MONITORING WELL CONSTRUCTION REPORT

GIBRALTAR AND SAUK LANDFILLS SKAGIT COUNTY, WASHINGTON

December 20, 1990 Project No. 8938

Prepared for

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• Geotechnical Engineering • Hydrogeology • Materials Testing • Construction Inspection •

December 20, 1989

R.W. Beck and Associates 2101 Fourth Avenue, Suite 600 Seattle, Washington 98121-2375

Attention: Robert Bingham, Principal-In-Charge

Re: Monitoring Well Construction Report

Gibraltar and Sauk Landfills, Skagit County, Washington

Dear Mr. Bingham:

This report documents the monitoring well construction Hong West & Associates supervised at the Sauk and Gibraltar landfills. Our report includes four sections and four appendices:

SECTION 1.0 SCOPE OF WORK AND AUTHORIZATION

SECTION 2.0 GIBRALTAR LANDFILL

SECTION 3.0 SAUK LANDFILL

SECTION 4.0 CONCLUSIONS AND RECOMMENDATIONS

APPENDIX A - MONITORING WELL CONSTRUCTION

APPENDIX B - GRAIN SIZE DISTRIBUTION CURVES

APPENDIX C - SUPPLY WELL LOGS

APPENDIX D - WATER QUALITY DATA

It has been a pleasure working on this project and we would like to extend special thanks to Robin LaRue of the Skagit County Public Works Department, Mark Ingham of R.W Beck and Associates and Ken Willis of the Skagit County Health Department for their valuable assistance and support in completing this project.

If you have any questions or if I can be of further service, please call me.

Respectfully submitted:

HONG WEST & ASSOCIATES

Lawrence M. West Groundwater Geologist

LMW:ds Enclosure

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SAUK AND GIBRALTAR LANDFILLS SKAGIT COUNTY, WASHINGTON

MONITORING WELL CONSTRUCTION REPORT

This report documents the construction of monitoring wells at the Sauk and Gibraltar landfills in Skagit County, Washington. Partial funding for the monitoring well construction was obtained through the Washington State Department of Ecology (DOE) grant program.

SECTION 1 - SCOPE OF WORK AND AUTHORIZATION

The following Scope of Work was authorized in R.W. Beck and Associates' subconsultant agreement with Hong Consulting Engineers, Inc. dated August 24, 1989, under work order WV-0000-BD-AA.

TASK 1: Monitoring Well Design

▶ Site inspection by geohydrologist.

- ► Evaluation of groundwater flow direction from DOE and Skagit County Health Department data.
- Monitoring well design.
- ▶ Site location of monitoring wells.

TASK 2: Geologist/Site Engineering

Subtask 2A: Sauk Landfill Monitoring Well Installation Services

- Observation of critical well construction activities by on-site geologist.
- ▶ Logging of wells and other relevant geohydrologic information by site geologist.
- ▶ Maintain record of installation activities as required by WAC 173-160-150.
- ▶ Monitor for methane gas during drilling.

Subtask 2B: Gibraltar Landfill Monitoring Well Installation Services

- ▶ Observation of critical well construction activities by on-site geologist.
- ▶ Logging of wells and other relevant geohydrologic information by site geologist.
- ▶ Maintain record of installation activities as required by WAC 173-160-150.
- ► Monitor for methane gas during drilling.
- ▶ Direct the installation of two gas probes in each well at approximately 10- and 25-foot depths below landfill.

Subtask 2C: Documentation of Monitoring Well Installation

- ▶ Geologic and Hydrologic data obtained.
- Estimates of range of aquifer conductivity based on drill cuttings inspection.
- ► Letter report.

SECTION 2 - GIBRALTAR LANDFILL

The Gibraltar Landfill is located in the NE1/4, SW1/4, Township 34 North, Range 2 East, immediately south of Fidalgo School off Gibraltar Road (Refer to Figure 2-1, Location Map, Gibraltar Landfill). Figure 2-1 also shows the location of domestic wells near the Gibraltar Landfill.

The site occupies an old gravel pit (the eastern part of the gravel pit is still active) and the landfill has recently been covered with a low permeability cap (refer to Figure 2-2, Site Map). Site elevations range from approximately 240-265 feet above sea level. Thickness/depth of waste is unknown.

2.1 GIBRALTAR LANDFILL MONITORING SYSTEM SUMMARY

Four monitoring wells were installed at the Gibraltar Landfill during the period September 25, 1989 to October 6, 1989. One monitoring well, MW-1, was installed in a perched aquifer and the remainder of the monitoring wells were installed in a shallow confined aquifer. All of the wells were installed in downgradient locations. There is currently no upgradient monitoring well for either the perched aquifer or the shallow confined aquifer. Gas monitoring probes were installed in each of the wells. Table 2-1, Monitoring Well Specifics, Gibraltar Landfill, summarizes the significant well parameters. For additional details refer to Appendix A - Monitoring Well Construction.

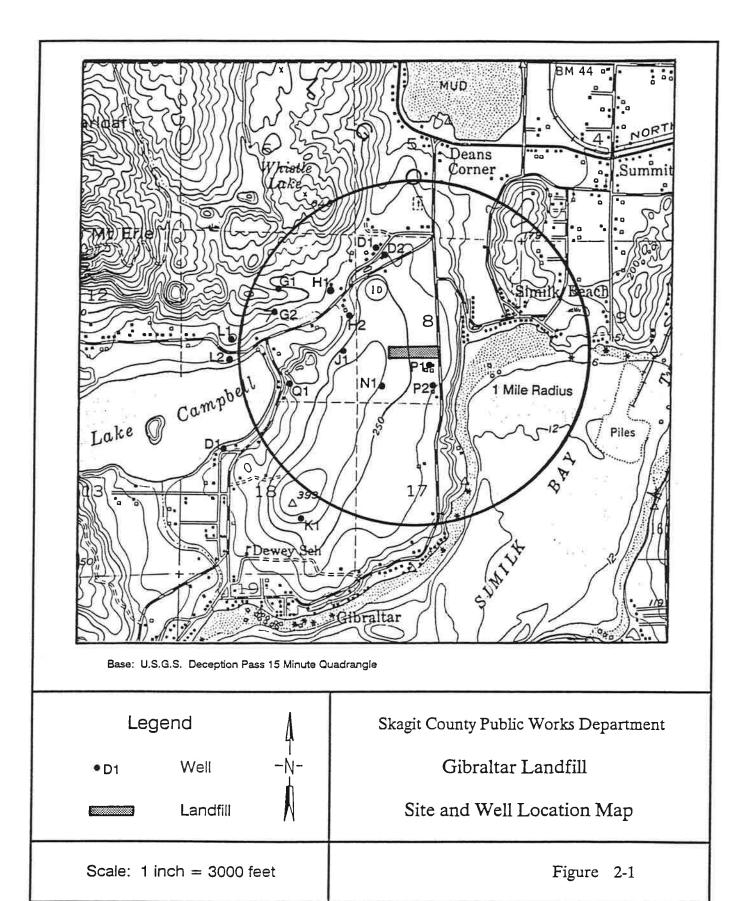
TABLE 2-1

Monitoring Well Specifics
Gibraltar Landfill

Well No.	Ground Surface Elevation Feet	Top of Casing Elevation Feet	Drill Depth Feet	Screen Depth Feet	Level Elevation Feet	Gas Probe Depth
MW-1	239.57	240.97	60	39-34	202-207	15
MW-2	254.28	256.73	200	185-175	77-82	10/25
MW-3	252.97	254.87	202	185-175	70-75	18/25
MW-4	239.25	240.55	198	180-170	60-70	25

All elevations are above sea level, USGS datum and the top of casing elevation includes Geoguard pump cap.

The Skagit County Health Department has installed dedicated Geoguard pumps in the three deep wells. The Health Department also performs quarterly sampling and water level measurements. Wellhead elevations were surveyed by the Skagit County Public Works Department. Table 2-2 presents water levels for fall 1989 and spring 1990.



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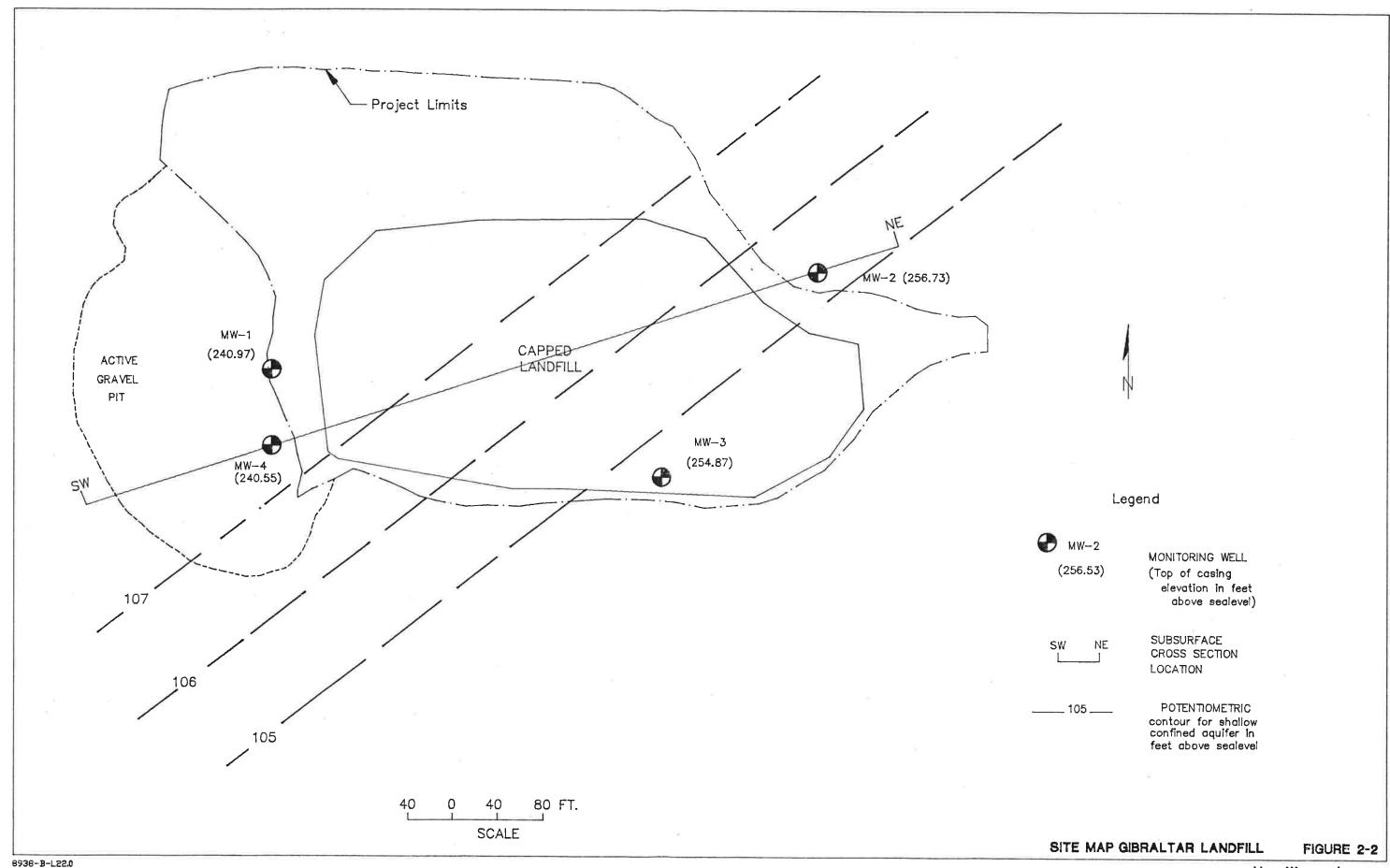


TABLE 2-2

Groundwater Levels Gibraltar Landfill

Well No.	Top of Casing Elevation Feet		r 31, 1989 Elevation Feet	May 11 Depth Feet	Elevation
MW-1	240.97	37.22	203.75	36.70	204.27
MW-2	256.73	151.12	105.61	149.90	106.83
MW-3	254.87	149.91	104.96	149.74	105.13
MW-4	240.55	133.00	107.55	132.56	107.99

Note: All elevations are above sea level, USGS datum.

2.2 REGIONAL SETTING

The Gibraltar Landfill is situated on the eastern side of Fidalgo Island. The area is predominantly covered by glacial debris overlying sedimentary and metamorphic bedrock. Bedrock is exposed within 1,500 to 3,000 feet northwest, north and northeast of the site. The nearest surface water bodies include Similk Bay, downslope, 2,000 feet to the southeast and Lake Campbell (elevation approximately 25 feet) 5,000 feet to the southwest.

2.3 SITE GEOLOGY

The site is underlain by glacial deposits consisting of light brown sand and gravel to about 160 feet (refer to Figure 2-3, Subsurface Cross Section, Gibraltar Landfill). Several silt stringers (typically less than one-foot thick) are also present between elevation 125 and 155 feet (refer to Appendix A - Well Logs).

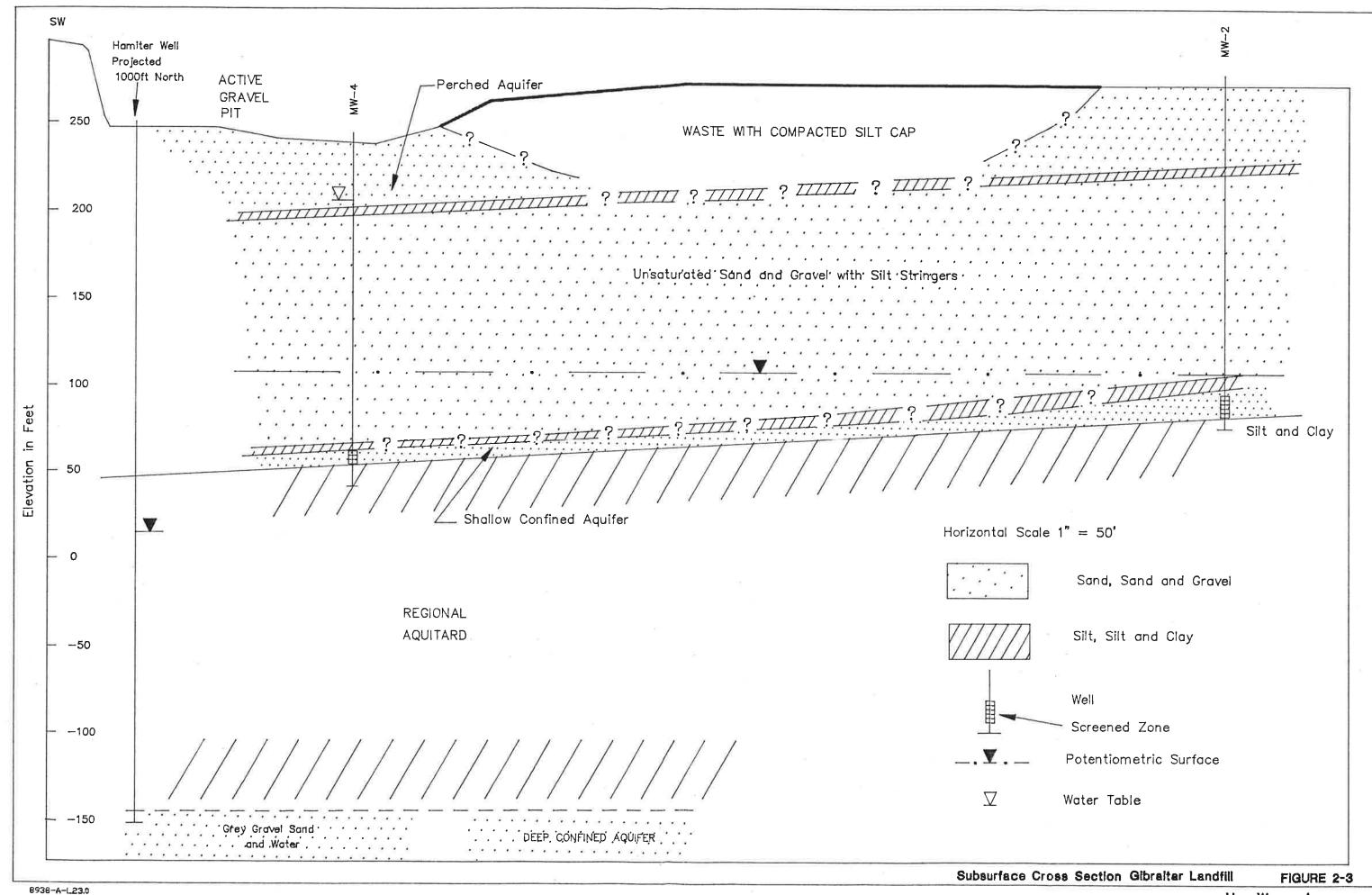
A prominent 3-5 foot thick silt layer was identified during drilling in all of the monitoring wells at a depth of approximately 40-45 feet (elevation 200 to 225 feet above sea level). The silt layer slopes to the west.

The brown sand and gravel is underlain by 20-35 feet of gray silty sand and silt, which is in turn underlain by approximately 200 feet of gray silt and clay (based on area water supply well logs).

Below the gray silt and clay are gray sands and gravels which constitute the principal water supply unit in the area.

2.4 GROUNDWATER OCCURRENCE AND FLOW

Several groundwater-bearing units have been identified beneath the Gibraltar Landfill including a shallow perched aquifer near the base of the fill, a shallow confined aquifer at approximately 160 feet and a deep confined aquifer approximately 400 feet.



Perched Aquifer

On-site investigations indicate a perched aquifer at approximately elevation 203 feet above sea level (37 feet deep) on the west side of the landfill. The perching layer is the prominent silt unit at approximately 40 feet. Although the silt layer was identified in all the monitoring wells, perched water was identified only in monitoring wells MW-1 and MW-4 on the west side of the landfill.

Two domestic shallow dug wells (Hunter and Palm) southeast of the landfill tap a shallow perched aquifer. However, the water levels in the Hunter and Palm wells are elevation 215 feet and 207 feet respectively indicating that both wells are upgradient/upslope from the landfill or producing from different perched aquifers than the perched aquifer beneath the landfill. Groundwater flow in the perched aquifer is probably westerly, the same direction as the slope of the perching layer. Based on grain size distribution (Appendix B - Grain Size Distribution Curves), fines separation (due to drilling technique) and data from Powers (1981) the estimated hydraulic conductivity of the perched aquifer is on the order of 5×10^{-2} ft/minute. Water level measurements indicate less than one foot decrease in the perched aquifer's water table between fall 1989 and spring 1990.

Shallow Confined Aquifer

The uppermost areally extensive groundwater bearing unit is a confined aquifer approximately 160 feet deep. The confined aquifer is about 5 to 10 feet thick and occurs in gray silty sands at the top of a regional aquitard.

The confining unit for this aquifer appears to be numerous thin silt and sandy silt stringers near elevation 50 feet on the west side of the landfill and about elevation 75 on the east side of the landfill. The confining zone appears to be about 5 to 10 feet thick.

The potentiometric level of the shallow confined aquifer ranges from elevation 108 on the west side of the landfill to about elevation 104 on the east (refer to Figure 2-2, Site Map). Groundwater flow in the shallow confined aquifer is south 38 degrees east based on water levels measured October 31, 1989. Water level measurements indicate about a one foot decrease in potentiometric levels for the shallow confined aquifer between fall 1989 and spring 1990.

Based on grain size distribution, fines separation (due to drilling technique) and data from Powers (1981) the hydraulic conductivity of the shallow confined aquifer is on the order of $1x10^{-3}$ to $1x10^{-2}$ ft/minute. Water level data indicate a hydraulic gradient of approximately .01 ft/ft. The porosity of a silty sand is quite variable and difficult to quantify. However, based on the literature (Powers, 1981 and Walton, 1984) and our experience with similar material, a porosity of 30% is reasonable to assume for the silty sand of the shallow confined aquifer. Assuming a porosity of 30%, the groundwater flow rate can be calculated using Darcy's Law. Where: V = Ki/n and V = velocity, K = hydraulic conductivity, K = hydraulic conducti

Therefore, the rate of groundwater flow beneath the Gibraltar Landfill = V = [(est .005 ft/min)(.01)/.30] (1440) = .25 ft/day or 90 feet per year.

Deep Confined Aquifer

The available data indicate the deep confined aquifer is separated from the shallow confined aquifer by a 200-foot thick regional aquitard of silt and clay (refer to Figure 2-3). The deep confined aquifer consists of gray gravelly sand at approximately 150 feet below sea level with a potentiometric level of approximately elevation 15 feet above sea level (based on Frank Hamiter well, 1,000 feet south of landfill).

Insufficient data are available to determine the direction and rate of flow in the deep confined aquifer. The deep confined aquifer is the principal water supply in the area.

2.5 GROUNDWATER USE

The Skagit County Health Department has identified 11 water supply wells within one mile of the landfill (refer to Figure 2-1). Most of these wells are west-northwest of the site. Five wells are within half a mile of the landfill. Refer to Table 2-3, Gibraltar Water Supply Wells for well distances and directions from the landfill (well locations are shown on Figure 2-1, well logs are included in Appendix C).

TABLE 2-3
Gibraltar Water Supply Wells

Well Owner		Depth	Distance & Direction from Landfill
8P1 8P2	Robert Hunter Warren Palm	35ft 15+ft	600ft SE 1,000ft SE
7J1	Wyman Tibbles	40ft	1,500ft SE 1,500ft W
7H2	Dan Tibbles	276ft	1,600ft WNW
8N 1	Frank Hamiter	400ft	1,100ft SSW
8D1	Terry Buchanan	85ft	3,500ft NNW
8D2	Craig Ginnett	?	3,000ft NNW
7G 1	Bob Tracy	400ft	4,000ft NW
7G2	Jim Hertzberg	270ft	4,000ft NW
7H 1	Tom Wilson	330ft	2,500ft NW
7L1	George Mcleod	72ft	5,500ft W
7L2	Vernon Hilbert	7 6ft	5,500ft W
7Q1	Hallie Allen	7 9ft	3,500ft WSW
18D1	Clayton Lunz	291ft	6,000ft SW
18K1	David Kwan	?	6,000ft SSW

Based on the available information, all of the wells in the vicinity of the Gibraltar Landfill produce from either the shallow perched aquifer or the deep confined aquifer. There are no known water supply wells tapping the shallow confined aquifer. Available data suggest that it is unlikely that any wells in the would use the shallow confined aquifer for water supply due to its low yield potential.

2.6 GROUNDWATER QUALITY

The Skagit County Health Department sampled the Gibraltar monitoring wells in February 1990. Analytical results are included in Appendix D.

All of the wells exhibited groundwater quality impacts. Table 2-4 lists the parameters and concentrations indicative of groundwater contamination in Gibraltar monitoring wells. Vinyl Chloride in MW-1 exceeds EPA's Primary Drinking Water Standard (2.0 ug/l). Manganese in all four wells exceeds the Secondary Drinking Water Standard (.05 mg/l).

TABLE 2-4

Water Quality Parameters at Concentrations
Indicative of Contamination in Gibraltar Landfill Monitoring Wells
(April, 1990)

Parameter	MW-1	MW-2	MW-3	MW-4
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Sulfate (mg/l)	102.0	67.8		63.6
Manganese (mg/l)	7.2	.178	.147	.304
Vinyl Chloride (ug/l)	2.2			
Chloroethane (ug/l)	1.3			
1,1-Dichloroethane (ug/l)	2.4			
2-Butanone MEK (ug/l)		94.0	30.0	37.0
Toluene (ug/l)				2.7
Conductivity (micromhos)	1984.0	729.0	603.0	727.0

The above data indicate groundwater impacts from previous landfill operations. The data represents only one sampling event and none of the wells represent background conditions.

SECTION 3 - SAUK LANDFILL

The Sauk Landfill is located in the NW1/4, NE1/4, Section 28, Township 35 North, Range 9 East approximately 6 miles east of Concrete, Washington, immediately southwest of Highway 20 (refer to Figure 3-1, Location Map). Figure 3-1 also shows the location of domestic wells near the Sauk Landfill.

The site occupies an old gravel pit and the landfill has recently been covered with a low permeability cap (refer to Figure 3-2, Site Map). Site elevations range from approximately 520-555 feet above sea level. Thickness/depth of waste is unknown.

3.1 SAUK LANDFILL MONITORING SYSTEM SUMMARY

Four monitoring wells were installed at the Sauk Landfill during the period October 12, 1989 to October 24, 1989. All four monitoring wells were installed in the uppermost aquifer. One well, MW-3, was installed in an upgradient position. The remaining three wells were installed in downgradient locations. Table 3-1, Monitoring Well Specifics, Sauk Landfill, summarizes the significant well parameters. For additional details refer to Appendix A - Monitoring Well Construction, Sauk and Gibraltar landfills.

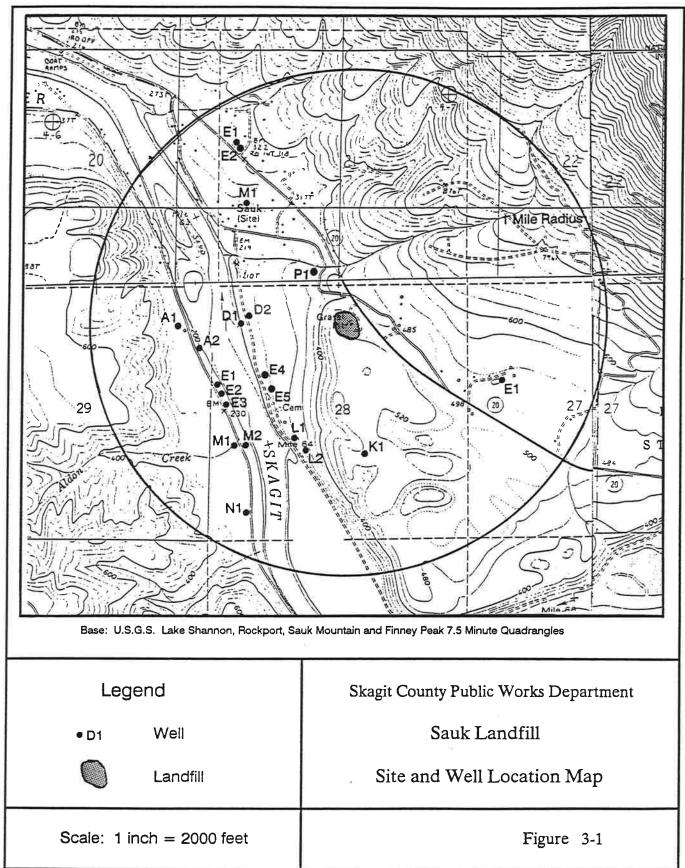
TABLE 3-1

Monitoring Well Specifics
Sauk Landfill

Well No.	Ground Surface Elevation Feet	Top of Casing Elevation Feet	Drill Depth Feet	Screen Depth Feet	Level Elevation Feet
-			S 	: 	-
MW-1	522.38	524.23	182	157-167	365-355
MW-2	524.22	526.07	182	155-165	369-359
MW-3	551.80	553.65	198	168-178	384-374
MW-4	528.14	530.04	178	158-168	370-360

Note: All elevations are above sea level, USGS datum. Top of casing includes a Geoguard pump cap.

The Skagit County Health Department has installed dedicated Geoguard pumps in the wells. The Health Department also performs quarterly sampling and water level measurements. Wellhead elevations were surveyed by the Skagit County Public Works Department. Table 3-2 presents water level measurements for fall 1989 and spring 1990.



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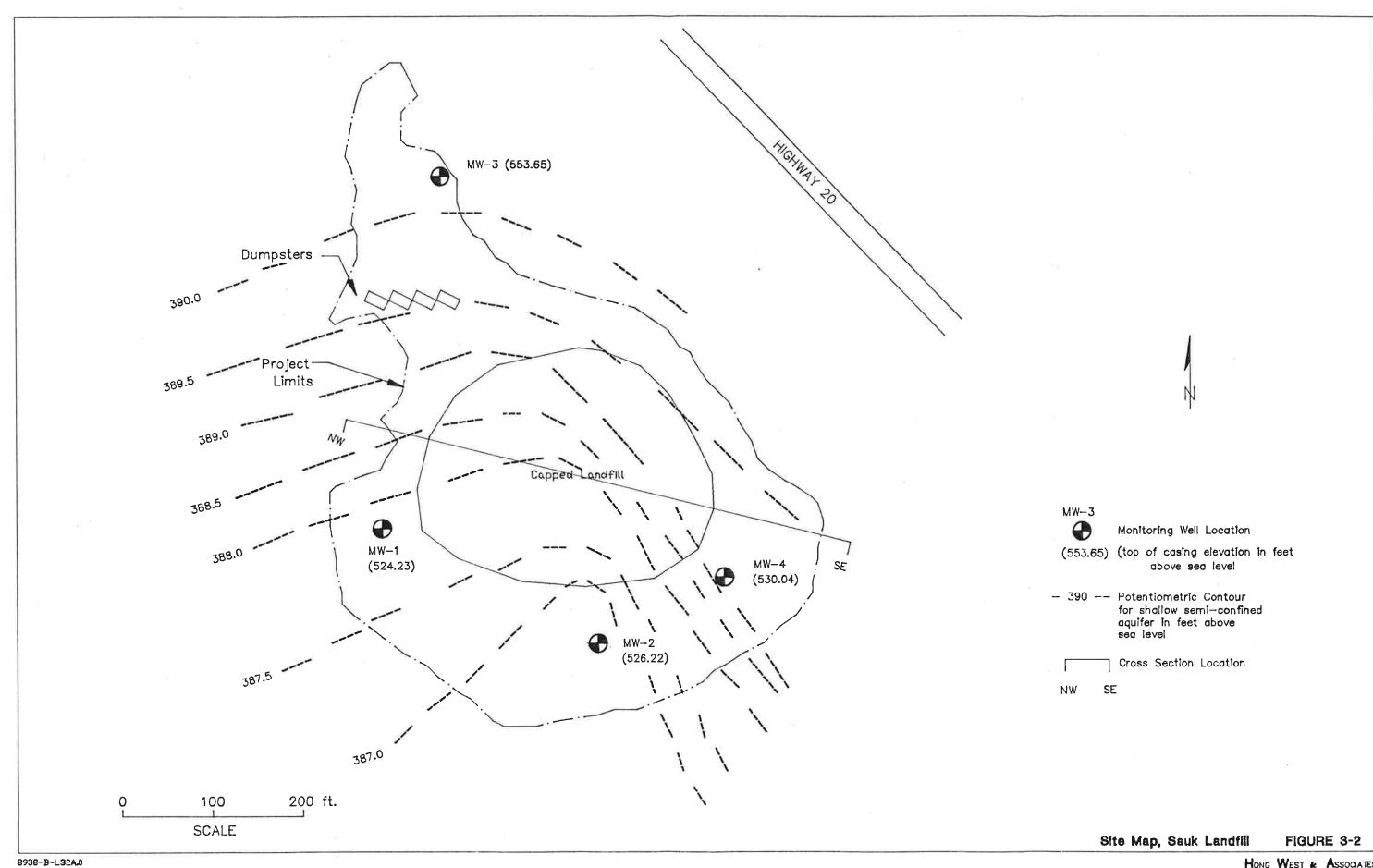


TABLE 3-2
Groundwater Levels
Sauk Landfill

Well No.	Top of Casing Elevation Feet	October 31, 1989 Depth Elevation Feet Feet	May 17, 1990 Depth Elevation Feet Feet
	=====		-
MW-1	524.23	151.45 372.78	135.92 388.31
MW-2	526.22	147.84 378.23	139.42 386.65
MW-3	553.65	176.81 376.84	163.42 390.23
MW-4	530.04	152.90 377.14	140.85 389.19

Note: All elevations are above sea level, USGS datum.

3.2 REGIONAL SETTING

The Sauk Landfill is situated in the upper Skagit valley approximately 2,000 feet north/northeast of the Skagit River. The river is approximately elevation 210 feet above sea level (asl), about 330 feet below the landfill. The area is covered by predominantly glacial and alluvial debris overlying metamorphic bedrock at an unknown depth. The nearest bedrock exposures are about 6,000 feet to the northeast on the flanks of Sauk Mountain.

