REPORT

PHASE I STORAGE EVALUATION, TOWN OF EATONVILLE

Eatonville, Washington

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1.0 INTRODUCTION

This report describes the evaluation of groundwater storage alternatives for the Town of Eatonville (Town). The evaluation of storage alternatives was funded under a water storage grant from Washington Department of Ecology (Ecology) to the Town. This work was completed under a water storage grant agreement between the Town and Ecology.

The Town currently uses four wells and a diversion on the Mashel River for supply. The Town has no interties with other water systems. Water from the wells and river is treated at a membrane filtration plant. During the dry portion of the year, coincident with peak demand periods, diversion from the river can be limited because of low head on the intake screens. In addition, the capacities of the Town's wells decreases as groundwater levels drop during the summer months.

There is potential for disruption of the supply from the Mashel River during periods of high turbidity and/or low summer flows. The Town is also facing growth and increased water demand that will exceed the capacity of its sources. As the Town grows and water demands increase, peak demand will also increase. Development of a new water supply for use during summer peak demand periods is not feasible because the Mashel River is closed to further appropriations during the summer because of low flows. Development of subsurface storage could provide the Town with a source of water to meet peak demands while minimizing diversions from the Mashel River. This could potentially increase stream flows during the summer months, providing an environmental benefit.

1.1 Background

The Town of Eatonville received a water storage grant from the Department of Ecology for the evaluation of water storage and/or development options for the Town. Two water storage options were presented in the grant agreement: 1.) shallow aquifer recharge, and 2.) aquifer storage and recovery. The Town is evaluating subsurface water storage in order to address projected future peak demands and provide an alternate source of supply should the existing river intake and/or wells be unavailable for a short period of time.

Phase I of the storage evaluation includes development of a conceptual hydrogeological model for the Eatonville area. The data sources include consultant reports and data, reports and from State and Federal agencies, and data collected by the Town of Eatonville. This report provides an evaluation of existing data and a summary of the existing hydrologic and hydrogeologic conditions in the Eatonville area and an assessment of the storage and development alternatives. Recommendations are provided to conduct further evaluation of the preferred alternative

1.2 Objectives and Scope of Work

The objectives of the Phase I storage evaluations are detailed the Scope of Work incorporated into the Ecology Grant Agreement dated March 5, 2008 as follows:

The purpose of the Phase I work is to evaluate existing information to develop an updated conceptual hydrogeological model of the Eatonville area, and use that information to evaluate the two storage options and select a preferred alternative for a feasibility study. Following completion of the Phase I work, a detailed scope of work will be developed to evaluate the feasibility of the preferred alternative as part of the Phase II activities.

The Scope of Work for the Phase I evaluation includes:

- Compilation and evaluation of existing data
- Development of a Quality Assurance Project Plan (QAPP) and collection of additional data
- Development of a hydrologic and hydrogeologic conceptual model
- Evaluation of recharge and storage alternatives
- A technical memorandum describing the conceptual model and evaluation of recharge and storage alternatives
- A completed ASR reservoir permit application form
- Meetings

This report includes the results of the evaluations of existing data, the conceptual hydrologic and hydrogeologic model, the evaluation of storage alternatives, and recommendations for Phase II evaluations. A QAPP was not prepared as part of the Phase I work because the existing data was found to be sufficient to evaluate potential storage options at a pre-feasibility level. Development of a QAPP will be completed as part of the Phase II.

1.3 Report Organization

This report is organized into several sections as follows:

Section 2 summarizes the sources of information used to develop the conceptual model.

Section 3 describes the hydrologic and hydrogeologic conditions in the Eatonville area.

Section 4 describes the Town of Eatonville water system.

Section 5 describes the water storage alternatives, recharge water sources, and storage volumes.

Section 6 describes the evaluation of recharge and storage alternatives.

Section 7 provides a summary of the evaluations and recommendations for evaluation of a storage alternative.

Several appendices are included with supporting information. Appendix A contains streamflow information in the Eatonville area. Appendix B contains well logs for the wells used to construct the hydrogeologic cross-sections. Appendix C contains a database of area well logs. Mounding and water level buildup hydrographs for several storage alternatives are included in Appendix D. The Phase II scope of work and cost estimate are included in Appendix E.

2.0 SOURCES OF INFORMATION

Existing information was used to develop the conceptual model and evaluate storage alternatives. The data sources include consultant reports and data, reports and maps from State and Federal agencies, and data collected by Golder Associates Inc. and the Town of Eatonville during previous groundwater development work for the Town. No new data were collected as part of this phase of the project. This section provides a summary of the references used.

2.1 Project Bibliography

Golder Associates Inc., 2003a, Town of Eatonville Groundwater Supply Evaluation, July 23, 2003.

Describes the results of an evaluation of the feasibility of developing a new groundwater supply within a 5-mile radius of Eatonville.

Golder Associates Inc., 2003b, Final Nisqually River Watershed Management Plan, October 31, 2003.

Presents the results of watershed scale evaluations of hydrology, groundwater, water rights, and identified issues and recommended actions for the watershed and individual subbasins.

Golder Associates Inc., 2004, Report on Well Construction and Testing, Wells No. 6 and 7, April 29, 2004.

Describes the drilling, construction, and testing of two new water supply wells and four test wells in the Eatonville Wellfield.

Golder Associates Inc., 2005a, Town of Eatonville Long-Term Wellfield Capacity Evaluation, March 22, 2005.

Provided an evaluation of interaction between alluvial aquifer and Mashel River and determined pumping capacity of Town's wellfield.

Golder Associates Inc., 2005b, Evaluation of Mashel River Streamflow Data to Support Winter Water Right Application for the Town of Eatonville, August 19, 2005.

Describes streamflow in the Mashel River and provides an estimate of when water is available for appropriation.

Golder Associates Inc. 2005c, Aquifer Storage and Recovery Hydrogeologic feasibility Study, City of Dallas, Oregon Water Treatment Plant Site, December 2005.

Describes the hydrogeologic conditions, conceptual model, storage capacity, water quality, and ASR well drilling and testing for proposed ASR development in low to moderate permeability basalts.

Golder Associates Inc., 2006a, Nisqually Watershed (WRIA 11) Instream Flow Assessment: Step B Mashel River Hydraulic Continuity Study, April 11, 2006.

Presents the results of hydraulic continuity studies completed in the Mashel River from Boxcar Canyon, through the Eatonville Wellfield, to the USGS gage above the confluence with the Nisqually River.

Golder Associates Inc., 2006b, Nisqually Watershed (WRIA 11) Final Mashel River Instream Flow Needs Assessment, April 18, 2006.

Presents the results of PHABSIM analyses for the Mashel River and a comparison of the existing instream flows and considerations for instream flow management.

Golder Associates Inc., 2007a, Final Nisqually River Detailed Implementation Plan, February 14, 2007.

Provides guidance to implement the recommended actions in the watershed and individual subbasins.

Golder Associates Inc, 2007b, Results from the First Year of ASR Pilot Testing at the City of Dallas, Oregon, February 12, 2007.

Presents the results of the first year of ASR pilot testing completed in the basalt aquifer at Dallas, Oregon, including groundwater level and groundwater quality changes.

Golder Associates Inc, 2008, Results from the Second Year of ASR Pilot Testing at the City of Dallas, Oregon, April 23, 2008.

Presents the results of the second year of ASR pilot testing completed in the basalt aquifer at Dallas, Oregon, including groundwater level and groundwater quality changes.

Golder Associates Inc, 2009, Results from the Third Year of ASR Pilot Testing at the City of Dallas, Oregon, March 17, 2009.

Presents the results of the third year of ASR pilot testing completed in the basalt aquifer at Dallas, Oregon, including groundwater level and groundwater quality changes.

Gray and Osborne, 2000, Town of Eatonville Water Comprehensive Plan Amendment.

Provides information on the Town's water system in order to meet the requirements of the State Drinking Water Revolving Fund loan program.

Gray and Osborne, 2002, Town of Eatonville Report of Findings, Water Source Investigations.

Describes the results of hydrogeologic evaluations conducted by Robinson and Noble to investigate additional sources of supply for the Town and provided recommendations for development.

Kask, Mart, 2003, Water Supply and Quantity, Town of Eatonville.

Overview of Town of Eatonville water system, water rights, sources, and future demands. Describes alternatives for increasing system reliability and supply.

Natural Resources Conservation Service, Sno-Tel Data and Products,
http://www.wcc.nrcs.usda.gov/snotel/.

Online database of snow water equivalent and snow depths.

Pringle, P.T., B.S. Goldstein, and N.R. Anderson, 2000, Tanwax Creek-Ohop Valley Late-Glacial Flood – Evidence that Discharge from an Ice-Dammed lake in the Carbon river Valley was Augmented by a Temporary Landslide Dam, Puget Lowland, Washington (abstract), 3rd Symposium on the Hydrogeology of Washington State, Tacoma.

Describes glacial outburst flooding from glacial Lake Carbon.

Pringle, P.T., 2008, Roadside Geology of Mount Rainer National Park and Vicinity, Washington Division of Geology and Earth Resources, Information Circular 107.

Describes geology in the area surrounding Mount Rainer National Park, including the Eatonville and Ohop Valley areas.

RH2 Engineering Inc., 2005, Town of Eatonville Comprehensive Water System Plan, June 2005.

Comprehensive description of the Town of Eatonville's water system, including sources, water rights, water system components, and recommended upgrades to the water system.

Robinson and Noble, 1966, Report on Well Number 1, Town of Eatonville.

Describes the drilling and testing of Town of Eatonville Well No. 1.

Robinson and Noble, 1969, Well Number 2, Town of Eatonville.

Describes the drilling and testing of Town of Eatonville Well No. 2.

Robinson and Noble, 2001, Town of Eatonville Groundwater Source Alternatives Study.

Describes the results of an evaluation to develop additional groundwater in the Eatonville area.

Robinson and Noble, 2002a, Town of Eatonville Ohop Valley Well Project.

Describes drilling of a test well in the Ohop Valley targeting outwash sediments below lahar deposits and the results of geophysical investigations in the Ohop Valley, Eatonville Wellfield, and area surrounding Eatonville.

Robinson and Noble, 2002b, Eatonville Monitoring Well 1R Construction and Testing Report.

Describes completion and testing of exploratory well in basalt in Eatonville wellfield

Robinson and Noble, 2002c, Town of Eatonville MW-1R Shallow Testing.

Describes conversion of basalt test well to alluvial monitoring well and testing alluvial aquifer in Eatonville wellfield

United States Geological Survey, 2009, Online Streamflow Database, http://wa.water.usgs.gov/.

Database of historic and real-time streamflow information.

Scott, K.M., J.W. Vallance, and P.T. Pringle, 1995, Sedimentology, Behavior, and Hazards of Debris Flows at Mount Rainer, Washington, U.S. Geological Survey Professional Paper 1547.

Describes geology and extent of lahar deposits originating from Mount Rainer.

Walters, K.L., and G.E. Kimmel, 1968, Groundwater Occurrence and Stratigraphy of Unconsolidated Deposits, Central Pierce County, Washington, Water Supply Bulletin No. 22, Washington State Department of Water Resources.

Describes geology and hydrogeology of unconsolidated materials and bedrock units in the Eatonville area.

Walsh, T.J., M.A. Korosec, W.M. Phillips, R.L. Logan, H.W. Schasse, 1987, Geologic Map of Washington – Southwest Quadrant, Washington Division of Geology and Earth Resources, Geologic Map GM-34.

Large-scale geologic map of the southwest part of Washington State, including the Eatonville area.

Watershed Professionals Network llc, 2002, Nisqually River Level I Watershed Assessment (WRIA 11), March 2002.

Provides a general overview and describes hydrology, groundwater, water quality, water rights and instream flow for the Nisqually River Basin.

Washington State Department of Ecology, 2009, Online Well Log Database, http://apps.ecy.wa.gov/welllog/index.asp.

Database of well information and images of well logs.

Washington State Department of Health, 2009, Online Water System Database, http://www4.doh.wa.gov/SentryInternet/Disclaimer.aspx?Page=/SentryInternet/FindWaterSystem.aspx.

Database of water system and water quality information from Class A and B water systems.

Western Regional Climate Center, Historic Climate Information, http://www.wrcc.dri.edu/CLIMATEDATA.html.

Database of historic precipitation and temperature data.

3.0 CONCEPTUAL HYDROGEOLOGIC MODEL

This section describes the conceptual hydrogeologic model for the Eatonville area, including climate, surface water hydrology, geology, and groundwater conditions.

3.1 Site Setting

The Town of Eatonville is located in southeastern Pierce County, about 27.5 miles south-southeast of Tacoma (Figure 3-1). The Town is at an elevation of about 800 feet above sea level. The Town is located at the transition between the Cascade Foothills to the east and rolling hills of the Puget Sound Lowlands to the west.

The Mashel River, a tributary of the Nisqually River, flows from east to west about 0.5 miles south of the center of Eatonville. Ohop Creek, a tributary of the Nisqually River, flows from north to south about 4,500 feet northwest of the center of Eatonville. The Nisqually River is the major drainage in the Eatonville area. The Nisqually River is about 3.5 miles southeast of Eatonville and flows westward towards Puget Sound.

3.2 Precipitation and Evapotranspiration

The Eatonville area receives about 40 to 45 inches of precipitation annually based on historic data collected at La Grande and Alder Dam Camp[1], located about 3.5 miles southwest and 4.8 miles south, respectively, of Eatonville and at the McMillan Reservoir, located about 18 miles north of Eatonville. At the Mowich Sno-Tel station located about 15 miles east of Eatonville at an elevation of 3,160 feet, the annual precipitation is estimated to be about 50 inches per year.

The average annual temperature in the Eatonville area ranges from about 36ºF in January to 60º to 65ºF in July and August. Potential evapotranspiration is estimated to be about 22 to 26 inches per year based on temperature data collected at the Alder Dam, La Grande, and McMillan Reservoir stations[2], and pan evaporation was measured at about 26 to 28 inches per year at the Puyallup Experimental Station, about 23 miles north of Eatonville[3] (Table 3-1). At the higher elevation Mowich Sno-Tel station, potential evapotranspiration was estimated to be about 16 inches per year.

3.3 Hydrology

The three principal surface water bodies near Eatonville are Lynch Creek, Ohop Creek, and the Mashel River (Figure 3-1). Lynch Creek is a westward-flowing stream that is a tributary to Ohop Creek. Lynch Creek drains the upland area northwest of Eatonville. Streamflow data available for Lynch Creek are limited to three measurements from 1927. The measurements were made in March (48 cfs), July (5 cfs) and August (5.9 cfs). Ohop Creek and the Mashel River are tributary to the Nisqually River. Hydrographs

[1] http://www.wrcc.dri.edu/Climsum.html
[2] Golder Associates Inc., 2003a, Town of Eatonville Groundwater Supply Evaluation
[3] http://www.ocs.orst.edu/page_links/comparative_climate/evap.html

from existing gaging stations on the Mashel River, Nisqually River, and Ohop Creek for Water Years 1998 through 2008 (October 1997 through September 2008) are included in Appendix A.

Ohop Creek drains the area north of Eatonville, and is a tributary of the Nisqually River. Ohop Creek is a low-elevation, precipitation-dominated watershed, with a headwater elevation of about 2,500 feet. Ohop Creek was gaged by the USGS from June 1927 through September, 1932 and September 1941 through September 1971. The USGS re-established the gaging station in June 1993 (USGS 12088000), and the station continues to operate. The gage location is immediately downstream of the Lynch Creek confluence (Figure 3-1). A hydrograph for Ohop Creek at the USGS gage for Water Years 1998 to 2008 is shown on Figure A-1. Mean annual streamflow ranged from about 37 cfs in 2001 to 84 cfs in 2007. This is equivalent to 14.3 inches (Water Year 1999) to 32.2 inches (Water Year 2007) of runoff in the catchment area above the gage. The average annual precipitation at the McMillan Reservoir gage over Water Years 1998 to 2008 (October 1997 through September 2008) was 41.73 inches. Figure 3-2 shows the mean daily flow in Ohop Creek over Water Years 1998 to 2008, along with the average monthly precipitation at McMillan Reservoir over the same period. The highest flows in Ohop Creek occur in the winter months (December through March), which have the highest precipitation. Flows are lowest in the late summer (August and September). Ohop Creek and all tributaries (including Lynch Creek) are closed year round to further appropriation under the Nisqually Basin Program (WAC 173-511).

The Mashel River is the largest surface water body in the vicinity of Eatonville. The Mashel River is a low-elevation, precipitation-dominated watershed. The headwater elevation is about 3,500 feet. The watershed does not extend to the Cascades or Mount Rainer and thus does not have significant snowpack. The USGS gaged the Mashel River between October 1940 and September 1957. In October 1991, the USGS re-established the gaging station, which remains in operation. The gage is located at the Highway 7 bridge downstream of the Little Mashel River confluence (Figure 3-1). A hydrograph for the Mashel River Water Years 1998 through 2008 at the USGS gage is shown on Figure A-2. Over this period, the average annual streamflow in Mashel River ranged from 126 cfs in 2001 to 301 cfs in 1999. This is equivalent to about 21.2 inches (Water Year 2001) to 50.7 inches (Water Year 1999) of runoff in the catchment area above the gage. The average annual precipitation at the McMillan Reservoir gage over Water Years 1998 to 2008 was 41.73 inches. The precipitation in the upper part of the watershed is likely higher based on the measured precipitation of 48.62 inches at the Mowich Sno-Tel Station[4], located about 15 miles east of Eatonville at an elevation of 3,160 feet.

The mean daily flow in the Mashel River is over Water Years 1998 to 2008, along with the average monthly precipitation at McMillan Reservoir over the same period shown on Figure 3-2. The hydrograph for the Mashel River is similar to Ohop Creek, with the highest flows occurring in the months of December through March. Flows in the Mashel River start to decrease in late March and April. This indicates that

[4] http://www.wcc.nrcs.usda.gov/cgibin/wygraph-multi.pl?state=WA&wateryear=2009&stationidname=21c40s-MOWICH

there is little snowpack storage and snowmelt in the Mashel Basin, and streamflow is driven by precipitation.

The Mowich Sno-Tel Station, is at an elevation of 3,160 feet, similar in the elevation of the headwaters of the Mashel River (up to 3,500 feet). The monthly average temperature in the winter months (December through March, inclusive) is about 36ºF to 37ºF (Table 3-1). On average, the snow water equivalent at the Mowich Sno-Tel Station is about 1.8 inches on March 1 and 1.0 inches on April 1. The monthly precipitation and snowmelt at the Mowich Sno-Tel is shown on Figure 3-2. Precipitation during March, April and May is about 4 to 5 inches each month. During the snowmelt period (March, April, and May), the percent of snowmelt in the total runoff in the Mashel watershed ranges from about 10% to 30%. This indicates that snowmelt is a small component of streamflow in the Mashel River (about five percent of the total runoff). Mashel River flows are lowest in the late summer (August and September) and are sustained by groundwater discharge.

Instream flows and closures have been established for the Mashel River under WAC 173-511 (Table 3-1). The Mashel River and all tributaries are closed to further appropriation between June 1 and October 31 under the Nisqually Basin Program. Over the remainder of the year, minimum flows have been established (Table 3-2).

Exceedance probability curves for the Mashel River at the USGS gage (USGS 12087000) were developed as part of the instream flow assessment of the Mashel River (Golder 2003) and as part of an evaluation of winter water rights for Eatonville (Golder 2005). The exceedance probability curves show the probability that flows in the river are above the minimum instream flow requirements. When the instream flows are exceeded, water is available for appropriation. The data are summarized on Table 3-3 and included in Appendix A. The data in Appendix A also include exceedance probability curves for the Nisqually River gage at McKenna (USGS 12089500), which is the flow control point on the Nisqually River downstream of the Mashel River confluence.

The results of the analysis indicate that water is available for diversion on the Mashel River between about 84.4% to 94.4% of the time when the river is open to further appropriation (November 1 through May 31). On the Nisqually River at McKenna, water is available for appropriation 75.6% to 98.6% of the time when the river is open to further appropriation (November 1 through May 31). The probability that the flows are above the instream flows is higher on the Nisqually River than the Mashel River except from November 1 through November 14. The months of December through April have the highest probability that water is available (greater than 90% on both the Mashel and Nisqually Rivers). Water availability on the Mashel River in November and May is about 85% of the time.

3.4 Water Balance

A water balance was developed for the Ohop Creek basin and the Mashel River Basin above the gages to provide an estimate of groundwater recharge that entered the deep groundwater system (i.e. by-

passed the stream gauge) for Water Years 1998 through 2008. The preliminary water balance was developed based on the following information:

- Stream gauging data from USGS gage 12088000 located on Ohop Creek below Ohop Lake near Eatonville and USGS gage 12087000 located on the Mashel River about (Figure 3-1), to estimate total runoff. Total runoff represents surface water runoff and groundwater discharge (baseflow) to the stream;
- Precipitation data from McMillan Reservoir, located about 18 miles north of Eatonville were used for the Ohop Creek water balance. Precipitation data from the Mowich Sno-Tel Station located about located about 15 miles east of Eatonville were used for the Mashel River water balance;
- Potential evapotranspiration calculated using the Thornthwaite method and temperature data from McMillan Reservoir for the Ohop Creek water balance and temperature data from the Mowich Sno-Tel Station were used for the Mashel River water balance.

The water balance was calculated using the following method:

$$GWR = P-R-Et$$

where:

GWR is deep groundwater recharge (inches)

P is precipitation (inches)

R is total runoff (inches)

Et is actual evapotranspiration (inches)

The water balance was calculated over a Water Year (October 1 through September 30) and assumes that there are no changes in soil moisture over the Water Year.

3.4.1 Ohop Creek

The water balance for Ohop Creek is summarized on Table 3-4. Over Water Years 1998 to 2008, the average precipitation was about 42.3 inches at McMillan Reservoir, and the total runoff at the Ohop Creek gage was equivalent to about 24 inches. The potential evapotranspiration was estimated to be 25.4 inches based on temperature data collected at McMillan Reservoir. In the months of October through February, the potential evapotranspiration is less than the precipitation minus runoff and is equal to the actual evapotranspiration. In the months of March through September, potential evapotranspiration is greater than the precipitation minus runoff (Figure 3-3). Therefore the actual evapotranspiration is equal to precipitation minus runoff. The deep groundwater recharge in the Ohop Creek basin over Water Years 1998 through 2008 is estimated to be about 8.5 inches. This indicates that there is potentially a substantial quantity of groundwater that by-passes the shallow groundwater system that feeds baseflow in

Ohop Creek. This groundwater probably discharges further down-valley, most likely to the Mashel or Nisqually Rivers.

Low flow at the Ohop Creek gage occurs in August. Assuming the average low flow measurement of 11.3 cfs (Water Years 1998-2008) in at the Ohop Creek gage in August represents baseflow (flow consists only of groundwater discharge to creek), this is equivalent to about 4.3 inches of shallow groundwater recharge annually. Therefore, of the total annual runoff of 24 inches, about 20% is groundwater discharge from the alluvial aquifer in hydraulic communication with Ohop Creek.

3.4.2 Mashel River

The water balance for the Mashel River is summarized on Table 3-4. Over Water Years 1998 to 2008, the average precipitation was about 48.6 inches at the Mowich Sno-Tel Station, and the total runoff was equivalent to about 35 inches at the Mashel River gage. The potential evapotranspiration was estimated to be 21.6 inches based on temperature data at the Mowich Sno-Tel Station. In the months of October and November, the potential evapotranspiration is less than the precipitation minus runoff and is equal to the actual evapotranspiration. In the other months of the year, potential evapotranspiration is greater than the precipitation minus runoff (Figure 3-4). Therefore the actual evapotranspiration is equal to precipitation minus runoff. The deep groundwater recharge in the Mashel River basin over Water Years 1998 through 2008 is estimated to be about 3.15 inches. Similar the Ohop Creek water balance, this calculation indicates a component of deep groundwater recharge that by-passes the Mashel River gauge.

At the Mashel gage, the average low flow measurement in August is 21.5 cfs (Water Years 1998-2008), which is equivalent to about 3.7 inches of groundwater recharge assuming the average low flow in August represents baseflow conditions. Therefore, of the total annual runoff of 35 inches, about 10% is groundwater discharge from bedrock and alluvial deposits in hydraulic communication with the Mashel River.

Based on the water balance, groundwater recharge in the Eatonville area is broken down as follows:

- Shallow groundwater recharge = 3.5 to 4.5 inches
- Deep groundwater recharge = 3.0 to 8.5 inches
- Total groundwater recharge = 6.5 to 13 inches

The groundwater recharge will be dependent on soil type and underlying geological conditions. This is seen in the difference in the estimated groundwater recharge between the Ohop Creek basin, which is underlain by permeable glacial materials, and the Mashel River basin, where a large portion of the headwaters of the basin is underlain by less permeable volcanic rocks.

3.5 Geology

The geologic units in the vicinity of Eatonville are shown on Figure 3-5 and on the hydrogeologic cross-sections (Figures 3-5 through 3-10, inclusive). Well logs used to develop the hydrogeologic cross-sections are included in Attachment B. The principal geologic units in the vicinity of Eatonville include the following:

Holocene Non-Glacial Units Unconsolidated materials including sand, gravel, and fine-grained materials. These materials include alluvium deposited within the floodplains of streams and rivers such as along the Mashel River and Ohop Creek. The alluvium is from about 10 to 100 feet thick, with the thickest deposits found along the Mashel River at the Town of Eatonville wellfield, where it is about 50 to 100 feet thick.

Mudflow deposits (lahars) consisting of unsorted silty sand, gravel, and boulders occur below alluvial deposits in the Ohop Valley. The mudflow deposits are at least 140 feet thick based on a test well drilled near the center of the valley north of Eatonville[5]. The Holocene non-glacial units also include landslide deposits and peat deposits.

Continental Glacial Deposits Continental glacial deposits, including till, advance and recessional outwash deposits, and undifferentiated drift of Fraser and Pre-Fraser ages associated with the advance and retreat of continental glaciations occur in the area west and northwest of Eatonville. West of Eatonville, these deposits consist of up to 100 feet of fine-grained materials including till and fine-grained outwash, and up to about 60 feet of coarser-grained outwash materials.

The Ohop Creek valley was eroded by glacial meltwater streams and outburst floods as the Puget Glacial Lobe receded (and prior to mudflow deposition). This suggests that outwash deposits may underlie the alluvial and lahar materials present at the surface of the valley. Some well logs in the Ohop Valley intersected sand and gravel below lahar deposits which may be glacial outwash. These well logs are summarized on Table 3-5, and show the glacial outwash materials at depths of 50 to 100 feet below the valley floor.

Alpine Glacial Deposits Till and undifferentiated drift deposits of Fraser and Pre-Fraser ages associated with the advance and retreat of alpine glaciations occur mantling the upland areas northeast and east of Eatonville. These materials range in thickness from about 50 to over 200 feet.

Bedrock Consolidated or semi-consolidated bedrock underlies the glacial and non glacial materials. The bedrock units include the Miocene Mashel Formation and un-named Miocene to Eocene andesite and basalts. The Mashel Formation consists of semi-consolidated, fluvially-deposited sands and gravels, with

[5] Robinson and Noble, 2002a, Town of Eatonville Ohop Valley Well Project.

some pumice and tuffaceous material, and some fine-grained lacustrine deposits. The Mashel Formation can be subdivided into an upper fine-grained part and a lower coarse grained part. The Mashel Formation underlies the continental glacial deposits, and is exposed in the valleys of Ohop Creek and the lower portion of the Mashel River southwest of Eatonville. The Mashel Formation is about 60 to over 200 feet thick. The Mashel Formation is underlain by andesites and basalts.

The andesite and basalts are Oligocene to Eocene in age. These rocks include rocks of the Hatchet Mountain Formation and Northcraft Formation, and may be regionally correlated to the Goble Volcanics. The andesites and basalts are exposed east and south of Eatonville, including in the Mashel River in Boxcar Canyon and at the Town's wellfield. The basalts also occur between about 40 and 100 feet below ground in the Town's wellfield. The total thickness of these rocks is unknown. A water supply test well drilled in Eatonville in 1942 (Figure 3-1) intersected 180 feet of glacial materials and Mashel Formation before being advanced to a depth of 750 feet in the volcanic rocks. The volcanic rocks likely overlie Eocene or older sedimentary rocks that may be correlative with Puget Group sedimentary rocks.

3.6 Hydrogeologic Units

3.6.1 Unconsolidated Materials

Groundwater occurs in two principal unconsolidated aquifers in the Eatonville area, the alluvial aquifer and the glacial aquifer system. The unconsolidated lahar deposits form a low-permeability hydrogeologic unit. Hydrogeologic units were delineated based on geologic mapping and well log data. Hydrogeologic cross sections (Figures 3-6 through 3-10, inclusive) show the relationships between the aquifers. The well logs used in the hydrogeologic cross sections are included in Attachment B.

3.6.1.1 Alluvial Aquifer

The alluvial aquifer consists of unconsolidated Quaternary alluvial materials found in the floodplains of streams and rivers such as the Mashel River and Ohop Creek (Figure 3-5), and generally consists of sands, gravels, and silts. The alluvial aquifer is unconfined, and is about 25 to 100 feet thick near Eatonville. The thickest known section of the alluvial aquifer occurs in the Town of Eatonville wellfield adjacent to the Mashel River (Figure 3-11), shown on the hydrogeologic sections in the wellfield area (Figures 3-12 and 3-13). The saturated thickness of the alluvial aquifer in the Eatonville wellfield area is between 10 to 70 feet.

In the Town of Eatonville wellfield area, the alluvial aquifer consists of a layer of silty sand and gravel that is about 35 to 50 feet thick, underlain by clean sand and gravel that is about 30 to 50 feet thick. Basalt bedrock underlies the alluvial materials. The basalt appears to form a trough in the area of the Town's wellfield, with the thickest section of alluvial materials at Wells No. 6 and 7 (Figures 3-12 and 3-13). The top of the basalt rises to the east and southeast, and also appears to rise to the west and northwest (Figures 3-12 and 3-13). The basalt trough may be a former river channel that is now infilled with alluvial sediments.

3.6.1.1.1 Hydraulic Properties

Aquifer hydraulic properties were estimated from short-term (1 to 4 hours) well test data presented on well logs and longer-term (72-hour) pumping tests completed in the Town of Eatonville's supply wells. Information on wells completed in the Eatonville area, including depth, location, completion material, and estimated transmissivity are summarized in Attachment C. The transmissivity was estimated from specific capacity using Logan's approximation[6].

The alluvial aquifer is the most productive aquifer in the vicinity of Eatonville. Short-term well yields range from about five to ten gpm for domestic wells with open-bottom casings to over 300 gpm for the Town of Eatonville wells completed with well screens. Pumping tests conducted in Eatonville Wells No. 6 and 7 and a test well in the Town's wellfield indicated an aquifer transmissivity of about 10,000 ft^2/d to 40,000 ft^2/d (Table 3-6), and a storativity of about 1×10^{-4} to 1×10^{-5}. The specific yield of the alluvial aquifer is estimated to be about 0.05 to 0.15. Based on a saturated thickness of the aquifer materials of 14 to 44 feet, the hydraulic conductivity is estimated to range from about 700 ft/d to 2,800 ft/d.

3.6.1.1.2 Groundwater Recharge and Discharge

Groundwater in the alluvial aquifer is recharged by the infiltration of precipitation. In the area of the Town of Eatonville's wellfield, the alluvial aquifer is also recharged by seepage from the Mashel River during periods of high streamflow. Stream gaging completed in August 2004 as part of hydraulic continuity studies on the Mashel River suggests the Mashel River loses about 2 to 3 cubic feet per second (cfs) as the river flows out of Boxcar Canyon, where the channel is on basaltic bedrock, onto the alluvial sediments in the Eatonville wellfield area[7].

In order to determine the hydraulic interaction between the Mashel River and alluvial aquifer at the Town's wellfield, a staff gage was installed on the Mashel River near the Eatonville wellfield in October 2003 to measure the stage of the river. A pressure transducer was installed in test well TW-03-03 in the Eatonville Wellfield (adjacent to Well No. 6; Figure 3-11) to measure groundwater levels in the alluvial aquifer. The stream gage was in operation until December of 2007 when the sensor failed. The pressure transducer in the well is operational as of May 2009. Hydrographs for the river and the well are shown on Figure 3-14. The following observations of the river stage and groundwater elevation are made:

- The river stage generally fluctuates between about 792 feet and 794 feet. Higher peaks (up to 798 feet) occur following large precipitation events. The lowest stages occur during the summer months (June through September) and reflect baseflow conditions. The highest flows generally occur during the winter months (November through February). The groundwater elevation is similar to the river stage during peak flow events (such as November 2006 and December 2007), but is generally about 2 to 20 feet below the river stage depending on pumping from the Eatonville Wellfield. This indicates that the river is losing water to the aquifer;

[6] Driscoll, F.G., 1986, Groundwater and Wells, Johnson Filtration Systems, St. Paul, Minnesota.
[7] Golder Associates Inc., 2006a, Nisqually Watershed (WRIA 11) Instream Flow Assessment: Step B Mashel River Hydraulic Continuity Study.

- The groundwater elevation (under non-pumping conditions) ranges from about 770 feet (summer 2006) to 794 feet during peak flows in November 2006 and December 2007. This is equivalent to a depth to water of about 34 feet below ground in the summer to about 10 feet below ground in the winter. The lowest groundwater elevations in summer 2006 occurred when the Town was using only groundwater during the construction of the new membrane filtration plant;
- Groundwater levels increase rapidly in response to increases in stage in the river, indicating infiltration from the river, especially during storm events, is a major source of recharge to the alluvial aquifer. In May, 2004, the river stage increased about one foot. Groundwater elevations in TW-03-03 increased by about six feet. A similar increase in groundwater elevation was also observed after a one foot increase in stage in January 2004;
- The groundwater elevation data suggest that the decline in groundwater elevations is related to the stage in the river and the pumping of the Town's wells. Before November 2004, the Town used surface water and groundwater from Wells 1 and 2. Between August 2004 and September 2006, the Town relied only on groundwater to meet demand when the membrane plant was being constructed and surface water could not be used. During construction of the plant, the groundwater level is highly variable because of pumping from Wells No. 6 and 7 and runoff events. Between December 2005 and August 2006, the groundwater level declined about 22 feet in response to pumping, reaching an elevation of about 770 feet in August 2006. There were several periods of runoff where short-term groundwater elevation increases of about four feet occurred;
- After August 2006, the membrane plant was in service, and surface water and groundwater were both used to meet demand. Groundwater elevations started to increase in September 2006 once the new membrane plant was operational and river water could be used for supply along with groundwater;
- The groundwater and river stage elevation monitoring indicate that the alluvial aquifer is recharged during high flow periods, with little recharge from the river at other times. Groundwater elevations decline because of natural groundwater discharge and pumping from the Town's wells. During the winter months in the wellfield area, the depth to groundwater could be as high as 10 feet below ground surface.

Before Wells No. 6 and 7 were drilled in 2003 and 2004, pumping was limited by the well construction of Wells No. 1 and 2. Both wells are shallow (about 45 feet deep). The maximum pumping water level was about 35 feet below ground, or an elevation of about 770 feet, because of the pump depth settings and the tops of the well screens. Since Wells No. 6 and 7 were installed, additional pumping is possible because the wells are deeper and the pumps are set at greater depths.

During construction of the membrane plant, when groundwater was used to meet demand and surface water was not available, the groundwater elevation at Well No. 6 declined to an elevation of 770 feet under non-pumping conditions, and about 756 feet during pumping in the summer of 2006. The pumping water elevation at Well No. 6 was below the base of wells No. 1 and 2. The pumping water elevation of about 756 feet (about 52 feet below ground) observed at Well No. 6 in the summer of 2006 is close to the low level shutoff switch in Well No. 6. The low level switch in Well No. 7 is slightly lower at 63 feet below ground (or an elevation of about 740 feet).

Groundwater flow in the alluvial aquifer in the area of the Eatonville wellfield is to the west and southwest. The groundwater velocity in the wellfield area was estimated to be about 10 to 30 ft/d based on

groundwater elevations measured in March 2004 and the hydraulic conductivities estimated from the pumping tests in Wells No. 6 and 7. The alluvial aquifer is interpreted to discharge to surface water including the Mashel River downstream of the Eatonville wellfield.

3.6.1.1.3 Groundwater Quality

Information on groundwater quality in the alluvial aquifer is from groundwater quality samples collected from Town of Eatonville Wells No. 1, 2, 6, and 7 during pumping tests following well construction or as part of routine compliance monitoring. Groundwater quality data from the Town's wells are summarized in Table 3-7.

The groundwater quality in the Town's wells indicates:

- Groundwater in the alluvial aquifer near the Mashel River is considered groundwater under the direct influence of surface water (groundwater that receives direct surface water recharge) by the Washington Department of Health because of water quality considerations including elevated turbidity and indicators of surface water such as algae and diatoms;
- The native groundwater has elevated turbidity in the range of 0.4 NTU to 2 to 3 NTU, with higher values observed in the winter months during periods of high flow in the Mashel River when recharge to the alluvial aquifer occurs;
- The pH of the native groundwater is in the range of about 5.5 to 6.5;
- With the exception of turbidity, there are no exceedences of primary or secondary drinking water criteria. Iron, manganese, and nitrate are detected at concentrations below the drinking water criteria.

3.6.2 Glacial Aquifer System

The glacial aquifer system includes aquifers and aquitards composed of glacial sediments including continental and alpine glacial materials. The composition of these materials are variable, ranging from low-permeability silt and clay (till and glacial lake deposits) to permeable sand and gravel outwash deposits. Continental glacial deposits are found west and southwest of Eatonville (Figure 3-5), overlying bedrock. The continental glacial deposits are from about 10 to 20 feet thick to over 200 feet thick. The coarse-grained continental glacial deposits (outwash materials) form a moderately productive unconfined or confined aquifer where the coarse-grained materials are extensive and there is sufficient saturated thickness. Wells completed in the coarse-grained materials can yield from five gpm to over 50 gpm.

Alpine glacial materials are found blanketing the upland areas east and southeast of Eatonville and in the Upper Nisqually Valley (Figure 3-5). The alpine glacial materials in the Upper Nisqually Valley near Elbe are about 40 to over 100 feet thick. The alpine glacial materials can form local productive aquifers. For example, the old Alder-Elbe-Ashford school well produced 150 to 285 gpm, and a well drilled for Park Junction Partners was reported to produce 150 gpm during well development. These wells are located about eight miles south of Eatonville.

3.6.2.1.1 Hydraulic Properties

No pumping test data are available for wells completed in the glacial aquifer. Specific capacity data presented on well logs (Attachment C) suggests a specific capacity of less than 1 gpm/ft to about 75 gpm/ft for wells completed in the glacial materials. Using Logan's approximation, the transmissivity of the glacial materials ranges from about 10 to 20,000 ft^2/d, with a median transmissivity of about 200 ft^2/d. The storativity is estimated to range from about 10^{-3} to 10^{-4}.

3.6.2.1.2 Groundwater Recharge and Discharge

Groundwater in the glacial aquifer is recharged by infiltration of precipitation and seepage from lakes perched on till in the area northwest of Eatonville. Groundwater in the glacial aquifer is interpreted to discharge to seeps and springs, particularly along the walls of the Ohop Valley, surface water, and to the underlying Mashel Formation and volcanic rocks.

3.6.2.1.3 Groundwater Quality

There is limited information on groundwater quality in the glacial aquifer. Limited groundwater quality data are available from a Class B water system (Barney's Corner) about two miles northwest of Eatonville that utilizes a well completed in glacial materials. The well was sampled for arsenic and nitrate. Both constituents were not detected (Table 3-8).

3.6.3 Lahar Deposits

Lahar deposits are found in the Ohop Valley. The lahar deposits consist of a poorly-sorted mix of silt, clay, sand, and cobbles that are at least 140 feet thick based on a test well drilled north of Eatonville. The lahar deposits are generally low permeability and do not form a productive aquifer.

3.7 Bedrock Hydrogeology

There are two aquifers found in the bedrock; the Mashel Formation (semi-consolidated sand, clay, and gravel) and underlying basaltic and andesitic volcanic rocks (volcanic aquifer).

3.7.1 Mashel Aquifer

The Mashel Aquifer is present below the glacial materials west and north of Eatonville, and is exposed in the lower reaches of the Mashel River valley and Ohop Creek. Groundwater occurs in the coarser-grained sand and gravel sections of the Mashel Formation.

3.7.1.1 Hydraulic Properties

No pumping test data are available for wells completed in the Mashel Aquifer. Pumping rates for domestic wells completed in Mashel Formation materials in the Eatonville area ranged from about 10 to 40 gpm. Specific capacity data presented on well logs (Attachment C) suggest a specific capacity of less than 1 gpm/ft to about 3 gpm/ft. The wells are generally completed as an open bottom casing (i.e. no well

screen or perforations). Using Logan's approximation, the transmissivity of the Mashel aquifer materials ranges from about 5 to 800 ft^2/d.

3.7.1.2 Groundwater Recharge and Discharge

Groundwater in the Mashel Aquifer is recharged by infiltration of precipitation where it is exposed at the ground surface, and by downward seepage of groundwater from the overlying glacial sediments (Figure 3-8). Groundwater in the Mashel Aquifer is interpreted to discharge to surface water, such as the lower reaches of the Mashel River, Ohop Creek, and the Nisqually River. Hydraulic continuity studies completed on the Mashel River suggested groundwater may be discharge to the river near the Little Mashel River Confluence[8]. Mashel Formation sediments are found in the bed of the Mashel River downstream of Eatonville, from near the Little Mashel River confluence to the confluence with the Nisqually River (Figure 3-5). They are also found along the walls of the Ohop Valley.

3.7.1.3 Groundwater Quality

There is limited information on groundwater quality in the Mashel Aquifer from a Class B water system (Pioneer Farm), about three miles west of Eatonville that utilizes a well completed in the Mashel Aquifer. The well was sampled for nitrate, which was detected at 1.1 mg/L (Table 3-8).

3.7.2 Volcanic Aquifer

The volcanic aquifer occurs east and south of Eatonville in the Oligocene to Eocene basalts and andesites, including rocks of the Hatchet Mountain and Northcraft Formations. Groundwater occurs in fractures and fracture zones in the basalt, or in interflow zones between two basalt flows. Well yields for wells in the basalt aquifer are dependent on the number of fractures or interflow zones intersected. All wells completed in the volcanic aquifer are domestic wells and drilling stopped when sufficient water was intersected was intersected for domestic needs (generally in the range of 5 to 10 gpm). Some wells reported higher flow rates of up to 50 gpm, with one well reporting a flow of 150 gpm.

3.7.2.1 Hydraulic Properties

No pumping test data are available for wells completed in the volcanic aquifer, with the exception of a short test completed in a test well in the Town's wellfield, and a short test completed in 2004 in an old (1942) test well drilled for the Town of Eatonville (Figure 3-1). Specific capacity data presented on well logs (Attachment C) suggest a specific capacity of less than 1 gpm/ft to about 7 gpm/ft for wells completed in the basalt. Using Logan's approximation, the transmissivity of the basalt materials ranges from about 5 to 1,800 ft^2/d. Recovery analysis of a short test competed in the test well in the Town's wellfield indicates a transmissivity of about 16 ft^2/d. Analysis of recovery data from the 2004 test completed in the old Town test well indicates a transmissivity of about 64 ft^2/d (Table 3-6). The hydraulic conductivity of the basalt is estimated to be about 0.1 to 0.4 ft/d based on the test data and the open

[8] Golder Associates Inc., 2006, Nisqually Watershed (WRIA 11) Instream Flow Assessment: Step B Mashel River Hydraulic Continuity Study.

interval of basalt in the well. The storativity of the basalt aquifer is unknown but likely ranges from about 10^{-3} to 10^{-5}.

3.7.2.2 Groundwater Recharge and Discharge

The volcanic aquifer is recharged by infiltration of precipitation through fractures or fracture zones where these materials are exposed at or near the ground surface. The volcanic aquifer is also recharged by seepage from the overlying alpine glacial materials in the upland areas east of Eatonville. Groundwater in the volcanic aquifer is interpreted to discharge to surface water, such as the Mashel River in Boxcar Canyon and the Nisqually River. Hydraulic continuity studies completed on the Mashel River suggest streamflow in the summer months in the Mashel River above the mouth of Boxcar Canyon, where the river flows over basalt bedrock, consists of baseflow sustained by seepage from the basaltic bedrock[9].

In the Eatonville wellfield area and downstream of Eatonville, the basalt is overlain by alluvial sediments or Mashel Formation. In these areas, the basalt is not in direct hydraulic continuity with the Mashel River. In this area, the hydraulic continuity with the river is interpreted to be limited because of the lower hydraulic conductivity of the basalt compared to the alluvial sediments.

3.7.2.3 Groundwater Quality

Existing groundwater quality data in the volcanic aquifer near the Town's wellfield is limited to a test well drilled in the Town's wellfield and a Class B water system (Hope International) located about 0.5 miles north of Eatonville that obtains water from a 360-foot deep well in the basalt. The limited groundwater quality data from the test well in the Wellfield indicated elevated iron and manganese concentrations, however, the sample turbidity was elevated (5.6 NTU) because of limited well development. The conductivity of the water was 145 μS/cm, and the temperature was 50ºF (Table 3-8).

Water quality data from the Hope International well indicates no exceedences of primary or secondary inorganic water quality criteria, however, iron and manganese concentrations are slightly elevated at up to 0.28 mg/L and 0.023 mg/L, respectively (Table 3-8).

[9] Golder Associates Inc., 2006, Nisqually Watershed (WRIA 11) Instream Flow Assessment: Step B Mashel River Hydraulic Continuity Study.

4.0 TOWN OF EATONVILLE WATER SYSTEM

The Town of Eatonville obtains water for municipal supply from both the Mashel River and groundwater. This section describes the Town's water rights, water sources, water use and future demand, water treatment, and distribution system.

4.1 Water Rights

The Town of Eatonville holds groundwater and surface water rights. The water rights held by the Town are summarized on Table 4-1. The Town has a surface water certificate for the year-round instantaneous maximum diversion (Qi) of 2.3 cfs (1,032 gpm) from the Mashel River. The annual permitted diversion quantity (Qa) is 525 AF, which is equivalent to an average annual diversion of 0.73 cfs (326 gpm).

The Town also has two groundwater certificates for the year round withdrawal (Qi) of 610 gpm (360 gpm from Wells No. 1 and 7 and 250 gpm from Wells No. 2 and 6). The two groundwater certificates are supplemental to the surface water certificate. The combined annual quantity (Qa) permitted under the three water rights is 525 AF (171 Mgal). In 2005, the Town's groundwater rights were consolidated into a wellfield.

The Town filed a water right claim for diversion from the Mashel River in 1971, claiming a vested right for the use of surface water pre-dating the 1917 surface water code. The Town claimed water used started in June 1908. The claimed quantities on the document are a Qi of 4 cfs (1,795 gpm) and a Qa of 1,000 AF/yr. At the time of filing, the stated water use was a Qi of 2.3 cfs (1,032 gpm) and a Qa of 588 AF/yr.

In 2006, the Town applied a water right application for one cfs (Qi) of water for municipal supply from the Mashel River when water is available subject to instream flows between November 1 and May 31. The application is currently pending.

4.2 Water Sources

The Eatonville water system includes a surface water diversion and four wells

4.2.1 Mashel River Diversion

The Town operates a diversion on the Mashel River, located about 1,000 feet upstream of the Town's wells and water treatment plant (Figure 3-11). The diversion consists of three 90 to 120-foot long, 8-inch diameter screens in the riverbed. Water collected in the screens is conveyed by gravity to the Town's water treatment plant. The diversion has a current capacity of about 400 gpm, but the capacity is reduced to about 200 gpm during the summer months when the flows in the river decrease and the head over the intake screens is reduced.

4.2.1.1 Surface Water Quality

The Town of Eatonville samples surface water from the Mashel River for compliance monitoring. The raw (pre-treatment) surface water quality data from the Mashel River are summarized on Table 4-2. The raw

surface water quality in the Mashel River meets primary drinking water quality criteria and generally meets the secondary water quality criteria.

4.2.1.2 Groundwater Quality

Raw (un-treated) groundwater quality data from the Town's four wells are summarized in Table 3-7.

The groundwater quality in the Town's wells indicates:

- The native groundwater has elevated turbidity in the range of 0.4 NTU to 2 to 3 NTU, with higher values observed in the winter months during periods of high flow in the Mashel River when recharge to the alluvial aquifer occurs;
- The pH of the native groundwater is in the range of about 5.5 to 6.5; and
- With the exception of turbidly, there are no exceedences of primary or secondary drinking water criteria. Iron, manganese, and nitrate are detected at concentrations below the drinking water criteria.

4.3 Water Use and Future Water Demand

Water used by the Town of Eatonville for 1999 through November 2008 is summarized on Table 4-4. For the years when complete data are available (1999 through 2007, inclusive), annual water use ranged from 101 million gallons to 151 million gallons, or an annual average rate of 193 to 288 gpm. The highest water use occurs in the months of July, August, and September when water is used for domestic supply and irrigation. Peak day demand for 2003 was estimated at 543 gpm based on a peaking factor of 2.4[10], about 70 gpm less than the groundwater Qi of 610 gpm.

In Water Year 2003 and 2004, the Town used 120 Mgal and 108 Mgal of water, respectively. Groundwater accounted for about 75% of the water used in both years, and surface water about 25%. In Water Year 2008, following completion of the membrane filtration plant, the Town used about 136 Mgal of water. Groundwater accounted for about 104 Mgal, or 76% of the water used, and surface water accounted for 32 Mgal (24%).

Future average day and peak demands for the Town to 2024 were estimated in the Town's comprehensive water system plan[11]. Future average day demands were estimated based on the average per capita water use between 1999 and 2003 and the projected population increase to 2024. The results are summarized on Table 4-5. In 2024, the average day demand is projected to be 293 gpm (no conservation) or 278 gpm with conservation. The peak day demand is projected to be 1,135 gpm (without conservation) or 1,022 gpm with conservation.

Based on the current capacities of the Town's water sources (Section 4.3), the projected deficiency to meet the peak day demand in 2024 is projected to be about 12 to 125 gpm (conservation or no conservation, respectively; Table 4-5). This assumes 400 gpm is available from the river and the wells

[10] RH2 Engineering Inc., 2005, Town of Eatonville Comprehensive Water System Plan,
[11] RH2 Engineering Inc., 2005, Town of Eatonville Comprehensive Water System Plan,

could be operated at full capacity (610 gpm). During the summer when river levels are low, the diversion capacity is reduced. Thus, the deficiency could be larger if the capacity of the diversion cannot be maintained. If the diversion is not available, the 2010 deficiency is projected to be about 57 to 93 gpm (conservation or no conservation, respectively; Table 4-5). The peak day deficiency is projected to increase to 412 to 525 gpm in 2024 if the diversion is not available. This assumes the wells can be operated at the full capacity of 610 gpm.

Previous estimates of the capacity of the Town's wells based on water use and groundwater level information collected in Water Years 2003 and 2004 indicated the short term capacity of the Town's wells was 610 gpm in the winter,. In the summer, the short term capacity was estimated to be about 510 to 560 gpm because of lower groundwater elevations and available drawdown, particularly in Wells No. 1, 2, and 6[12]. In the summer of 2006, when they Town was using groundwater only while the membrane plant was being constructed, the pumping water level in Well No. 6 was close to the low water level switch setting. At that time, the average pumping rate from the wells was 324 gpm in July and 276 gpm in August, or about half of the well pumping capacity of 610 gpm. This suggests that pumping at higher rates may not be possible without dropping the pumping water level to the pump intakes of Wells No. 6 and likely Wells No. 1 and 2. The long-term capacity of the Town's wellfield was estimated to be about 300 to 350 AF/year. This is equivalent to an annual average pumping rate of 186 to 217 gpm.

The installation of additional wells to meet peak demand is unlikely to significantly increase wellfield capacity because of the limited saturated thickness of the alluvial aquifer, and because groundwater levels decline during the summer months as a result of increased pumping for peak demand and limited recharge from the river.

4.4 Water Treatment

Water from the Mashel River was treated at the Town's slow sand filtration system prior to 2005. The slow sand filters were constructed in 1988. The capacity of the slow sand filters was limited, and they could not be used to treat water from the Town's wells, which were determined to be groundwater under the direct influence of surface water by the Washington Department of Health. The sand filters could not be used to treat surface water during winter and spring when the turbidity in the raw river water was elevated, and the filters required frequent maintenance.

In order to provide treatment for groundwater and surface water the Town constructed a new water treatment plant (WTP) in 2005 to replace the existing sand filter system. The WTP was placed into service in August 2006. The WTP is designed to treat both groundwater and surface water, either separately or together. The WTP is a membrane filtration plant that utilizes two membrane treatment

[12] Golder Associates Inc., 2005, Town of Eatonville Long-Term Wellfield Capacity Evaluation, March 22, 2005.

skids. The capacity of the treatment plant is currently about 1 MGD (694 gallons per minute; gpm). The plant was designed such that the capacity of the plant could be upgraded to 1.5 MGD (1,042 gpm) with the addition of a third treatment skid and associated piping and pumps, if needed. Operation of the WTP is fully automated, with an alarm system to notify the operators of an upset condition.

The treatment process at the membrane plant includes:

- Addition of up to 4% aluminum chlorohydrate as coagulant to remove organic matter, particularly when river water is being treated;
- Addition of soda ash to increase the pH, particularly when groundwater with a pH of about 6.5, is being treated; and
- Membrane filtration to removed particles larger than 2 microns. The membranes are cleaned using phosphoric acid and citric acid (which are not introduced into the treatment train).

Following treatment at the membrane plant, the treated water is chlorinated using sodium hypochlorite for disinfection and to maintain a residual chlorine content of 0.8%. The old slow sand filters used for filtration of the river water prior to construction of the new WTP have been converted to clearwells for chlorine contact. Thus, if the WTP were out of service, groundwater could still be chlorinated prior to introduction to the distribution system via the clear wells.

Surface water is not diverted for treatment when the turbidity in the river is greater than 10 NTU. This occurs primarily in the winter months. During this time the Town relies on the wells for supply. During the winter of 2007 and 2008, there was no or limited diversion from the river between October and May (Table 4-4). There was also no diversion in October or November 2008.

Finished water quality (either surface water, groundwater or a blend of the two waters) meets all primary and secondary drinking water standards.

4.5 Distribution System

The Town's distributions system includes three booster pump stations, three reservoirs, five pressure reducing stations, and over 15 miles of water main. The system serves customers over an elevation range between about 780 feet near the Mashel River to 1,030 feet in the Hilltop area. The system is divided into three pressure zones, the 996 Zone, the 1,050 Zone, and the 1,077 Zone (Hilltop Zone). One of the booster pump stations pumps water from the clearwells to the 966 Zone. The other two booster pump stations pump from the 966 Zone to the 1,050 Zone and 1,077 Zone.

The three reservoirs are:

- The 966 Zone Reservoir, a concrete tank which has a capacity of 282,000 gallons
- The 1,050 Zone Reservoir, a concrete tank with a capacity of 223,000 gallons;
- The Hilltop Reservoir, a steel tank with a capacity of 500,000 gallons.

The total storage capacity in the Town's reservoirs is about 1 million gallons.

The Town has no interties with other water systems.

5.0 WATER STORAGE ALTERNATIVES

This section presents a preliminary evaluation of storage alternatives, including estimated recharge and recovery rates, recharge volumes, general infrastructure requirements, and permitting requirements.

5.1 Introduction

In order to meet projected future demands, the Town could pursue development of new sources of supply. Development of a new source of supply to meet peaking demands is complicated because of the closure of the Mashel River basin to further withdrawals during the summer months when peak demands occur. Surface water is available in the winter months that could be stored in the subsurface and then pumped to meet peak demands. Use of stored water to meet peak demands could also reduce the amount of water diverted from the Mashel River during low flow periods, leaving more water in the river to sustain ecological resources.

The storage and development alternatives that are evaluated in this report include:

- Shallow aquifer recharge (SAR) in the Quaternary alluvial aquifer at the Town's wellfield adjacent to the Mashel River. This concept would involve diversion of surface water from the Mashel River and recharge of the alluvial aquifer during the winter months;
- Aquifer Storage and Recovery (ASR) in the glacial aquifer system, Mashel Aquifer, or volcanic aquifer that underlie the Town of Eatonville. This concept would involve diversion of surface water from the Mashel River or groundwater from the alluvial aquifer wells in the winter months followed by treatment at the Town's membrane filtration plant and recharge into a dedicated ASR well completed in either the Volcanic Aquifer, Mashel Aquifer, or Glacial System Aquifer. ASR in the Volcanic Aquifer would occur in a well at the wellfield. Other ASR systems would be located within the Town of Eatonville.

Deep groundwater development or ASR in the Ohop Valley. This concept was not originally part of the grant agreement, but is included here because of the findings of significant deep groundwater recharge to the Ohop Creek basin, and as a potential long-term development option if other storage alternatives cannot be feasibly developed.

The following sections describe components of each system including:

- Recharge Water – sources, availability, treatment and quality
- Storage Volume

Each alternative is described in detail in Section 6.0.

5.2 Recharge Water

5.2.1 Sources

Water is available from the Mashel River to recharge the Quaternary alluvial aquifer if SAR were developed. Under the Town's current water rights, up to 2.3 cfs can be diverted year round. The Town

applied for a winter water right for 1 cfs that could be diverted when instream flows are met. The current capacity of the diversion is about 400 gpm (0.9 cfs).

Recharge water for ASR is available from the Town's membrane filtration plant. The plant treats both groundwater from the Town's wells and surface water from the Mashel River. Either groundwater or surface water, or a mixture of groundwater and surface water, could be used for ASR in the Mashel aquifer, glacial aquifer system, or volcanic aquifer.

5.2.2 Availability

Instream flow requirements and closures on the Mashel River and Nisqually River are summarized on Table 3-2, and the probability that the streamflow is above the instream flow is summarized on Table 3-3. There are no timing restrictions to diverting water from the Mashel River under the Town's existing surface water right. Diversion from the river is limited by the current capacity of the diversion. There are no timing restrictions on groundwater pumping under the Town's existing groundwater rights.

Assuming the Town received a new water right on the Mashel River to divert water for storage during the winter, the new water right would be conditioned to the instream flows established for the Mashel River (Table 3-2). Water could be diverted from the river only when instream flows on the Mashel River and Nisqually River at the control points downstream of the diversion are exceeded. Similarly, a new groundwater source developed in Quaternary alluvial aquifer for use as a source of recharge for ASR in the winter would be conditioned to the instream flows.

5.2.3 Recharge Water Quality

Raw surface water quality from the Town's diversion on the Mashel River is summarized on Table 4-4. The raw water quality in the river is generally good. Raw water in the Mashel River occasionally exceeds secondary water quality criteria for iron, manganese, and color. The exceedences are likely related to elevated turbidity during periods of high flow.

Groundwater quality from the alluvial aquifer is summarized on Table 3-7. The raw groundwater quality is generally good. Groundwater in the alluvial aquifer exceeds the secondary water quality criteria for turbidity during winter months during periods of runoff. The pH of the groundwater occasionally falls below the minimum standard for pH.

Water from both the Mashel River and alluvial aquifer is treated in the Town's membrane filtration plant. The water treatment process increases the pH and provides filtration to remove organic matter and lower the turbidity. The finished water from the WTP meets all primary and secondary water quality criteria (Table 4-2). Finished water from the WTP is low turbidity (less than 1 NTU).

Post-disinfection water quality data are collected by the Town of Eatonville within their distribution system. Disinfection by-product and haloacetic acid concentrations in finished water from the WTP at three

locations in the Town's water system are summarized on Table 5-1. The finished water generally exceeds the WAC-173-200 criteria for chloroform, exceeds the criteria for bromodichloromethane, and meets the criteria for dibromochloromethane and bromoform. The finished water meets the drinking water MCL for total trihalomethane. The drinking water criteria for HAA(5) was exceeded once at one sample location. For ASR purposes, the water treatment plant can be modified to use water that has been treated using membrane filtration, but not disinfected. Using this approach, all disinfection by-product and haloacetic acid concentrations are expected to be lower than the WAC 173-200 criteria and primary and secondary drinking water standards.

5.2.4 WTP Capacity

The capacity of the WTP is currently about 694 gpm (1 MGD), but could be upgraded to 1.5 MGD (1,042 gpm) in the future to meet demand with the addition of a third treatment skid. The water produced by the Town in Water Year 2008 is shown on Figure 5-1. This includes surface water and groundwater, and reflects Town water use following the repair of water leaks and resolution of other sources of unaccounted water. Thus, Water Year 2008 should be representative of current Town water use. In Water Year 2008, the Town used 136 Mgal of water. 104 Mgal was groundwater and the remaining 32 Mgal was surface water. Groundwater was used year-round, and surface water was generally used in the summer months (June through September, inclusive) to meet demand.

Recharge water is available when:

- Instream flows are met (for a new winter water right)
- There is surface water and/or groundwater available to treat in the WTP
- If surface water is used, the turbidity is less than 10 NTU
- The WTP water production and Town water demand are less than the WTP capacity

In Water Year 2008, wells were used for primary supply between the beginning of October and mid-June. During this time, the average daily water production was about 200 to 275 gpm. Thus, there was about 400 gpm of treatment capacity over this time that could have been used for the treatment of recharge water from either additional pumping or from the river.

5.3 Storage Volume

The Town's Comprehensive Water System Plan[13] (CWSP) indicates that the capacity of the Town's sources to meet projected peak day demands could be exceeded by 2010 if diversion from the Mashel River was not possible, or if the diversion was limited because of low water levels. In 2024, the projected peak day demands exceed the capacity of the Town's sources, assuming diversion from the Mashel River at the current capacity of 400 gpm. It is likely that with the current configuration of the intake, less than 400 gpm could be diverted because the diversion capacity is reduced to about 200 gpm during low-flow periods.

[13] Town of Eatonville Comprehensive Water System Plan, RH2 Engineering, 2005.

The range in potential storage volumes the Town would require was estimated using the projected peak day demand data and source capacity data presented in the comprehensive water system plan and the following assumptions:

- Peak demand occurs for a maximum of 30 days per year
- The Town's water system plan indicates a peak day deficiency of 125 gpm in 2024, assuming 400 gpm could be withdrawn from the river and 610 gpm from the wells (Table 4-3)
- If the diversion is out of service, the peak day deficiency is projected to be 525 gpm with no conservation, or 412 gpm (with conservation; Table 4-3)

Based on these assumptions, 5.5 Mgal (17 AF) of storage would be required to meet future peak day demands assuming full diversion capacity, and 17.8 to 22.7 Mgal (55 to 70 AF) to meet demand in the event the surface water diversion is unavailable for a 30-day period. Additional storage may be required to account for water lost from the system, if the capacity of the diversion or one of the wells is reduced, or for greater demand or duration during peak periods.

The evaluation of storage alternatives in Section 6 will therefore consider whether the alternative can meet the storage requirements of 20 to 80 AF (6.5 to 26 Mgal).

6.0 EVALUATION OF STORAGE ALTERNATIVES

6.1 Shallow Aquifer Recharge

This section describes shallow aquifer recharge at the Town's WTP and wellfield area. Under this alternative, water would be diverted from the Mashel River during the winter months (when the turbidity was acceptable) to an infiltration facility (infiltration gallery or trench) in the alluvial aquifer located east or northeast (up-gradient) of the Eatonville WTP and wellfield. The goal of shallow aquifer recharge is maintain elevated groundwater levels in the alluvial aquifer throughout the winter and spring period so there is increased water in storage for the Town wells to meet peak demand. The infiltrated water would recharge the alluvial aquifer, causing water levels to rise. Groundwater would be withdrawn by the Town's existing supply wells and possibly additional wells during peak demand periods, treated in the existing WTP and sent to the distribution system. Some of the recharged water would also discharge naturally over the summer months as the water level in the aquifer drops, returning some of the recharged water to the Mashel River.

