating steps 9 through 11. Screen 2 should support a pumping rate between 40 and 50 gpm.

17. Monitor drawdown closely and be ready to pinch the control gate valve if required to maintain fluid over the pump intake.
    a. A maximum 100 psi of pressure upstream of the control valve should be sufficient to maintain fluid over the pump.
    b. In the event that Screen 2 cannot sustain the design rate for 12 hr., the pumping phase of the test should be halted.

18. Close the pumping port for Screen 2

5.4 Install Equipment and Instruments for Screen 3 Pump Test

19. Open the pumping port for Screen 3 and record manual water level measurement in the Scientific Notebook.

20. Install MOSDAX probes without centralizers in NC-EWDP-22S in Screens 1 and 2 and with centralizers in Screen 4.
    a. Collect background data as described in steps 2b and 4b.

21. Run in submersible pump and 250 psia SAM gauge following steps 5-7.

22. Hook up 1-in. discharge line and 1-in. water meter. Larger size tubing can be used for the discharge line as long as the flow meter section is in a straight run of 1-in. pipe upstream of the control gate valve and at least 3-ft away from any upstream or downstream flow disturbance such as bends, valves, expanders and reducers.

5.5 Conduct Screen 3 Pump Test

23. Pump test Screen 3 in NC-EWDP-22S by repeating steps 9 through 11. Screen 3 should support a pumping rate between 25 and 35 gpm and possibly higher. Monitor drawdown closely and be ready to pinch the control gate valve if required to maintain fluid over the pump intake.
    a. A maximum 100 psi of pressure upstream of the control valve should be sufficient to maintain fluid over the pump.
    b. In the event that Screen 3 cannot sustain the design rate for 12 hr. the pumping phase of the test should be halted.