3.3 SITE GEOLOGY

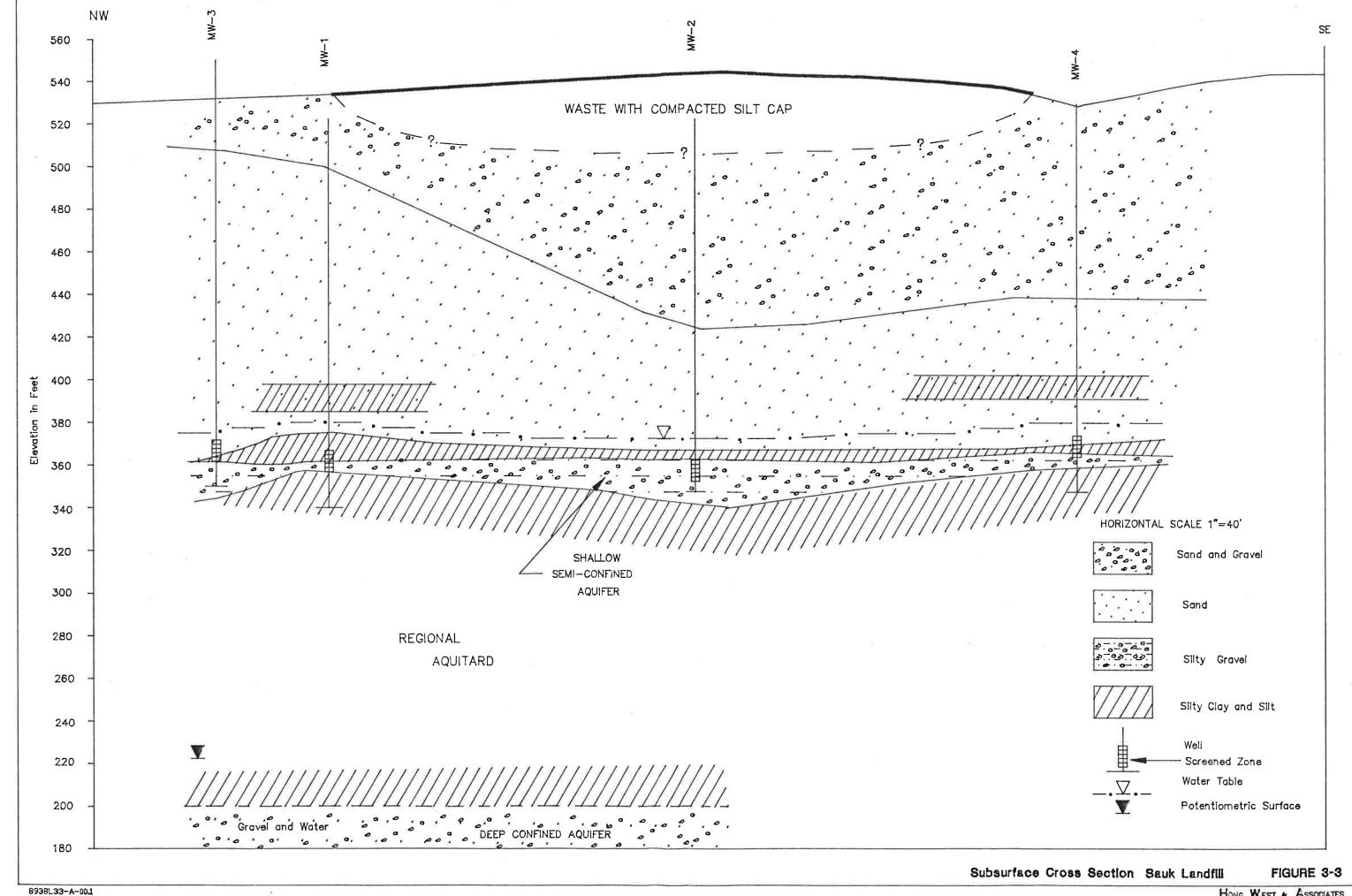
The site is underlain by glacio-fluvial deposits. Most of the material encountered in the boreholes appear to be glacial material which has been reworked and redeposited by the Skagit River. Subsurface exploration and existing domestic water well logs indicate five major units beneath the site: A Well Graded Sand and Gravel, a Poorly Graded Sand, a Silty Gravel, a Silt/Clay Strata and Deep Gravel Deposits.

Well Graded Sand and Gravel

Immediately below the landfill is well graded yellow-gray to olive-gray sand and gravel which varies in thickness from about 30 feet on the northwest side of the landfill to about 75 feet on the southeast side of the landfill. Cobbles and boulders are scattered throughout the unit (refer to Figure 3-3, Subsurface Cross Section).

Poorly Graded Sand

The upper gravel unit is underlain by a distinct pale yellowish-brown poorly graded sand with thin, infrequent silt stringers. The Poorly Graded Sand is about 140 feet thick on the western margin of the site narrowing to about 65 feet thick on the eastern margin. The unit becomes gravelly with depth (below elevation 390 asl).



A distinctive upper silt interbed, approximately 10 feet thick was identified in two of the four borings between elevation 390 and 400 feet asl. The interbed is discontinuous beneath the site and does not appear to be a perching layer.

The base of the Poorly Graded Sand is characterized by another distinctive silt layer at elevation 360 feet asl. This lower silt layer is only about 2-1/2 feet thick but appears to be continuous across the site. However, it was barely discernible in MW-3. The silt interbed has sufficient integrity to serve as a confining layer for the underlying uppermost aquifer.

Silty Gravel

The Silty Gravel is host to the uppermost aquifer and is encountered between elevation 350 and 360 feet asl. The Silty Gravel varies considerably in texture and was significantly coarser grained (less silt) in monitoring wells 1 and 3 than in wells 2 and 4. Monitoring wells 1 and 4 penetrated the full thickness of the Silty Gravel and were advanced into the underlying Clay/Silt Strata.

Clay/Silt Strata

Beneath the Silty Gravel is a gray to brown clayey silt to silty clay. This material appears to be a glacial lake deposit. A thin stringer of gray sand and gravel was identified in MW-1. The total thickness of the Clay/Silt Strata penetrated was about 20 feet. Nearby deep domestic well logs indicate the clay and silt unit is about 150 feet thick.

Deep Gravel Deposits

Domestic well logs show a gravel deposit beneath the Clay/Silt Strata near elevation 200 feet asl. The thickness of this unit is unknown.

3.4 GROUNDWATER OCCURRENCE AND FLOW

Two aquifers have been identified beneath the Sauk Landfill, a shallow semi-confined aquifer and a deep confined aquifer. Available data indicate that only the deep confined aquifer is used for water supply.

Shallow Semi-Confined Aquifer

Based on spring 1990 water level measurements by the Skagit County Health Department, the potentiometric level of the shallow confined aquifer ranges from elevation 395 to about elevation 386 feet above sea level (refer to Figure 3-2, Site Map). Water level differences between fall 1989 and spring 1990 indicate the potentiometric surface fluctuates erratically and to the extreme (15+ feet).

Groundwater flow in the shallow confined aquifer is south toward the Skagit River and appears to form a distinctive trough beneath the landfill. The average hydraulic gradient beneath the landfill ranges from .004 on the west side of the landfill to about .006 on the east side of the landfill.

The hydraulic conductivity of the shallow semi-confined aquifer appears to be quite low. Grain size distribution curves for samples of the silty gravel of the shallow semi-confined aquifer in MW-2 and MW-4 indicate very high uniformity coefficients (25+). Corresponding hydraulic conductivities based on Powers, 1981 are on the order of 1×10^{-4} to 1×10^{-3} ft/min. Drill cuttings from MW-3 indicate more uniform, sandier aquifer materials.

Based on the literature (Powers, 1981 and Walton, 1984) and our experience with similar material, a porosity of 25% is reasonable for the silty gravel of the shallow semi-confined aquifer. Assuming a porosity of 25%, an average hydraulic conductivity of .001 ft/min, and an average hydraulic gradient of .005, the rate of groundwater flow was calculated using Darcy's Law. Where: V = Ki/n and V = V velocity, V = V and V = V are the property of .001 ft/min, and an average hydraulic gradient of .005, the rate of groundwater flow was calculated using Darcy's Law. Where: V = V and V = V are the property of .001 ft/min, and an average hydraulic gradient of .005, the rate of groundwater flow was calculated using Darcy's Law.

Therefore, the rate of groundwater flow beneath the Sauk Landfill = V = [(.001 ft/min)(.005)/.25] (1440) = .03 ft/day or about 11 feet per year.

Deep Confined Aquifer

The available data indicate the deep confined aquifer is separated from the shallow confined aquifer by a 150-foot thick regional aquitard of silt and clay (refer to Figure 3-3). The deep confined aquifer consists of gray to brown sandy gravel at approximately 200 feet above sea level with a potentiometric level of approximately elevation 210 feet above sea level.

Water level data collected by the Skagit County Health Department indicate the direction of groundwater flow in the deep confined aquifer is approximately south 45 degrees west toward the Skagit River. The deep confined aquifer is the principal water supply in the area.

3.5 GROUNDWATER USE

The Skagit County Health Department has identified 18 water supply wells within one mile of the landfill (refer to Figure 3-1). Eight of these wells are on the south side of the river. Five wells are between the landfill and the river and in potentially downgradient locations. Refer to Table 3-3, Sauk Water Supply Wells, for well distance and direction from the landfill (well locations are shown on Figure 3-1, available well logs are included in Appendix C).

TABLE 3-3
Sauk Water Supply Wells

Well Owner		Depth	Distance & Direction from Landfill
21E1	Dean Mallory	214	4,500 NW
21E2	Dan Rapp	?	4,500 NW
21M1	Robert Taylor	60	3,000 NW
21P1	Mark Berg	312	1,100 NW
27E1	Otto Von Borke	155	3,500 ESE
28D1	Bill Groth	60	2,000 W
28D2	George Theodoratus	46	2,000 W
28E1	Les Bridges	40	3,000 SW
28E2	Lester Thistle	40	3,000 SW
28E3	Walter Magini	40	3,000 SW
28E4	Randy Riggles	110	2,000 S
28E5	Henry Young	?	2,300 SW
28L1	Jack Albrech	260	2,500 SSW
28L2	Steve Hylen	140	2,500 SSW
28N1	James Fratello	50	4,500 SW
28M1	Bill Blunt	60	3,500 SW

TABLE 3-3 (continued)

Sauk Water Supply Wells

Well Owner	Depth	Distance & Direction from Landfill		
(majordana ana ana ana ana ana ana ana ana ana		***************************************		
28M2 Roy Miller	37	3,500		
29A1 Jan Nottingham	60	3,500 E		
29A2 Rose J. Crouch	37	3,000 E		

Based on the available information, it appears that all of the wells (28D1, 28D2, 28L1, 28L2 and 28K1) potentially downgradient of the Sauk Landfill produce from a shallow river-fed unconfined aquifer or the deep confined aquifer. There are no known water supply wells tapping the shallow semi-confined aquifer. Available data suggest that it is unlikely that any wells in the area would use the shallow semi-confined aquifer for water supply due to its low yield potential. Insufficient data are available to determine the hydraulic relationship between the shallow semi-confined aquifer and the deep confined aquifer.

3.6 GROUNDWATER QUALITY

The Skagit County Health Department sampled the Sauk Landfill monitoring wells near the end of February, 1990. Downgradient monitoring wells 2 and 4 exhibited possible signs of contamination.

MW-2 registered 67 ug/l of total halogenated organics (TOX), 1.3 ug/l Cis 1,2-Dichloroethene and a conductivity of 956 micromhos. MW-3 registered 1.3 ug/l Trichlorofluoromethane and 1.4 ug/l of 1,1,1-Trichloroethane (refer to Appendix D for water quality data).

The high conductivity in MW-2 is indicative of groundwater contamination in this area. Typical groundwater conductivities are in the range of 100 to 300 micromhos. The TOX in MW-2 is also indicative of potential groundwater contamination (experience has shown that levels greater than 50 ug/l may indicate contamination). The three volatile organics identified are at concentrations barely above detection limits (1.0 ug/l). At these levels and for these parameters sample or laboratory contamination should not be ruled out.

SECTION 4 - CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are based on the data and information obtained during this investigation and recommendations focus on the specific monitoring requirements outlined in WAC 173-304-490 Minimum Functional Standards for Solid Waste Handling (MFS):

4.1 GIBRALTAR LANDFILL

Four monitoring wells were installed at the Gibraltar Landfill, one monitoring well in a perched aquifer and three monitoring wells in a shallow confined aquifer.

Conclusions

- 1. Groundwater quality data indicate that landfill operations have impacted the perched aquifer and the shallow confined aquifer. Primary drinking water standards have been exceeded in the perched aquifer and Secondary drinking water standards have been exceeded in the shallow confined aquifer. Organic chemicals have been detected in both aquifers. The landfill has been capped and the concentration of elevated parameters should decrease over time.
- 2. Data provided by Skagit County Health Department indicate there are no downgradient wells producing from the shallow confined aquifer and no downgradient wells producing from the perched aquifer within a mile of the landfill.
- 3. The direction of groundwater flow in the shallow confined aquifer is to the southeast. Only one monitoring well accesses the perched aquifer, therefore the direction of groundwater flow in the perched aquifer is unknown. However, flow may follow the westerly slope of the perching layer.
- 4. The rate of groundwater flow in the perched aquifer is unknown. The rate of groundwater flow in the shallow confined aquifer is on the order of .25 ft/day.
- 5. None of the monitoring wells installed are in an upgradient (background) position. The available data indicate that it will not be possible to install an upgradient well in the perched aquifer. It may be feasible to site an upgradient (background) well in the shallow confined aquifer near the northwest corner of the site.
- 6. The single monitoring well in the perched aquifer is in a downgradient position. Additional downgradient monitoring wells for the perched aquifer will require off-site locations.
- 7. The three monitoring wells in the shallow confined aquifer are in downgradient positions.

Recommendations

- 1. A an upgradient monitoring well, approximately 200 feet deep, should be installed in the shallow confined aquifer.
- 2. Two to three test borings, approximately 50 feet deep, should be drilled in the active borrow pit immediately west of the landfill to determine if the perching layer and the perched aquifer continues to the west.
- 3. As/if appropriate, complete test borings as monitoring wells.

 Continue sampling and analysis of monitoring system to establish statistically representative data base.

4.2 SAUK LANDFILL

Four monitoring wells were installed in the uppermost, shallow semi-confined, aquifer at the Sauk Landfill.

Conclusions

- Groundwater quality data indicate that landfill operations have impacted the shallow semiconfined aquifer. The available data indicate that drinking water standards have not been exceeded in any of the monitoring wells. Organic chemicals have been detected in two wells. The landfill has been capped and the concentration of elevated parameters should decrease over time.
- 2. Data provided by the Skagit County Health Department indicate there are no downgradient wells producing from the shallow semi-confined aquifer.
- 3. Based on spring 1990 water levels, the direction of groundwater flow is to the south toward the Skagit River. The rate of groundwater flow is about .03 feet/day.
- 4. Groundwater levels exhibit extreme seasonal variations which may result in changes in the direction of groundwater flow.
- 5. The Sauk Landfill monitoring system meets the MFS requirement for one upgradient and three downgradient monitoring wells.

Recommendations

- 1. Continue sampling and analysis of monitoring system to establish statistically representative data base.
- 2. Sample and monitor domestic wells which may be downgradient of the landfill.
- 3. Re-evaluate the rate and direction of groundwater flow on a quarterly basis.

APPENDIX A MONITORING WELL CONSTRUCTION SAUK AND GIBRALTAR LANDFILLS

APPENDIX A

MONITORING WELL CONSTRUCTION SAUK & GIBRALTAR LANDFILLS

Four monitoring wells were constructed at each landfill between September 25 and October 24, 1989. All drilling, well construction and development was supervised and inspected by Hong West & Associates' geologists. Drill hole logs were prepared on site by the geologist during well drilling and construction, and modified accordingly after reviewing samples in the laboratory/office. Refer to the accompanying well logs for lithologic and well construction details.

EQUIPMENT/DECONTAMINATION

Drilling for this project was performed with a Koehring Speedstar air rotary drill rig owned and operated by Hayes Drilling of Bow, Washington. The rig was equipped with a two-stage compressor capable of developing 700 cfm of air at 150 psi, a Tiger Tierra casing hammer adaptable to driving the casing in either direction, and a positive displacement mud pump used for proper bentonite slurry mixing and placement.

All drilling equipment was pressurized-hot water washed/steamed cleaned prior to entering and after leaving each landfill site. In addition, all downhole drilling tools were pressurized-hot water washed/steam cleaned between holes.

DRILLING

All borings were drilled using the "drill and drive" technique. A 6-inch diameter tricone bit was advanced 2-5 feet below the 6-inch steel drill casing after which the casing was pneumatically driven to the drilled depth. A 6-inch diameter drive shoe welded to the bottom of the initial length of 6-inch drill casing. In all wells, the drive shoe was cut and left in the hole a minimum of 5 feet below the bottom of the screen and bedded in bentonite. A 20-foot, 5-inch diameter stabilizer and 20-foot, 4-1/2 inch diameter drill rods were used to advance the boring. Cuttings were removed from the hole by air.

SAMPLING AND TESTING

Samples were collected at the end of the air discharge tube. Sampling intervals were typically every 5 feet or less. Samples were retained in wide-mouth plastic jars and after laboratory testing and inspection stored at the Public Works Department sample storage building in Mount Vernon.

Whenever a damp or moist formation was encountered, drilling was halted and the hole allowed to "rest" for 15 to 30 minutes to allow any free water to collect in the borehole. The well was then air surged to check if groundwater had been encountered. In some zones water was injected to clean the hole in the event drilled fines (silt and clay) were coating the formation.

Gas monitoring was performed during the drilling of each well to determine if any threat to personnel safety existed and if particular areas of the landfill sited were subject to gas migration. Explosive limit and % volume methane were measured with a GasTeck natural gas indicator. Readings were taken at drill casing connections and in the casing-surface annulus.

WELL COMPLETION

All monitoring wells were completed using threaded 2-inch PVC pipe as a riser and a 10-foot section of screen with 0.010-inch slot widths. A filter pack of Colorado 10/20 silica sand was placed around each screen and bentonite chips and a bentonite grout were used to seal and backfill the hole. The wells

at Gibraltar also contained one or two gas monitoring probes consisting of 1/2-inch diameter pvc pipe with 1/4-inch diameter Tygon tubing (refer to Figures A-1 and A-2 for details). Pea gravel was placed around each probe with bentonite chips and grout as a seal. As the pipe and backfill were placed, the 6-inch diameter drill casing was withdrawn from the hole. A 10-inch diameter security casing with a locking lid was installed at the surface and embedded in concrete.

DEVELOPMENT

All monitoring wells were developed using a single pipe airlift technique. Compressed air, filtered for both liquid and particulate matter, was conducted to the screened zone through a 3/4-inch threaded PVC pipe. The pipe was systematically raised and lowered over the screen during development. Samples of the water lifted during development were tested at regular intervals for pH and conductivity. Wells with insufficient water for airlift development were bailed. Development was continued until pH, temperature and conductivity stabilized.

WELLHEAD SURVEY

Wellhead elevations (top of 2-inch PVC well casings) were surveyed by the Skagit County Public Works Department to USGS datum.

GIBRALTAR MONITORING WELLS

The Gibraltar monitoring wells were constructed during the period September 25, 1989 to October 6, 1989. Table A-1 presents a summary of the Gibraltar monitoring well construction details.

TABLE A-1

Monitoring Well Specifics
Gibraltar Landfill

Well No.	Ground Surface Elevation Feet	Top of Casing Elevation Feet	Drill Depth Feet	Screen Depth Feet	Level Elevation Feet	Gas Probe Depth
		*********			********	
MW-1 MW-2 MW-3 MW-4	239.57 254.28 252.97 239.25	240.97 256.73 254.87 240.55	60 200 202 198	39-34 185-175 185-175 180-170	202-207 77-82 70-75 60-70	15 10/25 18/25 25

Note: All elevations are above sea level, USGS datum. Top of casing includes Geoguard pump cap.

Monitoring Well #1 (MW-1): This well was drilled, installed, and developed between September 25 and September 26, 1989.

Groundwater was found perched on a silt layer encountered between 37 and 40 feet, with a static water level measured at 35.4 feet. The hole was continued to a final depth of 60 feet to check for any additional aquifers. The hole was backfilled from 60 to 40 feet with bentonite chips.

The bottom of the screen was placed at 39 feet. A gas monitoring probe was installed at a depth of 15 feet in a 3/8-inch pea gravel filter pack.

Development of the well was discontinued after one hour due to the low capacity of the well. This well will require additional bailer development before sampling.

A pH of 6.45 and a conductivity reading of 1700 micromhos was recorded after the well stabilized.

Monitoring Well #2 (MW-2): This well was drilled, installed, and developed between September 27 and September 29, 1989. Measurable groundwater was not encountered in this boring until a silty fine sand layer was penetrated at a depth of 165 feet, just below a 2-foot thick confining layer of sandy silt. This aquifer continued to a depth of 192 feet where a stiff clayer silt to silty clay was encountered. The bottom of the screen was set at a depth of 185 feet. The bentonite seal was placed to 166 feet isolating the aquifer. The water level in the well after completion was 147.3 feet indicating approximately 20 feet of confining pressure. Gas monitoring probes were placed at 10 feet and 25 feet.

After the installation was completed, the well was developed for a period of three hours until the discharge had cleared, and stable pH and conductivity readings were obtained. After development a pH of 8.40 and a conductivity of 630 micromhos was recorded.

Monitoring Well #3 (MW-3): This well was drilled, installed, and developed between October 2 and October 4, 1989. Measurable groundwater was encountered in this boring at a depth of 172 feet, in a silty fine sand just below a 5-foot thick confining layer of silty clay. This aquifer continued to a depth of 191 feet where a sandy silt was encountered. The screen was set with the tip at a depth of 185 feet. The bentonite seal was placed to 170 feet to isolate the aquifer. The water level after completion was 147.6 feet indicating approximately 25 feet of confining pressure. Gas monitoring probes were installed at 18 feet and 25 feet.

After the installation was completed, the well was developed for a period of two hours until the return had cleared and stable pH and conductivity readings were obtained. After development a pH of 8.64 and a conductivity of 418 micromhos was recorded.

Monitoring Well #4 (MW-4): This well was drilled, installed, and developed between October 4 and October 6, 1989. Groundwater was first encountered in this boring in a silty fine sand layer at a depth of about 175 feet. This aquifer continued to a depth of 188 feet where a clayey silt silt was encountered. The screen was set with the tip at a depth of 180 feet. The bentonite seal was placed to 165 feet isolating the aquifer. Static water level after completion was 131.3 feet indicating 44 feet of confining pressure. One gas monitoring probe was installed at 25 feet.

After the installation was completed, the well was developed for a period of two hours until the return had cleared and stable pH and conductivity readings were obtained. After development a pH of 8.41 and a conductivity of 1010 micromhos was recorded.

SAUK LANDFILL

Sauk monitoring wells were constructed during the period October 12, 1989 to October 24, 1989. Poor access required road work which was provided by Skagit County Department of Public Works. Table A-2 presents a summary of the Sauk monitoring well construction details.

TABLE A-2

Monitoring Well Specifics
Sauk Landfill

Well No.	Ground Surface Elevation Feet	Top of Casing Elevation Feet	Drill Depth Feet	Screen Depth Feet	Level Elevation Feet
MW-1	522.38	524.23	182	157-167	365-355
MW-2	524.22	526.07	182	155-165	369-359
MW-3	551.80	553.65	198	168-178	384-374
MW-4	528.14	530.04	178	158-168	370-360

Note: All elevations are above sea level, USGS datum. Top of casing includes Geoguard pump cap.

Monitoring Well #1 (MW-1): This well was drilled, installed, and developed between October 12 and October 13, 1989. First groundwater was found confined in a sandy fine - medium gravel layer between 164 and 166 feet, with a static water level measured at 145.6 feet. The bottom of the screen was placed at 168 feet.

After completion the well was developed for seven hours. Bentonite grout invaded the gravel pack and air-water jetting was used to develop the well until discharge was clear. The well was then bailed for three hours. A pH of 7.02 and a conductivity reading of 150 micromhos was recorded after well development.

Monitoring Well #2 (MW-2): This well was drilled, installed, and developed between October 17 and October 18, 1989. Groundwater was first encountered in a gravelly fine to medium sand between 145 and 170 feet, with a static water level measured at 149.2 feet. The bottom of the screen was placed at a depth of 165 feet.

Because of a very low volume of return, development was discontinued after two and a half hours. The well was then later bailed for approximately one hour until the discharge was clear. A pH reading of 8.12 and a conductivity reading of 270 micromhos was recorded.

Monitoring Well #3 (MW-3): This well was drilled, installed, and developed between October 19 and October 20, 1989. Groundwater was first encountered in a sandy gravel to gravelly sand between 160 and 190 feet, with a static water level measured at 174.7 feet. The bottom of the screen was placed at a depth of 188 feet.

Because of a very low volume of return, development was discontinued after two hours. The well was then later bailed for approximately one hour until the discharge was clear. A pH reading of 7.82 and a conductivity reading of 120 micromhos was recorded.

Monitoring Well #4 (MW-4): This well was drilled, installed, and developed between October 23 and October 24, 1989. First groundwater was encountered in a silty fine sand to sandy gravel between 153 and 178 feet, with a static water level measured at 150.2 feet. The bottom of the screen was placed at a depth of 168 feet.

Like the previous wells, development was discontinued after two hours because of a very low volume of return. The well was then later bailed for approximately one hour until the discharge was clear. A pH reading of 7.82 and a conductivity reading of 120 micromhos was recorded.

GIBRALTAR MONITORING WELL LOGS

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: HAYES DRILLING AND PUMP

DRILLING METHOD: AIR ROTARY

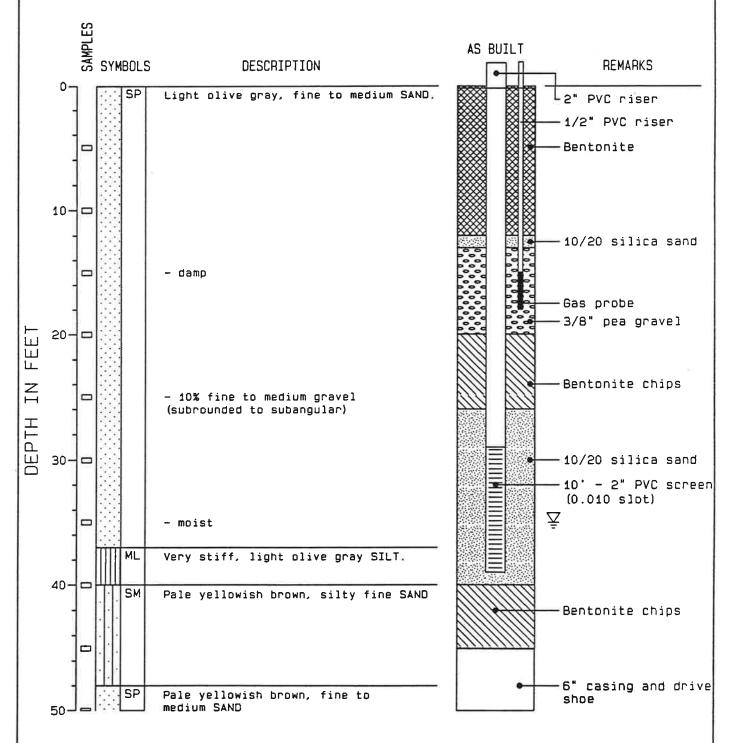
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: LMW

TOTAL DEPTH: 60 FEET DATE STARTED: 09-25-89

DATE FINISHED: 09-26-89



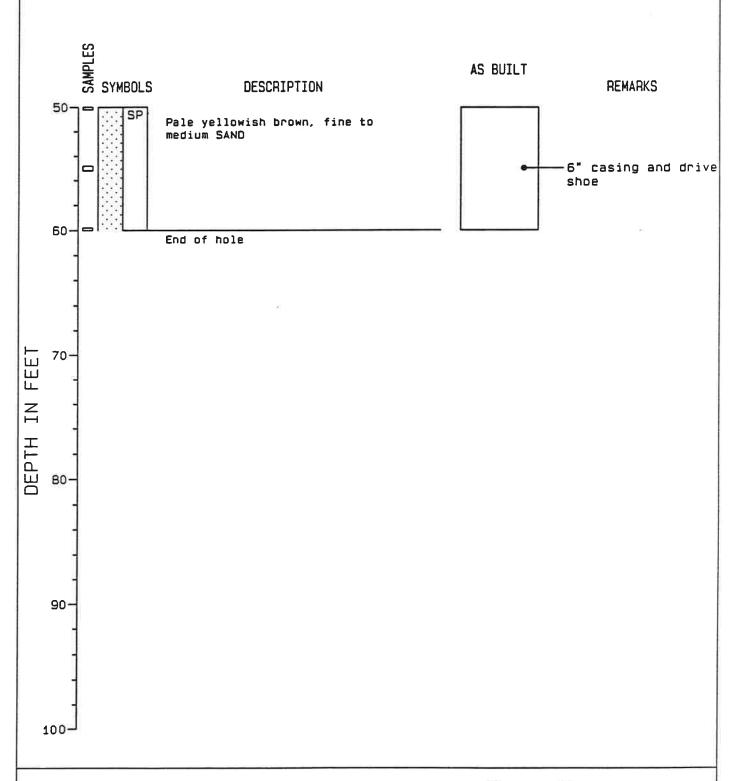
PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 239.57 ft. TOP OF WELL CASING: 240.97 ft.

WELL MW-1

PROJECT NUMBER: 8938

PAGE: 1 OF 2





PROJECT: GIBRALTER LANDFILL
LOCATION: SKAGIT COUNTY, WA
SURFACE ELEVATION: 239.57 ft.
TOP OF WELL CASING: 240.97 ft.