6.1.1 Conceptual Model Summary

The conceptual model for shallow aquifer recharge is summarized on Table 6-1. The alluvial aquifer is unconfined, and consists of 25 to 60 feet of clean sand and gravel materials overlain by silty sand and gravel in the area of the Town of Eatonville's wellfield. The alluvial aquifer is underlain by basalt. The saturated thickness of the alluvial aquifer in the Eatonville wellfield area is between 10 to 70 feet. The clean sand and gravel materials are moderately to highly transmissive, with a transmissivity of about 10,000 to 30,000 ft^2/d. The specific yield is estimated to be about 0.05 to 0.15. The Town's wells in the alluvial aquifer yield up to 350 gpm.

Water level monitoring shows the water table in the Eatonville wellfield area is found at depths of about 10 to 12 feet below ground surface during winter runoff events to about 30 feet below ground surface in the summer months. During the spring to early summer, the depth to water ranges from about 15 to 20 feet below ground, such as between January and June 2007 and January and June 2007.

The alluvial aquifer is recharged by infiltration of precipitation and by seepage from the Mashel River, particularly during periods of high flow, and is interpreted to discharge to the Mashel River downgradient of the Town's wellfield. Water quality in the alluvial aquifer is good however, some groundwater in the alluvial aquifer is considered groundwater under the direct influence of surface water.

As water is recharged to the alluvial aquifer in an infiltration facility, the groundwater elevation in the area of the recharge facility will rise, and a groundwater mound will develop under the recharge facility. The height of the mound will depend on the infiltration rate and the transmissivity of the aquifer materials. As groundwater levels rise, the hydraulic gradient in the aquifer will increase, driving groundwater flow to the west and southwest toward the Mashel River.

The area where recharge water could be stored is located to the east and north of the membrane plant and wellfield (Figure 3-3). The potential recharge area is approximately 500 feet by 1,000 feet. Assuming a specific yield of 0.05 to 0.15 and a maximum water level rise of 10 feet, the volume of water that could be stored is about 1.9 to 5.6 Mgal (5.7 to 17.2 AF). This is less than the desired storage volume of 6.5 to 26 Mgal (20 to 80 AF), but may be sufficient to provide an increased level of security for the wellfield capacity during the summer months.

6.1.2 Preliminary Groundwater Mounding Calculations

A preliminary assessment of groundwater mound growth and propagation in the alluvial aquifer materials beneath an infiltration pond using spreadsheet-based techniques was made based on methods developed by Hantush[14] , and Cooper-Jacob[15] for non-equilibrium distance-buildup calculations. These calculations include assumptions that downward vertical flow will be impeded by the presence of the lower-permeability silty sands and gravels, resulting in groundwater mound growth and lateral flow.

The assumptions used in the analysis include the following hydraulic characteristics:

- Depth to groundwater is 15 feet bgs based on winter measurements in the wellfield area
- Base of the aquifer is 70 feet bgs (top of basalt based on information from TW-03-02)
- Aquifer thickness is 20 to 30 feet (thickness of clean sand and gravel materials in TW-03-02 and TW-03-03)
- Specific yield is estimated at 0.15
- Aquifer transmissivity ranges from 10,000 ft^2/day to 30,000 ft^2/day based on the pumping tests completed in Wells No. 6 and 7
- Infiltration basin dimensions are 150 feet by 25 feet
- Infiltration rate ranges from 50 to 200 gpm
- Infiltration occurs continuously over a 210-day period, with a total recharge volume of 15 to 60 Mgal (20 to 80 AF)

The calculations are presented in Appendix D and summarized in Table 6-2. The groundwater level buildup is a function of the recharge rate and aquifer hydraulic properties, with the highest buildup resulting from the greatest recharge rate. The analytical model results indicate buildup at the infiltration pond after 2100 days is in the range of 4 to 6 feet for recharge rates of 200 gpm (Figures D-1 and D-2). This results in a depth to water of about 9 to 11 feet bgs in the recharge facility. The water level rise 1,000 feet from the recharge facility is predicted to be about 1 foot for the highest recharge rate and a transmissivity of 10,000 ft^2/d (Figures D-3 and D-4).

The groundwater mounding calculations indicate that the water level rise below the infiltration facility remains below ground surface during recharge. The mounding calculations indicate a water level rise of

[14] Hantush, M.S., 1967. Growth and decay of groundwater-mounds in response to uniform percolation, *Water Resources Research*, vol. 3, no. 1, pp. 227-234.
[15] Cooper, H. H., Jr. and Jacob, C.E., 1946. A generalized graphical method for evaluating formation constants and summarizing well field history. *Transactions, American Geophysical Union,* Vol. 27, No.4

about one foot at a radius of 1,000 feet from the center of the infiltration facility at the end of recharge. These calculations indicate that recharge results in some, but only limited, increase in storage in the alluvial aquifer, and is accompanied by increased discharge from the alluvial aquifer to the Mashel River. Water levels would decline during the summer in response to the increased hydraulic gradient towards the Mashel River.

6.1.3 Infrastructure

The Town has a surface water diversion on the Mashel River with a capacity of about 400 gpm. The Town also drilled several test wells in 2003 that could be used as monitoring wells, and has four production wells that could be used to recover the recharge water.

The following infrastructure would be required to evaluate the feasibility of shallow aquifer recharge:

- Infiltration facility (infiltration basin or gallery) to allow recharge to occur
- Piping to convey water from surface water intake to infiltration facility. Pumps may be required depending on the location of the infiltration facility
- Additional monitoring wells may be needed depending on the location of the infiltration facility
- Additional recovery wells may be needed depending on the location of the infiltration facility and change in groundwater levels

6.1.4 Permitting Requirements

The following permits would be required to evaluate the feasibility of shallow aquifer recharge:

- ASR Reservoir Permit
- Start card if additional wells are drilled for recovery or additional monitoring wells are needed
- Tacoma/Pierce County Health Department well site inspection for new production wells
- UIC registration for recharge facilities

6.1.5 Shallow Aquifer Recharge Uncertainties

There are several uncertainties regarding shallow aquifer recharge at the Eatonville WTP that would need to be evaluated in a pilot test. They include:

- The infiltration rate of the shallow soils which will affect the amount of water that can be recharged over the winter months
- The amount of available unsaturated zone storage in the alluvial aquifer
- The amount of increased discharge to surface water down-gradient of the wellfield during and following recharge which results in a loss of recharge/stored water
- The potential for changes in groundwater quality because of increased surface water recharge to the aquifer
- The potential for clogging of the recharge facility and loss of infiltration rate

6.2 Aquifer Storage and Recovery – Wellfield Area Volcanic Aquifer

Aquifer storage and recovery (ASR) in the volcanic aquifer underlying the Town's wellfield would involve recharge of treated water from the membrane filtration plant (without disinfection) into the deep volcanic aquifer in a new ASR well, storing the water, and later recovering the water. Under this alternative, finished water from the WTP would be used for recharge water. The finished water could be treated groundwater, surface water, or a combination of both depending on the operation of the WTP and whether river water turbidity was elevated during the recharge period.

Basalt aquifers are used for ASR in eastern Washington. The basalts in eastern Washington are the Columbia River Basalt, flood basalt deposits that have extensive, highly permeable interflow zones. The basalts in western Washington are not flood basalts. In comparison they are limited in extent and do not contain extensive highly permeable interflow zones. ASR could be developed in volcanics similar to those near Eatonville provided sufficient permeable zones are present and there is limited hydraulic communication with surface water.

The City of Dallas, Oregon is evaluating ASR in low- to moderately-permeable basaltic rocks, similar to the volcanic rocks near Eatonville, as a means to help meet peak demand without developing a new source of supply. The target storage volume for the City is about 50 million gallons, somewhat larger than the storage required by Eatonville to meet peaks demands. The City of Dallas has been recharging the Siletz River Volcanics using a single ASR well. The source of the recharge water is Rickreall Creek. Water from the creek is treated using flocculation, filtration, chlorination, and fluoridation at the City's treatment plant prior to being recharged. The recharge capacity of the well is about 150 to 250 gpm, and the pumping capacity is about 250 gpm. The native groundwater quality in the volcanic aquifer is poor, so recovery efficiency is governed by differential mixing between the native groundwater and recharge water in the aquifer. The Dallas ASR testing to date has indicated that ASR is feasible in a low- to moderately permeable basalt aquifer.

6.2.1 Conceptual Model Summary

Basalt is present below the alluvial materials in the Town's wellfield area, and below Mashel formation sediments and continental glacial materials in the area surround the Town. The thickness of the volcanic aquifer is not known but is at least 570 feet thick. Groundwater occurs in the basalt in fracture and interflow zones. The volcanic aquifer in the wellfield area has low to moderately transmissivity of about 16 to 64 ft^2/d, with well yields in a test well of about 5 to 10 gpm. There are other wells completed in the basalt in the Eatonville area that have higher transmissivities (up to 1,800 ft^2/d) and higher pumping rates (10 gpm to over 50 gpm) but the higher pumping rates are uncommon, likely because most of the wells in the basalt are domestic wells and were stopped when sufficient water for domestic needs was intersected. The storativity of the basalt aquifer is unknown but likely ranges from about 10^{-3} to 10^{-5}. The basalt aquifer is recharged by infiltration of precipitation and downward seepage from the overlying materials, and discharges to surface water such as the Mashel River and the Nisqually River. Continuity

with surface water is interpreted to be limited because of the relatively low to moderate permeability of the volcanic materials. There is little information on the water quality of the basalt aquifer.

6.2.2 Preliminary Estimates of Drawdown and Buildup

The volcanic aquifer is extensive in the Eatonville area. Assuming the area of the volcanic aquifer where storage occurs is equivalent to a circle with a radius of one mile, storage of 20 to 80 AF would result in a water level buildup of 10 to 40 feet if the storativity of the volcanic aquifer is 10^{-3}. This meets the Town's goals. A larger area would result in less buildup. If the storativity is 10^{-5}, the water level buildup over the same area would be significantly higher (over 1,000 feet). Under this condition, the water storage goal would not be achieved.

The Cooper-Jacob[16] method for non-equilibrium distance-buildup calculations was used to estimate the buildup for an ASR well in the volcanic aquifer. The assumptions used in the analysis include the following hydraulic characteristics:

- Storativity is estimated at 10^{-3}
- Aquifer transmissivity is estimated to range from 500 ft^2/day to 2,000 ft^2/day for the basalt
- The recharge rate ranges from 25 to 100 gpm
- Recharge occurs continuously over a 210-day period, with a total recharge volume of 7.6 to 30 Mgal (23 to 93 AF). There are no low-permeability aquifer boundaries or leakage from overlying materials
- Well losses are not included in the buildup calculations

The calculations are presented in Appendix D and summarized in Table 6-3. The buildup is a function of the recharge rate and aquifer hydraulic properties, with the highest buildup resulting from the highest recharge rate and lower transmissivity. The analytical model predicts buildup immediately outside the well after 210 days is in the range of 23 to 87 feet for recharge rates of 100 gpm (Figures D-5 and D-6). Buildup in the aquifer is shown on Figures D-7 and D-8. The radius of influence (defined as the distance to a point where the drawdown or buildup is one foot) ranges from about 16,600 feet to 17,400 feet at a recharge rate of 100 gpm for 210 days (Table 6-3).

The maximum water level build-up in the recharge well will be a function of the depth of the storage zone and the weight of the overlying confining rock and soil strata. For planning purposes, it is assumed that the storage zone in the volcanic aquifer would be no shallower than a depth of 300 feet below ground surface, and that the water level build-up will not exceed 300 feet above ground surface to minimize the potential for hydro-fracturing and damage to the well seal.

Lower storativities would result in an increased water level build up during recharge.

[16] Cooper, H. H., Jr. and Jacob, C.E., 1946. A generalized graphical method for evaluating formation constants and summarizing well field history. *Transactions, American Geophysical Union,* Vol. 27, No.4

6.2.3 Infrastructure

The following infrastructure would be required to evaluate the feasibility of aquifer storage and recovery in the basalt at the Town's wellfield:

- ASR pilot well in order to evaluate the properties of the basalt and conduct an ASR pilot test
- Connection of ASR well to the water treatment plant to provide recharge water to the ASR well
- Pump to waste connection at the ASR well to allow water to be wasted during ASR pilot testing, if needed
- Connection of the ASR well to the WTP if needed for post-recovery treatment and disinfection

6.2.4 Permitting Requirements

The following permits would be required to evaluate aquifer storage and recovery:

- ASR Reservoir Permit application
- Tacoma/Pierce County Health Department well site inspection for new ASR wells
- Preliminary permit to drill and test a pilot ASR well
- Start card to drill pilot ASR well and monitoring well(s)
- Discharge permitting for pumping-to-waste
- UIC registration for recharge well

6.2.5 Conceptual Model Uncertainties

There are several uncertainties in using the volcanic aquifer to recharge and store water. These uncertainties would be evaluated in a pilot test. The uncertainties include:

- The hydraulic properties and boundary conditions of the volcanic aquifer which will affect the amount of water that can be recharged into the well over the winter months and the potential migration of stored water during the storage and recovery period;
- The storativity of the volcanic aquifer which will affect the water level rise during recharge and the total quantity stored;
- The hydraulic communication between the storage zone and surface water;
- The potential for changes in quality of the stored water through interaction with the basalt and native groundwater;
- The potential for clogging of the well and loss of recharge via chemical, physical or biological precipitates.

6.3 Aquifer Storage and Recovery – Other Areas

Aquifer storage and recovery (ASR) in areas surrounding the Town wellfield would involve recharge of treated water from the membrane filtration plant to a deep aquifer in a new ASR well, storing the water, and later recovering the water. The aquifer used for ASR could be glacial materials, Mashel Formation, or basalt. Under this alternative, finished water from the WTP would be used for recharge water. The

finished water could be treated groundwater, surface water, or a combination of both depending on the operation of the plant and whether river water turbidity was elevated during the recharge period.

6.3.1 Conceptual Model Summary

The hydrogeologic units surrounding Eatonville include glacial aquifer system, Mashel aquifer, and volcanic aquifer system. The glacial aquifer system overlies the Mashel aquifer and volcanic aquifer and includes moderately permeable sand and gravel outwash deposits that are confined. The glacial aquifer is about 20 to over 200 feet thick. The transmissivity of glacial aquifer system ranges from about 10 to 20,000 ft^2/d, and the storativity is estimated to range from about 10^{-3} to 10^{-4}. Groundwater in the glacial aquifer system is recharged by precipitation, and discharges to surface water and the underlying Mashel aquifer or volcanic aquifer.

The Mashel aquifer consists of low to moderate permeability, semi-consolidated sands, gravels, and silty materials that are between 60 to over 200 feet thick. Groundwater occurs in the coarser-grained section of the Mashel aquifer. The transmissivity of the Mashel aquifer materials ranges from about 5 to 800 ft^2/d, and the storativity is estimated to range from about 10^{-3} to 10^{-4} (confined aquifer). Groundwater in the Mashel aquifer is recharged by seepage from the overlying glacial materials, and discharges to surface water.

The volcanic aquifer is a confined aquifer underlying the glacial materials and Mashel formation in the area surrounding Eatonville. Groundwater occurs in fractures, fracture zones, or interflow zones in basaltic or andesitic bedrock. The thickness of the volcanic aquifer is unknown but is at least 570 feet in the Eatonville area. The volcanic aquifer is generally low permeability with areas of moderate permeability, with a transmissivity of about 5 to 1,800 ft^2/d, and the storativity is estimated to range from about 10^{-3} to 10^{-5}. Groundwater in the volcanic aquifer is recharged by infiltration of precipitation where the volcanic aquifer is exposed at or near the ground surface, and by seepage from overlying units. Groundwater in the volcanic aquifer is interpreted to discharge to surface water.

The storativities of the glacial aquifer system, Mashel aquifer, and volcanic aquifer system are estimated to range from 10^{-3} to 10^{-5}. Assuming the area where storage occurs in these aquifers is equivalent to a circle with a radius of one mile, storage of 20 to 80 AF would result in a buildup of 10 to 40 feet if the storativity is 10^{-3}. A larger area would result in less buildup. If the storativity is lower (10^{-5}), the water level buildup over the same area would be significantly higher (over 1,000 feet). Under this condition, the water storage goal could not be achieved.

6.3.2 Preliminary Estimates of Drawdown and Buildup

The Cooper-Jacob[17] method for non-equilibrium distance-buildup calculations was used to estimate the water level buildup for an ASR well completed in either the Mashel aquifer or glacial aquifer system. Buildups for wells completed in the volcanic aquifer in the area surrounding Eatonville are expected to be similar to the buildup predicted for an ASR well completed in volcanic aquifer the wellfield area (Table 6-3). The assumptions used in the analysis include the following hydraulic characteristics:

- Storativity is estimated at 10^{-3}
- Aquifer transmissivity is estimated to range from 40 ft^2/day to 800 ft^2/day for the Mashel aquifer, and 200 to 20,000 ft^2/d for the glacial aquifer system
- The recharge rate ranges from 25 to 100 gpm
- Recharge occurs continuously over a 210 day period, with a total recharge volume of 7.6 to 30 Mgal (23 to 93 AF)
- There are no low-permeability aquifer boundaries or leakage from overlying materials
- Well losses are not included

The calculations are presented in Appendix D and summarized in Table 6-4. The buildup is a function of the recharge rate and aquifer hydraulic properties, with the highest buildup resulting from the greatest recharge rate. The analytical model results buildup immediately outside a well completed in the Mashel aquifer after 210 days recharge at 100 gpm is in the range of 55 feet for a transmissivity of 800 ft2/d to about 1,000 feet for a transmissivity of 40 ft2/d (Figures D-9 and D-10). The buildup in the aquifer is shown on Figures D-11 and D-12. The radius of influence (defined as the distance to a point where the drawdown or buildup is one foot) ranges from about 5,900 feet to 18,200 feet at a recharge rate of 100 gpm for 210 days (Table 6-4).

For recharge to the glacial aquifer system, the predicted buildup immediately outside a well after 210 days recharge at 100 gpm is in the range of 2.5 feet for a transmissivity of 20,000 ft2/d to 211 feet for a transmissivity of 200 ft2/d (Figures D-13 and D-14). The buildup in the aquifer is shown on Figures D-15 and D-16). The radius of influence (defined as the distance to a point where the drawdown or buildup is one foot) ranges from about 140 feet to 12,200 feet at a recharge rate of 100 gpm for 210 days (Table 6-4).

Water level buildup in the basalt, glacial system aquifer and Mashel aquifer is summarized on Table 6-3.

6.3.3 Infrastructure

The following infrastructure would be required to implement aquifer storage and recovery in the volcanic aquifer, glacial system aquifer, or Mashel aquifer:

- ASR pilot well in order to evaluate the aquifer properties and conduct an ASR pilot test

[17] Cooper, H. H., Jr. and Jacob, C.E., 1946. A generalized graphical method for evaluating formation constants and summarizing well field history. *Transactions, American Geophysical Union,* Vol. 27, No.4

- Distribution system extension to well location
- Connection of ASR well to the distribution system to provide recharge water to the ASR well
- Pump-to-waste connection at the ASR well to allow water to be wasted during ASR pilot testing, if needed
- Water treatment (if needed) and disinfection

6.3.4 Permitting Requirements

The following permits would be required to evaluate the feasibility of aquifer storage and recovery:

- ASR Reservoir Permit application
- Tacoma/Pierce County Health Department well site inspection for new ASR wells
- Preliminary permit to drill and test a pilot ASR well
- Start card to drill pilot ASR well and monitoring well(s)
- Discharge permitting for pumping to waste
- UIC registration for recharge well

6.3.5 Conceptual Model Uncertainties

There are several uncertainties in using the volcanic aquifer, glacial system aquifer, or Mashel aquifer to recharge and store water. These uncertainties would be evaluated in a pilot test. The uncertainties include:

- The hydraulic properties and boundary conditions of the aquifer which will affect the amount of water that can be recharged into the well over the winter months and the potential migration of stored water during the storage and recovery period
- The storativity of the aquifer which will affect the water level rise during recharge and the total quantity stored
- The hydraulic communication between the storage zone and surface water
- The potential for changes in quality of the stored water through interaction with the aquifer matrix and native groundwater
- The potential for clogging of the well and loss of recharge via chemical, physical or biological precipitates

6.4 Ohop Valley Groundwater Development and Storage

This section describes the potential to either develop a new groundwater supply or ASR in the Ohop Valley. Ohop Creek is closed to future surface water and groundwater withdrawals under WAC 173-511. Thus, new groundwater supply development would be subject to mitigation.

6.4.1 Conceptual Model

The Ohop Valley is a deep valley incised by glacial meltwater floods that is now partially filled with lahar deposits and alluvial materials. The Ohop Valley has been incised into Mashel Formation sediments. The thickness of the lahar deposits and alluvial sediments infilling the valley is not known, but the lahar deposits are at least 140 feet thick near Eatonville. Some area well logs suggest that permeable glacial

outwash materials may underlie the lahar deposits, that could be developed as either a new groundwater source or as a potential ASR location. The thickness, extent, and hydraulic properties of any glacial materials below the lahar deposits in the Ohop Valley are uncertain. If an extensive aquifer is present in the Ohop Valley, it is likely confined, and may have limited continuity with surface water because of the relatively low permeability of the overlying lahar deposits, except in the lower reaches of Ohop Creek near the confluence with the Nisqually River. The water balance calculations indicate a potentially significant amount of deep groundwater recharge that by-passes the shallow aquifer system which is in hydraulic communication with Ohop Creek. Identification and development of a deep groundwater supply may be possible with minimal impacts on flow in Ohop Creek. Impacts would most likely be translated to the Mashel River and/or Nisqually River.

6.4.2 Preliminary Estimates of Drawdown and Buildup

The storativity of the glacial materials in the Ohop Valley is estimated to be about 10^{-3} to 10^{-4}. Assuming the area where storage occurs in the Ohop Valley is confined to the glacial sediments inferred to be underlying the lahar deposits in the valley floor, the area available for storage is about 1,000 feet wide (width of the valley). Assuming storage occurs in an area 1,000 feet wide by 5,000 feet long, storage of 20 to 80 AF would result in a water level buildup of 174 to over 700 feet if the storativity is 10^{-3}. A larger area would result in less water level buildup. If the storativity is lower (10^{-5}), the buildup over the same area would be significantly higher (over 1,000 feet). Under this condition, the water storage goal could not be achieved.

The maximum water level build-up in the recharge well will be a function of the depth of the storage zone and the weight of the overlying confining rock and soil strata. For planning purposes, it is assumed that the storage zone in the glacial aquifer would be no shallower than a depth of 150 feet below ground surface, and that the water level build-up will not exceed 150 feet above ground surface to minimize the potential for hydro-fracturing and damage to the well seal.

The Cooper-Jacob[18] method for non-equilibrium distance-buildup calculations was used to estimate the drawdown (for a pumping well) or buildup (for an ASR well). The assumptions used in the analysis include the following hydraulic characteristics:

- Storativity is estimated at 10-3
- Aquifer transmissivity is estimated to range from 1,000 ft2/day to 2,000 ft2/day
- The pumping or recharge rate ranges from 25 to 100 gpm
- Pumping or recharge occurs continuously over a 210 day period, with a total recharge volume of 7.6 to 30 Mgal (23 to 93 AF)
- There are no low-permeability aquifer boundaries or leakage from overlying materials
- Well losses are not included

[18] Cooper, H. H., Jr. and Jacob, C.E., 1946. A generalized graphical method for evaluating formation constants and summarizing well field history. *Transactions, American Geophysical Union,* Vol. 27, No.4

The calculations are presented in Appendix B and summarized in Table 6-5. The drawdown or buildup is a function of the pumping or recharge rate and aquifer hydraulic properties, with the highest drawdown or buildup resulting from the greatest recharge rate. The analytical model results indicated drawdown or buildup immediately outside the well after 210 days is in the range of 23 to 45 feet for pumping or recharge rates of 100 gpm (Figures D-17 and D-18). The radius of influence (defined as the distance to a point where the drawdown or buildup is one foot) ranges from about 17,300 feet to 18,500 feet at a pumping or recharge rate of 100 gpm for 210 days (Figures D-19 and D-20).

6.4.3 Infrastructure

The following infrastructure would be required to evaluate the feasibility of either groundwater development or aquifer storage and recovery in the Ohop Valley:

- Test well or pilot ASR well to evaluate aquifer hydraulic properties, aquifer boundaries, and water quality
- Stream gages to evaluate groundwater-surface water interaction
- Pump-to-waste facility
- Disinfection and connection to distribution system (if needed)

6.4.4 Permitting Requirements

The following permits would be required to evaluate a new groundwater source or aquifer storage and recovery:

- ASR Reservoir Permit (for ASR project)
- Tacoma/Pierce County Health Department well site inspection for new wells
- Preliminary permit to drill and test a pilot/test well
- Start card to drill pilot/test well and monitoring wells
- UIC registration for recharge well (for ASR permit)

6.4.5 Conceptual Model Uncertainties

There are several uncertainties in developing groundwater from the glacial aquifer system or using these materials to recharge and store water. These uncertainties would be evaluated as part of a drilling and pump testing plan or in an ASR pilot test. The uncertainties include:

- The hydraulic properties and boundary conditions of the aquifer which will affect the amount of water that can be pumped or recharged
- The storativity of the aquifer which will affect the water level decline during pumping and the total quantity stored during ASR
- The hydraulic communication between the aquifer and surface water
- For ASR, the potential for changes in quality of the stored water through interaction with the aquifer matrix and native groundwater
- For ASR, the potential for clogging of the well and loss of recharge via chemical, physical or biological precipitates

6.5 Assessment of Storage Alternatives

Potential storage alternatives for the Town of Eatonville are summarized on Table 6-6. The table includes information on the geological and hydrogeological conditions and lists factors that are favorable to storage development at each site (positive implementation factors) and potential limitations that could result in the concept not meeting the Town's storage goal for a reasonable cost. Assessment and ranking is based on hydrogeological and engineering judgment.

The relative storage rank for each storage alternative is based on whether the alternative can provide sufficient storage to meet the Town's peak demand needs. Storage ranks over a range of 1 to 3. A rank of 1 indicates that the option could meet the storage requirements. A rank of 3 indicates that it is unlikely that the storage goal can be achieved.

For the cost ranking system, 1 = highest rank, 5 = lowest rank. A low cost (high rank) is applied for options at the wellfield where there is significant knowledge regarding the hydrogeology and water treatment and distribution system. Higher costs (lower ranking) is applied to options distant from the wellfield because less is known regarding the hydrogeological conditions and because of additional engineering facilities required to transport water to/from these locations.

The evaluation of each of the storage alternatives is summarized as follows:

Shallow Aquifer Recharge: Shallow aquifer recharge could be developed with a relatively low capital cost for an infiltration basin, piping and pumps, and possibly additional recovery and/or monitoring wells. The greatest uncertainties with shallow aquifer recharge are the available storage capacity in the shallow aquifer and the continuity of the shallow aquifer with the Mashel River. Preliminary calculations show that the permeable nature of the alluvial aquifer may make it difficult to increase storage sufficient to meet the Town's goals. Because of the possibility of increased discharge to the river during recharge, storage, and recovery, the amount of water recharged to the shallow aquifer may need to significantly greater than the amount of storage required to meet the Town's needs. Stored water that is recovered would require treatment and disinfection before use. The overall ranking of shallow aquifer storage alternative is 2.

Volcanic Aquifer ASR - Eatonville Wellfield: ASR could be developed in the basalt at the Eatonville wellfield for a relatively moderate cost for an ASR well, and piping and pumps. The ASR infrastructure could be developed in close proximity to the existing WTP. The basalt aquifer could be recharged using either treated groundwater or surface water. Development of storage in the basalt would provide a second source of water that is not hydraulically connected to the Mashel River or the alluvial aquifer. Storage of the quantities required by the Town is possible given the higher end of the likely hydraulic conductivity and storativity of the basalt. In the volcanic aquifer, it may be possible to recover about 90% of the recharge water because of limited continuity with surface water. The recharge volume would need to be slightly larger than the amount of storage required by the Town. The greatest uncertainties of basalt aquifer ASR are the basalt aquifer hydraulic properties, which could limit recharge and pumping rates

because of excessive drawdown or buildup, and the potential storage volume. A test well is required to determine the presence of a suitable aquifer. The overall ranking of basalt aquifer ASR at the Eatonville wellfield is 1 because of the potential for greater storage volumes than shallow aquifer storage.

ASR – Other Areas: ASR could be developed in the volcanic aquifer, Mashel aquifer, or glacial aquifer system in areas distal from the Eatonville wellfield using treated surface water or groundwater. The cost for developing ASR in these areas would be relatively high because of the potential distance of the ASR well to the distribution system, and the costs for an ASR well, monitoring wells, and piping and pumps. The greatest uncertainties of ASR in these areas are the aquifer hydraulic properties and boundaries, storage capacity, and interaction with surface water. A test well is required to determine the presence of a suitable aquifer. The overall ranking of ASR in other areas is 3 because this is a higher cost alternative than ASR at the wellfield and because the potential storage volumes in other areas remain uncertain.

Ohop Creek ASR or Groundwater Development: Groundwater or ASR could be developed in the Ohop valley. The cost for developing groundwater or ASR in the Ohop Valley would be relatively high because there is no distribution system infrastructure in the valley, and wells would need to be constructed. Water would need to be pumped up to the Town. The greatest uncertainties for groundwater development in the Ohop Valley are the extent and aquifer properties of permeable outwash materials below the lahar deposits are uncertain, and the Ohop Creek basin is closed to further water withdrawals. The water balance indicates that there is the possibility of finding substantial deep groundwater quantities that are not in hydraulic communication with Ohop Creek. A test well is required to determine the presence of a suitable aquifer. The overall ranking of groundwater development or ASR in the Ohop Creek valley is 3.

7.0 SUMMARY AND RECOMMENDATIONS

7.1 Summary

- The Town of Eatonville obtains it's water from the Mashel River and from four wells. Water from both the river and wells is treated in the Town's membrane filtration plant. The Town has no interties or other sources of water. Under the Town's existing water rights and withdrawal and diversion capacity, the Town will likely experience a water shortfall during peak demand periods by 2024. The Town could also face a water shortfall if operation of the treatment plant is disrupted or the Town's sources were to become compromised and the Town were forced to rely on only the storage capacity of the existing reservoirs
- The Town has excess source and treatment capacity during winter months. Water available during the winter months could be recharged and stored to provide the Town with a second source of water during peak demand periods or in the event of a disruption in the sources or the water treatment plant. If required, excess water from the water treatment plant could be treated and recharged with little or no disinfection to limit the formation of disinfection byproducts
- Potential storage alternatives for the Town include;
  - Shallow aquifer recharge of the alluvial aquifer adjacent to the Mashel River and Town wellfield using surface water
  - Deep aquifer recharge - ASR using treated water from the Town's water treatment plant in the following potential aquifers:
    - The volcanic aquifer below the alluvial aquifer in the Town's wellfield; and
    - The volcanic aquifer, glacial aquifer system, or Mashel aquifer sediments in areas away from the Town's wellfield; and
  - ASR or groundwater development in the Ohop Valley
- A preliminary evaluation of storage options was completed based on the hydrogeological conceptual model and knowledge of the Town's water supply and distribution system
- Development of ASR in the volcanic aquifer near the Town's wellfield appears to be the most favorable storage alternative for the Town because of the proximity of existing infrastructure and relatively low cost, and it appears the volcanic aquifer could store sufficient water to meet the Town's needs with limited hydraulic connection to surface water. The uncertainties of ASR in the volcanic aquifer are the basalt aquifer hydraulic properties, which could limit recharge and pumping rates, and the potential storage volume
- Development of shallow aquifer recharge in the alluvial aquifer near the Town's wellfield appears to be less favorable because preliminary calculations indicate the Town's minimum storage goal may not be achieved. Water storage may also result in increased groundwater discharge to the Mashel River thus further diminishing the benefit of shallow aquifer recharge
- Development of ASR in other areas or development of groundwater in the Ohop Valley appear to be less favorable because of higher costs and uncertainties in the aquifer extent and hydraulic properties, and continuity with surface water

7.2 Recommendations

Based on the work completed as part of this study, it is recommended that the Town proceed with Phase II which includes a more detailed evaluation of ASR in the volcanic aquifer underlying the Town's wellfield. The first step in Phase II would be to drill a test well into the volcanic bedrock to determine

whether a suitable aquifer exists. The work would be completed in steps with an assessment of whether to proceed to the next step at the end of the first step.

A generalized Phase II scope of work is presented in Appendix E. This would constitute Phase II of the Ecology Storage Grant agreement. The work would be completed in two phases:

Phase IIa – Test Well Drilling

Phase IIb – ASR Pilot Test Design and Completion

Phase IIa would include:

- Drilling a test well into the basalt aquifer in the area of the Town's wellfield to evaluate hydrogeologic conditions
- Completion of a pumping test to evaluate the volcanic bedrock aquifer hydraulic properties and boundaries
- Collection of a groundwater quality sample from the volcanic bedrock aquifer to evaluate the native groundwater quality
- Geochemical modeling to evaluate the compatibility of the recharge water and native groundwater and the aquifer mass
- Evaluation of the data and completion of a technical memorandum documenting the results of Phase IIa and providing recommendations for the next steps if the results of Phase IIa suggested ASR is feasible

Phase IIb could include additional investigations including ASR pilot testing. The recommendations for Phase IIb would be included in the Phase 2a technical memorandum and could include:

- Engineering design for modifications to the Town's WTP to allow recharge of treated water that meets regulatory requirements
- Engineering design to recharge, store and recovery water via the test well
- Completion of an ASR pilot test
- Evaluation or the pilot test data and completion of a technical memorandum documenting the pilot test and providing recommendations for full-scale ASR implementation if pilot testing confirms ASR feasibility

8.0 CLOSING

GOLDER ASSOCIATES INC.

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Senior Project Hydrogeologist

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State of Washington
Hydrogeologist
339
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expires 7/12/2010

TABLES

TABLE 3-1
CLIMATE DATA SUMMARY

Station	Elevation (feet msl)	Period of Record	Average Monthly Precipitation (inches)												
			January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Mowich Sno-Tel	3,160	10/99-9/08	6.40	3.88	5.14	3.77	4.32	3.42	0.91	1.50	2.02	3.93	7.05	6.29	48.62
McMillan Reservoir	579	3/41-3/09	6.46	3.82	4.56	3.00	2.66	2.20	0.80	0.99	1.19	3.90	6.79	5.90	42.26
Alder Dam Camp	1,302	2/27 to 2/54	6.37	4.84	4.58	3.31	2.54	2.22	0.76	1.18	2.15	4.03	5.79	7.66	45.43
La Grande	961	1/54 to 4/83	5.06	3.67	3.88	3.21	2.40	2.12	0.90	1.57	2.09	3.30	4.73	5.59	38.52

Station	Elevation (feet msl)	Period of Record	Average Monthly Temperature (degrees F)												
			January	February	March	April	May	June	July	August	September	October	November	December	
Mowich Sno-Tel	3,160	10/99-9/08	36.75	36.25	37.40	40.02	45.25	49.84	56.05	56.22	52.29	45.75	40.02	36.91	
McMillan Reservoir	579	3/41-3/09	37.91	40.74	43.66	47.96	53.73	58.46	63.03	63.18	58.50	50.68	43.22	38.89	
Alder Dam Camp	1,302	2/27 to 2/54	36.03	38.79	42.24	47.20	52.25	56.75	61.30	61.02	56.86	49.93	42.19	38.09	
La Grande	961	1/54 to 4/83	39.03	42.27	43.87	48.20	54.87	59.97	64.93	64.90	60.27	52.17	44.09	40.53	

Station	Elevation (feet msl)	Period of Record	Pan Evapotranspiration (inches)												
			January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Puyallup 2 W Exp. Sta.	5	1931-1995	0.00	0.71	1.58	2.46	3.97	4.63	5.61	4.97	2.92	1.28	0.61	0.00	28.74

Station	Elevation (feet msl)	Period of Record	Calculated Average Potential Evapotranspiration (inches)												
			January	February	March	April	May	June	July	August	September	October	November	December	
Mowich Sno-Tel	3,160	10/99-9/08	0.54	0.57	0.81	1.30	2.22	3.03	3.82	3.53	2.68	1.66	0.90	0.54	21.62
McMillan Reservoir	579	3/41-3/09	0.41	0.72	1.13	1.83	2.84	3.71	4.32	3.98	2.95	1.74	0.86	0.46	24.96
Alder Dam Camp	1,302	2/27 to 2/54	0.31	0.62	1.08	1.85	2.76	3.58	4.17	3.79	2.86	1.77	0.85	0.46	24.10
La Grande	961	1/54 to 4/83	0.44	0.79	1.07	1.75	2.88	3.83	4.52	4.14	3.08	1.81	0.87	0.53	25.70

Note:
Precipitation and temperature data from La Grande, McMillan reservoir, and Alder Dam Camp from Western Regional Climate Center http://www.wrcc.dri.edu/CLIMATEDATA.html
Precipitation and temperature data from Mowich Sno Tel from http://www.wcc.nrcs.usda.gov/snotel/Washington/washington.html
Pan evaporation from http://www.ocs.orst.edu/page_links/comparative_climate/evap.html#washington

TABLE 3-2
SUMMARY OF INSTREAM FLOWS

Month	Mashel River at USGS Gage 12-0870-00			Nisqually River at USGS Gage 12-0895-00		
	Day	Streamflow (cfs)	Note	Day	Streamflow (cfs)	Note
January	1	100		1	600	
	15	100		15	600	
February	1	100		1	600	
	15	100		15	600	
March	1	100		1	600	
	15	100		15	600	
April	1	100		1	600	
	15	100		15	600	
May	1	100		1	600	
	15	80		15	600	
June	1	80	(closed)	1	500	(closed)
	15	70	(closed)	15	450	(closed)
July	1	50	(closed)	1	400	(closed)
	15	40	(closed)	15	400	(closed)
August	1	30	(closed)	1	370	(closed)
	15	30	(closed)	15	370	(closed)
September	1	20	(closed)	1	370	(closed)
	15	20	(closed)	15	370	(closed)
October	1	20	(closed)	1	550	(closed)
	15	20	(closed)	15	550	(closed)
November	1	40		1	600	
	15	70		15	600	
December	1	100		1	600	
	15	100		15	600	

From WAC 173-511-030
GS Gage 12-0870-00 at river mile 3.25, Section 11, T16N/R4E
eam to the headwaters including all tributaries

TABLE 3-3
SUMMARY OF INSTREAM FLOW EXCEEDANCES

Month	Probability that Flow is Available above the Minimum Instream Flow - Mashel River at USGS 12087000[a]	Probability that Flow is Available above the Minimum Instream Flow - Nisqually River at USGS 12089500[a]
November 1 to 14	86%	76%
November 15 to 30	85%	85%
December	90%	96%
January	90%	99%
February	91%	97%
March	90%	95%
April	94%	94%
May 1 to 14	86%	94%
May 15 to 31	84%	88%

Notes:

a. Indicated by the intersection of the probability curve and the minimum instream flow line (see Figures A-4 through A-10).

Summarized from Golder Associates Inc., 2005, Evaluation of Mashel River Streamflow Data to Support Winter Water

TABLE 3-4
WATER BALANCES FOR OHOP CREEK AND MASHEL RIVER

Mashel River WY 1998 to 2008													
	Month												Total
	October	November	December	January	February	March	April	May	June	July	August	September	
Precipitation at Mowich Sno-Tel	3.93	7.05	6.29	6.40	3.88	5.14	3.77	4.32	3.42	0.91	1.50	2.02	48.62
Total Runoff at Mashel River at Gage	0.97	4.33	6.36	6.17	4.01	4.51	3.34	2.75	1.63	0.51	0.31	0.35	35.24
Precipitation minus Runoff	2.96	2.71	-0.07	0.23	-0.13	0.63	0.43	1.57	1.79	0.40	1.19	1.67	13.38
Snowmelt At Mowich (included in runoff)						0.40	1.00	0.40					1.80
PET at Mowich Sno-Tel	1.66	0.90	0.54	0.54	0.57	0.81	1.30	2.22	3.03	3.82	3.53	2.68	21.62
Actual Evapotranspiration	1.66	0.90	0.00	0.23	0.00	0.63	0.43	1.57	1.79	0.40	1.19	1.67	10.47
Groundwater Recharge	1.30	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11

Ohop Creek WY 1998 to 2008													
	Month												Total
	October	November	December	January	February	March	April	May	June	July	August	September	
Precipitation at McMillan Reservoir	3.90	6.79	5.90	6.46	3.82	4.56	3.00	2.66	2.20	0.80	0.99	1.19	42.26
Total Runoff at Ohop Creek at Gage	0.92	2.83	3.56	3.93	2.81	3.21	2.58	1.77	1.15	0.47	0.38	0.37	23.98
Precipitation minus Runoff	2.98	3.96	2.33	2.53	1.00	1.35	0.42	0.89	1.04	0.33	0.61	0.82	18.28
PET at McMillian Reservoir	1.68	0.86	0.50	0.53	0.70	1.52	1.74	2.78	3.72	4.44	4.04	2.89	25.41
Actual Evapotranspiration	1.68	0.86	0.50	0.53	0.70	1.35	0.42	0.89	1.04	0.33	0.61	0.82	9.74
Groundwater Recharge	1.30	3.10	1.83	2.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53

Note:
Precipitation and temperature data from La Grande, McMillan reservoir, and Alder Dam Camp from Western Regional Climate Center http://www.wrcc.dri.edu/CLIMATEDATA.html
Precipitation and temperature data from Mowich Sno Tel from http://www.wcc.nrcs.usda.gov/snotel/Washington/washington.html
Pan evaporation from http://www.ocs.orst.edu/page_links/comparative_climate/evap.html#washington

TABLE 3-5
SUMMARY OF OHOP VALLEY WELLS

Well Name	TRS Location	Well Depth (feet bgs)	Depth to Glacial Sediments (feet bgs)	Thicknes of Glacial Sediments (feet)	Depth to Water (feet bgs)	Well Yield (gpm)	Drawdown (feet)	Comment
R. Glanschneg	T17N/R4E-36 SW/NW	199	75	76	162	15	19	
J. Buker	T16N/R4E-3 SE	124	55	69	44	7	no data	
T. Garasi	T16N/R4E-3 NW/SE	95	82	13	+2	8	76	
G. McGinnis	T16N/R4E-10 NE/SE	51	49	2	5	10	13	
T. Pruitt	T16N/R4E-15 NW/NE	67	66	1	+7	17.5	28	
Eatonville	T16N/R4E-15 SW/NE	140	not intersected		16	not tested		Ohop Valley Test Well
L. Greidanus	T16N/R4E-18 NE/SE	99	96	3	14	20	4	
J. Howard	T16N/R4E-19 NW/SW	199	162	19	165	21	no data	Completed in Mashel Fm.
J. McCurdy	T17N/R4E-24 SE/NW	93	91	2	+2	40	35	

TABLE 3-6
SUMAMRY OF TOWN OF EATONVILLE WELL TESTING RESULTS

Pumping Well	Observation Well	Hydrogeologic Unit	Test Phase	Pumping Rate (gpm)	Transmissivity (ft^2/d)	Aquifer Thickness[1] (feet)	Hydraulic Conductivity (ft/d)	Storativity (-)	Note/Analysis Method
Well No. 6	TW-03-03	Alluvial Aquifer	Pumping	230	9,730	14	695	-	Cooper-Jacob
	TW-03-04				13,560	14	969	1.4E-04	Cooper-Jacob
			Geometric Mean		11,490	14	821		
	TW-03-03		Recovery		39,040	14	2789	-	Theis Recovery
	TW-03-04				15,530	14	1109	-	Theis Recovery
			Geometric Mean		24,630	14	1759		
Well No. 7	TW-03-04	Alluvial Aquifer	Pumping	430	30,330	44	689	-	Cooper-Jacob
	TW-03-03				43,920	44	998	2.1E-05	Cooper-Jacob
			Geometric Mean		36,500	44	830		
TW-03-02	-	Alluvial Aquifer	Pumping	32	330	20	17		Estimated from Specific Capacity
Old Town Test Well	-	Volcanic Aquifer	Pumping	85	214	573	0.37	-	Estimated from Specific Capacity
Old Town Test Well	-	Volcanic Aquifer	Recovery	85	64	573	0.11	-	Theis Recovery
R/N Test Well	-	Volcanic Aquifer	Recovery	3	17	185	0.09	-	Basalt Completion
R/N Test Well	-	Alluvial Aquifer	Recovery	33	5,800	17	341	-	Alluvial Completion

Notes:
1. Interval of clean aquifer materials in alluvial wells or open interval in basalt wells.

TABLE 3-7
SUMMARY OF TOWN OF EATONVILLE ALLUVIAL AQUIFER GROUNDWATER QUALITY

Sample Date				3/7/1988	9/21/1993	1/15/2004	3/3/2004
Parameter	MCL	Anti-Degradation Criteria WAC 173-200	Units	Well No. 1	Well No. 2	Well No. 6	Well No. 7
Primary Inorganic Constituents				Result	Result	Result	Result
Arsenic	0.01	0.05	ug/L	<0.01	<0.01	<0.002	<0.002
Barium	2	1	mg/L	<0.25	<0.25	<0.01	<0.1
Cadmium	0.005	0.01	mg/L	<0.002	<0.002	<0.002	<0.002
Chromium	0.1	0.05	mg/L	<0.01	<0.01	<0.01	<0.01
Mercury	0.002	0.002	mg/L	<0.001	<0.001	<0.0005	<0.0005
Selenium	0.05	0.01	mg/L	<0.005	<0.005	<0.005	<0.005
Beryllium	0.004	nc	mg/L	na	na	<0.002	<0.003
Nickel	0.1	nc	mg/L	na	na	<0.04	<0.04
Antimony	0.006	nc	mg/L	na	na	<0.002	<0.005
Thallium	0.002	nc	mg/L	na	na	<0.001	,0.002
Cyanide	0.2	nc	mg/L	na	na	<0.05	<0.05
Fluoride	4	4	mg/L	<0.2	<0.2	<0.2	<0.2
Nitrate (as N)	10	10	mg/L	0.5	0.2	0.8	<0.2
Nitrite (as N)	1	nc	mg/L	na	na	<0.2	0.5
Total Nitrate/Nitrite (as N)	10	nc	mg/L	na	na	0.8	0.5
Secondary Inorganic Constituents							
Iron	0.3	0.3	mg/L	0.25	0.08	0.13	0.1
Manganese	0.05	0.05	mg/L	<0.01	<0.01	<0.01	<0.01
Silver	0.1	0.05	mg/L	<0.01	<0.01	<0.01	<0.01
Chloride	250	250	mg/L	2	3	5	2
Sulfate	250	250	mg/L	na	na	3	3
Zinc	5	5	mg/L	na	na	<0.05	<0.2
Other Inorganic Constituents							
Sodium	20[a]	nc	mg/L	4	3	4	<5
Potassium	nc	nc	mg/L	na	na	4.6	0.6
Hardness	nc	nc	mg/L as $CaCO_3$	24	22	21	18
Conductivity (25 C)	700	nc	mg/L	56	61	68	52
Turbidity	1	nc	NTU	3.4	1.4	2.5	2.6
Color	15	15	unit	10	5	5	5
Total Dissolved Solids	500	500	mg/L	na	na	41	50
Lead	0.015[b]	0.05	mg/L	<0.01	<0.005	<0.002	<0.002
Copper	1.3[b]	1	mg/L	na	na	<0.02	<0.02
Orthophosphate	nc	nc	mg/L	na	na	<0.01	<0.01
Silica	nc	nc	mg/L	na	na	17	17
Aluminum	nc	nc	mg/L	na	na	0.14	0.29
Alkalinity	nc	nc	mg/L	na	na	22	18
Magnesium	nc	nc	mg/L	na	na	2	1.4
Calcium	nc	nc	mg/L	na	na	5	6
Ammonia	nc	nc	mg/L	na	na	<1.0	2.1
pH	6.5-8.5	6.5-8.5	s.u.	na	na	6.6	6.0

Notes
a. Recommended level
b. Action level
nc: no criteria, na: not analyzed
Shaded values exceed MCL or anti-degradation criteria.

TABLE 3-8
SUMMARY OF GLACIAL AND VOLCANIC AQUIFER GROUNDWATER QUALITY

			Volcanic Aquifer			Glacial Aquifer System	Mashel Aquifer
Sample Location			Town of Eatonville R/N Test Well	Hope International Water System Source 01		Barneys Corner	Pioneer Farm
Sample Date			6/3/2002	3/21/1991	6/16/1992	12/18/2007	11/14/1989
Constituent	Units	MCL	Result	Result	Result	Result	Result
Arsenic	mg/L	0.01	na	<0.005	<0.01	<0.002	na
Barium	mg/L	2	na	<0.05	<0.25	na	na
Cadmium	mg/L	0.005	na	<0.001	<0.002	na	na
Chromium	mg/L	0.1	na	<0.001	<0.01	na	na
Mercury	mg/L	0.0005	na	<0.0002	<0.001	na	na
Selenium	mg/L	0.05	na	<0.005	<0.005	na	na
Beryllium	mg/L	0.004	na	na	na	na	na
Nickel	mg/L	0.1	na	na	na	na	na
Antimony	mg/L	0.006	na	na	na	na	na
Thallium	mg/L	0.002	na	na	na	na	na
Cyanide	mg/L	0.2	na	na	na	na	na
Fluoride	mg/L	2/4	na	0.2	0.2	na	na
Nitrite as N	mg/L	1	na	na	na	na	na
Nitrate as N	mg/L	10	na	<0.1	<0.2	<0.2	1.1
Total Nitrite+Nitrate as N	mg/L	10	na	na	na	na	na
Iron	mg/L	0.3	0.3	0.04	0.28	na	na
Manganese	mg/L	0.05	0.04	0.02	0.023	na	na
Silver	mg/L	0.1	na	<0.001	<0.1	na	na
Chloride	mg/L	250	na	14	3	na	na
Sulfate	mg/L	250	na	9	na	na	na
Zinc	mg/L	5	na	na	na	na	na
Sodium	mg/L	20 (recommended)	na	42	36	na	na
Hardness	mg/L	nc	na	16	26	na	na
Conductivity	mS/cm	700	145	156	217	na	na
Turbidity	NTU	nc	5.6	0.5	2.8	na	na
Color	CU	15	na	5	15	na	na
Lead	mg/L	0.015 (action level)	na	<0.001	<0.002	na	na
Copper	mg/L	1.3 (action level)	na	na	na	na	na

Note:
Data downloaded from Washington Department of Health Online Database http://www4.doh.wa.gov/SentryInternet/Disclaimer.aspx?Page=/SentryInternet/FindWaterSystem.aspx.)
Secondary standards underlined.
Shaded cells exceed water quality criteria.
na: not analyzed, nc: no criteria

TABLE 4-1
SUMMARY OF TOWN OF EATONVILLE WATER RIGHTS

Water Right Number	Priority Date	Instantaneous Quantity (gpm)	Annual Quantity (AF)	Source	Note
10307	8/18/67	1,032	525	Mashel River	Primary Right
5676-A	11/29/66	360	394	Wells 1 and 7	Supplemental
G2-01087C	8/18/67	250	400	Wells 2 and 6	Supplemental
	Total	**1,642**	**525**		

TABLE 4-2
SUMMARY OF TOWN OF EATONVILLE MASHEL RIVER DIVERSION WATER QUALITY

Sample Location				Mashel River Raw Water				WTP Pilot Plant Finished Water
Sample Date			WAC 173-200 Anti-Degradation Criteria	9/13/2004	9/12/2005	9/11/2006	4/7/2008	3/10/2005
Constituent	Units	MCL		Result	Result	Result	Result	Result
Arsenic	mg/L	0.01	0.05	0.004	<0.002	na	<0.002	<0.002
Barium	mg/L	2	1.0	<0.1	<0.1	na	<0.1	<0.1
Cadmium	mg/L	0.005	0.01	<0.002	<0.002	na	<0.002	<0.002
Chromium	mg/L	0.1	0.05	<0.01	<0.01	na	<0.01	<0.01
Mercury	mg/L	0.0005	0.00	<0.0005	<0.0005	na	<0.0005	<0.0005
Selenium	mg/L	0.05	0.01	<0.005	<0.005	na	<0.005	<0.005
Beryllium	mg/L	0.004	nc	<0.003	<0.003	na	<0.003	<0.003
Nickel	mg/L	0.1	nc	<0.04	<0.04	na	<0.04	<0.04
Antimony	mg/L	0.006	nc	<0.005	<0.005	na	<0.005	<0.005
Thallium	mg/L	0.002	nc	<0.002	<0.002	<0.002	<0.002	<0.002
Cyanide	mg/L	0.2	nc	<0.05	<0.05	na	<0.05	<0.05
Fluoride	mg/L	2/4	4	<0.2	<0.2	na	<0.2	<0.2
Nitrite as N	mg/L	1	10	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate as N	mg/L	10	nc	<0.2	<0.2	na	0.2	<0.2
Total Nitrite+Nitrate as N	mg/L	10	nc	<0.4	<0.4	na	<0.4	<0.4
Iron	mg/L	0.3	0.30	4.35	0.77	0.1	0.1	<0.1
Manganese	mg/L	0.05	0.05	0.14	0.03	<0.01	<0.01	<0.01
Silver	mg/L	0.1	0.05	<0.01	<0.01	na	<0.01	<0.01
Chloride	mg/L	250	250	1.0	<0.2	na	1.0	3.0
Sulfate	mg/L	250	250	2.0	<0.002	na	2.0	2.0
Zinc	mg/L	5	5	<0.2	<0.02	na	<0.02	<0.02
Sodium	mg/L	20 (recommended)	nc	5.0	7.0	na	<5	<5
Hardness	mg/L	nc	nc	36	28	na	20.0	26
Conductivity	µS/cm	700	nc	55	75	na	42.0	60
Turbidity	NTU	nc	nc	52	5.5	na	2.6	0.2
Color	mg/L	15	15	30	20	na	25	<5
Lead	mg/L	0.015 (action level)	0.05	<0.002	<0.002	na	<0.002	<0.002
Copper	mg/L	1.3 (action level)	1.0	<0.02	<0.02	na	<0.02	<0.02

Note:
Data downloaded from Washington Department of Health Online Database (http://www4.doh.wa.gov/SentryInternet/Disclaimer.aspx?Page=/SentryInternet/FindWaterSystem.aspx.)
Secondary water quality criteria underlined.
Shaded cells exceed water quality criteria.
na: not analyzed, nc: no criteria

TABLE 4-3
SUMMARY OF TOWN OF EATONVILLE WELLS

Well Number	Date Drilled	Diameter (inches)	Depth (feet bgs)	Screened Interval (feet bgs)	Current Capacity (gpm)
1	1966	10	52	38.5-43.5	175
2	1969	10	45.5	38-44	200
3	1975	10	39	34-39	Not Used
4	1976	10	63	54-61	Not Used
5	1977	8	71.5	61-71	Not Used
6	2003	12	73.5	59.5-69.5	250
7	2004	12	93.5	73.5-83.5	360
				Total	985

Note:
The instantaneous combined water right capacity for the Town's wells is 610 gpm. If Wells No. 6 and 7 are used at the full capacity, Wells No. 1 and 2 cannot be used.

TABLE 4-4
SUMMARY OF TOWN OF EATONVILLE WATER USE

Month and Year	Total Water (gallons)	Wells (gallons)	River (gallons)	Total (gpm)	Wells (gpm)	River (gpm)	Wells%	River %
1999 Total	**110,282,000**	**No Data**		**210**	**No Data**			
2000 Total	**117,874,000**	**No Data**		**224**	**No Data**			
2001 Total	**115,711,000**	**No Data**		**220**	**No Data**			
10/15/02	9,191,000	6,349,000	2,842,000	206	142	64	69%	31%
11/15/02	8,291,000	7,287,000	1,004,000	192	169	23	88%	12%
12/15/02	8,107,000	7,604,000	503,000	182	170	11	94%	6%
1/15/03	8,201,000	8,201,000	0	184	184	0	100%	0%
2/15/03	7,156,000	7,156,000	0	177	177	0	100%	0%
3/15/03	8,137,000	8,137,000	0	182	182	0	100%	0%
4/15/03	7,740,000	7,331,000	409,000	179	170	9	95%	5%
5/15/03	8,155,000	5,060,000	3,095,000	183	113	69	62%	38%
6/15/03	13,391,000	9,153,000	4,238,000	310	212	98	68%	32%
7/15/03	17,258,000	9,178,000	8,080,000	387	206	181	53%	47%
8/15/03	13,494,000	5,919,000	7,575,000	302	133	170	44%	56%
9/15/03	11,672,000	7,434,000	4,238,000	270	172	98	64%	36%
Water Year 2003	**120,793,000**	**88,809,000**	**31,984,000**	**230**	**169**	**61**	**74%**	**26%**
10/15/03	7,988,000	6,690,000	1,298,000	179	150	29	84%	16%
11/15/03	7,570,000	7,570,000	0	175	175	0	100%	0%
12/15/03	8,074,000	8,074,000	0	181	181	0	100%	0%
1/15/04	8,135,000	8,135,000	0	182	182	0	100%	0%
2/15/04	5,793,000	5,793,000	0	139	139	0	100%	0%
3/15/04	6,488,000	6,488,000	0	145	145	0	100%	0%
4/15/04	7,072,000	4,072,350	2,999,650	164	94	69	58%	42%
5/15/04	8,017,000	4,116,000	3,901,000	180	92	87	51%	49%
6/15/04	9,810,000	5,316,000	4,494,000	227	123	104	54%	46%
7/15/04	16,208,000	8,368,000	7,840,000	363	187	176	52%	48%
8/15/04	14,129,000	9,293,000	4,836,000	317	208	108	66%	34%
9/15/04	8,628,000	8,628,000	0	200	200	0	100%	0%
Water Year 2004	**107,912,000**	**82,543,350**	**25,368,650**	**205**	**157**	**48**	**76%**	**24%**

TABLE 4-4
SUMMARY OF TOWN OF EATONVILLE WATER USE

Month and Year	Total Water (gallons)	Wells (gallons)	River (gallons)	Total (gpm)	Wells (gpm)	River (gpm)	Wells%	River %
10/15/04	8,933,600	8,933,600	0	200	200	0	100%	0%
11/15/04	7,611,567	7,611,567	0	176	176	0	100%	0%
12/15/04	7,696,600	7,696,600	0	172	172	0	100%	0%
1/15/05	8,561,400	8,561,400	0	192	192	0	100%	0%
2/15/05	7,565,900	7,565,900	0	181	181	0	100%	0%
3/15/05	7,599,104	7,599,104	0	170	170	0	100%	0%
4/15/05	4,343,700	4,343,700	0	101	101	0	100%	0%
5/15/05	7,380,000	No Data		165	No Data			
6/15/05	7,768,000	No Data		180	No Data			
7/15/05	10,839,000	No Data		243	No Data			
8/15/05	13,997,000	No Data		314	No Data			
9/15/05	9,622,000	No Data		223	No Data			
Water Year 2005	**101,917,871**	**52,311,871**		**194**	**No Data**			
10/15/05	7,412,000	No Data		166	No Data			
11/15/05	7,405,000	No Data		171	No Data			
12/15/05	8,989,000	No Data		201	No Data			
1/15/06	9,939,000	No Data		223	No Data			
2/15/06	8,839,000	No Data		212	No Data			
3/15/06	10,424,000	No Data		234	No Data			
4/15/06	9,298,000	No Data		215	No Data			
5/15/06	9,262,000	No Data		207	No Data			
6/15/06	11,549,000	No Data		267	No Data			
7/15/06	14,453,000	No Data		324	No Data			
8/15/06	12,324,000	No Data		276	No Data			
9/15/06	14,250,000	No Data		330	No Data			
Water Year 2006	**124,144,000**			**236**	**No Data**			

TABLE 4-4
SUMMARY OF TOWN OF EATONVILLE WATER USE

Month and Year	Total Water (gallons)	Wells (gallons)	River (gallons)	Total (gpm)	Wells (gpm)	River (gpm)	Wells%	River %
10/15/06	13,037,000	No Data		292	No Data			
11/15/06	11,362,000	No Data		263	No Data			
12/15/06	10,367,000	No Data		232	No Data			
1/15/07	12,306,000	No Data		276	No Data			
2/15/07	10,420,000	No Data		250	No Data			
3/15/07	10,707,000	No Data		240	No Data			
4/15/07	10,167,000	No Data		235	No Data			
5/15/07	12,033,000	No Data		270	No Data			
6/15/07	13,658,000	No Data		316	No Data			
7/15/07	17,231,900	2,947,900	14,284,000	386	66	320	17%	83%
8/15/07	16,062,740	6,312,740	9,750,000	360	141	218	39%	61%
9/15/07	14,471,940	6,308,940	8,163,000	335	146	189	44%	56%
Water Year 2007	**151,823,580**			**289**	**No Data**			
10/15/07	11,450,630	11,450,630	0	257	257	0	100%	0%
11/15/07	11,137,000	11,137,000	0	258	258	0	100%	0%
12/15/07	11,642,000	11,638,000	4,000	261	261	0	100%	0%
1/15/08	11,692,000	11,586,000	106,000	262	260	2	99%	1%
2/15/08	10,876,000	10,832,000	44,000	260	259	1	100%	0%
3/15/08	10,617,000	10,617,000	0	238	238	0	100%	0%
4/15/08	9,293,000	9,293,000	0	215	215	0	100%	0%
5/15/08	8,500,000	8,500,000	0	190	190	0	100%	0%
6/15/08	10,230,000	7,182,000	3,048,000	237	166	71	70%	30%
7/15/08	15,852,000	1,479,000	14,373,000	355	33	322	9%	91%
8/15/08	13,302,000	3,714,000	9,588,000	298	83	215	28%	72%
9/15/08	11,638,000	6,318,000	5,320,000	269	146	123	54%	46%
Water Year 2008	**136,229,630**	**103,746,630**	**32,483,000**	**259**	**197**	**62**	**76%**	**24%**
10/15/08	8,203,000	8,203,000	0	184	184	0	100%	0%
11/15/08	5,241,000	5,241,000	0	121	121	0	100%	0%

Note:
Pumping from Wells 1, 2, and 5 through the beginning of August 2004.
Wells 6 and 7 placed into service August 2004.
New WTP placed online June 2006

TABLE 4-5
SUMMARY OF TOWN OF EATONVILLE FUTURE WATER USE

	Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2024
Actual Average Annual Demand (gpm)	230	205	194	236	289	259	no data	no data	no data
Estimated Average Day Demand - No Conservation (gpm)	no data	no data	247	256	265	274	284	293	473
Estimated Average Day Demand - Conservation (gpm)	no data	no data	241	248	255	262	269	278	426
Estimated Peak Day Demand - No Conservation (gpm)	no data	no data	593	614	636	658	682	703	1,135
Estimated Peak Day Demand - Conservation (gpm)	no data	no data	578	595	612	629	646	667	1,022
Source Capacity with Diversion Limitation and Well Water Rights[1]	not applicable							1,010	1,010
Peak Day Demand Surplus or Deficiency - No Conservation (gpm)	not applicable							307	-125
Peak Day Demand Surplus or Deficiency - Conservation (gpm)	not applicable							343	-12
Source Capacity with Well Water Rights Only[2]	not applicable							610	610
Peak Day Demand Surplus or Deficiency - No Conservation (gpm)	not applicable							-93	-525
Peak Day Demand Surplus or Deficiency - Conservation (gpm)	not applicable							-57	-412

Note:
1. Assumes river limited to diversion of 400 gpm and wells pumping 610 gpm. WTP capacity upgraded.
2. Assumes no river diversion and wells pumping 610 gpm. WTP capacity upgraded.
Summarized from Tables 4-10, 7-3, and 7-4, Town of Eatonville Comprehensive Water System Plan, RH2 Engineering Inc., 2005.