24. Close the pumping port for Screen 3.

5.6 Install Equipment and Instruments for Screen 4 Pump Test

25. Open the pumping port for Screen 4 and record manual water level measurement in the Scientific Notebook.

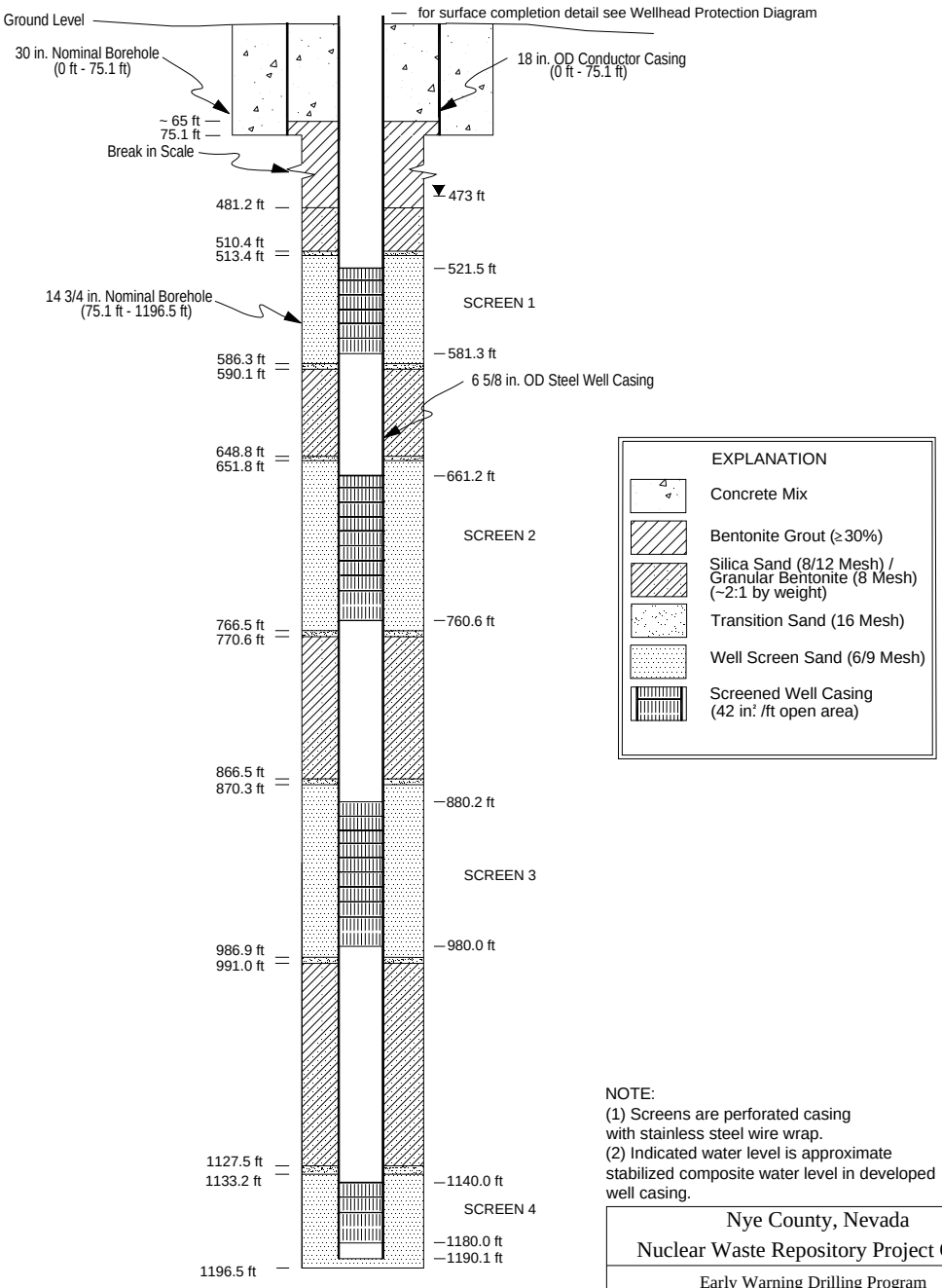
26. Install MOSDAX probes without centralizers in NC-EWDP-22S in Screens 1, 2 and 3.
    a. Collect background data as described in steps 2b and 4b.

27. Install submersible pump and 250 psia SAM gauge and hook up 1-in. discharge line, 1-in water meter, 160 psi pressure gauge, and gate valve as described in steps 21 and 22.