WELL MW-1

PROJECT NUMBER: 8938

PAGE: 2 OF 2

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: HAYES DRILLING AND PUMP

DRILLING METHOD: AIR ROTARY

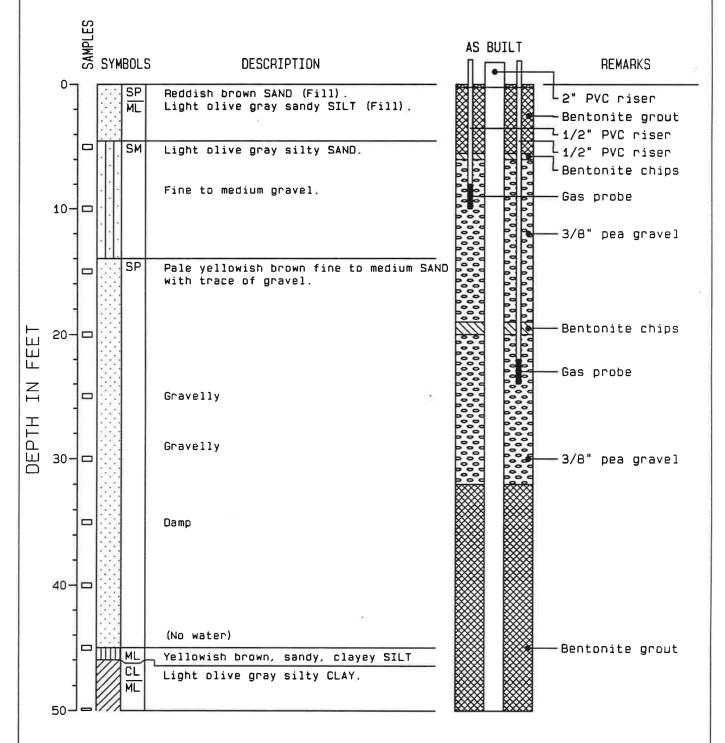
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: PNW

TOTAL DEPTH: 198 FEET DATE STARTED: 09-27-89

DATE FINISHED: 09-28-89



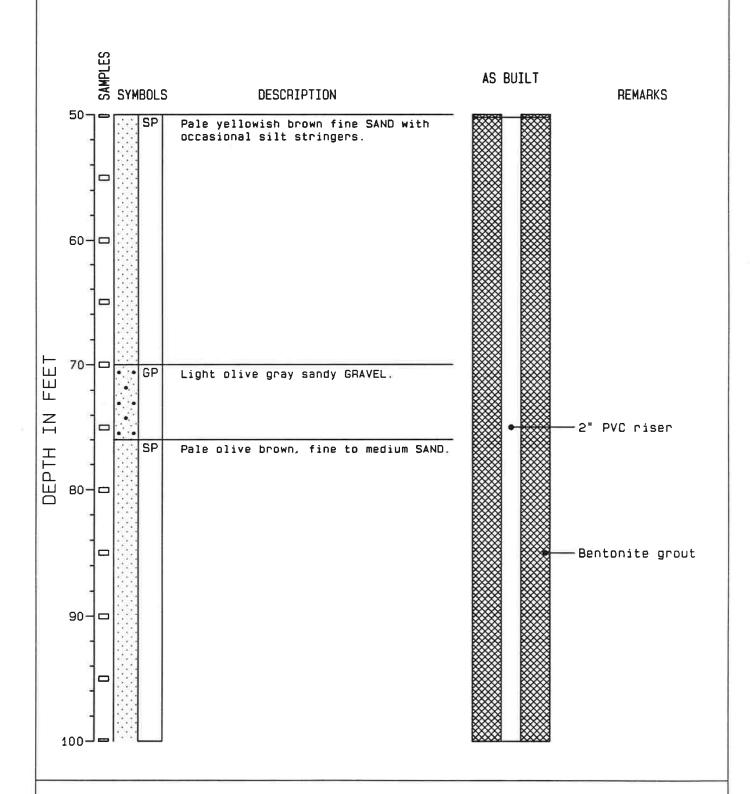
PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 254.28 ft. TOP OF WELL CASING: 256.73 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 1 OF 4

HONG WEST & ASSOCIATES WELL LOG

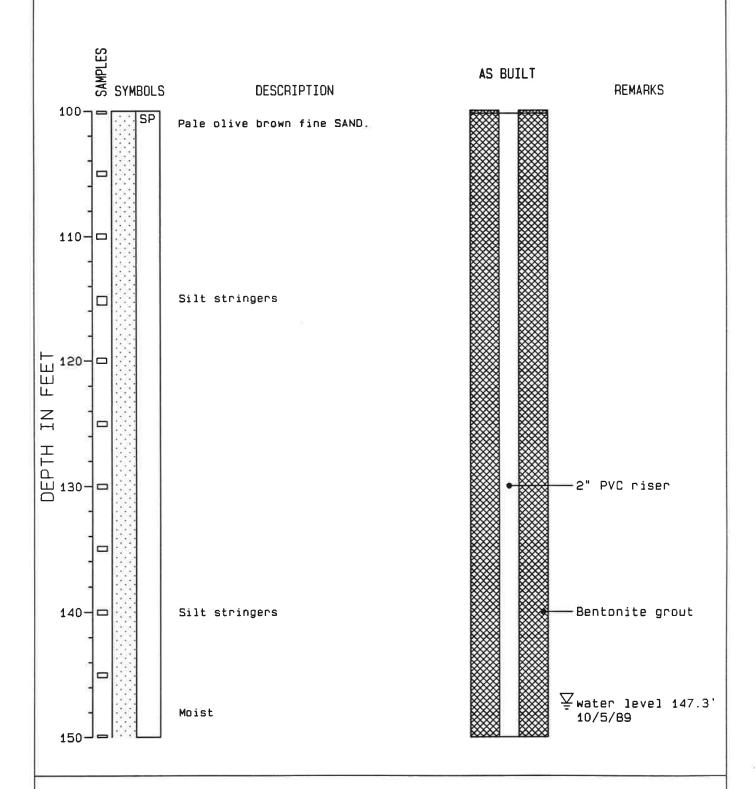


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 254.28 ft. TOP OF WELL CASING: 256.73 ft. WELL MW-2

PROJECT NUMBER: 8938

PAGE: 2 OF 4

HONG WEST & ASSOCIATES WELL LOG



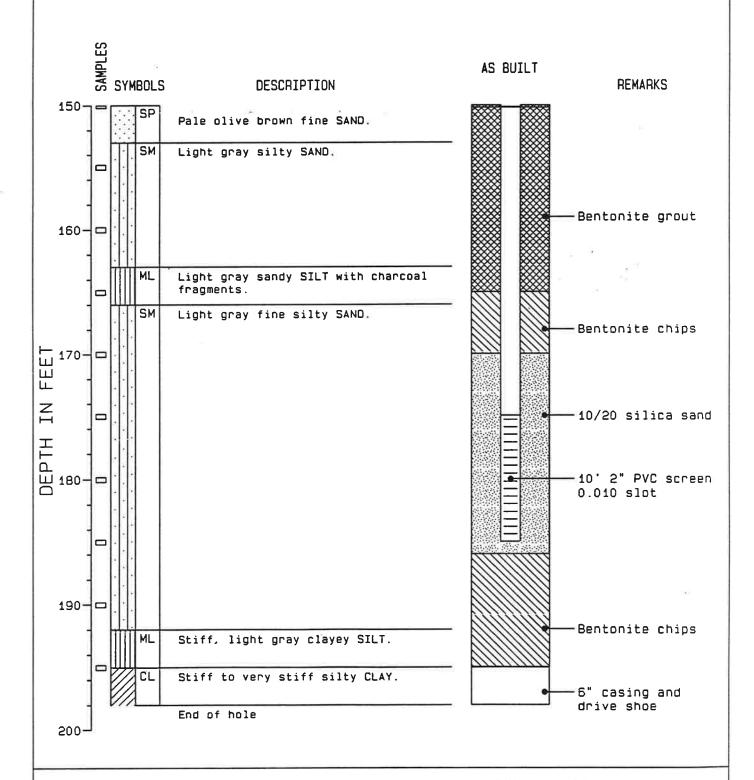
PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 254.28 ft. TOP OF WELL CASING: 256.73 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 3 OF 4

HONG WEST & ASSOCIATES WELL LOG



PROJECT: GIBRALTER LANDFILL
LOCATION: SKAGIT COUNTY, WA
SURFACE ELEVATION: 254.28 ft.
TOP OF WELL CASING: 256.73 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 4 OF 4

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: HAYES DRILLING AND PUMP

DRILLING METHOD: AIR ROTARY

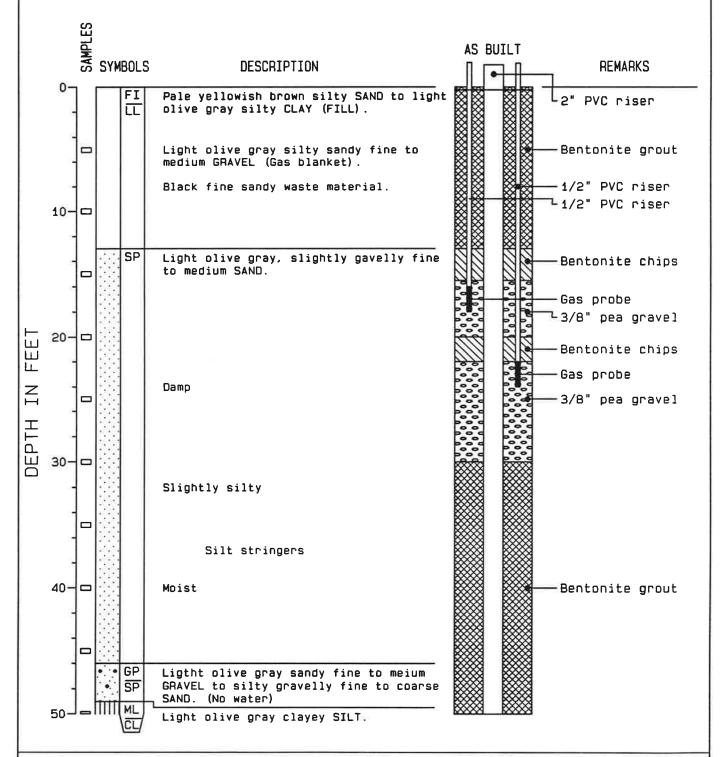
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: PNW

TOTAL DEPTH: 202 FEET DATE STARTED: 10-02-89

DATE FINISHED: 10-03-89

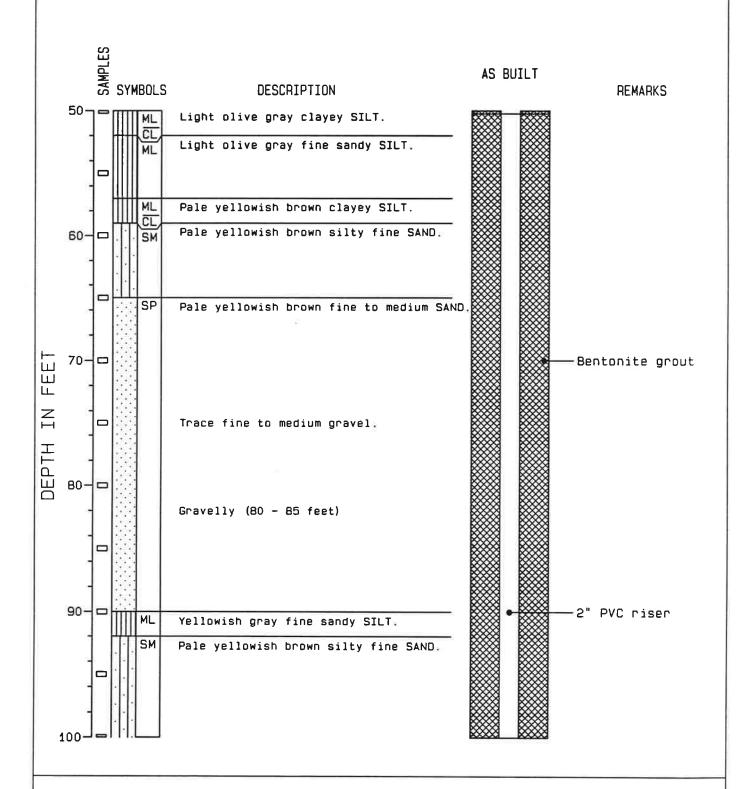


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 252.97 ft. TOP OF WELL CASING: 254.87 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 1 OF 5

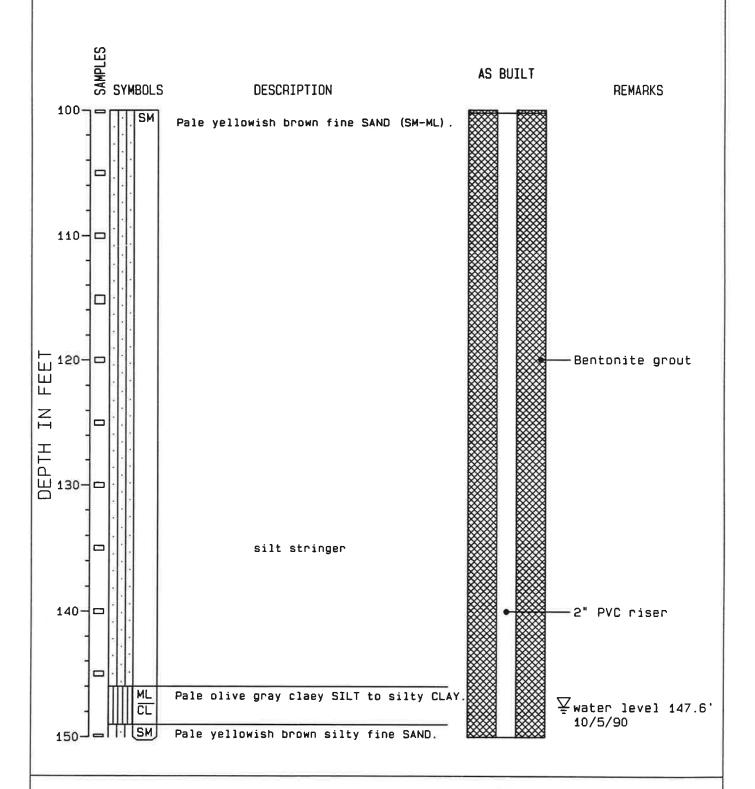


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 252.97 ft. TOP OF WELL CASING: 254.87 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 2 OF 5

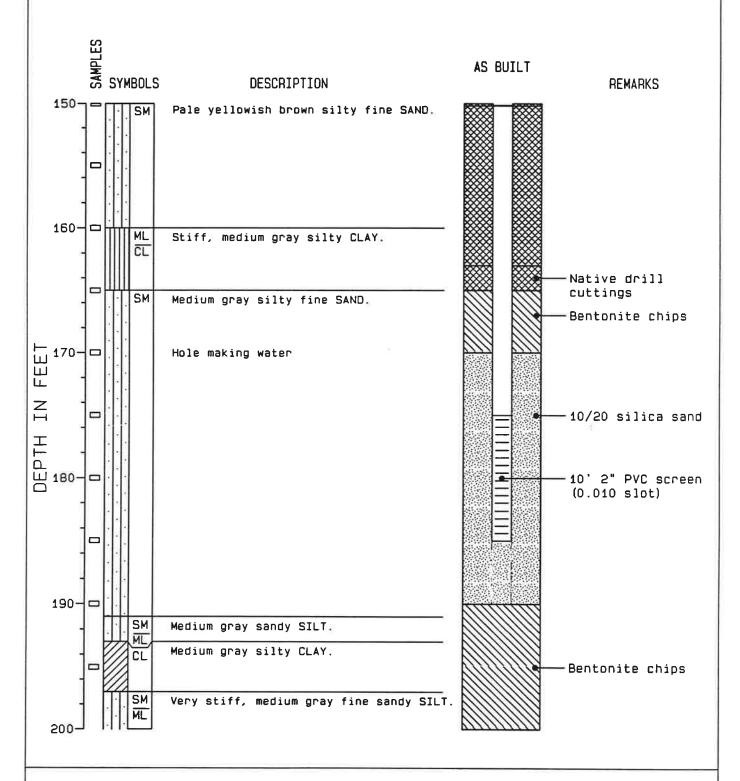


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 252.97 ft. TOP OF WELL CASING: 254.87 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 3 OF 5

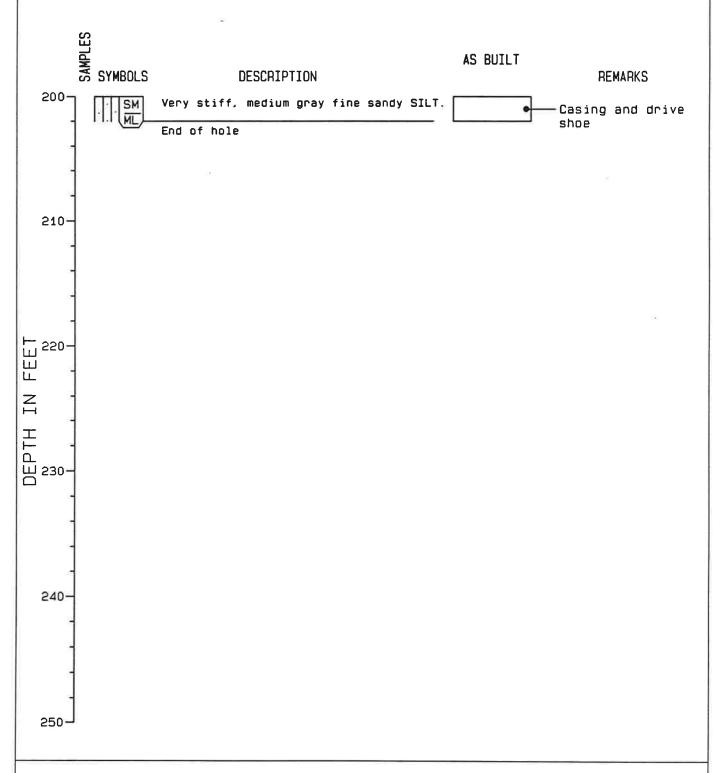


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 252.97 ft. TOP OF WELL CASING: 254.87 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 4 OF 5



PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 252.97 ft. TOP OF WELL CASING: 254.87 ft. WELL MW-3

PROJECT NUMBER: 8938

PAGE: 5 OF 5

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: HAYES DRILLING AND PUMP

DRILLING METHOD: AIR ROTARY

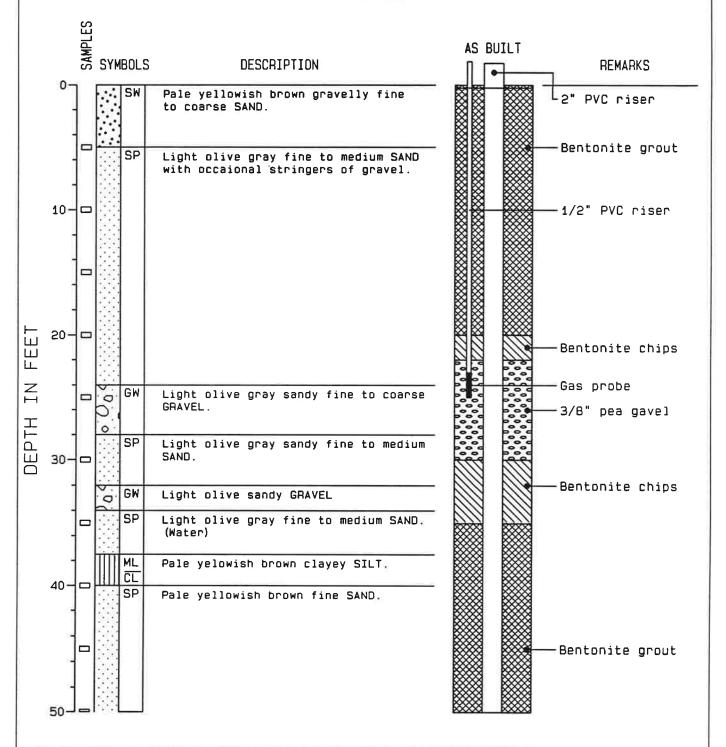
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: PNW

TOTAL DEPTH: 198 FEET DATE STARTED: 10-04-89

DATE FINISHED: 10-06-89

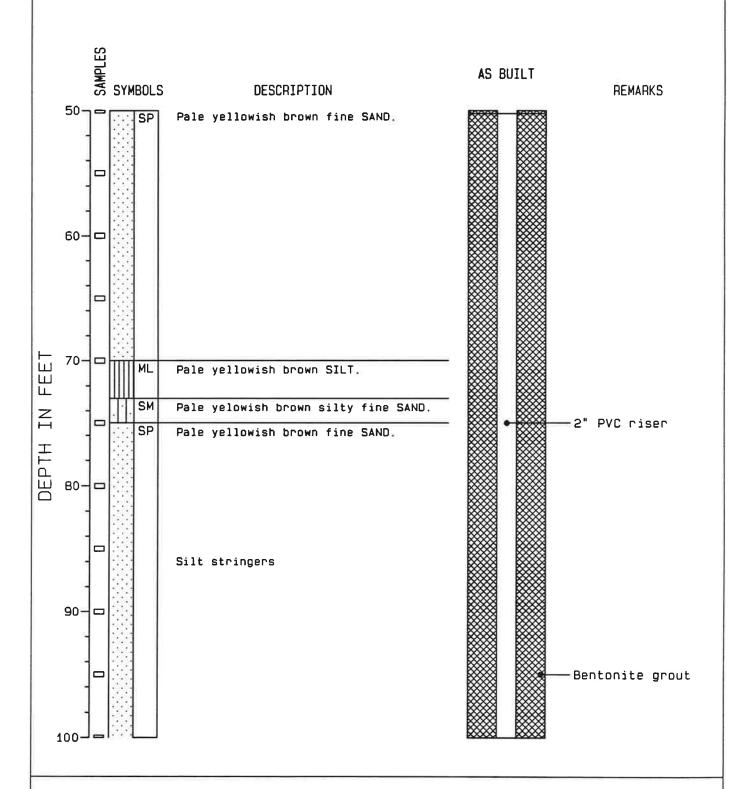


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 239.25 ft. TOP OF WELL CASING: 240.55 ft.

WELL MW-4

PROJECT NUMBER: 8938

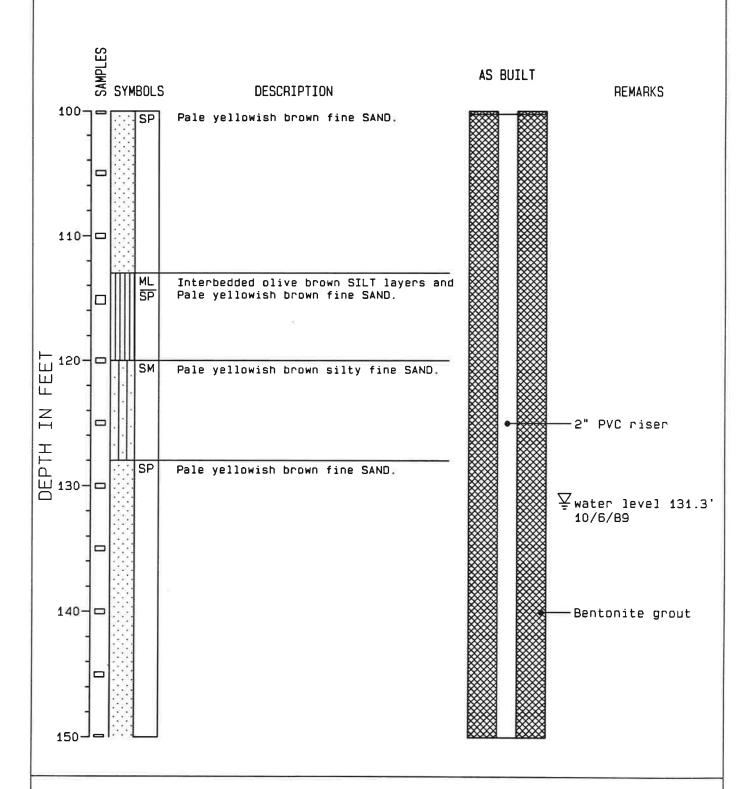
PAGE: 1 OF 4



PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 239.25 ft. TOP OF WELL CASING: 240.55 ft. WELL MW-4

PROJECT NUMBER: 8938

PAGE: 2 OF 4

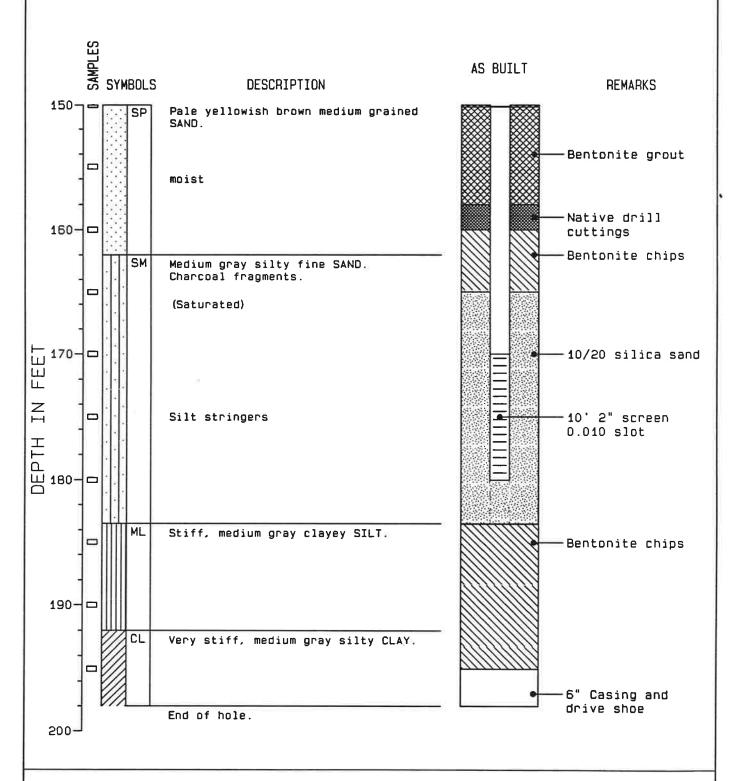


PROJECT: GIBRALTER LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 239.25 ft. TOP OF WELL CASING: 240.55 ft.

WELL MW-4

PROJECT NUMBER: 8938

PAGE: 3 OF 4



PROJECT: GIBRALTER LANDFILL
LOCATION: SKAGIT COUNTY, WA
SURFACE ELEVATION: 239.25 ft.
TOP OF WELL CASING: 240.55 ft.

WELL MW-4

PROJECT NUMBER: 8938

PAGE: 4 OF 4

SAUK MONITORING WELL LOGS

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: Hayes Drilling & Pump DRILLING METHOD: Air Rotary - Tricone

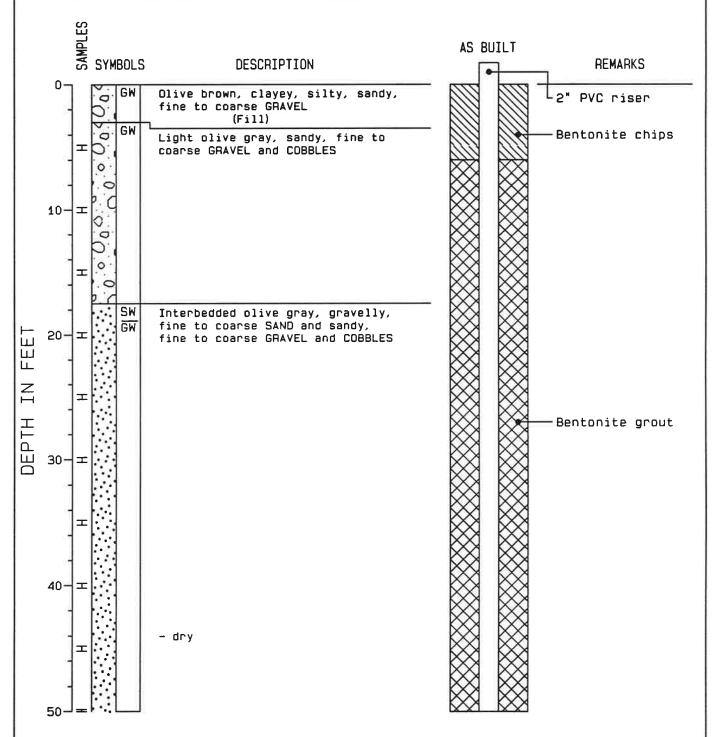
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: PAUL WHITE

TOTAL DEPTH: 182 FEET DATE STARTED: 10/11/89

DATE FINISHED: 10/16/89



PROJECT: SAUK LANDFILL

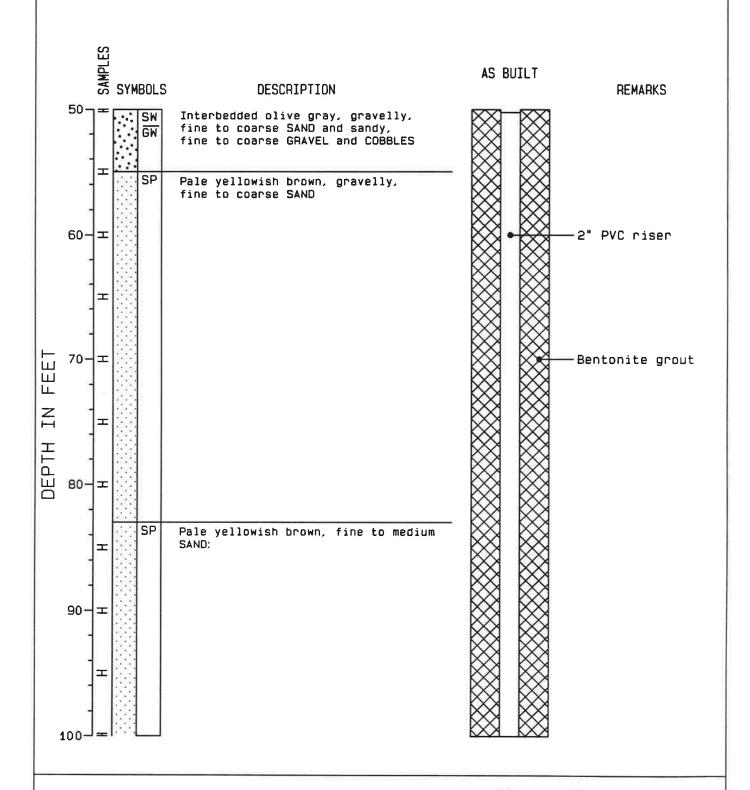
LOCATION: SKAGIT COUNTY, WASHINGTON

SURFACE ELEVATION: 522.38 ft. TOP OF WELL CASING: 524.23 ft.

WELL MW-1

PROJECT NUMBER: 8938

PAGE: 1 OF 4



PROJECT: SAUK LANDFILL

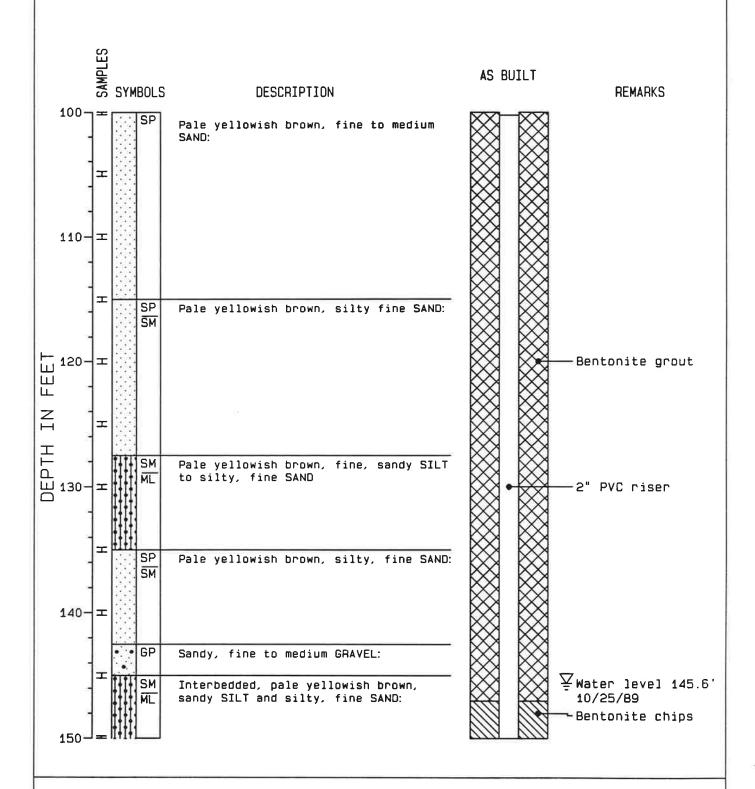
LOCATION: SKAGIT COUNTY, WASHINGTON

SURFACE ELEVATION: 522.38 ft. TOP OF WELL CASING: 524.23 ft.

WELL MW-1

PROJECT NUMBER: 8938

PAGE: 2 OF 4



PROJECT: SAUK LANDFILL

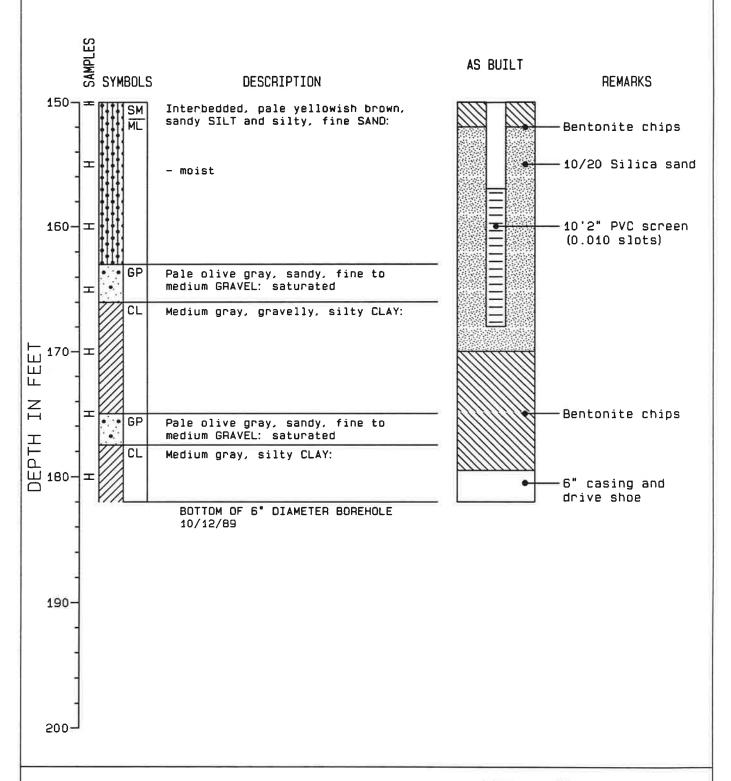
LOCATION: SKAGIT COUNTY, WASHINGTON

SURFACE ELEVATION: 522.38 ft.
TOP OF WELL CASING: 524.23 ft.