TABLE 5-1
SUMMARY OF FINISHED WATER DISINFECTION BY-PRODUCTS AND HALOACENTIC ACIDS

Sample Location	Constituent	Units	MCL	WAC 173-200 Criteria	Sample Date 5/5/08	8/4/08	11/3/08	2/2/09	5/4/09	8/3/09	11/2/09
303 Antonie Ave.	Chloroform	mg/L	nc	7	10.6	70.7	7.6	5.1	6.0	17.5	12.9
	Bromodichloromethane	mg/L	nc	0.3	1.4	1.5	1.9	1.4	1.0	1.3	1.5
	Total Trihalomethane	mg/L	80	nc	12	72.2	9.5	6.5	7.0	18.8	14.5
	Dibromochloromethane	mg/L	nc	0.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	Bromoform	mg/L	nc	5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
650 Joy St.	Chloroform	mg/L	nc	7	37.1	56.9	26.1	27.4	25.2	32.2	24.5
	Bromodichloromethane	mg/L	nc	0.3	2.3	1.8	2.4	2.6	1.9	1.8	1.8
	Total Trihalomethane	mg/L	80	nc	39.4	58.7	28.5	30.0	27.1	34.0	26.3
	Dibromochloromethane	mg/L	nc	0.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	Bromoform	mg/L	nc	5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
10920 Eatonville Highway	Chloroform	mg/L	nc	7	24.0	71.8	22.9	9.5	28.4	28.0	24.8
	Bromodichloromethane	mg/L	nc	0.3	1.9	1.0	2.4	1.9	2.3	1.9	2.1
	Total Trihalomethane	mg/L	80	nc	25.9	72.8	25.3	11.4	30.7	29.9	26.9
	Dibromochloromethane	mg/L	nc	0.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
	Bromoform	mg/L	nc	5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6

Sample Location	Constituent	Units	MCL	WAC 173-200 Criteria	Sample Date 5/5/08	8/4/08	11/3/08	2/2/09	5/4/09	8/3/09	11/2/09
303 Antonie Ave.	Diclhloroacetic Acid	mg/L	nc	nc	6.0	37.8	3.5	3.0	13.6	<1.0	6.2
	Monochloroacetic Acid	mg/L	nc	nc	<2.0	4.9	<2.0	<2.0	<2.0	<2.0	<2.0
	Monobromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Dibromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromochoroacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Triclhloroacetic Acid	mg/L	nc	nc	2.5	34.3	1.5	2.3	8.5	4.1	2.6
	HAA(5)	mg/L	60	nc	8.5	77.0	5.0	5.3	22.1	4.1	0.8
650 Joy St.	Diclhloroacetic Acid	mg/L	nc	nc	18.0	2.3	1.5	6.5	4.1	<1.0	1.7
	Monochloroacetic Acid	mg/L	nc	nc	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Monobromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Dibromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromochoroacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Triclhloroacetic Acid	mg/L	nc	nc	6.1	2.3	3.4	7.7	3.1	5.6	2.8
	HAA(5)	mg/L	60	nc	24.1	5.6	4.9	14.2	7.2	5.6	4.5
10920 Eatonville Highway	Diclhloroacetic Acid	mg/L	nc	nc	16.8	2.5	8.1	5.9	15.6	<1.0	<1.0
	Monochloroacetic Acid	mg/L	nc	nc	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	Monobromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Dibromoacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bromochoroacetic Acid	mg/L	nc	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Triclhloroacetic Acid	mg/L	nc	nc	4.6	26.1	6.3	4.0	9.6	6.1	<1.0
	HAA(5)	mg/L	60	nc	21.4	29.6	14.4	9.9	25.2	6.1	<15

Data downloaded from Washington Department of Health Online Database (http://www4.doh.wa.gov/SentryInternet/Disclaimer.aspx?Page=/SentryInternet/FindWaterSystem.aspx.)
Shaded cells exceed drinking water quality or anti-degradation criteria.
nc: no criteria

TABLE 6-1
CONCEPTUAL HYDROGEOLOGICAL MODEL SUMMARY

Storage Concept	Location	Geologic Unit(s)	Groundwater Occurrence	Aquifer Thickness and Depth Interval (ft)	Well Yields (gpm)	Transmissivity (ft^2/d)	Storativity	Available Data	Water Levels (feet bgs)	Water Quality	Potential Storage Quantities (AF)	Relative Cost (1=low, 4=high)	Uncertainties	Investigation Requirements
Shallow Aquifer Recharge	Eatonville Wellfield	Alluvial Deposits	Alluvial Materials, Unconfined	25-60 feet thick, 50 to 100 feet bgs	150-350	10,000 to 40,000	10-3 to 10-4 (from pumping tests Wells 6 and 7) but connection with river suggests unconfined (0.05 to 0.15?)	Water Quality, Well Logs, Pumping Tests, Groundwater and River Levels, Geophysical Surveys	10-20	Some alluvial water is GUI, native groundwater has elevated turbidity, low pH	TBD	TBD	Residence time of recharged water, available storage quantity	Pilot recharge facility, testing
Deep Aquifer Recharge	Eatonville Wellfield	Basalt	Basalt, Confined	Thin Fractures and Fracture Zones within Unfractured Rock	5-10	15-20	Unknown, likely 10-3 to 10-5	Well Logs, Pumping Test, Limited Water Quality, Geophysical Surveys	30-35?	Limited data suggest elevated Fe and Mn but sample turbidity high (>5 NTU)	TBD	TBD	Water Quality Hydraulic Properties Communication with Surface Water and Other wells	Geophysical survey?, test well, pilot testing
	Surrounding Area	Glacial Sediments	Glacial Sediments, Confined or Unconfined	20-40 feet thick, 70 to 150 feet bgs	5-100	10-20,000	Unknown, likely 10-3 to 10-4 if confined, 0.05 to 0.15 if unconfined	Well Logs, Airlift/Bail Flows	1 to 300	Unknown	TBD	TBD	Water quality Hydraulic properties Communication with Surface Water and Other wells	Geophysical survey?, test wells, pilot testing
		Mashel Formation	Semi-consolidated Sediments, Confined or Unconfined?	60 to >100 feet thick, 100 to 250 feet bgs	10-40	5-800	Unknown, likely 10-3 to 10-4 if confined, 0.05 to 0.15 if unconfined	Well Logs, Airlift/Bail Flows	10-350	Unknown	TBD	TBD	Water Quality Hydraulic Properties Communication with Surface Water and Other wells	Geophysical survey?, test wells, pilot testing
		Basalt	Basalt, Confined	Thin Fractures and Fracture Zones within Unfractured Rock	<5-150	4-1,780	Unknown, likely 10-3 to 10-5	Well Logs, Airlift/Bail Flows	+1 to 300	Unknown	TBD	TBD	Water Quality Hydraulic Properties Communication with Surface Water and Other wells	Geophysical survey?, test wells, pilot testing
Deep Groundwater Development/ Storage	Ohop Creek Valley	Glacial Sediments	Glacial Sediments, Likely Confined	Unknown, > 140 feet	10-100?	Unknown	Unknown, likely 10-3 to 10-4?	Well Logs, Airlift/Bail Flows, Geophysical Surveys	+7 to 20 to 100 to 200	Unknown	TBD	TBD	Geological Conditions Hydraulic Properties Water Quality Communication with Surface Water and Other Wells Basin Closed to Further Withdrawals	Geophysical survey, test well, pumping test

TABLE 6-2
SUMMARY OF SHALLOW AQUIFER RECHARGE MOUND HEIGHTS

Tranmissivity (ft^2/d)	Recharge Rate (cfs)	Recharge Rate (gpm)	Recharge Volume (Mgal)	Recharge Volume (AF)	Buildup at Center of Infiltration Pond (feet)	Water at Center of Infiltration Pond (feet bgs)	Depth to Water 1,000 feet from Pond (feet bgs)
10,000	0	50	15	46	1.03	13.97	14.76
	0.22	100	30	93	2.06	12.94	14.51
	0.33	150	45	139	3.10	11.90	14.27
	0.45	200	60	186	4.13	10.87	14.02
30,000	0.11	50	15	46	1.58	13.42	14.89
	0.22	100	30	93	3.16	11.84	14.78
	0.33	150	45	139	4.74	10.26	14.67
	0.45	200	60	186	6.32	8.68	14.56

Note:
Recharge duration of 90 days
Depth to water assumes pre-recharge depth to water of 15 feet bgs.

TABLE 6-3
SUMMARY OF BUILDUP FOR BASALT AQUIFER RECHARGE

Tranmissivity (ft^2/d)	Recharge Rate (cfs)	Recharge Rate (gpm)	Recharge Volume (Mgal)	Recharge Volume (AF)	Drawdown or Buildup at Well (feet)	Radius of Influence[1] (feet)
500	0.06	25	8	23	21.82	8,680
	0.11	50	15	46	43.64	13,103
	0.17	75	23	70	65.46	15,292
	0.22	100	30	93	87.28	16,576
2,000	0.06	25	8	23	5.72	2,259
	0.11	50	15	46	11.44	8,499
	0.17	75	23	70	17.16	13,545
	0.22	100	30	93	22.88	17,360

Note:
1. Point where drawdown or buildup is less than or equal to one foot.

TABLE 6-4
SUMMARY OF BUILDUP FOR GLACIAL MATERIALS AND MASHEL FORMATION AQUIFER RECHARGE

Hydrogeologic Unit	Tranmissivity (ft^2/d)	Recharge Rate (cfs)	Recharge Rate (gpm)	Recharge Volume (Mgal)	Recharge Volume (AF)	Drawdown or Buildup at Well (feet)	Radius of Influence[1] (feet)
Mashel Formation	40	0.06	25	7.6	23	249	5,554
		0.11	50	15	46	497	5,778
		0.17	75	23	70	746	5,854
		0.22	100	30	93	994	5,892
	800	0.06	25	7.6	23	14	7,085
		0.11	50	15	46	28	12,846
		0.17	75	23	70	42	16,089
		0.22	100	30	93	55	18,159
Glacial Materials	200	0.06	25	7.6	23	53	9,080
		0.11	50	15	46	106	11,016
		0.17	75	23	70	158	11,775
		0.22	100	30	93	211	12,174
	20,000	0.06	25	7.6	23	0.6	<1
		0.11	50	15	46	1.2	<1
		0.17	75	23	70	1.8	16
		0.22	100	30	93	2.5	142

Note:
1. Point where drawdown or buildup is less than or equal to one foot.

TABLE 6-5
SUMMARY OF BUILDUP AND DRAWDOWN FOR GLACIAL MATERIAL IN OHOP VALLEY

Tranmissivity (ft^2/d)	Recharge Rate (cfs)	Recharge Rate (gpm)	Recharge Volume (Mgal)	Recharge Volume (AF)	Drawdown or Buildup at Well (feet)	Radius of Influence[1] (feet)
1,000	0.06	25	8	23	11.18	6,010
	0.11	50	15	46	22.35	12,270
	0.17	75	23	70	33.53	16,032
	0.22	100	30	93	44.70	18,530
2,000	0.06	25	8	23	5.72	2,259
	0.11	50	15	46	11.44	8,499
	0.17	75	23	70	17.16	13,539
	0.22	100	30	93	22.88	17,352

Note:
1. Point where drawdown or buildup is less than or equal to one foot.

TABLE 6-6
SUMMARY OF RECHARGE ALTERANTIVES

Storage Concept	Location	Potential to Meet Storage or Capacity Goal	Potential Recharge Rate (gpm)	Potential Recovery Rate (gpm)	Permitting Requirements	Infrastructure Requirements	Positive Implementation Factors	Potential Limitations	Investigative Requirements	Storage Ranking	Cost Ranking	Overall Ranking
Shallow Aquifer Recharge	Eatonville Wellfield	Low	50-100	100-300	UIC Registration ASR Reservoir Permit Start Card and Well Site Inspection for New wells	Infiltration Basin/Gallery Recovery and Monitoring Wells Pumps and Pipes Treatment	Close to Wellfield and WTP Infrastructure Known Water Quality Known Aquifer Properties	Storage Volume, Surface Water Dischage	Pilot Recharge Facility and Testing	2 to 3	1	2
Deep Aquifer Recharge	Eatonville Wellfield Basalt	Low to Moderate	10-50	10-50	Preliminary Permit UIC Registration ASR Reservoir Permit Start Card and Well Site Inspection for New wells	ASR Well Piping and Pumps Treatment	Close to Wellfield and WTP Infrastructure Likely Limited Interaction with Surface Water and Alluvial Aquifer	Basalt Aquifer Hydraulic Properties Storage Volume Water Quality	ASR Test Well and Monitoring Wells Pumping Tests ASR Pilot Testing	1 to 3	2	1
	Surrounding Area (Basalt, Mashel Formation, Glacial Aquifer)	Low to Moderate	10-100	10-100	UIC Registration ASR Reservoir Permit Start Card and Well Site Inspection for New wells	Connection to System ASR Well Piping and Pumps Treatment	Potential Permeable Confined Aquifers	Aquifer Hydraulic Properties Continuity with Surface Water Storage Volume Distal from Rest of System Land Ownership and Access	Test Well Pumping Tests Pilot Testing	2 to 3	3 to 5	3
Deep Groundwater Development/Storage	Ohop Creek Valley	Moderate	50-200	50-200	Preliminary Permit UIC Registration ASR Reservoir Permit Mitigation Plan Start Card and Well Site Inspection for New wells	Connection to System Pumping/Recharge Well Piping and Pumps Treatment?	Potential Permeable Confined Aquifer with Little Other GW Use Possible Limited Continuity with SW	Land Ownership and Access Continuity with Surface Water Distal from Rest of System Closed Basin - Mitigation Requirements or ASR Permit Conditioning	Test Well Pumping Tests	1 to 3	4 to 5	3

Note:
Relative Cost Ranking: 1 = Lowest, 5= Highest
Relative Storage Ranking 1 = Highest, 3= Lowest

FIGURES

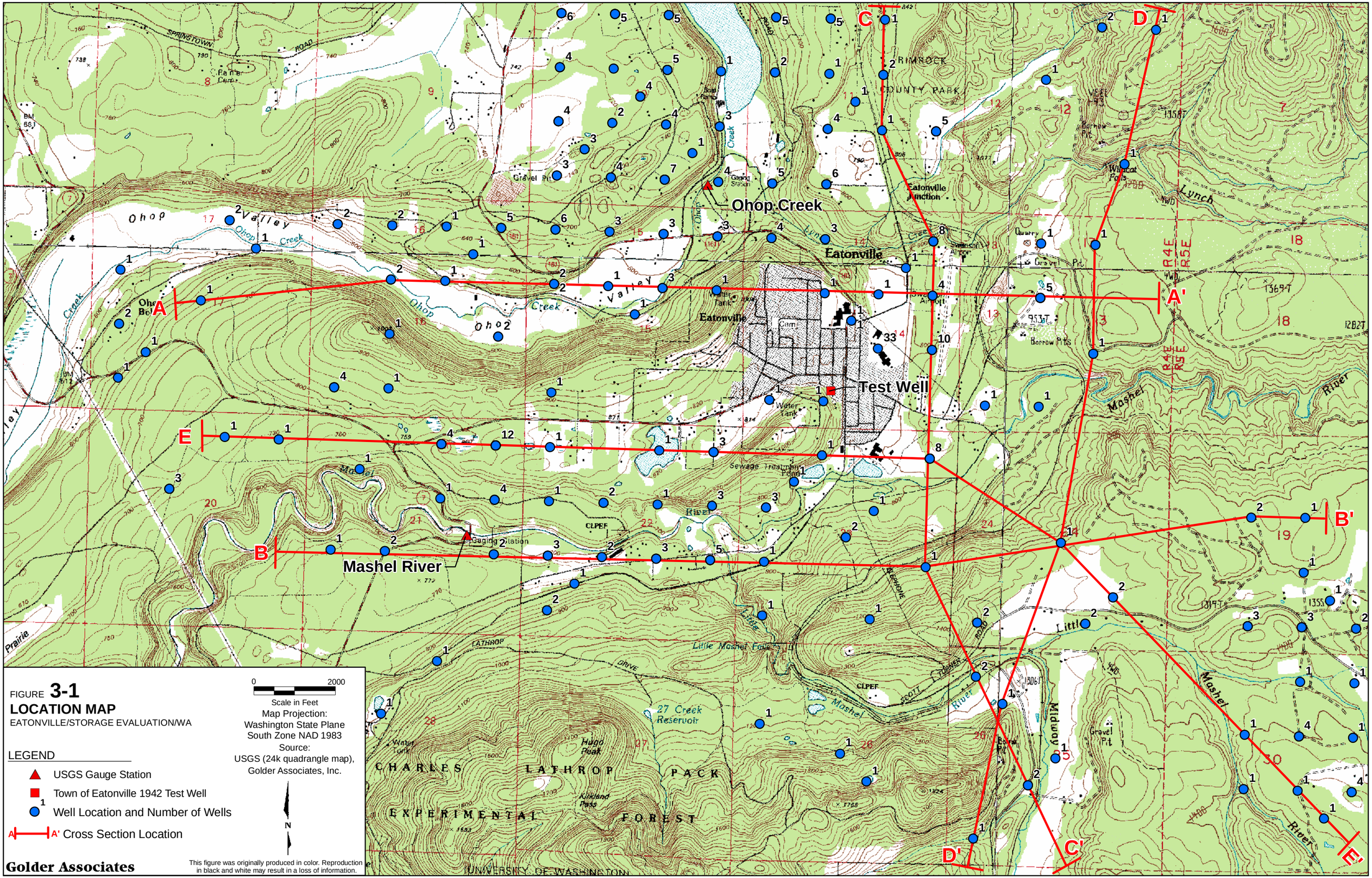

FIGURE **3-1**

LOCATION MAP

EATONVILLE/STORAGE EVALUATION/WA

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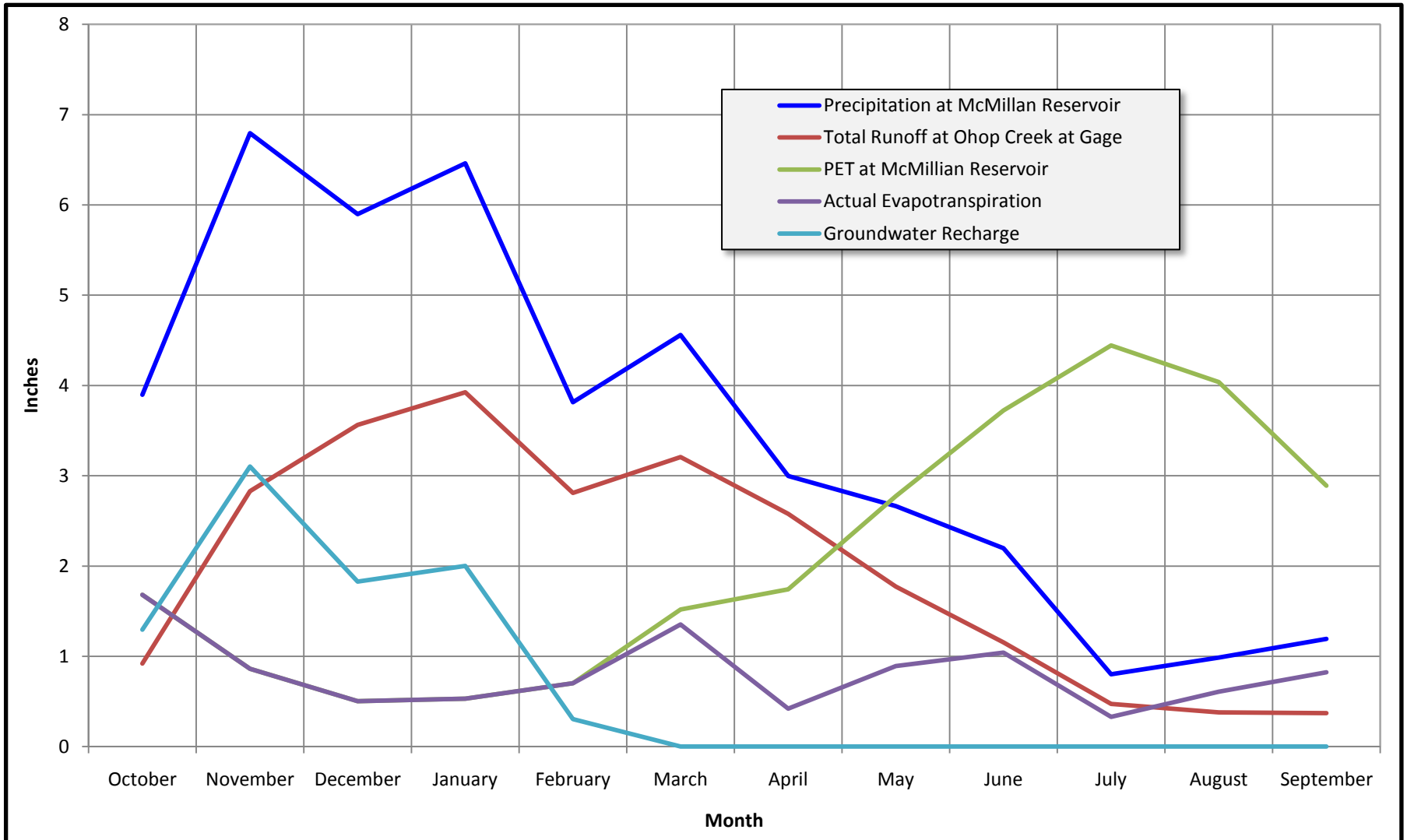
Golder Associates

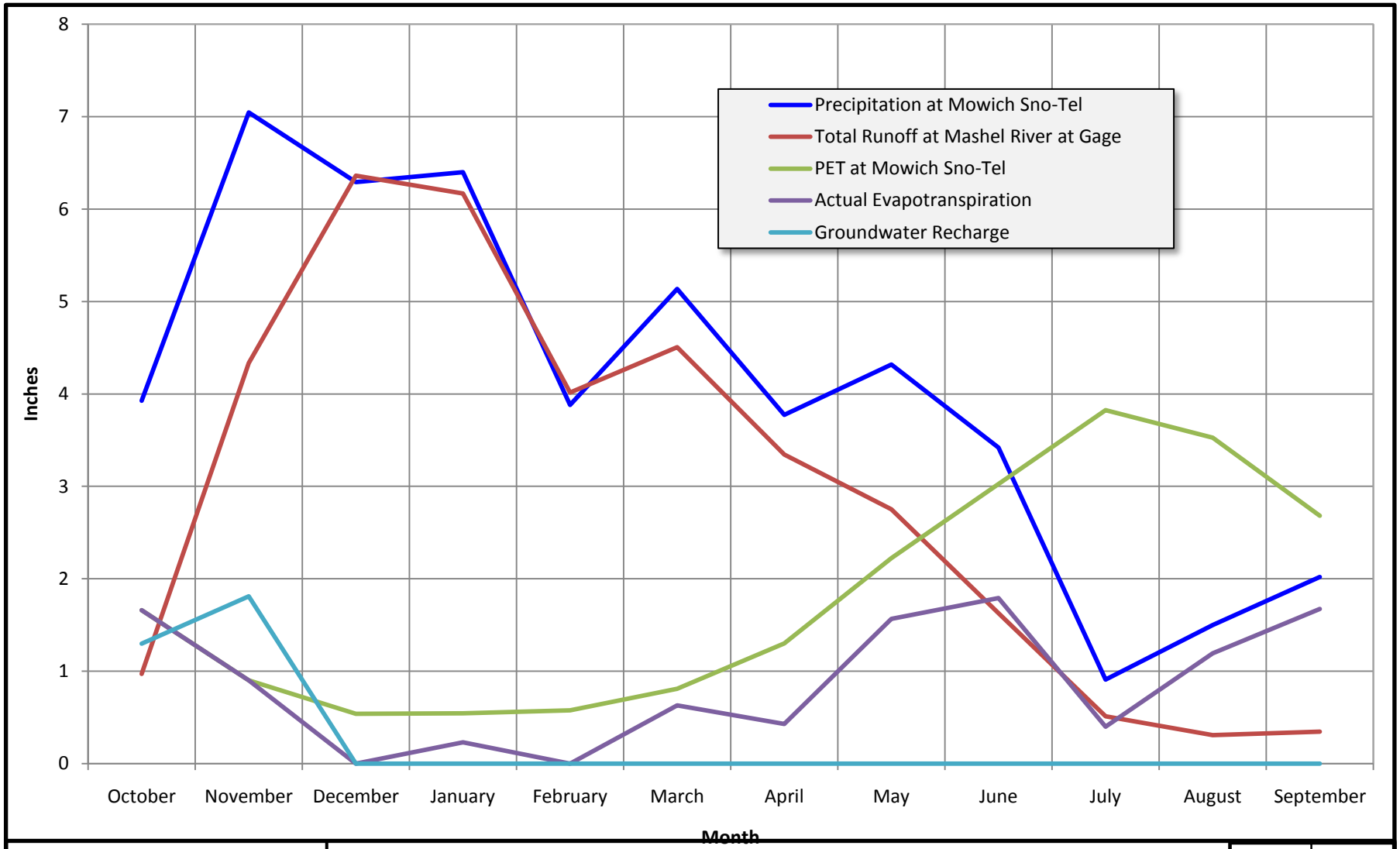
Title	Mean Daily Flow for Ohop Creek and Mashel River (WY 1998-2008)	Drawn	MPK
Project Name	WADOE/Eatonville Storage/WA	Checked	MPK
Project No.	083-93607-005	Reviewed	DB
Client Name	WADOE/Town of Eatonville	FIGURE	3-2
Date	March 2010		

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow



Golder Associates	Title: Ohop Creek Water Balance		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.005	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: June 2009	FIGURE 3-3

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\tables.xlsx



Golder Associates	Title: Mashel River Water Balance		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.005	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: June 2009	FIGURE 3-4

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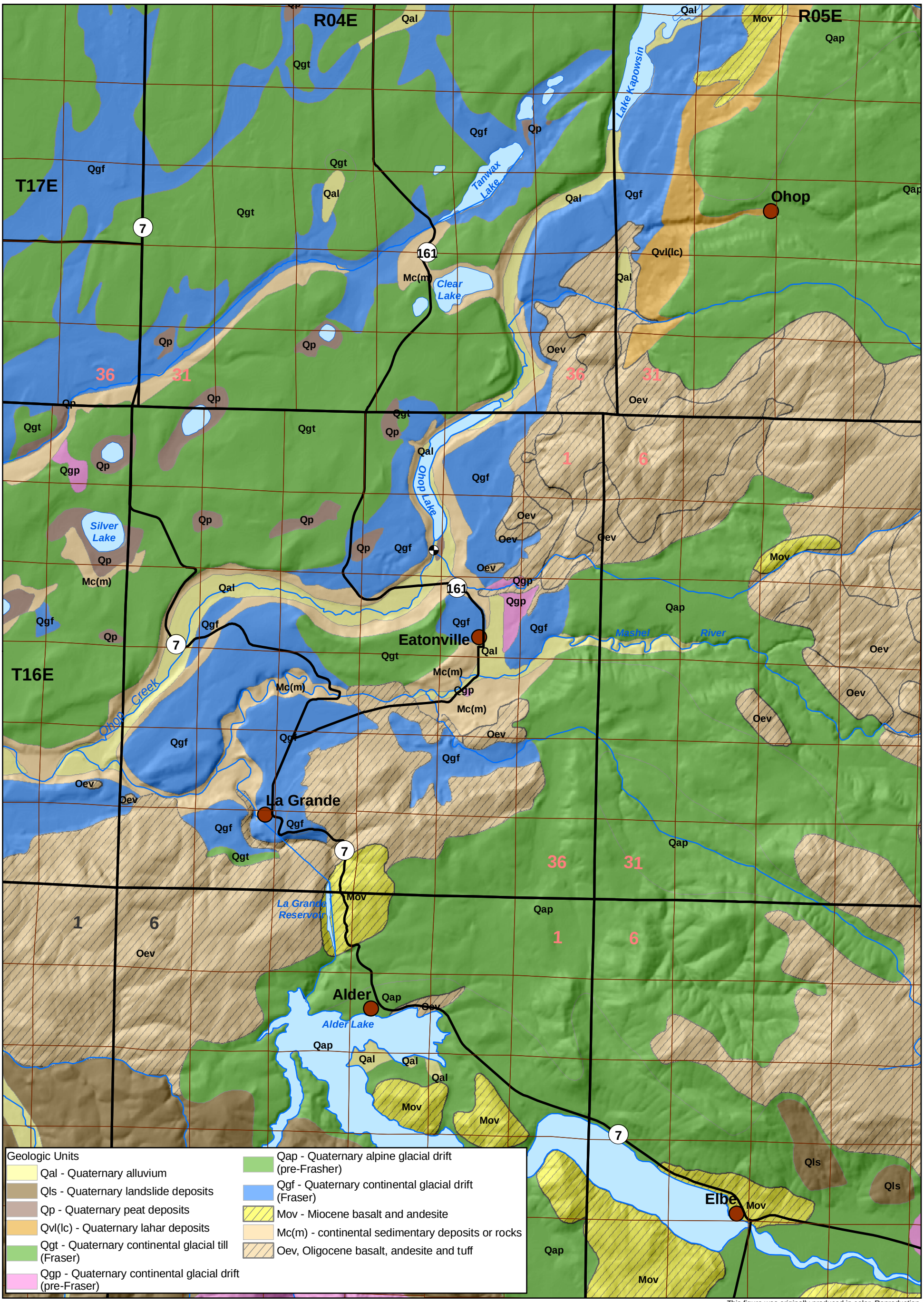

This figure was originally produced in color. Reproduction in black and white may result in a loss of information.

LEGEND

- USGS Ohop Creek Gauge
- Cities
- Roads
- Streams
- Waterbodies
- Township and Range
- 36 Sections

0 6000
Scale in Feet

Map Projection:
Washington State Plane
North Zone NAD 1983

N

Source: Washington State Department of Natural Resources, Washington State Department of Transportation

FIGURE **3-5**

SURFACE GEOLOGY MAP

EATONVILLE/STORAGE EVALUATION/WA

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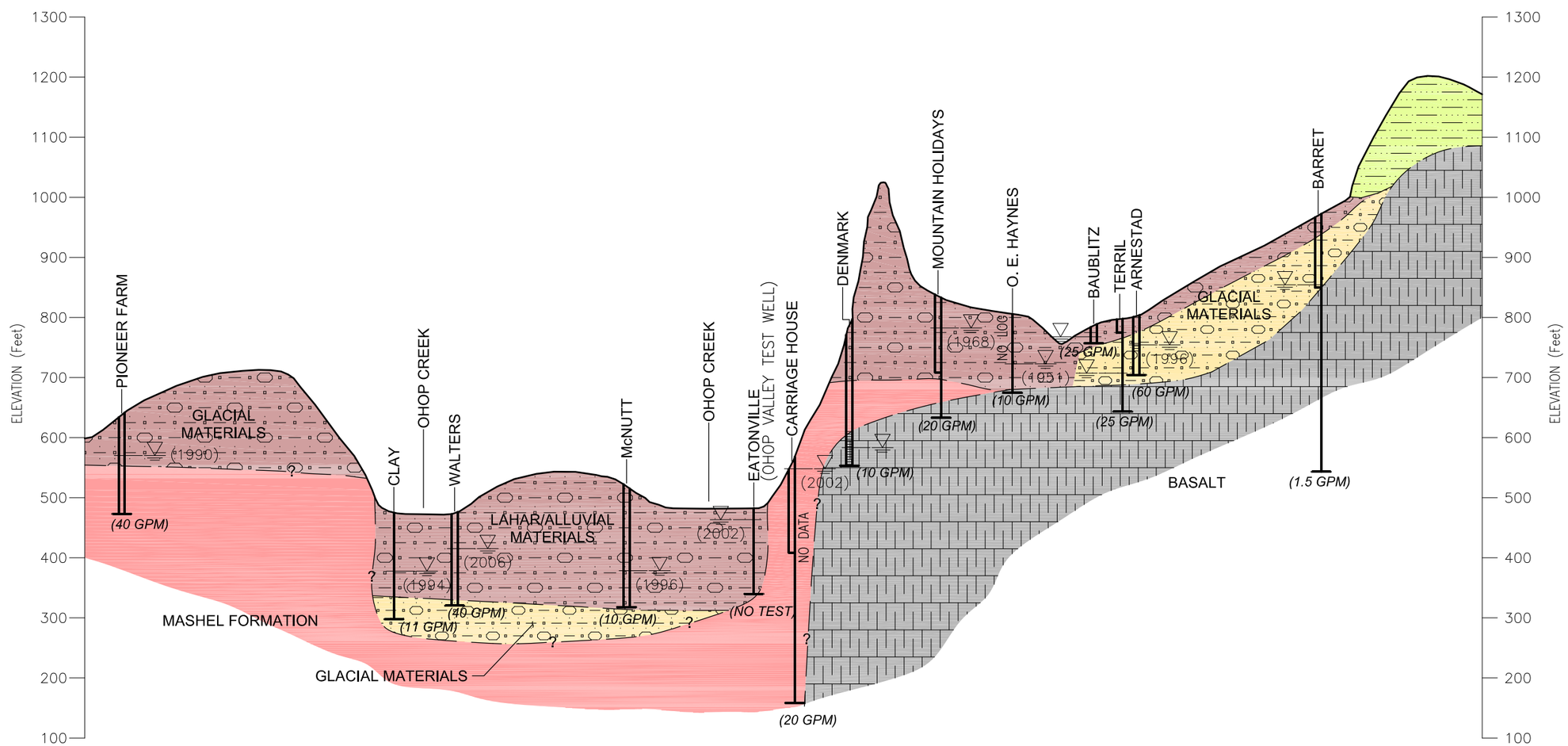
Golder Associates



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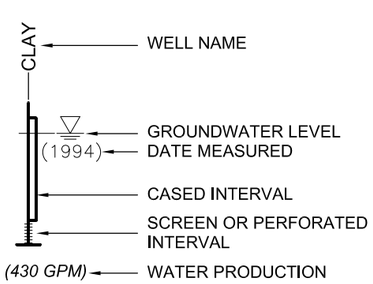

0 2000 4000

SCALE IN FEET

HORIZONTAL SCALE: 1"=2000'
VERTICAL SCALE: 1"=200'
VERTICAL EXAGGERATION 10X

GEOLOGIC LEGEND:

- SILTY CLAY
- SAND/GRAVEL
- SILTY SAND/GRAVEL
- MASHEL FORMATION
- BASALT

FIGURE **3-6**

REGIONAL GEOLOGIC CROSS SECTION A-A'

EATONVILLE|STORAGE EVALUATION|WA (US)

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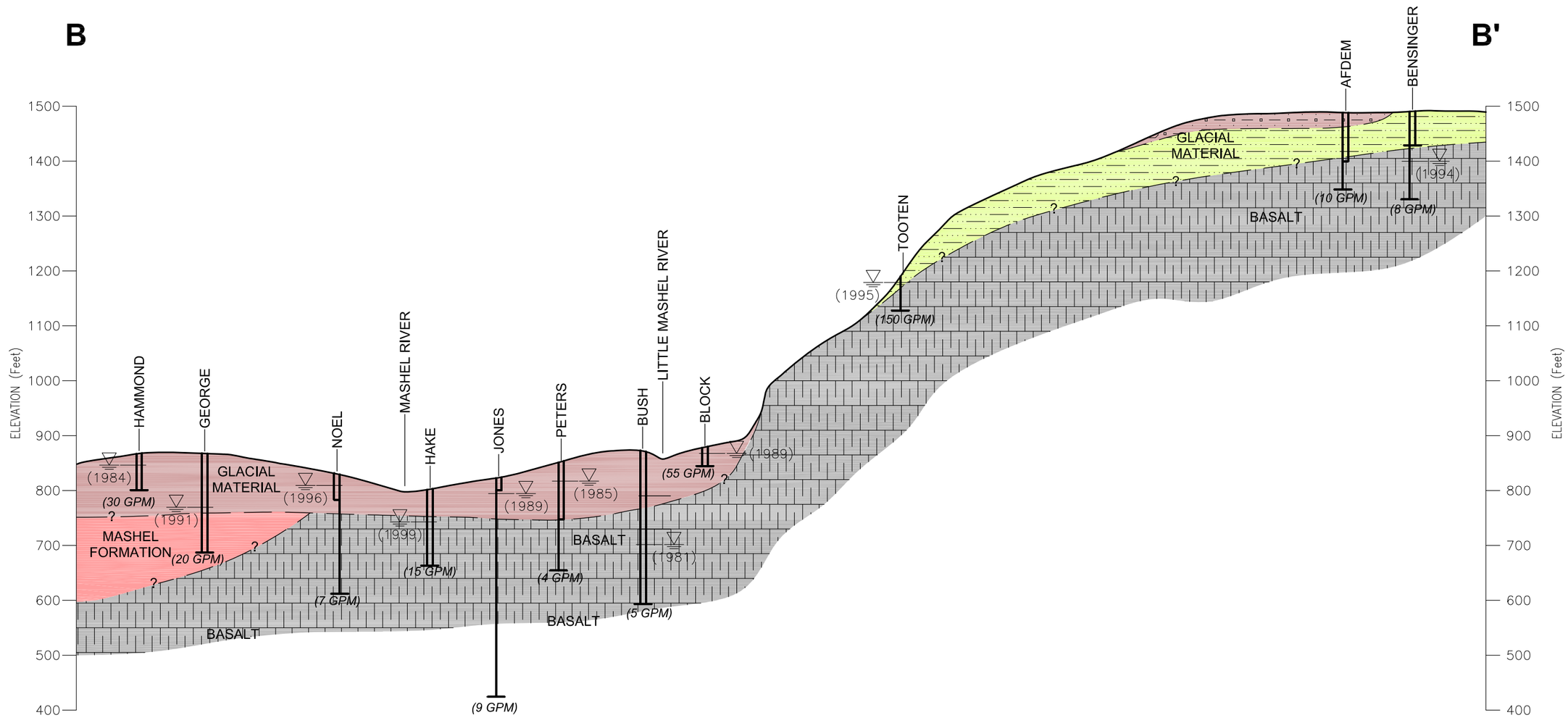
Golder Associates



LEGEND:

CLAY — WELL NAME

(1994) — GROUNDWATER LEVEL DATE MEASURED

CASED INTERVAL

SCREEN OR PERFORATED INTERVAL

(430 GPM) — WATER PRODUCTION

0 2000 4000

SCALE IN FEET

HORIZONTAL SCALE: 1"=2000'
VERTICAL SCALE: 1"=200'
VERTICAL EXAGGERATION 10X

GEOLOGIC LEGEND:

- SILTY CLAY
- SAND/GRAVEL
- SILTY SAND/GRAVEL
- MASHEL FORMATION
- BASALT

FIGURE **3-7**

REGIONAL GEOLOGIC CROSS SECTION B-B'

EATONVILLE|STORAGE EVALUATION|WA (US)

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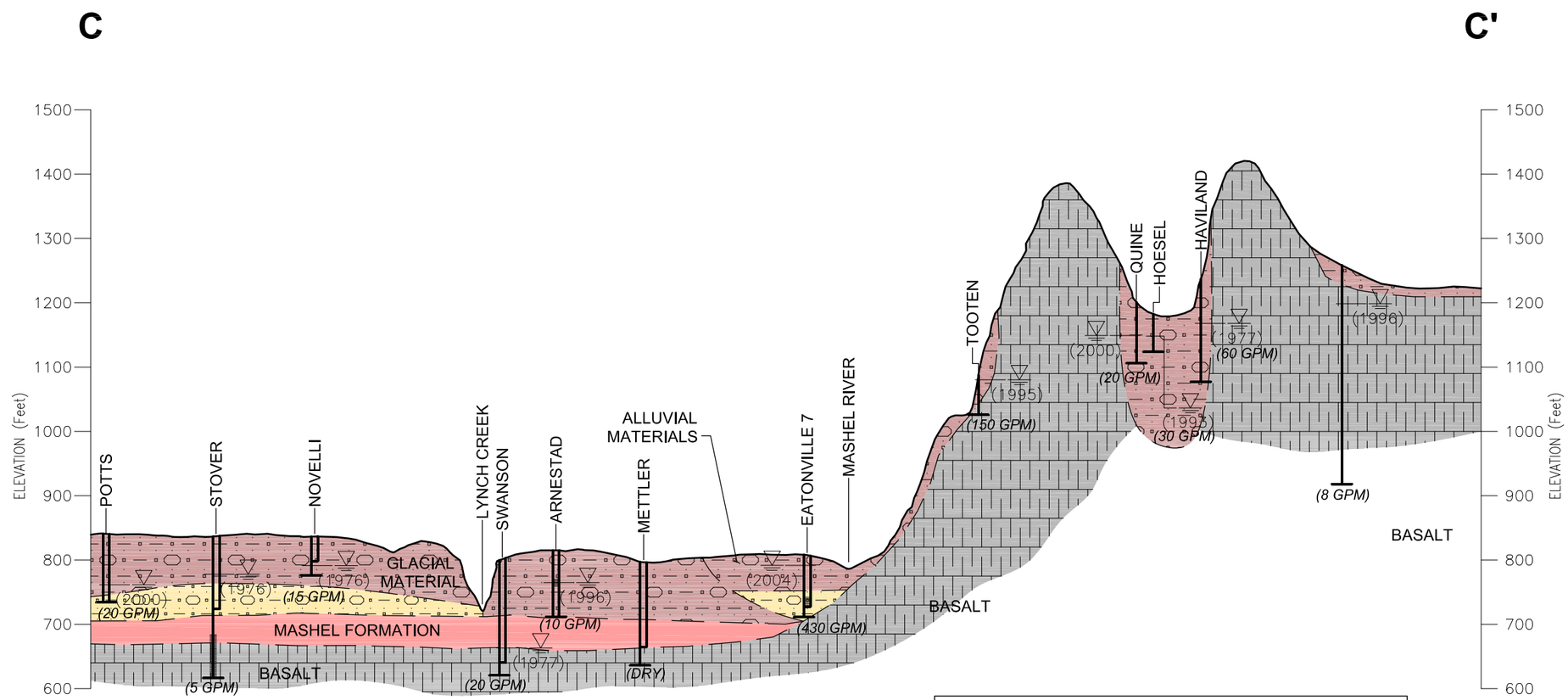
Golder Associates



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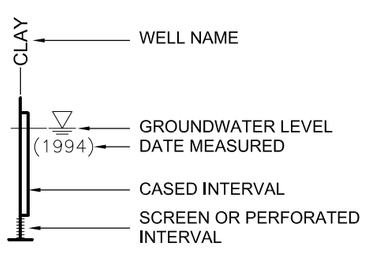

HORIZONTAL SCALE: 1"=2000'
VERTICAL SCALE: 1"=200'
VERTICAL EXAGGERATION 10X

GEOLOGIC LEGEND:

- SILTY CLAY
- SAND/GRAVEL
- SILTY SAND/GRAVEL
- MASHEL FORMATION
- BASALT

FIGURE **3-8**

REGIONAL GEOLOGIC CROSS SECTION C-C'

EATONVILLE|STORAGE EVALUATION|WA (US)

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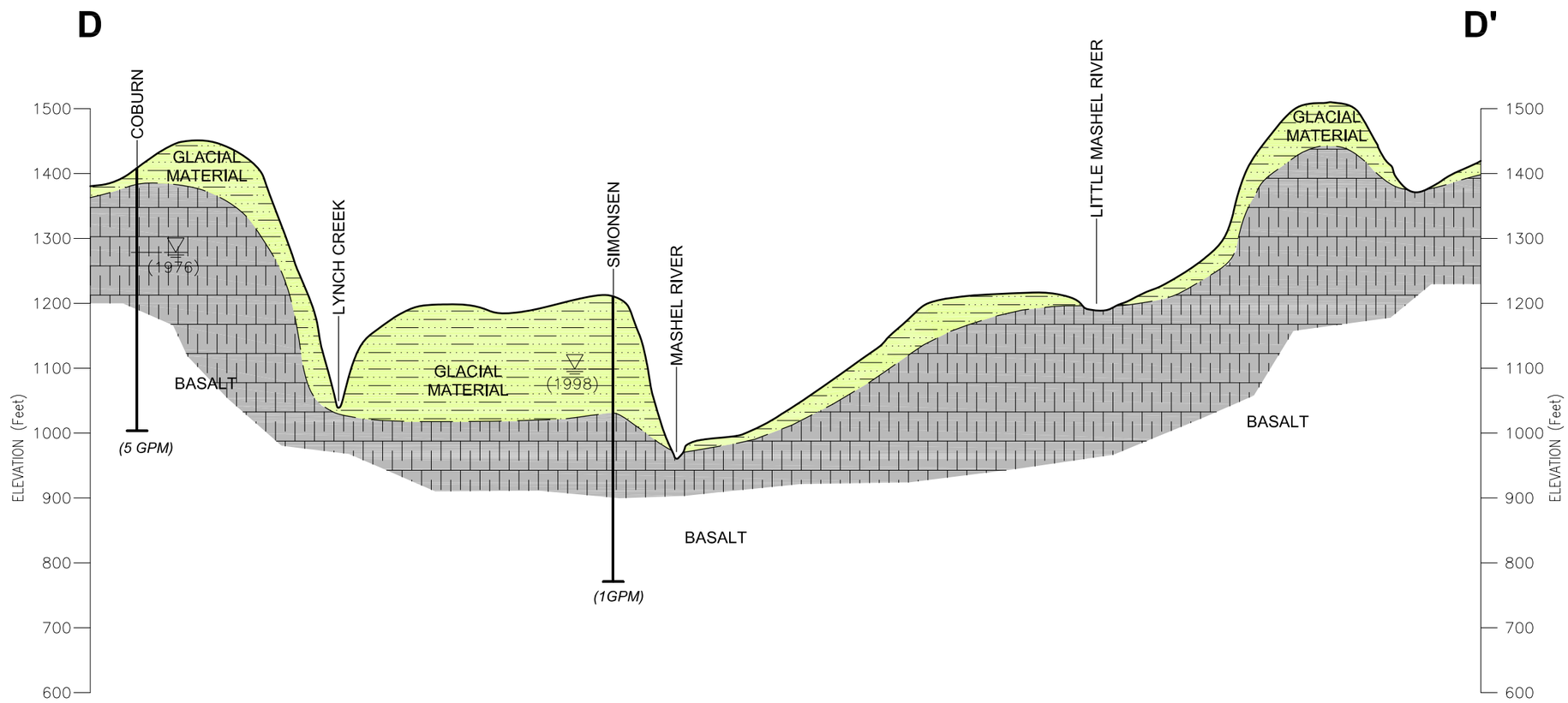
Golder Associates



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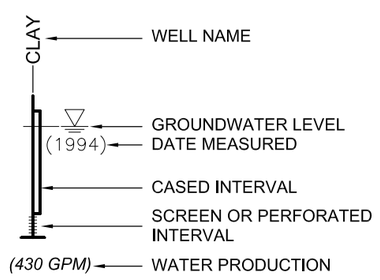


SCALE IN FEET

HORIZONTAL SCALE: 1"=2000'
VERTICAL SCALE: 1"=200'
VERTICAL EXAGGERATION 10X

GEOLOGIC LEGEND:

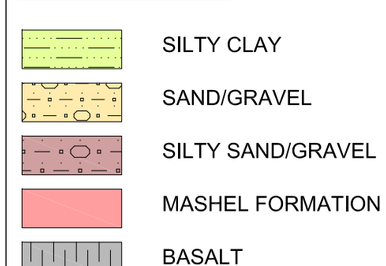
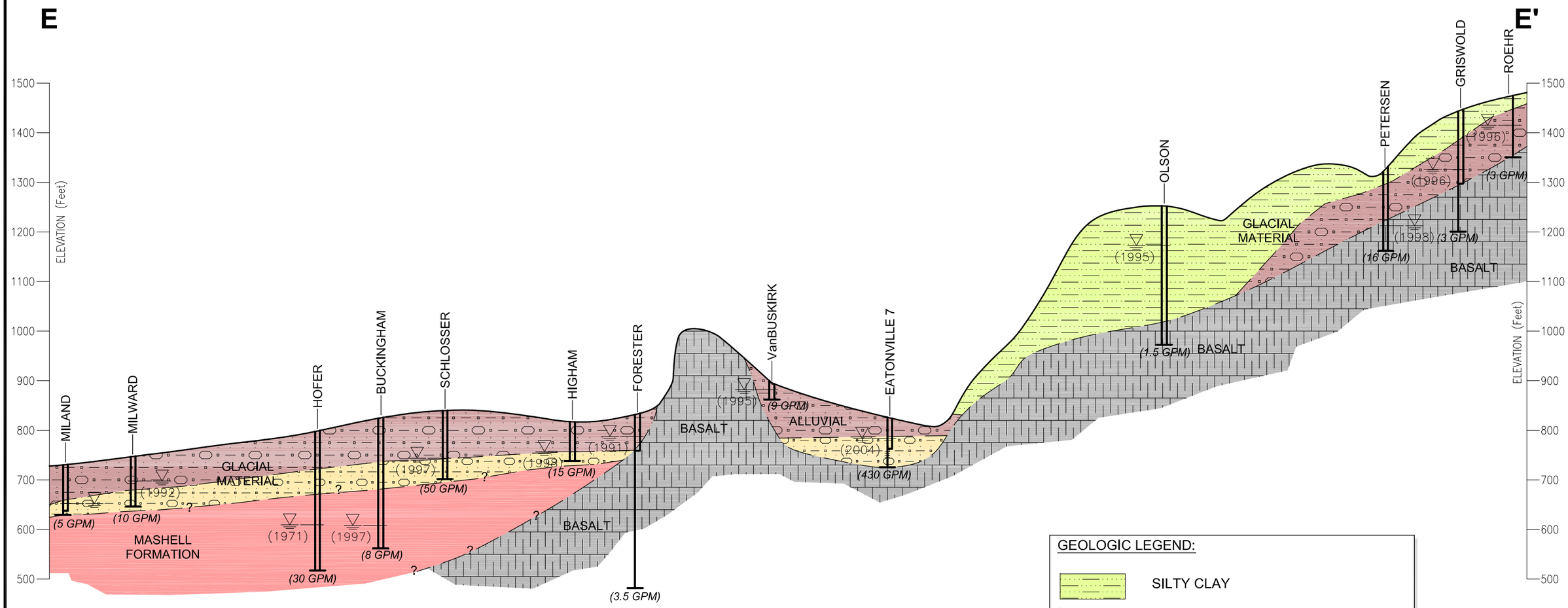


FIGURE **3-9**

REGIONAL GEOLOGIC CROSS SECTION D-D'

EATONVILLE|STORAGE EVALUATION|WA (US)

Golder Associates



LEGEND:

CLAY — WELL NAME

(1994) — GROUNDWATER LEVEL DATE MEASURED

CASED INTERVAL

SCREEN OR PERFORATED INTERVAL

(430 GPM) — WATER PRODUCTION

GEOLOGIC LEGEND:

- SILTY CLAY
- SAND/GRAVEL
- SILTY SAND/GRAVEL
- MASHEL FORMATION
- BASALT

0 2000 4000

SCALE IN FEET

HORIZONTAL SCALE: 1"=2000'
VERTICAL SCALE: 1"=200'
VERTICAL EXAGGERATION 10X

FIGURE **3-10**

REGIONAL GEOLOGIC CROSS SECTION E-E'

EATONVILLE|STORAGE EVALUATION|WA (US)

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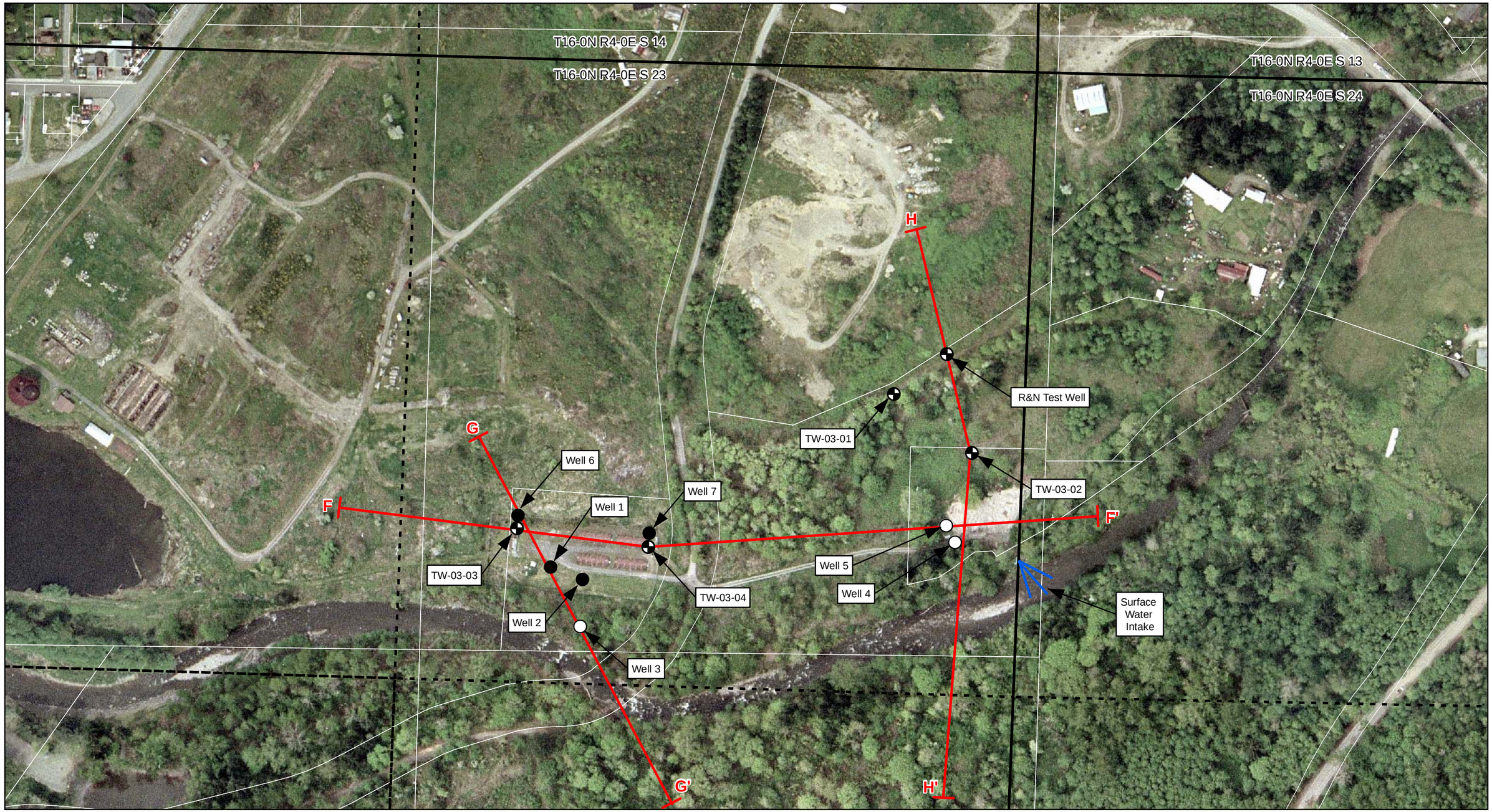
Golder Associates



This figure was originally produced in color. Reproduction in black and white may result in a loss of information.