5.7 Conduct Screen 4 Pump Test

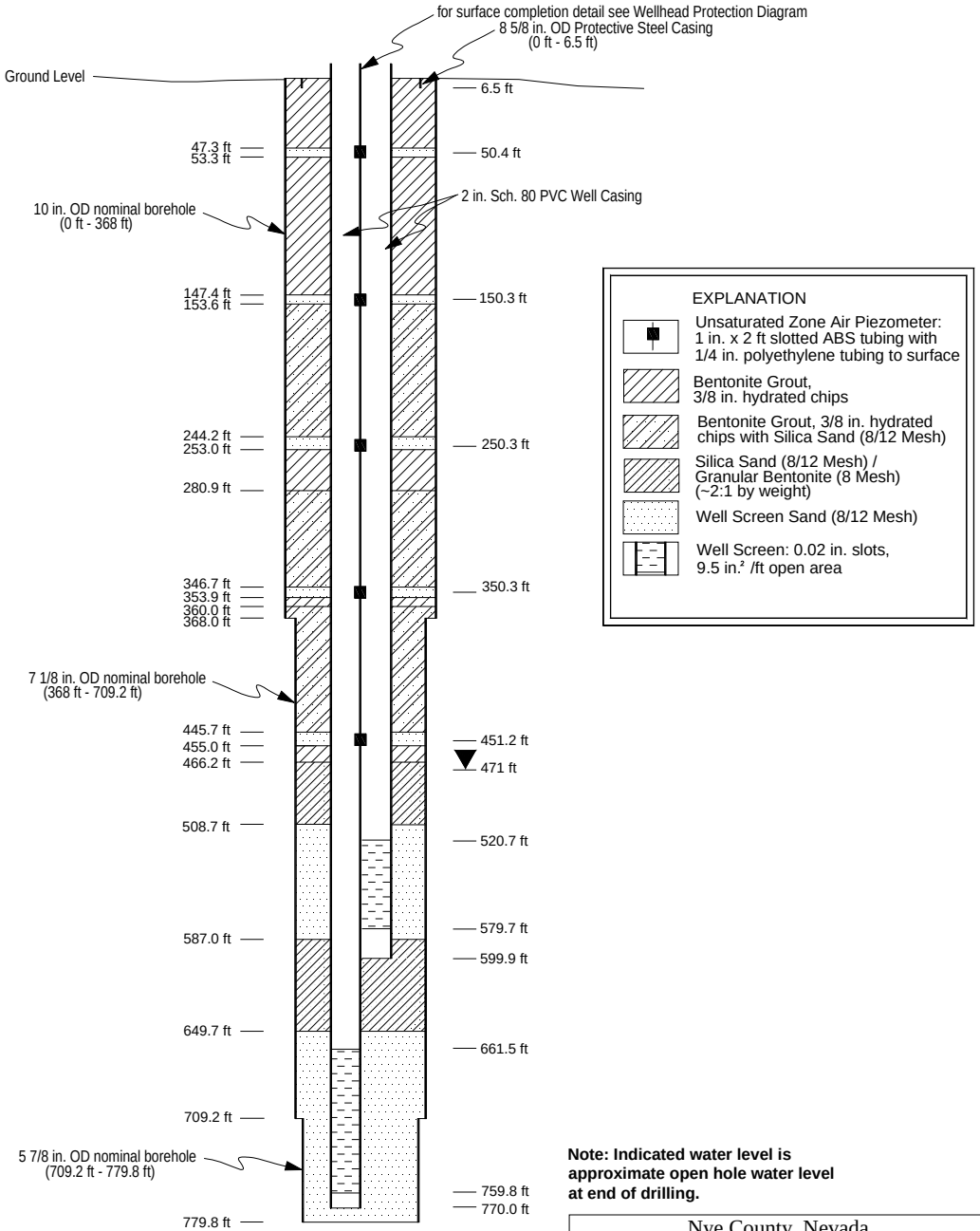
28. Pump test Screen 4 in NC-EWDP-22S by repeating steps 9 through 11. Screen 4 should support a pumping rate between 25 and 35 gpm. Monitor drawdown closely and be ready to pinch the control gate valve if required to maintain fluid over the pump intake.
    a. A maximum 100 psi of pressure upstream of the control valve should be sufficient to maintain fluid over the pump.
    b. In the event that Screen 4 cannot sustain the design rate for 12 hr., the pumping phase of the test should be halted.