WELL MW-1

PROJECT NUMBER: 8938

PAGE: 3 OF 4



PROJECT: SAUK LANDFILL

LOCATION: SKAGIT COUNTY, WASHINGTON

SURFACE ELEVATION: 522.38 ft. TOP OF WELL CASING: 524.23 ft. WELL MW-1

PROJECT NUMBER: 8938

PAGE: 4 OF 4

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: Hayes Drilling & Pump DRILLING METHOD: Air Rotary - Tricone

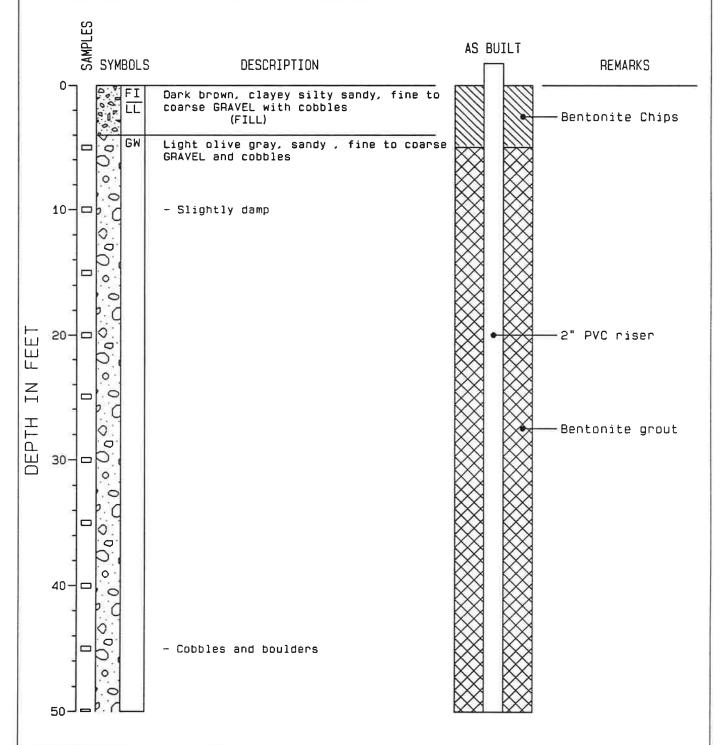
SAMPLING METHOD: Grab Sample From Air Discharge Tube

WELL LOG

LOGGED BY: Paul White

TOTAL DEPTH: 182 FEET DATE STARTED: 10/17/89

DATE FINISHED: 10/18/89



PROJECT: Sauk Landfill

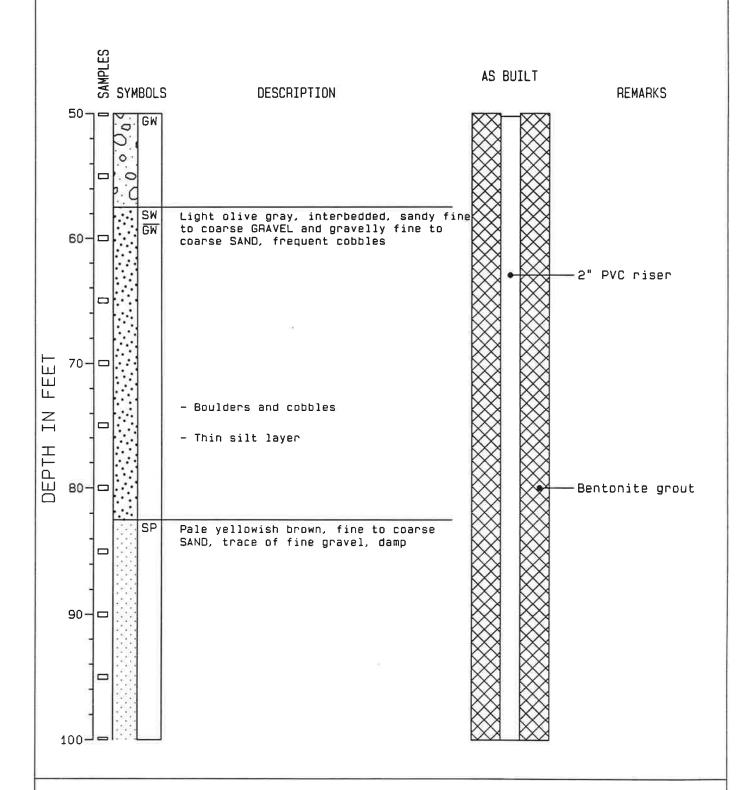
LOCATION: Skagit County, Washington

SURFACE ELEVATION: 524.22 ft.
TOP OF WELL CASING: 526.07 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 1 OF 4



PROJECT: Sauk Landfill

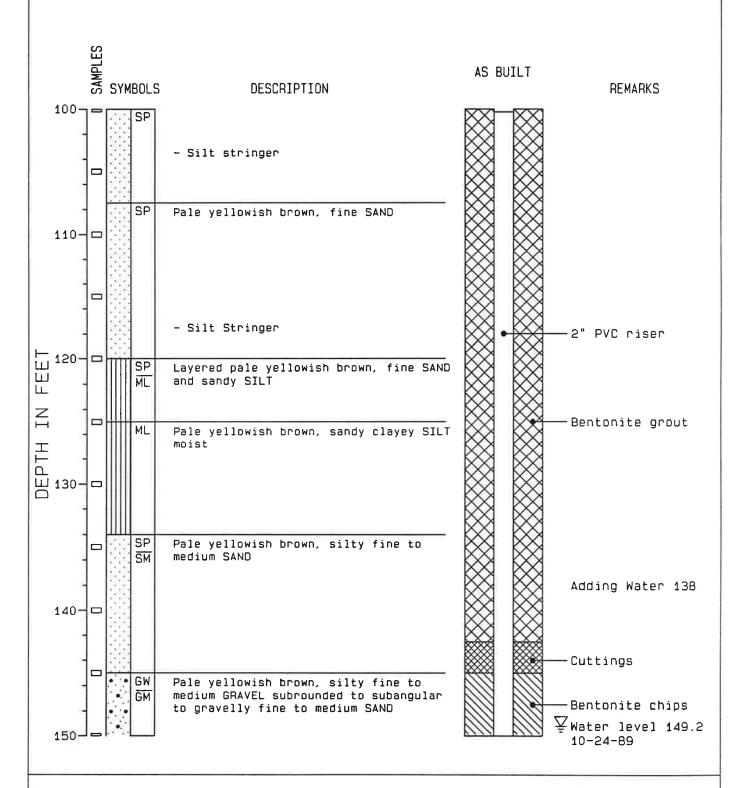
LOCATION: Skagit County, Washington

SURFACE ELEVATION: 524.22 ft. TOP OF WELL CASING: 526.07 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 2 OF 4



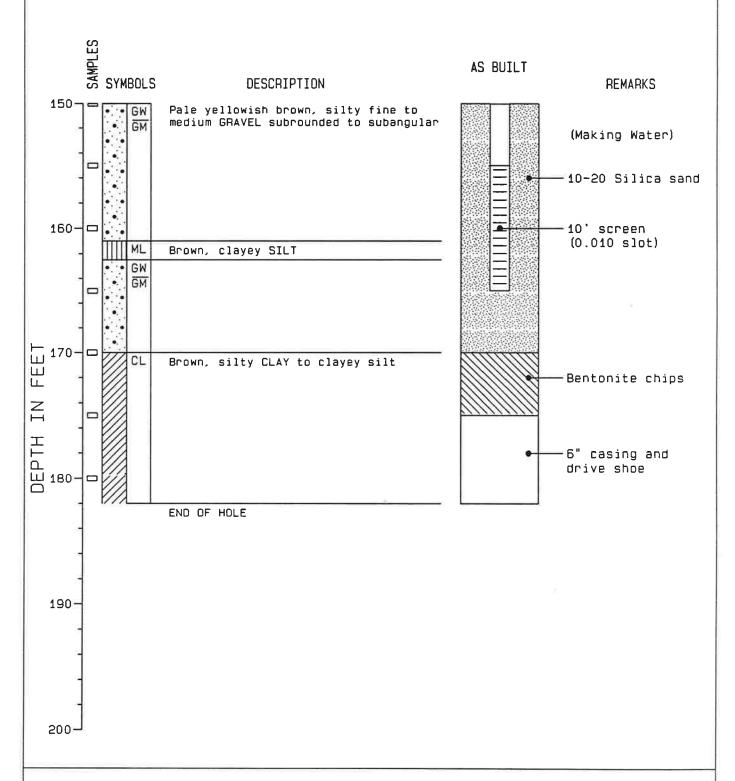
PROJECT: Sauk Landfill

LOCATION: Skagit County, Washington

SURFACE ELEVATION: 524.22 ft. TOP OF WELL CASING: 526.07 ft. WELL MW-2

PROJECT NUMBER: 8938

PAGE: 3 OF 4



PROJECT: Sauk Landfill

LOCATION: Skagit County, Washington

SURFACE ELEVATION: 524.22 ft.
TOP OF WELL CASING: 526.07 ft.

WELL MW-2

PROJECT NUMBER: 8938

PAGE: 4 OF 4

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

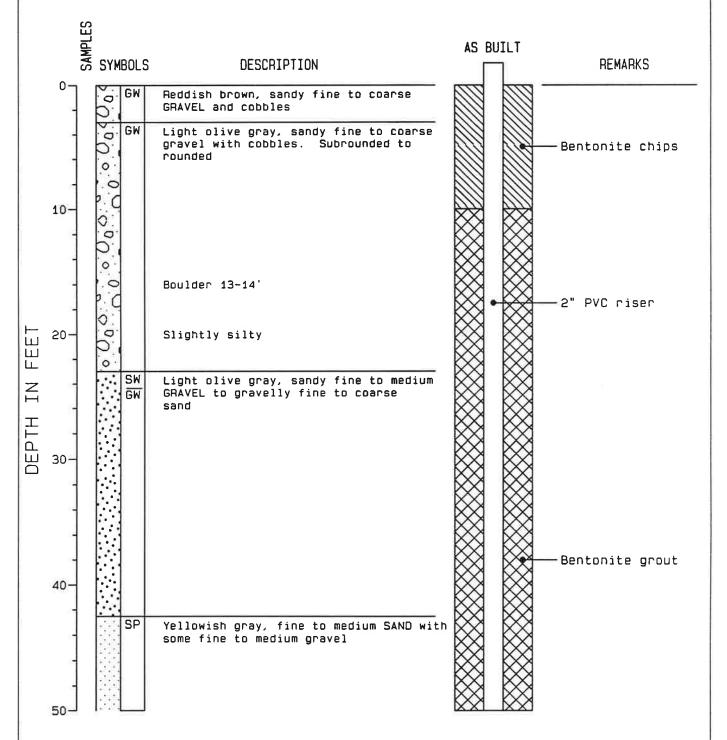
DRILLING COMPANY: Hayes Drilling & Pump DRILLING METHOD: Air Rotary - Tricone

SAMPLING METHOD: Grab Sample From Air Discharge Tube

WELL LOG

LOGGED BY: Paul White

TOTAL DEPTH: 198 FEET DATE STARTED: 10/19/89 DATE FINISHED: 10/20/89



PROJECT: Sauk Landfill LOCATION: Skagit County, WA

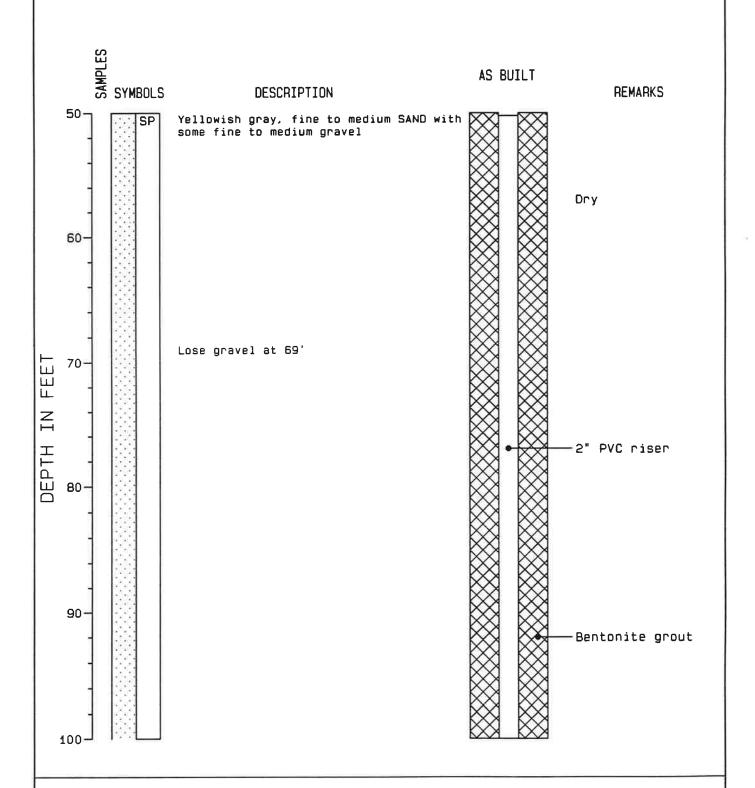
SURFACE ELEVATION: 551.80 ft;

TOP OF WELL CASING: 553.65 ft:

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 1 OF 4



PROJECT: Sauk Landfill

LOCATION: Skagit County, WA

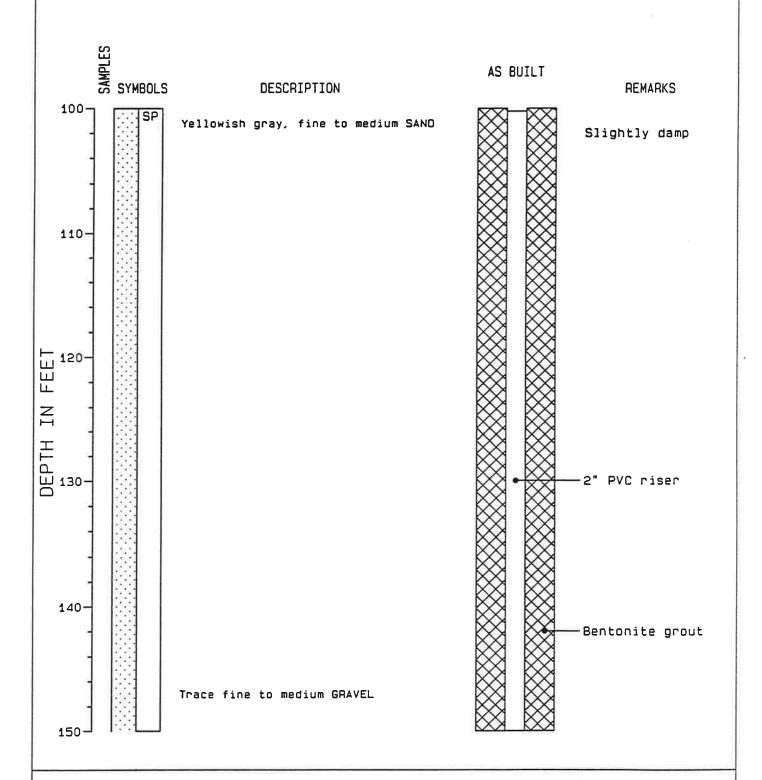
SURFACE ELEVATION: $551.80 \ \text{ft}$.

TOP OF WELL CASING: 553.65 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 2 OF 4

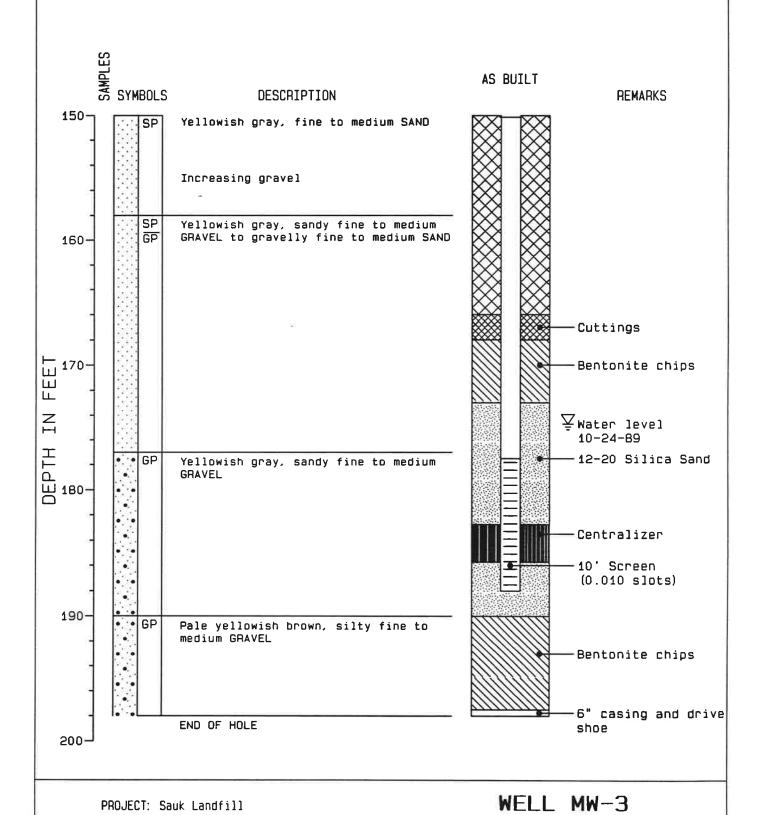


PROJECT: Sauk Landfill LOCATION: Skagit County, WA SURFACE ELEVATION: 551.80 ft. TOP OF WELL CASING: 553.65 ft.

WELL MW-3

PROJECT NUMBER: 8938

PAGE: 3 OF 4



PROJECT: Sauk Landfill

LOCATION: Skagit County, WA SURFACE ELEVATION: 551.80 ft. TOP OF WELL CASING: 553.65 ft.

PROJECT NUMBER: 8938 PAGE: 4 OF 4

HONG WEST & ASSOCIATES

P.O. BOX 598, LYNNWOOD, WASHINGTON 98046, (206) 743-4774

DRILLING COMPANY: Hayes Drilling and Pump DRILLING METHOD: Air Rotary - Tricone

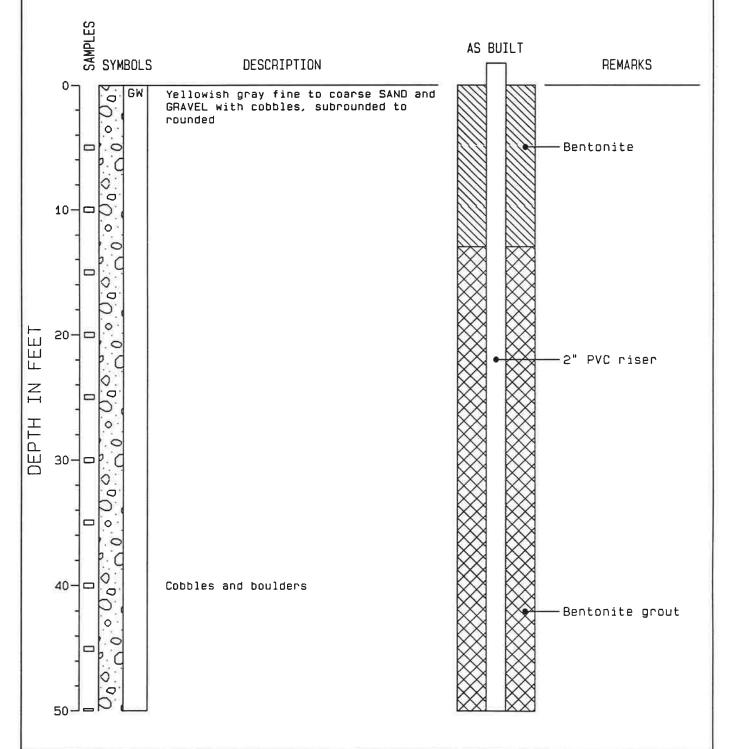
SAMPLING METHOD: GRAB SAMPLE FROM AIR DISCHARGE TUBE

WELL LOG

LOGGED BY: PAUL WHITE

TOTAL DEPTH: 178 FEET DATE STARTED: 10-23-89

DATE FINISHED: 10-24-89



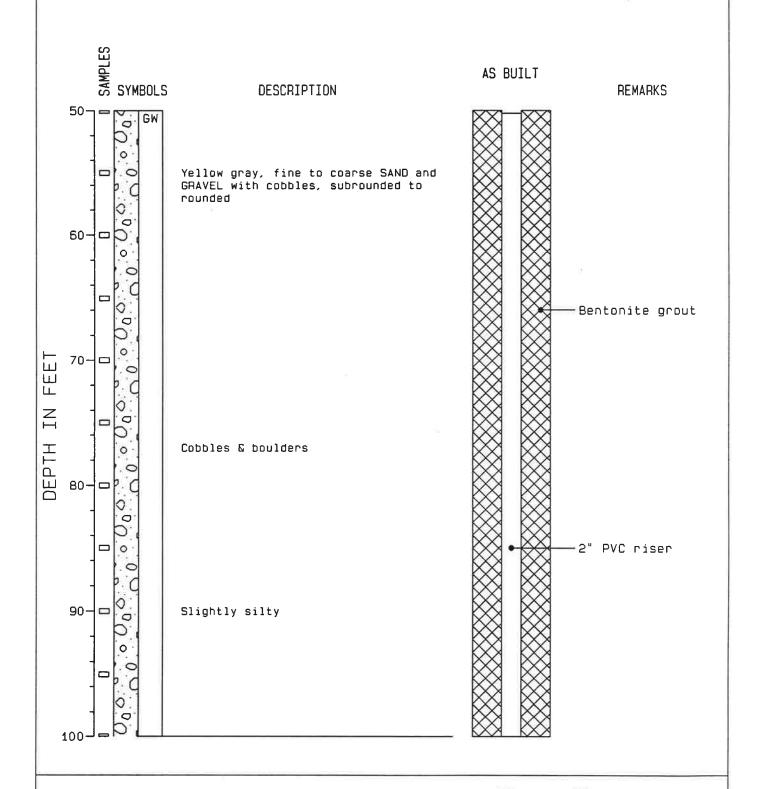
PROJECT: SAUK LANDFILL

LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 528.14 ft. TOP OF WELL CASING: 530.04 ft.

WELL MW-4

PROJECT NUMBER: 8938

PAGE: 1 OF 4

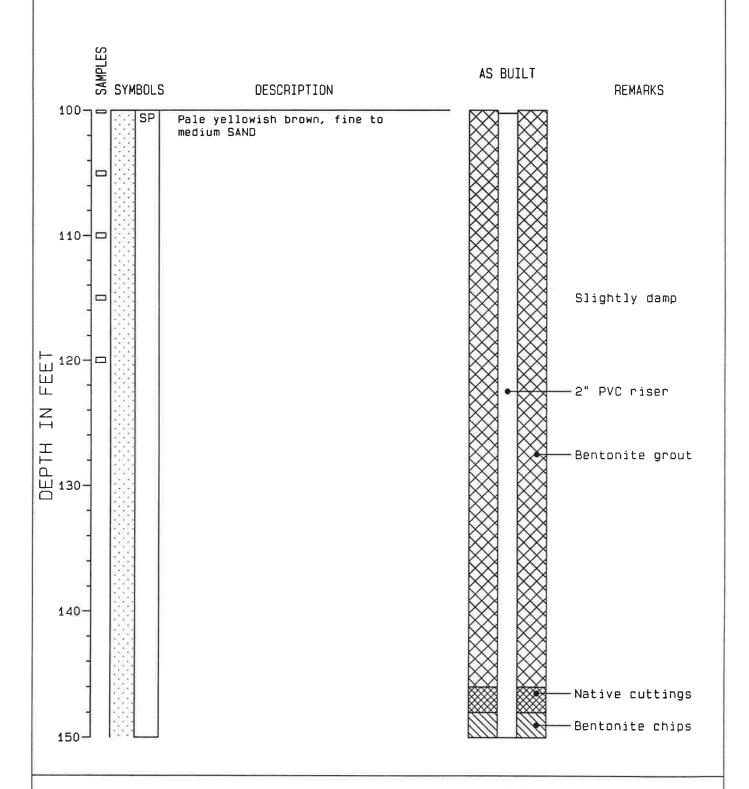


PROJECT: SAUK LANDFILL LOCATION: SKAGIT COUNTY, WA SURFACE ELEVATION: 528.14 ft. TOP OF WELL CASING: 530.04 ft.

WELL MW-4

PROJECT NUMBER: 8938

PAGE: 2 OF 4

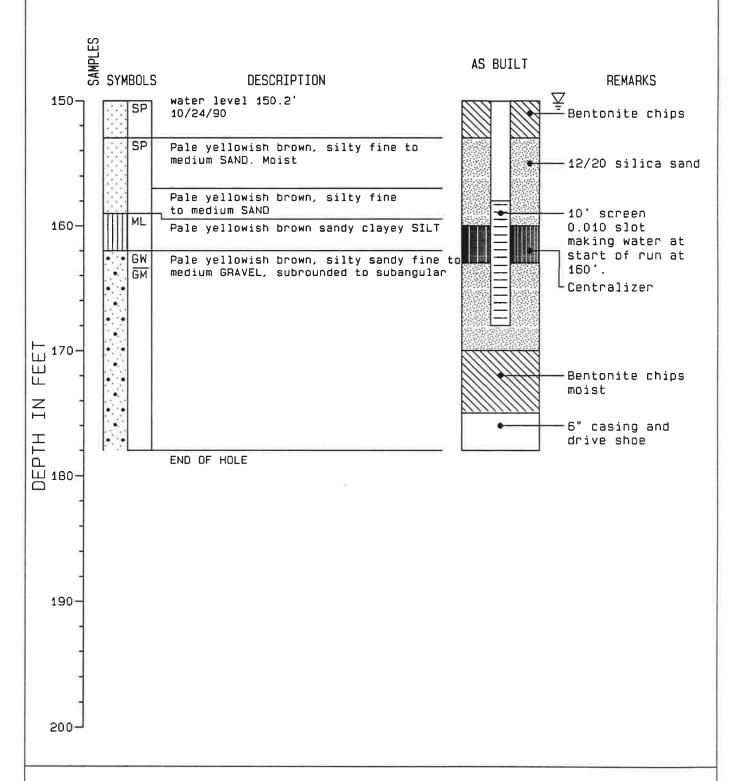


PROJECT: SAUK LANDFILL
LOCATION: SKAGIT COUNTY, WA
SURFACE ELEVATION: 528.14 ft.
TOP OF WELL CASING: 530.04 ft.

WELL MW-4

PROJECT NUMBER: 8938

PAGE: 3 OF 4



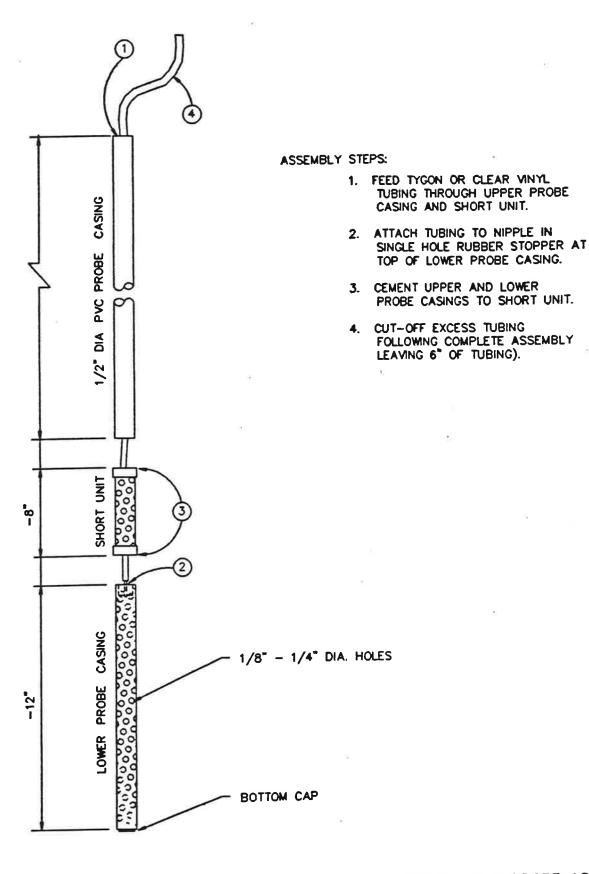
PROJECT: SAUK LANDFILL
LOCATION: SKAGIT COUNTY, WA
SURFACE ELEVATION: 528.14 ft.
TOP OF WELL CASING: 530.04 ft.

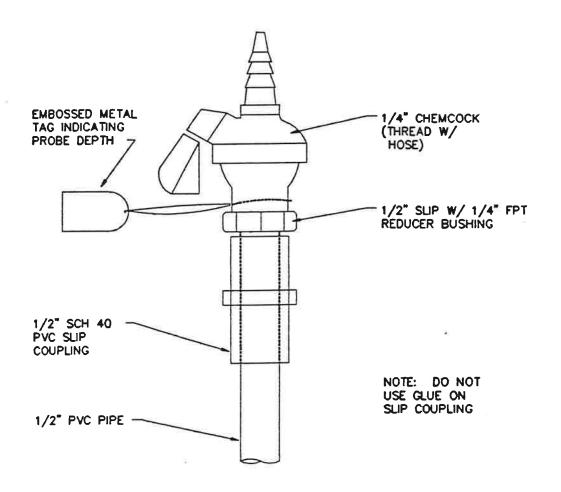
WELL MW-4

PROJECT NUMBER: 8938

PAGE: 4 OF 4

GAS PROBE DETAILS





APPENDIX B GRAIN SIZE DISTRIBUTION CURVES

Geotechnical Engineering
 Material Testing
 Construction Quality Control Inspection

		GRA	AIN SIZE							
Project:	Gibra	ltar Landfill		Test Hole Number: MW-1 S-1 Depth: 35 '						
Project Number: 8938 Date Tested: 10-10-89 Remarks: Gray, poorly graded SAND (SP)				Sample De	escription Gravel: Sand: Silt:	4.1 90.8 5.1				
	CLAY	SILT	*	S FINE	AND MEDIUM CR		RAVEL COARSE			
	SIEVE SIZES 200 100 60 40 30 20 16 108 4 36 1/2 3/4 1 11/2 2									
90 80 80 80 90 90 80 90 90 90 90 90 90 90 90 90 90 90 90 90	5 .001 .002	2 ,005 ,01 ,02	.05 .1 GRAIN SIZ	.2 .5 CE-MILLIM		5 10	20 50			
				Reviewed	By Ste	ح کا	<u>ک</u>			

	GRAII	N SIZE DISTRIBUTION
		Test Hole Number: MW-4 S-1 Depth: 55 - 60
roject Number	8938 .0-10-89	Sample Description
emarks Gray.	poorly graded SAN	D
	3114 DIE 2011	Clay:
CLAY	SILT	SAND GRAVEL FINE MEDIUM CRSE FINE COARS
OD/II	0,12,	SIEVE SIZES 200 100 60 40 30 20 16 108 4 3 1/2 3 1 11/2 2
100		
90		
80		
60 50		
60 50 50 40		
c 70 2 60 5 50		
50 50 50 40 30		

• Geotechnical Engineering • Material Testing • Construction Quality Control Inspection •

	GRAIN SIZI	E DISTRIBUTION					
Project: Gibralt	ar Landfill	Test Hole Number: MW-4 S-2 Depth: 170 '					
Date Tested: 10-	poorly graded SAND	Sample Description Gravel: 92,5					
CLAY	SILT	SAND GRAVEL FINE MEDIUM CRSE FINE COARSE					
100 90 80 70 50 40 30 20 10 0 0 0 0 0 0 0 0 0 0 0 0 0	1000	SIEVE SIZES 100 60 40 30 20 16 108 4 38 2 3 1 12 2 3 11 2 5 1 2 5 10 20 50 SIZE-MILLIMETRES					
		Reviewed By:					

Geotechnical Engineering
 Material Testing
 Construction Quality Control Inspection

GRAIN SIZE DISTRIBUTION															
Project: Skagit Co. Sauk Landfill					Test Hole Number: MW-2 Depth: 160										
Project Number: 8938 Date Tested: 11-2-89 Remarks: Brown, silty SAND (SM)					Sam	ple Des	criptio (n Gravel: Sand:	80.	2 1 7					
	CLAY			SIL	т			FINE	SAI	ND MEDIUN	л I С	RSE	G FINE	RAVE	EL COARSE
SIEVE SIZES 200 100 60 40 30 20 16 10 8 4 3 1/2 3/4										3 ₄ 1	1/223				
100											سور	7		Ī	
90															
										1					
CENT SMALLER															
WS 1									Λ						
40 40								1							
30 BE								1			-				
20							1								
10										11					
.0005	.001	.002	.005	,01	.02	.05 GRAI	.1 N SIZ	.2 ZE – MII	.5 LIMET	1 RES	2	5 5	10	20	50
	Reviewed By:														

· Geotechnical Engineering · Material Testing · Construction Quality Control Inspection ·

		GRAIN	I SIZE	DISTR	IBUTION				
Project: Skagit Co., Sauk Landfill					Test Hole Number: MW-4 Depth: /65'				
Project Number: 8938 Date Tested: 11-2-89 Remarks: Brown, silty SAND with gravel					le Description Gr Sá Si		5.7 3.1 1.2		
	CLAY	SILT	E	FINE	SAND MEDIUM	CRSE	GR FINE	AVEL COARSE	
100 90 80 70 60 50 40 30 10 0			200	100 60	40 30 20 16	SIZES 10.8 4		3 ₄ 1 1 ¹ 2 2 3	
		GH	IAIN SIZ	ZE – MILI Review	ved By:	Jan.	(F)	Ja	

APPENDIX C WATER SUPPLY WELL LOGS

GIBRALTAR LANDFILL LOGS

Dug Wells (Gibralter Area)

Robert Hunter 1376 Gibraltar Road Anacortes, WA 98221 Dug Well 35' Concrete Sides

8/24/87 Letter Mailed

#3

293-3862

24.83

No well log on file

US6565.E.