LEGEND

- Production Wells (not in service)
- Test Wells
- Production Wells
- F—F' Cross Section Location
- Township Range Section
- PLSS Quarter Section
- Parcel Boundry

0 200
Scale in Feet

Map Projection:
Washington State Plane,
South Zone, NAD 83, Feet

Source: WSDOE, WSDOT

N

FIGURE **3-11**

TOWN OF EATONVILLE WELL FIELD AREA

EATONVILLE/ STORAGE ASSESMENT DEVELOPMENT/ WA

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Golder Associates

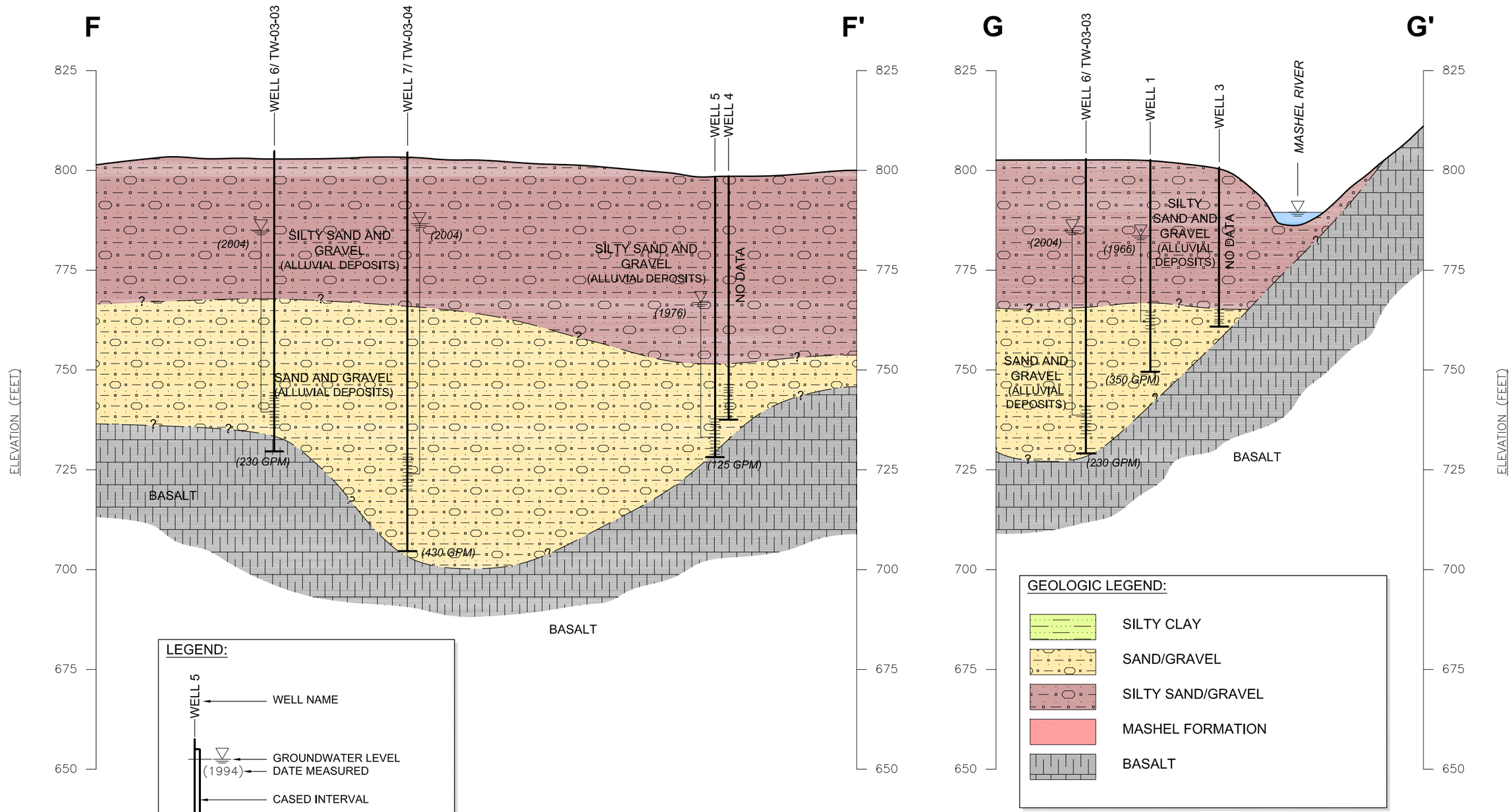

FIGURE **3-12**

LOCAL GEOLOGIC CROSS SECTIONS F-F' AND G-G'

EATONVILLE|STORAGE EVALUATION|WA (US)

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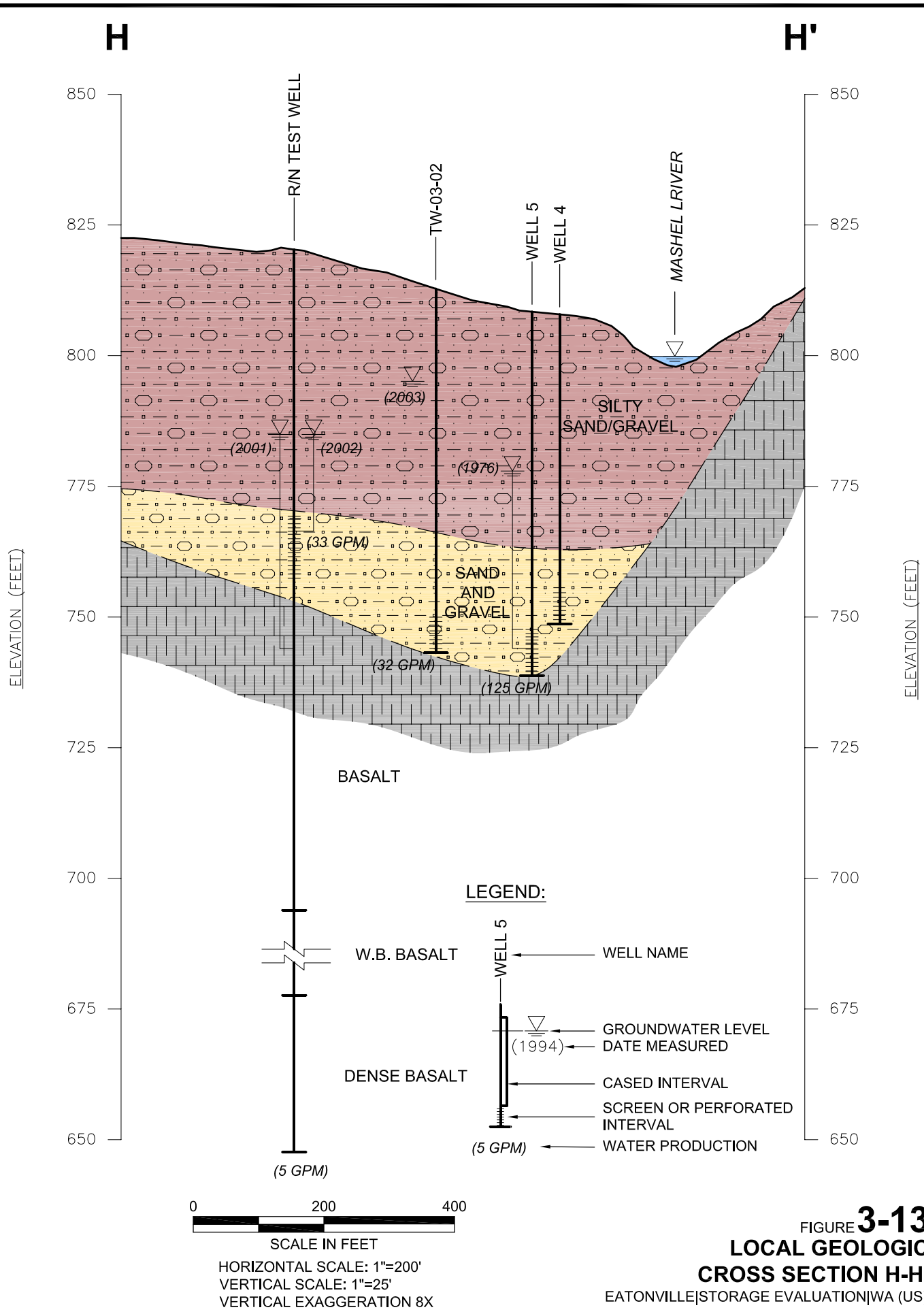
Golder Associates

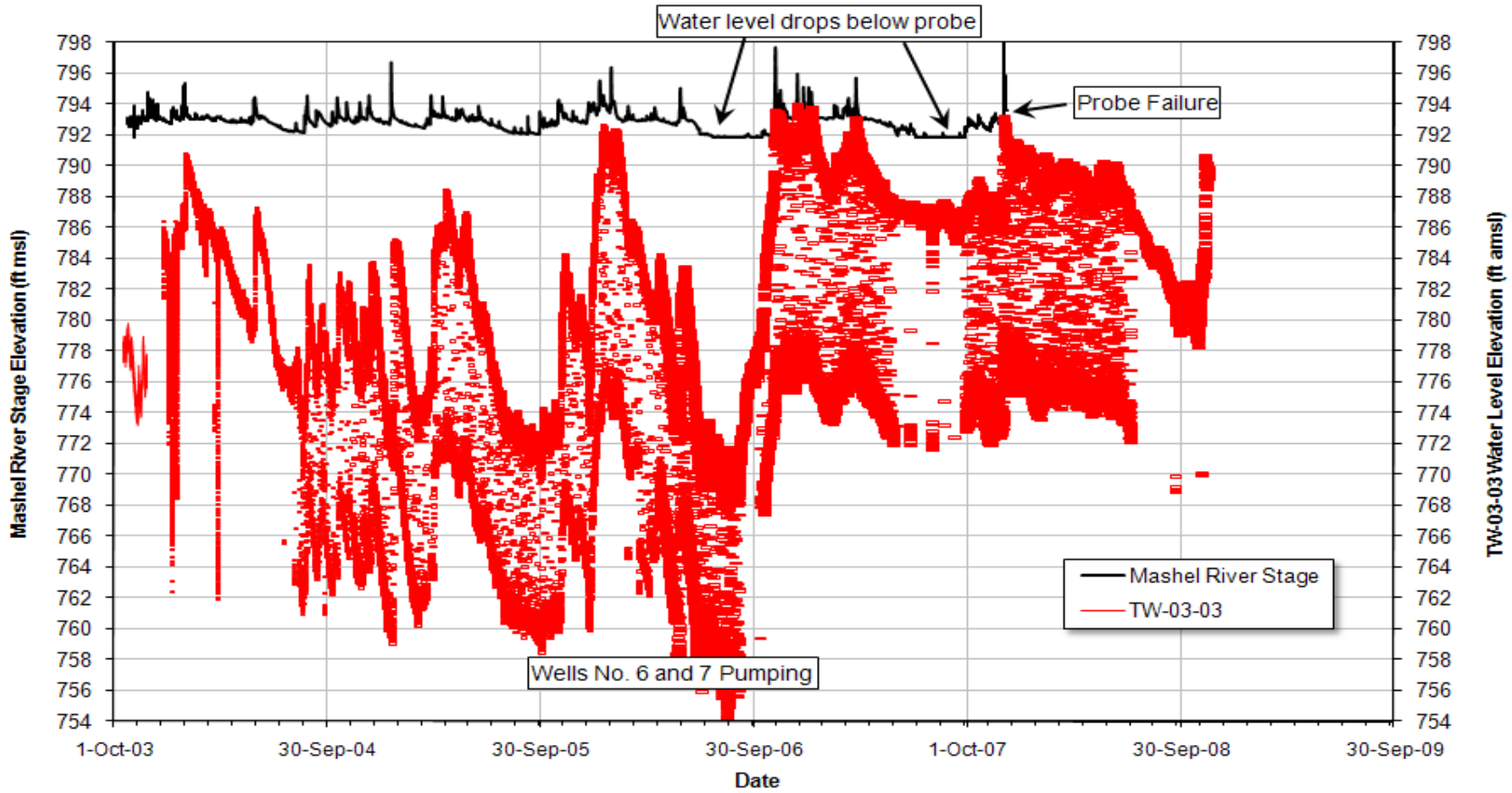


HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=25'
VERTICAL EXAGGERATION 8X

FIGURE **3-13**

LOCAL GEOLOGIC CROSS SECTION H-H'

EATONVILLE|STORAGE EVALUATION|WA (US)



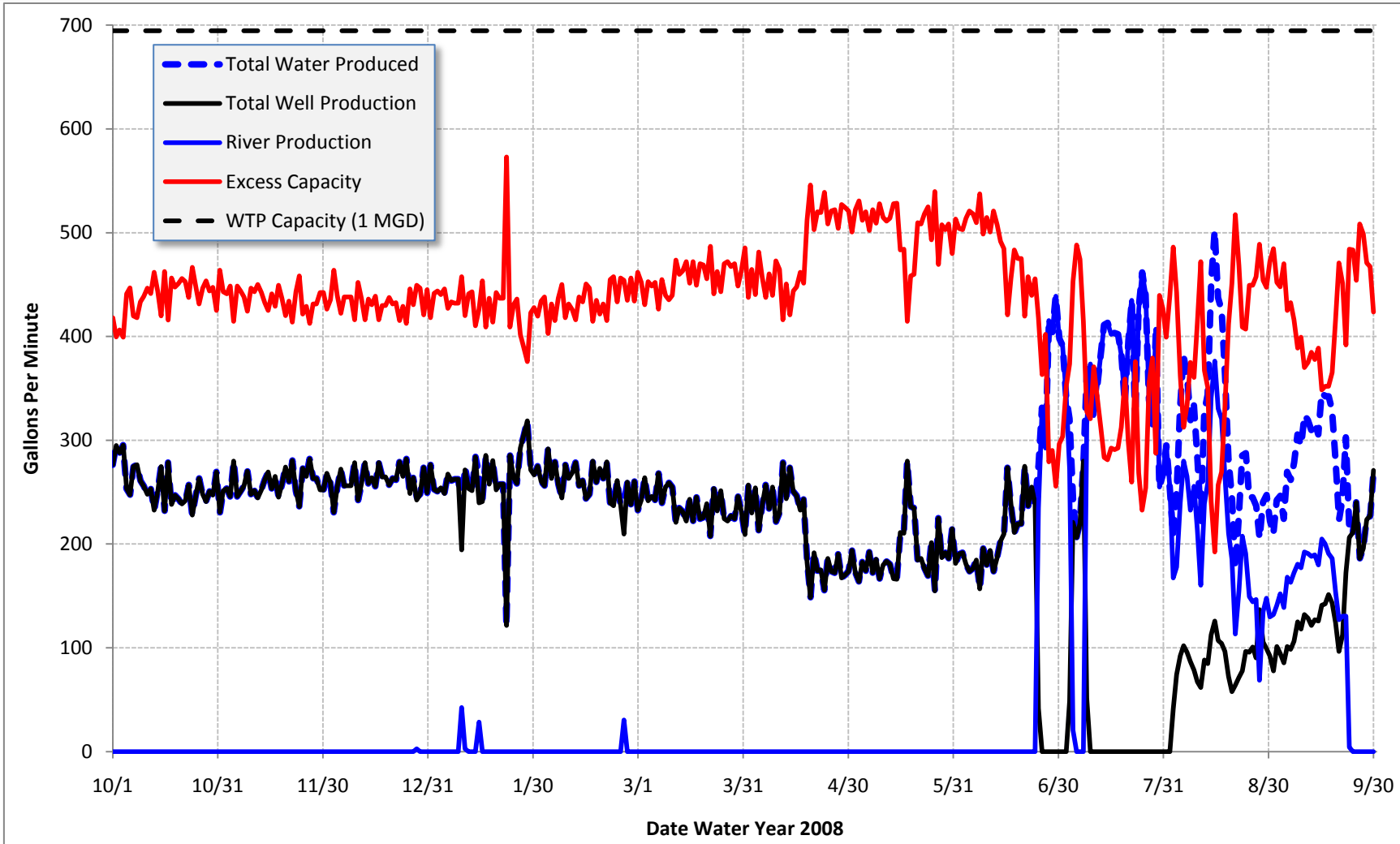
Golder Associates

TOWN OF EATONVILLE
GW WELLS

TITLE

Mashel River Stage and Groundwater Elevation in TW-03-03

DRAWN	TMW	DATE	Jun-09	JOB NO.	033-1531-001.103
CHECKED	MPK	SCALE	na	DWG. NO.	na
REVIEWED	DB	FILE NAME	Mashel River Gage.xls	FIGURE NO.	3-14



Golder Associates	Title: Town of Eatonville Water Year 2008 Water Production		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.005	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: June 2009	FIGURE 5-1

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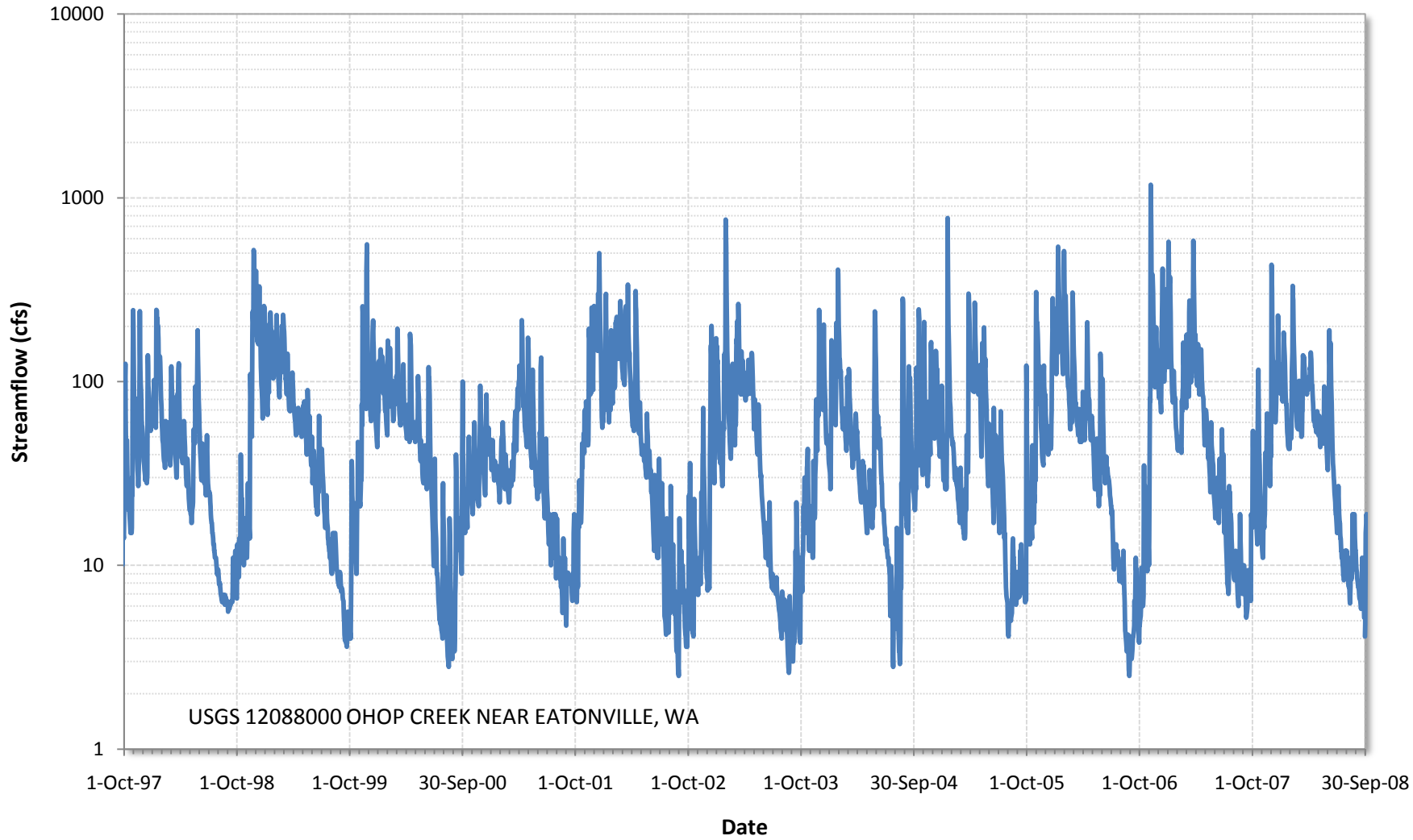
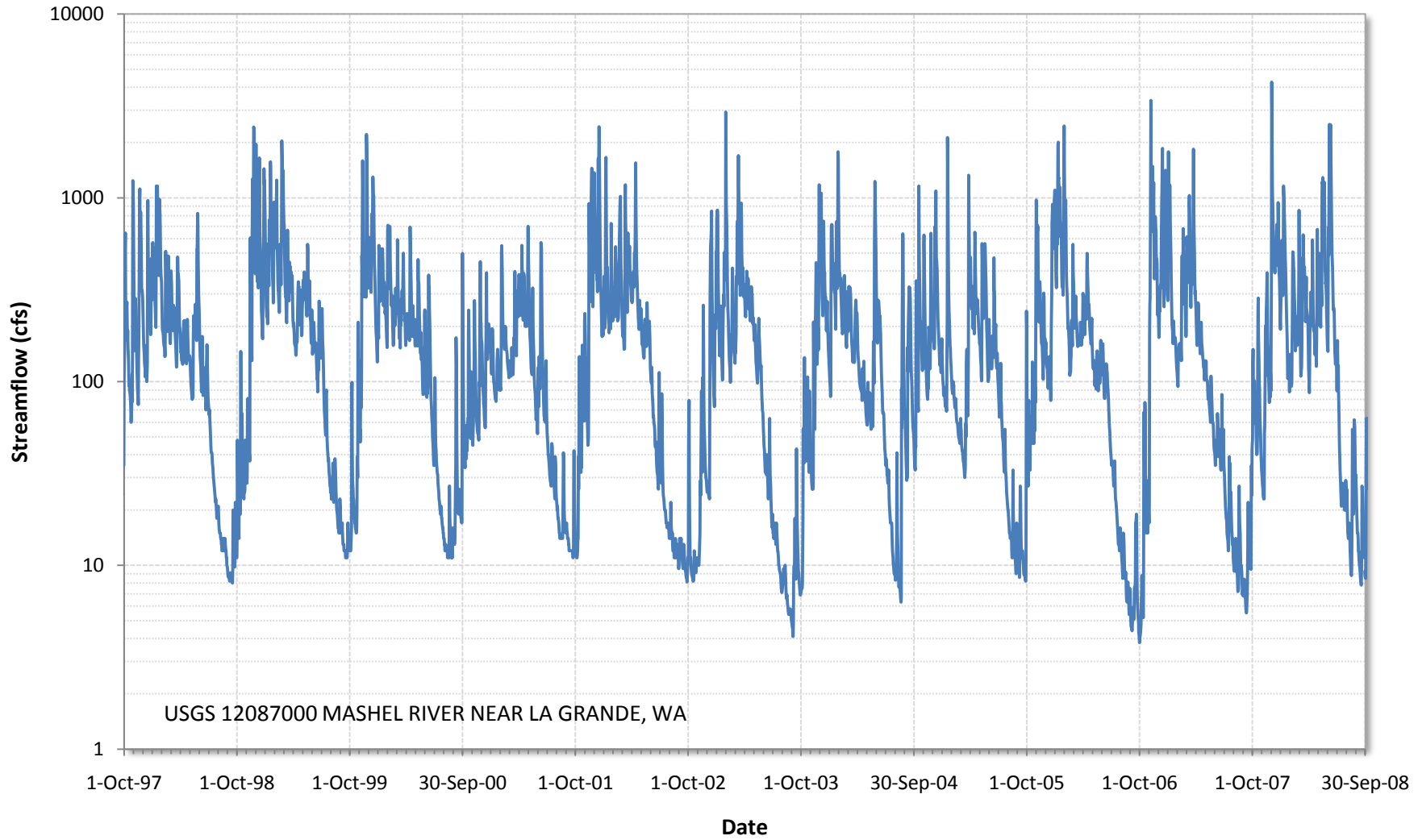
APPENDIX A

STREAMFLOW DATA



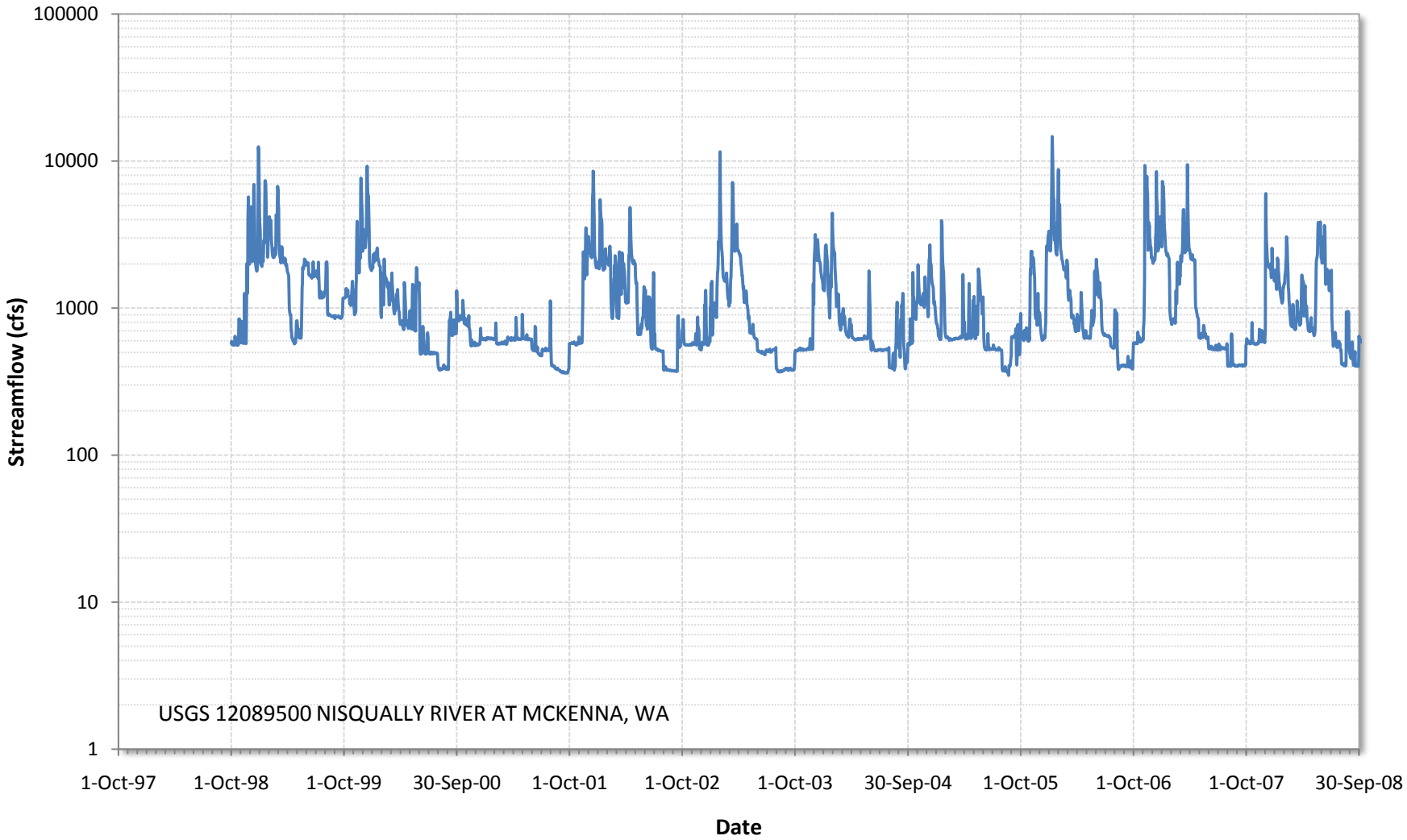
Golder Associates	Title: Ohop Creek Hydrograph (WY 1998-2008)		Drawn: MPK
			Checked: MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-005	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-1

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow



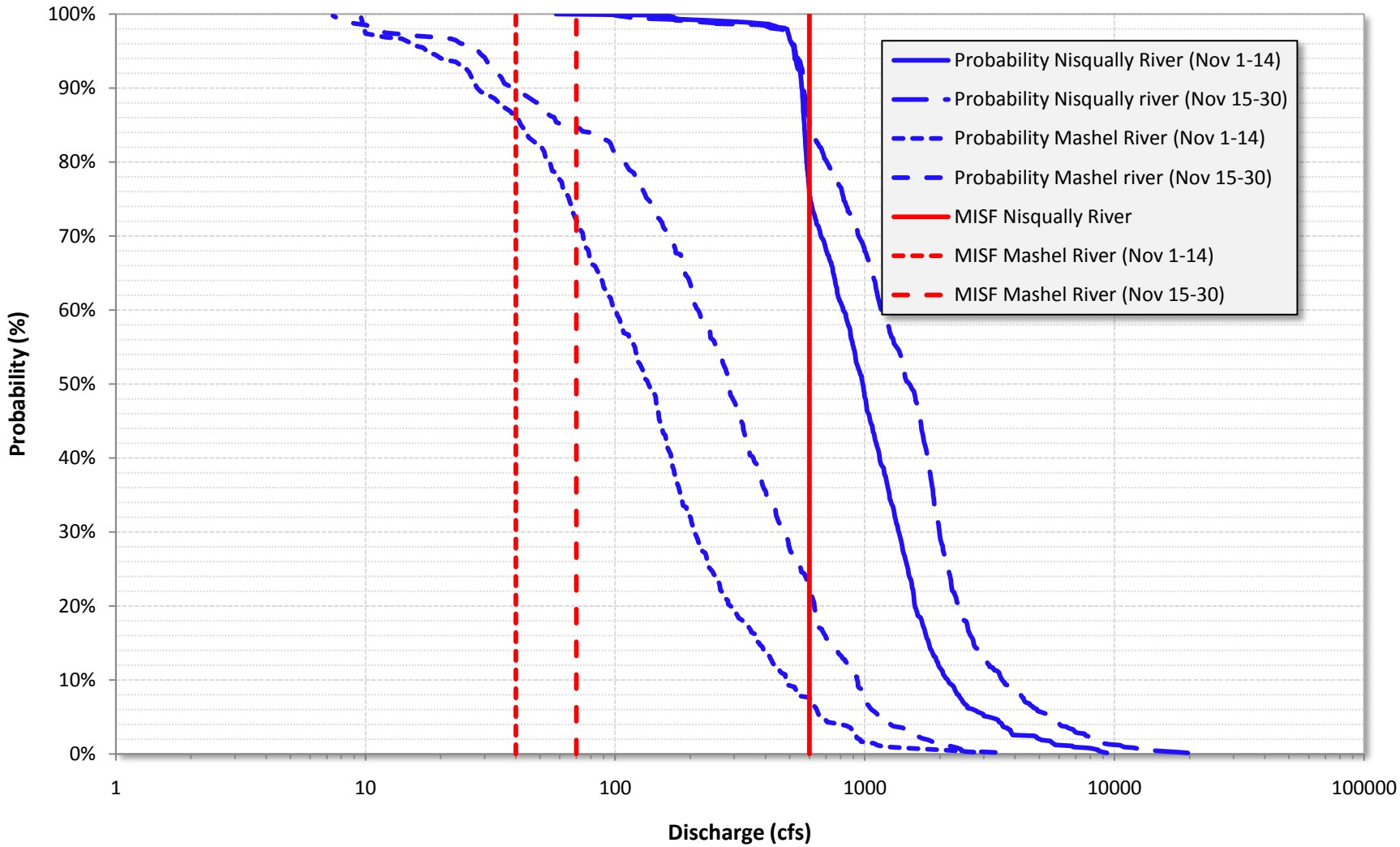
Golder Associates	Title: Mashel River Hydrograph (WY 1998-2008)		Drawn: MPK
			Checked: MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-005	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-2

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow



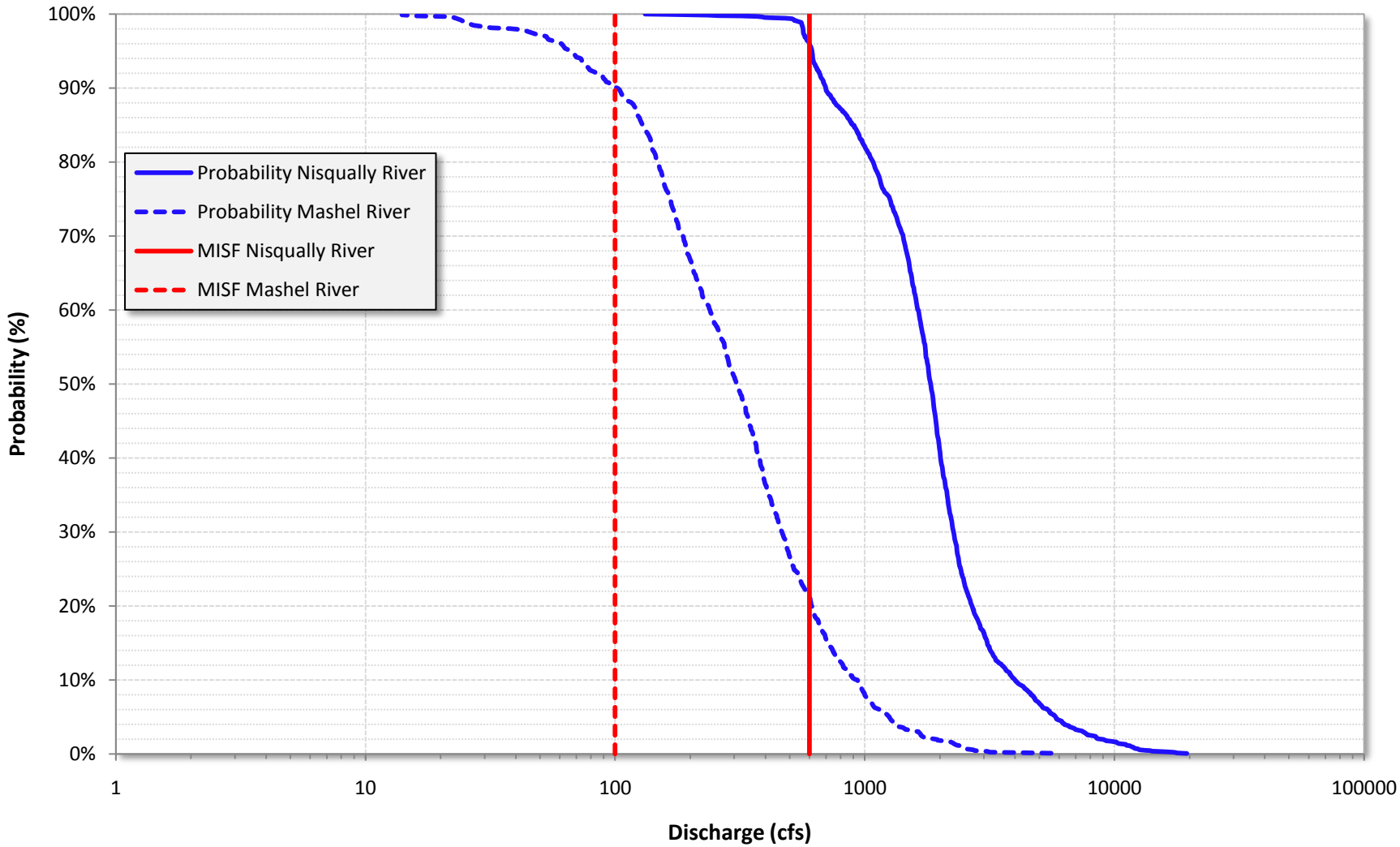
Golder Associates	Title: Nisqually River at McKenna (WY 1998-2008)		Drawn: MPK
			Checked: MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-3

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



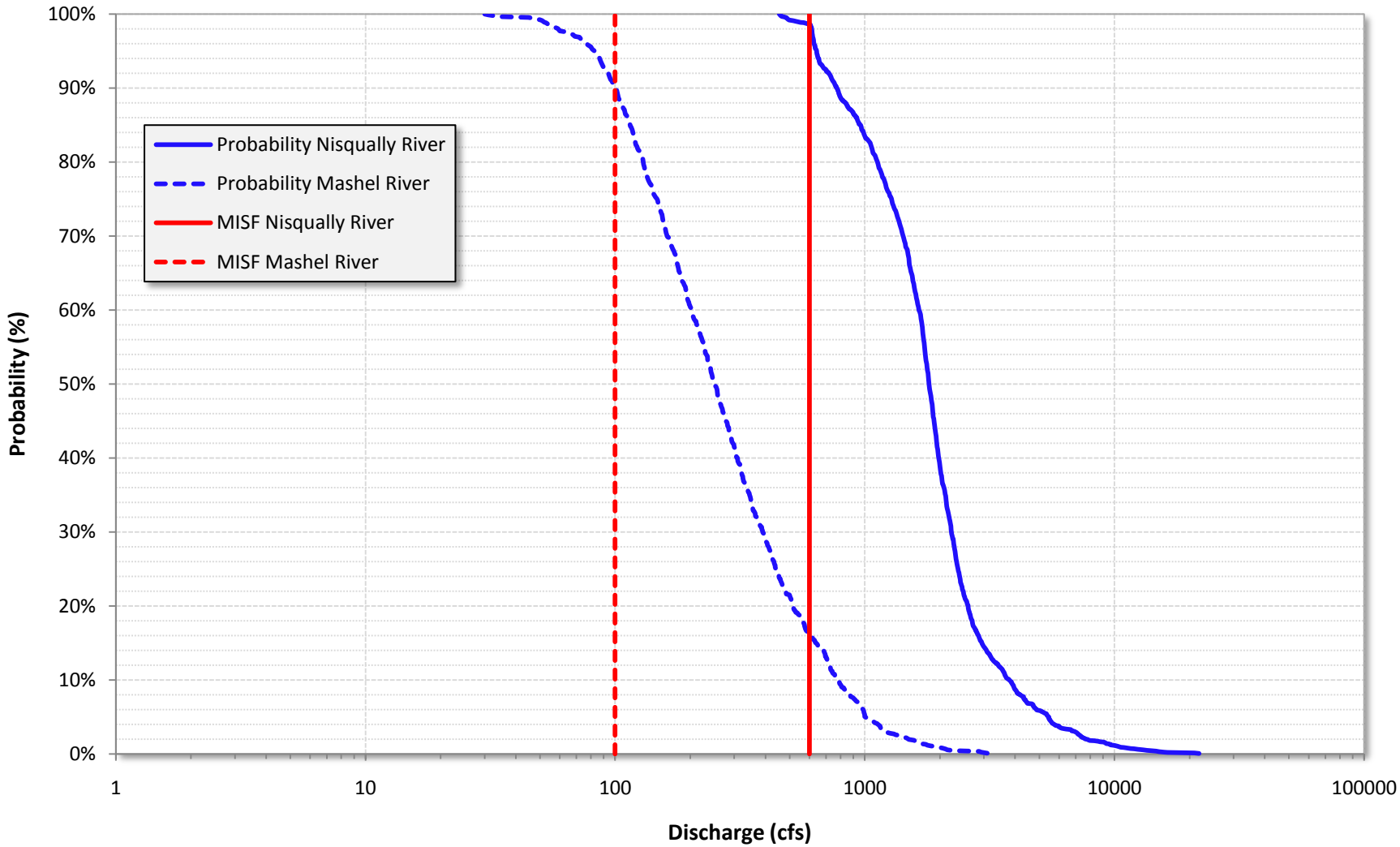
Golder Associates	Title: MISF Exceedance - November	Drawn	MPK
		Checked	MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-4

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



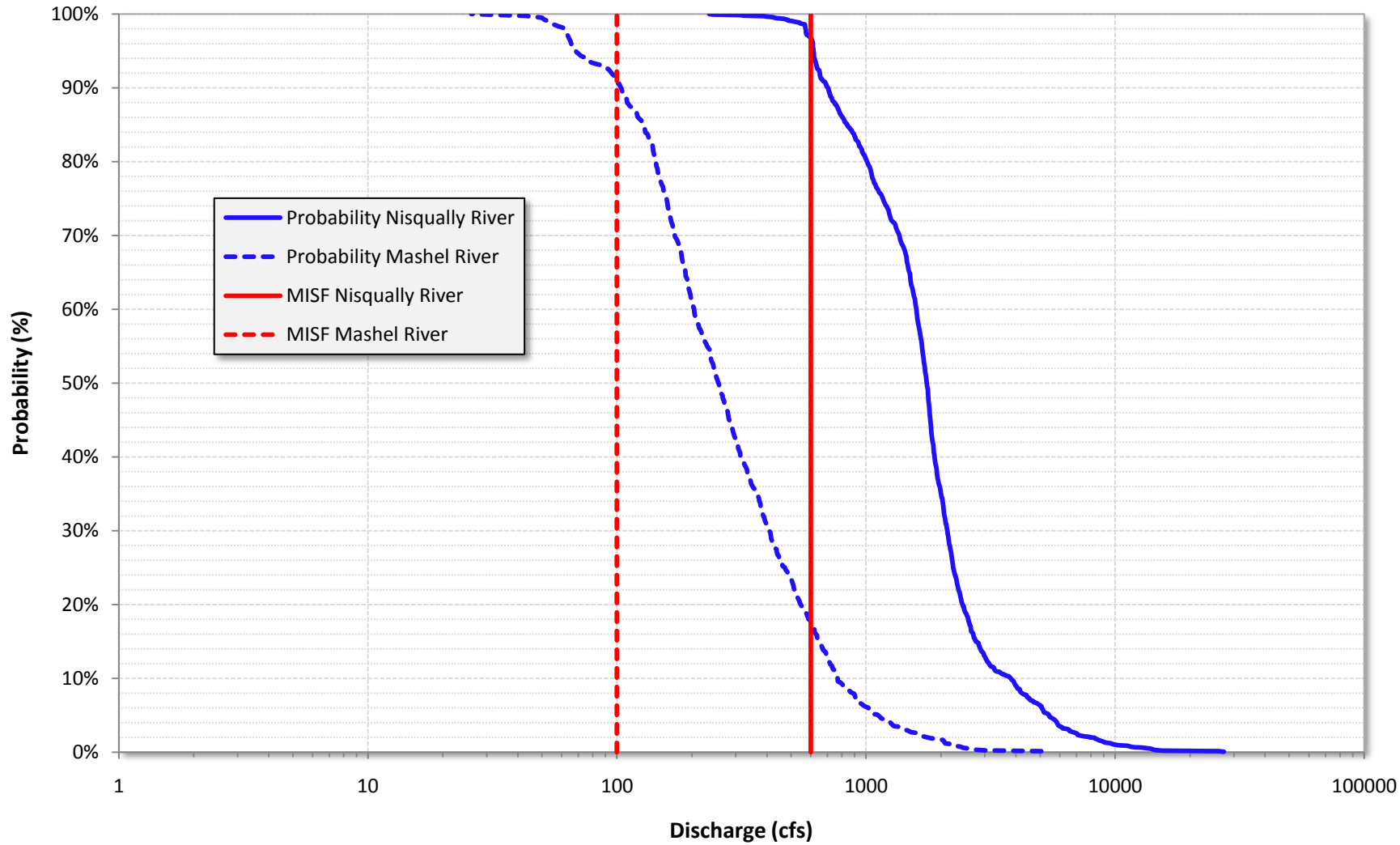
Golder Associates	Title: MISF Exceedance - December	Drawn	MPK
		Checked	MPK
	Project Name: WADOE/Eatonville Storage/WA — Project No.: 083-93607-500	Reviewed	DB
	Client Name: WADOE/Town of Eatonville — Date: March 2010	FIGURE	A-5

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



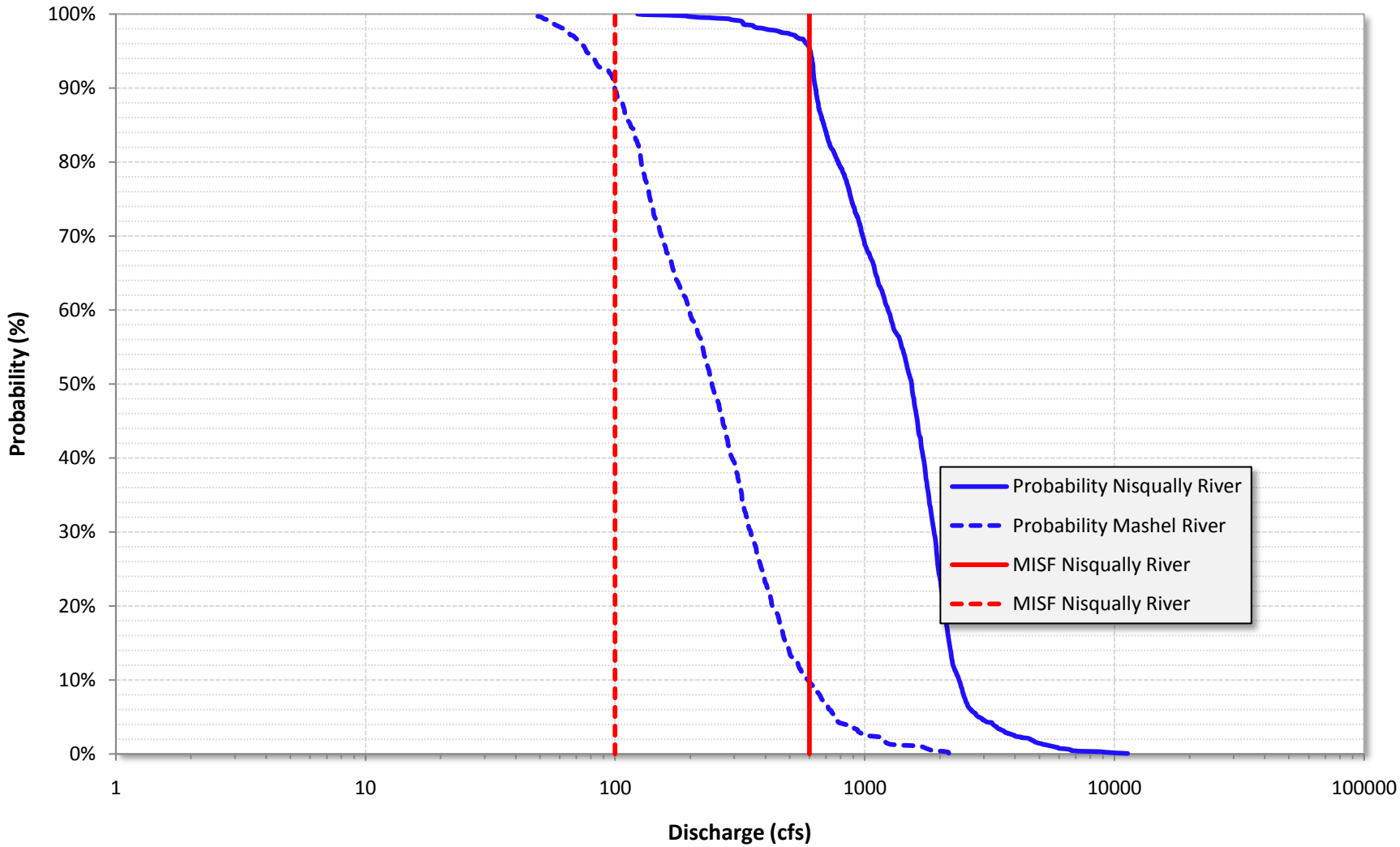
Golder Associates	Title: MISF Exceedance - January	Drawn	MPK
		Checked	MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed	DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-6

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



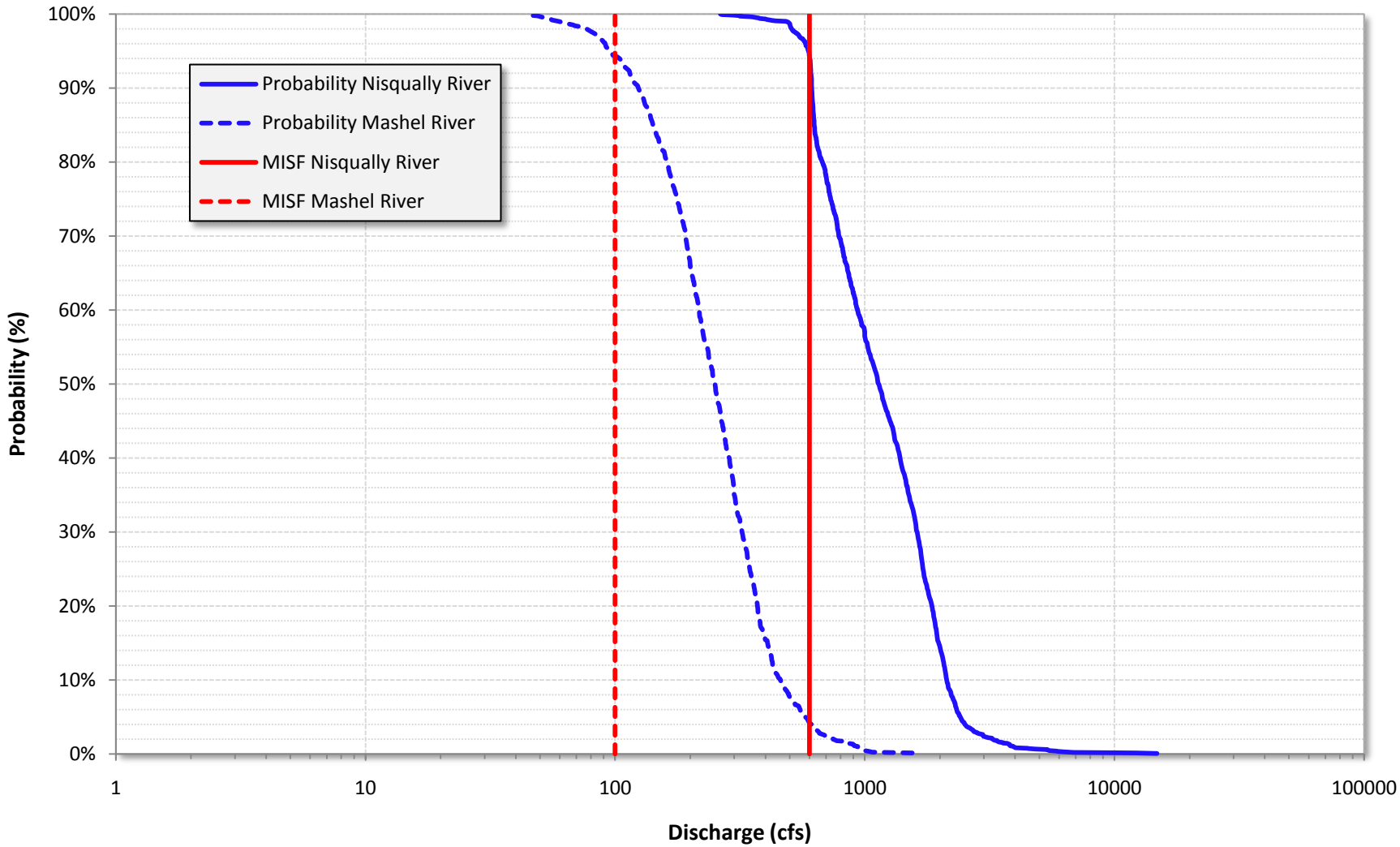
Golder Associates	Title: MISF Exceedance - February	Drawn	MPK
		Checked	MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-7

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



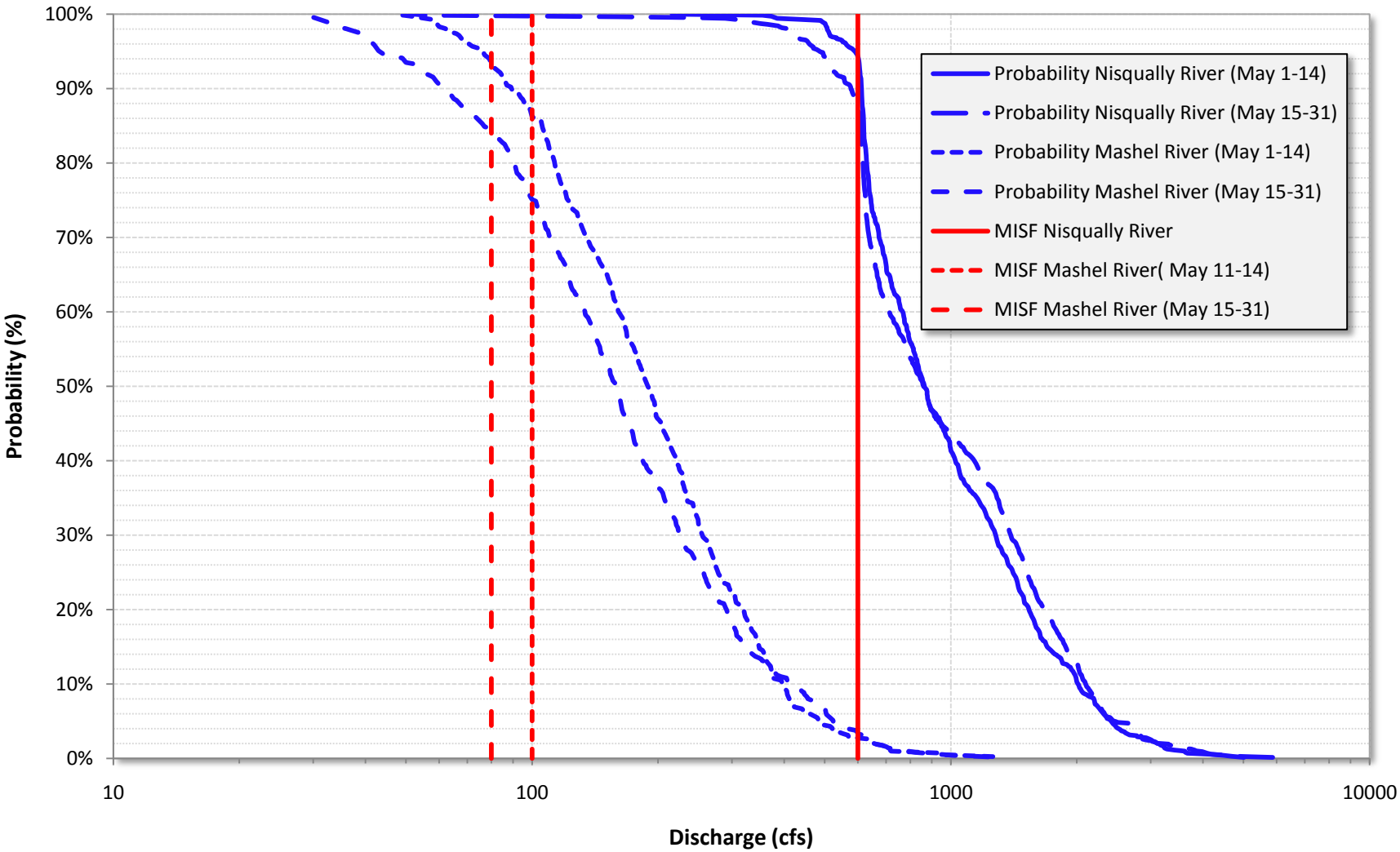
Golder Associates	Title: MISF Exceedance - March		Drawn: MPK
			Checked: MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-8

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



Golder Associates	Title: MISF Exceedance - April	Drawn	MPK
		Checked	MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-9

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually



Golder Associates	Title: MISF Exceedance - May		Drawn: MPK
			Checked: MPK
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607-500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 2010	FIGURE A-10

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix A Streamflow\USGS steamflow nisqually

APPENDIX B

WELL LOGS USED ON CROSS-SECTIONS

Section A-A'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.
The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 061030

Water Right Permit No. _____

(1) OWNER: Name PIONEER FARM Address 7716 OHOP VALLEY RD, EATONVILLE

(2) LOCATION OF WELL: County PIERCE ¼ ¼ Sec 16 T 17 N., R 3E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) SAME

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 158 feet. Depth of completed well 158 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from 0 ft. to 158 ft.
Welded [X] _____ " Diam. from _____ ft. to _____ ft.
Liner installed [ ]
Threaded [ ] _____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes [ ] No [X]
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [X]
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [X] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [X] No [ ] To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 68' ft. below top of well Date 2-26-90
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test 40 gal./min. with 21 ft. drawdown after 1 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
BROWN CLAY	0'	5'
BROWN CLAY & GRAVEL	5'	20'
SILTY BROWN SAND & GRAVEL	20'	34'
GRAY CLAY	34'	58'
BROWN CLAY & GRAVEL	58'	90'
SANDY GRAY CLAY-SOME PUMICE		
STONE WATER 2 GPM	90'	98'
GRAY/BLUE CLAY	98'	139'
GRAY SAND & GRAVEL-SOME PUMICE	139	158'
STONE		
WATER 40 GPM		

Work started 2/23/90 19. Completed 2/26 19 90

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME S-K PUMP & DRILLING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 32519 MT HWY, EATONVILLE, WA 98328

(Signed) Richard Braun (WELL DRILLER) License No. 1065

Contractor's Registration No. S-KPUMD*136N1 Date 8/21/90 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329-

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Bruner, Marian

From: Helen Gilbert [helentpd@rainierconnect.com]
Sent: Tuesday, March 07, 2006 2:10 PM
To: Bruner, Marian
Subject: 726413582.pdf
Attachments: 726413582.pdf

Hi Marian
I was wondering what if anything we should do when we find logs in the wrong area this one my dad did has the wrong legal on it the legal is sec 17 twn 16 range 4E
Thanks Helen

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 052153

Water Right Permit No. AAD 284

(1) OWNER: Name Ann Clay Address 9328 Ohop Valley Ext. Rd.

(2) LOCATION OF WELL: County Pierce SE ¼ NW ¼ Sec. 16 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 9328 Ohop Valley Ext. Rd. Eatonville

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 174 feet. Depth of completed well 171 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from Ø ft. to 171 ft.
Welded [X] " Diam. from ft. to ft.
Liner installed [ ] Threaded [ ] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 18' ft.
Material used in seal Quick Grout
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 96 ft. below top of well Date 9/23/94
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 11 gal./min. with stem set at 160 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	Ø	1
Silty Sand & Gravel Brown	1	25
Gravel Sand & Silt Gray Moist	25	35
Sand & Gravel Clean Wet 4 GPM @ 40'	35	40
Silt Gray Dry	40	48
Silty Clay Blu Gray	48	75
Gravel Silty Sand Brown	75	100
Gravel Sand w/ Silt Gray Wet 5 GPM @ 100'	100	110
Silty Sand & Gravel Gray Dry	110	160
Gravel & Sand 11 GPM @ 160'	160	171

RECEIVED '94 SEP 29 P3:51 DEPARTMENT OF ECOLOGY SW REGIONAL OFFICE

Work started 9/22, 19. Completed 9/23, 19 94

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Tacoma Pump & Drilling Co., Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 30316 Mt. Hwy Graham

(Signed) [signature] (WELL DRILLER) License No. 1964

Contractor's Registration No. TACOMPD203PF Date Sept. 23, 1994

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1929- 3

FILE: ORIG. & FIRST COPY - DEPT. OF ECOLOGY
SECOND COPY - OWNER; THIRD COPY - DRILLER

WATER WELL REPORT
STATE OF WASHINGTON

START CARD NO. W223091
UNIQUE WELL ID APB833
WATER RIGHT PERMIT NO.

208844

(1) OWNER NAME: DUANE WALTERS ADDRESS: 9910 OHOP VALLEY EXT. RD. E. EATONVILLE WA. 98328
(2) LOCATION OF WELL : County PIERCE SW 1/4 NE 1/4 SEC 16 TWP 16N R 4E
(2a) STREET ADDRESS OF WELL (or nearest address): 9300 OHOP VALLEY EXT RD. E EATONVILLE

(3) PROPOSED USE: DOMESTIC
(4) TYPE OF WORK: NEW WELL
METHOD: ROTARY

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 150 feet. Depth of completed well 148'10" ft.

(6) CONSTRUCTION DETAILS
Casing instld: 6 " Diam. From +1 ft. to 148'10" ft.
Welded ☑ " Diam. From ft. to ft.
Liner ☐ " Diam. From ft. to ft.
Threaded ☐

Perforations: Yes ☐ No ☑
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes ☐ No ☑
Manufacturer's Name:
Type Model No.
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed Yes ☐ No ☑ Size of gravel?
Gravel packed from ft. to ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE CHIPS
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of Strata ft.
Method of sealling strata off

(7) PUMP: Manufacturer's Name
Type H. P.

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 52 below top of well Date 04/25/06
Artesian pressure lbs. Per sq. in. Date
Artesian pressure is controlled by

(10) WELL LOG OR DECOMMISSIONING PROCEDURE DESCRIPTION

MATERIAL	FROM	TO
BROWN CLAY	0	9
GREY CLAY	9	13
REDDISH BROWN CLAY	13	16
BROWN SAND, GRAVELS, COBBLES	16	35
BROWN CLAY	35	38
BROWN SILTY SAND, GRAVELS	38	54
BOULDER	54	56
BROWN SILTY SAND, GRAVELS	56	57
GREY SILTY CLAY, SAND, GRAVELS, COBBLES	57	114
GREY SAND, GRAVELS, COBBLES	114	130
GREY SAND, GRVAELS, COBBLES	130	150

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NOV 15 2006
Washington State
Department of Ecology

(9) WELL TESTS: Pump test made? By Whom
Yield gal./min with ft. drawdown after hrs.
Yield gal./min with ft. drawdown after hrs.
Yield gal./min with ft. drawdown after hrs.
Recovery data:
Time Wtr Lvl. Time Wtr Lvl. Time Wtr Lvl.

Date of test:
Bailer test gal./min with ft. drawdown after hrs.
Airtest 40 gal/min stem set at 142 ft. for 1 hrs.
Artesion flow gal/min Date
Temperature of water Was chemical analysis made? NO

Work Started 04/24/06 Completed: 04/25/06

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Name: RICHARDSON WELL DRILLING COMPANY INC.
Address: P. O. BOX 44427 TACOMA, WA 98444
(Signed) (Well Driller) Lic No. 2246
Contractor's Registration No. RICHAW*3210B DATE 5/4/06

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Start Card No. W060656

UNIQUE WELL I.D. # ABF 493

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name Larry McNutt Address 40618 417 th St E Eatonville

(2) LOCATION OF WELL: County Pierce SW 1/4 NW 1/4 Sec 15 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 10407 418th St E

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 196 feet. Depth of completed well 196 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: Welded [X] Liner installed [ ] Threaded [ ]
8" Diam. from 41½ ft. to 196 ft.
Diam. from _____ ft. to _____ ft.
Diam. from _____ ft. to _____ ft.

Perforations: Yes [ ] No [X]
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [X]
Manufacturer's Name _____ Model No. _____
Type _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [X] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Quick Grout
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 135 ft. below top of well Date 8/7
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test 7 gal./min. with 10 ft. drawdown after 1 hrs.
Airtest 10 gal./min. with stem set at 180 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Yellow-brown clay	0	8
Grey Clay	8	53
Brown silty Sandy Gravel + Cobble	53	68
Black-Brown Silt	68	73
Brown Silty Gravel + cobbles	73	98
Grey Silty Gravels	98	156
Grey silty Gravel Hump	156	176
Grey silty Gravel, wet	176	196

Work Started 8/1 19. Completed 8/7/96 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Gedbor Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 9415 52 Ave E Puyallup WA 98371

(Signed) [signature] (WELL DRILLER) License No. 1733

Contractor's Registration No. GEDBOI 211707 Date 8/9/96 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECL 050-1-20 (2/93) * * 1

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT

Original & 1st copy Ecology, 2nd copy owner, 3rd copy driller

Construction/Decommission ("x" in circle)
(X) Construction
( ) Decommission ORIGINAL CONSTRUCTION Notice of Intent Number 115577

CURRENT Notice of Intent No. W 155903

Unique Ecology Well ID Tag No. AEC 927

Water Right Permit No 56716-A / G2-01087C

Property Owner Name Town of Eatonville

Well Street Address

City Eatonville County Pierce

Location SW 1/4-1/4 NE 1/4 Sec 15 Twn 16N R 4E EWM or WWM (circle one)

Lat/Long (s,t,r still REQUIRED) Lat Deg 46 Lat Min/Sec 52
Long Deg 122 Long Min/Sec 17

Tax Parcel No 041 61 51 040

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☒ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)
☒ New Well ☐ Reconditioned Method ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☒ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches drilled 140 ft
Depth of completed well N/A ft

CONSTRUCTION DETAILS
Casing Installed: ☒ Welded 12" Diam. from 0 ft to 122 ft
☐ Liner installed ____" Diam. from ____ ft to ____ ft
☐ Threaded ____" Diam. from ____ ft to ____ ft

Perforations: ☐ Yes ☒ No
Type of perforator used
SIZE of perfs ____ in by ____ in. and no of perfs ____ from ____ ft to ____ ft

Screens: ☐ Yes ☒ No ☐ K-Pac Location
Manufacturer's Name
Type Model No
Diam Slot Size from ft to ft
Diam Slot Size from ft to ft

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand
Materials placed from ft to ft

Surface Seal: ☒ Yes ☐ No To what depth? 20 ft
Materials used in seal Bentonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

PUMP: Manufacturer's Name N/A
Type HP

WATER LEVELS: Land-surface elevation above mean sea level 580 ft
Static level 16 ft below top of well Date
Artesian pressure lbs per square inch Date
Artesian water is controlled by (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield gal./min. with ft drawdown after hrs
Yield gal./min. with ft drawdown after hrs
Yield gal./min. with ft drawdown after hrs
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min with ft drawdown after hrs
Airtest gal./min with stem set at ft for hrs
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Silty Sand & Gravel	0	10
Silty Sand & Gravel some clay	10	30
Clayey silty Sand	30	40
Grey Clay	40	45
Grey silty Sand & Gravel	45	60
grey silt & sand some clay	60	70
Silt clay sand & Gravel Boulders	70	105
Silty Clayey Sand & Gravel some Boulders	105	125
Brown clay & Boulders some gravel	125	140

RECEIVED
MAY 21 2002
Washington State Department of Ecology

Start Date 1/30/02 Completed Date 3/25/02

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) DAVE CHARON
Driller/Engineer/Trainee Signature Dave Charon
Driller or Trainee License No 1190
If trainee, licensed driller's Signature and License no.

Drilling Company Charon Drilling Co.
Address 12719-224 St. East
City State, Zip Graham, WA 98338
Contractor's Registration No. CHARODI 1320JF Date 5/10/02

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 4/01)

File Original and First Copy with Department of Ecology
Second Copy Owner's Copy
Third Copy Driller's copy

WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent W161776
UNIQUE WELL I D # AEC927
Water Right Permit No

117443

(1) OWNER Name Carriage House Inc. Address P.O. Box 850, Eatonville, WA 98328

(2) LOCATION OF WELL County 27 Pierce SW 1/4 NE 1/4 Sec 15 T 16N N R 4E WM

(2a) STREET ADDRESS OF WELL (or nearest address) 41908 Meridian E, Eatonville, WA 98328

TAX PARCEL NO 0416151040

(3) PROPOSED USE [X] Domestic [ ] Industrial [ ] Municipal [ ] Irrigation [ ] Test Well [ ] Other [ ] DeWater

(4) TYPE OF WORK Owner's number of well (If more than one)
[ ] New Well [X] Deepened [ ] Reconditioned [ ] Decommission
Method [ ] Dug [ ] Cable [X] Rotary [ ] Bored [ ] Driven [ ] Jetted

(5) DIMENSIONS Diameter of well 6 inches
Drilled 240 feet Depth of completed well 400 ft

(6) CONSTRUCTION DETAILS
Casing Installed
[X] Welded 6 Diam from +2 ft to 150 ft
[X] Liner installed 4 5 Diam from 40 ft to 400 ft
[ ] Threaded Diam from ft to ft

Perforations [X] Yes [ ] No
Type of perforator used Saw Cut
SIZE of perforations 1/4 in by 3 in
100 perforations from 400 ft to 300 ft
perforations from ft to ft
perforations from ft to ft

Screens [ ] Yes [X] No [ ] K Pac Location
Manufacturer's Name
Type Model No
Diam Slot size from ft to ft
Diam Slot size from ft to ft

Gravel/Filter packed [ ] Yes [X] No [ ] Size of gravel/sand
Material placed from ft to ft

Surface seal [X] Yes [ ] No To what depth? 18 ft
Material used in seal Bentonite Chips
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP Manufacturer's Name
Type H P

(8) WATER LEVELS Land surface elevation above mean sea level ft
Static level 17 ft below top of well Date 6/20/2002
Artesian pressure lbs per square inch Date
Artesian water is controlled by (Cap valve etc)

(9) WELL TESTS Drawdown is amount water level is lowered below static level
Was a pump test made? [ ] Yes [X] No If yes by whom?
Yield gal /min with ft drawdown after hrs
Yield gal /min with ft drawdown after hrs
Yield gal /min with ft drawdown after hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal /min with ft drawdown after hrs
Airtest 20 gal /min with stem set at 390 ft for 1 hrs
Artesian flow g p m Date
Temperature of water Was a chemical analyses made? [ ] Yes [X] No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered

MATERIAL	FROM	TO
Brown Silty Gravel Some Med Sand	140	146
Fractured Brown Rusty Sandstone	146	150
Dense Grey Sandstone	150	205
Purple Sandstone	205	240
Blue Grey & Brown Sandstone	240	370
Fractured Blue Green Sandstone	370	375
Dense Grey Sandstone	375	400
TPD File # 02-852-6		

RECEIVED
JUL 0 9 2002
Washington State
Department of Ecology

Work Started 6/19/2002 19 Completed 6/20/2002 19

WELL CONSTRUCTION CERTIFICATION
I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Type or Print Name Matt Call (Licensed Driller/Engineer) License No 2571
Trainee Name License No
Drilling Company Tacoma Pump & Drilling Co , Inc
(Signed) Matt Call (Licensed Driller/Engineer) License No 2571
Address 30316 Mountain Highway Graham, WA 98338
Contractor's Registration No TACOMPD203PF Date 7/9/2002 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer For special accommodation needs contact the Water Resources Program at (360) 407 6600 The TDD number is (360) 407 6006

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W114089
Unique Well I.D. # AEW239
Water Right Permit No.

(1) OWNER: Name DENMARK PROPERTIES LTD. Address P. O. BOX 1231 GRAHAM, WA 98338-

(2) LOCATION OF WELL: County PIERCE - SE 1/4 NE 1/4 Sec 15 T 16 N., R 4E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 910 OHOP VALLEY EXT. ROAD,

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 227 ft. Depth of completed well 227 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +1 ft. to 157 ft.
WELDED 4.5 " Dia. from 147 ft. to 227 ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used ROTARY STAR
SIZE of perforations 1/8 in. by 3 in.
20 perforations from 187 ft. to 227 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name GOULDS
Type SUBMERSIBLE H.P. 3/4

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 41 ft. below top of well Date 07/18/00
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 10 gal/min. w/ stem set at 227 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? YES

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN SILTY TOPSOIL	0	5
LIGHT BROWN SILT SOME WATER	5	25
TAN SILT SOME GRAVEL	25	45
GRAY SILT SOME GRAVEL	45	55
BROWN SILTY CLAY STICKY	55	61
MULTI COLORED CLAY BROWN	61	105
GRAY GREEN BLUE	61	105
RED TAN STICKY	61	105
TAN SILTY CLAY	105	116
BROWN TO GRAY	116	136
BROKEN SILTSTONE	116	136
BROWN WEATHERED ROCK	136	170
GRAY HARD ROCK	170	182
FRACTURED BLACK ROCK	182	215
FRACTURED BROWN TO	215	227
BLACK ROCK	215	227

RECEIVED
JUL 25 2000
Washington State
Department of Ecology

Work started 07/11/00 Completed 07/18/00

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME OELKE DRILLING, INC.
(Person, firm, or corporation) (Type or print)

ADDRESS 4312-166 AVE E. SUMNER,WA

[SIGNED] License No. 379 ROGER OELKE

Contractor's Registration No. OELKEDI 1360C Date 07/19/00

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Appli: 9953

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL LOG

Record by Driller

Source Driller's Record

Location: State of WASHINGTON

County Pierce

Area

Map

NW¼ NW ¼ NW ¼ sec. 14 T. 16 N., R. 4 E. W.