29. Close the pumping port for Screen 4.



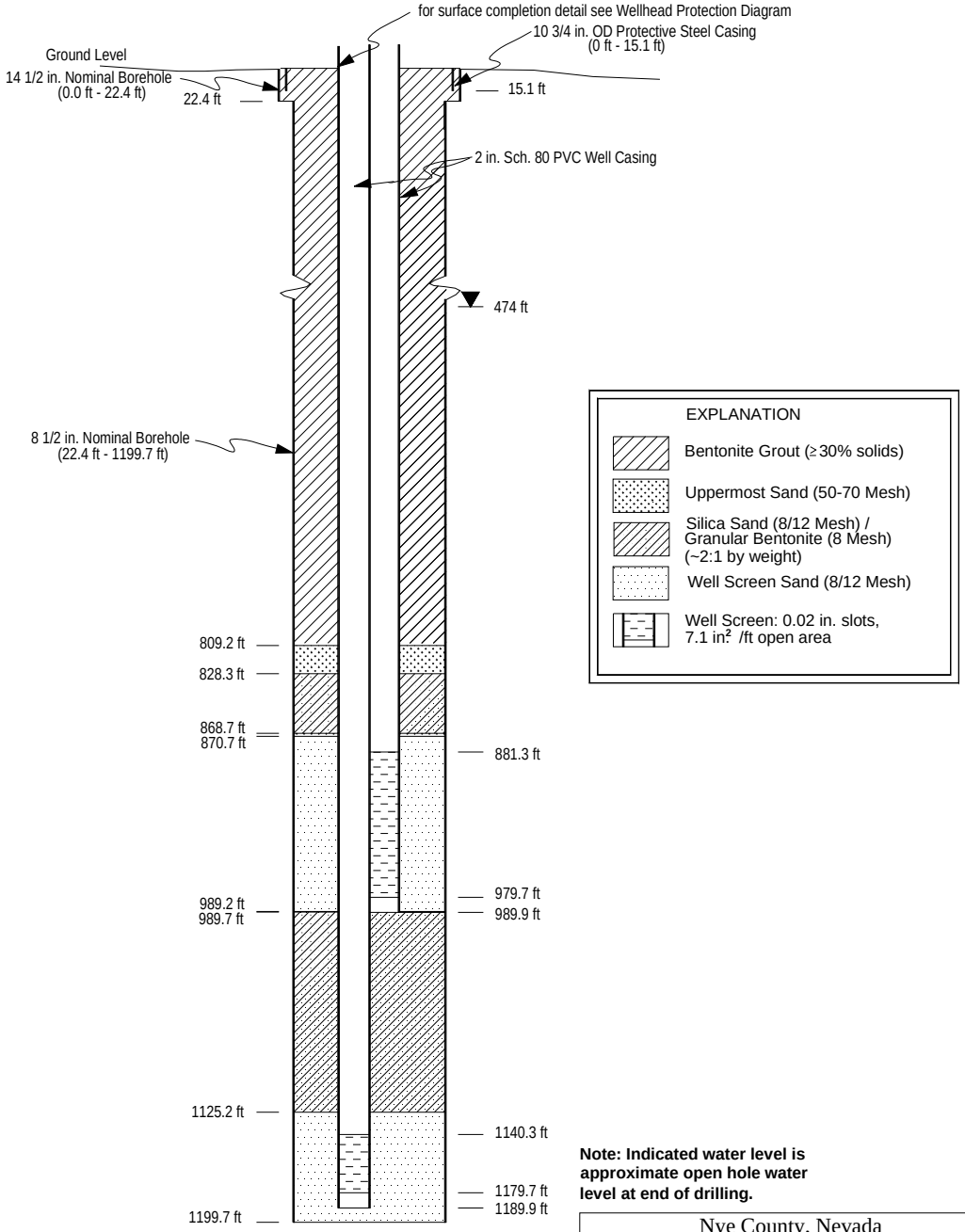
NOTE:
(1) Screens are perforated casing with stainless steel wire wrap.
(2) Indicated water level is approximate stabilized composite water level in developed well casing.

Nye County, Nevada Nuclear Waste Repository Project Office	
Early Warning Drilling Program Well Completion Diagram NC-EWDP-22S	
Date: 9/20/02	Geologist: JSW/KDD
Scale: none	Drawn by: KJG



Note: Indicated water level is approximate open hole water level at end of drilling.

Nye County, Nevada Nuclear Waste Repository Project Office	
Early Warning Drilling Program Well Completion Diagram NC-EWDP-22PA	
Date: 9/20/02	Geologist: KDD
Scale: none	Drawn by: KJG