239.56

Wyman Tibbles 1353 Highway 20 Anacortes, WA 98221 293-2861

(Dug Well 40'

No well log on file

8/21/87 Letter Mailed



AL HOWARD

NEY of NE 1/4 of SW/+ OF SEC 18, T34, R 2 EWIN.

Terry Buchanan 507 Miller Road Anacortes, WA 98221 293-3891

Dug Well 85') Concrete tile 36" Well log on file

8/20/87 Letter Mailed

William Woodruff 505 Miller Road Anacortes, WA 98221 293-2872

Dug Well 95'

No well log on file

8/24/87

Letter Mailed

Permission siven

hird Copy — Driller's Copy	STATE OF W	ASHINGTON	Permit No	
(1) OWNER: Name al Howar	d	Address	nan-m-va-va-va-catatoset	Wilder Will State Control
(2) LOCATION OF WELL: County Searing and distance from section or subdivision corner	it	NELGINE SW	Sec. 18 T 34N.	r2Ewm
(3) PROPOSED USE: Domestic M Industrial	Municipal [(10) WELL LOG:		į.
Irrigation [] Test Well [Formation: Describe by color, character show thickness of aquifers and the kind stratum penetrated, with at least one e	and nature of the mat	erial in each
(4) TYPE OF WORK: Owner's number of well (if more than one)		MATERIAL	FROI	
New well	•	topsil.	0'	11
Reconditioned Rotary		Compast sens	1	60
	36 inches.	water bearing of	and be	80'
Drilledft. Depth of completed well				
(6) CONSTRUCTION DETAILS:				
Casing installed: 36 " Diam. from C ft. Threaded T Threaded ft.	to ft.			+
Welded Diam. from ft.	to It.			
Perforations: Yes No 🗆	_			
Type of perforator usedin. by	80 in			
Size of perforations	80 n	•		
perforations from ft. to .	ft.			
perforations from ft. to .	ft.			
Screens: Yes No No	1			
Manufacturer's Name				
Type Model No				_
Diam. Slot size from ft. Diam. Slot size from ft.				
Gravel packed: Yes ⋈ No □ Size of gravel: Gravel placed from ft. to	Pea n			
Surface seal: Yes No To what depth? _	18			
Material used in seal Conclusion				
	s 🗆 No 🕅			
Type of water? Depth of strata_				
Method of sealing strata off				
(7) PUMP: Manufacturer's Name		, -,,,,,,,,,,		-
Туре: Е	IP	, 	1910	-
(8) WATER LEVELS: Land-surface elevation				
Static levelft. below top of well Date.	2/2480		THE REAL PROPERTY.	
Artesian pressurelbs. per square inch Date	/			
Artesian water is controlled by (Cap, valv	re, etc.)			
(0) WELL TESTS. Drawdown is amount water	level is			
(9) WELL TESTS: lowered below static level		Work started 2/24, 1980	Completed 2/2	7, 19 8
Was a pump test made? Yes ☐ No ☑ If yes, by whom? Yield: gal./min. with ft. drawdown after	hrs.	WELL DRILLER'S STATEM	ENT:	
" " "		This well was drilled under m		is report is
W N H		true to the best of my knowledge	and belief.	·m report 12
Recovery data (time taken as zero when pump turned off measured from well top to water level)) (water level	D17	i.i N	•
Time Water Level Time Water Level Time	Water Level	NAME /T/ (Person, firm, or corr	poration) (Type or	gg/h/c
	***************************************	Address 2803 - 128 T	LnE. ma	بلارتمها ، ما خ
			`	
Date of test		[Signed]	<u></u>	
Bailer test.) gal./min, with ft, drawdown after	erhrs.	(W	Vell Driller)	
Temperature of water		License No. 0.502	Date 6/2 3	<u>ئے 19 ,</u>
(USE A	very 15	THE I NECESSARY		
S. F. No. 7356—OS—(Rev. 4-71).	PDITTONAL SH	LEIS IF RECESSARI)		*

Third Copy — Driller's Copy

WATER WELL REPORT

<i>ت</i>	TI	102 -05 D
Application	No.	

Nie Original and First Copy with Danas tment of Ecology School Copy — Owner's Copy Thirs' Copy — Driller's Copy	WATER WE		Application Permit No.		
(1) OWNER: Name Jerry B		Address 507- 30	14 Rs On	MARK	1582
(2) LOCATION OF WELL: County	Prent	_X W 14	NELY Sec 8 T	34/N. R.	2 E.M.
Bearing and distance from section or subdivision of	orner				
		(10) WELL LOG:			
(3) PROPOSED USE: Domestic X Indu	strial Municipal	Formation: Describe by color, show thickness of aquifers an stratum penetrated, with at 1			
(4) TYPE OF WORK: Owner's number of (if more than one)	f well	MATER		FROM	TO
New well X Method	Dug 🔀 Bored 🛚	Topsoil		0'	1
Deepened ☐ Reconditioned ☐	Cable Driven Rotary Jetted	Joshpact.	2and	1	570
	36	-doore a	and	70'	80
(5) DIMENSIONS: Diameter of we Drilled Depth of complete	ell inches.				
(6) CONSTRUCTION DETAILS:					
Casing installed: 36 " Diam, from _	O # 60 85 #	<u> </u>			
Threaded []" Diam. from	ft. to ft.				
Welded [] " Diam. from _	ft. to ft.				
Perforations: Yes No				-	
Type of perforator used SIZE of perforations 1/2 ir	by 8 in) 			
8 perforations from 82	ft. to ft.	l			
perforations from	ft. to ft.	-	~		
perforations from	ft. to It.				
Screens: Yes No 🗆	FC			<u> </u>	
Manufacture 's Name	Model No				
Diam. Slot size from	ft. to ft.				
Diam Slot size from .	ft. to ft.				
Gravel packed: Yes No D Size	of gravel:n. t. ton.				
Surface seal: Yes No D To what	t depth? 18 ft.				
Did any strata contain unusable wat	er? Yes 🗌 No				
Type of water? Depth					-
Method of sealing strats off			100 15		
(7) PUMP: Manufacturer's Name				1.2	
Type:	HP	1 2 a. 24 V	JUN 2-	1000	
(8) WATER LEVELS: Land-surface el-	level		1980	1000	_
· · · · · · · · · · · · · · · · · · ·	well Date 2/19/8	AUG 6	1300	12 21	
Artesian water is controlled by	nch Date	SKAGIT CO. HE	ALTH DEPT.		+
	(Cap, valve, etc.)	SKAGII OO! III			
(9) WELL TESTS: Drawdown is ame lowered below st.	ount water level is atic level	Work started 2/19	, 19SCompleted	2/23	1500
	whom?	WELL DRILLER'S S		/	
Alette.	down after hrs.			m and thi	- wongettie
	,	true to the best of my	l under my jurisdictio knowledge and belief	n and thi	s report is
Recovery data (time taken as zero when pump measured from well top to water level)		NAME HILLOG	ie W211 D.	Gyge or	N9
Time Water Level Time Water Level	Time Water Level	Address 2803-1	irm, or corporation) コ8乙/ 人。と)	Mane	orny) Sville
				_	8)
Date of test _2/23/80		[Signed]	(Well Driller)		
Bailer test: gal/min. with ft. dra			(Well Driller)		-
Artesian flow	lysis made? Yes 🗍 No 🗆	License No. 0503	Date 6	121	, 195
approximately 900 go	il sie I 4 hor	1	/		
cypes remaining	(USE ADDITIONAL	SHEETS IF NECESSARY)			4 - 3

S. F. No. 7356-OS-(Rev. 4-71).

RILLED WELLS (Gibralter)

GEORGE MCLEOD 419 CampBELL Lake ROAD Anacortes, WA 98221 DRILLED 58'

NW14, SW14

LOT 3 SEC 7, T 34, RZE

Except West 880'

Edward Laving Box 633 1583 Sneedosh Rd La Conner, WA 98257 DRÍLLED 70'

NW14 NW14 Sec 7, 734, 82 BTN of Dort Lot = 1

VERNON HILBERT

428 Lake Campbell Rd

Anacortes, WA 98221

PRILLED)

w/2 Gout Lot 4 Sec 7 T34 RZ

HALLIE ALLEN

409 Campbell Lake ROAD

Anacentes, Wit 1824

DRILLED 74-79'

SW14 SE1/7 Sec7, T34 R2 EWM 418181 JM

DRILLED WELLS

Craig Ginnett 510 Miller Road Anacortes, WA 98221 293-5854 Drilled Well ?

No well log on file

8/24/87 Letter Mailed

James Lyle 523 Miller Road Anacortes, WA 98221 293-4937 Drilled Well 150') Steel 5 casing No well log on file

8/24/87 Permission given

Jim Hertzberg 462 Ocar Lane Angeortes, WA 98221 DRILLED 270'

NW'4 NE/4 Sec 7, T34, R2E

Dan Tibbles 1358 Tibbles Lane Anacortes, WA 98221 293-7201 Drilled Well 276)
Steel Casing
No well log on file

8/21/87 Letter Mailed

×4 ...

CLAYTON LUNZ 1428 Commercial Rd Anacortes, WA 98221 DRILLED 291'

NW14, NW14 See 18, T34, R2

Tom Wilson Deer Lane Anacortes, WA 98221 No Phone Drilled Well 330' Steel Casing 6" Well log on file

8/20/87 Letter Mailed 5/18/85 JM

DRILLED WELLS

BOB TRACY
467 DEER LANE
Anacortes, WA 98221



SW14 NE 1/4 SEC 7, T 34, R 2

Frank Hamiter 630 Hamiter Lane Anacortes, WA 98221 Unlisted phone Drilled Well 400°) Steel Casing 6" Well log on file

8/20/87 Letter Mailed

45

Mark Tibbles 1370 Tibbles Lane Anacortes, WA 98221 293-5087 Drilled Well?

8/21/87 Letter Mailed

Michael D. Ensign 2014 32nd St. Anacortes, WA 98221 293-4406 Well?

8/21/87 Letter Mailed

No well log on file

Palm

15.70" I 45E 222.80 Dug well shallow

#4



Drd Copy - Driller's Copy	ZEE REPURI	Application	n No	
OWNER H		Permit No		
OWNER: Name Leage merlons	Address 4/9 Campbell fl D	10	+ /	. /
) LOCATION OF WELL: County Sheart THE	AT PORTION OF AOT 3 Sec	CONTRACT.	suo, u	ash.
aring and distance from section or subdivision corner Nu	14, Swith FICEPT	7 т.	$3Y_{N,R}$	2¢wm
) PROPOSED USE:	7/1/1/1/	f WK	ST 880	FEET
Irrigation Test Well Door	(10) WELL LUG:			
	chain think Describe by color, character ex	e of mater	ial and -t-	V-1000 P 1000
TYPE OF WORK: Owner's number of well (if more than one)	show thickness of aquifers and the kind and stratum penetrated, with at least one entry	for each	the mater	ial in each
Method: Dug Bored	MATERIAL	yer eden	FROM	jornation.
Deepened Cable Driven	Landonan		-	TO
	Hardran & houlder	5	2"	24'
DIMENSIONS: Diameter of well	France & Long Home		24	46
Drilled 72 ft. Depth of completed well 58 ft.	Sand Water		576	23
	Dramet Kochs Come	71	53	38
CONSTRUCTION DETAILS:	Beroch	seef	58'	68
Casing installed: "Diam. from ft. to ft.			68'	72'
- Diam, Irom				
ft. to =3.3 ft.			-	
Perforations: Yes No			 	
Type of perforator used			1	
SIZE of perforations			-	
periorations from ft. to	×		-	
perforations from ft. to				
perforations from ft. to ft.	-			
Screens: Yes No D 1 0				
Manufacturer's Name				
Diam Steel Model No 3.04				
Diam. Slot size from ft. to ft. Diam. Slot size from ft. to ft.				_
C I t. to ft.				
Gravel placed tes No Size of gravel:				
Gravel placed fromft. toft.				
Surface seal: Yes No To what depth? 20 ft.				
Material used in seal				
Did any strata contain unusable water? Yes \(\) No \(\)				
Type of water? Depth of strata Method of sealing strata off				
UMP: Manufacturer's Name Soulds				
Type: Dubnerille HP 13				
WATER LEVELS: Land-surface elevation				
above mean sea level				-
an pressurelbs. per square inch Date				
Artesian water is controlled by				
(Cap, valve, etc.)				
VELL TESTS: Drawdown is amount water level is lowered below static level				
pump test made? Yes No If yes, by whom?	Work started 9-16 1974. Complet	. 10	U	7/
gal/min with	WELL DRILLERS CON-	ed. J. W	7 1	1976
n n	WELL DRILLER'S STATEMENT:			
, , , , , , , , , , , , , , , , , , ,	This well was drilled under my jurisdiction to the best of my knowledge and be	ction and	i this rep	ort is
(water level)	Allowledge and be	nef.		
Water Level Time	AME KADKE WELL	D	011	
The second secon	(Person, firm, or corporation)	(7)	الملدا	NG
	ddress 1632 mconguel 7)A :	e or print)	
of test	O These !	d. mi	Ver	on
* * *	Signed] K.O. Kash		*	
flowhrs.	(Well Driller		***************************************	
iture of water. Wes a sharp water	0417			-12233751
165 76 76 76 76	cense No. 0417 Date	0-8	19	76
(2107)				

×	34/02-	- 74	ノ
File Original and First Copy with Department of Ecology WATER	WELL REPORT Application		
Second Copy — Owner's Copy Third Copy — Driller's Copy			
	remut No.	98	257
(2) LOCATION OF WELL	Address BOX 033, 1583 Sneeoosh Rd.	LaConn	er, WA
(2) DOCATION OF WELL: County Skagi	T	/N. R	2 w.
Bearing and distance from section or subdivision corner	ocurrent Lot "/		***** (e
(3) PROPOSED USE: Domestic 💢 Industrial 🗆 Municip	pal (10) WELL LOG:		
Irrigation Test Well Other	Formation: Describe by color, character, size of material show thickness of aquifers and the kind and nature of stratum penetrated with at least constant fathers.	il and stri	icture, an
(4) TYPE OF WORK: Owner's number of well	show thickness of aquifers and the kind and nature of stratum penetrated, with at least one entry for each c	the mater hange of	ial in eac formation
New well Method: Dug Bore	MATERIAL	FROM	TO
Deepened	en [Top Soil	0	2
Reconditioned Rotary Jette	Brown Clay	2	20
(5) DIMENSIONS: Diameter of well 6"	Blue Clay & Gravel	20	60
Drilled 70 ft. Depth of completed well 70	a Graver	60	70
Depth of completed well	Blue Clay	70	75
(6) CONSTRUCTION DETAILS:			
Casing installed: 6 "Diam from 0 ft 26		1	-
Threaded Diam. from ft. to	- n.		
Welded Diam. from ft. to	ft.		
Parforations			
Perforations: Yes No X			
Type of perforator used			
perforations fromft. to			
perforations from ft. to			
perforations from ft. to	ft		
Screens: Yes No X	***************************************		
Screens: Yes No X Manufacturer's Name			
Type Model No			
Diam Slot size from ft. to			
Diam. Slot size from ft. to	ft		
Gravel packed: Yes No Size of gravel:			
Gravel placed from ft. to			
7			
Surface seal: Yes No D To what depth? /5	. ft		
Material used in seal. Hutoriti			
Did any strata contain unusable water? Yes North	° D ——————————————————————————————————		
Method of sealing strata off			
T) PTT (P	_		
7) PUMP: Manufacturer's Name			
Type: H.P	_		
8) WATER LEVELS: Land-surface elevation		انتنا	
above mean sea level above mean sea level ft. below top of well Date // -/0 -	PEC 2 1 1988		
rtesian pressure The per square inch Date	DEC 2 1 150		
Artesian water is controlled by(Cap, valve, etc.)		MOGY	
	DEPARTMENT OF EC	NOI	
Drawdown is amount water level is lowered below static level	77 77 07 01 01 17 17 17		
as a pump test made? Yes 🗌 No 💢 If yes, by whom?	Work started 11-10-83 NOR Completed 11-1	10-83	, 19
iold: mal /min mast	hrs. WELL DRILLER'S STATEMENT:		
	This well was drilled under my jurisdiction as	nd this =	enort is

true to the best of my knowledge and belief.

Recovery measu	data (time tak ired from well	en as ze	ro when pump iter level)	turned o	off) (water level	DAUTMAN DIMD & DETITION THE
Time	Water Level	Time	Water Level	Time	Water Level	NAME DAHLMAN PUMP & DRILLING, INC. (Person, firm, or corporation) (Type or print)
				ļ		Address Box 422, Burlington, WA. 98233
Bailer tes	of test tgal./r		/5 ft. dra		terhrs.	[Signed] H Hess Fouler
					e? Yes 🗆 No 💢	License No

WATER WELL REPORT

STATE OF WASHINGTON

34	/-	フ
Application	No.	—

STATE OF	Washington	Permit No	
(1) OWNER: Name Vernon Hilbert	Address 1128 Take Commis-	33 D2 4	-0
(2) LOCATION OF WELL: County Skagit	W 1 Court 1+ /	II ka. Anacortes	98221
Bearing and distance from section or subdivision corner	W ½ Govt. 1t 4,	Sec T 34 N	r., R2w.ı
(3) PROPOSED USE: Domestic M Industrial Municipal D	(10) WELL LOG:		
Irrigation Test Well Other (4) TYPE OF WORK: Owner's number of well	Formation: Describe by color, char show thickness of aquifers and the stratum penetrated, with at least of	acter, size of material and kind and nature of the m one entry for each change	structure, an
New well Nethod: Dug Bored	MATERIAL	FRO	
Deepened	Gravel and clay	0	17
Reconditioned Rotary A Jetted	Blue_clay	17	
(5) DIMENSIONS: Diameter of well inches.	Gravel, clay and wa	ater 63	
Drilled // Depth of completed well // tt.	- Roak	74	76
(6) CONSTRUCTION DETAILS:			
	? !		
Casing installed:			
Threaded "Diam. from ft. to ft. Welded "Diam. from ft. to ft.			
	=======================================		
Perforations: Yes No No			
Type of perforator used			
SIZE of perforations			
perforations fromft. toft.			
perforations from ft. to ft.			
Screens: Yes No 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 V Size of gravel:			
Gravel placed fromft. toft.		*	
Surface seal: Yes No D To what depth? 18 ft. Material used in seal CEMEN.	Control		
Did any strata contain unusable water? Yes No N			
Type of water? Depth of strata			
Method of sealing strata off		1001	
(7) PUMP: Manufacturer's Name	اخ يال ر.	1356	
Type: HP			
		-4 V 2 V 3 I	+
(8) WATER LEVELS: Land-surface elevation above mean sea level	Qui l	F # X	
Static level 23 ft. below top of well Date & 24-52	5655		
Artesian pressure			
(Cap, valve, etc.)			
(9) WELL TESTS: Drawdown is amount water level is			
lowered below static level	Work started June 24 19 8	32 Completed June 2	4 19 82
Was a pump test made? Yes □ No ☑ If yes, by whom?Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATE		10
<u>u</u> <u>u</u> <u>u</u> <u>u</u>	This well was drilled under a true to the best of my knowled	my jurisdiction and thi	is report is
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	•	B- Liid Bellet.	
	NAME DAHLMAN PUMP A	ND DRITTIING	
Time Water Level	(Person, firm, or co	orporation) (Type or	print)
	Address P.O. Box 422 Bur	lington, 98233	
	$\mathcal{A} \mathcal{A} \mathcal{A}$	1	***************************************
Date of test	[Signed] T. C. Let	mon	
Artesian flow g.p.m. Date	(/ - (Well Driller)	
Company of the Compan	License No. 0222	Date June 29	, 1982

WATER WELL REPORT STATE OF WASHINGTON

Application No.

	Permit No
(1) OWNER: Name Follie Fills	Address 409 Can shall dish Ry Com
(2) LOCATION OF WELL: County	- 5 4'4 3 E 14 Sec. 7 T 34N, R 2 EWM.
Bearing and distance from section or subdivision corner	
(3) PROPOSED USE: Domestic 🗹 Industrial 🗆 Municipal 🗆	(10) WELL LOG:
Irrigation Test Well Other	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
(4) TYPE OF WORK: Owner's number of well	stratum penetrated, with at least one entry for each change of formation.
(if more than one)	MATERIAL FROM TO
Deepened Cable Doriven	1605011
Reconditioned Rotary Jetted	
(F) DIMENSIONS	1010 de clay 4 60
(5) DIMENSIONS: Diameter of well inches. Drilled ft. Depth of completed well ft.	
Drilledft. Depth of completed wellft.	Continued grande, bole
(6) CONSTRUCTION DETAILS:	
Casing installed: ft. to ft.	1/21 10.74
Threaded Diam. from ft. to ft.	I - (n
Threaded "Diam. from ft. to ft. Welded Time ft. to ft. to ft. to ft.	12 care 1 63 65
	- in the transfer
Perforations: Yes No No No	- 1: 11: 1 (c/ Alad /6/04 6) 19
Type of perforations in. by in.	
perforations from ft. to ft.	- Consel sond /grand 74 79
perforations from ft. to ft.	
perforations from ft. to ft.	
Screens: Yes D No D	
Manufacturer's Name Wallit Lee	
Type 1/A:7-4:11 Model No	
Diam. Slot size from ft. to ft. Diam. Slot size f from 7 / ft. to 7 ft.	
Diam. Slot size from ft. to ft.	
Gravel packed: Yes No D Size of gravel:	
Gravel placed from ft. to ft.	
Surface seal: Yes No No To what depth? 18 11.	2 100
Material used in seal 12 12 16 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 P 10 SD
Did any strata contain unusable water? Yes 🗗 No 🗆	27 600
Type of water? Depth of strata	2%
Method of sealing strata off	至3 5 倍
(7) PUMP: Manufacturer's Name Acutelo	<u> </u>
Type: Acclinicate HP	5
2) WATER I EVELS. Land-surface elevation	66
above mean sea levelft.	1- 36
static level	1
Artesian water is controlled by (Cap, valve, etc.)	
(Cap, valve, etc.)	
9) WELL TESTS: Drawdown is amount water level is lowered below static level	(2)
Vas a pump test made? Yes No If yes, by whom?	Work started 5-24 , 19 75 Completed 9.3 , 19.5-5
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:
n n	This well was drilled under my jurisdiction and this report is
<u>,, , , , , , , , , , , , , , , , , , ,</u>	true to the best of my knowledge and belief.
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	NAME SIC ULL CALL, y Inc. (Person, firm, or corporation) (Type or print)
	Address 855/5/1/4 A Billingtion
Date of test	(Signed) Flicher - Liknist
Bailer test / 5 gal/min. withft. drawdown afterhrs.	(Well Driller)
Artesian flow g.p.m. Date	License No. 266 Date 6-5
'emperature of water	License No

WATER WELL REPORT STATE OF WASHINGTON

B

Application	No.	
Permit No.	555	

(1) OWNER: Name Jim Hertzberg	Address 462 Deer Lane Anacortes, 98221	name and a
(2) LOCATION OF WELL: County Skagit		
Bearing and distance from section or subdivision corner Lot 6	Campbell Lake Estates	** .111.
(3) PROPOSED USE: Domestic Municipal []	(10) WELL LOG:	
Irrigation Test Well Other	Formation: Describe by color, character, size of material and structure	re. and
(A) MILITARY OF THE PARTY (American property of mall	show thickness of aquifers and the kind and nature of the material i stratum penetrated, with at least one entry for each change of form	m each
(4) TYPE OF WORK: Owner's number of well (if more than one)		TO
New well Method: Dug Bored Deepened Cable Driven		10
Reconditioned	Roek 10	270
(5) DIMENSIONS: Diameter of well findness.	Water at 240	
Drilled 27 Depth of completed well 77 Sty		
Difference with the second sec		
(6) CONSTRUCTION DETAILS:		
Casing installed: 6 "Diam from O ft. to 1 ft.		
Threaded D "Diam. from ft. to tt.	I	
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.		
Sanoansi		
Screens: Yes No No No Manufacturer's Name		
Type Model No		
Diam Slot size from ft. to ft.	[
Diam Slot size from ft. to ft.		
Gravel packed: Yes D No Size of gravel:	·	
Gravel placed from ft. to ft.	1	
Surface scale - 20	I ————————————————————————————————————	
Surface seal: Yes No To what depth? Rock to 2 ft.		
Did any strata contain unusable water? Yes No.		
Type of water? Depth of strata		
Method of sealing strata off		
(7) PUMP: Manufacturer's Name JOCUZZI BRO.	4	
Type: 545 Meps/ Ge HP 3/4	- 10,	
(8) WATER LEVELS: Land-surface elevation	*	
(8) WATER LEVELS; above mean sea level	12 62	
Artesian pressurelbs. 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	Work started Sept. 4, 19 79 Completed Sept 5	19 79
Was a pump test made? Yes \(\bar{\cup} \) No \(\bar{\cup} \) If yes, by whom?		20
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:	
· · · · · · · ·	This well was drilled under my jurisdiction and this rep true to the best of my knowledge and belief.	ort is
Recovery data (time taken as zero when pump turned off) (water level	and to the best of my knowledge and benef.	
measured from well top to water level)	NAME DAHLMAN PUMP AND DRILLING	
Time Water Level Time Water Level Time Water Level	(Person, firm, or corporation) (Type or print))
	Address P.O. Box 422 Burlington, 98233	
	1001	
Date of test	(Simula K. C. Literson	
Bailer test 2 gal/min. with 70 ft. drawdown after hrs.	[Signed] (Well Driller)	
Artesian flowg.p.m. Date		-70
Temperature of water	License No. 0227 Date Sept. 6 , 1	197.7

(1) OWNER: Name Clayton Lunz	Address 1428 Commercial Rd., Anacortes	98221
(2) LOCATION OF WELL: County Skagit		, DEWM
Bearing and distance from section or subdivision corner		
(3) PROPOSED USE: Domestic K Industrial [] Municipal []	(10) WELL LOG:	
Irrigation ☐ Test Well ☐ Other ☐	Formation: Describe by color, character, size of material and show thickness of aquifers and the kind and nature of the m stratum penetrated, with at least one entry for each change	aterial in each
(4) TYPE OF WORK: Owner's number of well (if more than one).		OM TO
New well . Method: Dug	Brown Sand & Clay	0 30
Reconditioned Rotary Jetted	Blue Clay 30	290
(5) DIMENSIONS: Diameter of well nches. Drilled 39 ft. Depth of completed well 79 ft.		
(6) CONSTRUCTION DETAILS:		
Casing installed: 6 "Diam. from On to 286 n.		
Threaded " Diam. from ft. to ft.		
Welded Diam. from ft. to ft.		
Perforations: Yes No Di		
Type of perforator used		
SIZE of perforations in. by in.		
perforations from ft. to ft ft ft ft. to ft		
perforations from ft. to ft.		
Screens: Yes X No [// / / / /	· · · · · · · · · · · · · · · · · · ·	
Manufacturer's Name Houston Woll Schoen		
Type Statutes Model No Diam to Slot size / C from 286 ft. to 291 ft.		
Diam. Slot size from 1t. to 1. 11. Tt.		
(**************************************		
Gravel placed from ft. to ft.		
		•
Surface seal: Yes No D To what depth? tt.		
Material used in seal	N ARCENTED	
Type of water? Depth of strata	RECEIVE	
Method of sealing strata off	1	
(7) PUMP: Manufacturer's Name Jacquzz 1 Bpo.	- 1075	
Type: SUB MURRSIBLE HP 3/4	CED 4	
(8) WATER LEVELS: Land-surface elevation		_
Static levelft. below top of well Date 5-19-7	7	
Artesian pressurelbs. 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	Work started 5-9-77 19 Completed 5-19-7	77 19
Was a pump test made? Yes No If yes, by whom?	WELL DRILLER'S STATEMENT:	
Yield: gal./min. with ft. drawdown after nrs.	This well was drilled under my jurisdiction and	this report is
	true to the best of my knowledge and belief.	mus report is
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	NAME DAHLMAN PUMP & DRILLING, INC. (Person, firm, or corporation) (Type	or print)
		or himsi
	Address Burlington 98233	
	To Continue	
Date of test Bailer test	[Signed] (Well Driller)	
Artesian flowp.m. Date	222 02 7387 5 25 75	7
Temperature of water	License No. 227-02-1,50 Date 7-27-11	19
	to the control of the	

File Orig	inaland	Fyst Copy logy wner's Copy liler's Copy	with
Departm	Fol E	MORY	
Sevend (DDY - 9	wner's Co	ру
Tulea Ca	py — Jor	lier's Copy	,

WATER WELL REPORT

Application	No.	 	
		Ç.	

hird Copy — Friller's Copy	STATE OF WASHINGT		Permit No	··········
1) OWNER: Name Tom Wilson	Mail: 608 35th St. Ana.	Deer Lane Anacortes	s98221	
2) LOCATION OF WELL: County	Skagit	SE NEWS	ec 7 34 N. R.	2_w.m.
earing and distance from section or subdivision co				
3) PROPOSED USE: Domestic N Indus	trial Municipal (10) WF	ELL LOG:		
Irrigation 🗆 Test	show thick	Describe by color, character, mess of aquifers and the kind	and nature of the mater	iai in each
4) TYPE OF WORK: Owner's number of (if more than one).	well stratum pe	metrated, with at least one en	try for each change of	formation.
New well Method:	Dug Bored			17
Deepened		1.&.Clay	A - A - A - A - A - A - A - A - A - A -	330
5) DIMENSIONS: Diameter of well Drilled 330 ft. Depth of completed	well 330 ft.			
6) CONSTRUCTION DETAILS:				<u> </u>
Casing installed: Diam. from				
Threaded				
			•	
Perforations: Yes No (A				-
Type of perforator used	by in.			+
perforations from	ft. to ft.			
perforations from	ft. to ft.			
				-
Screens: Yes No No No No No No No N		2		
TypeM	odel No			
Diam. Slot size from Diam. Slot size from From Diam.				
Gravel placed from ft.	to ft.			1
Surface seal: Yes No To what Material used in seal Cemen	depth? n			ļ
Did any strata contain unusable water	? Yes No			-
Type of water? Depth of Method of sealing strata of		**************************************		1
(7) PUMP: Manufacturer's Name	EP			ļ
(o) WIATED I FIFE C. Land-surface elev	ration	RECEIVED		
static level	evel ft.	JUN 2 7 1980		1
artesian pressure	ch Date			
Artesian water is controlled by	Cap, valve, etc.)	SKAGIT CO. HEALTH DE	PT.	-
(9) WELL TESTS: Drawdown is amou		ted 19 19	Completed	10
Was a pump test made? Yes [] No [] If yes, by	whom?	DRILLER'S STATEM		
/ield: gal./min. with ft. drawdo				
	This true to t	well was drilled under my the best of my knowledge	and belief.	s report):
Recovery data (time taken as zero when pump to	rned off) (water level		N	
measured from well top to water level) Time Water Level Time Water Level	Time Water Level NAME	DAHLMAN PUMP AND I		print)
		P.O. Box 422 Burli		
		200	سنزور به المراجب و الدران المناس	
Date of test		K.C. Llins	m_	
Date of test 12 gal / with 3.75 ft. draws		// (W	ell Driller)	
Artesian flow	sis made? Yes No License	No0222	Date Sept. 4	, 1979

WATER WELL REPORT STATE OF WASHINGTON

34/0	21	076
Application	No.	
Permit No		

(1) OWNER: N	Name Bob Tra	cy		1160 D		Fermit N	0	•••••
(2) LOCATION	OF WELL: Court	QI 1	Address	407 Deer	Ln. Anaco	rtes Wa	9822	1
Bearing and distance	from section or subdivis	Skagit	***************************************	_ 54	I to s	:c	34N.	$R \geq WN$
(3) PROPOSED								4
(0) I HOI USED		Industrial Municipal	□ (10) W	ELL LOG:				
		Test Well Atherd	ormation	Describe by co	lor, character, s	ize of mate	rial and st	Tucture on
(4) TYPE OF V	WORK: Owner's numi	her of wall	stratum pe	enetrated, with o	and the kind a it least one ent	nd nature of	of the mat change o	erial in each
	New well Me	one) ethod: Dug Bored	*****		TERIAL		FROM	
	Deepened 4	Cable Driven	_	ened Well				
(E) 30 TO	Reconditioned	Rotary Jetted	- Gran				1.00	1100
(5) DIMENSION	, Diameter (of well inche	Wate	- 1 C D W			ار د	400
Drilled 250	ft. Depth of com	pleted well (400	tt.	r1GPM				1
(6) CONSTRUC	TION DETAILS:	125 201	<i>-</i>					
Casing instal	lled:	The - 1= 20	1979					
Threaded [Diam, fro	m ft. to f	tt.		~		+	
Welded 🚜	" Diam. fro	m ft. to f	it.			-		
Perforations:								
	- 40 F							
SIZE of pe	erforations	in. by ir						1
	perforations from	ft. to #					 	+
	perforations from	ft, to f						
		ft. to ft	<u>.</u>					
Screens: Yes [□ No □							
Manufactur	er's Name	••••						
Type	Flat size	Model No						
Diam.	Slot size from	n ft. to ft n ft. to ft						
					•			
Gravel packet	d: Yes No D Siz	ze of gravel:					-	
Graver place	ea irom	. ft. to ft	.	6				
Surface seal:	Yes No 🗆 To wh	hat depth?	11/1/	at 18'			-	
Material use	ed in seal	REDTO STITE	In W	979				
Type of wat	rata contain unusable w	ater? Yes No 🖸	H					
Method of se	ealing strata off	th of strata						
						2155	1715	
Type: Manufa	returer's Name	uzzi //				- branchist	/	
		HP / / J			_U\			
8) WATER LEV	ELS: Land-surface e above mean se	levation				JL 31	500	
tatic level/	ft. below top of	well Date 8 -/9-	<u> </u>					
rtesian pressure	lbs. per square	inch Date	1		DEPARTM	ENT OF	500 A	2.V
Artesian wat	er is controlled by	(Cap, valve, etc.)	 		NORTH	WEST H	FOUNT	4.4
) WELL TESTS	. Drawdown is an		1					
	lowered below st	ount water level is tatic level	Work stant of	(10				
as a pump test made? eld: gal./min		y whom?	WOIR Started	6-18-	. 19.86. Comp	leted6	<u> </u>	, 1986
, ,		down after hrs.	WELL DR	ILLER'S ST	ATEMENT	;		
	·	<u>.</u>	This well	was drilled u	ınder my juri	sdiction a	nd this r	enort is
covery data (time tak	ten as zero when pump	turned off) (water level	true to the	best of my kn	lowledge and	belief.	-	oport 15
measured from well	i - water level)	ì	NAME Da	hlman Dumm	W			
		Teber	NAME DA	hlman Pump (Person, firm	or corporation	mlling	Inc.	
			A. D				ype or pri	nt)
			Address±	0 Box 422	Durlingto	1 Wa. 9	8233	***********
Date of test			A	4 1	1	11		
test /G/gal/h	nin, with 360 ft. draw	vdown afterhrs.	[Signed]	per		VU	_	
esian how	g.p.m. Date	V642-4-00076-00-6-00-6-0		4400	(Well Dri			
The state of water	Was a chemical anal	ysis made? Yes 🗌 No 🕼	License No	1192	Date.	6-	23- ,	1986
					¥/)		,	

WATER WELL REPORT



Application	No.	