Diagram of Section

Drilling Co. Tacoma Pump & Drilling Co., Inc.

Address 14621 Pacific Ave. Tacoma, Wash. 98444

Method of Drilling cable Date November 21, 19 68

Owner Mountain Holidays, Inc. % Westgate Realty

Address 3080 148th SW, Bellevue, Washington

Land surface, datum ft above below

SWL: 49 Date November 21, 1968 Dims.: 8" x 196'

Correlation	Material	From (feet)	To (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	COMMUNITY DOMESTIC		
	Rock, large	0	10
	Hard Pan	10	18
	Gravel, large	18	21
	Clay	21	60
	Clay, brown	60	75
	Clay, blue	75	126
	Rock, bed	126	196
Const. Casing: 0' to 126'			
Seal: Bentonite to 10'			
Test: 20 gpm with 133' DD after 62 hrs.			
	(over)		

Turn up

Sheet ..... of ..... sheets

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WELL LOG.—Continued No...../.....-.....

Correlation	Material	From (feet)	To (feet)
	Depth forward →		
	Time Water Level		
	8:30 182		
	9:00 162		
	10:00 141		
	12:00 118		
	3:00 96		
	6:00 63		
	12:00 49		
	from 11-19-68 to 11-21-68		

S. F. No. 7449—OS—12-65.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

No. Appli. #2285
Cert. #1072A

WELL LOG

Date Dec. 14, 1951

Record by L. B. Richardson

Source Driller record

Location: State of WASHINGTON

County Pierce

Area

Map

SW¼SE¼NW¼ sec. 14 T. 16N. R. 4 W.

DIAGRAM OF SECTION

Drilling Co.

Address

Date Dec. 14, 1951

Method of Drilling

Owner O. E. Haynes & Sons

Address Box 284, Eatonville, Wash.

Land surface, datum ft. above below

Correlation	Material	Thickness (feet)	Depth (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	No log available		
	Pump test:		
	Dim: 137' x 8"		
	SWL: 80'		
	D.D. 10'		
	Yield 60 g.p.m.		
	Casing: none		
	Perforations: 6 holes per round		
	with Mills knife.		

Sheet ___ of ___ sheets

Turn up

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 106121
UNIQUE WELL I.D. # AES 902
Water Right Permit No. _____

(1) OWNER: Name Dee Baublitz Address P.O. Box 1088 Eatonville, WA 98328

(2) LOCATION OF WELL: County Pierce - SW 1/4 NE 1/4 Sec 14 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 42310 Lynch Creek Rd. E Eatonville, WA 98328

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 32 feet. Depth of completed well 32 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from +1 ft. to 32 ft.
Welded [X] " Diam. from _____ ft. to _____ ft.
Liner installed [ ] " Diam. from _____ ft. to _____ ft.
Threaded [ ]

Perforations: Yes [ ] No [X]
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [X]
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [X] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 21 ft. below top of well Date 4/26
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 25 gal./min. with stem set at 30 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [X]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Browns silt	0	10
Brown gravel silt	10	25
Brown gravel silt some sand wet	25	27
Brown coarse gravel sand silt water	27	32
Gray silt	32	

RECEIVED
MAY 17 1999
DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

Work Started 4/26/99, 19. Completed 4/26/99, 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Tacoma Pump & Drilling Co. INc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 30316 Mtn. Hwy. Graham, Wa 98338

(Signed) [signature] (WELL DRILLER) License No. 2432

Contractor's Registration No. TACOMPD203PF Date 4/29/99, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6008.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name John J. Terril Address P.O. Box 626 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce E. 1/2// NE ¼ Sec. 14 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Bored ☐ Cable ☐ Driven ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 155 ft. Depth of completed well 155 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 20 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 85 ft. below top of well Date 7-3-29-76
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 25 gal./min. with 125 ft. drawdown after 4 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Sandy top soil	0	3
Rock, med. soft red gray	3	32
Red cinder	32	35
Rock gray	35	80
Rock, red gray med. soft	80	130
Rock gray hard, water 25 GPM	130	155

RECEIVED
JUL 30 1976
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 3-29, 19 76 Completed 3-29, 19 76

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No. 223-02-6500 Date 7-27, 19 76

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

Start Card No. 53122

UNIQUE WELL I.D. # ABA-477

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name Don + Carol Aynestad Address 341 Weyerhauser RD N Eatonville WA 98328

(2) LOCATION OF WELL: County Pierce — SE 1/4 NE 1/4 Sec 14 T. 16N N. R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 341 Weyerhauser RD N, Eatonville WA

(3) PROPOSED USE: [X] Domestic [ ] Industrial [ ] Municipal [ ] Irrigation [ ] Test Well [ ] Other [ ] DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [ ] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 103 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8" Diam. from 0 ft. to 60 ft.
Welded [ ] _____" Diam. from _____ ft. to _____ ft.
Liner installed [ ] _____" Diam. from _____ ft. to _____ ft.
Threaded [ ]

Perforations: Yes [X] No [ ]
Type of perforator used Hole
SIZE of perforations 1" x 1/4" in. by _____ in.
240 perforations from 45 ft. to 55 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [X]
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [ ] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [X] No [ ] To what depth? 20 ft.
Material used in seal Bent
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? no Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 50 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 10 gal./min. with stem set at 60 ft. for 2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
top soil	0	3
gravels/cobbles/sands	3	8
gravels cobbles	8	12
~~12-17~~		
cobbles gravels silve clay	12	18
cobbles / gravels	18	25
cobbles/gravels/sands	25	30
gravels / sands	30	35
gravels/cobbles/sands	35	53
fills - clay - gravels	53	60

Work Started 12-27, 19. Completed 12-28, 1985

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME SLEAD CONST. INC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 2703 96th ST. E. TACOMA, W.

(Signed) [signature] (WELL DRILLER) License No. 1772

Contractor's Registration No. SLEAD*325KO Date 1-3, 1996

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

A-A'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

FILE: ORIG. & FIRST COPY - DEPT. OF ECOLOGY
SECOND COPY - OWNER; THIRD COPY - DRILLER

176513

WATER WELL REPORT
STATE OF WASHINGTON

START CARD NO. W183698
UNIQUE WELL ID AKJ117
WATER RIGHT PERMIT NO.

(1) OWNER NAME: CHAD BARRETT ADDRESS: 1511 168TH ST. E. SPANAWAY WA. 98387
(2) LOCATION OF WELL: County PIERCE SE 1/4 NW 1/4 SEC 13 TWP 16N R 4E
(2a) STREET ADDRESS OF WELL (or nearest address): 42112 BERGREN RD. E. EATONVILLE WA. 98328

(3) PROPOSED USE: DOMESTIC
(4) TYPE OF WORK: NEW WELL
METHOD: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 422 feet. Depth of completed well 422 ft.

(6) CONSTRUCTION DETAILS
Casing instd. 6 " Diam. From +1 ft. to 136'9" ft.
Welded ☑ " Diam. From ft. to ft.
Liner ☐ 4.5" " Diam. From 40 ft. to 422 ft
Threaded ☐

Perforations: Yes ☑ No ☐
Type of perforator used SAW
Size of perforations 1/4" in by 4 in.
125 perforations from 372 ft. to 422 in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes ☐ No ☑
Manufacturer's Name:
Type Model No.
Diam Slot size from ft to ft.
Diam Slot size from ft. to ft.

Gravel packed Yes ☐ No ☑ Size of gravel?
Gravel packed from ft. to ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE CHIPS
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of Strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H P.

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 118' below top of well Date 01/17/05
Artesian pressure lbs Per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? By Whom
Yield gal./min with ft. drawdown after hrs.
Yield gal./min with ft. drawdown after hrs
Yield gal./min with ft. drawdown after hrs.
Recovery data:
Time Wtr Lvl. Time Wtr Lvl. Time Wtr Lvl.

Date of test
Bailer test gal./min with ft. drawdown after hrs
Airtest 1.5 gal/min stem set at 422 ft. for 1 hrs
Artesion flow gal/min Date
Temperature of water Was chemical analysis made? NO

(10) WELL LOG OR DECOMMISSIONING PROCEDURE DESCRIPTION

MATERIAL	FROM	TO
BROWN SILT, GRAVELS	0	5
BOULDER	5	12
BROWN SAND, GRAVELS	12	123
BLUE BEDROCK, HARD	123	160
PURPLE BEDROCK, HARD WITH FRACTURES	160	200
PINK BEDROCK, HARD	200	260
PINK BEDROCK, HARD	260	305
DARK BROWN BEDROCK, HARD	305	315
BROWN BEDROCK, HARD	315	325
GREENISH BLUE ROCK, FRACTURES	325	330
PURPLE ROCK, FEW FRACTURES	330	336
DARK BROWN ROCK, FRACTURES	336	351
GREY ROCK, FRACTURED	351	359
DARK BROWN ROCK, FRACTURED	359	364
GREY ROCK, FRACTURED	364	370
BROWN ROCK FRACTURED	370	372
BLUE ROCK, FRACTURED	372	379
RED ROCK, FRACTURED	379	380
GREEN ROCK, HARD FRACTURED, WATER	380	388
PINK ROCK, VERY FRACTURED, WATER	388	401
TOTAL 1.5 GPM		
BROWN FRACTURED ROCK, NO WATER	401	422

Work Started 01/12/05 Completed: 01/17/05

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Name. RICHARDSON WELL DRILLING COMPANY INC.
Address P. O. BOX 44427 TACOMA, WA 98444
(Signed) (Well Driller) Lic No. 2623
Contractor's Registration No. RICHAW*3210B DATE 1/18/05

RECEIVED
JUL 18 2005
Washington State
Department of Ecology

Section B-B'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Original and First Copy with the Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name MILAND HAMMOND Address ACROSS FROM PACK FOREST, ETONVILLE

(2) LOCATION OF WELL: County PIERCE — NW ¼ SW ¼ Sec. 21 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 67'6" ft. Depth of completed well 67'6" ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 67'-6" ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 20 ft. below top of well Date OCT 11 84
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 30 gal./min. with 35 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOPSOIL	0	1
SAND, GRAVEL, CLAY	1	60
SAND, GRAVEL, WATER	60	67

Work started OCT 11, 1984 Completed OCT 11, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME TACOMA PUMP & DRILLING (Person, firm, or corporation) (Type or print)

Address 30316 MT HIGHWAY GRAHAM

[Signed] Eric Hansen (Well Driller)

Registration No. 0710 Date OCT 8, 1984

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY-060-1-30

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W116908
UNIQUE WELL I.D. # AC 5484
Water Right Permit No. _____

(1) OWNER: Name Guth George Address 304-720 N.W. Pay WA 98371

(2) LOCATION OF WELL: County Pierce NE 1/4 SW 1/4 Sec 21 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 9801 - 438th St. Ct. E Eatonville WA 98328

(3) PROPOSED USE: ☑ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☑ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☑ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 180 feet. Depth of completed well 178 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from 0 ft. to 178 ft.
Welded ☐ 6" Diam. from _____ ft. to _____ ft.
Liner installed ☐
Threaded ☐ _____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☑
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☑
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☑ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☑ No ☐ To what depth? 19 ft.
Material used in seal Bentonite Chip
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 100 ft. below top of well Date 3-31
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 30 gal./min. with stem set at 170 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown silty Gravel + cobbles	0	25
Gravels + sands some water	25	58
Grey clays some gravels	58	120
silty Gravels + sand 1/4 water	120	135
Grey silty Gravels moist	135	165
20gpm Gravels + sands	165	180

Work Started 3-30, 19. Completed 3-31, 19 99

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling INC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address P.O. Box 1890 Milton WA 98354
(Signed) [signature] (WELL DRILLER) License No. 2352
Contractor's Registration No. HOLDI*813606 Date 4-1-99, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W116922
UNIQUE WELL I.D. # ABB 124
Water Right Permit No. _____

(1) OWNER: Name Schenk / Bill Hake Address 19210 - 65th St. E. Bonney Lk 98390

(2) LOCATION OF WELL: County Pierce NW 1/4 SW 1/4 Sec 22 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 10315 - 438th St. E.

(3) PROPOSED USE: ☑ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Municipal ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☑ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Cable ☐ Rotary ☑ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 140 feet. Depth of completed well 138 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 6" Diam. from 0 ft. to 138 ft.
Welded ☐ Liner Installed ☐ Threaded ☐
" Diam. from _____ ft. to _____ ft.
" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☑
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☑
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☑ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 60 ft. below top of well Date 5-13-99
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 15 gal./min. with stem set at 130 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	0	2
Brown silt sand gravel	2	10
gravels and sand + silts	10	22
Brown clay	22	35
Brown silty gravels	35	50
grey clays	50	100
grey silty gravels	100	110
gravels + sands	110	140

Work Started 5-13, 19. Completed 5-13, 19 99

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling INC (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address P.O. 1890 Milton WA. 98354
(Signed) _____ (WELL DRILLER) License No. 2355
Contractor's Registration No. WCC 1306 Date 5-17-99, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

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ECY 050-1-20 (9/93) * * 1

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Well Log Data and Image are 'As Is' with NO Warranty. Well Log ID: 32061 (page 1 of 1)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

52041

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W072030
UNIQUE WELL I.D. # AKK 059
Water Right Permit No.

(1) OWNER: Name Noel, Mike Address

(2) LOCATION OF WELL: County Pierce — NE 1/4 SE 1/4 Sec 21 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 218.5 feet. Depth of completed well 218.5 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from +2 ft. to 49.5" ft.
Welded [X] 4.5" Diam. from 0 ft. to 218.5 ft.
Liner installed [X]
Threaded [ ] " Diam. from ft. to ft.

Perforations: Yes [X] No [ ]
Type of perforator used Hand Saw
SIZE of perforations 1/4" x 3" in. by in.
50 perforations from 170' ft. to 218.5 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 19' ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level
Static level 20' ft. below top of well Date Aug 22 96
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 70 gal./min. with stem set at 218.5 ft. for 2.0 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top Soil	0	1
Fine silt Sands & Gravels	1	12
Blue Clay w/silts	12	435
Basalt Black Hard Drilling	435	218.5

Work Started Aug 22 19. Completed Aug 22 19 96

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Tacoma Blvd Puyallup
(Signed) (WELL DRILLER) License No. 2338
Contractor's Registration No. HOLTDI*736CG Date Aug 26 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

Department of Ecology Well Log Image System

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name HARRY JONES (GENE CERPA) Address 723 15 AVE. S.E

(2) LOCATION OF WELL: County PIERCE — NE ¼ SW ¼ Sec. 22 T 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☑ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☑ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☑ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 400 ft. Depth of completed well 400 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to ~~400~~ 18 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☑ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☑
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☑
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☑ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name BERKELEY
Type: SOB H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 25 ft. below top of well Date 10-31-79
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☑ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 9 gal./min. with 325 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☑

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOPSOIL	0	2
HARDPAN - BROWN	2	16
BEDROCK - BLACK	16	135
" - RED CLAY	135	157
" BLACK	157	190
" ORANGE CLAY	190	195
" BLACK	195	220
" RED CLAY	220	227
" BLACK	227	310
" RED CLAY	310	320
" BLACK	320	400

RECEIVED
MAR 27 1980
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 10-26, 19 79. Completed 10-31, 19 79

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME TACOMA PUMP & DRILLING INC. (Person, firm, or corporation) (Type or print)

Address 30316 MT. HWY GRAHAM

[Signed] Eric Hansen by (Well Driller)

License No. 0710 Date 1/4, 1980

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File original and first copy with [illegible]
[illegible] copy
[illegible] copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Father John Peters Address Rt 2 Box 70 Eatonville Wa 98328

(2) LOCATION OF WELL: County Pierce — NW ¼ SE ¼ Sec. 22 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 200 ft. Depth of completed well 200 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 100 ft.
Threaded ☐ 4" PVC " Diam. from 200 ft. to 40 ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

[illegible] Manufacturer's Name
Type: H.P.

(7) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 30 ft. below top of well Date 8-5-85
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " "
" " "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 15 gal./min. with 165 ft. drawdown after 4 hrs.
Air test [illegible] cu. ft./min. with [illegible] ft. drawdown after [illegible] hrs.

(9) [illegible]

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
brown clay & gravel	0	16'
gray shale boulder	16'	21'
gray clay & gravel	21'	36'
gray clay	36'	51'
gray shale	51'	78'
brown clay	78'	83'
red cinder	83'	91'
gray shale & sand seams	91'	126'
shale red cinder fractured 2 gpm	126'	200'

RECEIVED
AUG 30 1985
DEPARTMENT OF ECOLOGY
S.W. REGIONAL OFFICE

Work started 8-5, 19 85. Completed 8-7, 19 85

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Stofean Drilling Inc.
(Person, firm, or corporation) (Type or print)

Address 32519 Mt. Hwy Eatonville Wa 98328

[Signed] [illegible]

License No. 0248 [illegible]

(USE ADDITIONAL STATEMENT IF NECESSARY)

[illegible]

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Allen Bush Address P.O. Box 786 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce — NE ¼ SE ¼ Sec. 22 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 280 ft. Depth of completed well 280 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 280 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used Mills Knive
SIZE of perforations 1/4 in. by 1½ in.
4 around every 1' perforations from 240 ft. to 280 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi Bros.
Type: 1s4b H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 170 ft. below top of well Date 9-11-81
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 5 gal./min. with 280 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 9-11-81
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Topsoil	0	4
Hardpan	4	16
Silty sand & gravels wet	16	32
Brown clay w/sand & gravels	32	56
Glacial till	56	86
Red silty sand & hard clay	86	96
Rock silty stone brown, blackining color	96	150
Rock not so hard gray in color	150	166
Rock black in color hard	166	187
Red silty sand & clay	187	194
Rock black in colorphard	194	232
Red rock	232	253
Green rock medium hard	253	266
Red rock medium hard	266	280

RECEIVED
DEC 14 1981
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 9-11-81, 19..... Completed 9-11, 19 81

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44427 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No. 223-02-5500 Date 10-2, 19 81

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Dwayne Block Address Box 187 Eatonville WA. 98328.

(2) LOCATION OF WELL: County Pierce — NW ¼ SW ¼ Sec. 23 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ AIR Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 35 ft. Depth of completed well 35'5" ft.

(6) CONSTRUCTION DETAILS: with 1 ft Above Ground.

Casing installed: 6" Diam. from 0 ft. to 35'5" ft.
Threaded ☐ ..." Diam. from ... ft. to ... ft.
Welded ☒ ..." Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ... in. by ... in.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ... Slot size ... from ... ft. to ... ft.
Diam. ... Slot size ... from ... ft. to ... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ... ft. to ... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite & Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level Approx 780 ft.
Static level 8 ft. below top of well Date .....
Artesian pressure ... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? .....
Yield: ... gal./min. with ... ft. drawdown after ... hrs.
" " " " "
" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
AIR Bailer test 55 gal./min. with 26 ft. drawdown after 1 hrs.
Artesian flow ... g.p.m. Date .....
Temperature of water 49 Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown Silty Clay	0	2½
Blue Gray Till + Boulders	2½	26
Brown Clay	26	29
Gravelly Clay Binder w/15 40+ gpm	29	35
Red Clay	35	-

RECEIVED
JUN 7 1983
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 3-7, 19 83 Completed 3-7, 19 83

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Stoican Drilling Co Inc (Person, firm, or corporation) (Type or print)

Address PO Box 161 Sequim WA. 98382
Rt. 1, Box 175 Eatonville WA 98328

[Signed] Valin Stoican President (Well Driller)

Tom Ketzenberg
License No. 0240 Date 3-30- 19 83

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W 059259
Water Right Permit No.

(1) OWNER: Name TOOTEN DANA Address 1506 FOXFIRE DR SE LACEY, WA 98513-

(2) LOCATION OF WELL: County PIERCE - NE 1/4 SE 1/4 Sec 23 T 16 N., R 4E WM

(2a) STREET ADDRESS OF WELL (or nearest address) 44209 ALDER CUT OFF RD EA

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 06 inches
Drilled 62 ft. Depth of completed well 62 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 06 " Dia. from 0 ft. to 20.3 ft.
WELDED 04 " Dia. from 5.3 ft. to 62 ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used HAND SLOTTED
SIZE of perforations 1/4 in. by 1 1/2 in.
12 perforations from 44 ft. to 62 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 8.6 ft. below top of well Date 03/18/95
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 150 gal/min. w/ stem set at 60 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN CLAY	0	10
RED ROCK	10	24
BROWN ROCK	24	27
BLACK ROCK	27	36
FRACTURED ROCK WATER	36	48
BLACK ROCK	48	53
BLACK ROCK FRACTURES	53	60
BLACK ROCK	60	62

'95 APR -3 AM 9:08

Work started 03/18/95 Completed 03/18/95

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME RICHARDSON WELL DRILLING (Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 44427 TAC WA 98444

[SIGNED] Ronald Gm License No. 1547

Contractor's Registration No. RICHAW#32108 Date 03/30/95

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W088812
UNIQUE WELL I.D. # AEP188
Water Right Permit No. _____

(1) OWNER: Name TIM AFDEM Address 17404 Meridian E. F-15, Puyallup 98375

(2) LOCATION OF WELL: County Pierce — SE 1/4 NW 1/4 Sec 19 T. 16 N. R 5E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 44002 - 161st Ave E Eatonville, Wa. 98328

(3) PROPOSED USE: [x] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one) Lot 4
Abandoned [ ] New well [x] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [x] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 in inches.
Drilled 114 feet. Depth of completed well 140 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from 0 ft. to 114 ft.
Welded [x] Liner installed [ ] Threaded [ ] _____" Diam. from _____ ft. to _____ ft.
Perforations: Yes [ ] No [x]
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [x]
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [x] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [x] No [ ] To what depth? 18 feet ft.
Material used in seal _____
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level 0 ft.
Static level 0 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [x] If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
gravel & sand	0	23
orange clay	29	90
broken basalt	90	114
seams of water		
broken basalt	114	140
10 GPM		

RECEIVED
SEP 09 1999
DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

Work Started 6-5-, 1999 Completed 6-7-, 1999

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Slead Construction, Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 2703 - 96th St E Tacoma, Wa 98445
(Signed) Brian Jordan (WELL DRILLER) License No. 2327
Contractor's Registration No. SLEADC*325KO Date 6-30, 1999

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93) * * f

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

B-B'

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W01861
Unique Well I.D. # ABB513
Water Right Permit No.

(1) OWNER: Name BENSINGER, CHARLES T. Address P.O. BOX 748, MZ7015 FORT WORTH, TX 76101-

(2) LOCATION OF WELL: County PIERCE - SW 1/4 NE 1/4 Sec 19 T 16 N., R 5 WM E

(2a) STREET ADDRESS OF WELL (or nearest address) 43709 161ST AVE E., EATONVILLE

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 160 ft. Depth of completed well 160 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +1 ft. to 57 ft.
WELDED/LINER 4.5 " Dia. from 47 ft. to 160 ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used SAW CUT
SIZE of perforations 1/8 in. by 3 in.
50 perforations from 60 ft. to 160 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name GRUNDFOS
Type SUBMERSIBLE H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 83 ft. below top of well Date 02/23/94
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 8 gal/min. w/ stem set at 160 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? YES

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN DAMP SILT	0	10
BROWN STICKY SILT	10	17
SOME GRAVEL	10	17
ORANGE BROWN SILT	17	54
WEATHERED ROCK	17	54
DAMP WEATHERED ROCK	54	57
WATER BEARING	54	57
ORANGE BROWN SILTY	57	65
ROCK	57	65
GRAY ROCK	65	83
BLACK ROCK	83	92
GRAY WEATHERED ROCK	92	114
GRAY ROCK	114	135
FRACTURED GREEN ROCK	135	160
WATER BEARING	135	160

Work started 02/22/94 Completed 02/23/94

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME OELKE DRILLING, INC.
(Person, firm, or corporation) (Type or print)

ADDRESS 4312-166 AVE E. SUMNER, WA

[SIGNED] [signature] License No. 837 K. MCKENNA

Contractor's Registration No. OELKEDI 136QC Date 03/01/94

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Section C-C'

C-C'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File: Orig. & First Copy - Dept of Ecology
Second Copy - Owner; Third Copy - Driller

WATER WELL REPORT
State of Washington

Start Card No. W121975
Unique Well ID AEF127
Water Right Permit No.

(1) OWNER: Name MADELINE POTTS Address PO BOX 1417 EATONVILLE WA +9328 Page 1 of
(2) LOCATION OF WELL: County PIERCE NW 1/4 NE 1/4 Sec 11 T 16 N R 4 EW
(2a) STREET ADDRESS OF WELL (or nearest address) 12709 E 401ST ST EATONVILLE WA

(3) PROPOSED USE: DOMESTIC
(4) Type of work: NEW WELL
Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 107 feet. Depth of completed well 107 ft.

(6) CONSTRUCTION DETAILS:
Casing instld: 6 " Diam. from 0 ft. to 107 ft.
Welded X " Diam. from ft. to ft.
Liner _ " Diam. from ft. to ft.
Threaded _

Perforations: Yes _ No X
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes _ No X
Manufacturer's Name
Type Model No
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes _ No X Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes X No _ To what depth? 26 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes _ No X
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P. 0

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 79.11 ft. below top of well Date 04/13/20
Artesian pressure lbs. per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? ___ By whom?
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Recovery data:

Time	Wtr. Lvl.	Time	Wtr. Lvl.	Time	Wtr. Lvl.

Date of test
Bailer test 0 gal/min with ft. drawdown after hr
Airtest 20 gal/min with stem set at 102 ft. for 2 hrs
Artesian flow 0 gal/min Date
Temperature of water Was chemical analysis made? YES

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION

Material	From	To
TOPSOIL	0	1
LOOSE BROWN SAND, GRAVELS, COBBLES	1	5
CEMENTED BROWN SAND, GRAVELS, COBBLES, BOULDERS	5	37
BROWN SANDY CLAY, GRAVELS, COBBLES	37	54
LOOSE BROWN SANDY CLAY	54	100
LOOSE BROWN SILTY SAND, GRAVELS, COBBLES	100	107

RECEIVED
JUN 23 2000

Work Started 04/12/20 Completed 04/13/20

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction o this well, and its compliance with all Washington well construction standards. Materials used and the information reporte above are true to my best knowledge and belief.
Name RICHARDSON WELL DRILLING
Address P.O. Box 4427 Tacoma WA 98444
(Signed) _____ Lic. No 2017
(Well Driller)
Contractor's Registration No. RICHAW*3210B Date 04/17/1
Based on form ECL 050-1-20 (2/93)**f-1329- by Speed Systems Cor

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name William Stover Address P.O. Box 383 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce — SW ¼ NE ¼ Sec. 11 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

Class 4

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 220 ft. Depth of completed well 220 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 140 ft.
PVC lines Threaded ☐ 4" Diam. from 4 ft. to 220 ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used knive
SIZE of perforations 1/4 in. by 1½ in.
4 times around perforations from 153 ft. to 220 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 50 ft. below top of well Date 1-20-84
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 5 gal./min. with 90 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 1-20-84
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Gravel-boulders	0	16
Brown clay-gravel	16	21
Sand-gravel	21	46
Hardpan	46	83
Gravel-boulders	83	110
Red clay	110	153
Red shale	153	160
Basalt	160	172
Red shale	172	196
Basalt	196	220

RECEIVED
APR 26 1984
Department of Ecology
Southwest Regional Office

Work started 1-20, 19 84. Completed 1-20, 19 84

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co.
(Person, firm, or corporation) (Type or print)

Address P.O. Box 44427 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No. 0419 Date 4-10, 19 84

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Antonio Novelli Address P.O. Box 195 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce — NW ¼ SE ¼ Sec. 11 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 63 ft. Depth of completed well 60 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 38 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi Bros.
Type: 1S4H H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 45 ft. below top of well Date 12-22-76
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 15 gal./min. with 5 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top soil	0	2
Sand & gravel	2	5
Clay & gravel	5	18
Seapage & gravel	18	20
Hardpan	20	38
Red shale Rock	38	53
Clay, gravel & water	53	57
Rock	57	63

RECEIVED
MAY 10 1977
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 12-22, 19 76 Completed 12-22, 19 76

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] [signature] (Well Driller)

License No. 223-02-6500 Date 5-6, 19 77

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 060-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Dale M. Swanson Address P.O. Box 716 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce NE ¼ NE ¼ Sec. 14 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Bored ☐ Cable ☐ Driven ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 183 ft. Depth of completed well 180 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 180 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi Bros.
Type: 1S 4B H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 140 ft. below top of well Date 11-1-77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 20 gal./min. with 20 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 11-1-77
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top soil & gravel	0	2
Clay & gravel	2	12
Clay, gravel & boulders	12	36
Hardpan & boulders	36	52
Soft gray rock	52	61
Hard gray rock	61	87
Red shale	87	119
Soft red shale & seapage	119	126
Hard gray rock	126	152
Hard green rock	152	157
Soft red shale	157	165
Water & red shale	165	183

RECEIVED
SEP 15 1978
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 11-1, 19 77. Completed 11-1, 19 77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No. 223-02-6500 Date 9-7, 1978

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

Start Card No. 53122

UNIQUE WELL I.D. # ABA-477

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name Don + Carol Aynestad Address 341 Weyer Hauser RD N Eatonville

(2) LOCATION OF WELL: County Pierce SE 1/4 NE 1/4 Sec 14 T. 16N N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 341 Weyer Hauser RD N, Eatonville W

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 103 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8" Diam. from 0 ft. to 60 ft.
Welded ☐ Liner installed ☐ Threaded ☐ _____" Diam. from _____ ft. to _____ ft.
_____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used Hole
SIZE of perforations 1" x 1/4" in. by _____ in.
240 perforations from 45 ft. to 55 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bent
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? no Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 50 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 10 gal./min. with stem set at 60 ft. for 2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
top soil	0	3
gravels/cobbles/sands	3	8
gravels cobbles	8	12
~~12-17~~		
cobbles gravels silve clay	12	18
cobbles / gravels	18	25
cobbles/gravels/sands	25	30
gravels / sands	30	35
gravels/ cobbles / sands	35	53
fills - clay - gravels	53	60

Work Started 12-27, 19. Completed 12-28, 1985

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME SLEAD CONST. INC. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 2703 96th ST. E. TACOMA, W.

(Signed) [signature] (WELL DRILLER) License No. 1772

Contractor's Registration No. SLEAD*325KO Date 1-3, 1996

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93) * * f

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Start Card No. W074219.

UNIQUE WELL I.D. # ABF 366

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name Jim Mettler Address P.O. Box 1455 Eatonville 98328.

(2) LOCATION OF WELL: County Pierce NE 1/4 SE 1/4 Sec 14 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 379 Supercub Dr. North.

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 163 feet. Depth of completed well 163 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 6" Diam. from +2 ft. to Ø ft.
Welded ☒ " Diam. from Ø ft. to 98 ft.
Liner Installed ☐
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level Ø ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest Ø gal./min. with stem set at Ø ft. for Ø hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Topsoil	0	1
Lt Brn sand Gravel w Cobbles	1	10
DK Brn silt	10	11
Lt Brn sand Gravel + cobbles	11	13
DK Brn sand some Gravel damp	13	31
Lt Brn silt + Gravel - Dense dry	31	33
DK Brn Sand + Gravel damp	33	43
Reddish Brown clay some Gravel	43	72
Lt orange Brown silt	72	75
Reddish Grey sandy Clay	75	77
Grey - Purple sandy clay	77	109
Grey Clay w sand	109	116
Grey clay w sand damp	116	117
Sandstone dry	117	122
Lt Brn silt dry	122	145
Lt Brn silt w gravels dry	145	152
Lt Brn silt dry	152	161

Work Started 5-4-98, 19. Completed 5-6-98, 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Todd Rd E Puyallup
(Signed) Thomas W. Cassady (WELL DRILLER) License No. 2409
Contractor's Registration No. HOLTDI*J360G Date 5-7-98, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

Construction/Decommission

☑ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 146602

Current Notice of Intent No. WE01768

Unique Ecology Well ID Tag No. AKT 667

Water Right Permit No. _____

Property Owner Name Town of Eatonville

Well Street Address 401XX Weyerhauser Road South

City Eatonville County Pierce

Location NE 1/4-1/4 NE 1/4 Sec 23 Twn 16 R 4E EWM ☑ or WWM ☐ circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0416231011

PROPOSED USE: ☐ Domestic ☐ Industrial ☑ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) #7

☑ New well ☐ Reconditioned ☐ Deepened *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 97 ft

Depth of completed well 93.5 ft

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 12" Diam from +2 ft to 73 ft

☐ Liner installed _____" Diam from _____ ft to _____ ft

☐ Threaded _____" Diam from _____ ft to _____ ft

Perforations: ☐ Yes ☑ No

Type of perforator used _____

SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens: ☑ Yes ☐ No ☑ K-Pac Location 69.5

Manufacturer's Name Nagaoka

Type Stainless Wire Wrap Model No _____

Diam 11 Slot size 90 from 73.5 ft to 83.5 ft

Diam 11 Slot sump from 83.5 ft to 93.5 ft

Gravel/Filter packed: ☐ Yes ☑ No ☐ Size of gravel/sand _____

Materials placed from _____ ft to _____ ft

Surface Seal: ☑ Yes ☐ No To what depth? 18 ft

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type _____ H P _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft

Static level 16.5 ft below top of well Date 3/1/04

Artesian pressure _____ lbs per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☑ Yes ☐ No If yes, by whom? Golder w/T.P.D.

Yield 430 gal /min with 15 ft drawdown after 24 hrs

Yield 430 gal /min with 16 ft drawdown after 48 hrs

Yield 430 gal /min with 16.5 ft drawdown after 72 hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
Recovered		after	20 Minutes	80%	
1 hour		for	100%	recovery	

Date of test _____

Bailer test _____ gal /min with _____ ft drawdown after _____ hrs

Airtest 300+ gal /min with stem set at 60 ft for 1 hrs

Artesian flow _____ g p m Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Dry brown, gray silty sandy cobbles with boulders.	0	9
Moist olive gray medium gravel, with olive black sandy silt.	9	15
Boulder.	15	17
Dark yellow brown silty sandy gravel with trace sticky clay	17	21
Soft brown, orange sandy silt, trace medium gravel.	21	25
Soft light gray olive clay silt with trace sand. Gravel	25	41
Wet, yellow, brown, orange silty medium sand with gravel.	41	80
Dark gray, boulder	80	83
Wet gray silty sandy medium gravel.	83	87
Green gray silty medium to coarse gravel with light gray clay.	87	97
Soft sticky olive gray clay	97	99
03-1052-11		

Start Date 1/20/04 Completed Date 3/4/04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Driller/Engineer/Trainee Name (Print) Matthew Call

Driller/Engineer/Trainee Signature _____

Driller or trainee License No 2571

If TRAINEE, Driller's Licensed No. _____

Driller's Signature _____

Drilling Company Tacoma Pump & Drilling Co., Inc

Address 30316 Mountain Highway

City, State, Zip Graham, WA 98338

Contractor's Registration No TACOMPD203PF Date 3/8/04

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 2/03)

RECEIVED MAR 17 2004 Washington State Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W 059259
Water Right Permit No.

(1) OWNER: Name TOOTEN DANA Address 1506 FOXFIRE DR SE LACEY, WA 98513-

(2) LOCATION OF WELL: County PIERCE - NE 1/4 SE 1/4 Sec 23 T 16 N., R 4E WM

(2a) STREET ADDRESS OF WELL (or nearest address) 44209 ALDER CUT OFF RD EA

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 06 inches
Drilled 62 ft. Depth of completed well 62 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 06 " Dia. from 0 ft. to 20.3 ft.
WELDED 04 " Dia. from 5.3 ft. to 62 ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used HAND SLOTTED
SIZE of perforations 1/4 in. by 1 1/2 in.
12 perforations from 44 ft. to 62 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 8.6 ft. below top of well Date 03/18/95
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 150 gal/min. w/ stem set at 60 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN CLAY	0	10
RED ROCK	10	24
BROWN ROCK	24	27
BLACK ROCK	27	36
FRACTURED ROCK WATER	36	48
BLACK ROCK	48	53
BLACK ROCK FRACTURES	53	60
BLACK ROCK	60	62

'95 APR -3 A9:58

Work started 03/18/95 Completed 03/18/95

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME RICHARDSON WELL DRILLING (Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 44427 TAC WA 98444

[SIGNED] Ronald Yoman License No. 1547

Contractor's Registration No. RICHAW*32108 Date 03/30/95

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent W123436
UNIQUE WELL I.D. # ACY800
Water Right Permit No.

(1) OWNER: Name Majestic Mobile Homes/Tom Quin Address 24505 36th Ave. E. Spanaway, WA 9838

(2) LOCATION OF WELL: County Pierce SW 1/4 SW 1/4 Sec 24 T 16 N.R. 4E WM

(2a) STREET ADDRESS OF WELL: (or nearest address) 14118 Scott Turner Rd. Eatonville, WA 98328

TAX PARCEL NO.:

(3) PROPOSED USE: [X] Domestic [ ] Industrial [ ] Municipal [ ] Irrigation [ ] Test Well [ ] Other [ ] DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
[X] New Well [ ] Deepened [ ] Reconditioned [ ] Decommission
Method: [ ] Dug [ ] Bored [ ] Cable [ ] Driven [X] Rotary [ ] Jetted

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 95 feet. Depth of completed well 95 ft.

(6) CONSTRUCTION DETAILS
Casing Installed:
[X] Welded 6 " Diam. from +1.5 ft. to 95 ft.
[ ] Liner installed " Diam. from ft. to ft.
[ ] Threaded " Diam. from ft. to ft.

Perforations: [ ] Yes [X] No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.

Screens: [ ] Yes [X] No [ ] K-Pac Location
Manufacturer's Name
Type Model No.
Diam. Slot Size from ft. to ft.
Diam. Slot Size from ft. to ft.

Gravel/Filter packed: [ ] Yes [X] No [ ] Size of gravel/sand
Material placed from ft. to ft.

Surface seal: [X] Yes [ ] No To what depth? 18 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 53 ft. below top of well Date 4/4/00
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? [ ] Yes [X] No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 20 gal./min. with 93 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? [ ] Yes [X] No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
SANDY LOAM	0	13
BROWN GRAVEL SILT TRACE SAND	13	18
BROWN COARSE GRAVEL COBBLES SILT SAND WET	18	76
BROWN BOULDERS COBBLES COARSE GRAVEL SAND SILT SOME WATER	76	85
BROWN BOULDERS COBBLES COARSE GRAVEL SAND SILT WATER	85	95

RECEIVED
APR 17 2000
DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

Work Started 4/4 00 Completed 4/4 00

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Mark Wiese License No. 2432
(Licensed Driller/Engineer)

Trainee Name License No.
Drilling Company Tacoma Pump & Drilling
(Signed) License No. 2432
(Licensed Driller/Engineer)
Address 30316 MT.HWY. Graham, WA 98338
Contractor's Registration No. TACOMPD203PF Date 4/11 00

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

ECY 050-1-20 (11/96)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 33684
[redacted]. AAC-950

(1) OWNER: Name HOESEL, DENNIS & PAULA Address 709 7TH ST. SW PUYALLUP, WA 98371-

(2) LOCATION OF WELL: County PIERCE - NW 1/4 NW 1/4 Sec 25 T 16 N., R 04E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 44808 GROE RD. E.

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 60 ft. Depth of completed well 59 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +1 ft. to 59 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name GRNFS10S059/X92
Type SUBMERSIBLE H.P. 1/2

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 20 ft. below top of well Date 08/04/93
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 30 gal/min. w/ stem set at 59 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? YES

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN TOPSOIL	0	6
BROWN SILTY SAND & GRAVEL	6	38
W/ COBBLES	6	38
COARSE TO MEDIU FRACTURED GRAVL W/ COBBLES	38	59
WATER BEARING	38	59

Work started 08/03/93 Completed 08/04/93

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME OELKE DRILLING, INC.
(Person, Firm, or Corporation) (Type or Print)

ADDRESS 4312-166 AVE E. SUMNER WA

[SIGNED] [signature] License No. 837 K. MCKENNA

Contractor's Registration No. OELKEDI 136QC Date 08/11/93

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name W.W. Haviland Address Rt. 2 Box 232 Eatonville, Wa. 98[illegible]

(2) LOCATION OF WELL: County Pierce N½ ¼ NW ¼ Sec. 25 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 163 ft. Depth of completed well 160 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 54 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi Bros.
Type: 2S4H H.P. 2

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 49 ft. below top of well Date 8-8-77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 60 gal./min. with 60 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top soil	0	2
Clay	2	12
Clay & gravel	12	23
Clay & gravel & boulders	23	51
A little water & rock	51	52
Gray rock	52	81
Light gray rock	81	116
Brown rock	116	123
Gray rock	123	131
Red soft shale	131	142
~~[illegible]~~		
White sand stone	142	145
Water & white sand stone	145	147
Yellow sand stone & water	147	163

RECEIVED
SEP 26 1977
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 8-5, 19 77 Completed 8-8, 19 77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] [illegible] (Well Driller)

License No. 223-02-6500 Date 8-31, 19 77

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 060-1-30

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. N060716

UNIQUE WELL I.D. # ABW627

Water Right Permit No.

(1) OWNER: Name Bob Miller Address 45915 Alder Cutoff Rd., Eatonville, We

(2) LOCATION OF WELL: County Pierce NE 1/4 SW 1/4 Sec 25 T. 16N N., R 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) XXXXXXXX as above

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater Industrial [ ] Test Well [ ] Municipal [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 340 feet. Depth of completed well 340 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from +1 ft. to 37 ft.
Welded [X] 4" Diam. from 5 ft. to 340 ft.
Liner installed [X]
Threaded [ ] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 60 ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 8 gal./min. with stem set at 335 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [X]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown clay topsoil	0	3
Brown clay soft	3	16
Brown clay cobbles hard	16	25
Gray basalt hard	25	120
Red basalt hard	120	140
Brown basalt hard	140	156
Black basalt hard	156	180
Gray basalt hard	180	234
Red basalt hard	234	242
Black basalt hard	242	280
Green basalt hard	280	306
Green/white basalt hard	306	340

Work Started 12/27/96 19. Completed 1/17 1996

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Royer Park Electric, Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address P. O. Box 699, Morton, Wa. 98356

(Signed) [signature] (WELL DRILLER) License No. 0604

Contractor's Registration No. ROYERPE193PZ Date 1/19/96 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Section D-D'

D-D'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name Arnold B. Coburn Address P.O. Box 191 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce — NE ¼ NE ¼ Sec. 12 T. 16 N., R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 405 ft. Depth of completed well 400 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to ~~400~~ 26' ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☐
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi
Type: Submersible H.P. 1.5

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 130 ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 5 gal./min. with 100 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Top Soil	0	2
Clay & Gravel	2	18
Clay	18	23
Red Shale	23	85
Gray Shale	85	96
Green Rock	96	154
Red Shale	154	168
Gray Shale	168	214
Red Shale	214	256
Soft Red Shale	256	280
Hard Gray Shale	280	292
Light Green Sandstone	292	327
Red Shale	327	379
Red Shale & Water	379	384
Gray Shale	384	405

RECEIVED
FEB 16 1977
DEPARTMENT OF ECOLOGY
COLUMBIA REGIONAL OFFICE

Work started 12-17, 1976 Completed 12-22, 1976

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co.
(Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] [signature]
(Well Driller)

License No. 223-02-6500 Date 1-20-77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

CY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W094317
UNIQUE WELL I.D. # ACT 049
Water Right Permit No. _____

(1) OWNER: Name Simonsen, Ron Address 43610 SR 161, Eatonville 98328

(2) LOCATION OF WELL: County Pierce NW 1/4 SE 1/4 Sec 13 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 42112 Bergren Rd E.

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 440 feet. Depth of completed well 440 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from 0 ft. to 180 ft.
Welded [ ] 4" Diam. from -4 ft. to 436 ft.
Liner installed [ ]
Threaded [ ] " Diam. from _____ ft. to _____ ft.

Perforations: Yes [X] No [ ]
Type of perforator used Skill Saw
SIZE of perforations 1/8" [redacted]" in. by 4" in.
[redacted]" perforations from [redacted] ft. to _____ ft.
160 perforations from 400 BLG ft. to 440 BLG ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes [ ] No [ ]
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes [ ] No [ ] Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes [X] No [ ] To what depth? 19 ft.
Material used in seal Bentonite Chips
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Red Jacket
Type: 1 HP 12614 H.P. 1

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 112 ft. below top of well Date 9-26-98
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [X] No [ ] If yes, by whom? Holt Drilling
Yield: 5+ gal./min. with 305 ft. drawdown after 3 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test ____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 1 gal./min. with stem set at 458 ft. for 2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Top soil	0	3
Brown Silty sands	3	25
Grey Clays	25	100
Grey silty gravels	100	105
Grey Clays	105	178
Bedrock	178	440

Work Started 8-24, 19. Completed 8-27, 19 98

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling, Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Todd Rd E. Puyallup 98372
(Signed) [signature] (WELL DRILLER) License No. 2059
Contractor's Registration No. HOLTDI*136OG Date 9-18-98, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

Section E-E'

E-E'

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 412584
UNIQUE WELL I.D. # AEF 627
Water Right Permit No. _____

(1) OWNER: Name Milano Address 50319 Midway Cr Rd Eatonville WA. 98328

(2) LOCATION OF WELL: County Pierce NW 1/4 NE 1/4 Sec 20 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 7315-457 st. E.

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 101 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from +2 ft. to 0 ft.
Welded ☒ 6" Diam. from 0 ft. to 98 ft.
Liner installed ☐ " Diam. from _____ ft. to _____ ft.
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 78 ft. below top of well Date 9-13-99
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 5-6 gal./min. with stem set at 95 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
lt Brn sand Gvl cobbles Boulders Dry	0	30
DK Brn silty sand Gvl cobbles no st	30	55
DK Grey clay w boulders gvl Brns Dry	35	55
Grey silty sand Gvl no st	55	64
Grey clay w sand Dry	64	86
DK Grey sand Gvl water Bearing	86	98
Grey silt w gvl Dense Dry	98	

Work Started 9-13-99 19. Completed 9-13-99 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 11621 Todd Rd E. Puyallup
(Signed) Thomas G. Cooney (WELL DRILLER) License No. 2407
Contractor's Registration No. HOLDI*1360G Date 9-14-99 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 69409

Water Right Permit No.

(1) OWNER: Name FRANK MILWARD Address 14315-188 ST.E.ORTING,WA.98360

(2) LOCATION OF WELL: County PIERCE NE ¼ NE ¼ Sec 20 T 16 N, R 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 43202 MOUNTAIN HIGHWAY EATONVILLE,WA.

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ]
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 101 feet. Depth of completed well 101 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from 0 ft. to 101 ft.
Welded [X] " Diam. from ft. to ft.
Liner installed [ ]
Threaded [ ] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 20 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 49 ft. below top of well Date 1-24-92
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 10 gal./min. with ft. drawdown after 1 hrs.
Airtest gal./min. with stem at ft. for hrs.
Artesian flow Date
Temperature of water Was a chemical analysis made? Yes [X] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
brown sand & gravel	0'	6'
gray sand,gravel,clay,	[illegible]	[illegible]
boulders	[illegible]	[illegible]
silty brown sand & gravel-	[illegible]	[illegible]
some clay-water 12 gpm	69'	101'

Work started 1-22-92, 19. Completed 1-24-92, 19

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME S-K PUMP & DRILLING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 32519 MT.HWY.EATONVILLE,WA. 98328
(Signed) Richard Braun (WELL DRILLER) License No. 1065
Contractor's Registration No. S-K Pumd*136N1 Date 8-21, 19 92

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329-

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Start Card No. W 094677

UNIQUE WELL I.D. # ACW 405

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name Norman & Joan Hofer Address 305 E 90th, Tacoma, WA 98445

(2) LOCATION OF WELL: County Pierce — NW 1/4 NE 1/4 Sec. 21 T. 16 N. R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 9623 435th St Ct E, Eatonville, WA 98328

(3) PROPOSED USE: ■ Domestic ☐ Irrigation ☐ DeWatering Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ■ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ■ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches. Drilled 280 feet. Depth of completed well 280 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from +2 ft. to 280 ft.
Welded ■ Liner installed ☐ Threaded ☐
Diam. from _____ ft. to _____ ft.
Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ■
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ■
Manufacturer's Name _____ Model No. _____
Type _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ■ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ■ No ☐ To what depth? 18 ft.
Material used in seal Bentonite 3/4 Chips
Did any strata contain unusable water? Yes ☐ No ■
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ H.P. _____
Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 188 ft. below top of well Date 8/27/97
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 30 gal./min. with stem set at 270 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Gravel, Silty Sand, Brown	0	30
Sand, Brown	30	40
Silty Gravel & Sand, Brown	40	48
Sandy Silt, Brown	48	70
Gravel, Silty Sand, Grey	70	105
Silty Sand, Light Brown	105	120
Silty Sand, Grey	120	190
Gravel, Silty Sand, Grey Moist 1GPM	190	240
Silty Sand & Gravel, & Wood	240	260
Reddish Grey, Moist 2 GPM		
Gravel, Sand & Silt	260	280
Grey, Wet 30 GPM		

Work Started 8/26/97, 19. Completed 8/27, 19 97

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Tacoma Pump & Drilling Co. Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 30316 Mtn. Hwy. E Graham, WA 98338

(Signed) [signature] (WELL DRILLER) License No. 1964

Contractor's Registration No. TACOMPD203PF Date 8/27, 19 97

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File: Orig. & First Copy - Dept of Ecology
Second Copy - Owner; Third Copy - Driller

WATER WELL REPORT
State of Washington

Start Card No. W093427
Unique Well ID 1
Water Right Permit No.

(1) OWNER: Name PAM BUCKINGHAM Address 8212 358TH ST E EATONVILLE WA 98328 Page 1 of
(2) LOCATION OF WELL: County PIERCE NE 1/4 NE 1/4 Sec 21 T 16 N R 4 E
(2a) STREET ADDRESS OF WELL (or nearest address) 10103 E 435TH ST CT EATONVILLE WA

(3) PROPOSED USE: DOMESTIC
(4) Type of work: NEW WELL
Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 263 feet. Depth of completed well 263 ft.

(6) CONSTRUCTION DETAILS:
Casing instld: 6 " Diam. from 0 ft. to 263 ft.
Welded X " Diam. from ft. to ft.
Liner _ " Diam. from ft. to ft.
Threaded _

Perforations: Yes _ No X
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes _ No X
Manufacturer's Name
Type Model No
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes _ No X Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes X No _ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes _ No X
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi
Type Sub. H.P. 1.5

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 216 ft. below top of well Date 07/29/97
Artesian pressure lbs. per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? ___ By whom?
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Recovery data:

Time	Wtr. Lvl.	Time	Wtr. Lvl.	Time	Wtr. Lvl.

Date of test
Bailer test 0 gal/min with ft. drawdown after hr
Airtest 8 gal/min with stem set at 253 ft. for 2 hrs
Artesian flow 0 gal/min Date
Temperature of water Was chemical analysis made? YES

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION

Material	From	To
CLAY, GRAVEL, SAND	0	20
BOULDERS	20	23
GRAVEL, CLAY	23	25
GRAVELS	25	60
GRAVEL	60	80
GRAVEL, CLAY, BOULDERS	80	100
BROWN CLAY AND SANDY GRAVEL,-HARD	100	115
BOULDER	115	117
GRAVEL, COBBLES, BROWN AND GREY CLAY BOULDERS	117	180
PACKED GRAVEL, CLAY HARD	180	197
SANDY CLAY SOFT	197	210
GRAVEL CLAY BINDER SEAPAGE	210	250
GRAVEL, ALITTLE CLAY WATER	250	260
PINKISH GREY SILTY SAND CLAY-PACKED	260	263

Work Started 07/25/97 Completed 07/29/97

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction this well, and its compliance with all Washington well construction standards. Materials used and the information report above are true to my best knowledge and belief.
Name RICHARDSON WELL DRILLING
Address P.O. Box 44427 Tacoma WA 98444

(Signed) Ronald E Jones Lic. No 1547
(Well Driller)
Contractor's Registration No. RICHAW*3210B Date 08/05/
Based on form ECL 050-1-20 (2/93)**f-1329- by Speed Systems Co

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W 094664
UNIQUE WELL I.D. # ACW 402
Water Right Permit No. _____

(1) OWNER: Name Ted Schlosser Address 15104 112th Ave. E. Puyallup, WA 98374

(2) LOCATION OF WELL: County Pierce - NW 1/4 NW 1/4 Sec 22 T. 16 N., R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 10212 438th St. Ct. E. Eatonville, WA 98328

(3) PROPOSED USE: ■ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ■ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ■ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 138 feet. Depth of completed well 138 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from +2 ft. to 138 ft.
Welded ■ Liner installed ☐ Threaded ☐
" Diam. from ft. to ft.
" Diam. from ft. to ft.

Perforations: Yes ☐ No ■
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ■
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ■ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ■ No ☐ To what depth? 18 ft.
Material used in seal Bentonite 3/4 Chips
Did any strata contain unusable water? Yes ☐ No ■
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 96 ft. below top of well Date 7-24-97
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airlift 50 gal./min. with stem set at 130 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Silty-gravel & sand Brown	0	2
Gravel & sand	2	12
Silty-sand & gravel Brown	12	28
Gravel, sand & silt Brown, wet 4 gpm	28	35
Silty-sand & gravel Gray	35	85
Gravel, sand & silt Brown	85	91
Cuttings wet		
Boulders, hard Black	91	96
Gravel, sand & silt Gray, moist 50gpm	96	139

RECEIVED 97 AUG -6 AM 10:27 DEPT. OF ECOLOGY SOUTHWEST REGIONAL OFFICE

Work Started 7-23, 19. Completed 7-24, 19 97

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Tacoma Pump & Drilling Co. Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 30316 Mtn. Hwy. E Graham, WA 98338
(Signed) [signature] (WELL DRILLER) License No. 1964
Contractor's Registration No. TACOMPD203PF Date 7-24, 19 97

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93) * * *

W 094335

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. ~~W 094335~~
UNIQUE WELL I.D. # ABE 362
Water Right Permit No. _____

(1) OWNER: Name Hugh Higham Address PO Box 1633 Eatonville WA 98328

(2) LOCATION OF WELL: County Pierce NW ¼ NE ¼ Sec 22 T. 16 N., R. 4E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) 44009 106 th AVE E

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 79 feet. Depth of completed well 79 ft.

(6) CONSTRUCTION DETAILS:
Casing Installed: 6" Diam. from 2 ft. to 0 ft.
Welded ☐ 6" Diam. from 0 ft. to 78 ft.
Liner installed ☐
Threaded ☐ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☒ No ☐ Size of gravel 18
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☐ To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 60.5 ft. below top of well Date 9-10-98
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.))

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 15+ gal./min. with stem set at 70 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
med Brn sand gravel cobbles	0	11
Dk Brn Sand gravel boulders	11	13
Grey Silts moist boulders	13	16
Blu grey silt gravel boulders	16	27
Grey Silts	27	70
Grey silt w/sm gravel & sand	70	73
Course Dk Brn sand gravel	73	75
Course Dk Brn sand gravel wet	75	79
Blu Grey silts w/ gravel	79	

Work started 9-10-98, 19. Completed 9-10, 98

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 10621 Todd Rd E Puyallup 98372
(Signed) [signature] (WELL DRILLER) License No. 1099
Contractor's Registration No. HOLTDI*J3606 Date 9-29-98, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329-

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

10U

WATER WELL REPORT

start card number- 063460

owner- CAREY FORESTER address- PO BOX 566, SPANAWAY, WA.

location of well, county- PIERCE NE1/4 NE1/4 SEC 22 TN 16N R 4EWM
street address of well- SR 161, WEST OF EATONVILLE

proposed use- COMMUNITY

number of well- ONE

type of work- NEW CONSTRUCTION

method of construction- AIR ROTARY

dimensions- diameter- 6"
drilled- 350' completed- 350'

construction details
casing installed- 6" from +2 'to 78 '
- " from 'to '
welded- YES liner installed- NO

perforations- NO
type of perforater-
size of perforations-
to-
to-

screen- NO
manufacturer
type- model no.-
dia- size- from-
dia- size- from-

surface seal to- 18'
material used- BENTONITE
did any strata contain unusable water?
NO depth of strata ' TO '
type of water-
method of sealing-

water levels on this date- 01/28/91
land surface elevation- UNKNOWN
static level below top of casing- 44 '

well test
was a pump test made? NO
by whom- date-
for results see attached.

air test-
3.5gpm with bit set at- 340'for 1 HR

DESCRIPTION - WELL LOG

MATERIALS		FROM	TO
BROWN	CLAY,ROCKS	0	8
BROWN-GRAY	GRAVEL	8	35
SMALL BOULDER AT 8'			
BIG BOULDER		26	30
DRK RED	CLAY	35	38
RED VERY STICKY	CLAY	38	53
DRK RED	CLAY	53	74
DARK GRAY BROKEN	ROCK	74	78
SWITCHED TO DTH HAMMER			
TAN TO LIGHT BLUE	ROCK	78	98
YELLOW ROCK (2 GPM)		98	105
TAN TO LIGHT BLUE	ROCK	105	118
BLUE GRAY	ROCK	118	125
BROWN/DRK RED/ PURPLE	ROCK	125	136
DRK BLUE GRAY	ROCK	136	164
RED	ROCK	164	176
DRK BLUE/GRAY	ROCK	176	221
DRK BLUE/GRAY,BROKEN LAYERS			
OF WHITE ROCK		221	224
DRK BLUE/GRAY	ROCK	224	298
3.5 GPM TOTAL YIELD @ 240'			
DRK BLUE/GRAY THIN LAYERS			
OF RED ROCK		298	331
GREEN/GRAY	ROCK	331	333
DARK BLUE/GRAY	ROCK	333	336
SAME WITH LAYERS OF WHITE		336	337
SAME WITH LAYERS OF RED		337	350

STARTED- 01 17 91 COMPLETED 01 28 91

WELL CONSTRUCTERS CERTIFICATION
I accept responsibility for construction of this well and its compliance with all Washington well construction standards. The information reported above is true to my best knowledge and belief.

KING BROS. DRILLING INC.
644 Shorey Road
Chehalis, Washington 98532
206-748-3798

contractors number- KING BDI 124 DC

CURTIS M. KING License# 0609

DATE 01/30/91

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Roy L. VanBuskirk Address P.O. Box 192 Eatonville, Wa. 98328

(2) LOCATION OF WELL: County Pierce — NE ¼ NW ¼ Sec. 23 T. 16 N., R. 4E W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 38 ft. Depth of completed well 38 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 38 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 22 ft. below top of well Date 3-21-85
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 9 gal./min. with 14 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 3-21-85
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top soil	0	1
Gravel & boulders	1	12
Hardpan, boulders & seepage	12	18
Hardpan & boulders	18	28
Alittle water, gravel & clay	28	34
Water, gravel & clay	34	38

RECEIVED 85 MAY 31 AM 10:18 DEPARTMENT OF ECOLOGY S.W. REGIONAL OFFICE

Work started 3-21, 19 85 Completed 3-21, 19 85

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co. (Person, firm, or corporation) (Type or print)

Address P.O. Box 44427 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No. 0419 Date 5-29, 19 85

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

Please print, sign and return to the Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

Construction/Decommission

☑ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 146602

Current Notice of Intent No. WE01768

Unique Ecology Well ID Tag No. AKT 667

Water Right Permit No. _____

Property Owner Name Town of Eatonville

Well Street Address 401XX Weyerhauser Road South

City Eatonville County Pierce

Location NE 1/4-1/4 NE 1/4 Sec 23 Twn 16 R 4E EWM ☑ or WWM ☐ circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0416231011

PROPOSED USE: ☐ Domestic ☐ Industrial ☑ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) #7

☑ New well ☐ Reconditioned ☐ Deepened

Method ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 97 ft

Depth of completed well 93.5 ft

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 12 " Diam from +2 ft to 73 ft

☐ Liner installed _____ " Diam from _____ ft to _____ ft

☐ Threaded _____ " Diam from _____ ft to _____ ft

Perforations: ☐ Yes ☑ No

Type of perforator used _____

SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens: ☑ Yes ☐ No ☑ K-Pac Location 69.5

Manufacturer's Name Nagaoka

Type Stainless Wire Wrap Model No _____

Diam 11 Slot size 90 from 73.5 ft to 83.5 ft

Diam 11 Slot sump from 83.5 ft to 93.5 ft

Gravel/Filter packed: ☐ Yes ☑ No ☐ Size of gravel/sand _____

Materials placed from _____ ft to _____ ft

Surface Seal: ☑ Yes ☐ No To what depth? 18 ft

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type _____ H P _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft

Static level 16.5 ft below top of well Date 3/1/04

Artesian pressure _____ lbs per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☑ Yes ☐ No If yes, by whom? Golder w/T.P.D.

Yield 430 gal /min with 15 ft drawdown after 24 hrs

Yield 430 gal /min with 16 ft drawdown after 48 hrs

Yield 430 gal /min with 16.5 ft drawdown after 72 hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
Recovered	after	20 Minutes	80%		
1 hour	for	100%	recovery.		

Date of test _____

Bailer test _____ gal /min with _____ ft drawdown after _____ hrs

Airtest 300+ gal /min with stem set at 60 ft for 1 hrs

Artesian flow _____ g p m Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Dry brown, gray silty sandy cobbles with boulders.	0	9
Moist olive gray medium gravel, with olive black sandy silt.	9	15
Boulder.	15	17
Dark yellow brown silty sandy gravel with trace sticky clay	17	21
Soft brown, orange sandy silt, trace medium gravel.	21	25
Soft light gray olive clay silt with trace sand. Gravel	25	41
Wet, yellow, brown, orange silty medium sand with gravel.	41	80
Dark gray, boulder	80	83
Wet gray silty sandy medium gravel.	83	87
Green gray silty medium to coarse gravel with light gray clay.	87	97
Soft sticky olive gray clay	97	99
03-1052-11		

Start Date 1/20/04 Completed Date 3/4/04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Driller/Engineer/Trainee Name (Print) Matthew Call

Driller/Engineer/Trainee Signature _____

Driller or trainee License No 2571

If TRAINEE, Driller's Licensed No. _____

Driller's Signature _____

Drilling Company Tacoma Pump & Drilling Co., Inc

Address 30316 Mountain Highway

City, State, Zip Graham, WA 98338

Contractor's Registration No TACOMPD203PF Date 3/8/04

RECEIVED MAR 17 2004

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 2/03)

Washington State Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Martin Olson Address Rt 3 Box 366 Eatonville Wa 98328

(2) LOCATION OF WELL: County Pierce — ¼ SE ¼ Sec 24 T 16 N., R 4 E W.M.

Bearing and distance from section or subdivision corner auditors # 2840479

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 280 ft. Depth of completed well 280 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 280 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 80 ft. below top of well Date 6-3-85
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test 1½ gal./min. with ..... ft. drawdown after 1 hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
brown clay & gravel large rocks	0	34'
tan gray clay	34'	41'
brown clay	41'	73'
brown clay & gravel	73'	75'
brown clay	75'	84'
blue gray clay	84'	100
blue clay & sandy gravel	100	103
brown sandy clay	103'	108'
brown clay & pete	108'	140'
gray clay	140'	167'
tan clay	167'	242'
blue green rock	242'	261'
dark red cinders & black basalt fractured	261'	270'
dark gray basalt	270'	280'

Work started 5-31, 19 85 Completed 6-3, 19 85

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Stoican Drilling Inc (Person, firm, or corporation) (Type or print)
Address 32519 Mt Hwy Eatonville Wa 98328
[Signed] Thomas L. Kettenberg (Well Driller)
License No. 0240 Date 7-4, 19 85

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File: Orig. & First Copy - Dept of Ecology
Second Copy - Owner; Third Copy - Driller

WATER WELL REPORT
State of Washington

Start Card No. W108384
Unique Well ID AEA177
Water Right Permit No.