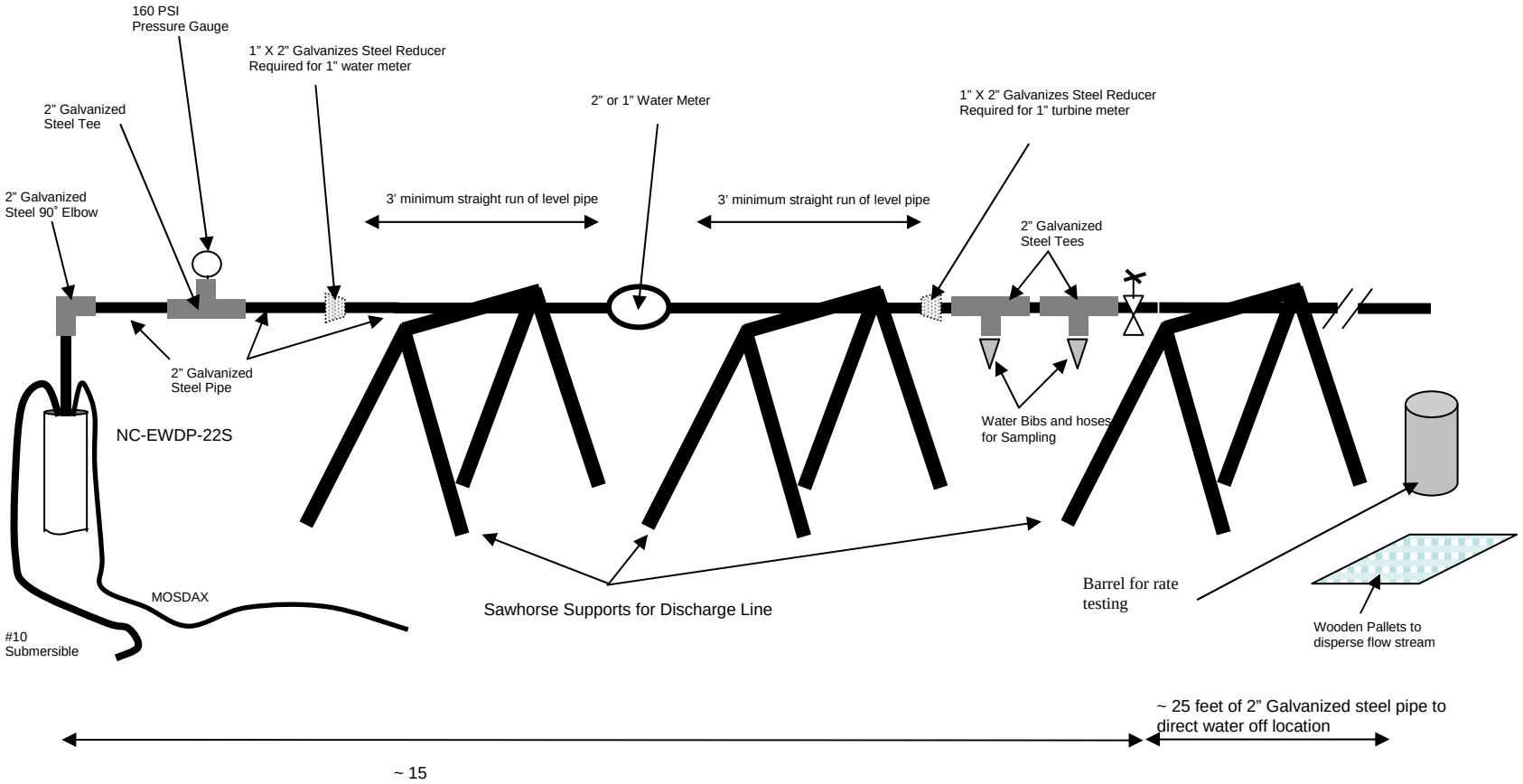


Note: Indicated water level is approximate open hole water level at end of drilling.

Nye County, Nevada Nuclear Waste Repository Project Office	
Early Warning Drilling Program Well Completion Diagram NC-EWDP-22PB	
Date: 9/20/02	Geologist: JSW
Scale: none	Drawn by: KJG

Pump Test of Individual Screens in NC-EWDP-22S

Preferred Piping Setup



Nye County, Nevada
Nuclear Waste Repository Project Office
TPN 9-1
Pump Test of Individual Screens in NC-EWDP-22S

Piping Diagram for Pumping at NC-EWDP-22S