WATER WELL REPUI

(1) OWNER Name Frank Hamiter	Address 630 Hamiser Lane, Anacortes	s, Wash	•
	SW 14 SW 14 Sec. 8 T		**************
Bearing and distance from section or subdivision corner	Т	N., B	
	(10) WELL LOG:		
(3) PROPOSED USE: Domestic [Industrial		al and story	objec and
	Formation: Describe by color, character, size of materia show thickness of aquifers and the kind and nature of stratum penetrated, with at least one entry for each of	the materi	al in each
(4) TYPE OF WORK: Owner's number of well (if more than one)	MATERIAL	FROM	TO
New well Method: Dug Bored Deepened Cable Driven			
Reconditioned Rotary Distrete	Topsoil	0	3
(F) DIRECTORIC 4	Brown sandy clay	3	10
(5) DIMENSIONS: Diameter of well inches. Drilled ft. Depth of completed well 400 ft.	Gray clay	10	18
Drilled ft. Depth of completed well ft.	Brown clay and gravel	18	225
(6) CONSTRUCTION DETAILS:	Brown sand and gravel	22½ 54	<u>54</u> _ 59_
Casing installed: 6 "Diam. from ±2 nt to 400 nt	Tan clay Tan sandy clay and gravel	59	74
Threaded [] "Diam. from	Brown sand , little clay	74	125
Welded 🖸 The man of the m	Brown sand and gravel, little cla		160
Perforations: Yes No.	Gray sand , clay and wood	160	165
Type of perforator used	Gray sand and clay	165	168
SIZE of perforations in. by in.	Sand and clay layers with wood	168	125
perforations from ft. to ft	Gray clay	225	245
perforations from	Gray clay and few clam shells	245	2405
	Gray clay	2465	340
Screens: Yes No 🖰	Gray clay and gravel	340	396
Manufacturer's Name	Gray sand gravel and water	26.5	
Diam Slot size from ft. to ft.	15 gpm @ 397 ft.	396	399
Diam. Slot size from ft. to ft.	Gray gravel sand and water	200	
Gravel packed: Yes No No Size of gravel:	25 gpm @ 400 ft. Course gravel and trace of clay	399 400	400
Gravel placed from	ocurse graver and trace or cray	400	
Surface seal: Yes No To what depth? 13 ft.			
Material used in seal Puddeling clay			
Did any strata contain unusable water? Yes No No			
Method of sealing strata off			
(7) PUMP: Manufacturer's Name			
Type:HP			
(2) WATER LEVELS. Land-surface elevation			
above mean sea level 9-1/-05ft.			
Static level			
Artesian pressurelbs. per square inch Date			
(Cap, valve, etc.)			
(9) WELL TESTS: Drawdown is amount water level is lowered below static level	Work started 8-12-85, 19 Completed	8-14	85
Was a pump test made? Yes □ No ὧ If yes, by whom?			, 192.2
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:		
H H H	This well was drilled under my jurisdiction	and this	report is
D B H H	true to the best of my knowledge and belief.		
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	NAMES House Holl Dediling & Done	. T	
Time Water Level Time Water Level Time Water Level	NAME Haves Well Drilling & Pump (Person, firm, or corporation) (Type or pr	
	Address 1415 Colony Rd. Bow, Washi	neton	
	Address 1413 Colony Rd. Bow, Washi		
; Date of test	reimal - Cold	hort	
Baller test 5 gal/min, with 100 ft, drawdown after 2 hrs.	[Signed] (Well Driller)	.XX	
Artesian flowg.p.m. Date	Ticense No. 762 Det. 8-1	5	35
Temperature of water	License No		., 19

SAUK LANDFILL LOGS

WATER WELL REPORT

-	•	
Application	No.	

3

SIAIE OF	WASHINGTON Permit No
(1) OWNER: Name Dean Mallory	Address 944 Adans Dr., Concrete Wa. 98237
(2) LOCATION OF WELL: County Skagit	_ SW, NW, Sec 21 T 35N, R 9
Bearing and distance from section or subdivision corner	PTN-SWA-NWY ARATRZ SAT PLT 107-75
	1
(3) PROPOSED USE: Domestic Mindustrial Municipal	
Irrigation Test Well Other	Formation: Describe by color, character, size of material and structure show thickness of aquifers and the kind and nature of the material is stratum penetrated, with at least one entry for each change of form
(4) TYPE OF WORK: Owner's number of well (if more_than one)	
New well Method: Dug Bored	
Deepened	C
Reconditioned Rotary Jetted	
(5) DIMENSIONS: Diameter of well inches.	
Drilled 2/4 ft. Depth of completed well 2/4 ft.	
	Water Gravel 212 2
(6) CONSTRUCTION DETAILS:	
Casing installed: 6 " Diam from 6 tt to 2/4 tt	
Threaded Diam. from ft. to ft.	
Welded Diam. from ft. to ft.	I I I
· · · · · · · · · · · · · · · · · · ·	
Perforations: Yes No	
Type of perforator used	
SIZE of perforations in. by in.	
perforations from ft. to ft	
perforations from ft. to ft.	
Screens: Yes No D	
Manufacturer's Name	
Type Model No Model No	
Diam. Slot size from ft. to ft.	
Diam Slot size from ft. to ft.	
Gravel packed: Yes No P Size of gravel:	
Gravel placed from ft. to ft.	
Section and	
Surface seal: Yes No D To what depth?	
Material used in seal. Brallowic. Did any strata contain unusable water? Yes □ No P	- annela
Type of water? Depth of strata	
Method of sealing strata off	
	Very
(7) PUMP: Manufecturer's Name Jacuszi	138 1 0 1983
Type: 5 16 mes. 6/2 HP 3/4	067 1 9 1500
(8) WATER LEVELS: Land-surface elevation	
above mean sea levelft.	TO THE ENDINEY
static level 150 ft. below top of well Date 9-7-83. Artesian pressure lbs. per square inch Date.	PARTMENT REGION
Artesian water is controlled by	P.C.William
(Cap, valve, etc.)	
9) WELL TESTS: Drawdown is amount water level is	
ibwered below static level	Work started 9-6-83 19 Completed 9-7-83 1
Vas a pump test made? Yes No If yes, by whom?	WELL DRILLER'S STATEMENT:
rield: gal./min. with ft. drawdown after hrs.	1
	This well was drilled under my jurisdiction and this report to the best of my knowledge and belief
	true to the best of my knowledge and belief.
decovery 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	NAME DAHLMAN PUMP & DRILLING INC. (Person, firm, or corporation) (Type or print)
	(Person, firm, or corporation) (Type or print)
· · · · · · · · · · · · · · · · · · ·	I see that the management of the control of the con
	AddressPO_Box 422, BURLINGTON WA 98233
	AddressPO_Box_422, BURLINGTON_WA_98233
Date of test	11 K. 5 1/2-
Bailer test 5 gal/min with 56 ft, drawdown after hrs	AddressPO_Box_422, BURLINGTON_WA 98233 [Signed] /- /en (Well Briller)
	[Signed] H. Ken Fowler

WATER WELL REPORT STATE OF WASHINGTON

Арриса	tion	1	N	C	١.		
Permit	No.					imi	

(1) OWNER: Name Robert Taylor	Address 4831 Sauk Store Rodd Concre	te, 98237
(2) LOCATION OF WELL: County Skagit		
Bearing and distance from section or subdivision corner	AND	
(3) PROPOSED USE: Domestic M Industrial Municipal	(10) WELL LOG:).
Irrigation Test Well Other	Formation: Describe by color, character, size of material show thickness of aquifers and the kind and nature of t stratum penetrated, with at least one entry for each ch	l and structure, and he material in each hange of formation.
(4) TYPE OF WORK: Owner's number of well (if more than one)	MATERIAL	FROM TO
New well Method: Dug Bored Deepened Cable Driven	Brown clay	0 22
Reconditioned Rotary Jetted	_Brown clayand gravel	22 28
	Sand and gravel	28 55
(5) DIMENSIONS: Diameter of well inches. Drilled 60 ft Depth of completed well 60 ft.	Water and gravel	55 60
(6) CONSTRUCTION DETAILS:		
Casing installed: 6 "Diam from 6 ft. to 60 ft.	-	
Threaded \(\) \(\) Diam. from \(\) ft. to \(\) ft.		
Welded :		
Perforations: Yes No M		
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 IN		
Manufacturer's Name		
Type Model No		
Diam. Slot size from ft. to ft.		
Gravel packed: Yes No No Size of gravel:		
Gravel placed from ft. to ft.		
Surface seal: Yes No D To what depth? ft.		
Material used in seal (CINENT		
Did any strata contain unusable water? Yes \(\) No \(\)		
Type of water? Depth of strata		
(7) PUMP: Manufacturer's Name		
Type: H.P		
(8) WATER LEVELS: Land-surface elevation above mean sea level		
Static level 44 ft. below top of well Date/1-15-3/	24	
Artesian pressure	77 2.8.0	
Artesian water is controlled by (Cap, valve, etc.)		
(0) WELL TESTS. Drawdown is amount water level is		
lowered below static level	Work started NOV . 18 19 81 Completed No	ov18 1981
Was a pump test made? Yes \(\) No \(\) If yes, by whom?	WELL DRILLER'S STATEMENT:	
iteld: gar/min. with it. drawdown after his.		
	This well was drilled under my jurisdiction a true to the best of my knowledge and belief.	ind this report is
Recovery data (time taken as zero when pump turned off) (water level	-	
measured from well top to water level)	NAME DAHLMAN PUMP AND DRILLING	
Time Water Level Time Water Level Time Water Level		Type or print)
	Address P.O. Box 422 Burlington, 98	3233
	1 100/	
Date of test	[Signed] N. C. W. 1110-1	/
Baller test gal/min. with it. drawdown after hrs.	(Well Driller)	
Artesian flow g.p.m. Date	License No. 0222 Date Nov	7 12 34
Temperature of water Was a chemical analysis made? Yes No	Date	

WATER WELL REPORT

35/09/Application No. ...

2	l	1-	

STATE OF WASHINGTON Permit No. Address 4908 Hiway 20 Concrete Wa. 98237 (1) OWNER: Name Mark Berg SEN SEN SENT TSIN R 9 WM (2) LOCATION OF WELL: County Skagit Bearing and distance from section or subdivision corner (10) WELL LOG: (3) PROPOSED USE: Domestic Industrial Municipal Irrigation | Test Well | Other 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. Owner's number of well (4) TYPE OF WORK: MATERIAL New well Method: Dug 0 93_ Dirty Sand-Gravel Deepened Cable [Driven 🛘 97 Reconditioned [Rotary Jetted Brown Clay-Sand 97 110 Blue Clay (5) DIMENSIONS: Diameter of well inches. 110 120 .. Brown Clay-Gravel Drilled 3/2 ft Depth of completed well.... 120 187_ Blue Clay 187 225 (6) CONSTRUCTION DETAILS: Brown Clay 225 298 Brown Clay-Gravel Casing installed: 6 " Diam. from O ft. to 3/2-tt 298 306 Blue Clay Threaded [] " Diam. from ft. to ft. ft. to ft. 306 Brown Clay-Gravel Water 312 Perforations: Yes No P 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 P 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. ace seal: Yes No Do What denth? Material used in seal BENTONIE Surface seal: Yes No 🗆 Did any strata contain unusable water? Type of water?..... Depth of strata..... FEB 14 K Method of sealing strata off..... (7) PUMP: Manufacturer's Name..... DEPARTMENT OF ECOLOGY Туре: NORTHWEST REGION (8) WATER LEVELS: Land-surface elevation above mean sea level.... Static level 280 ft. below top of well Date 1-30-86 Artesian pressure _____lbs. per square inch Date...... Artesian water is controlled by..... (Cap, valve, etc.) Drawdown is amount water level is lowered below static level (9) WELL TESTS: Work started 1-28- , 19.86. Completed 1-30-1986 Was a pump test made? Yes No If yes, by whom?.... WELL DRILLER'S STATEMENT: Yield: gal./min. with ft. drawdown after hrs. ** This well was drilled under my jurisdiction and this report is .. true to the best of my knowledge and belief. Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) DAHLMAN PUMP & WELL DRILLING INC. Water Level | Time Water Level | Time (Person, firm, or corporation) (Type or print) Address P.O. BOX 422 Burlington Wa. 98233 (Well Driller) Date of test gal/mil with 20 ft. drawdown after hrs. [Signed] //. Artesian flow......g.p.m. Date...... License No..... Date.....

WATER WELL REPORT STATE OF WASHINGTON

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

(1) OWNER: Name Von Porcke, Otto	Address Route 1, Pox 279, Concret	e 08237
(2) LOCATION OF WELL: County Skazit	_ SW 14 NW 14 Sec 27 T35	N P OF WM
Bearing and distance from section or subdivision corner		V., 25
	(10) WELL LOG:	
(3) PROPOSED USE: Domestic Y Industrial Municipal		
Irrigation Test Well Other	Formation: Describe by color, character, size of material an show thickness of aquifers and the kind and nature of the stratum penetrated, with at least one entry for each chan	material in each
(4) TYPE OF WORK: Owner's number of well (if more than one)		ROM TO
New well Method: Dug 🛛 Bored 🖂	Top soil	7 !!
Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☑ Jetted ☐		01 60"
Reconditioned Rotary Jetted	Clay % Gravel	0 62
(5) DIMENSIONS: Diameter of well inches.	Dirty Sand & Gravel 6	
Drilled 155 ft. Depth of completed well 155 ft.		15 230
(6) CONSTRUCTION DETAILS:		30 119
		9 155
Casing installed: 6 "Diam. from D ft. to 155ft.		
Threaded " Diam. from ft. to ft. Welded 5 " Diam. from ft. to ft.		Ųa.
Perforations: Yes No No		
Type of perforator used		
SIZE of perforations		
perforations from ft. to ft.		
perforations from ft. to ft.		
Scrance		
Screens: Yes No No No No No No No N	[
Type Model No		
Diam Slot size from ft. to ft.		
Diam ft. to ft.		
Gravel packed: Yes No SA Size of gravel:		
Gravel placed fromft. toft.		
The state of the s		
Surface seal: Yes No D To what lepth?		
Material used in seal Clay + Coutout + e Did any strata contain unusable water? Yes No		
Type of water? Depth of strata		
Method of sealing strata off		
(7) Primp Teaus Bac		
(7) PUMP: Manufacturer's Name SCOUZZI DES. Type: SUDWOUS (b) HP /2		
Control Colombia (Colombia Colombia) Colombia (Colombia) Colombia (Colo		
(8) WATER LEVELS: Land-surface elevation above mean sea level		
Static level 68 ft. below top of well Date/-28-77		
Artesian pressurelbs. 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	Work started 1-21-77, 19 Completed 1-25	77, 19
Was a pump test made? Yes \(\square\) No \(\square\) If yes, by whom?	WELL DRILLER'S STATEMENT:	
	This well was drilled under my jurisdiction and	this
	true to the best of my knowledge and belief.	this report is
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	NAME DAMINAN PIPO & DRILLING,	INC.
Time Water Level Time Water Level Time Water Level		or print)
	Address Purlington 08233	*******
	2000	
Date of jest/	[Signed] A.C. Johnson	
Bailer test 2 2 gal/mir. with 7 5 ft. drawdown after hrs.	(Well Driller)	***************************************
Artesian flow g.p.m. Date	License No. 223-02-73°7 Date. 2-0-7"	7
Temperature of water 2 chemical analysis made? Yes No	Date	19

WATER WELL REPORT

35/09/28 D
Application No.

Third Copy — Driller's Copy STATE OF W	VASHINGTON LOO 4799-3 Sauk Valley Hwy Concrete Wa.
(1) OWNER: Name Bill Groth	
(2) LOCATION OF WELL: County Skagit	-NV NV Sec 28 T35 N. R 9 WM
	3-003-006
(3) PROPOSED USE: Domestic PIndustrial Municipal	(10) WELL LOG:
Irrigation Test Well Other	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
(4) TYPE OF WORK: Owner's number of well (if more than one)	stratum penetrated, with at least one entry for each change of formation. MATERIAL FROM TO
New well Method: Dug Bored Deepened Cable Driven	Brown Clay - Gravel 0 50
Reconditioned Rotary D Jetted	Gravel - Water 50 60
(5) DIMENSIONS: Diameter of well 6 inches. Drilled 10 ft. Depth of completed well 60 ft.	
(6) CONSTRUCTION DETAILS:	
Casing installed: 6 "Diam from O ft to 60 ft	
Threaded ft. to ft.	
Welded Diam. from ft. to ft.	
Perforations: Yes No P	
Type of perforator used	
perforations from ft. to ft.	
perforations from ft. to ft	
Screens: Yes No Z	
Type Model No	
Diam. Slot size from ft. to ft. Diam. Slot size from ft. to ft.	
Gravel placed from	
Surface seal: Yes No D To what depth? 18 ft. Material used in seal BENTON!	
Did any strata contain unusable water? Yes No 2	
Type of water? Depth of strata Method of sealing strata off	
(7) PIIMP:	DECEMBE
(7) PUMP: Manufacturer's Name	
(8) WATER LEVELS: Land-surface elevation	<u>UU</u>
Static level 32 ft. below top of well Date 1-27-86	FEB 7 1986
Artesian pressurelbs. per square inch Date	DEDARTMENT OF FROM
Artesian water is controlled by(Cap, valve, etc.)	NORTHWEST REGION
(9) WELL TESTS: Drawdown is amount water level is lowered below static level	1-28- 86 : 1-28 86
Was a pump test made? Yes D No D If yes, by whom?	WELL DRILLER'S STATEMENT:
Yield: gal./min. with ft. drawdown after hrs.	This well was drilled under my jurisdiction and this report is
	true to the best of my knowledge and belief.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	DAMENAN DIND & HELL DOLLING INC
Time Water Level Time Water Level Time Water Level	NAME DAHLMAN PUMP & WELL DRILLING INC (Person, firm, or corporation) (Type or print)
	Address O Box 422 Burlington Wa. 98233
	11 12 -
	[Signed] Hen Joseful
Date of test test 30 gai/min, with ft. drawdown after hrs. g.p.m. Date	(Well Driller)
sture of water	License No 1192 Date 1-29- , 1986

35/04-28 D
55/01 20 45

File Original and First Copy with Department of Ecology Second Copy — Owner's Copy Third Copy — Driller's Copy	WATER WE STATE OF V	LL REPORT	r 	Application 1 Permit No		
(1) OWNER: Name George Theo	doratus	Address 3593	Hiway 20	Concre	te, W	A. 98237
(2) LOCATION OF WELL: County Bearing and distance from section or subdivision				4 Sec 28 TJ	I.n., r	9 w.m.
(3) PROPOSED USE: Domestic M In Irrigation To	ndustrial Municipal est Well Other	(10) WELL L	OG: be by color, character aquifers and the kir	er, size of materia	l and stru he materi	cture, and al in each
(4) TYPE OF WORK: Owner's number (if more than on	of well	stratum penetrated	i, with at least one MATERIAL	entry for each ci	FROM	formation.
New well 🐹 Metho	od: Dug 🛮 Bored 🗎	Dirty		own Clay	0	37
Deepened ☐ Reconditioned ☐	Cable Driven Rotary X Jetted	and v	gravel			
(5) DIMENSIONS: Diameter of	well		1 & Water		37	46
	eted well 46 ft.	Grave.	1 & Water			1.7
·	0 ft. to 46 ft. ft. to ft. ft. to ft.			<i>S</i> .		
Perforations: Yes 🗆 No 🕱						
Type of perforator usedSIZE of perforations						
perforations from	ft. to ft.					
perforations from perforations						
Screens: Yes No X						
Screens: Yes \(\text{No PL} \) Manufacturer's Name		-				
Type						
Diam. Slot size from Diam. Slot size from		-				
Gravel packed: Yes No K Size		-				
Gravel placed from	e of gravel: ft.	***************************************				
Surface seal: Yes No AD To who						
Material used in seal & Material used in seal	LITE					2
Did any strata contain unusable wa				-7-5	- 1, Te	4-11
Type of water? Dept Method of sealing strata off				115	Sec. 3	-11-11-
(7) PIIMP		W	10	1	7 1301	
(7) PUMP: Manufacturer's Name		***************************************		17 FEB O	•	2001
(8) WATER LEVELS: Land-surface el shous mans se					2.5	111-
(8) WATER LEVELS: above mean set	a level 45,	2,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		DEPIG IN E		18/45/97
Artesian pressurelbs. per square	inch Date			3.3		
Artesian water is controlled by	(Cap, valve, etc.)					
(9) WELL TESTS: Drawdown is am	ount water level is					
Towered below st	tatic level y whom?	Work started		Completed1	2-23-	.869
Yield: gal./min. with ft. draw	down after hrs.	WELL DRILL	ER'S STATEM	IENT:		
<u>**</u>	· · · · ·	This well was	s drilled under m	y jurisdiction a	nd this	report is
Recovery data (time taken as zero when pump		wife to the pest	of my knowledg	e anu Denen.		
measured from well top to water level) Time Water Level Time Water Level	Time Water Level	NAMEDAHLM	AN PUMP &	WELL DRIL	LING,	INC.
			Person. firm, or cor		ype or pr 9823	
		Address DUX 4	ZZ, Dullin	Gron, MA.		
Pate of test		(Simes)	la. St	. 6 =		
gal/min. with 🗸 🗲 ft. dra	~ 1	[Signed]	A STATE OF THE PARTY OF THE PAR	vell Driller)	••••••	**********
Z gpm. Date Was a chemical ana		License No. 062	23	Date 12-23	-86	10
The state of the s	7			Duve.sammanin		. 10

F 0 0 050 1 20

WATER WELL REPORT

Application No.

	WASHINGTON Permit No
(1) OWNER: Name Les Bridges Mail:	3417 36th W., Seattle 98199 Address
(2) LOCATION OF WELL: County Skagit	- 14 Sec 28 T 35 N R 9 E WI
Bearing and distance from section or subdivision corner $\sqrt{Rac} + 17$	
(3) PROPOSED USE: Domestic Tindustrial Municipal	(10) WELL LOG:
Irrigation Test Well Other	Formation: Describe by color, character, size of material and structure, are show thickness of aquifers and the kind and nature of the material in east stratum penetrated, with at least one entry for each change of formatio
(4) TYPE OF WORK: Owner's number of well (if more than one)	MATERIAL FROM TO
New well Method: Dug 🗆 Bored 🗆	Sand 0 10
Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary 🗗 Jetted ☐	Clay & Gravel 10 35
(E) DIMENGIONG	Water & Gravel 35 40
(5) DIMENSIONS: Diameter of well of inches. Drilled 4D ft. Depth of completed well ft.	
(6) CONSTRUCTION DETAILS:	
Casing installed: 6 "Diam. from 0 ft. to 40 ft.	
Threaded ft. to ft.	
Welded ft. to ft.	
Perforations: Yes No No	
Type of perforator used	
SIZE of perforations	
perforations from ft. to ft.	
perforations from ft. to ft.	
Screens: Yes No No	
Manufacturer's Name	
Type Model No	
Diam. Slot size from ft, to ft.	
Gravel packed: Yes No No Size of gravel:	
Gravel placed from ft. to ft.	
Surface seal: Yes No D To what depth? 18 ft.	
Did any strata contain unusable water? Yes No	
Type of water? Depth of strata	$N_{O_{i}}$
Method of sealing strata off	Con Z
(7) PUMP: Manufacturer's Name	0, 10,
Type:	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
(8) WATER LEVELS: Land-surface elevation above mean sea level	
Static level 30 ft. below top of well Date 7-3/-79	
Artesian pressure	
Artesian water is controlled by(Cap, valve, etc.)	
(9) WELL TESTS: Drawdown is amount water level is lowered below static level	[11] 11 [11] [11] [11] [11]
Was a pump test made? Yes No 1 If yes, by whom?	Work started July 31 19 Completed July 31 19 79
rield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:
<u> </u>	This well was drilled under my jurisdiction and this report is
Recovery data (time taken as zero when pump turned off) (water level	true to the best of my knowledge and belief.
measured from well top to water level Time Water Level Time Water Level Time Water Level	NAME DAHLMAN PUMP & DRILLING, INC. (Person, firm, or corporation) (Type or print)
	Address Burlington 98233
Date of test	[Signed] L Q Luson
Bailer test 15 gal/min with 19 ft. drawdown after hrs. Artesian flow g.p.m. Date 7-21-79	(Well Driller)
Temperature of water	License No

WATER WELL REPORT

STATE OF WASHINGTON

	ctete, 982	מככ
45	T.35N, R.2	E
size of mi and natur try for e	aterial and struct e of the materic ach change of f	cture, al in e ormat
	FROM	TO
	FROM	10
	0 10	10 35
	0	10 35 40
	0 10	10 35 40
	0 10	10 35 40

The state of the s	A
(1) OWNER: Name Lester B. Thistle	031 Raymond Bellingham, 98225 address_Old Steelhead Tracts Concrete, 98237
(2) LOCATION OF WELL: County Skagit	
Bearing and distance from section or subdivision corner 15 19	Steelhood Tructs
(2) PROPOSED LISE.	(10) WELL LOG:
(3) PROPOSED USE: Domestic V Industrial Municipal Intrigation Test Well Other	
Irrigation Test Well Other	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
(4) TYPE OF WORK: Owner's number of well (if more than one)	stratum penetrated, with at least one entry for each change of formation MATERIAL FROM TO
New well Method: Dug 🗍 Bored 🗍	
Deepened Cable Driven	Sand 0 10
Reconditioned Rotary Jetted	Clay and gravel 10 35 Water and gravel 35 40
(5) DIMENSIONS: Diameter of well inches.	Water and gravel 35 40
Drilled 40 ft. Depth of completed well 40 ft.	
(6) CONSTRUCTION DETAILS:	
Casing installed: "Diam. from	
Threaded	
Perforations: Yes 🗆 No 📉	
Type of perforator used 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 Yo Size of gravel:	
Gravel placed fromft. toft.	RECEIVEL!
Surface seal: Yes No D To what depth?	The transfer of the transfer o
Material used in seal Coment	1879
Did any strata contain unusable water? Yes \(\) No \(\)	100
Type of water? Depth of strata	1 51
Method of sealing strata off	64 CH (1983)
(7) PUMP: Manufacturer's Name	
Туре: НР	
(8) WATER LEVELS. Land-surface elevation	
above mean sea levelft.	
Static levelft. below top of well Date	
Artesian water is controlled by	l
(Cap, valve, etc.)	
(9) WELL TESTS: Drawdown is amount water level is lowered below static level	
Was a pump test made? Yes No x yes, by whom?	Work started July 31, 19.79. Completed July 31, 19.79
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:
	This well was drilled under my jurisdiction and this report is
<u> </u>	true to the best of my knowledge and belief.
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	NAME DAHLMAN PUMP AND DRILLING
	(Person, firm, or corporation) (Type or print)
	Address P.O. Box 422 Burlington, Wa. 98233
	10001
Date of test	[Signed] Charge
Bailer test. / gal/min with / 3 ft. drawdown after hrs. Artesian flow gpm. Date / gpm.	(Well Driller)
Artesian flow	License No. 0222 Date Aug. 7, 19.79
	Date Aug

WATER WELL REPORT

Ap	plication	No.	

	Permit No	
(1) OWNER: Name Walter Mangini Mail: 1231	Madison Way Alderwood Manor, 98036	
(2) LOCATION OF WELL: County	Skaģit	E 9E
Bearing and distance from section or subdivision corner Stagit St.	eelhead Tructs # 76 + 77	JN., R.Z.—W.
(3) PROPOSED USE: Domestic Industrial Municipal Industrial Industr	(10) WELL LOG:	
Irrigation Test Well Other	Formation: Describe by color, character, size of material show thickness of aquifers and the kind and nature of t	the meterial in ear
(4) TYPE OF WORK: Owner's number of well (if more than one)	stratum penetrated, with at least one entry for each ch	
New well Method: Dug 🛛 Bored 🗆	A CONTRACTOR OF THE PARTY OF TH	FROM TO
Deepened	Sand	0 10
Reconditioned Rotary Jetted	Clay and gravel	10 35
(5) DIMENSIONS: Diameter of well inches.	Water and gravel	35 40
Drilled	-	
(A) CONCERNIONION DEMAN C.		
(6) CONSTRUCTION DETAILS:		
Casing installed: 6" Diam. from 0 ft. to 40 ft.		
Threaded Diam. from ft. to ft.		
Welded 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		
Screens: Yes D No P		
Manufacturer's Name		
Type Model No Diam, Slot size from ft, to ft.		
Diam. Slot size from ft. to ft.		
Gravel packed: Yes No No Size of gravel:		
Gravel placed fromft. toft.		
Surface seal: Yes No D To what depth? 18 ft. Material used in seal Center.		
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:HP		
(O) YEAR THE A TRAINING . I and surface claustics		
(8) WATER LEVELS: Land-surface elevation above mean sea level		6
Static level 22 ft. below top of well Date 8-1-79	D 01	
Artesian pressurelbs. per square inch Date		7 .
(Cap, valve, etc.)		10
(9) WELL TESTS: Drawdown is amount water level is		0
Was a pump test made? Yes No lif yes, by whom?	Work started Aug. 1979 Completed Avg	5. 1 , 19 7 9
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:	•
" " " " " " " " " " " " " " " " " " "		1 41 1-
	This well was drilled under my jurisdiction as true to the best of my knowledge and belief.	na this report i
Recovery data (time taken as zero when pump turned off) (water level	Service Sample Report Service	
measured from well top to water level) Time Water Level Time Water Level Time Water Level	NAME DAHLMAN PUMP AND DRILLING	
Time water Level		ype or print)
	Address P.O. Box 422 Burlington, 982	33
	1000	<i>y.y.</i>
Date of test, 5-1-79	[Signed] R. C. Jerhusan	
Bailer test 5 gal/min. with 10 tt. drawdown after hrs.	(Well Driller)	***************************************
Artesian flow	License No. 0222 Date Aug. 2	2 7.070
remperature of water Was a chemical analysis made? Yes 🗋 No 🏌	License No. 0222 Date Aug. 2	£±7/719
,	n = 1	

File Original and First Copy with	i
Department of Ecology	١
Second Copy - Owner's Copy	
Third Copy - Driller's Copy	

WATER WELL REPORT

5 /	09E-28 \$ C	1
	Application No.	