(1) OWNER: Name GERALD D PETERSEN Address 3119 TYEE DR. UNIVERSITY PL. WA 98466
(2) LOCATION OF WELL: County PIERCE SE 1/4 NW 1/4 Sec 30 T 16 N R 5 E
(2a) STREET ADDRESS OF WELL (or nearest address) 15108 E SCOTT TURNER RD EATONVILLE WA

(3) PROPOSED USE: DOMESTIC
(4) Type of work: NEW WELL
Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 160 feet. Depth of completed well 160 ft.

(6) CONSTRUCTION DETAILS:
Casing instld: 6 " Diam. from 0 ft. to 160 ft.
Welded X " Diam. from ft. to ft.
Liner _ " Diam. from ft. to ft.
Threaded _

Perforations: Yes _ No X
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes _ No X
Manufacturer's Name
Type Model No
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes _ No X Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes X No _ To what depth? 20 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes _ No X
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P. 0

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 109 ft. below top of well Date 10/08/98
Artesian pressure lbs. per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? ___ By whom?
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Recovery data:

Time	Wtr. Lvl.	Time	Wtr. Lvl.	Time	Wtr. Lvl.

Date of test
Bailer test 0 gal/min with ft. drawdown after hr
Airtest 16 gal/min with stem set at 160 ft. for 2 hrs
Artesian flow 0 gal/min Date
Temperature of water Was chemical analysis made? YES

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION

Material	From	To
BROWN STICKY CLAY, OCCASSIONAL GRAVEL	0	24
BROWN CLAY, GRAVELS, COBBLES	24	54
BLACK HARAD BEDROCK, SOME FRACTURES,WTR	54	85
GREY SEMI HARD SANDSTONE	85	102
HARD GREY ROCK	102	160

Work Started 10/07/98 Completed 10/08/98

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction this well, and its compliance with all Washington well construction standards. Materials used and the information report above are true to my best knowledge and belief.
Name RICHARDSON WELL DRILLING
Address P.O. Box 44427 Tacoma WA 98444

(Signed) [signature] Lic. No 2017
(Well Driller)
Contractor's Registration No. RICHAW*3210B Date 10/19/
Based on form ECL 050-1-20 (2/93)**f-1329- by Speed Systems Co

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Corrected copy

File: Orig. & First Copy - Dept of Ecology
Second Copy - Owner; Third Copy - Driller

WATER WELL REPORT
State of Washington

Start Card No. W 071902
Unique Well ID ABA839
Water Right Permit No.

(1) OWNER: Name SUE GRISWOLD Address PO BOX 1108 EATONVILLE WA 98328 Page 1 of [redacted]
(2) LOCATION OF WELL: County PIERCE NW 1/4 SE 1/4 Sec [redacted]
(2a) STREET ADDRESS OF WELL (or nearest address) 15904 E 456TH ST EATONVILLE WA

163

(3) PROPOSED USE: DOMESTIC
(4) Type of work: NEW WELL
Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 243 feet. Depth of completed well 243 ft.

(6) CONSTRUCTION DETAILS:
Casing instld: 6 " Diam. from 0 ft. to 147.6 ft.
Welded X 4 " Diam. from 0 ft. to 240 ft.
Liner _ " Diam. from ft. to ft.
Threaded _

Perforations: Yes X No _
Type of perforator used SAW CUT
Size of perforations 1 1/2 in. by 1/4 in.
perforations from 220 ft. to 240 in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes _ No X
Manufacturer's Name
Type Model No
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes _ No X Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes X No _ To what depth? 21 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes _ No X
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P. 0

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level 117.2 ft. below top of well Date 08/16/96
Artesian pressure lbs. per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? ___ By whom?
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Recovery data:

Time	Wtr. Lvl.	Time	Wtr. Lvl.	Time	Wtr. Lvl.

Date of test
Bailer test 0 gal/min with ft. drawdown after hr
Airtest 3 gal/min with stem set at 237 ft. for 1 hrs
Artesian flow 0 gal/min Date
Temperature of water Was chemical analysis made? NO

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION

Material	From	To
TOPSOIL	0	1
BROWN CLAY, GRAVELS	1	7
BROWN STICKY CLAY	7	26
BROWN CLAY GRAVELS	26	73
BROWN CLAY, GRAVELS, COBBLES	73	86
BOULDER	86	88
BROWN CLAY, GRAVELS, COBBLES	88	131
BOULDER	131	133
BROWN CLAY, GRAVELS, COBBLES	133	146
SOFT BROWN BEDROCK	146	160
HARD BLACK BEDROCK	160	168
HARD BLUEISH BEDROCK, FRACTURES, WATER	168	243

Work Started 08/12/96 Completed 08/16/96

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction this well, and its compliance with all Washington well construction standards. Materials used and the information report above are true to my best knowledge and belief.
Name RICHARDSON WELL DRILLING
Address P.O. Box 44427 Tacoma, WA 98444

(Signed) [signature] Lic. No 2017
(Well Driller)
Contractor's Registration No. RICHAW*3210B Date 09/05/
Based on form ECL 050-1-20 (2/93)**f-1329- by Speed Systems Co

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 02989
UNIQUE WELL I.D. # AC0943
Water Right Permit No.

(1) OWNER: Name Rick Roehr Address 25402 34th Ave E, Spanaway, WA 98387

(2) LOCATION OF WELL: County Pierce - W ½ 1/4 SE 1/4 Sec 30 T. 16 N., R. 5E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 45922 162nd Ave E, Eatonville, WA 98328

(3) PROPOSED USE: [X] Domestic [ ] Irrigation [ ] DeWater [ ] Industrial [ ] Test Well [ ] Municipal [ ] Other

(4) TYPE OF WORK: Owner's number of well (if more than one)
Abandoned [ ] New well [X] Deepened [ ] Reconditioned [ ] DR24
Method: Dug [ ] Cable [ ] Rotary [X] Bored [ ] Driven [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 125 feet. Depth of completed well 100 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from 0 ft. to 100 ft.
Welded [X] " Diam. from ft. to ft.
Liner installed [ ] " Diam. from ft. to ft.
Threaded [ ]

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [ ] No [X]
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Quick Grout
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 61 ft. below top of well Date 8/26
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [ ] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 3 gal./min. with stem set at 100 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Silty sand & gravel brown	0	12
Silty sand & gravel grey	12	17
Silty sand & gravel brown	17	65
Silty sand & gravel greenish blue	65	72
Silty stone grey	72	117
Rock black	117	125

Work Started 8/22/96, 19. Completed 8/26, 19 96

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Tacoma Pump & Drilling Co., Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 30316 Mnt. Hwy, Graham, WA 98338

(Signed) (WELL DRILLER) License No. 1964

Contractor's Registration No. TACOMPD 203PF Date 9/4/, 19 96

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

Section F-F'

Please print, sign and return to the Department of Ecology

well 6

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

Construction/Decommission

☑ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

150081

Current Notice of Intent No. WE01620

Unique Ecology Well ID Tag No. AHG 991

Water Right Permit No. _____

Property Owner Name Town of Eatonville

Well Street Address 401xx Weyerhauser Road South

City Eatonville County Pierce

Location NE 1/4-1/4 NE 1/4 Sec 23 Twn 16 R 4E EWM ☑ or WWM ☐ circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0416231011

PROPOSED USE: ☑ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☑ New well ☐ Reconditioned ☐ Deepened *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 73.5 ft

Depth of completed well 73.5 ft

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 12" Diam from +2 ft to 68 ft

☐ Liner installed _____" Diam from _____ ft to _____ ft

☐ Threaded _____" Diam from _____ ft to _____ ft

Perforations: ☐ Yes ☑ No

Type of perforator used _____

SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens: ☑ Yes ☐ No ☑ K-Pac Location 55.4

Manufacturer's Name Johnson

Type V. Wire Model No _____

Diam 11 Slot size 0.090 from 59.5 ft to 69.5 ft

Diam _____ Slot size _____ from _____ ft to _____ ft

Gravel/Filter packed: ☐ Yes ☐ No ☐ Size of gravel/sand _____

Materials placed from _____ ft to _____ ft

Surface Seal: : ☑ Yes ☐ No To what depth? 18 ft

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type _____ H P _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft

Static level 19.4 ft below top of well Date 01/20

Artesian pressure _____ lbs per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☑ Yes ☐ No If yes, by whom? T.P.D.

Yield 230 gal /min with 25 ft drawdown after 72 hrs

Yield _____ gal /min with _____ ft drawdown after _____ hrs

Yield _____ gal /min with _____ ft drawdown after _____ hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal /min with _____ ft drawdown after _____ hrs

Airtest W/A gal /min with stem set at _____ ft for _____ hrs

Artesian flow _____ g p m Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Loose brown silty cobbles with gravel	0	9
Brown silty gravel with cobbles.	9	20
Moist brown rusty colored silty sandy gravel with cobbles.	20	40
Dark yellowish brown silty medium sand with fine gravel.	40	58
Light brown silty medium sand with gravel.	58	71.5
Dense dark gray with black basalt.	71.5	73.5
Screen Assembly:		
K-packer	55.4	56.1
10" riser	56.1	59 5
11" x 0.090 screen	59.5	69.5
10" sump	69.5	73.5
Notes: Drilling started 11/24/03		
Drilling completed 11/24/03		
03-1052-11		

Start Date 11/24/03 Completed Date 1/20/04

RECEIVED JAN 29 2004 Washington State Department of Ecology

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Driller/Engineer/Trainee Name (Print) Matthew Call

Driller/Engineer/Trainee Signature _____

Driller or trainee License No 2571

Drilling Company Tacoma Pump & Drilling Co., Inc.

Address 30316 Mountain Highway

City, State, Zip Graham, WA 98338

Contractor's Registration No TACOMPD203PF Date 1/26/04

If TRAINEE,

Driller's Licensed No. _____

Driller's Signature _____

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 2/03)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

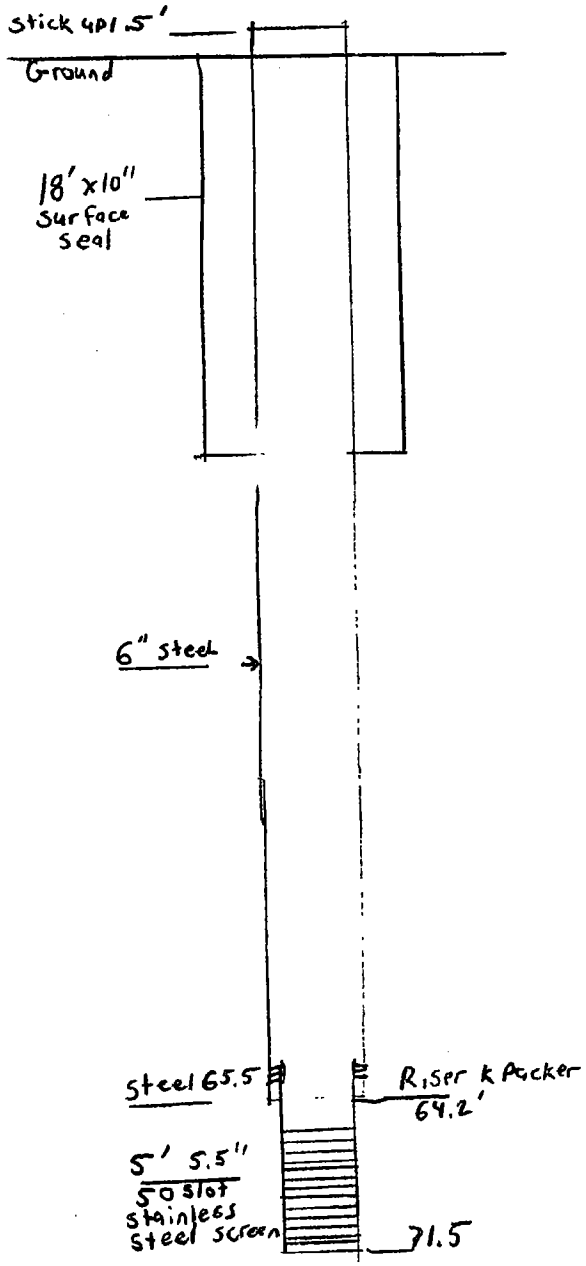
142203

Washington State Resource Protection Well Report

Project Name: Town of Eatonville
Well Identification: TW-03-03
Drilling Method:
Rotary [X] Cabletool [ ] Auger [ ] Other [ ]
Type of work:
New Construction [X] Conversion [ ] Abandonment [ ]
Driller: Mark Wiese

Start Card No.: RE00686 Unique No.: AHG 947
Location: T 16 R 4E Sec 23
NE 1/4 NE 1/4
County: Pierce
Address: Weyerhauser Road
Eatonville, WA

Signature: [signature]
Date: 10/31/03
Drilling Contractor: *Tacoma Pump and Drilling*
Geologist: Tim White



Well Log.	From	To
Brown gravel sand silt.	0	10
Brown gravel sand silt wet.	10	28
Brown gravel sand silt water bearing.	28	71.5
Basalt.	71.5	75

Finished Depth: 71.3 ft
Static Level: 23 ft
Date Started: 10/14/03
Date Finished: 10/15/03

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NOV 07 2003
Washington State Department of Ecology

Please print, sign and return to the Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Construction/Decommission

☑ Construction
☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 146602

Current Notice of Intent No. WE01768

Unique Ecology Well ID Tag No. AKT 667

Water Right Permit No. _____

Property Owner Name Town of Eatonville

Well Street Address 401XX Weyerhauser Road South

City Eatonville County Pierce

Location NE 1/4-1/4 NE 1/4 Sec 23 Twn 16 R 4E EWM ☑ or WWM ☐ circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0416231011

PROPOSED USE: ☐ Domestic ☐ Industrial ☑ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) #7

☑ New well ☐ Reconditioned ☐ Deepened *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 97 ft

Depth of completed well 93.5 ft

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 12" Diam from +2 ft to 73 ft
☐ Liner installed _____" Diam from _____ ft to _____ ft
☐ Threaded _____" Diam from _____ ft to _____ ft

Perforations: ☐ Yes ☑ No

Type of perforator used _____

SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens: ☑ Yes ☐ No ☑ K-Pac Location 69.5

Manufacturer's Name Nagaoka

Type Stainless Wire Wrap Model No _____

Diam 11 Slot size 90 from 73.5 ft to 83.5 ft

Diam 11 Slot ~~size~~ sump from 83.5 ft to 93.5 ft

Gravel/Filter packed: ☐ Yes ☑ No ☐ Size of gravel/sand _____

Materials placed from _____ ft to _____ ft

Surface Seal: ☑ Yes ☐ No To what depth? 18 ft

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type _____ H P _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft

Static level 16.5 ft below top of well Date 3/1/04

Artesian pressure _____ lbs per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☑ Yes ☐ No If yes, by whom? Golder w/TP.D.

Yield 430 gal /min with 15 ft drawdown after 24 hrs

Yield 430 gal /min with 16 ft drawdown after 48 hrs

Yield 430 gal /min with 16.5 ft drawdown after 72 hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
Recovered		after	20 Minutes	80%	
1 hour		for	100%	recovery	

Date of test _____

Bailer test _____ gal /min with _____ ft drawdown after _____ hrs

Airtest 300+ gal /min with stem set at 60 ft for 1 hrs

Artesian flow _____ g p m Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Dry brown, gray silty sandy cobbles with boulders.	0	9
Moist olive gray medium gravel, with olive black sandy silt.	9	15
Boulder.	15	17
Dark yellow brown silty sandy gravel with trace sticky clay	17	21
Soft brown, orange sandy silt, trace medium gravel.	21	25
Soft light gray olive clay silt with trace sand. Gravel	25	41
Wet, yellow, brown, orange silty medium sand with gravel.	41	80
Dark gray, boulder	80	83
Wet gray silty sandy medium gravel.	83	87
Green gray silty medium to coarse gravel with light gray clay.	87	97
Soft sticky olive gray clay	97	99
03-1052-11		

Start Date 1/20/04 Completed Date 3/4/04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Driller/Engineer/Trainee Name (Print) Matthew Call

Driller/Engineer/Trainee Signature _____

Driller or trainee License No 2571

Drilling Company Tacoma Pump & Drilling Co., Inc

Address 30316 Mountain Highway

City, State, Zip Graham, WA 98338

Contractor's Registration No TACOMPD203PF Date 3/8/04

If TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

RECEIVED
MAR 17 2004

Ecology is an Equal Opportunity Employer

ECY 050-1-20 (Rev 2/03)

Washington State
Department of Ecology

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

TW-03-04

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

Construction/Decommission

☑ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 177435

Current Notice of Intent No. RE00731

Unique Ecology Well ID Tag No. AHG 983

Water Right Permit No.

Property Owner Name Town of Eatonville

Well Street Address Weyerhauser Road & Alder Cut Off

City Eatonville County Pierce

Location NW1/4-1/4 NW1/4 Sec 24 Twn 16 R 4 EWM or WWM ☑ circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. 0416242011

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☑ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)

☑ New well ☐ Reconditioned ☐ Deepened

Method: ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 87.5 ft.

Depth of completed well 87.5 ft.

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 6" Diam. from +2.5 ft. to 85 ft.

☐ Liner installed ____" Diam. from ____ ft. to ____ ft.

☐ Threaded ____" Diam. from ____ ft. to ____ ft.

Perforations: ☐ Yes ☑ No

Type of perforator used

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☑ Yes ☐ No ☑ K-Pac Location 75

Manufacturer's Name Johnson

Type S.S. Model No.

Diam. 5 Slot size 80 from 80 ft. to 85 ft.

Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel/Filter packed: ☐ Yes ☑ No ☐ Size of gravel/sand

Materials placed from ____ ft. to ____ ft.

Surface Seal: ☑ Yes ☐ No To what depth? 19 ft.

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? Depth of strata

Method of sealing strata off

PUMP: Manufacturer's Name

Type: H.P.

WATER LEVELS: Land-surface elevation above mean sea level ____ ft.

Static level 27 ft. below top of well Date 11/26/03

Artesian pressure ____ lbs. per square inch Date

Artesian water is controlled by (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☑ No If yes, by whom?

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.

Airtest 60 gal./min. with stem set at 73 ft. for 3 hrs.

Artesian flow ____ g.p.m. Date

Temperature of water ____ Was a chemical analysis made? ☐ Yes ☑ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Loose brown silty gravel with cobbles.	0	6
Rusty-orange brown silty gravel with cobbles.	6	24
Olive-grey silty fine sand with gravel (medium).	24	63
Brown silty medium sand with fine gravel.	6	80
Pink-red coarse sandy boulder.	80	82
Wet gray olive sandy gravel.	82	86
Medium dense broken basalt with medium gravels.	86	87
Denser blue-gray basalt.		

RECEIVED

AUG 12 2005

Washington State Department of Ecology

03-1052-11

Start Date 11/25/03 Completed Date 11/26/03

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller/Engineer/Trainee Name (Print) Matthew Call

Driller/Engineer/Trainee Signature Helen Gilbert 2320 for Matthew Call

Driller or trainee License No. 2571

If TRAINEE,

Driller's Licensed No.

Driller's Signature

Drilling Company Tacoma Pump & Drilling Co., Inc.

Address 30316 Mountain Highway

City, State, Zip Graham, WA 98338

Contractor's Registration No. TACOMPD203PF Date 12/12/03

Ecology is an Equal Opportunity Employer. ECY 050-1-20 (Rev 2/03)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WELL #5

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 8415
Permit No. 83555

(1) OWNER: Name TOWN OF EATONVILLE Address P.O. BOX 296 EATONVILLE, WA.

(2) LOCATION OF WELL: County PIERCE — NE¼ NE¼ Sec. 23 T. 16N. R. 4E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☑ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 5
New well ☑ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Cable ☒ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" inches.
Drilled 71.5 ft. Depth of completed well ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from 0 ft. to 70 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☑ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☑
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☑ No ☐
Manufacturer's Name JOHNSON
Type STAINLESS STEEL Model No. PIPE SIZE
5' Diam. 8" Slot size 150 from 61 ft. to 71 ft.
5' Diam. 8" Slot size 100 from ft. to ft.

Gravel packed: Yes ☑ No ☐ Size of gravel: 3/8 —
Gravel placed from 25 ft. to 70.8 ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal CONCRETE
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 30 ft. below top of well Date JUNE 1976
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom?
Yield: 125 gal./min. with 15 ft. drawdown after 4 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOPSOIL	0	6
ROCK & CLAY	6	22
LARGE GRAVEL	22	24
GRAVEL & CLAY	24	47.5
SAND, GRAVEL, CLAY, WATER	47.5	68.5
ROCK, CLAY, BEDROCK	68.5	71.5

RECEIVED
AUG 31 1977
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started MAY 1976. Completed JUNE 1976

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME TACOMA PUMP & DRILLING CO. INC (Person, firm, or corporation) (Type or print)

Address 30316 MOUNTAIN HIGHWAY

[Signed] [signature] (Well Driller)

License No. 0193 Date SEPT 24, 1976

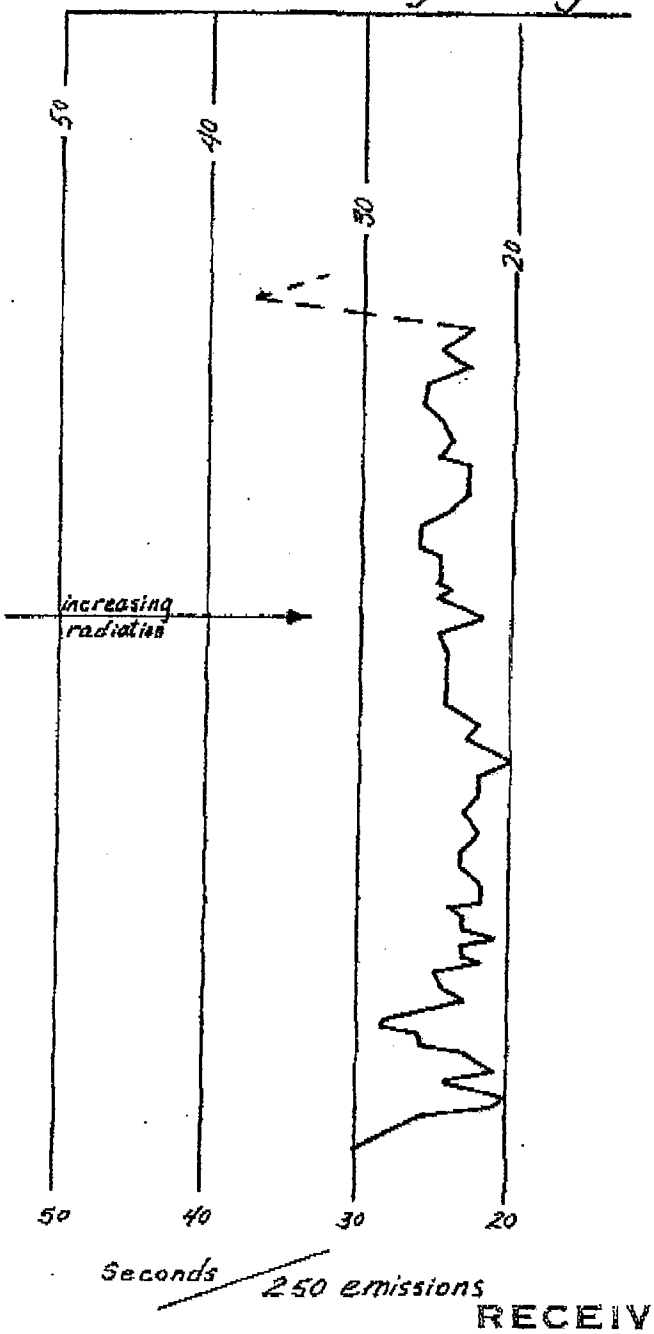
(USE ADDITIONAL SHEETS IF NECESSARY)

OK MB 1-22-79

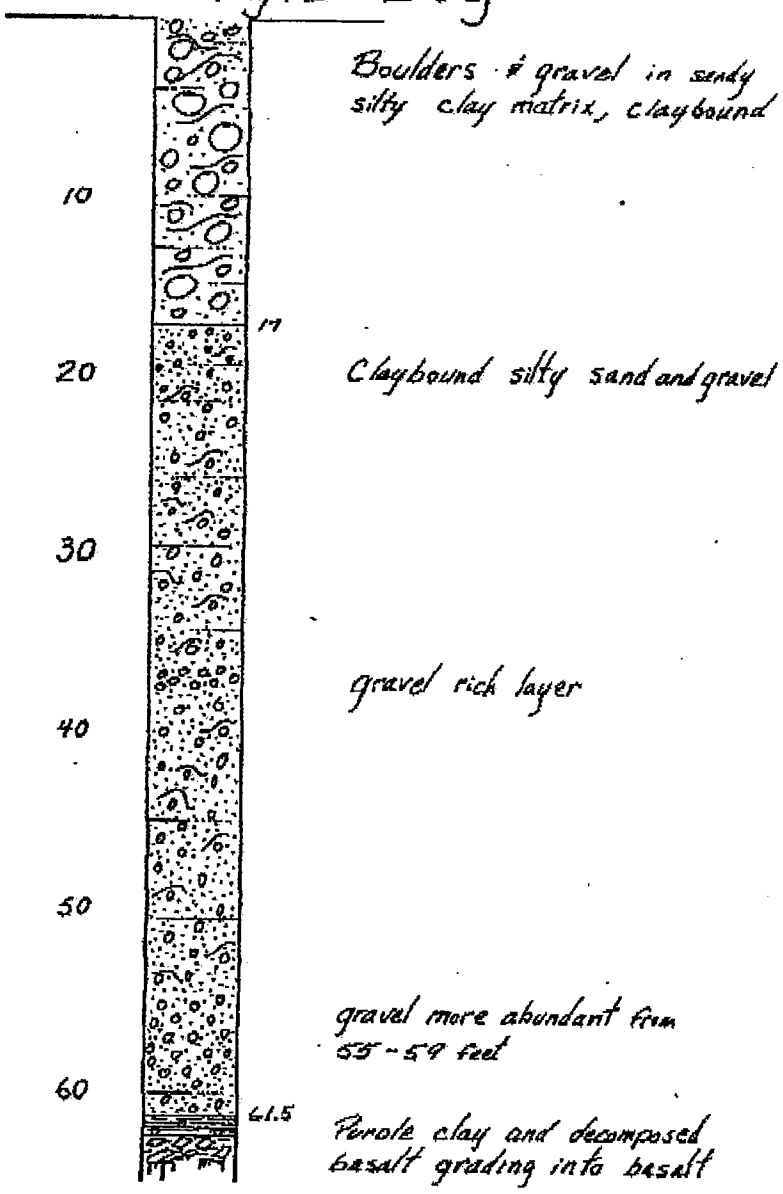
S. F. No. 7356—OS—(Rev. 4-71)
ECY-070-28

Eatonville Well No. 4

Gamma Ray Log



Geologic Log



City of Eatonville Washington	Robinson & Noble Inc. Ground Water Geologists Tacoma, Washington	April, 1976 MK

RECEIVED
JAN 18 2002
NW DRINKING WATER

figure 4

Section G-G'

Please print, sign and return to the Department of Ecology

Well 6

Water Well Report

Original – Ecology, 1st copy – owner, 2nd copy – driller

Construction/Decommission

☑ Construction
☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

150081

PROPOSED USE: ☑ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____
☑ New well ☐ Reconditioned *Method* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 12 inches, drilled 73.5 ft
Depth of completed well 73.5 ft

CONSTRUCTION DETAILS
Casing Installed: ☑ Welded 12 " Diam from +2 ft to 68 ft
☐ Liner installed _____ " Diam from _____ ft to _____ ft
☐ Threaded _____ " Diam from _____ ft to _____ ft

Perforations: ☐ Yes ☑ No
Type of perforator used _____
SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens: ☑ Yes ☐ No ☑ K-Pac Location 55.4
Manufacturer's Name Johnson
Type V. Wire Model No _____
Diam 11 Slot size 0.090 from 59.5 ft to 69.5 ft
Diam _____ Slot size _____ from _____ ft to _____ ft

Gravel/Filter packed: ☐ Yes ☐ No ☐ Size of gravel/sand _____
Materials placed from _____ ft to _____ ft

Surface Seal: ☑ Yes ☐ No To what depth? 18 ft
Material used in seal Bentonite Chips
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type _____ H P _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft
Static level 19.4 ft below top of well Date 01/20
Artesian pressure _____ lbs per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? T.P.D.
Yield 230 gal/min with 25 ft drawdown after 72 hrs
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Yield _____ gal/min with _____ ft drawdown after _____ hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal/min with _____ ft drawdown after _____ hrs
Airtest W/A gal/min with stem set at _____ ft for _____ hrs
Artesian flow _____ g p m Date _____
Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

Current Notice of Intent No. WE01620
Unique Ecology Well ID Tag No. AHG 991
Water Right Permit No. _____
Property Owner Name Town of Eatonville
Well Street Address 401xx Weyerhauser Road South
City Eatonville County Pierce
Location NE 1/4-1/4 NE 1/4 Sec 23 Twn 16 R 4E EWM ☑ or WWM ☐ circle one
Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____
Tax Parcel No. 0416231011

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
Loose brown silty cobbles with gravel	0	9
Brown silty gravel with cobbles.	9	20
Moist brown rusty colored silty sandy gravel with cobbles.	20	40
Dark yellowish brown silty medium sand with fine gravel.	40	58
Light brown silty medium sand with gravel.	58	71.5
Dense dark gray with black basalt.	71.5	73.5
Screen Assembly:		
K-packer	55.4	56.1
10" riser	56.1	59 5
11" x 0.090 screen	59.5	69.5
10" sump	69.5	73.5
Notes: Drilling started 11/24/03		
Drilling completed 11/24/03		
03-1052-11		

RECEIVED
JAN 29 2004
Washington State Department of Ecology

Start Date 11/24/03 Completed Date 1/20/04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Driller/Engineer/Trainee Name (Print) Matthew Call
Driller/Engineer/Trainee Signature _____
Driller or trainee License No 2571

Drilling Company Tacoma Pump & Drilling Co., Inc.
Address 30316 Mountain Highway
City, State, Zip Graham, WA 98338
Contractor's Registration No TACOMPD203PF Date 1/26/04

If TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Ecology is an Equal Opportunity Employer ECY 050-1-20 (Rev 2/03)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

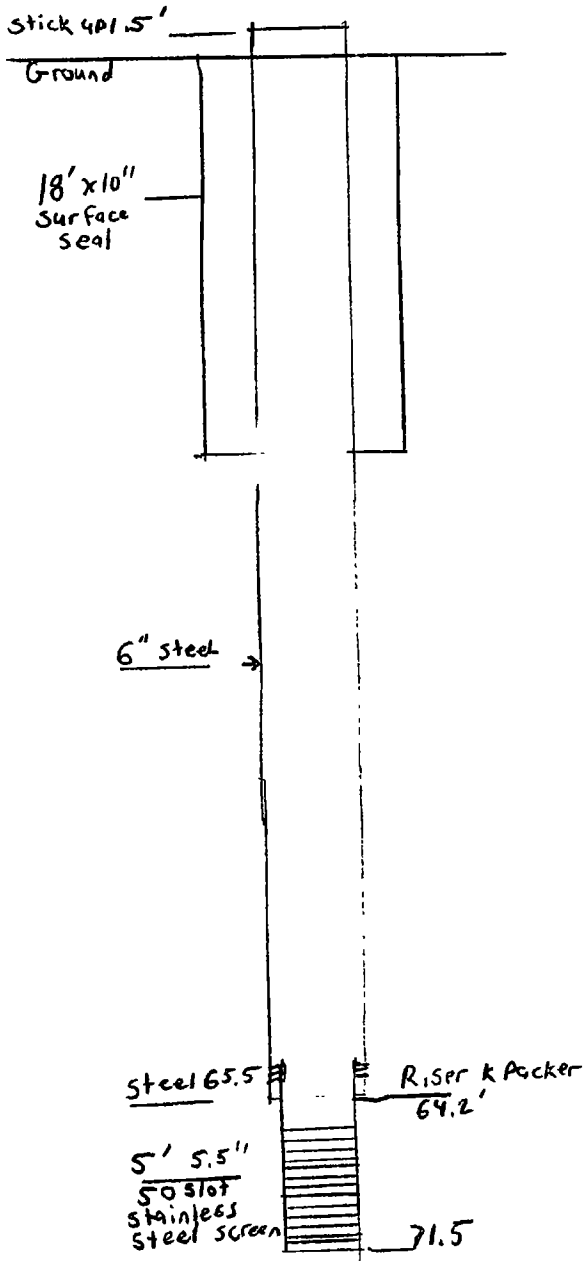
142203

Washington State Resource Protection Well Report

Project Name: Town of Eatonville
Well Identification: TW-03-03
Drilling Method:
Rotary [X] Cabletool [ ] Auger [ ] Other [ ]
Type of work:
New Construction [X] Conversion [ ] Abandonment [ ]
Driller: Mark Wiese

Start Card No.: RE00686 Unique No.: AHG 947
Location: T 16 R 4E Sec 23
NE 1/4 NE 1/4
County: Pierce
Address: Weyerhauser Road
Eatonville, WA

Signature: [signature]
Date: 10/31/03
Drilling Contractor: *Tacoma Pump and Drilling*
Geologist: Tim White



Well Log.	From	To
Brown gravel sand silt.	0	10
Brown gravel sand silt wet.	10	28
Brown gravel sand silt water bearing.	28	71.5
Basalt.	71.5	75

Finished Depth 71.3 ft

Static Level 23 ft

Date Started 10/14/03

Date Finished 10/15/03

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Washington State
Department of Ecology

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STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

5676A

Appl. #8408
Permit # 7798

WELL LOG

Record by: Driller
Source: Driller's record

Location: State of WASHINGTON
County: Pierce
Area:
Map:
NE ¼ NE ¼ sec. 23 T 16 N., R. 4 E. W.

Diagram of Section

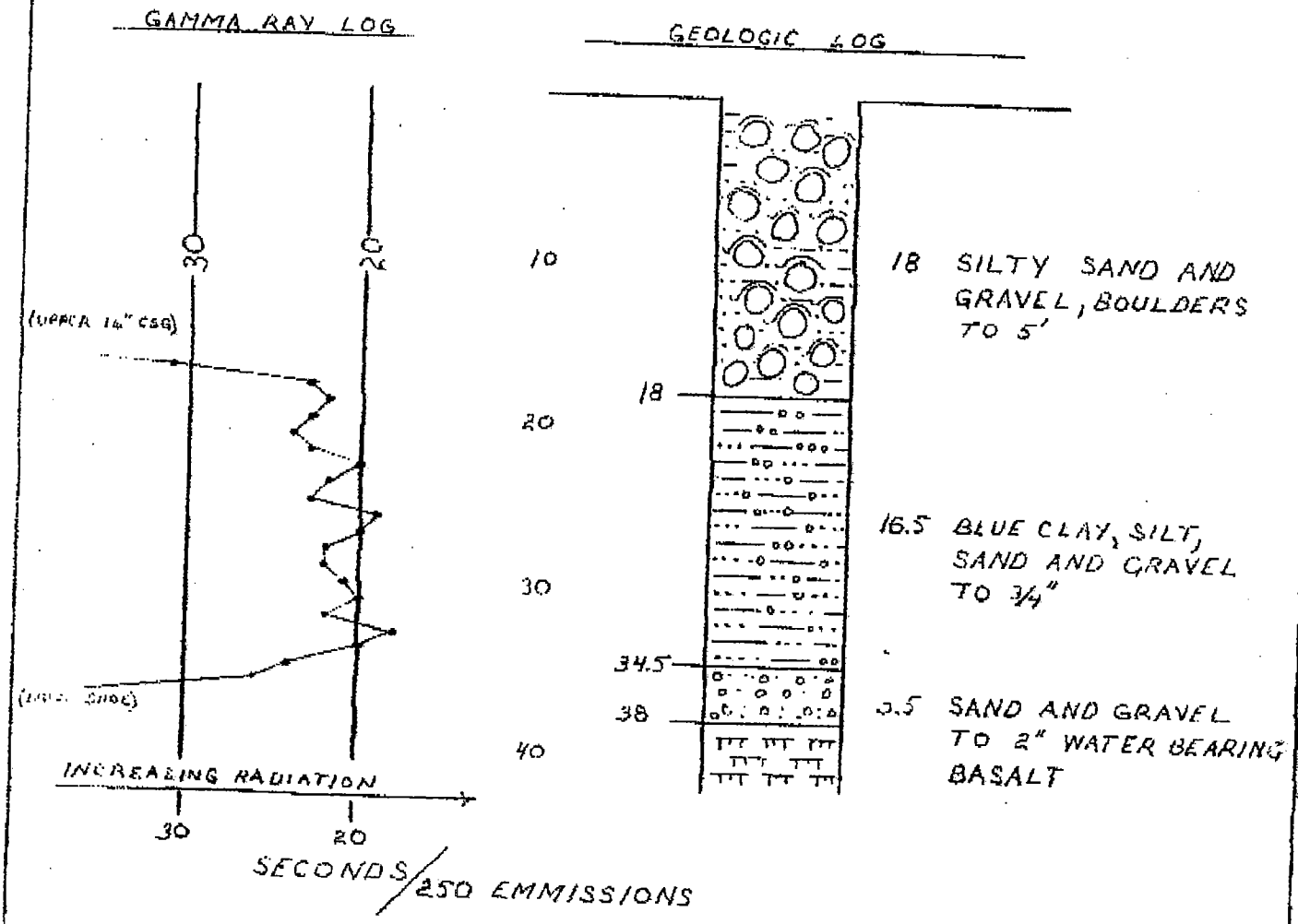
Drilling Co.: Robinson, Roberts & Assoc., Inc.
Address: 1315 South 59th - Tacoma, Washington
Method of Drilling: Cable Date: 19
Owner: Town of Eatonville
Address: Eatonville, Washington
Land surface, datum: ft. above / below
SWL: 19' Date October 25, 1966 Dims. 12" x 52'

Correlation	Material	From (feet)	To (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	Domestic		
	Sand & gravel, muddy	0	18
	Pebbles, sand, coarse, dirty	18	34
	Sand & silt, blue	34	36
	Cobbles, pebbles, some sand, coarse	36	42
	Sand, gravel, clay, tight	42	49
	Hardpan (Sand on top)	49	52
	Casing: 12" from 1:3-38½'		
	10" from 34½-38½'		
	Screened from 38½-43½'		
	Yield: 260 gpm with 5.4' DD after 4 hrs.		
	352 gpm with 10.7' DD after 3 hrs.		
	Test made November 2, 1966		
	Temperature 50°		
	Pump: 7½ h.p. turbine Jacuzzi		

Turn up

Sheet ____ of ____ sheets

LOG OF WELL #3



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NW DRINKING WATER

figure 2

EATONVILLE WATER DISTRICT EATONVILLE, WASHINGTON DRILLED BY TACOMA	ROBINSON AND NOBLE GROUND WATER GEOLOGISTS TACOMA WASHINGTON	OCTOBER 3, 1975

Section H-H'

R/P Test Well

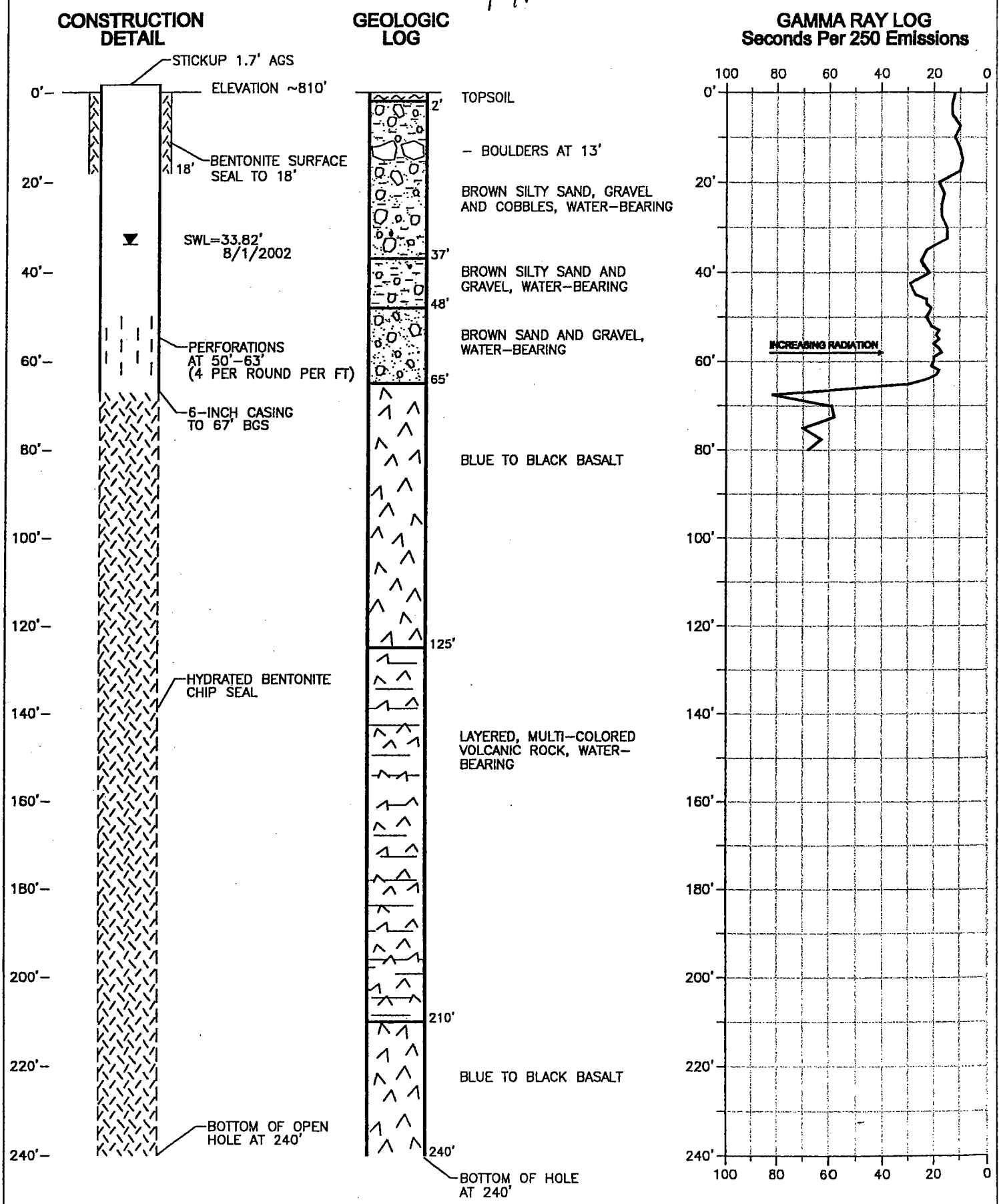


Figure 1

ROBINSON & NOBLE, INC.

T 16 N/R 4 E-23A
PM: MFP
JOB NO. 7014A
August 2002

Construction Detail, Geologic Log and Gamma Ray Log for Monitor Well 1R
Town of Eatonville

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

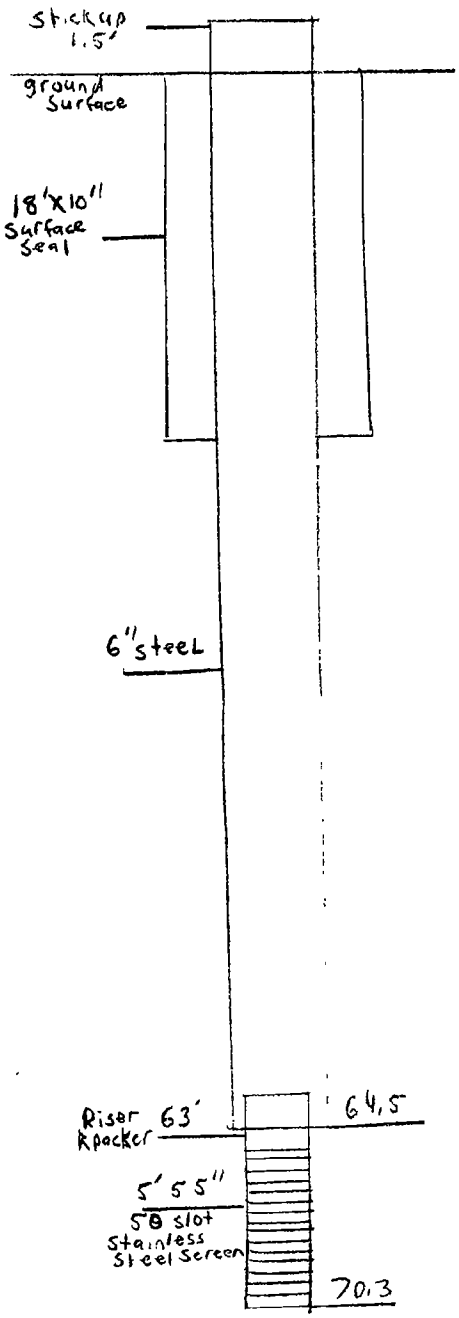
142202

Washington State Resource Protection Well Report

Project Name: Town of Eatonville
Well Identification: TW-03-02
Drilling Method:
Rotary [X] Cabletool [ ] Auger [ ] Other [ ]
Type of work:
New Construction [X] Conversion [ ] Abandonment [ ]
Driller: Mark Wiese

Start Card No.: RE00686 Unique No.: AHG 846
Location: T 16 R 4E Sec 23
NE 1/4 NE 1/4
County: Pierce
Address: Weyerhauser Road
Eatonville, WA

Signature: [signature]
Date: 10/31/03
Drilling Contractor: *Tacoma Pump and Drilling*
Geologist: Tim White



Well Log.	From	To
Brown gravel sand silt.	0	10
Brown some boulders gravel sand silt wet.	10	30
Brown gravel sand silt some boulders water bearing.	30	70.5
Basalt.	70.5	

Finished Depth: 70.5 ft
Static Level: 27 ft
Date Started: 10/14/03
Date Finished: 10/14/03

TW 03 02

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Washington State
Department of Ecology

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WELL #5

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 8415
Permit No. 83555

(1) OWNER: Name TOWN OF EATONVILLE Address P.O. BOX 296 EATONVILLE, WA.

(2) LOCATION OF WELL: County PIERCE — NE¼ NE¼ Sec. 23 T. 16N. R. 4E. W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☑ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 5
New well ☑ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Bored ☐ Cable ☒ Driven ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" inches.
Drilled 71.5 ft. Depth of completed well ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from 0 ft. to 60 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☑ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☑
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☑ No ☐
Manufacturer's Name JOHNSON
Type STAINLESS STEEL Model No. PIPE SIZE
5' Diam. 8" Slot size 150 from 61 ft. to 91 ft.
5' Diam. 8" Slot size 100 from ft. to ft.

Gravel packed: Yes ☑ No ☐ Size of gravel: 3/8 —
Gravel placed from 25 ft. to 70 ft.

Surface seal: Yes ☑ No ☐ To what depth? 18 ft.
Material used in seal CONCRETE
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 30 ft. below top of well Date JUNE 1976
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom?
Yield: 125 gal./min. with 15 ft. drawdown after 4 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOPSOIL	0	6
ROCK & CLAY	6	22
LARGE GRAVEL	22	24
GRAVEL & CLAY	24	47.5
SAND, GRAVEL, CLAY, WATER	47.5	68.5
ROCK, CLAY, BEDROCK	68.5	71.5

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DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started MAY 16, 1976. Completed JUNE 1, 1976

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME TACOMA PUMP & DRILLING CO. INC (Person, firm, or corporation) (Type or print)

Address 30316 MOUNTAIN HIGHWAY

[Signed] John M. Jenkins (Well Driller)

License No. 0193 Date SEPT 24, 1976

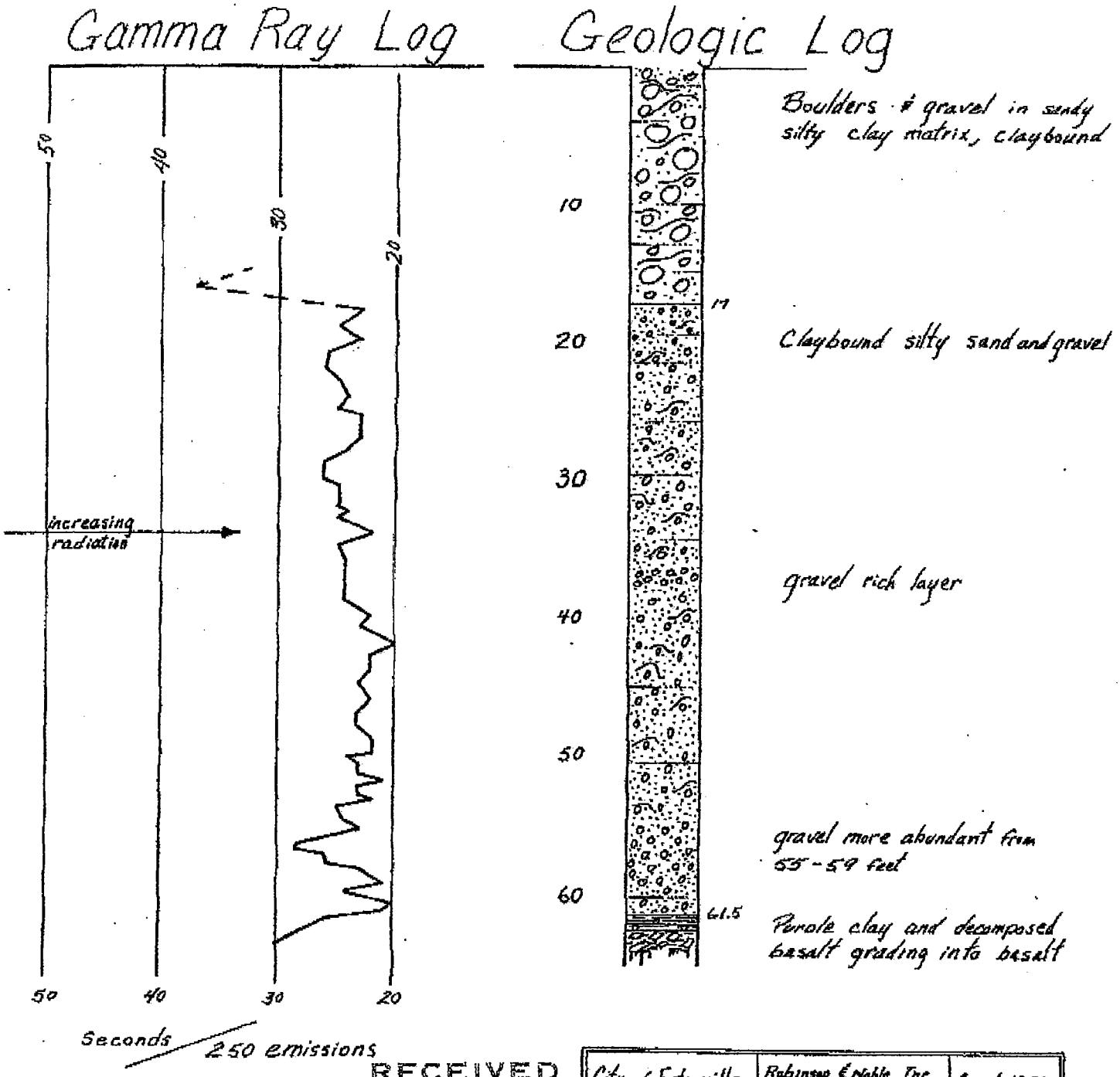
(USE ADDITIONAL SHEETS IF NECESSARY)

OK MB 1-22-79

S. F. No. 7356—OS—(Rev. 4-71)
ECY-070-28

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Eatonville Well No. 4



City of Eatonville Washington	Robinson & Noble Inc. Ground Water Geologists Tacoma, Washington	April, 1976 MK

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NW DRINKING WATER

figure 4

APPENDIX C
WELL LOG DATABASE

TABLE C-1
SUMMARY OF WELL LOG INFORMATION

Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
AKB440	253	6	AMERICAN HOME CENTER	195	25		Air	na		Unconsolidated	T16N/R4E-SW-NE 10	11/15/2004	W
	241	6	BARRY PENN	200	6.6		Air	na		Unconsolidated	T16N/R4E-SE-SE 10	10/25/1988	W
	250	6	BILL MOBLEY		3		Bail	na		Unconsolidated	T16N/R4E-SE-NE 10	8/12/1980	W
	118	6	BOB DOUD	50	10		Air	na		Unconsolidated	T16N/R4E-NW-NE 10	6/20/1995	W
AAZ104		6	BOBBY RICE	150	8	21	Bail	0.4	100	Unconsolidated	T16N/R4E-SW-SE 10	12/2/1996	W
	279	6	BRENT MICHAELSONS	212.4	10		Air	na		Unconsolidated	T16N/R4E-NE-SW 10	8/2/1994	W
ABQ275	93	6	BRUCE HULTKRANTZ	54	15	10	Bail	1.5	400	Unconsolidated	T16N/R4E--SW 10	3/13/1996	W
	110	6	BW VON FASSEN	60	2	50	Bail	0.0	10	Unconsolidated	T16N/R4E-NW-SE 10	1/8/1979	W
AAZ864	298	6	CARRIAGE HOUSE	188	6		Air	na		Unconsolidated	T16N/R4E-NE-NW 10	6/2/1997	W
	157	6	CHERYL SCHACTLER	122	15	9	Bail	1.7	450	Unconsolidated	T16N/R4E--SW 10	11/17/1988	W
	68	6	CLARENCE POTTER		2		Bail	na		Unconsolidated	T16N/R4E-NW-SE 10	9/16/1980	W
	265	6	DAN & KAREN WORTHY	222	9		Air	na		Unconsolidated	T16N/R4E-SW-NE 10		W
	278	6	DAN WORTHY	231	10		Air	na		Mashel Fm.	T16N/R4E-NW-NW 10	2/22/1989	W
ABV261	47	6	DARYLE HOLDER	21	30		Air	na		Unconsolidated	T16N/R4E-SW-SW 10	6/27/1995	W
		6	DAVE SCHACTLER	100	15	0	Bail	na		Unconsolidated	T16N/R4E-- 10		W
AEK391	218	6	DAVE WAZBACH	160	10		Air	na		Basalt	T16N/R4E-NE-NW 10	3/16/1999	W
	50	6	DAVID REED	25	20	15	Bail	1.3	360	Unconsolidated	T16N/R4E-NE-NW 10	8/20/1978	W
	180	6	DON PENY	152	12	20	Bail	0.6	160	Unconsolidated	T16N/R4E-NW-NW 10	8/15/1983	W
	179	6	DON RAMUSON	151	10	16	Bail	0.6	170	Unconsolidated	T16N/R4E-SW-NE 10	8/30/1991	W
	78	6	DON RAMUSON	3	10	46	Bail	0.2	60	Unconsolidated	T16N/R4E-SW-NE 10	9/3/1991	W
	270	6	DOUG BROWN		1.6		Air	na		Unconsolidated	T16N/R4E-- 10	11/12/1977	W
	96	6	ERVIN KIPFER	71	20		Air	na		Unconsolidated	T16N/R4E-SW-SW 10		W
		6	EVEYLYN CHAPMAN	17	40	1	Bail	40.0	10,690	Unconsolidated	T16N/R4E-SE-SE 10	2/13/1978	W
	150	6	FRANCIS SOTER & PM MADDOX	115	5		Air	na		Unconsolidated	T16N/R4E-NW-SW 10	9/26/1988	W
	51	6	GARY MCGINNIS	5	10	13	Bail	0.8	210	Unconsolidated	T16N/R4E-NE-SE 10	5/8/1977	W
	280	6	GARY SUNDE	234	7		Air	na		Unconsolidated	T16N/R4E--SW 10	6/19/1992	W
	168	6	GEORGE BLANK		5		Bail	na		Unconsolidated	T16N/R4E-NW-SE 10	3/6/1980	W
	256	6	GEORGE HONROTH	225	15	10	Bail	1.5	400	Unconsolidated	T16N/R4E-SE-SE 10	3/20/1978	W
	256	6	GRAHAM REALTY	227	6	12.5	Pump	0.5	130	Unconsolidated	T16N/R4E-- 10	4/10/1991	W
AEF041	176	6	HEMMING WAY DALE	134	15		Air	na		Unconsolidated	T16N/R4E-NW-NW 10	1/13/2000	W
	301	6	JAY GUTKA	244	10	23	Bail	0.4	120	Unconsolidated	T16N/R4E-SW-SE 10	2/6/1992	W
	179	6	JEFFREY DAVIS	156	20	38	Bail	0.5	140	Unconsolidated	T16N/R4E-NW-NE 10	9/16/1981	W
AEN435	188	6	JOE STRALING	157	12	22	Bail	0.5	150	Unconsolidated	T16N/R4E-NW-NE 10	10/11/1999	W
	18	6	JOHN MCCARTHY	90	3.5		Air	na		Unconsolidated	T16N/R4E-SE-SW 10	4/21/1994	W
	80	6	JONATHAN SLAYTON					na			T16N/R4E-SE-SE 10	1/25/1984	W
	120	6	KELLY MAYNE	80	10		Air	na		Unconsolidated	T16N/R4E-NE-SE 10	7/22/1992	W
ABF490	220	6	LARRY MCNETT	180	5	0	Bail	na		Mashel Fm.	T16N/R4E-SW-NE 10	5/1/1995	W
	196	6	LAURINDA BARROW	165	8	27	Bail	0.3	80	Unconsolidated	T16N/R4E-NW-NW 10	2/19/1979	W
	200	6	MARK GRAHAM					na			T16N/R4E-NW-SW 10	7/22/1991	W
	190	6	MARTY SPROUT	163	10	15	Bail	0.7	180	Unconsolidated	T16N/R4E-NW-SW 10	10/18/1983	W
	157	6	MARY & DAVE SCHACTLER	105	40		Air	na		Mashel Fm.	T16N/R4E-SW-SW 10	1/12/1996	W
	175	6	MELVIN COX	155	10	18	Bail	0.6	150	Unconsolidated	T16N/R4E-SW-NW 10	1/30/1979	W
	303	6	MICHAEL CASSIDY	200	5		Air	na		Mashel Fm.	T16N/R4E-NW-NE 10	12/15/1994	W
	152	6	MIKE DEAN	125	20	12	Bail	1.7	450	Unconsolidated	T16N/R4E-- 10	6/9/1983	W
ACK554	198	6	MIKE MCGEHEE	160	20		Air	na		Unconsolidated	T16N/R4E-NE-NW 10	8/5/1996	W
AHL759	256.6	6	MIL FEINIERA	190.6	25		Air	na		Unconsolidated	T16N/R4E-SW-SE 10	3/2/2004	W
	100	6	MILO HIBBERT	75	10	13	Bail	0.8	210	Unconsolidated	T16N/R4E-SW-NW 10	7/14/1980	W
	80	6	MILO HIBBERT	67	5	10	Bail	0.5	130	Unconsolidated	T16N/R4E-SW-NW 10	4/23/1980	W
	140	6	NANCY MCGINNIS	20	10		Air	na		Mashel Fm.	T16N/R4E-SW-SE 10	7/7/1988	W
	100	6	RANDY HILL	95	6		Air	na		Unconsolidated	T16N/R4E-SE-SW 10	5/29/1980	W
	122	6	RAY BOATMAN	80	12		Air	na		Unconsolidated	T16N/R4E-NE-SE 10	7/20/1992	W
	209	6	RAYMOND HARPER	124	13	16	Bail	0.8	220	Mashel Fm.	T16N/R4E--SE 10	10/2/1991	W
ACK060		6	RICHARD PEASE	65	15		Air	na		Unconsolidated	T16N/R4E-NW-SE 10	8/14/1996	W
	190	6	ROBERT HUGHES	151	10		Air	na		Unconsolidated	T16N/R4E-NW-SW 10	1/17/1995	W
ABF393	279	6	RONALD PIERCE	197	5	58	Bail	0.1	20	Mashel Fm.	T16N/R4E-SE-SW 10	6/13/1994	W
			ROY BANBUSKIRK	27	35		Air	na			T16N/R4E-NW-NW 10	10/8/1992	W
	47	6	ROY VANBUSKIRK	27	20	2	Bail	10.0	2,670	Unconsolidated	T16N/R4E-NW-NW 10	9/4/1980	W
ABE765	100	6	SCOTT GERVAIS	60	20		Air	na		Unconsolidated	T16N/R4E-NW-NE 10	6/10/1996	W

TABLE C-1
SUMMARY OF WELL LOG INFORMATION

Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
ALK901	351.3	6	SITE READY INC	301	50		Air	na		Basalt	T16N/R4E-SW-SE 10	10/3/2006	W
AEJ137	366	6	SONYA TENFER	200	15		Air	na		Mashel Fm.	T16N/R4E-SE-SW 10	4/8/1999	W
	45	6	STAN KAMIENSKI	30	12	6	Bail	2.0	530	Unconsolidated	T16N/R4E-NE-NW 10	9/27/1982	W
AFP348	340	6	TRAVIS RUSH	226.5	30		Air	na		Mashel Fm.	T16N/R4E-SW-NW 10	1/22/2001	W
AKT671	299	6	WESPAK LAND DEVELOPERS LLC	237	5		Air	na		Mashel Fm.	T16N/R4E-SW-SE 10	4/23/2004	W
AKT672	299	6	WESPAK LAND DEVELOPERS LLC	230	10		Air	na		Mashel Fm.	T16N/R4E-SW-SE 10	4/23/2004	W
ACD946		6	WILLETT PALMER	209	10		Air	na		Mashel Fm.	T16N/R4E-NE-SW 10	8/27/1996	W
	120	6	ALBERT SILBERLING	72	30	20	Bail	1.5	400	Unconsolidated	T16N/R4E-NW-NW 11	7/10/1978	W
	60	6	ANTONIO NOVELLI	45	15	5	Bail	3.0	800	Mashel Fm.	T16N/R4E-NW-SE 11	12/22/1976	W
	345	6	BMC ENTERPRISES	211	5		Air	na		Mashel Fm.	T16N/R4E-NE-SE 11		W
AHA288	363	6	BOB HENDRICKSON	280	1		Air	na		Basalt	T16N/R4E-NE-SW 11	11/21/2002	W
BAK619	210	6	CARRIAGE HOUSE	78	15		Air	na		Basalt	T16N/R4E-SW-SW 11	11/14/2007	W
ABS216	200	8	CEDAR CREEK CORRECTIONS CENTER	13.4	70	69.7	Pump	1.0	270	Mashel Fm.	T16N/R4E-NE-SE 11	12/6/1986	W
ACK100	57	6	DARRELL HOLDEN	25	30		Air	na		Unconsolidated	T16N/R4E-SE-SW 11	6/1/1996	W
AEF014	200		DENMARK PROP	95	7		Air	na		Unconsolidated	T16N/R4E-SW-SW 11	7/22/1999	W
AFN607	362	6	DENMARK PROPERTIES LTD	125.6	2		Air	na		Basalt	T16N/R4E-SW-NW 11	3/7/2001	W
	80	6	ED NELSON	25	10	45	Bail	0.2	60	Unconsolidated	T16N/R4E-SW-SW 11	10/6/1978	W
AES930	680	6	EDWARD MURPHY	270	10		Air	na		Basalt	T16N/R4E-NE-NW 11	6/23/1999	W
	450	6	Edward/Sandra Murphy	270	1		Air	na		Mashel Fm.	T16N/R4E-NE-NW 11	4/1/1994	W
AKB459	377	8	GERVAIS OHOP WATER SYSTEM	240	15		Air	na		Basalt	T16N/R4E-NE-NW 11	1/17/2005	W
			GERVAIS OHOP WATER SYSTEM				Decommissioning				T16N/R4E-NE-NW 11	5/3/2005	A
ACK149	113	6	HILGA VAHN	82	10		Air	na		Mashel Fm.	T16N/R4E-SE-SW 11	3/21/1997	W
AHM280	360	8	HOPE INTERNATIONAL	176	15	118	Pump	0.1	30	Basalt	T16N/R4E-NE-NW 11	10/23/2002	W
	299	6	HOPE INTERNATIONAL				Decommissioning				T16N/R4E-NW-NW 11	9/21/2001	A
	265	8	HOPE INTERNATIONAL	115	20	3	Bail	6.7	1,780	Basalt	T16N/R4E-SE-NW 11	9/19/1988	W
ABY024	139	6	JIM DOUD	50	10		Air	na		Unconsolidated	T16N/R4E-NW-NW 11	6/21/1995	W
ACC044	75	6	JIM MILLER	56	7	8	Bail	0.9	230	Unconsolidated	T16N/R4E-NE-SW 11	7/31/1996	W
	300	6	JIM MILLER	180	10	80	Bail	0.1	30	Mashel Fm.	T16N/R4E-SE-SW 11	1/24/1978	W
	403	6	JIM MILLER	220	10	80	Bail	0.1	30	Mashel Fm.	T16N/R4E-SE-SW 11	1/25/1978	W
	43	6	JIM MILLER	19				na		Unconsolidated	T16N/R4E-SE-SW 11	9/3/1996	W
AGT255	53	6	KAREN HERMSTAD	20	60		Air	na		Unconsolidated	T16N/R4E-SW-SW 11	2/28/2002	W
ALK802	300	6	KENT RUTLEDGE	14	2		Air	na		Basalt	T16N/R4E-SE-SW 11	1/26/2007	W
	303	6	KIMBERLY THOMAS	153	2		Air	na		Basalt	T16N/R4E-NE-SW 11	10/26/1988	W
	720	6	LEE GERVAIS	169	8.5	505	Bail	0.0	0	Basalt	T16N/R4E-- 11		W
AEF127	107	6	MADELINE POTTS	79.11	20		Air	na		Unconsolidated	T16N/R4E-NW-NE 11	4/13/2000	W
	169	8	MT. HOLIDAY INC.	33	25	59	Pump	0.4	110	Basalt	T16N/R4E-SW-SW 11		W
	83	6	NOEL MARJORIE	64				na		Unconsolidated	T16N/R4E-NE-SE 11	10/9/1992	W
AFP218	505	6	PARAMOUNT BUILDERS INC	58.11	15		Air	na		Basalt	T16N/R4E-NE-SE 11	5/10/2001	W
	300	6	RANDY DORN	+1	10	190	Pump	0.1	10	Basalt	T16N/R4E-NW-NW 11	10/31/1986	W
ABW384	82	6	RON CULBERTSON	60	5		Air	na		Unconsolidated	T16N/R4E-NW-NW 11	3/2/1995	W
ABV268			TIM BLOOM	27	10		Air	na		Unconsolidated	T16N/R4E-NE-SE 11		W
	265	6	TIM BLOOMF		7			na		Mashel Fm.	T16N/R4E-NE-SW 11	9/5/1982	W
	180	6	WILLIAM STOVER	60	10	60	Bail	0.2	40	Mashel Fm.	T16N/R4E-SW-NE 11	5/9/1977	W
	220	6	WILLIAM STOVER	50	5	90	Bail	0.1	10	Basalt	T16N/R4E-SW-NE 11		W
AAC967	145	6	WILLIAM TIPTON	113.2	12.5		Air	na		Unconsolidated	T16N/R4E-SW-NW 11		W
	400	6	ARNOLD COBURN	130	5	100	Bail	0.1	10	Mashel Fm.	T16N/R4E-NE-NE 12	12/22/1976	W
	97	6	GARY GUILES	3	5	87	Bail	0.1	20	Unconsolidated	T16N/R4E-NW-NE 12	8/4/1983	W
	363	6	ROBERT BORSH	185	15	125	Bail	0.1	30	Mashel Fm.	T16N/R4E-SE-NW 12	6/12/1976	W
ABQ290	132	6	STEVE NELSON	61	10	15	Bail	0.7	180	Unconsolidated	T16N/R4E--SE 12	1/10/1995	W
	250	6	VERN BLOCK	59	60		Air	na		Mashel Fm.	T16N/R4E-NW-NE 12	10/17/1991	W
AKJ117	422	6	CHAD BARRETT	118	1.5		Air	na		Basalt	T16N/R4E-SE-NW 13	1/17/2005	W
	395	6	FORREST COLEMAN	150	1.5		Air	na		Unconsolidated	T16N/R4E-SE-NW 13	3/2/1998	W
	380	6	GEORGE GOLLEHON	201	1		Air	na		Basalt	T16N/R4E-SE-NW 13	9/12/1997	W
	254	6	GORDON ROBERT	105	30		Air	na		Unconsolidated	T16N/R4E-NE-NW 13	7/18/1988	W
	400	6	KURT ERICKSON	354	15		Air	na		Mashel Fm.	T16N/R4E-SE-SW 13	1/11/1993	W
	64	6	MIKE BERTRAM					na			T16N/R4E-SE-NW 13	7/29/1993	W
AAX025	240	6	MIKE BERTRAM	53	10		Air	na		Unconsolidated	T16N/R4E-SE-NW 13	9/14/1994	W
	87	6	PAUL GOOD	67	20		Air	na		Unconsolidated	T16N/R4E-NW-NE 13	10/12/1994	W

TABLE C-1
SUMMARY OF WELL LOG INFORMATION

Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
ACT049	440	6	RON SIMONSEN	112	5	305	Pump	0.0	0	Basalt	T16N/R4E-NW-SE 13	8/27/1998	W
			WEYERHAEUSER TIMBER CO.	65	10	5	Pump	2.0	530	Unconsolidated	T16N/R4E-SW-SW 13		W
			101 WASHINGTON AVE. EATONVILLE					na			T16N/R4E-NE-SW 14		R
			101 WASHINGTON AVE. EATONVILLE					na			T16N/R4E-NE-SW 14		R
			101 WASHINGTON AVE. EATONVILLE					na			T16N/R4E-NE-SW 14		R
AEM088	20		ASSOCIATED PETROLEUM PROD INC					na			T16N/R4E-NW-SE 14	1/25/1999	R
AEM087	20		ASSOCIATED PETROLEUM PROD INC					na			T16N/R4E-NW-SE 14	1/25/1999	R
AEM075	20		ASSOCIATED PETROLEUM PROD INC					na			T16N/R4E-NW-SE 14	1/25/1999	R
AEM052	20		ASSOCIATED PETROLEUM PROD INC					na			T16N/R4E-NW-SE 14	1/25/1999	R
ACT047	38	6	BRIAN WORKMAN	15	10		Air	na		Unconsolidated	T16N/R4E-NE-SE 14	7/6/1998	W
AKJ152	75.6	6	BRYAN BRIGHT	45.4	37		Air	na		Unconsolidated	T16N/R4E-NE-NW 14	4/25/2005	W
	260	6	CANCADE WATERS	20	37	145	Bail	0.3	70	Mashel Fm.	T16N/R4E-- 14	5/31/1983	W
	73	6	CHARLES POOLE	45	15	60	Bail	0.3	70	Unconsolidated	T16N/R4E-NE-NE 14	4/13/1976	W
ABA476	56	8	CHARLES SLEAD	37	15		Air	na		Unconsolidated	T16N/R4E-SE-NE 14	12/27/1995	W
	180	6	DALE SWANSON	140	20		Air	na		Mashel Fm.	T16N/R4E-NE-NE 14	11/1/1977	W
ABA477	100	6	DAN & CAROL ARNESTAD	58	10		Air	na		Unconsolidated	T16N/R4E-SE-NE 14	12/28/1985	W
AES902	32	6	DEE RAUBLITZ	21	25		Air	na		Unconsolidated	T16N/R4E-SW-NE 14	4/26/1999	W
	54	6	DON ARNESTAD	48.5	10	9	Bail	1.1	300	Unconsolidated	T16N/R4E-NE-NE 14	12/21/1992	W
	300	6	DONOVAN RULIEN					na		Mashel Fm.	T16N/R4E-SW-SW 14	8/15/1986	W
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	A
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	A
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	A
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	R
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	R
	15	7	EATONVILLE SCHOOL DIST | ASSOCIATED EARTH SCIENCES					na			T16N/R4E-NE-SE 14	2/13/2008	R
	26.5		EATONVILLE SCHOOL DISTRICT | CDM					na			T16N/R4E-NW-SE 14	10/10/2008	R
	26.5		EATONVILLE SCHOOL DISTRICT | CDM					na			T16N/R4E-NW-SE 14	10/10/2008	R
	26.5		EATONVILLE SCHOOL DISTRICT | CDM					na			T16N/R4E-NW-SE 14	10/10/2008	R
	26.5		EATONVILLE SCHOOL DISTRICT | CDM					na			T16N/R4E-NW-SE 14	10/10/2008	R
	31.5		EATONVILLE SCHOOL DISTRICT | CDM					na			T16N/R4E-NW-SE 14	10/10/2008	R
AAD261	38	6	EDWARD TILTON	28	20		Air	na		Unconsolidated	T16N/R4E-NE-NE 14	11/2/1994	W
AKB493	70	6	EDWARD TILTON	27	20		Air	na		Unconsolidated	T16N/R4E-NE-NE 14	4/20/2005	W
	145	6	FRANK ASHBY	82.5	12		Air	na		Basalt	T16N/R4E-NE-NE 14	8/19/1987	W
	80	6	GEORGE RICHARDS	47	5		Air	na		Unconsolidated	T16N/R4E-SE-NE 14	7/8/1991	W
	220	6	GRAG ROGERS	53	60		Air	na		Unconsolidated	T16N/R4E-NE-NW 14		W
	79	6	HAL BURLINGAME	66.5	16		Air	na			T16N/R4E-NE-NE 14	8/18/1987	W
	172	6	HERMANN CLEMENS	95	45	40	Bail	1.1	300	Mashel Fm.	T16N/R4E-NE-NW 14	1/24/1984	W
	80	6	HOWARD BLANCHER	50	40	10	Bail	4.0	1,070	Unconsolidated	T16N/R4E-NE-NE 14	3/20/1979	W
	14.5	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	16	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	15	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	15	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	16	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	16	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	16	2	JEAN ANN MILLER					na			T16N/R4E-NW-SE 14	10/11/2005	A
	162	6	JIM METTLER	Dry				na			T16N/R4E-NE-SE 14	5/6/1998	W
	79	6	JIM METTLER	Dry				na			T16N/R4E-NE-SE 14	5/5/1998	A
	79	6	JIM METTLER	Dry				na			T16N/R4E-NE-SE 14	5/5/1998	W
	155	6	JOHN TERRIL	10	10	62	Bail	0.2	40	Mashel Fm.	T16N/R4E--NE 14	3/29/1976	W
	38	6	KAREL NESTEGARD	20	20	3	Bail	6.7	1,780	Unconsolidated	T16N/R4E-NW-NW 14	7/16/1976	W
	58	6	KEITH RICHARDS	52.4	10	0.3	Pump	33.3	8,910	Unconsolidated	T16N/R4E-SE-NE 14		W
	80	8	MASHELL TELEPHONE					na		Unconsolidated	T16N/R4E-NW-SE 14		W
ACD931	75	6	MIKE MCGINNIS	21	8		Air	na		Unconsolidated	T16N/R4E-NW-NW 14	10/25/1996	W
	14.5	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	16	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	15	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	15	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	16	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R

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Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
	16	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	16	2	MILLER JEAN ANN					na			T16N/R4E-NW-SE 14	10/11/2005	R
	196	8	MOUNTAIN PUMP & DRILLING CO.	49	20	133	Pump	0.2	40	Basalt	T16N/R4E-NW-NW 14		W
			O.E. HAYNES & SONS	80	60	10	Pump	6.0	1,600		T16N/R4E-SE-NW 14	12/14/1951	W
	56	6	ROBERT GAYEG	28	10	15	Bail	0.7	180	Unconsolidated	T16N/R4E-NW-NW 14	7/20/1976	W
	750	6	THE CITY OF EATONVILLE	30	50		Bail	na		Basalt	T16N/R4E-SE-SW 14		W
APB687	13	8.5	VENTURA BANK					na			T16N/R4E-SW-SE 14	1/6/2006	R
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	R
	14	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	R
	15	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	R
	12	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	R
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	A
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	A
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	A
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	A
	13.5	2	VENTURE BANK					na			T16N/R4E-NW-SE 14	5/20/2004	A
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	12	2	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/18/2006	R
	8.6	8.5	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/6/2006	R
	8	8.5	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/6/2006	R
	8	8.5	VENTURE BANK					na			T16N/R4E-SW-SE 14	1/6/2006	R
AHL797	108	6	A AND J DEVELOPMENT	82.5	18		Air	na		Unconsolidated	T16N/R4E-SW-SW 15	4/23/2004	W
	239	6	ANDREW ALBAND	168	15	35	Pump	0.4	110	Unconsolidated	T16N/R4E-NE-NW 15	1/29/1992	W
	113	6	BILLY WEEKS	28	6		Bail	na		Unconsolidated	T16N/R4E-NE-NE 15	8/15/1988	W
AKJ224	54.3	6	CARRIAGE HOUSE	8	20		Air	na		Unconsolidated	T16N/R4E-NW-NE 15	4/5/2005	W
AKT274	68	6	CARRIAGE HOUSE	14	30		Air	na		Unconsolidated	T16N/R4E-NW-NE 15	2/17/2006	W
AKJ144	50	6	CARRIAGE HOUSE INC	11.5	60		Air	na		Unconsolidated	T16N/R4E-NW-NE 15	3/18/2005	W
AEC927	400	6	CARRIAGE HOUSE INC	17	20		Air	na		Mashel Fm.	T16N/R4E-SW-NE 15	6/20/2002	W
AEC927	140	12	CITY OF EATONVILLE	16				na		Unconsolidated	T16N/R4E-SW-NE 15	3/25/2002	W
AFR809	158	6	DENMARK PROPERTIES LLC	62	20		Air	na		Unconsolidated	T16N/R4E-NW-NW 15	7/18/2001	W
AFR810	197	6	DENMARK PROPERTIES LLC	89	10		Air	na		Mashel Fm.	T16N/R4E-NW-NW 15	7/16/2001	W
AFR808	158.67	6	DENMARK PROPERTIES LLC	163	20		Air	na		Mashel Fm.	T16N/R4E-NW-NW 15	7/19/2001	W
AEN239	227	6	DENMARK PROPERTIES LTD.	41	10		Air	na		Basalt	T16N/R4E-SE-NE 15	7/18/2000	W
AFS659	179	6	ELTON ROTH	126	5		Air	na		Unconsolidated	T16N/R4E-NE-NE 15	9/1/2000	W
	192	6	ELTON ROTH	166	7	16	Bail	0.4	120	Unconsolidated	T16N/R4E-NW-NW 15	8/19/1981	W
	298	6	GARY DISCH	246	20	8	Bail	2.5	670	Unconsolidated	T16N/R4E-NW-NW 15	8/30/1979	W
	60	6	GARY MCGINNIS		30		Air	na		Unconsolidated	T16N/R4E-- 15	12/7/1987	W
	60	6	JACK ELMS	1	150	2	Bail	75.0	20,050	Unconsolidated	T16N/R4E-SW-NE 15	9/17/1979	W
	40	6	JAVAINE JOHNSON	5	40	8	Bail	5.0	1,340	Unconsolidated	T16N/R4E-NE-NW 15	8/15/1984	W
	99	6	JOAN BEGALLIA	51	9		Air	na		Basalt	T16N/R4E-NE-NE 15	3/19/1993	W
ABF493	196	8	LARRY MCNUTT	135	7	10	Bail	0.7	190	Unconsolidated	T16N/R4E-SW-NW 15	8/7/1996	W
AES135	258	6	MATTHEW KOFF	180	10		Air	na		Unconsolidated	T16N/R4E-NW-NW 15	8/9/1999	W
	52	6	MICHAL KILTS	19	20	11	Bail	1.8	490	Unconsolidated	T16N/R4E-NE-NW 15	8/14/1992	W
	160	6	PETE WHITTACKER	96	3	27	Bail	0.1	30	Basalt	T16N/R4E-SE-NW 15	5/14/1992	W
	77	6	V. WEPPLER		100		Bail	na		Unconsolidated	T16N/R4E-SW-NW 15	9/17/1979	W
AAZ116	416	6	ALEX & PAT FORD	333	4		Air	na		Mashel Fm.	T16N/R4E-SW-SW 16	3/29/1997	W
AAD284	171	6	ANN CLAY	96	11		Air	na		Unconsolidated	T16N/R4E-SE-NW 16	9/23/1994	W
AAD284	117	6	ANNE CLAY	83	32		Air	na		Unconsolidated	T16N/R4E-SE-NW 16	8/15/1994	W
APP630	155	6	ANTHONY FORD	103	30		Air	na		Unconsolidated	T16N/R4E-NE-NW 16	9/19/2006	W
AHA269	305	6	CARL ROTTER	256	25		Air	na		Unconsolidated	T16N/R4E-SW-SW 16	8/27/2002	W
	55	6	CARL WEATHERBEE	7.7	13		Air	na		Unconsolidated	T16N/R4E-NE-SW 16	2/28/1995	W
ACW432	175	6	DAN BRUNO	86	25		Air	na		Unconsolidated	T16N/R4E-NW-NE 16	6/3/1998	W
AAD285	130	6	DEBRA BOSTON	93	12		Air	na		Unconsolidated	T16N/R4E-SE-SW 16	8/17/1994	W
	250	6	DEWEY BAITER	190	5		Air	na		Unconsolidated	T16N/R4E-NE-NE 16	10/22/1996	W

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	120	6	DICK LUSINK	60	9	18	Bail	0.5	130	Unconsolidated	T16N/R4E-NE-NE 16	10/19/1992	W
AAD260	202	6	DON PAINTER	157	12		Air	na		Unconsolidated	T16N/R4E-NE-NE 16	11/21/1994	W
AAD267	150	6	DON PAINTER	105	25		Air	na		Unconsolidated	T16N/R4E-NE-NE 16	11/9/1994	W
AAD268	155	6	DON PAINTER	127	20		Air	na		Unconsolidated	T16N/R4E-NE-NE 16	11/7/1994	W
APB833	148.1	6	DUANE WALTERS	52	40		Air	na		Unconsolidated	T16N/R4E-SW-NE 16	4/25/2006	W
	325	8	FLORENCE ANDERSON	266	6	15	Bail	0.4	110	Unconsolidated	T16N/R4E-SW-SW 16	8/23/1996	W
	120	6	FRANCIS FULLER	85	10	20	Bail	0.5	130	Unconsolidated	T16N/R4E-NE-NW 16	12/15/1982	W
	38	6	GARY MCINNIS & OHOP VALLEY SUPPLY	20	20	7	Bail	2.9	760	Unconsolidated	T16N/R4E-NE-SE 16	1/2/1992	W
AKT001	174	6	HELEN AND GLEN GILBERT	130	25		Air	na		Unconsolidated	T16N/R4E-NW-NW 16	4/8/2005	W
	87	6	JAMES RAY	46	12	16	Bail	0.8	200	Unconsolidated	T16N/R4E--NE 16	4/28/1992	W
ACD944	160	6	STEVEN NELSON	110	20		Air	na		Unconsolidated	T16N/R4E-NW-NW 16	8/16/1996	W
	403	8	TOM BOARDMAN	326	3		Air	na		Unconsolidated	T16N/R4E-SW-SW 16	3/10/1997	W
	44	6	VICKIE & SHANE LANTZ	18	14	17	Bail	0.8	220	Unconsolidated	T16N/R4E-NE-SE 16	9/19/1991	W
BAA030	63.9	6	CHRIS BIVINS	34.7	16		Air	na		Unconsolidated	T16N/R4E-NW-SW 17	4/29/2008	W
	66	6	DOUG WALLOWER	10	30	25	Bail	1.2	320	Unconsolidated	T16N/R4E-SW-SW 17	9/30/1976	W
	153	6	JACK DOLMAN	100	20	43	Bail	0.5	120	Mashel Fm.	T16N/R4E-NW-SW 17	9/18/1979	W
	164	6	KEITH MALCOMS	97	10	4	Bail	2.5	670	Unconsolidated	T16N/R4E--NE 17	10/20/1986	W
AEF157	215	6	MARCIA BERGER	164	30		Air	na		Unconsolidated	T16N/R4E-NW-NE 17	7/20/1999	W
AEH977	154	6	MARCUS PRUITT	80	15		Air	na		Unconsolidated	T16N/R4E-SW-NW 17	8/24/1998	W
	158	6	PIONEER FARM	68	40	21	Bail	1.9	510	Unconsolidated	T16N/R4E-- 17	2/26/1990	W
	79	6	ROD PRUITT	38	20	16	Bail	1.3	330	Unconsolidated	T16N/R4E--SW 17	12/20/1991	W
AFG686	63	6	TIM PRUITT	7	17.5	28	Pump	0.6	170	Unconsolidated	T16N/R4E-NW-NE 17	7/20/2000	W
	101	6	FRANK MILWARD	49	10		Bail	na		Unconsolidated	T16N/R4E-NE-NE 20	1/24/1992	W
	236	6	FRANK MUMANN	174	15		Bail	na		Unconsolidated	T16N/R4E-SE-NW 20		W
AEF029	100	6	HAMMOND MILAND	78	3		Air	na		Unconsolidated	T16N/R4E-NW-NE 20	9/13/1999	W
AFE610	100	6	HAZENBALG, CHARLES & AMY	81	15		Air	na		Mashel Fm.	T16N/R4E-SE-NW 20	1/20/2000	W
	173	6	MARTIN MILLER	70	1		Air	na		Mashel Fm.	T16N/R4E-SE-NW 20	5/26/1994	W
AEJ183	57	6	AMY FALLIN	168	15	35	Pump	0.4	110	Unconsolidated	T16N/R4E-NE-SW 21	3/29/1999	W
	40	6	ANTONE BASKETT	4	20	29	Bail	0.7	180	Unconsolidated	T16N/R4E-NE-SE 21	1/3/1979	W
AAZ865	178	6	BRUCE & LINDA BEMENT	122	40		Air	na		Unconsolidated	T16N/R4E-NW-NE 21	6/5/1997	W
AGN200	198	6	CALEB BERNT	158	12		Air	na		Unconsolidated	T16N/R4E-NW-NE 21	8/10/2002	W
	60	6	CARRIAGE HOUSE	44	14		Air	na		Unconsolidated	T16N/R4E-SW-NE 21	3/17/1998	W
AEJ484	178	6	GUTH GEORGE	111	20		Air	na		Unconsolidated	T16N/R4E-NE-SW 21	3/31/1999	W
ABB059	21	6	HW HIGHRAM	9	2		Air	na		Unconsolidated	T16N/R4E-SE-NE 21	9/30/1993	W
	199	6	I. SWANSON	106	10	0	Bail	na		Unconsolidated	T16N/R4E--NW 21	8/7/1970	W
AEF195	114	6	JEFF NESTAR	62	30		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	2/5/1999	W
AHA227	256	6	LARRY AND MARY ROBERTS	177	60		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	5/15/2002	W
AGF833	241	6	LOREN SUEDINE	187	2		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	10/2/2001	W
			M.P. 28.3 SLIDE SR-7					na			T16N/R4E-NW-SE 21	3/12/1996	A
ACK059	218.5		MIKE NOEL	20	7		Air	na		Basalt	T16N/R4E-NE-SE 21	8/22/1996	W
	67	6	MILAND HAMMOND	20	30	35	Bail	0.9	230	Unconsolidated	T16N/R4E-NW-SW 21	10/11/1984	W
ACT037	98	6	MITCH BRISBAVE	50	25		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	6/4/1998	W
ACW405	280	6	NORMAN & JOAN HOFER	188	30		Air	na		Mashel Fm.	T16N/R4E-NW-NE 21	8/27/1997	W
	263	6	PAM BUCKINGHAM	216	8		Air	na		Mashel Fm.	T16N/R4E-NE-NE 21	7/29/1997	W
AFR943	117	6	RICHARD GUARDON	94	20		Air	na		Unconsolidated	T16N/R4E-SE-NE 21	2/19/2001	W
ACK057	96	6	RICHARD HAGEK	31	10		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	7/22/1996	W
	169	6	RICHARD SKAGETT	139	15		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	6/18/2007	W
			RICHARD SKANGSET				Decommissioning				T16N/R4E-NE-NE 21	6/18/2007	A
ACK085	128	6	SCOTT HOLSTON	90	5	20	Bail	0.3	70	Unconsolidated	T16N/R4E-NE-NE 21	12/30/1996	W
AEF484	225	6	SCOTT NELSON	190	12		Air	na		Unconsolidated	T16N/R4E-NW-NE 21	12/4/1999	W
AEF184	138	6	STEVE ANDERSON	116	15		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	4/6/1999	W
AEF487	118	6	TERRY SODEN	87.8	50		Air	na		Unconsolidated	T16N/R4E-SE-NE 21	10/19/1999	W
ABA484	146	6	TERRY WAGNER	96	21	10	Pump	2.1	560	Unconsolidated	T16N/R4E-SE-NE 21	4/1/1996	W
AES121	117	6	TIM HOLSTEN	40	25		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	6/28/2000	W
AGF830	118	6	TIM HOLSTEN	96	15		Air	na		Unconsolidated	T16N/R4E-NE-NE 21	9/26/2001	W
								na			T16N/R4E-NW-SE 21		A
	280	6	ALLEN BUSH	170	5	280	Bail	0.0	0	Mashel Fm.	T16N/R4E-NE-SE 22	9/11/1981	W
AGP472	199	6	BERNARD SCHENIK	38	10		Air	na		Mashel Fm.	T16N/R4E-SW-NE 22	6/3/2002	W

TABLE C-1
SUMMARY OF WELL LOG INFORMATION

Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
	350	6	CAREY FORESTER	44	3.5		Air	na		Mashel Fm.	T16N/R4E-NE-NE 22		W
	88	6	CARRAGE HOUSE	22	40		Air	na		Unconsolidated	T16N/R4E-SW-NW 22	9/1/1998	W
	46	6	CHRISTINE GLOUDERMAN	8	11		Air	na		Unconsolidated	T16N/R4E-NW-SE 22	2/8/1978	W
ABV278	120	6	CHUCK POOL	48	6		Air	na		Basalt	T16N/R4E-SE-NE 22	9/7/1995	W
AFC633	66	6	COOLIDGE JANE	9	20		Air	na		Unconsolidated	T16N/R4E-NW-SE 22	3/2/2000	W
	53	6	DAVE COLLINS	45	20		Air	na		Unconsolidated	T16N/R4E-NE-SE 22	8/26/1992	W
		6	GENE CEARLEY	dry				na		Unconsolidated	T16N/R4E-NE-SE 22	2/15/1978	W
	40	6	GENE CEARLY	8	15	22	Bail	0.7	180	Unconsolidated	T16N/R4E-NE-SE 22	2/17/1978	W
	400	6	HARRY JONES	25	9	325	Bail	0.0	10	Basalt	T16N/R4E-NE-SW 22	10/31/1979	W
ABF362	79	6	HUGH HIGHAM	60.5	15		Air	na		Unconsolidated	T16N/R4E-NW-NE 22	9/10/1998	W
		6	HUGHIE HIGHMAN	Decommissioning							T16N/R4E-SE-NE 22	2/9/1995	A
AEH969	200	6	JOHN & JOANNA TWEET	47	5		Air	na		Basalt	T16N/R4E-SE-NE 22	9/17/1998	W
	110	6	JOHN CARNEY		3		Bail	na		Mashel Fm.	T16N/R4E-SW-SW 22	8/29/1980	W
	140	6	JOHN MILLER	50	10		Air	na		Basalt	T16N/R4E-NE-NE 22		W
	200	6	JOHN PETERS	30				na		Mashel Fm.	T16N/R4E-NW-SE 22	8/7/1985	W
ABE555	262	6	KARL SCHENK	72	4		Air	na		Mashel Fm.	T16N/R4E-NE-SW 22	8/28/2007	W
ABG712	76	6	LAKEPOINTE CONSTRUCTION	56	12		Air	na		Unconsolidated	T16N/R4E-SW-SW 22	12/3/1996	W
	100	6	LARRY MAGILL	Dry				na			T16N/R4E-NE-SE 22	6/8/1982	W
AAD410	350	6	LITTLE MASHEL WATER SYSTEM					na			T16N/R4E-NE-NE 22	6/9/2005	W
AHA260	23.8	6	LLOYD EMERY	15	15	6.6	Pump	2.3	610	Unconsolidated	T16N/R4E-NW-SW 22	9/16/2002	W
ABV263	94	6	MARK GUENTHER	50	25		Air	na		Unconsolidated	T16N/R4E-SE-NW 22		W
AEK379	129	6	ROBERTA KELLY	93	60		Air	na		Unconsolidated	T16N/R4E-SE-NW 22	1/19/1999	W
ABB124	138	6	SCHUNK / BILL HAKE	60	15		Air	na		Unconsolidated	T16N/R4E-NW-SW 22	5/13/1999	W
AEN225	34	6	SMITH HENRY & KATHY	8	60		Air	na		Unconsolidated	T16N/R4E-NW-SW 22	2/3/2000	W
AEN223	38	6	SMITH HENRY & KATHY	18.75	20		Air	na		Unconsolidated	T16N/R4E--SW 22	1/29/2000	W
ACW402	138	6	TED SCHLOSSER	96	50		Air	na		Unconsolidated	T16N/R4E-NW-NW 22	7/24/1997	W
	223	6	ALLAN & INA PAPP	80	1		Air	na		Mashel Fm.	T16N/R4E-SW-NW 23	7/25/1990	W
	62	6	DANA TOOTEN	8.6	150		Air	na		Basalt	T16N/R4E-NE-SE 23	3/18/1995	W
	205	6	DAVE BABCOCK	68	6	165	Bail	0.0	10	Mashel Fm.	T16N/R4E-- 23	12/9/1988	W
	35	6	DUWAYNE BLOCK	8	55		Air	na		Unconsolidated	T16N/R4E-NW-SW 23	3/7/1983	W
	45.5	10	EATONVILLE	23	240	12.5	Pump	19.2	5,130	Unconsolidated	T16N/R4E-NE-NE 23	7/1/1969	W
	52	12	EATONVILLE	19	352	10.7	Pump	32.9	8,790	Unconsolidated	T16N/R4E-NE-NE 23		W
	138	6	JOHN ERHART	20.4	15		Air	na		Unconsolidated	T16N/R4E-SW-SW 23	9/7/1990	W
AKT623	221	6	LORENE PETITT	1.5	2		Air	na		Basalt	T16N/R4E-SW-NE 23	5/5/2004	W
	134	6	MARTHA PIERCE	27	2.5		Air	na		Mashel Fm.	T16N/R4E-SW-NW 23	7/27/1990	W
AGT264	98	6	MELVIN COX	52	5		Air	na		Unconsolidated	T16N/R4E-SW-SE 23	3/29/2002	W
	38	6	RICHARD COLLINS	18	20	5	Bail	4.0	1,070	Unconsolidated	T16N/R4E-SW-NW 23	7/11/1978	W
	52	6	ROBERT COLLINS	34	20	11	Bail	1.8	490	Unconsolidated	T16N/R4E-- 23	6/23/1983	W
	38	6	ROY VANBUSKIRK	22	9	14	Bail	0.6	170	Unconsolidated	T16N/R4E-NE-NW 23	3/21/1985	W
	35	6	TED OBERLANDER	6	20	12	Bail	1.7	450	Unconsolidated	T16N/R4E--NW 23	10/9/1990	W
		12	TOWN OF EATONVILLE	30	125	15	Pump	8.3	2,230	Unconsolidated	T16N/R4E-NE-NE 23		W
AHG945	75		TOWN OF EATONVILLE	35				na		Unconsolidated	T16N/R4E-NE-NE 23	10/14/2003	R
AHG846	70.5		TOWN OF EATONVILLE	27				na		Unconsolidated	T16N/R4E-NE-NE 23	10/14/2003	R
AHG947	71.3		TOWN OF EATONVILLE	23				na		Unconsolidated	T16N/R4E-NE-NE 23	10/15/2003	R
AKT667	93.5	12	TOWN OF EATONVILLE	16.5	430	16.5	Pump	26.1	6,970	Unconsolidated	T16N/R4E-NE-NE 23	3/4/2004	W
AHG991	73.5	12	TOWN OF EATONVILLE	19.4	230	25	Pump	9.2	2,460	Unconsolidated	T16N/R4E-NE-NE 23	1/20/2004	W
AEH970	85	6	DAVE LOITE	50	5		Air	na		Unconsolidated	T16N/R4E-SW-SW 24	9/28/1998	W
	127	6	JOHN MARLING	60	12		Air	na		Mashel Fm.	T16N/R4E-SW-SE 24	6/12/1996	W
	50	6	JOHN PHELAN	13	10	40	Bail	0.3	70	Unconsolidated	T16N/R4E-SW-SE 24	11/23/1973	W
ACY800	95	6	MAJESTIC MOBILE HOMES/ TOM QUINE	53	20		Air	na		Unconsolidated	T16N/R4E-SW-SW 24	4/4/2000	W
	280	6	MARTIN OLSON	80	1.5		Bail	na		Basalt	T16N/R4E--SE 24	6/3/1985	W
	106	6	MORTON OLSON	76	15	14	Bail	1.1	290	Unconsolidated	T16N/R4E--SE 24	7/30/1987	W
	100	6	RICHARD SUMEY	42	20	46	Bail	0.4	120	Unconsolidated	T16N/R4E-- 24	9/4/1984	W
AHG983	87.5	6	TOWN OF EATONVILLE	27	60		Air	na		Unconsolidated	T16N/R4E-NW-NW 24	11/26/2003	R
AHG983	87.5	6	TOWN OF EATONVILLE	27	60		Air	na		Unconsolidated	T16N/R4E-NW-NW 24	11/26/2003	R
	78	6	BARBRA GIBSON	31	12	14	Bail	0.9	230	Unconsolidated	T16N/R4E-- 25	8/27/1992	W
ABW627	340	6	BOB MILLER	60	8		Air	na		Basalt	T16N/R4E-NE-SW 25	1/17/1996	W
	59	6	DENNIS & PAULA HOESEL	30	30		Air	na		Unconsolidated	T16N/R4E-NW-NW 25		W

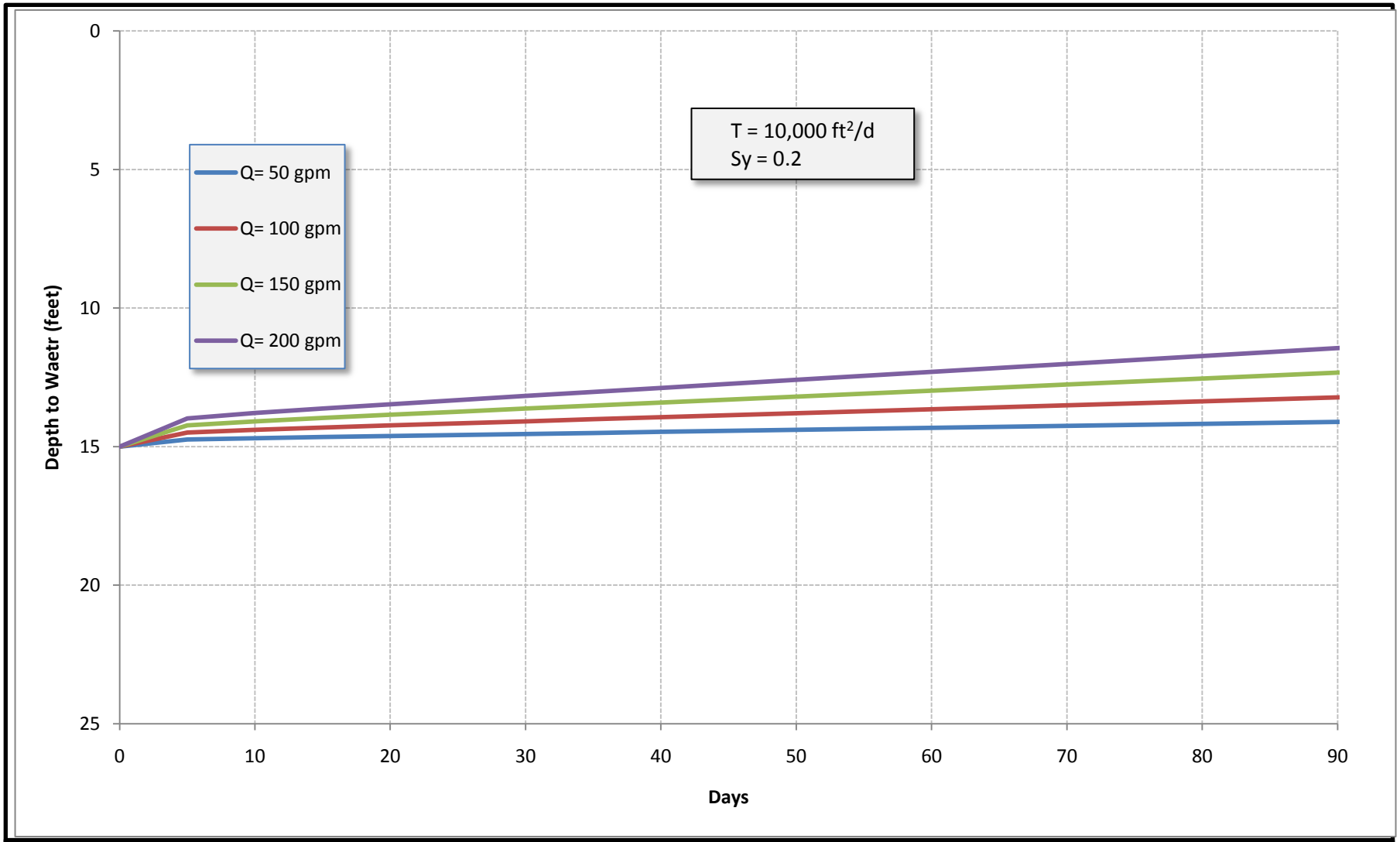
TABLE C-1
SUMMARY OF WELL LOG INFORMATION

Well Tag Number	Well Depth (feet bgs)	Well Diameter (inches)	Well Owner	Depth to Water (feet btc)	Pumping Rate (gpm)	Drawdown (feet)	Type of Test	Specific Capacity (gpm/ft)	Transmissivity (ft^2/d)	Completion Material	TRS Well Location	Well Completed Date	Well Type
	45	6	ROGER MCKOWN		6.5		Bail	na		Unconsolidated	T16N/R4E-NW-NW 25	10/16/1979	W
AET450	58	6	RON WILLIS	46.1	0.67	8.9	Pump	0.1	20	Basalt	T16N/R4E-NE-SW 25	2/23/2000	W
	160	6	W.W. HAVILAND	49	60	60	Bail	1.0	270	Mashel Fm.	T16N/R4E--NW 25	8/8/1977	W
	42	6	WALTER WESTLING	8	20	5	Bail	4.0	1,070	Unconsolidated	T16N/R4E-SW-SW 25	7/9/1996	W
	62	6	DICK LUND	19	5	36	Bail	0.1	40	Basalt	T16N/R4E-- 26	6/21/1983	W
	200	6	STEVE KVAVLE & FLOYD BROWN	25	8		Air	na		Mashel Fm.	T16N/R4E-NW-SE 26	4/7/1997	W
			UNIVERSITY OF WASHINGTON	53.2	100	2.8	Pump	35.7	9,550	Unconsolidated	T16N/R4E-SW-NW 26	12/17/1963	W
AEF047	133	6	DYCKMAN RODGER	111	10		Air	na		Unconsolidated	T16N/R4E-NW-NE 28	5/3/2000	W
AHG998	122.4	8	PACK FOREST	78	25	89.6	Pump	0.3	70	Unconsolidated	T16N/R4E-SE-NW 28	10/16/2002	W
ABB513	160	6	CHARLES BENSINGER	83	8		Air	na		Basalt	T16N/R5E-SW-NE 19		W
AGJ603	76	6	CHRISTINE REIDINGER	30	30		Air	na		Unconsolidated	T16N/R5E-SW-SE 19	3/26/2001	W
	98	6	ED SMITH	81	2		Air	na		Unconsolidated	T16N/R5E-SE-SW 19	12/18/1991	W
AFP341	124	6	GRETCHEN FOSTER	28.7	8		Air	na		Basalt	T16N/R5E-SW-SE 19	12/6/2000	W
	310	6	HUCK ARNOLD	Dry				na			T16N/R5E-SE-SW 19	6/28/1994	W
ACT192	125	6	JACKIE HOLLINGSWORTH	17	20		Air	na		Basalt	T16N/R5E-NW-SE 19	12/8/1998	W
	65	6	MARK JOHNSON	41	14	60	Bail	0.2	60	Unconsolidated	T16N/R5E-SE-SW 19	7/24/1985	W
AKT700	130	6	MELISSA MCLEAN	100	10	127	Bail	0.1	20	Basalt	T16N/R5E-SE-SE 19	8/5/2004	W
AEK376	115	6	RICHARD EVANS	75		3	Air	0.0		Unconsolidated	T16N/R5E-SW-SE 19	1/12/1999	W
	300	6	STEPHAN SCHMIDT	18.7	5		Air	na		Basalt	T16N/R5E--SE 19	3/18/1992	W
	180	6	Thomas Roulier	143	16.5		Air	na		Unconsolidated	T16N/R5E-SE-SE 19	4/5/1994	W
	260	6	TIM AFDEM	Decommissioning							T16N/R5E-SE-NW 19	4/7/1999	A
AEP188	140	6	TIM AFDEM	0	10		Air	na		Basalt	T16N/R5E-SE-NW 19	6/7/1999	W
AFT238	196	6	DAVID PECK	81.4	6	65.5	Pump	0.1	20	Basalt	T16N/R5E-NE-SE 30	9/14/2001	W
AFT237	120	6	DAVID PECK	Dry				na			T16N/R5E-NE-SE 30	9/11/2001	W
AFT237	120	6	DAVID PECK	Decommissioning							T16N/R5E-NE-SE 30	9/13/2001	A
AEA177	160	6	GERALD PETERSEN	109	16		Air	na		Unconsolidated	T16N/R5E-SE-NW 30	10/8/1998	W
ALL862	258	6	JEFF WELK	160	2		Air	na		Mashel Fm.	T16N/R5E-NE-SW 30	11/21/2005	W
APP642	156	6	JIM AND SHEILA THRONE	80	20		Air	na		Mashel Fm.	T16N/R5E-NE-SE 30	5/3/2007	W
	51	6	JOE WALCH	21	10		Air	na		Unconsolidated	T16N/R5E-NE-NE 30	9/12/1991	W
AGF827	259	6	KAREN WOODCOCK	102	1		Air	na		Basalt	T16N/R5E-SW-NE 30	10/31/2001	W
AFR950	117	6	RANDY HOOD	100	0.25		Air	na		Unconsolidated	T16N/R5E-SW-NE 30	12/12/2000	W
AFR950	117	6	RANDY HOOD	Decommissioning							T16N/R5E-SW-NE 30	12/12/2000	A
AFS695	119	6	RANDY HOOD	53	5		Air	na		Unconsolidated	T16N/R5E-SW-NE 30	12/27/2000	W
ACD943	100	6	RICK ROEHR	61	3		Air	na		Unconsolidated	T16N/R5E--SE 30	8/26/1996	W
ACA241	80	6	ROBERT BENSON	37	20		Air	na		Unconsolidated	T16N/R5E-NW-NE 30	10/24/1995	W
ACM656	60	6	SCOTT & BECKI SADOWSKI	30	3	8	Bail	0.4	100	Unconsolidated	T16N/R5E-SE-NE 30	8/22/1997	W
ABA839	243	6	SUE GRISWOLD	117.2	3		Air	na		Basalt	T16N/R5E-NW-SE 30	8/16/1996	W

Note:
Well Type: A - Decommisioning; W- Water; R - Resource Protection
Source of Information: Washington State Department of Ecology Online Well Log Database, http://apps.ecy.wa.gov/welllog/index.asp

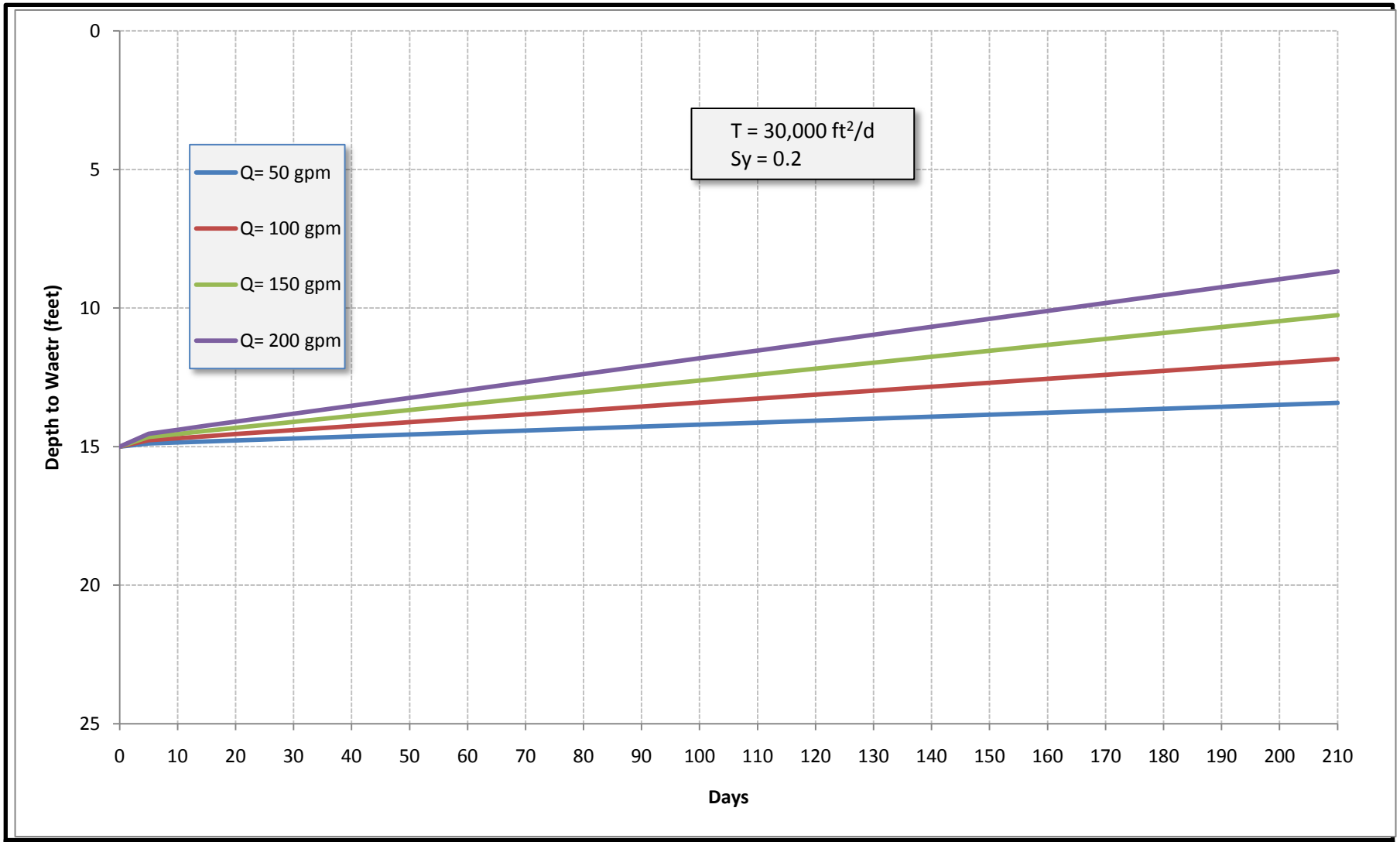
APPENDIX D

GROUNDWATER MOUNDING CALCULATIONS



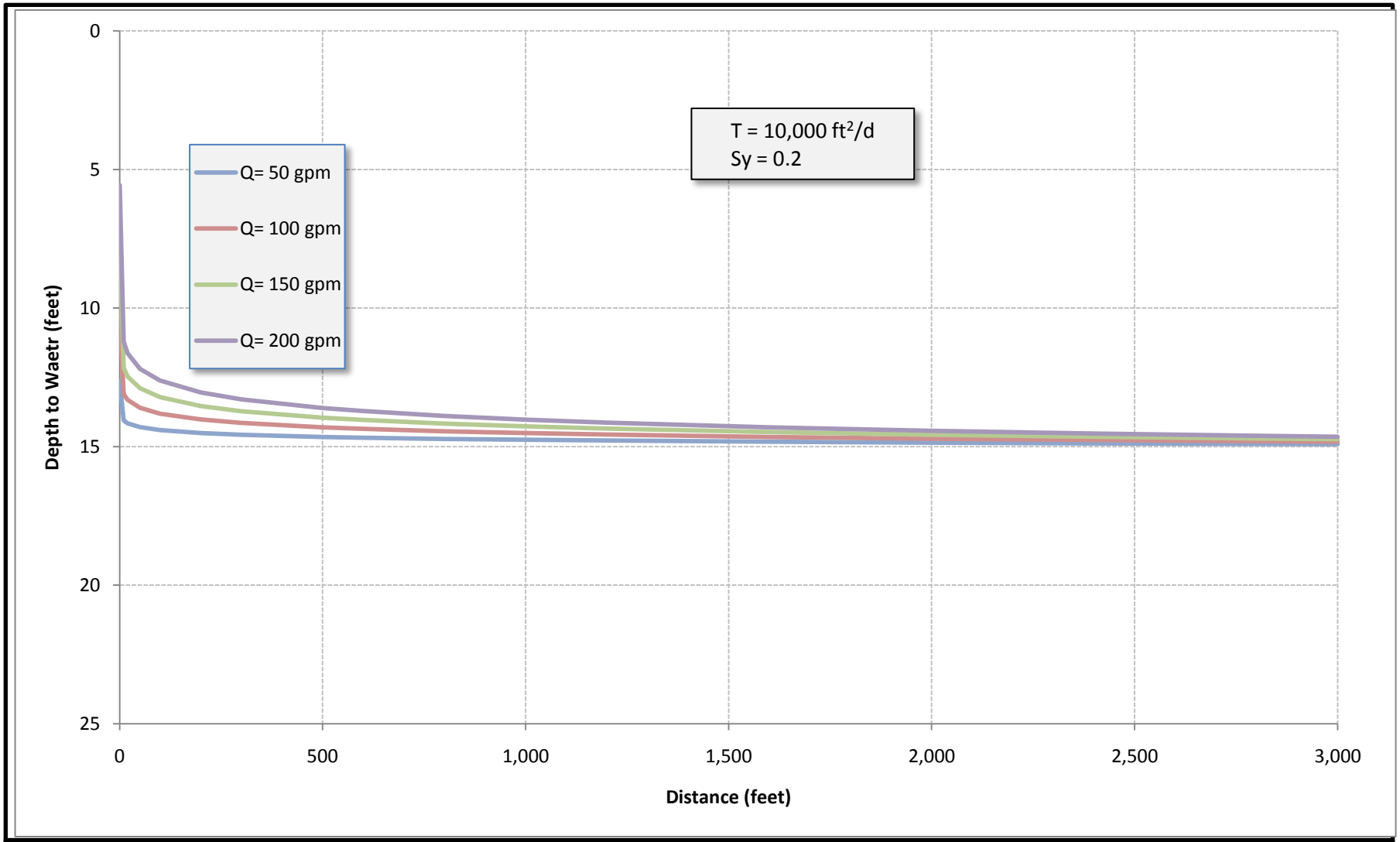
Golder Associates	Title: Estimated Water Level Rise after 210 Days (T= 10,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOETown of Eatonville	Date: March 11, 2010	FIGURE D-1

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs t=10K



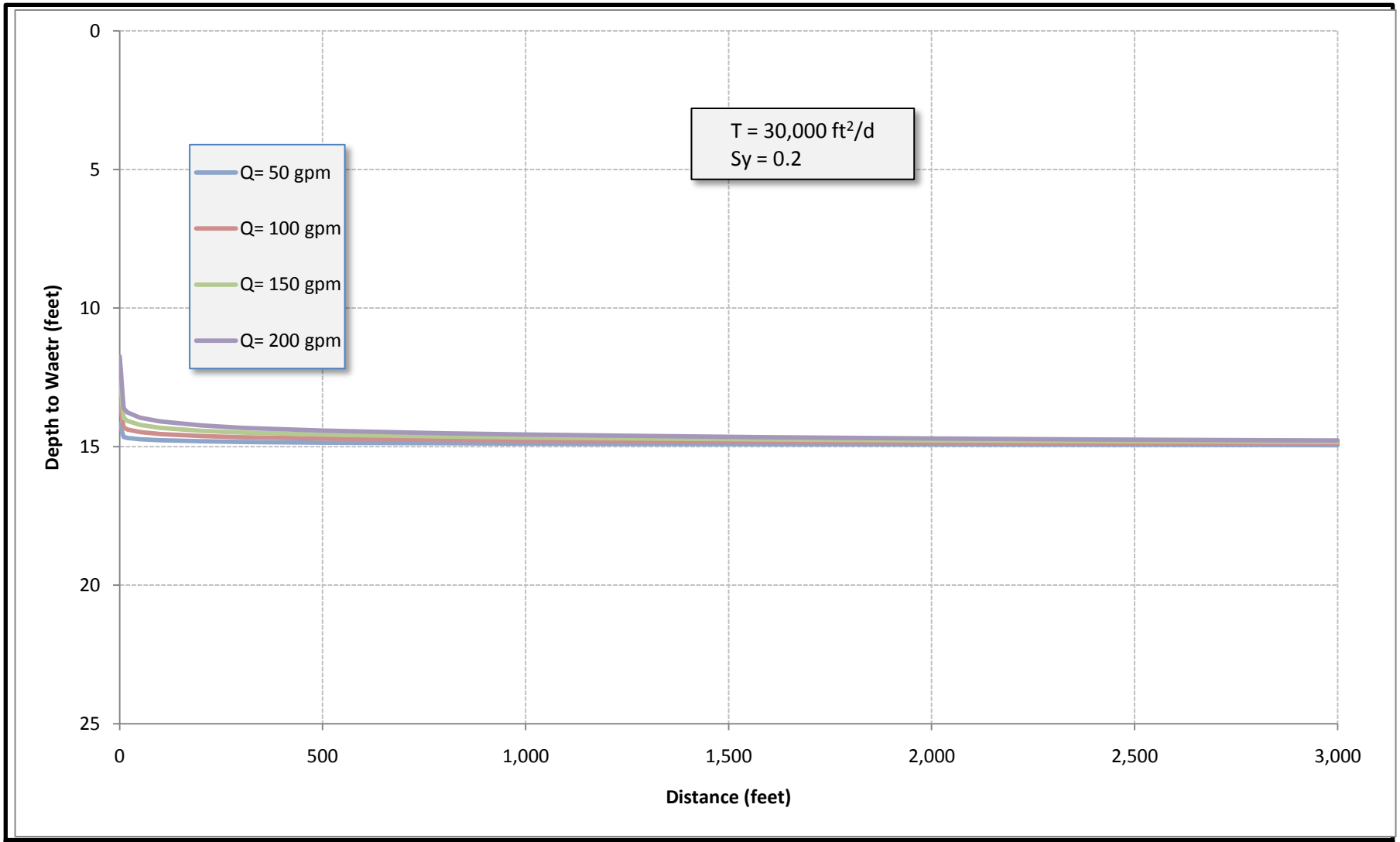
Golder Associates	Title: Estimated Water Level Rise after 210 Days (T= 30,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOETown of Eatonville	Date: March 11, 2010	FIGURE D-2

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs t=30 k



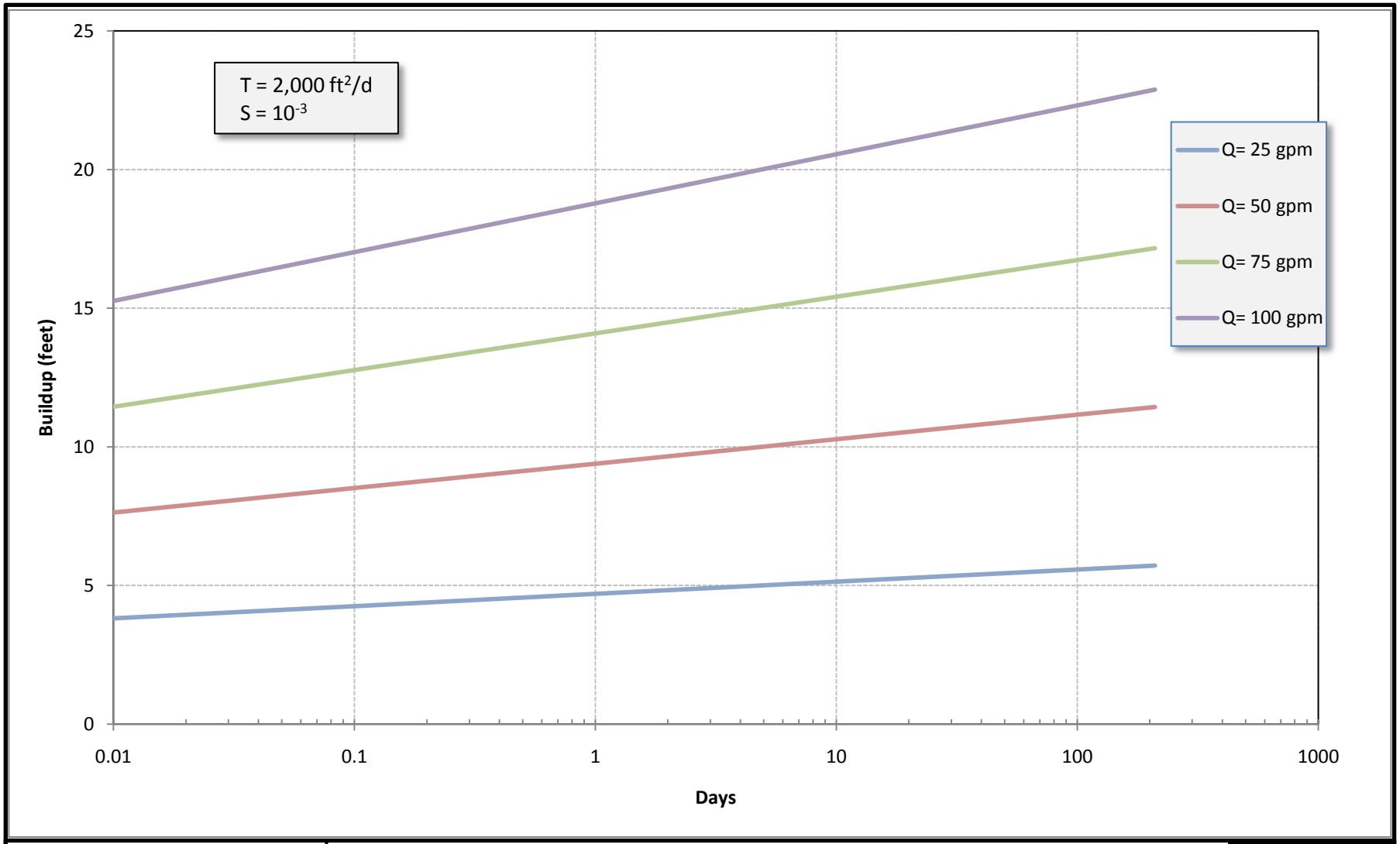
Golder Associates	Title: Estimated Groundwater Mound Configuration After 210 Days (T= 10,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOETown of Eatonville	Date: March 11, 2010	FIGURE D-3

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs t=10K



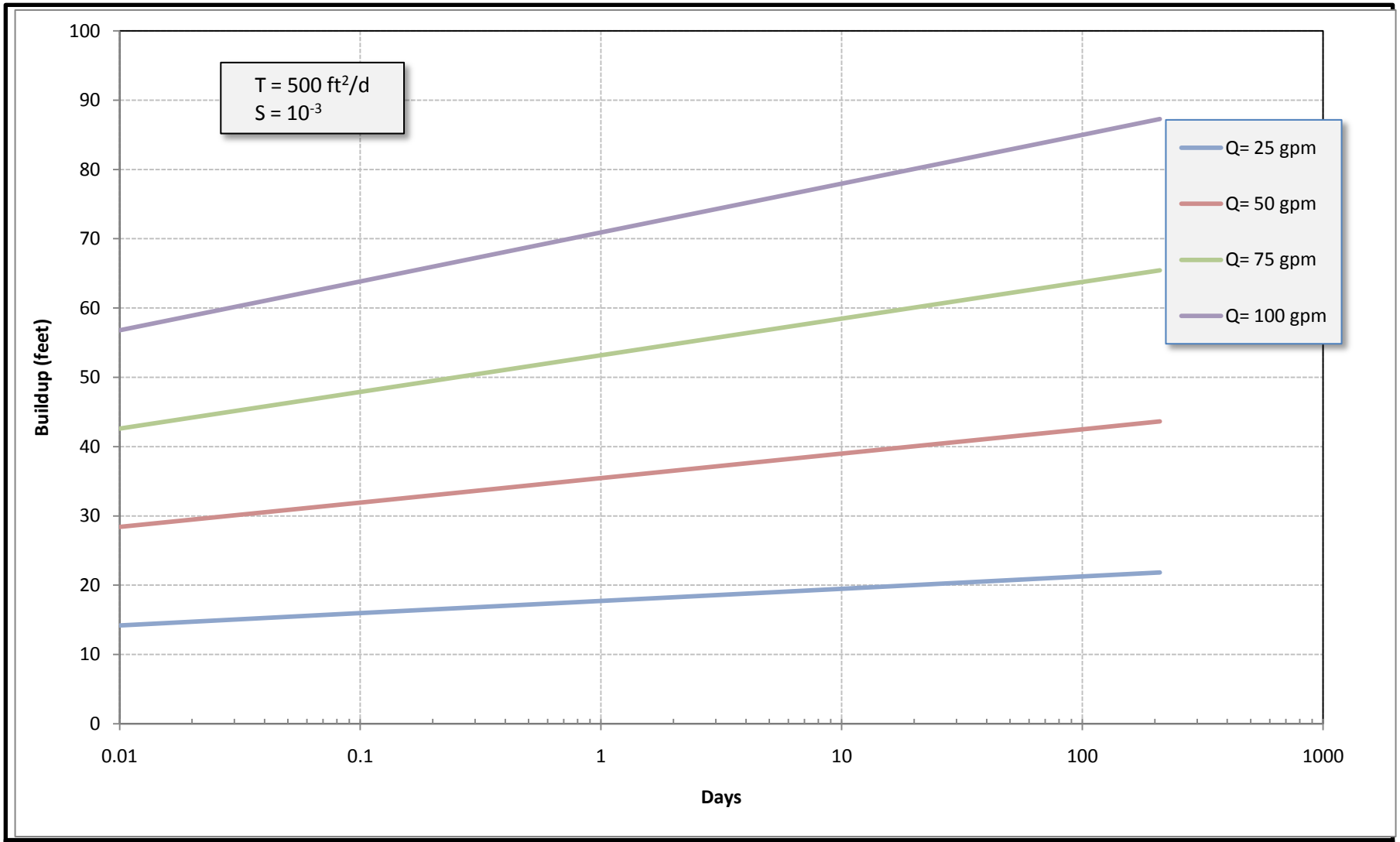
Golder Associates	Title: Estimated Groundwater Mound Configuration After 2100 Days (T= 30,000 ft2/d)	Drawn	MPK
		Checked	DH
	Project Name: WADOE/Eatonville Storage/WA — Project No.: 083-93607.500	Reviewed	DB
	Client Name: WADOETown of Eatonville — Date: March 11, 2010	FIGURE	D-4