STATE OF WASHINGTON Permit No. (1) OWNER: Name Randy Riggles Address 1061 Evergreen Hill Lane Concrete Wa. 9823 (2) LOCATION OF WELL: County..... Skagit - NW SE 1 Sec 28 T 35 N R 9 WM Bearing and distance from section or subdivision corner (10) WELL LOG: (3) PROPOSED USE: Domestic Municipal 🗆 Municipal 🗆 Irrigation | Test Well | Other 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. (4) TYPE OF WORK: Owner's number of well (if more than one).... MATERIAL FROM New well E Method: Dug Bored | Dirty Sand & Gravel Ω 100 Deepened Cable Driven 🛘 Jetted [Water & Gravel Reconditioned [Rotary 110 (5) DIMENSIONS: Diameter of well inches. Drilled 110 ft. Depth of completed well 110 ft. (6) CONSTRUCTION DETAILS: Casing installed: 6 " Diam. from 6t. to 110 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 P 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 D To what depth? 18

Material used in seal Bentonite Did any strata contain unusable water? Yes □ Type of water?..... Depth of strata...... Method of sealing strata off..... (7) PUMP: Manufacturer's Name.... (8) WATER LEVELS: Land-surface elevation above mean sea level.... AUG 1 4 1985 Static level 82 ft. below top of well Dat 72-85 DEPARTMENT OF ECOLOGY Artesian water is controlled by..... (Cap, valve, etc.) NORTHWEST REGION Drawdown is amount water level is lowered below static level (9) WELL TESTS: 7-2-19.85. Completed 7-2-Work started..... 19.85 Was a pump test made? Yes [] No PIf yes, by whom?..... WELL DRILLER'S STATEMENT: ft. drawdown after Yield: gal./min. with hrs. ,, This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) NAME DAHLMAN PUMP & WELL DRILLING INC.
(Person. firm, or corporation) (Type or print) Water Level | Time | Water Level | Time Water Level Address P.O. Box 422 Burlington Wa. 98233/ Date of test R Bailer test 30 GP fal /min with 15 ft. drawdown after hrs. Artesian flow......g.p.m. Date

WATER WELL REPORT

Application No.

Permit 1	No.	 10000	

STATE OF WASHINGTON

126 W. Miller, Concrete, WA 98237 Mail: (1) OWNER: Name Jack Albrecht Address Sec. 28 T. 35 N. R. 9 W.M. Gov. Lot 4 14 Skagit (2) LOCATION OF WELL: County.... NEW SWE Bearing and distance from section or subdivision corner (10) WELL LOG: Domestic 🗖 Industrial 🗌 Municipal 🗋 (3) PROPOSED USE: 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. Irrigation [Test Well [Other П Owner's number of well (if more than one) (4) TYPE OF WORK: MATERIAL Bored Method: Dug 25 New well Ø 0 Sand Driven 6 Cable [Deepened 25 105 Gravel and Sand Jetted 🔲 Rotary M Reconditioned [105 115 Blue clay 115 125 (5) DIMENSIONS: inches. Diameter of well Brown clay Drilled 260 ft. Depth of completed well 260 ft. 145 Blue clay 170 240 Gravel and Clay (6) CONSTRUCTION DETAILS: 240 260 Water and Gravelmin Casing installed: 6 " Diam. from 6 ft. to 240 ft. ft. to ft. " Diam. from ft. to ft. Welded | 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: ____ ft. to ft. Gravel placed from To what depth? Surface seal: yes No No To what de Material used in seal De nonte Did any strata contain unusable water? Yes | Type of water?..... Depth of strata..... Method of sealing strata off (7) PUMP: Manufacturer's Name - GREZZI Type: SUBMICES I BLE HP Land-surface elevation (8) WATER LEVELS: above mean sea level..... Static level 210 ft. below top of well Date 11-16-78 Artesian pressurelbs. per square inch Date..... Artesian water is controlled by..... (Cap, valve, etc.) Drawdown is amount water level is lowered below static level (9) WELL TESTS: Work started Ov. 13 19 78 Completed Nov. 16 19 78 Was a pump test made? Yes No V If yes, by whom?... WELL DRILLER'S STATEMENT: ft. drawdown after hrs. gal./min. with Yield: ** This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. ** Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) NAME Dahlman Pump and Dtilling Water Level | Time Water Level (Type or print) Water Level | Time (Person, firm, or corporation) Box 422 Burlington, Washington 98233 [Signed]..... Date of test Bailer ter: gal/min. with 30 ft. drawdown after hrs. (Well Driller) Artesia g.p.m. Date License No. 0222 Date Nov. 21 , 19.78

WATER WELL REPORT

STATE OF WASHINGTON

•		
Application	No.	
Permit No.		

Mail: F	OBox 622 Concrete 98237	10
(1) OWNER: Name Steve Hylen	Address	
(2) LOCATION OF WELL: County Skagit	Ptn. Gv. Lt. 4 sec 28	т. 35 n., r. 09 w.m.
Bearing and distance from section or subdivision corner	NE Y SWY	
(3) PROPOSED USE: Domestic Q Industrial Municipal	(10) WELL LOG:	
Irrigation Test Well Other	Formation: Describe by color, character, size of ma show thickness of aquifers and the kind and nature stratum penetrated, with at least one entry for ea	terial and structure, and of the material in each change of formation.
(4) TYPE OF WORK: Owner's number of well (if more than one)	MATERIAL	FROM TO
New well [] Method: Dug	Birty sand and gravel	0 15
Reconditioned [Rotary [Jetted [Silty sand	15 42
(5) DIMENSIONS: Diameter of well 6 inches	Brown clay and gravel	42 102
(5) DIMENSIONS: Diameter of well inches. Drilled 140 ft. Depth of completed well 140 ft.	- Gravel and water	102 140
(6) CONSTRUCTION DETAILS:		
Casing installed: 6 " Diam from 0 ft. to 140 ft.		·
Threaded Diam. from ft. to ft.		
Welded ft. to ft.		
Perforations: Yes No		
Type of perforation used		
perforations from ft. to ft.		
perforations from ft. to ft.		
perforations from ft. to ft.		
Screens: Yes No I		
Manufacturer's Name Model No		
Diam. Slot size from ft. to ft. to ft.		
Diam. Slot size from ft. to ft.		
Gravel packed: Yes No Q Size of gravel:		
Gravel placed from ft. to ft.		
Surface seal: Yes No To what depth? ft.		
Material used in seal 2000.07 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	2	
(8) WATER LEVELS: Land-surface elevation above mean sea level		
Static level 83 = ft. below top of well Date 3-21-50		
Artesian pressure		
Artesian water is controlled by (Cap, valve, etc.)		
(9) WELL TESTS: Drawdown is amount water level is lowered below static level		2 2 20
Was a pump test made? Yes 🗍 No 🍞 If yes, by whom?	Work started March 21 19 80 Completed	March 21 19.80
Yield: gal./min. with ft. drawdown after hrs.	WELL DRILLER'S STATEMENT:	
	This well was drilled under my jurisdiction true to the best of my knowledge and believe	
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	DAITMAN TORCH AND DOCKS	
Time Water Level Time Water Level Time Water Level	NAMBAHIMAN PUMP AND DRILLING (Person, firm, or corporation)	(Type or print)
	Address P.O.Box 422 Burlington, 9	
	Address 1.0.Dox 122 Dulling toll, 9))
Date of test	[Signed] The Loty on	
Bailer test Sc gal/min with fi drawdown after hrs.	[Signed] (Well Driller)	•••••
Artesian flow	License No0222 Date Mi	arch 25 19 80
analysis mader ies No	License NoUZZZ Date Pi	MAN AL J, 19 00

WATER WELL REPORT

	′ /		ت	-	v
lication No	,				

Third Copy — Driller's Copy	STATE OF W	ASHINGTON	Per	mit No	***************************************
(1) OWNER: Name James Fratello		Address Route 1,	Box 237, C	oncrete 982	237
(2) LOCATION OF WELL: County Snehom	leh Co. 5	KAGIT _ S	W SW 14 Sec 2	8 _T 35 _{N R}) ww
Bearing and distance from section or subdivision corner N	330' ofLo	t 6 W of Road			
(3) PROPOSED USE: Domestic & Industrial		(10) WELL LOG:			
Irrigation [] Test Well [Other 🗆	Formation: Describe by show thickness of aquife stratum penetrated, with	color, character, size of	of material and structure of the material	ture, and il in each
(4) TYPE OF WORK: Owner's number of well (if more than one)			ATERIAL	FROM	TO
New well 😫 Method: Dug	□ Bored □	Topsoil		0	1
Deepened ☐ Cable Reconditioned ☐ Rotary		Dirty Sand	- Gravel	1	22
		Rocks		22	211
(5) DIMENSIONS: Diameter of well	/	Sand & Grave		24	28_
Drilledft. Depth of completed well	It.	Clay & Grave		28	<u>-13</u>
(6) CONSTRUCTION DETAILS:		_Clean Sand	' Water	43	56_
Casing installed: " Diam. from ft					
Threaded Diam. from ft					
Welded [] "Diam. from ft	. to ft.				
Perforations: Yes 🗆 No 🖫					
Type of perforator used					
SIZE of perforations in. by perforations from ft. to		·			
perforations from ft. to	ft.				
perforations from ft. to	ft.	-			
Screens: Yes No No No					
Manufacturer's Name					
Type Model No. Diam. Slot size from ft	to ft				
Diam. Slot size from from ft					
Gravel packed: Yes No & Size of gravel:					
Gravel placed from ft. to ft. to					
Surface seal: Yes V No D To what depth? . Material used in seal					
Did any strata contain unusable water? Ye	es 🗆 No 🗘				
Type of water? Depth of strata Method of sealing strata off					
(7) PUMP: Manufacturer's Name					
	<u> </u>	<u> </u>			
(8) WATER LEVELS: Land-surface elevation above mean sea level					
Static levelft. below top of well Date	•	•			
Artesian pressure					
(Cap, val	ve, etc.)				
(9) WELL TESTS: Drawdown is amount water lowered below static level	r level is	Work started 7_12	76 10 Compl	1 7 16 7/	, 10
Was a pump test made? Yes No If yes, by whom?				€	J., 19
Yield: gal./min. with ft. drawdown after	r hrs.	WELL DRILLER'S	S STATEMENT:		
, , , , , , , , , , , , , , , , , , ,		This well was dril true to the best of n	lled under my juris		report is
Recovery data (time taken as zero when pump turned of				×	
measured from well top to water level)	Water Level	TALLET	PIMP & DRI		•
Time Water Level Time Water Level Time	Water Level		n, firm, or corporation		int)
		Address Dur	lington 982	33	
		An-	- 0		
Date of test		[Signed]	tin on	112-2	
Bailer test AL gal/min with L ft. drawdown aft Artesian flow g.p.m. Date		· 2/	Well Dri	Her)	
Temperature of water		License No. 2222-0	2-71 Date	7-19-76	., 19
	(I.		W	

File Original and First Copy with Department of Ecology Second Copy — Owner's Copy Third Copy — Driller's Copy WATER WELL REPORT 19E/19/M STATE OF WASHINGTON Permit No. (1) OWNER: Name Bill Blunt Address Route 1, Concrete 98237 (2) LOCATION OF WELL: County Skagit NW, 5W, Sec 28 T35 N, R 09 WM Lot lving btw Co Rd & Skagit River & Skagit Bearing and distance from section or subdivision corner Less ptn. Steelhead (10) WELL LOG: Domestic 🗖 Industrial 🗆 Municipal 🗋 (3) PROPOSED USE: 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. Irrigation | Test Well | Other Owner's number of well (if more than one).... (4) TYPE OF WORK: MATERIAL New well K Method: Dug Top soil Cable B Driven 🗆 Deepened 5 17 Sand & Gravel Rotary 🗀 Jetted 🔲 Reconditioned [Boulders 1h(5) DIMENSIONS: 49 Diameter of well inches. Dirty Sand & Gravel Drilled 60 ft. Depth of completed well Sand & Gravel (6) CONSTRUCTION DETAILS: Casing installed: 6 " Diam. from 0 ft. to 5 ____ " Diam. from _____ ft. to _____ ft. Threaded [_" Diam. from ft. to ft. Perforations: Yes □ No ☑ Type of perforator used..... _____ in. by _____ in. SIZE of perforations _____ perforations from _____ ft. to _____ ft. perforations from _____ ft. to ____ ft. perforations from _____ ft. to ____ ft. Screens: Yes | No N Manufacturer's Name..... _ 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 D To what depth? _____ Did any strata contain unusable water? Type of water?_____ Depth of strata___ Method of sealing strata off (7) PUMP: Manufacturer's Name..... Type: (8) WATER LEVELS: Land-surface elevation above mean sea level.... 40 ft. below top of well Date 10-7-75 Static level Artesian water is controlled by..... (Cap, valve, etc.) Drawdown is amount water level is lowered below static level (9) WELL TESTS: Work started 10-2-75, 19 Completed 10-7-75 Was a pump test made? Yes 🔲 No 🗍 If yes, by whom?.... WELL DRILLER'S STATEMENT: gal./min. with ft. drawdown after hrs. Yield: .. This well was drilled under my jurisdiction and this report is . .. true to the best of my knowledge and belief. ** Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) NAME DAHLMAN PUMP & DRILLING, INC. Water Level | Time Water Level | Time Water Level (Person, firm, or corporation) (Type or print) Burlington 98233 Thusen (Well Driller) Date of test Bailer test / _____gal/min, with / O_ft. drawdown after.....hrs.

License No. 223-02-7387 Date 10-13-75, 19

Artesian flow......g.p.m. Date.....

Temperature of Was a chemical analysis made? Yes [] No [].

File Original and First Cop Department of Ecology Second Copy — Owner's Co	nev.	WATER WE		Application No	7-287
	35/9E/28/M		VASHINGTON	Permit No	110 re 55 ×635 Eur
(1) OWNER: Name.		11 -5 1 1	Address 2210-22-32	19575-0	WII 9
	WELL: County S.K.			~ ~	., R./_E.W.М.
Bearing and distance from	n section or subdivision corr	ner	C-avt	LOT 5 SCC	.28
(3) PROPOSED US			(10) WELL LOG:	,	
	Irrigation [] Test W	ell Other	Formation: Describe by color,	the kind and nature of the m	aterial in each
(4) TYPE OF WOR	CWner's number of war (if more than one).	vell	stratum penetrated, with at lea		
	w well 🔀 Method: D	ug 🗌 Bored 🗎	Torgoil	. 0	10
		lotary Jetted	What anove	1 10	32
		/_	Chisa ve	3,	7 37
(5) DIMENSIONS:	Diameter of wellft. Depth of completed				
(6) CONSTRUCTIO	ON DETAILS:				
• •	l: 🔑 " Diam. from 🗁	ft. to 3 7 ft.			
Threaded [" Diam. from				
Welded 🗹		ft. to ft.			
Perforations: y	es □ No □				
Type of perfor	ator used				
	rations in. b				
pe	rforations from	ft. to ft.			
pe	rforations from	ft. to ft.			
Screens: Yes 🗆	No 💢				
	Name				
**	Slot size from		/		
	Slot size from				
Gravel packed:	Ves □ No M Size of a	ravel:			
	fromft. to		N 		
Surface seal: Ye		pth? ft.			
	in seal				
-	contain unusable water?				
**	P	strata			
	7	27/			
(7) PUMP: Manufact	7_	нр Д			
	'accommon to the second				
(8) WATER LEVEL	abovet. SCL levi	el ft.			
Artesian pressure	ft. below top of welllbs. per square inch				
	is controlled by. (Ca)				-
	0.4 85 904				
(9) WELL TESTS:	Drawdown is amount lowered below static	level	Work started / -// 1	9.7.3 Completed 4-12	7_ 1973
Was a pump test made? Y Yield: gal./min.			WELL DRILLER'S STA		
		,		der my jurisdiction and t	hic report is
• •			true to the best of my know	wledge and belief.	ms report is
Recovery data (time take measured from well to	n as zero when pump turn to water level)	ed off) (water level	Dalla	Kun DADDO	11.:-
	(i)	me Water Level	NAMEL CONTROL (Person, firm.	or corporation) (Type of	or print)
			Vaientine	tous 700	3
······			Address During	11 12-	/
Date of test	······································		reignod X. (S	of uson	
Bailer testgal/mi	in. with5ft. drawdow		[Signed]	(Well Driller)	
	Was a chemical analysis		License No. 7.23-62-7	387 Date 4/	10 フュ
and the state of water	www a chemical analysis	made. Zes 🗀 140 by.			, 18

WATER WELL REPORT

STATE OF WASHINGTON 953 W. Aultfield Rd - Oak Harbor, 98277

33/01-21 FF

(1) OWNER: Name Nottingham, Jan	Address Prop; 4779-1 Sauk Valley Rd. Con	crete WA
(2) LOCATION OF WELL: County Skagit	_ NE NE Sec 29 T35 N.	
Bearing and distance from section or subdivision corner 45	1810 Skarit Tell had Troops	
(3) PROPOSED USE: Domestic D Industrial D Municipal	(10) WELL LOG:	
Irrigation Test Well Other	Formation: Describe by color, character, size of material and s show thickness of aquifers and the kind and nature of the ma stratum penetrated, with at least one entry for each change	terial in each
(4) TYPE OF WORK: Owner's number of well (if more than one)	MATERIAL FROM	
New well Method: Dug Bored	Sand 0	25
Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary [Y] Jetted ☐	Gravel & Brown Clay 2	
	Gravel & Water 5	
Diameter of well inches.		
Drilled 60 ft. Depth of completed well 60 ft.		
(6) CONSTRUCTION DETAILS:		
Casing installed: 6" Diam from C n to 60 n		
Threaded ft. to ft.		
Welded 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.		
Sanonge		
Screens: Yes No Manufacturer's Name		
Type		-
Diam Slot size from ft. to ft.		
Diam. Slot size from ft, to ft.		
Gravel packed: Yes No Size of gravel:		
Gravel placed fromft. toft.		
Surface seal: Yes No To what depth? rt.		
Material used in seal \$2.70 cm / 2 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:HP		
(8) WATER LEVELS: Land-surface elevation		
above mean sea level		
Artesian pressure		
Artesian water is controlled by(Cap, valve, etc.)		
lowered below static level	Work started 4-9, 19.8/ Completed 4-	9 19.8/
Was a pump test made? Yes No Y If yes, by whom?	WELL DRILLER'S STATEMENT:	
" " " "	This well was drilled under my jurisdiction and th	is report is
	true to the best of my knowledge and belief.	*-bor 4 to
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	DANIMAN TORED A DUTTITUE	
Time Water Level Time Water Level Time Water Level	NAME DAHLMAN PUMP & DRILLING (Person, firm, or corporation) (Type of	neint)
	NA.	Бітіг)
	Address Box 422 Burlington, WA 98233	•••••
	20 1	
Date of test Description of t	[Signed] (Well Driller)	
artesian flow g.p.m. Date	2222 4 72 97	
Cemperature of water Was a chemical analysis made? Yes 🗆 No 🗵	License N	, 19
	F) (f.	

Second Copy — Owner's Copy	ASHINGTON Permit No	221
(1) OWNER: Name Journs A. CROUCH	Address 1211 - 16 the ANACOK	Tes
(2) LOCATION OF WELL: County SKAGIT	- NE 14 KE 14 Sec 29 135 N. R.9	Ćw.M.
Bearing and distance from section or subdivision corner 20	+35 Steelhard Tract	
(3) PROPOSED USE: Domestic 🖫 Industrial 🗆 Municipal 🖂	(10) WELL LOG:	
Irrigation Test Well Other	Formation: Describe by color, character, size of material and struct show thickness of aquifers and the kind and nature of the material	in each
(4) TYPE OF WORK: Owner's number of well (if more than one)	stratum penetrated, with at least one entry for each change of for MATERIAL FROM	TO
New well Method: Dug Dored	Sand Clay & Gravel DI	18
Deepened ☐ Cable 🛜 Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐	CHANOL + (104 18 3	55
	Chavel 35	37
(5) DIMENSIONS: Diameter of well inches. Drilled 76 th. Depth of completed well 36 th.		
(6) CONSTRUCTION DETAILS:		
Casing installed: 6 "Diam. from 0 ft. to 3627		
Threaded Threaded ft. to ft.		
Welded D ft. to ft.		
Perforations: Yes 🗆 No 🗗		
Type of perforator used in. by in.		
perforations from ft. to ft.		
perforations from ft. to ft		
Screens: Yes No iq		
Type Model No		
Diam. Slot size from ft. to ft. Diam. Slot size from ft. to ft.		
Gravel placed fromft. toft.		
100		
Surface seal: Yes No D To what depth?		
Did any strata contain unusable water? Yes No 🗸		
Type of water? Depth of strata		
Method of sealing strata off		
(7) PUMP: Manufacturer's Name JUCUZZI DEC.		
Type: HP		
(8) WATER LEVELS: Land-surface elevation above mean sea level		
Static level		
Artesian water is controlled by(Cap, valve, etc.)		
(9) WELL TESTS: Drawdown is amount water level is lowered below static level	Work started \$ -/4, 19 73 Completed \$ -/4	. 1973
Was a pump test made? Yes \(\) No \(\) If yes, by whom?	WELL DRILLER'S STATEMENT:	
n n n	This well was drilled under my jurisdiction and this re	eport is
<u> </u>	true to the best of my knowledge and belief.	a .
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)	NAME Dallman Yamp & Delle	ui
Time Water Level Time Water Level Time Water Level	(Person, firm, or corporation) (Type or prin	nt
	Address DURlington 78733	
	DM 257-	5556
Date of test	[Signed]	
Bailer test / gal/min. with / 2 ft. drawdown after hrs. Artesian flow g.p.m. Date	(Well Driller)	-17
Temperature of water	License No. 773-62-738 Date 5-16	19./
	— 0323 —	

APPENDIX D WATER QUALITY DATA SAUK AND GIBRALTAR LANDFILLS (February, 1990)

SAMPLING CODE/NOMENCLATURE

MONITORING WELL NUMBER	SAMPLE ID
Gibraltar MW-1	WELL #5-G
Gibraltar MW-2	WELL 1-G
Gibraltar MW-3	WELL 2-G
Gibraltar MW-4	WELL #3-G
Sauk MW-1	WELL 4-S
Sauk MW-2	WELL 3-S
Sauk MW-3	WELL 7-S
Sauk MW-4	WELL 2-S

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 03/01/90

SUBMITTED BY: Ken Willis

WORK ORDER #:

K90672

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

Inorganic Parameters

mg/L

et.	•	-	MW-46	field blank	MW-1G
Sample Name: Lab Code:			Well #3-G 672-1	Well #4-G 672-2	Well #5-G 672-3
	<u>Method</u>	MRL			
Chloride COD Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Sulfate TOC	300.0 410.1 350.3 300.0 300.0 300.0 415.1	0.2 5 0.05 0.2 0.2 0.2	41.0 8 0.14 ND ND 63.6 1.0	ND 6 ND ND ND 0.2 0.9	12.0 27 ND ND ND 102 4.3

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Analytical Report

CLIENT: Skagit County Health Dept. DATE RECEIVED: 03/01/90

SUBMITTED BY: Ken Willis

WORK ORDER #:

K90672

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

> Inorganic Parameters mg/L

			Hami	Van ter Tibbles	Mark Tibbles	Method
Sample Name: Lab Code:			Well #6-G 672-4	Well #7-G 672-5	Well #8-G 672-6_	Blank 672—MB
	<u>Method</u>	MRL				
Chloride	300.0	0.2	35.2	22.9	19.5	ND
COD	410.1	5	10	11	13	ND
Nitrogen, Ammonia	350.3	0.05	0.45	ND	0.34	ND
Nitrogen, Nitrate	300.0	0.2	ND	1.47	ND	ND
Nitrogen, Nitrite	300.0	0.2	ND	ND	ND	ND
Sulfate	300.0	0.2	13.1	26.3	7.8	ND
TOC	415.1	0.1	1.5	2.5	2.0	ND

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 03/01/90

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water WORK ORDER #: K90672

Dissolved Metals mg/L

			mw-4G	Blank	Mm-10
Sample Name: Lab Code:			Well #3-G 672-1	Well #4-G 672-2	Well #5-G 672-3
	<u>Method</u>	MRL			
Iron Manganese Zinc	200.7 200.7 200.7	0.02 0.005 0.01	0.02 0.304 ND	0.02 ND ND	0.11 7.20 0.02

ND means None Detected at or above MRL MRL means Method Reporting Limit

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

Dissolved Metals mg/L

			Humiter	Dun Tibbles	Mark
Sample Name: Lab Code:			Well #6-G 672-4	Well #7-G 672-5	Well #8-G 672-6
Hab code.	<u>Method</u>	MRL		1/1	
Iron Manganese Zinc	200.7 200.7 200.7	0.02 0.005 0.01	0.43 0.084 0.20	0.02 0.010 0.02	0.21 0.032 0.32

MRL means Method Reporting Limit

Approved by

Date 3-29-90

Analytical Report

Skagit County Health Dept. CLIENT:

DATE RECEIVED: 03/01/90

SUBMITTED BY: Ken Willis

WORK ORDER #: K90672

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

Total Metals mg/L

Sample Name: Lab Code:			MW-46 Well #3-G 672-1	Blunk Well #4-G 672-2	Mω-\6 Well #5-G _672-3_
	<u>Method</u>	MRL			
Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	206.2 200.7 200.7 200.7 239.2 245.1 270.2 200.7	0.005 0.005 0.002 0.005 0.002 0.0005 0.005	0.005 0.050 ND ND ND ND ND ND	ND ND ND ND ND ND ND	0.016 0.304 0.003 0.029 0.023 ND ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis
PROJECT: Skagit County
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 03/01/90
DATE ANALYZED: 03/02/90
WORK ORDER #: K90672

Volatile Organic Analytes EPA Method 8240 µg/L (ppb)

Sample Name: Lab Code:		Trip Blank <u>672-7</u>	Method Blank 672-MB
Compound	_MRL_		
Chloromethane	1	ND	ND
Vinyl Chloride	1	ND	ND
Bromomethane	1	ND	ND
Chloroethane	1	ND	ND
Trichlorofluoromethane	1	ND	ND
Freon 113	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	10	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
Trans 1,2-Dichloroethene	1	ND	ND
Cis 1,2-Dichloroethene	1	ND	ND
2-Butanone (MEK)	10	ND	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethylvinyl ether	10	ND	ND
Trans 1,3-Dichloropropene	1	ND	ND
2-Hexanone	10	ND	ND
4-Methyl-2-Pentanone (MIBK)	10	ND	ND
Toluene	1	ND	ND
Cis 1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	1	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

MRL means Method Reporting Limit

ND means None Detected at or above the MRL

Approved by Dave Ellowan Date 3/29/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis
PROJECT: Skagit County
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 03/01/90
DATE ANALYZED: 03/02/90
WORK ORDER #: K90672

Volatile Organic Analytes EPA Method 8240

	LPA MEUROO			•	
	μg/L (pr	ab) MW-46	Blank	MW-16	
Sample Name:		Well #3-G	Well #4-G	Well #5-G	
Iab Code:		672-1	672-2	672-3	
Compound	MRL		5		
Chloromethane	1	ND	ND	ND	
Vinyl Chloride	1	ND	ND	2.2	-
Bromomethane	1	ND	ND	ND	
Chloroethane	1	ND	ND	1.3	-
Trichlorofluoromethane	1	ND	ND	ND	
Freon 113	10	ND	ND	ND	
1,1-Dichloroethene	1	ND	ND	ND	
Acetone	10	ND	ND	ND	
Carbon Disulfide	1	ND	ND	ND	
Methylene Chloride	10	ND	ND	ND	
Trans 1,2-Dichloroethene	1	ND	ND	ND	
Cis 1,2-Dichloroethene	1	ND	ND	ND	
2-Butanone (MEK)	10	37	ND	ND	
1,1-Dichloroethane	1	ND	ND	2.4	_
Chloroform	1	ND	ND	ND	
1,1,1-Trichloroethane	1	ND	ND	ND	
Carbon Tetrachloride	1	ND	ND	ND	
Benzene	1	ND	ND	ND	
1,2-Dichloroethane	1	ND	ND	ND	
Vinyl Acetate	10	ND	ND	ND	
Trichloroethene	1	ND	ND	ND	
1,2-Dichloropropane Bromodichloromethane	1	ND	ND	ND	
	1	ND	ND	ND	
2-Chloroethylvinyl ether	10	ND	ND	ND	
Trans 1,3-Dichloropropene 2-Hexanone	1	ND	ND	ND	
4-Methyl-2-Pentanone (MIBK)	10	ND	ND	ND	
Toluene (MIDA)	10	ND	ND	ND	_
Cis 1,3-Dichloropropene	1	2.7 ND	ND ND	ND ND	
1,1,2-Trichloroethane	1	ND	ND	ND	
Tetrachloroethene	•				
Dibromochloromethane	1	ND ND	ND ND	ND	
Chlorobenzene	i	ND ND	ND	ND ND	
Ethylbenzene	i	ND	ND	ND	
Styrene	1	ND	ND	ND	
Total Xylenes	1	ND	ND	ND	
Bromoform	ī	ND	ND	ND	
1,1,2,2-Tetrachloroethane	î	ND	ND	ND	
1,3-Dichlorobenzene	ī	ND	ND	ND	
1,4-Dichlorobenzene	ī	ND	ND	ND	
1,2-Dichlorobenzene	ī	ND	ND	ND	
					

MRL means Method Reporting Limit

ND means None Detected at or above the MRL

Approved by Down Elling Date 3/29/90

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 03/01/90

SUBMITTED BY: Ken Willis PROJECT: Skagit County

DATE ANALYZED: 03/06/90 WORK ORDER #: K90672

SAMPLE DESCRIPTION: Water

Total Organic Halogens (TOX) EPA Method 9020 µg/L (ppb)

Sample Name	Lab Code	MRL	Measured Concentration
Well #3-G	672-1	5	ND
Well #4-G	672-2	5	56 -
Well #5-G	672-3	5	16 - MW-16
Well #6-G	672-4	5	ND
Well #7-G	672-5	5	9 🖚
Well #8-G	672-6	5	ND
Method Blank	672 - MB	5	ND

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Dave Elebron. Date 3/29/90

APPENDIX A LABORATORY QC RESULTS

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

QA/QC Report
Duplicate Results
Inorganic Parameters
mg/L

Sample Name: Well #3-G
Lab Code: 672-1

	<u>Method</u>	MRL	A	B	Average	<pre>% Relative Difference</pre>
Nitrogen, Ammonia	350.3	0.05	0.14	0.15	0.14	7
TOC	415.1	0.1	1.0	1.1	1.0	10

MRL means Method Reporting Limit

Approved by

Date 3-29-9

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

QA/QC Report Matrix Spike Results Inorganic Parameters mg/L

Sample Name: Well #3-G
Lab Code: 672-1

	Spike <u>Level</u>	MRL	Unspiked Sample Result	Spiked Sample Result	% Recovery
TOC	3.6	0.1	1.0	4.8	106

MRL means Method Reporting Limit

Approved by Jeff Clution Date 3-29-90

Skagit County Health Dept. CLIENT:

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

QA/QC Report Duplicate Results Total Metals mq/L

Sample Name: Well #5-G

Lab Code:

672-3

	<u>Method</u>	MRL	<u>A</u>	B	Average	<pre>% Relative <u>Difference</u></pre>
Arsenic	206.2	0.005	0.005	0.005	0.005	<1
Barium	200.7	0.005	0.304	0.300	0.302	1
Cadmium	200.7	0.002	0.003	ND	0.003	-
Chromium	200.7	0.005	0.029	0.027	0.028	7
Lead	239.2	0.002	ND	ND	ND	-
Selenium	270.2	0.005	ND	ND	ND	_
Silver	200.7	0.01	ND	ND	ND	-

ND means None Detected at or above MRL MRL means Method Reporting Limit

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis
PROJECT: Skagit County
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

QA/QC Report Matrix Spike Results Total Metals mg/L

Sample Name: Well #5-G Lab Code: 672-3MS

Element	Spike <u>Le</u> vel	MRL	Sample <u>Result</u>	Spike <u>Result</u>	% <u>Recovery</u>
Arsenic	0.04	0.005	0.005	0.041	90
Barium	2.0	0.005	0.304	2.24	97
Cadmium	0.05	0.002	0.003	0.045	84
Chromium	0.2	0.005	0.029	0.215	93
Lead	0.02	0.002	ND	0.018	90
Selenium	0.01	0.005	ND	0.009	90
Silver	0.05	0.01	ND	0.048	96