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs t=30 k



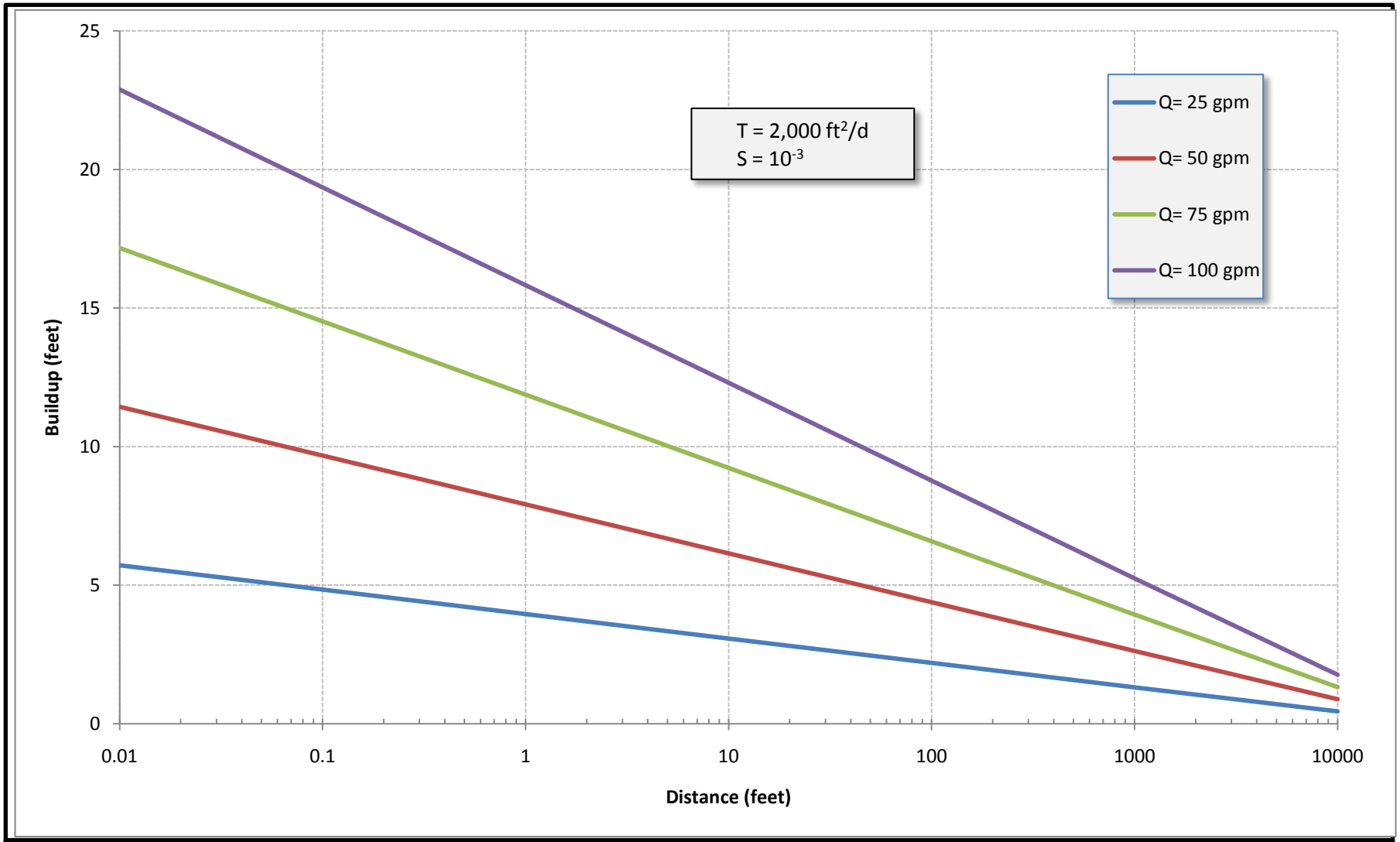
Golder Associates	Title: Estimated Buildup at Well after 210 Days (Basalt T= 2,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: DOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: Ecology/Town of Eatonville	Date: March 11, 2010	FIGURE D-5

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs basalt



Golder Associates	Title: Estimated Buildup at Well after 210 Days (Basalt T= 500 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: DOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: Ecology/Town of Eatonville	Date: March 11, 2010	FIGURE D-6

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs basalt



Golder Associates	Title: Estimated Basalt Aquifer Buildup After 210 Days (T= 2,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: DOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: Ecology/Town of Eatonville	Date: March 11, 2010	FIGURE D-7

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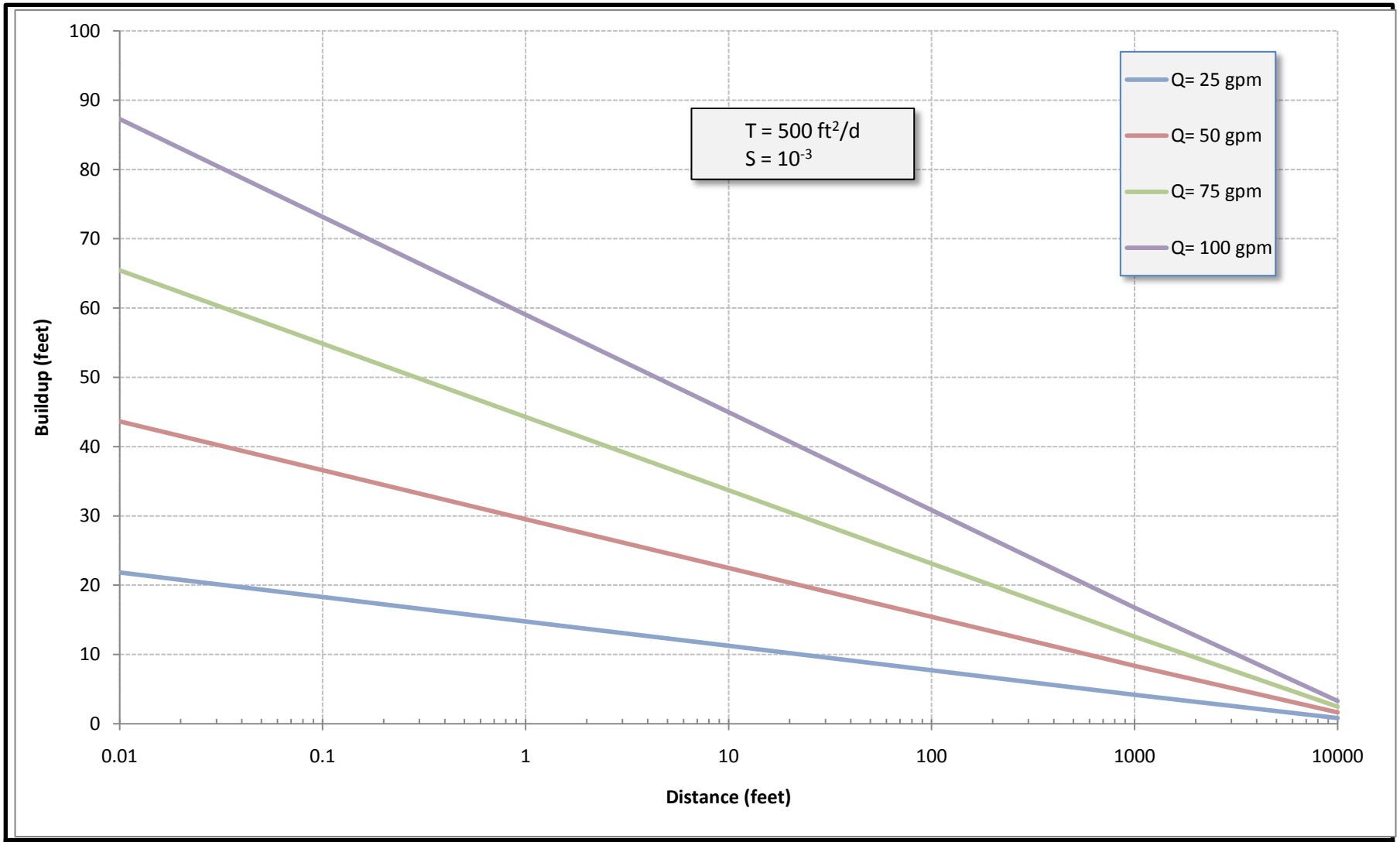

Golder Associates	Title: Estimated Basalt Aquifer Buildup After 210 Days (T= 500 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: DOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: Ecology/Town of Eatonville	Date: March 11, 2010	FIGURE D-8

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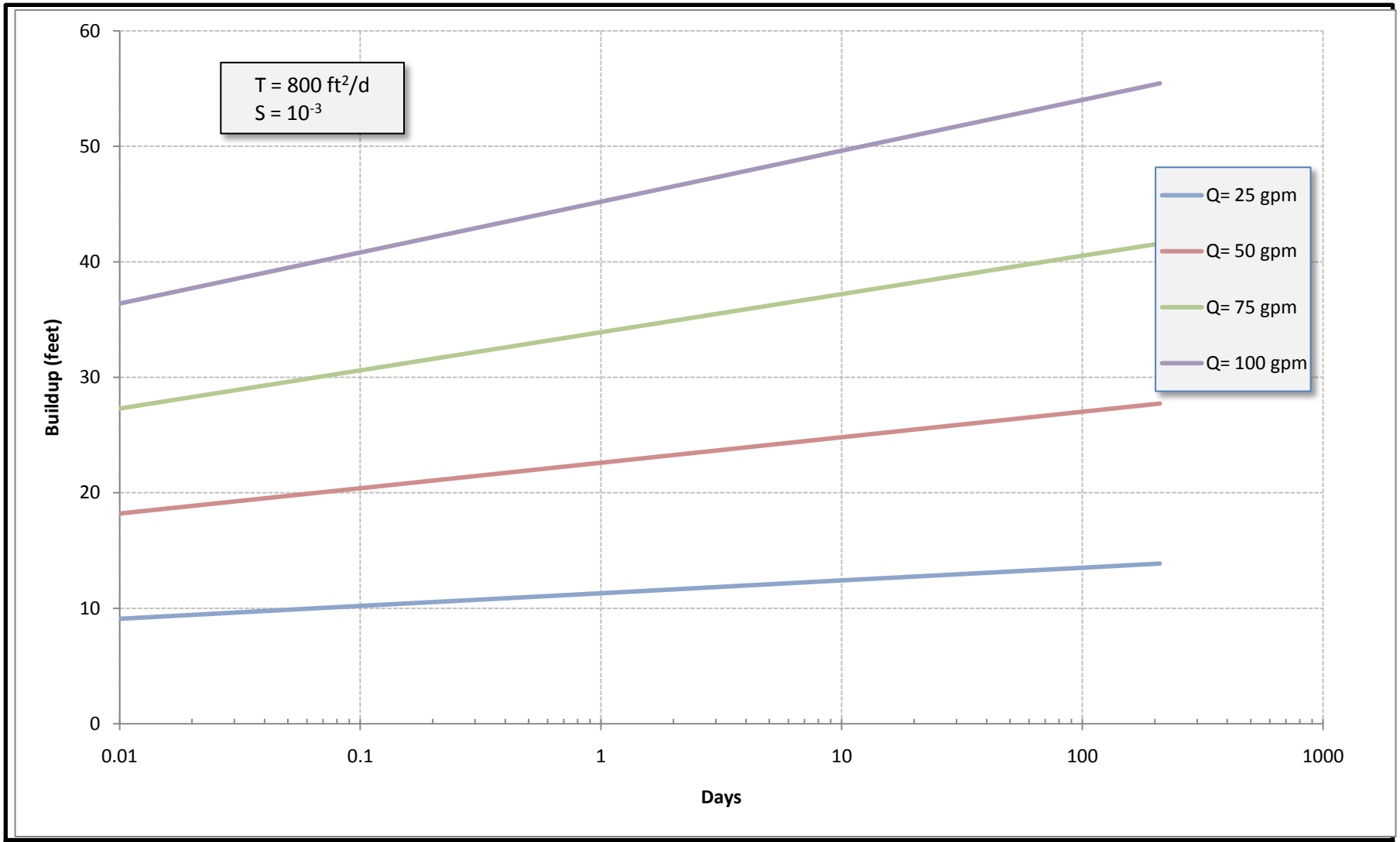
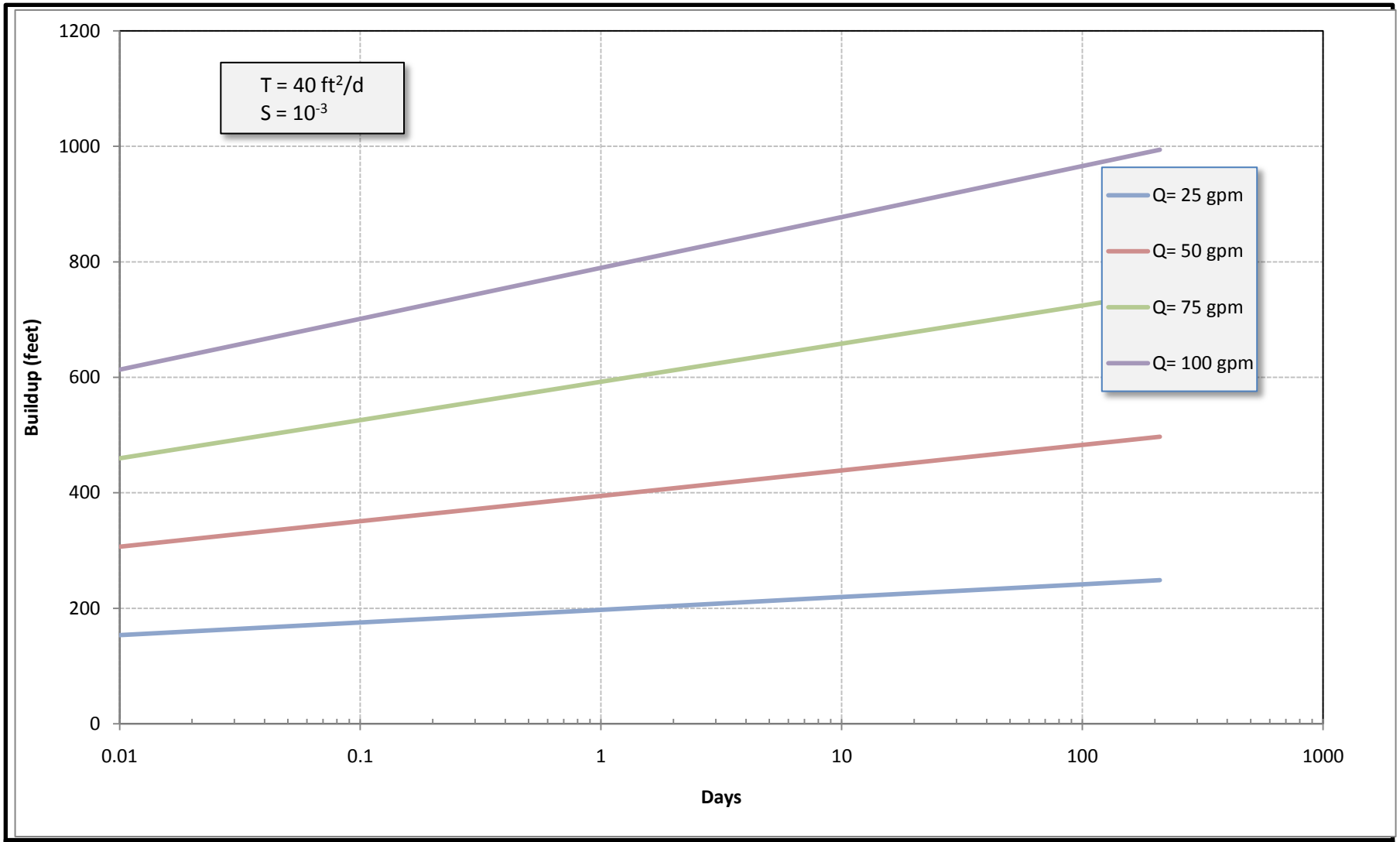
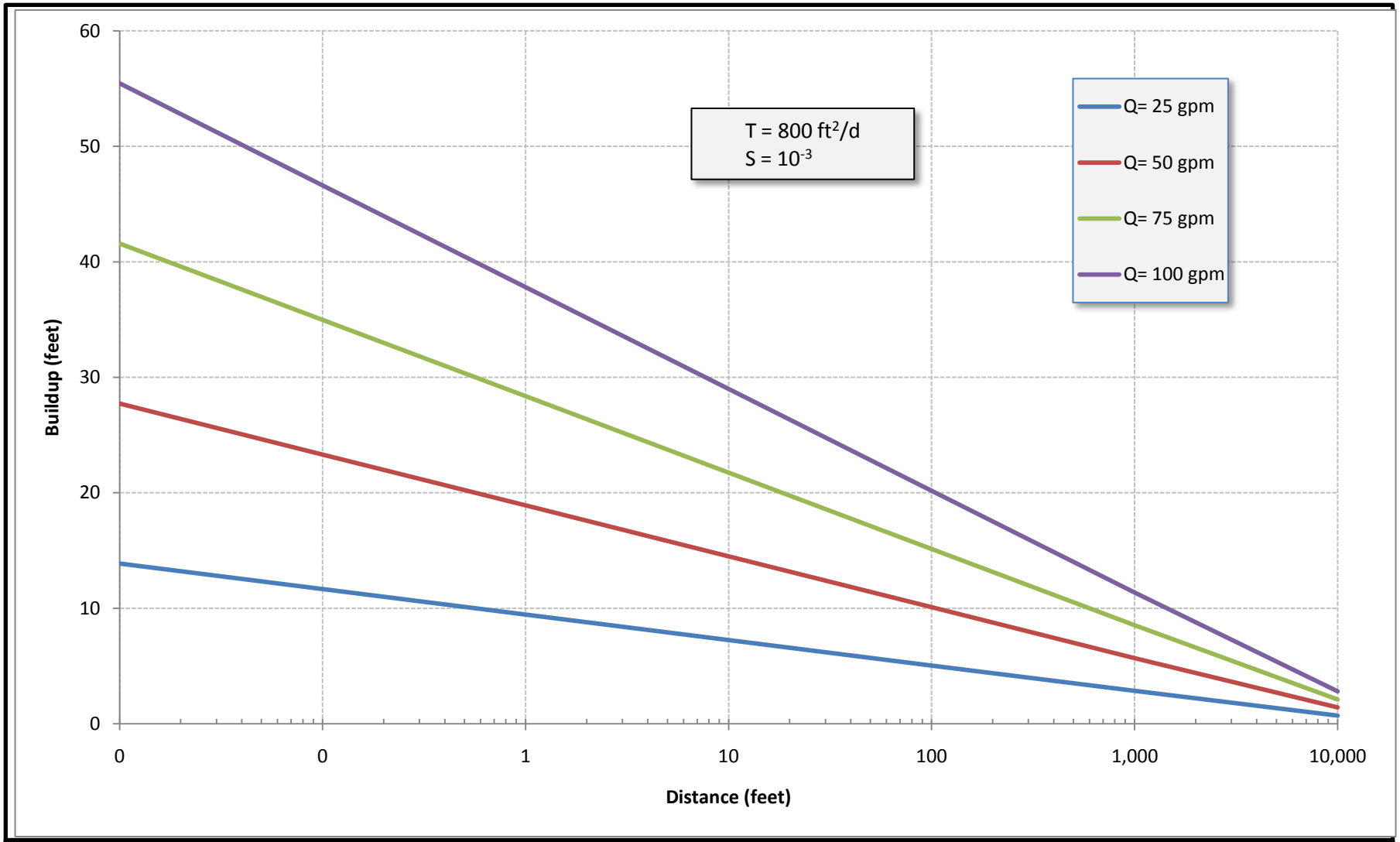


Golder Associates	Title: Estimated Water Level Rise after 210 Days (Mashel Fm T= 800 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-9



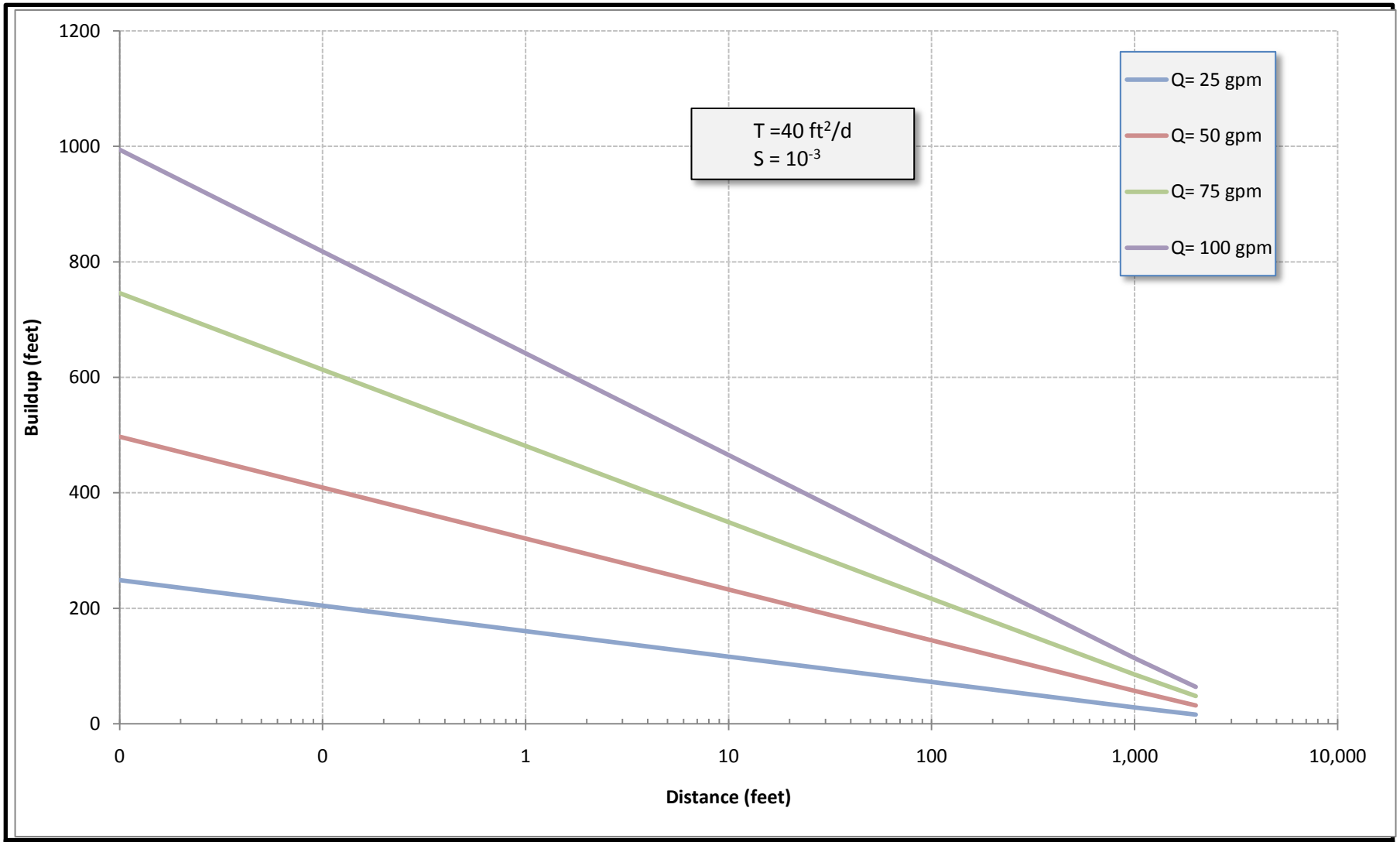
Golder Associates	Title: Estimated Water Level Rise after 210 Days (Mashel Fm T= 40 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-10

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs mashel



Golder Associates	Title: Estimated Buildup in Mashel Formation After 210 Days (T= 800 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-11

V:\PROJECTS_2008 PROJECTS\083-93607 Eatonville_Storage_Banton\Phase 500 Reporting\Revised Report Mar 10\Final Report March 2010\Appendix D Mounding - Buildup\mounding calcs mashel



Golder Associates	Title: Estimated Buildup in Mashel Formation After 210 Days (T= 40 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-12

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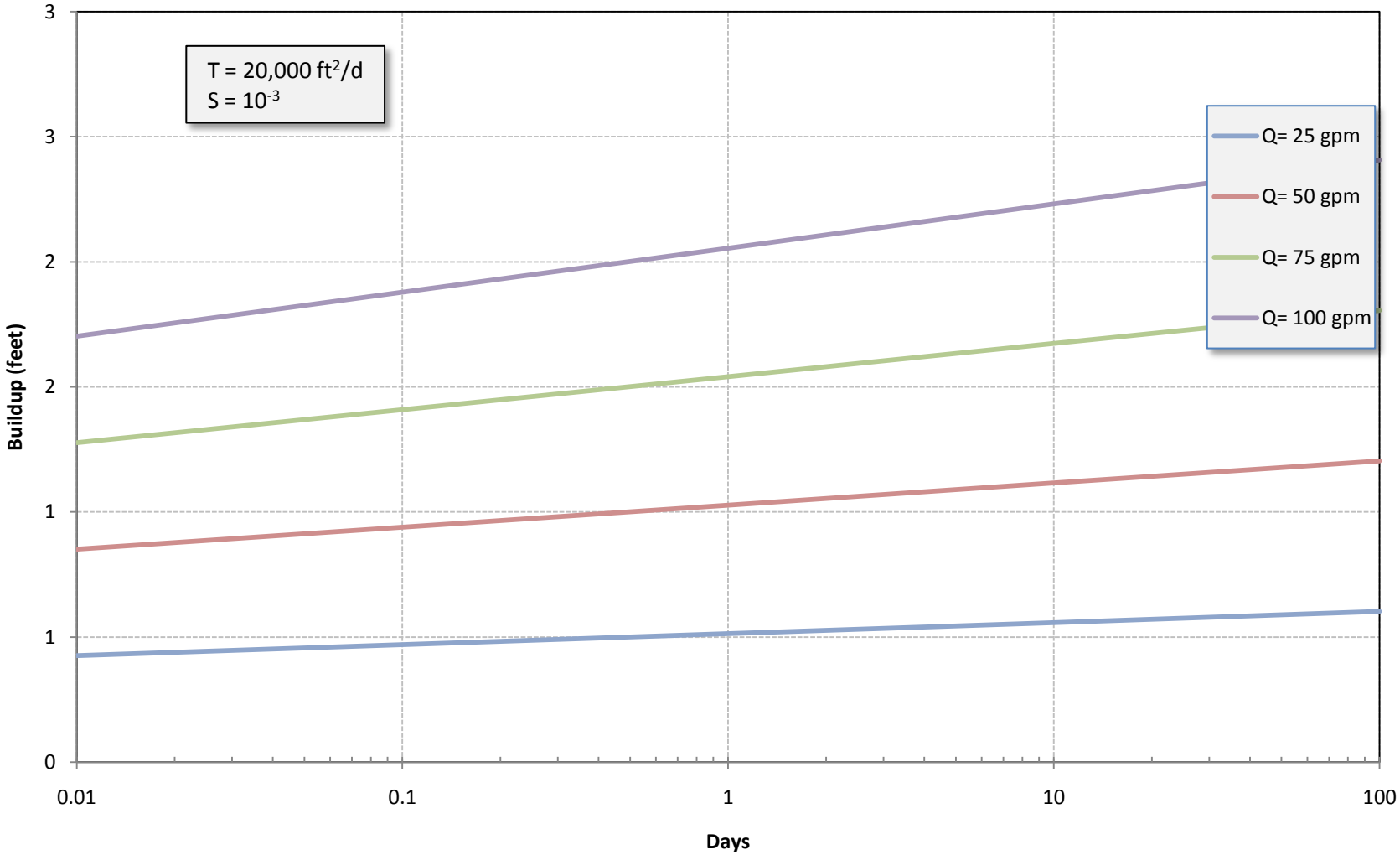

Golder Associates	Title: Estimated Water Level Rise after 90 Days (Glacial Materials T= 20,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-13

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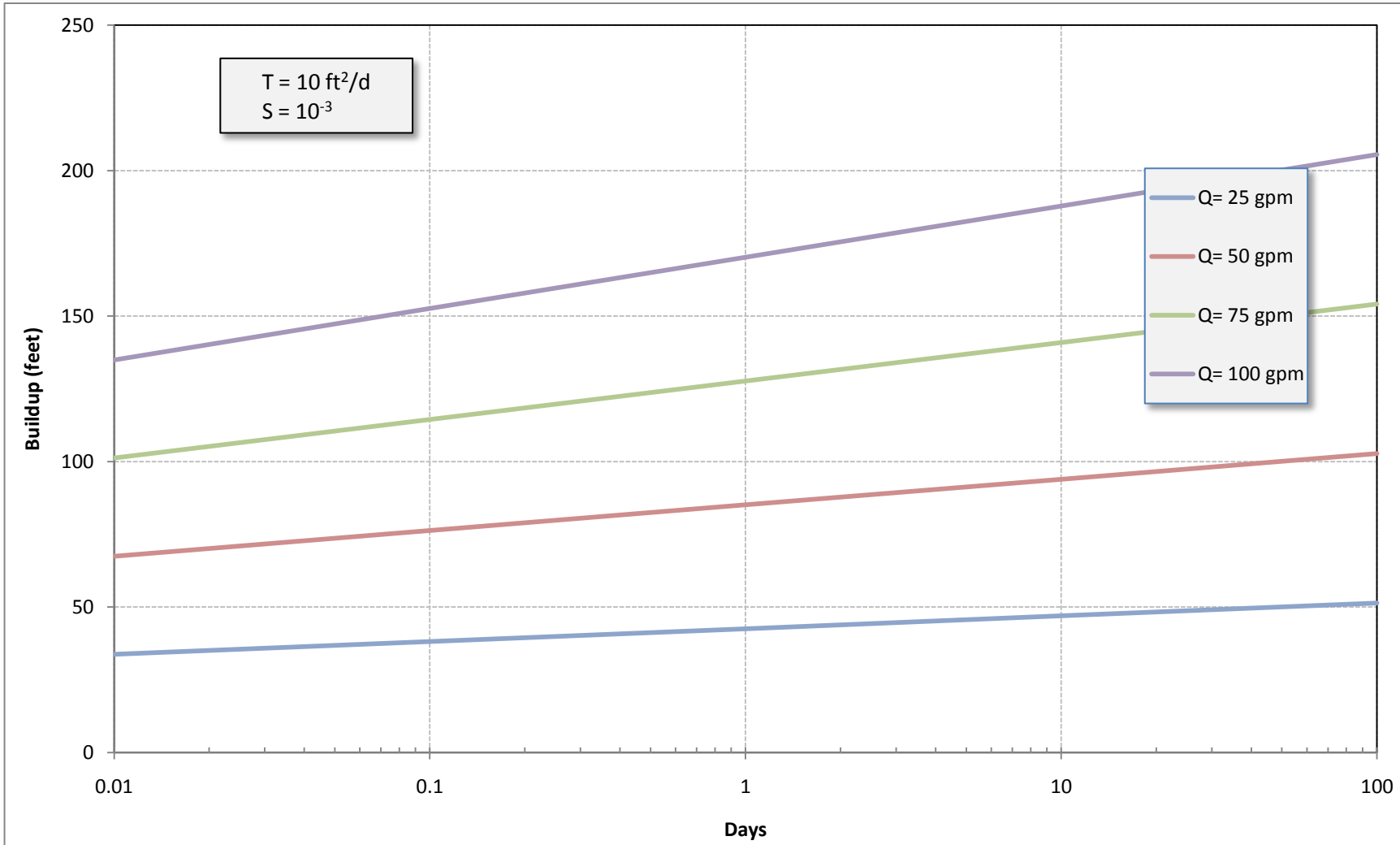

Golder Associates	Title: Estimated Water Level Rise after 90 Days (Glacial Materials T= 200 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-14

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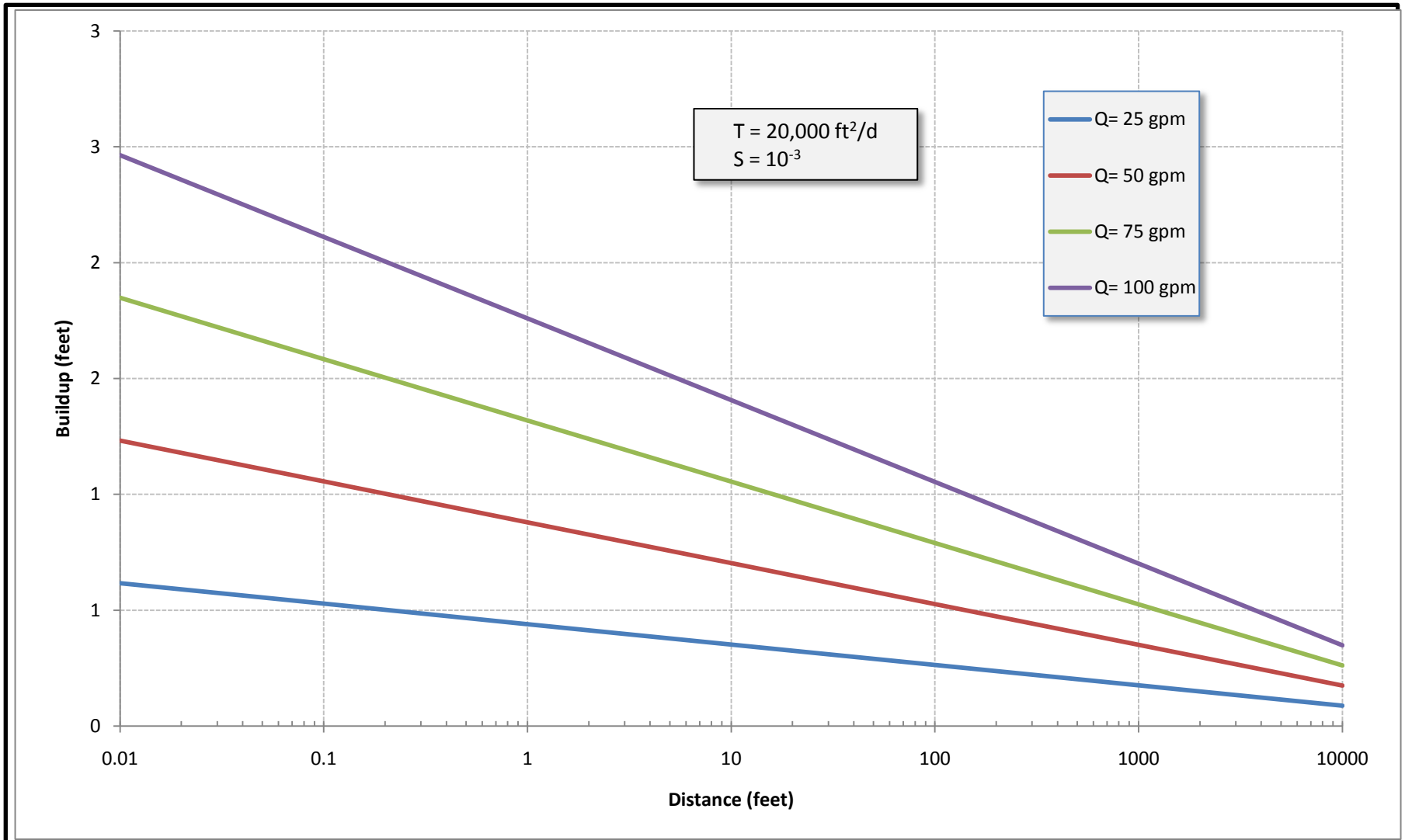

Golder Associates	Title: Estimated Buildup in Glacial Aquifer After 90 Days (T= 20,000 ft2/d)		Drawn: MPK
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	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-15

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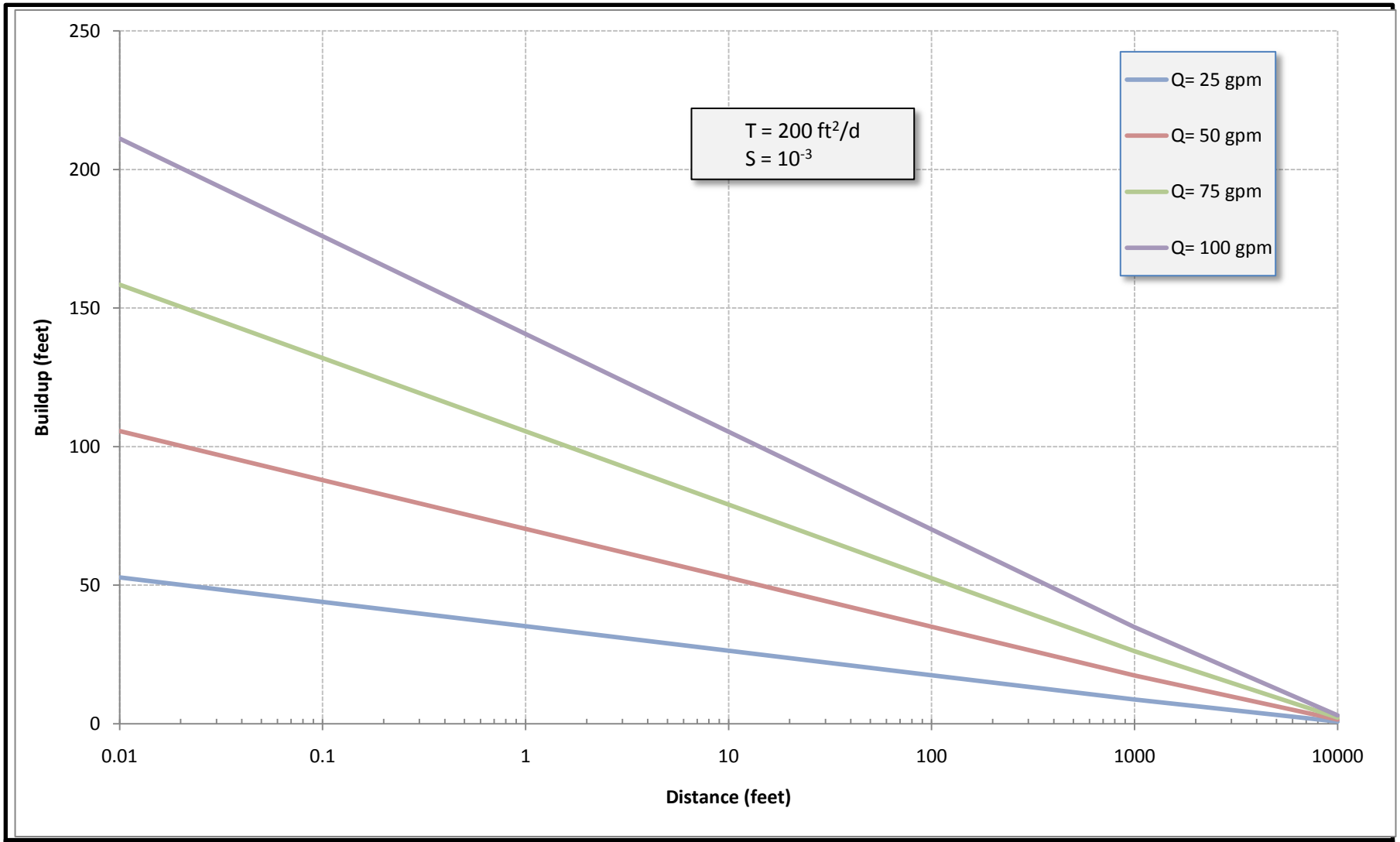

Golder Associates	Title: Estimated Buildup in Glacial Aquifer After 90 Days (T= 200 ft2/d)		Drawn: MPK
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	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-16

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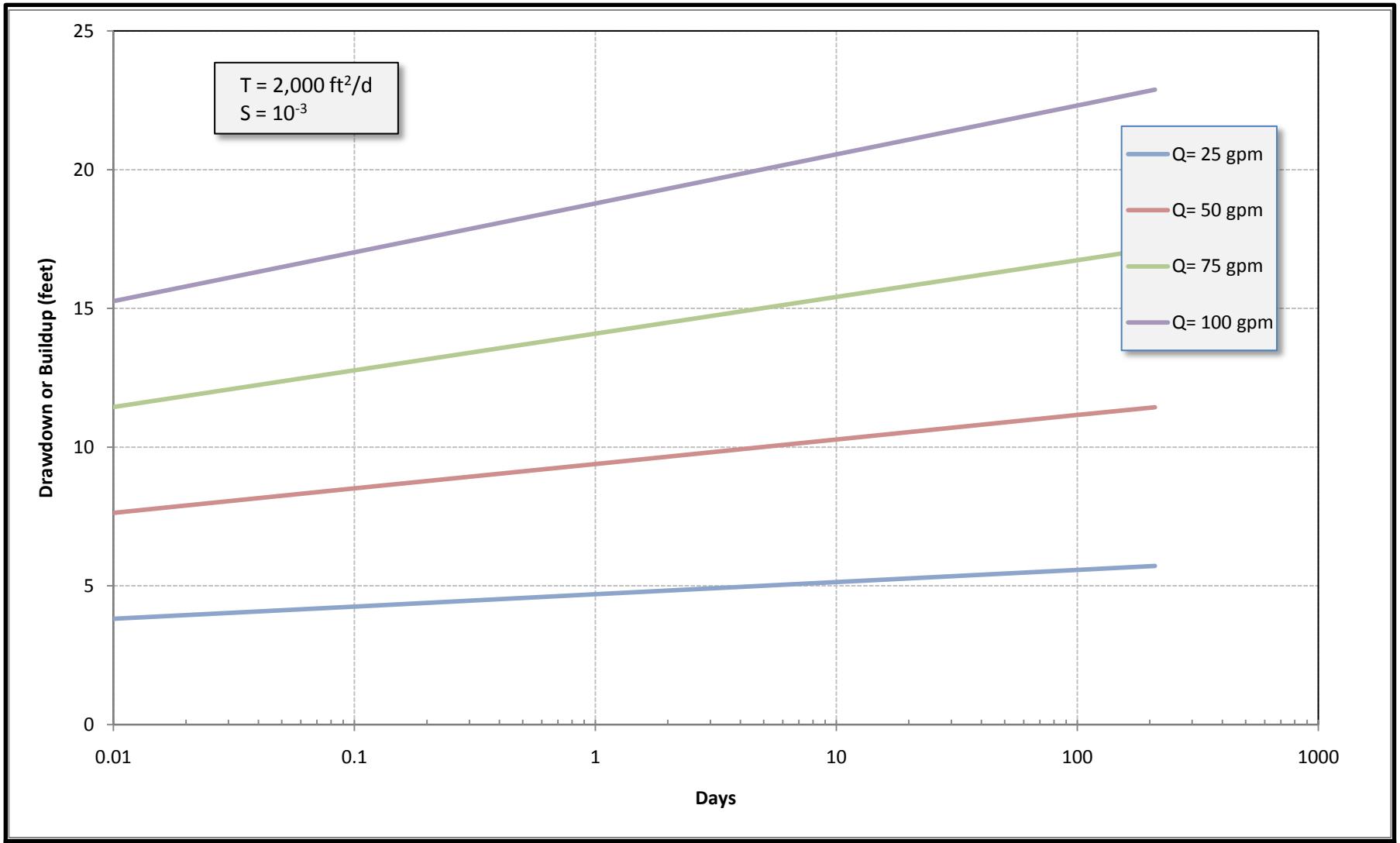

Golder Associates	Title: Estimated Drawdown or Water Level Rise after 210 Days (T= 2,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-17

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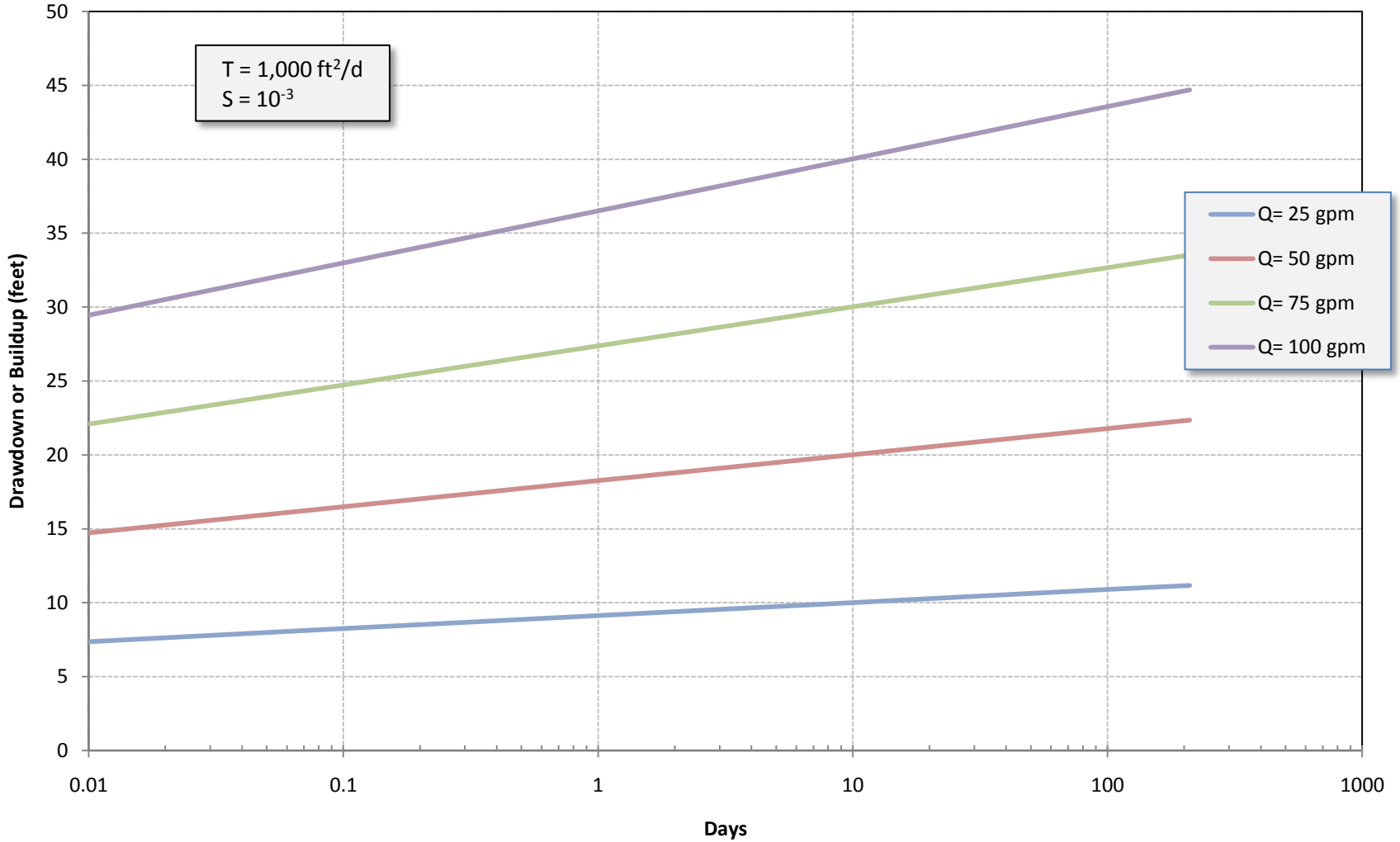

Golder Associates	Title: Estimated Drawdown or Water Level Rise after 210 Days (T= 1,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-18

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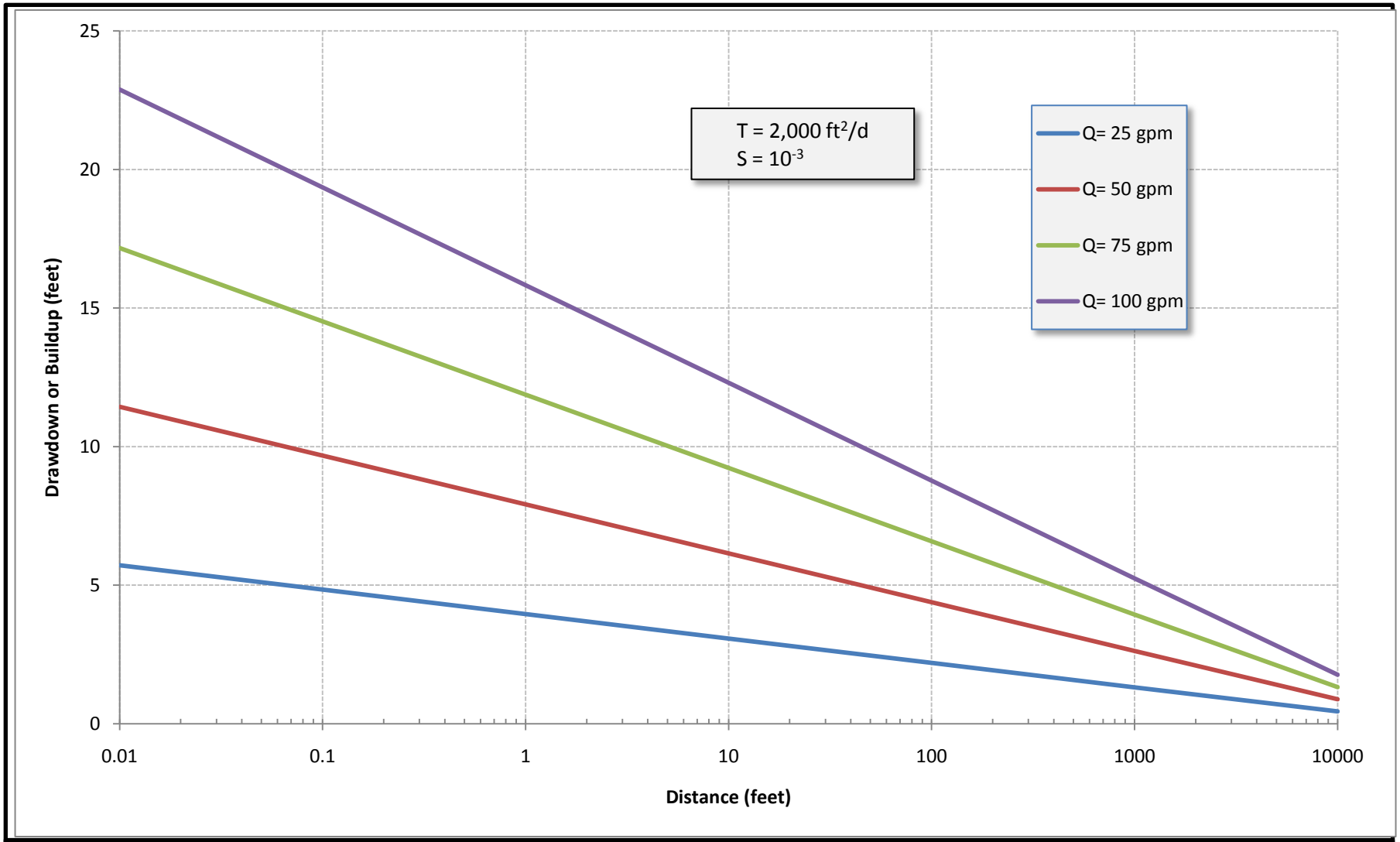

Golder Associates	Title: Estimated Groundwater Drawdown or Mound Configuration After 210 Days (T= 2,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-19

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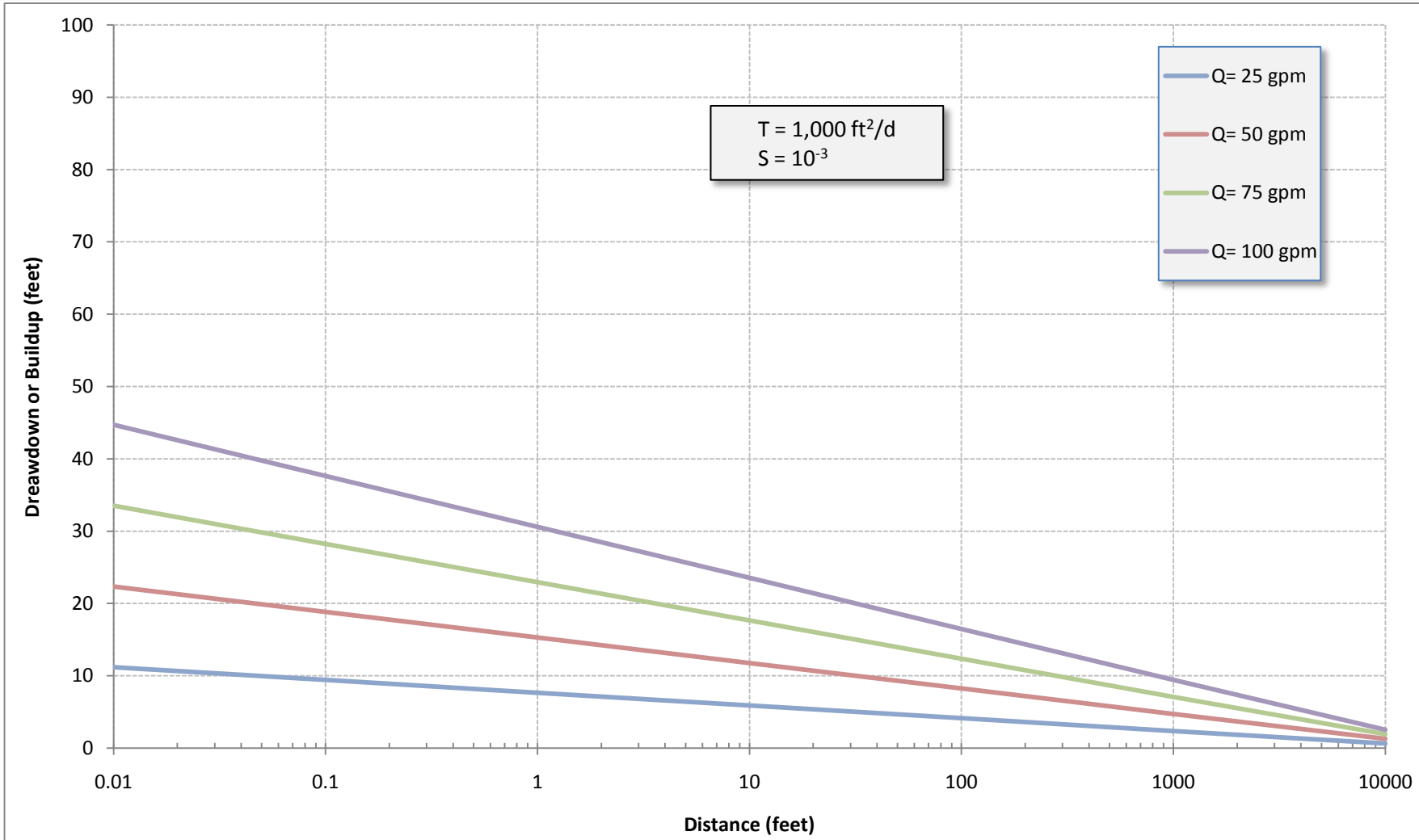

Golder Associates	Title: Estimated Groundwater Drawdown or Mound Configuration After 210 Days (T= 1,000 ft2/d)		Drawn: MPK
			Checked: DH
	Project Name: WADOE/Eatonville Storage/WA	Project No.: 083-93607.500	Reviewed: DB
	Client Name: WADOE/Town of Eatonville	Date: March 11, 2010	FIGURE D-18

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APPENDIX E

PHASE II SCOPE AND BUDGET

SCOPE OF WORK FOR PHASE II STORAGE EVALUATIONS, TOWN OF EATONVILLE

The following scope of work is for the Phase II evaluation of the preferred storage option for the Town of Eatonville, identified in the Phase I report[1]:

- Aquifer Storage and Recovery (ASR) in the volcanic aquifer materials that underlie the Town of Eatonville.

The purpose of the Phase II work is to evaluate the feasibility of the preferred alternative. The Phase II work is subdivided into two sub-phases. Phase IIa involves the installation and testing of test well to evaluate the hydrogeological and hydro-chemical conditions in the volcanic aquifer in area of the Town of Eatonville wellfield. If the results of the Phase IIa indicate ASR pilot testing is feasible, ASR infrastructure will be designed and an ASR pilot test will be completed under Phase IIb.

The scope of work for the Phase II work has the following phases:

Phase IIa – Test Well Drilling

Task 1- Quality Assurance Project Plan and Additional Data Collection

Task 2 – Test Well Drilling

Task 3 – Pumping Test and Groundwater Quality Sampling

Task 4 – Phase IIa Technical Memorandum and Recommendations

Task 5- Meetings and Management

Phase IIb – ASR Pilot Test Design and Completion

Task 6 – ASR Engineering

Task 7 - Permit Application(s)

Task 8 – ASR Pilot Testing

Task 9 - Phase IIb Technical Memorandum and Recommendations

Task 10 – ASR Reservoir Permit Application Package

Task 10- Meetings and Management

[1] Golder Associates Inc, 2010, Phase I Storage Evaluation, Town of Eatonville, Eatonville, Washington, March 2010.

Phase IIa – Test Well Drilling

Task 1 – Quality Assurance Plan

A Quality Assurance Project Plan (QAPP) will be prepared for the work. The QAPP will include procedures used to collect and evaluate environmental data that will be completed as part of the Phase II work. This could include:

- Groundwater levels in new or existing wells;
- River stage;
- Groundwater and surface water quality;
- Hydraulic testing programs (pumping tests or other means); and
- Drilling and construction of monitoring wells, piezometers or pilot recharge well.

The QAPP will be prepared in accordance with Ecology's guidelines. A project database will be developed for the new and existing data that is compatible with Ecology's EIM data reporting forms and database to facilitate data uploading and retrieval.

A limited data collection program would be implemented. This program would most likely collect groundwater level data of yield data from existing domestic wells in the Eatonville area and installation of dedicated groundwater level monitoring equipment in selected wells.

Task 2 – Test Well Drilling

A test well would be drilled into the volcanic aquifer materials that underlie the Town of Eatonville. The well will be drilled to provide hydrogeologic information on the volcanic aquifer materials and serve as a pilot ASR Well if conditions are favorable.

A preliminary permit will be requested to drill and test the well. Specifications will be prepared for the well and sent to qualified contractors. The preliminary well design is for an 8-inch diameter open well completed to depths of 500 to 700 feet and sealed through the alluvial aquifer. The geologic units encountered in the well will be logged and a well log prepared. Short air-lift tests will be performed during drilling to estimate groundwater production. Following completion of drilling, the data from the test well will be evaluated in order to determine subsequent phases of the investigation.

A brief technical memorandum will be prepared following the completion of drilling. The memorandum will contain recommendations for subsequent phases of work if the airlift testing data indicates moderate permeability (airlift rates greater than 50 gpm).

Task 3 - Pumping Test and Groundwater Quality Sampling

If the airlift testing results are favorable (greater than 50 gpm), a temporary pump will be installed in the well and pumping tests completed. A 4-hour step-pumping test will be performed to evaluate the well performance. A 24-hour constant rate test will be performed to evaluate the aquifer hydraulic properties and aquifer boundaries, and to evaluate groundwater quality.

Field water quality parameters (pH, specific conductance, dissolved oxygen, turbidity, and temperature) and field chemistry (iron and manganese) will be monitored throughout the pumping test. At the end of the constant rate test, a groundwater quality sample will be collected and analyzed for a complete set of regulated constituents, major anions and cations, and other parameters that could affect ASR.

Task 4 – Phase IIa Technical Memorandum and Recommendations

A technical memorandum will be prepared documenting the results of the Phase IIa activities. The memorandum will include:

- Details of the test well drilling and construction
- Evaluation of the aquifer hydraulic properties and aquifer boundaries
- Groundwater flow directions and rates
- Evaluation of continuity with the alluvial aquifer and Mashel River
- Evaluation of native groundwater quality
- Evaluation of ASR feasibility including:
  - Estimated recharge and recovery rates
  - Estimated storage volume
  - Estimated water level rise during recharge and drawdown during pumping
  - Groundwater and recharge water compatibility
  - Radius of influence during recharge, storage, and recovery
- Evaluation of regulatory requirements for an ASR pilot test
- Identification of water source for pilot testing and modifications to the water treatment plant to meet engineering and regulatory requirements
- Recommendations for Phase IIb

Task 5- Meetings and Management

Three meetings will be held during the project: 1.) Project kickoff meeting; and 2.) A meeting held to review the results of the Phase IIa evaluations, and 3) Meeting with Ecology to discuss findings and the design, regulatory requirements and permitting of an ASR pilot test

Monthly and quarterly progress reports and budget updates will be provided.

Phase IIb – ASR Pilot Test Design and Completion

Task 6 – ASR Engineering

Engineering design will be completed for ASR pilot testing. This could include:

- Modifications to the Town's Water Treatment Plant to allow recharge of treated water consistent with regulatory requirements
- Piping from the water treatment plant to the recharge well
- Well pump and piping to allow recharge and pumping
- Pump to waste connection and discharge of the water produced during ASR pilot testing

An engineering design memorandum will be prepared that includes design drawings and specifications.

Task 7 - Permit Application(s)

Permits will be prepared and submitted for:

- ASR reservoir permit application for pilot testing
- UIC well registration
- Any other permits required for pilot testing such as JARPA for pumping to waste, if needed

Task 8 – ASR Pilot Testing

An ASR pilot test will be completed to evaluate ASR feasibility. The pilot test would consist of a short (4 to 8 hours) shakedown test to evaluate system performance, determine long-term recharge rates, and evaluate initial water level buildup. A longer pilot test would be completed involving multiple recharge, storage and recovery periods from as short as one day to as long as several months. The design of the test would consider the overall data needs – hydraulic properties, water quality, and water balance to complete an assessment of ASR feasibility. The test would include:

- Recharge and pumping rate and volume monitoring
- Recharge water suspended sediment monitoring
- Groundwater level monitoring in the recharge well and nearby observation wells in the alluvial aquifer and other basalt wells (if available)
- Monitoring of field water quality parameters and chemistry in the recharge water, stored water, and recovered water
- Water quality sampling of the recharge water, stored water, and recovered water
- Stage monitoring in the Mashel River

Task 9 - Phase IIb Technical Memorandum and Recommendations

A technical memorandum will be prepared documenting the results of the pilot testing. The memorandum will include evaluations of:

- Hydrogeological conceptual model of the volcanic aquifer system
- Evaluation of ASR performance including:
  - Aquifer hydraulic properties and boundaries
  - Water level buildup and radius of influence during recharge
  - Residual water level during storage
  - Drawdown and radius of influence during pumping
  - Hydraulic continuity with the Mashel River and alluvial aquifer
  - Changes in groundwater flow and migration of recharge water
  - Physio-chemical changes in the recharge water during storage and recovery
- Evaluation of full scale ASR storage capacity and recharge and recovery rates
- Recommendations for ASR system development and operations

Task 10 - ASR Reservoir Permit Application Package

A complete ASR reservoir permit application package meeting all of the requirements of WAC 173-157 will be prepared for submission to Ecology. The ASR Pilot Test will provide a significant amount of information needed to complete the reservoir permit application package.

Task 11- Meetings and Management

Three meetings will be held during the project: 1.) Meeting prior to the start of ASR pilot testing; and 2.) Two meetings held to review the results of the Phase IIb evaluations.

Monthly and quarterly progress reports and budget updates will be provided over an estimated nine-to twelve-month duration.