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by

Date 3-29-90

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 03/01/90 WORK ORDER #: K90672

SUBMITTED BY: Ken Willis PROJECT: Skagit County

SAMPLE DESCRIPTION: Water

QA/QC Report
Method Blank Summary
Total and Dissolved Metals
mg/L

Sample Name:			Method Blank
	<u>Method</u>	MRL	DICHE
Arsenic	206.2	0.005	ND
Barium	200.7	0.005	ND
Cadmium	200.7	0.002	ND
Chromium	200.7	0.005	ND
Iron	200.7	0.02	ND
Lead	239.2	0.002	ND
Manganese	200.7	0.005	ND
Mercury	245.1	0.0005	ND
Selenium	270.2	0.005	ND
Silver	200.7	0.01	ND
Zinc	200.7	0.01	ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by

Date

3-29-90

Skagit County Health Dept. CLIENT:

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 03/01/90
DATE ANALYZED: 03/02/90
WORK ORDER #: K90672

QA/QC Report Surrogate Recovery Summary Volatile Organic Analytes EPA Method 8240

		Percent Recovery				
Sample Name	<u> Lab Code</u>	1,2-Dichloroethane - D ₄	Toluene - D ₈	Bromofluorobenzene		
Method Blank Well #3-G Well #4-G Well #5-G Trip Blank	672-MB 672-1 672-2 672-3 672-7	107 104 108 111 110	99.5 92.5 93.0 92.0 97.1	92.1 90.6 99.2 102 104		
EPA % Acceptant	œ Criteria:	76–114	88-110	86-11 5		

Approved by Dave Elelman 1	Date 3/29/90
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Analytical Report

Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/21-23/90

WORK ORDER #: K90557

Inorganic Parameters mg/L

				parker	MW-45
Sample Name: Lab Code:			Well 15-I 557-4	Well 1-S 557-5	Well 2-S 557-6
	<u>Method</u>	MRL			
Chloride COD Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Sulfate TOC	300.0 410.1 350.3 300.0 300.0 415.1	0.2 5 0.05 0.2 0.2 0.2	16.2 12 1.34 ND ND 0.21 3.9	0.85 ND 0.07 0.83 ND 1.84 0.3	3.98 ND ND 0.53 ND 1.34 0.2

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Mila Salton Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 02/23-24/90

SUBMITTED BY: Ken Willis

WORK ORDER #: K90557

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

> Inorganic Parameters mg/L

			MW-25	mw-15	Blank
Sample Name: Lab Code:			Well 3-S 557-7	Well 4-S 557-8	Well 5-S 557-9
13	<u>Method</u>	MRL			
Chloride COD Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Sulfate TOC	300.0 410.1 350.3 300.0 300.0 415.1	0.2 5 0.05 0.2 0.2 0.2 0.2	4.64 24 0.09 ND ND 8.55 7.7	1.66 ND ND 0.55 ND 2.73 0.3	ND ND ND ND ND ND

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Mike Stelton Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

DATE RECEIVED: 02/24/90 WORK ORDER #: K90557

Inorganic Parameters mg/L

Sample Name: Lab Code:			Suskutes Well 6-s 557-10	ル ^ル っえら Well 7-S 557-11	Nell-8S
	<u>Method</u>	MRL			
Chloride COD Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Sulfate TOC	300.0 410.1 350.3 300.0 300.0 415.1	0.2 5 0.05 0.2 0.2 0.2 0.1	0.92 ND ND 0.42 ND 3.87 0.3	1.86 ND ND 0.45 ND 2.02 0.2	0.95 ND ND 0.41 ND 10.9 0.1

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Mike Skelton Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/24-27/90

WORK ORDER #: K90557

Inorganic Parameters mg/L

Sample Name: Lab Code:			Kerry 101 Well 95 _557-13	Well 1-G _557-14	Well 2-G _557-15
	Method	MRL			
Chloride COD Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Sulfate TOC	300.0 410.1 350.3 300.0 300.0 415.1	0.2 5 0.05 0.2 0.2 0.2 0.1	1.06 ND ND 0.53 ND 3.18	24.1 ND 0.14 ND 67.8	32.9 ND 0.13 ND ND ND

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Mike Sultan Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/21-23/90

WORK ORDER #: K90557

Dissolved Metals mg/L

				Parker	MW-25	
Sample Name: Lab Code:			Well 15-I	Well 1-S	Well 3-S	
nab code.	<u>Method</u>	MRL	557-4	557-5	557-7	-
Iron Manganese Zinc	200.7 200.7 200.7	0.02 0.005 0.01	14.0 2.05 ND	ND ND ND	0.03 1.19 ND	_

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Slefter Date 3/20/90

Analytical Report

Skagit County Health Dept. CLIENT:

DATE RECEIVED: 02/23-24/90

SUBMITTED BY: Ken Willis

WORK ORDER #: K90557

PROJECT: Skagit County SAMPLE DESCRIPTION: Water

> Dissolved Metals mg/L

			mu-15	Blunk	south Mtn Estates
Sample Name: Lab Code:	Method	MRL	Well 4-S 557-8	Well 5-S 557-9	Well 6-S _557-10
Iron Manganese Zinc	200.7 200.7 200.7	0.02 0.005 0.01	ND 0.029 ND	0.10 ND ND	0.07 ND 0.12

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by mile Sletton Date 3/20/90

1947 South 49th August & DM Barr 470 & W. W. W.

Analytical Report

Skagit County Health Dept.

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/24/90 WORK ORDER #:

K90557

Dissolved Metals mg/L

			MW 35	hoory	Horryonk)
Sample Name: Lab Code:	Method	MRL	Well 7-S 557-11	Well-8S _557-12	Well 9-S 557-13
Iron Manganese Zinc	200.7 200.7 200.7	0.02 0.005 0.01	ND ND ND	0.06 ND 0.30	0.16 ND 0.26

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by mile Slefton Date 3/20/90

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Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/27/90 WORK ORDER #:

K90557

Dissolved Metals mg/L

Sample Name:

Lab Code:

<u>Method</u> MRL

Iron Manganese Zinc

200.7 200.7 200.7

0.02 0.005 0.01

Well 1-G <u>557-14</u>

Well 2-G 557-15

0.02 0.147

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Sletter

Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

SUMMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/23/90 WORK ORDER #: K90557

Total Metals mg/L

			mus-4	NWI	hn
Sample Name:			Well 2-S	Well 3-S	Well 4-S
Lab Code:	Method	MRL	557-6_	<u>557-7</u>	<u>557-8</u>
Arsenic	206.2	0.005	ND	ND	ND
Barium	200.7	0.005	0.013	0.173	0.062
Cadmium	200.7	0.002	ND	ND	ND
Chromium	200.7	0.005	ND	ND	0.011
Lead	239.2	0.002	ND	ND	ND
Mercury	245.1	0.0005	ND	ND	ND
Selenium	270.2	0.005	ND	ND	ND
Silver	200.7	0.010	ND	ND	ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Skelton Date 3/20/90

4947 South 49th Attack A - BO Bott 470 - 18 - 18 to Morbinson - DOLOK - 18 - 18 - 18 - 18 - 1900 - 18 - 18 - 1907 1891 1807 1907

Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/23-27/90

WORK ORDER #: K90557

Total Metals mg/L

			Win-H	MAN	nw.1	Nw-3
Sample Name:			Well 2-S	Well 3-S	Well 4-S	Well 2-G
Lab Code:			<u> 557-9</u>	<u>557-11</u>	<u> 557-14</u>	557-14
	<u>Method</u>	MRL				
Arsenic	206.2	0.005	ND	ND	0.014	0.020 —
Barium	200.7	0.005	ND.	0.007	0.062	0.046
Cadmium	200.7	0.002	ND	ND	ND	ND
Chromium	200.7	0.005	ND	ND	ND	ND
Lead	239.2	0.002	ND	ND	ND	ND
Mercury	245.1	0.0005	ND	ND	ND	ND
Selenium	270.2	0.005	ND	ND	ND	ND
Silver	200.7	0.010	ND	ND	ND	ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Sletton Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 02/21/90

SUBMITTED BY: Ken Willis PROJECT: Skagit County

DATE ANALYZED: 03/05/90 WORK ORDER #: K90557

SAMPLE DESCRIPTION: Water

Total Organic Halogens (TOX) EPA Method 9020 µg/L (ppb)

Sample Name	<u> Lab Code</u>	MRL	Measured Concentration
Well #12-I	557-1	5	48
Well #13-I	557-2	5	18
Well #14-I	557-3	5	336
Well #15-I	557-4	5	9

MRL means Method Reporting Limit

Approved by Mike Stiften Date 3/20/90

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Analytical Report

Skagit County Health Dept. CLIENT:

DATE RECEIVED: 02/23/90

SUBMITTED BY: Ken Willis

DATE ANALYZED: 03/05/90 WORK ORDER #:

K90557

PROJECT: Skagit County

SAMPLE DESCRIPTION: Water

Total Organic Halogens (TOX) EPA Method 9020 μ g/L (ppb)

Sample Name	Sample Name <u>Lab Code</u>		Measured Concentration
Well 1-S	557 - 5	5	ND
Well 2-S	557 - 6	5	ND
Well 3-S	557 - 7	5	67 MW-2
Well 4-S	557 - 8	5	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

Approved by Chi Ellit

____Date 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 02/24/90

SUBMITTED BY: Ken Willis

DATE ANALYZED: 03/05/90

PROJECT: Skagit County

WORK ORDER #:

K90557

SAMPLE DESCRIPTION: Water

Total Organic Halogens (TOX) EPA Method 9020 μ g/L (ppb)

Sample Name	Lab Code	MRL	Measured Concentration
Well 5-S	557-9	5	ND
Well 6-S	557-10	5	ND
Well 7-S	557-11	5	ND
Well-8S	557-12	5	ND
Well-9S	557-13	5	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

Approved by Colin Elliott

____Date_ 3/20/90

Analytical Report

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/27/90

DATE ANALYZED: 03/05/90

WORK ORDER #: K90557

Total Organic Halogens (TOX) EPA Method 9020 $\mu g/L (ppb)$

Sample Name	<u> Lab Code</u>	MRL	Measured <u>Concentration</u>
Well 1-G	557 - 14	5	ND
Well 2-G	557 - 15	5	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

Approved by Colin Ellit ____Date_ 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis
PROJECT: Skagit County
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 02/23/90
DATE ANALYZED: 02/27/90
WORK ORDER #: K90557

Volatile Organic Analytes EPA Method 8240

μg/L (ppb)

MW-25 -- 15

Sample Name: Well 2-S Well 3-S Well 4-S S57-6 S57-7 S57-8		R 58	mo	$N_{I,a}$	h, .
Compound	Sample Name:				Well 4-S
Chloromethane	Lab Code:		<u> 557-6</u>	<u>557-7</u>	557-8
Vinyl Chloride 1 ND ND ND Bromomethane 1 ND ND ND Chloroethane 1 ND ND ND Trichlorofluoromethane 1 1.3 ND ND Freen 113 10 ND ND ND 1, -Dichloroethene 1 ND ND ND Acetone 10 ND ND ND ND Carbon Disulfide 1 ND ND ND ND ND Methylene Chloride 10 ND ND <td>Compound</td> <td>MRL</td> <td></td> <td></td> <td></td>	Compound	MRL			
Bromomethane	Chloromethane	1	ND	ND	ND
Chloroethane 1 ND ND ND ND Trichlorofluoromethane 1 1.3 ND	Vinyl Chloride	1	ND	ND	ND
Trichlorofluoromethane 1 1.3 ND ND Frecn 113 10 ND	Bromomethane	1	ND	ND	ND
Trichlorofluoromethane 1 1.3 ND ND Freen 113 10 ND ND ND ND 1,1-Dichloroethene 1 ND ND ND ND Acetone 10 ND ND ND ND ND Carbon Disulfide 1 ND ND ND ND ND ND Carbon Disulfide 1 ND	Chloroethane	1	ND	ND	ND
Freen 113	Trichlorofluoromethane	1	1.3	ND	
Acetone	Freon 113	10	ND	ND	ND
Carbon Disulfide 1 ND		1	ND	ND	ND
Methylene Chloride 10 ND ND ND Trans 1,2-Dichloroethene 1 ND ND ND Cis 1,2-Dichloroethene 1 ND ND ND 2-Butanone (MEK) 10 ND ND ND 1,1-Dichloroethane 1 ND ND ND 1,1-Trichloroethane 1 ND ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND ND ND ND ND ND Vinyl Acetate 1 ND ND ND Trichloroethane 1 ND ND ND Trichloropropane 1 ND ND ND Romodichloromethane 1 ND ND ND Trans 1,3-Dichloropropene 1	Acetone	10	ND	ND	
Methylene Chloride 10 ND ND ND Trans 1,2-Dichloroethene 1 ND ND ND Cis 1,2-Dichloroethene 1 ND ND ND 2-Butanone (MEK) 10 ND ND ND 1,1-Dichloroethane 1 ND ND ND 1,1-Dichloroethane 1 ND ND ND 1,1,1-Trichloroethane 1 ND ND ND 1,2-Dichloroethane 1 ND ND ND 1,2-Dichloroethane 1 ND ND ND 1,2-Dichloroethene 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND 1,2-Chloroethylvinyl ether 10 ND ND ND 1-Mexanore 1 ND ND ND	Carbon Disulfide	1	ND	ND	
Trans 1,2-Dichloroethene 1 ND ND ND Cis 1,2-Dichloroethene 1 ND 1.3 ND 2-Butanone (MEK) 10 ND ND ND 1,1-Dichloroethane 1 ND ND ND 1,1-Trichloroethane 1 ND ND ND 1,1-Trichloroethane 1 ND ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND ND Carbon Tetrachloride 1 ND ND ND ND Benzene 1 ND ND ND ND 1,2-Dichloroethane 1 ND ND ND 1,2-Dichloropropane 1 ND ND	Methylene Chloride	10	ND	ND	
Cis 1,2-Dichloroethene 1 ND 1.3 ND 2-Butanone (MEK) 10 ND ND ND 1,1-Dichloroethane 1 ND ND ND 1,1,1-Trichloroethane 1 ND ND ND 1,1,1-Trichloroethane 1 ND ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND 1,2-Dichloroethane 1 ND ND ND Vinyl Acetate 10 ND ND ND Vinyl Acetate 10 ND ND ND Trichloroethane 1 ND ND ND Trichloropropane 1 ND ND ND Bromodichloromethane 1 ND ND ND Trans 1,3-Dichloropropene 1 ND ND ND Thexanone 1 ND ND ND Toluene	Trans 1,2-Dichloroethene	1	ND	ND	
2-Butanone (MEK) 10 ND ND ND ND 1,1-Dichloroethane 1 ND	Cis 1,2-Dichloroethene	1	ND	1.3	
1,1-Dichloroethane 1 ND ND ND Chloroform 1 ND ND ND 1,1,1-Trichloroethane 1 1.4 ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND 1,2-Dichloroethane 1 ND ND ND Vinyl Acetate 10 ND ND ND Trichloroethene 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND Bromodichloromethane 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND Bromodichloromethane 1 ND ND ND Trans 1,3-Dichloropropene 1 ND ND ND 2-Hexanore 1 ND ND ND 4-Methyl-2-Pentanone (MIBK) 10 ND ND ND Toluene	2-Butanone (MEK)	10	ND	ND	
Chloroform 1 ND ND ND 1,1,1-Trichloroethane 1 1.4 ND ND Carbon Tetrachloride 1 ND ND ND Benzene 1 ND ND ND 1,2-Dichloroethane 1 ND ND ND Vinyl Acetate 10 ND ND ND Trichloroethene 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND Bromodichloromethane 1 ND ND ND 1,2-Dichloropropane 1 ND ND ND 2-Chloroethylvinyl ether 10 ND ND ND Trans 1,3-Dichloropropene 1 ND ND ND 2-Hexanone 10 ND ND ND 4-Methyl-2-Pentanone (MIBK) 10 ND ND ND Cis 1,3-Dichloropropene 1 ND ND ND 1,1,2-T	1,1-Dichloroethane	1	ND	ND	
Carbon Tetrachloride 1 ND	Chloroform	1	ND	ND	
Carbon Tetrachloride 1 ND ND ND ND ND ND ND ND 1,2-Dichloroethane 1 ND	1,1,1-Trichloroethane	1	1.4	ND	ND 👄
1,2-Dichloroethane 1 ND	Carbon Tetrachloride	1	ND	ND	
Vinyl Acetate 10 ND ND ND ND Trichloroethene 1 ND	Benzene	1	ND	ND	ND
Trichloroethene 1 ND ND ND ND 1,2-Dichloropropane 1 ND		1	ND	ND	ND
1,2-Dichloropropane 1 ND		10	. ND	ND	ND
Bromodichloromethane 1 ND ND ND ND 2-Chloroethylvinyl ether 10 ND		1	ND	ND	ND
2-Chloroethylvinyl ether 10 ND ND ND ND ND Trans 1,3-Dichloropropene 1 ND		1	ND	ND	ND
Trans 1,3-Dichloropropene 1 ND ND ND ND 2-Hexanone 10 ND		-	ND	ND	ND
2-Hexanone 10 ND ND ND ND 4-Methyl-2-Pentanone (MIBK) 10 ND			ND	ND	ND
4-Methyl-2-Pentanone (MIBK) 10 ND ND ND ND Toluene 1 ND		1	ND	ND	ND
Toluene 1 ND ND ND Cis 1,3-Dichloropropene 1 ND ND ND 1,1,2-Trichloroethane 1 ND ND ND Tetrachloroethene 1 ND ND ND Dibromochloromethane 1 ND ND ND Chlorobenzene 1 ND ND ND		10	ND	ND	ND
Cis 1,3-Dichloropropene 1 ND ND ND 1,1,2-Trichloroethane 1 ND ND ND ND Tetrachloroethene 1 ND ND ND ND Dibromochloromethane 1 ND ND ND ND Chlorobenzene 1 ND ND ND ND		10	ND	ND	ND
1,1,2-Trichloroethane1NDNDNDTetrachloroethene1NDNDNDDibromochloromethane1NDNDNDChlorobenzene1NDNDND	ACC N 7	1	ND	ND	ND
Tetrachloroethene 1 ND ND ND Dibromochloromethane 1 ND ND ND Chlorobenzene 1 ND ND ND ND ND			ND	ND	ND
Dibromochloromethane 1 ND ND ND Chlorobenzene 1 ND ND ND			ND	ND	ND
Chlorobenzene 1 ND ND ND		1	ND	ND	ND
		1	ND	ND	ND
Ethylbenzene 1 ND ND ND			ND	ND	ND
			ND	ND	ND
Styrene 1 ND ND ND	Styrene		ND	ND	ND
Total Xylenes 1 ND ND ND			ND	ND	ND
Bromoform 1 ND ND ND			ND	ND	ND
1,1,2,2-Tetrachloroethane 1 ND ND ND			ND	ND	ND
1,3-Dichlorobenzene 1 ND ND ND			ND	ND	ND
1,4-Dichlorobenzene 1 ND ND ND			ND	ND	
1,2-Dichlorobenzene 1 ND ND ND	1,2-Dichlorobenzene	1	ND	ND	ND

MRL means Method Reporting Limit

ND means None Detected at or above the MRL

Approved by Colin Ellett Date 3/20/9

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/24-24/90
DATE ANALYZED: 02/27/90
WORK ORDER #: K90557

Volatile Organic Analytes EPA Method 8240 µg/L (ppb)

MW. V

				W_{a}
Sample Name:		Well 5-S	Well 7-S	Well 1-G
Lab Code:		<u> 557-9</u>	557-11	557-14
Compound	MRL			
Chloromethane	1	ND	ND	ND
Vinyl Chloride	1	ND	ND	ND
Bromomethane	1	ND	ND	ND
Chloroethane	1	ND	ND	ND
Trichlorofluoromethane	1	ND	ND	ND
Freon 113	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	10	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
Trans 1,2-Dichloroethene	1	ND	ND	ND
Cis 1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	94
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene	1	ND	ND	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethylvinyl ether	10	ND	ND	ND
Trans 1,3-Dichloropropene	1	ND	ND	ND
2-Hexanone	10	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	10	ND	ND	ND [
Toluene	1	ND	ND	(7.8) X
Cis 1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND /
Tetrachloroethene	1	ND	ND	ND
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	ND	ND	ND
Ethylbenzene	1	ND	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

Approved by Colin Ellitt

Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County

SAMPLE DESCRIPTION: Water

DATE RECEIVED: 02/27/90 DATE ANALYZED: 02/28/90

WORK ORDER #: K90577

Volatile Organic Analytes EPA Method 8240 $\mu g/L (ppb)$

Sample Name: Lab Code:		Well 2-G 557-15	Method Blank 557-MB (4)
Compound	MRL		
Chloromethane	1	ND	ND
Vinyl Chloride	ī	ND	ND
Bromomethane	ī	ND	ND
Chloroethane	ī	ND	ND
Trichlorofluoromethane	ī	ND	ND
Freon 113	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	10	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
Trans 1,2-Dichloroethene	1	ND	ND
Cis 1,2-Dichloroethene	ī	ND	ND
2-Butanone (MEK)	10	30	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethylvinyl ether	10	ND	ND
Trans 1,3-Dichloropropene	1	ND	ND
2-Hexanone	10	ND	ND
4-Methyl-2-Pentanone (MIRK)	10	ND	ND
Toluene	1	ND	ND
Cis 1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	1	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

Skagit County Health Dept. CLIENT:

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE ANALYZED: 02/22,23,27/90

WORK ORDER #: K90557

Method Blank Summary Volatile Organic Analytes EPA Method 8240 μg/L (ppb)

		Method	Method	Method
Sample Name:		Blank	Blank	Blank
Iab Code:		<u>557-MB (1)</u>	557-MB (2)	557-MB (3)
Compound	MRL			
Chloromethane	1	ND	ND	ND
Vinyl Chloride	1	ND	ND	ND
Bromomethane	1	ND	ND	ND
Chloroethane	1	ND	ND	ND
Trichlorofluoromethane	ī	ND	ND	ND
Freon 113	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	10	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
Trans 1,2-Dichloroethene	1	ND	ND	ND
Cis 1,2-Dichloroethene	ī	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	ī	ND	ND	ND
1,1,1-Trichloroethane	ī	ND	ND	ND
Carbon Tetrachloride	ī	ND	ND	ND
Benzene	ī	ND	ND	ND
1,2-Dichloroethane	ī	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene	1	ND	ND	ND
1,2-Dichloropropane	ī	ND	ND	ND
Bromodichloromethane	ī	ND	ND	ND
2-Chloroethylvinyl ether	10	ND	ND	ND
Trans 1,3-Dichloropropene	1	ND	ND	ND
2-Hexanone	10	ND	ND	ND
4-Methyl-2-Pentanone (MIBK)	10	ND	ND	ND ND
Toluene	1	ND	ND	ND
Cis 1,3-Dichloropropene	i	ND	ND	
1,1,2-Trichloroethane	i	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND ND
Dibromochloromethane	i	ND	ND	
Chlorobenzene	1	ND	ND	ND ND
Ethylbenzene	1	ND	ND	
Styrene	ī	ND	ND	ND
1 Xylenes	1	ND ND		ND
aromoform	i		ND	ND
1,1,2,2-Tetrachloroethane		ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND
1,2-DIGHOLOBEIZEUS	1	ND	ND	ND

MRL means Method Reporting Limit ND means None Detected at or above the MRL

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/27/90 WORK ORDER #: K90557

QA/QC Report Duplicate Results Dissolved Metals mg/L

Sample Name: Well 12-I

Lab Code:

557-1

<u>Method</u>	MRL	A	<u> </u>	Average	* Relative Difference
200.7	0.02	44.5	42.3	43.4	5
200.7	0.005	4.15	3.94	4.04	5
200.7	0.01	ND	ND	ND	-
	200.7	200.7 0.02 200.7 0.005	200.7 0.02 44.5 200.7 0.005 4.15	200.7 0.02 44.5 42.3 200.7 0.005 4.15 3.94	200.7 0.02 44.5 42.3 43.4 200.7 0.005 4.15 3.94 4.04

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by mile Shelton

Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/21/90 WORK ORDER #: K90557

QA/QC Report Matrix Spike Results Dissolved Metals mg/L

Sample Name: Well 12-I Lab Code: 557-1MS

Element	Spike <u>Level</u>	MRL	Sample <u>Result</u>	Spike <u>Result</u>	Recovery
Iron	1.0	0.02	44.5	44.5	NC
Manganese	0.5	0.005	4.15	4.55	80
Zinc	0.5	0.01	ND	0.50	100

ND means None Detected at or above MRL

MRL means Method Reporting Limit

NC means Not Calculated; sample value greater than 4 times the spike level.

Approved by Mike Sletton Date 3/20/90

Skagit County Health Dept.

DATE RECEIVED: 02/21-27/90

SUBMITTED BY: Ken Willis

PROJECT: Skagit County

WORK ORDER #: K90557

SAMPLE DESCRIPTION: Water

QA/QC Report Method Blank Summary Dissolved Metals mg/L

Sample Name:			Method Blank
26	<u>Method</u>	MRL	
Iron	200.7	0.02	ND
Manganese	200.7	0.005	ND
Zinc	200.7	0.01	ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Shellon Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/26/90

WORK ORDER #: K90557

QA/QC Report Duplicate Results Total Metals mq/L

Sample Name: Well 2-S

Lab Code:

557-6

	Method	MRL	A	B	Average	Relative Difference
Arsenic	206.2	0.005	ND	ND	ND	-
Barium	200.7	0.005	0.013	0.013	0.013	<1
Cadmium	200.7	0.002	ND	ND	ND	-
Chromium	200.7	0.005	ND	ND	ND	-
Lead	239.2	0.002	ND	ND	ND	- g
Selenium	270.2	0.005	ND	ND	ND	_
Silver	200.7	0.010	ND	ND	ND	_

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by mike Shelton

Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/26/90 WORK ORDER #: K90557

QA/QC Report Matrix Spike Results Total Metals mg/L

Sample Name: Well 2-S Lab Code: 557-6MS

Element	Spike <u>Level</u>	MRL	Sample <u>Result</u>	Spike <u>Result</u>	Recovery
Arsenic	0.04	0.005	ND	0.039	98
Barium	2.0	0.005	0.013	2.18	108
Cadmium	0.05	0.002	ND	0.048	96
Chromium	0.2	0.005	ND	0.203	101
Lead	0.02	0.002	ND	0.019	95
Selenium	0.01	0.005	ND	0.010	100
Silver	0.05	0.01	ND	0.051	102

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Stellon Date 3/20/90

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 02/21-27/90
WORK ORDER #: K90557

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

QA/QC Report Method Blank Summary Total Metals mg/L

Sample Name:			Method Blank
	<u>Method</u>	MRL	
Arsenic	206.2	0.005	ND
Barium	200.7	0.005	ND
Cadmium	200.7	0.002	ND
Chronium	200.7	0.005	ND
Lead	239.2	0.002	ND
Mercury	245.1	0.0005	ND
Selenium	270.2	0.005	ND
Silver	200.7	0.01	ND

ND means None Detected at or above MRL MRL means Method Reporting Limit

Approved by Mike Shillon Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

DATE RECEIVED: 02/26/90 WORK ORDER #: K90557

QA/QC Report
Duplicate Results
Inorganic Parameters
mg/L

Sample Name: Well 1-S
Lab Code: 577-5

	<u>Method</u>	MRL	A	<u> </u>	Average	<pre>% Relative Difference</pre>
Chloride	300.0	0.2	0.8	0.8	0.8	<1
COD*	410.1	5	30	31	30	3
Nitrogen, Nitrate	300.0	0.2	0.8	0.8	0.8	<1
Nitrogen, Nitrite	300.0	0.2	ND	ND	ND	-
Sulfate	300.0	0.2	1.8	1.8	1.8	1
TOC	415.1	0.1	9.3	9.4	9.4	1

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Duplicate data on 557-1

Approved by Mike Shelton Date 3/20/90

- - ---

45.0

CLIENT: Skagit County Health Dept.

DATE RECEIVED: 02/26/90 WORK ORDER #: K90557

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water

QA/QC Report Matrix Spike Results Inorganic Parameters mg/L

Sample Name: Well 1-S
Lab Code: 557-5

	Spike <u>Level</u>	MRL	Unspiked Sample Result	Spiked Sample Result	Recovery
Chloride Nitrogen, Nitrate	3 3	0.2 0.2	0.8 0.8	3.6 3.7	93 97
Nitrogen, Nitrite	3	0.2	ND	2.9	97
Sulfate	3	0.2	1.8	4.4	87
TOC	3.6	0.1	9.3	13.2	108

ND means None Detected at or above the MRL MRL means Method Reporting Limit

Approved by Mike Stellen Date 3/20/90

CLIENT: Skagit County Health Dept. SUBMITTED BY: Ken Willis

PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/21/90

DATE ANALYZED: 02/23/90

WORK ORDER #:

k90557

QA/QC Report Surrogate Recovery Summary Volatile Organic Analytes EPA Method 8240

		Percent Recovery					
Sample Name	Lab Code	1,2-Dichloroethane - D ₄	Toluene - D ₈	Bromofluorobenzene			
Method Blank Well #14-I	557 -M B 557 - 3	105 105	102 100	101 104			
EPA % Acceptance	œ Criteria:	76-114	88-110	86-115			

Colin Ellet 3/20/90

Skagit County Health Dept. CLIENT:

DATE RECEIVED: 02/21/90

SUBMITTED BY: Ken Willis PROJECT: Skagit County

DATE ANALYZED: 02/22/90 WORK ORDER #:

k90557

SAMPLE DESCRIPTION: Water

QA/QC Report Surrogate Recovery Summary

Volatile Organic Analytes EPA Method 8240

		Percent Recovery					
Sample Name	Lab Code	1,2-Dichloroethane - D ₄	Toluene - D ₈	Bromofluorobenzene			
Method Blank Well #15-I	557 -M B 557 -4	98.7 104	98.0 98.2	98.7 108			
EPA % Acceptan	œ Criteria:	76–114	88-110	86–115			

ali Elliott Date 3/20/90 Approved by

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/23-27/90
DATE ANALYZED: 02/27/90
WORK ORDER #: k90557

QA/QC Report Surrogate Recovery Summary Volatile Organic Analytes EPA Method 8240

		Percent Recovery					
Sample Name	<u> Lab Code</u>	1,2-Dichloroethane - D ₄	Toluene - D ₈	Bromofluorobenzene			
Method Blank	557 -M B	92.3	94.3	99.7			
Well 2-S	557-6	94.1	94.4	100			
Well 3-S	557-7	86.1	93.1	103			
Well 4-S	557-8	96.5	91.4	103			
Well 5-S	557 - 9	88.3	95.2	104			
Well 7-S	557-11	93.6	92.4	106			
Well 1-G	557-14	95.3	94.9	108			
Well 4-S	557-8MS	88.7	94.4	102			
Well 4-S	557-8DMS	76.8	89.5	98.5			
EPA & Acceptant	œ Criteria:	76-114	88-110	86-115			

Approved by Colin Ellist Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/27/90
DATE ANALYZED: 02/28/90
WORK ORDER #: k90557

QA/QC Report Surrogate Recovery Summary Volatile Organic Analytes EPA Method 8240

		Percent Recovery					
Sample Name	Lab Code	1,2-Dichloroethane - D ₄	Toluene - D ₈	Bromofluorobenzene			
Method Blank Well 2-G	557-MB 557-15	93.9 83.0	96.0 96.4	97.4 99.4			
EPA & Acceptant	ce Criteria:	76-114	88-110	86-115			

Approved by Colin Elliott Date 3/20/90

CLIENT: Skagit County Health Dept.

SUBMITTED BY: Ken Willis PROJECT: Skagit County

SAMPLE DESCRIPTION: Water

DATE RECEIVED: 02/21/90

DATE ANALYZED: 02/27/90

WORK ORDER #: K90557

QA/QC Report Matrix Spike Summary Volatile Organic Analytes EPA Method 8240 $\mu g/L (ppb)$

SAMPLE NAME: Well 4-S

LAB CODE:

577-8MS/DMS

Compound	Spike <u>Level</u>	Sample Result	Spike MS	Result DMS	•	ike Recovery DMS	EPA % Acceptance <u>Criteria</u>
1,1-Dichloroethene Trichloroethene Chlorobenzene Toluene Benzene	100 100 100 100	ND ND ND ND ND	96.3 96.5 96.0 85.8 85.3	88.5 94.0 93.2 83.2 86.2	96.3 96.5 96.0 85.8 85.3	88.5 94.0 93.2 83.2 86.2	61-145 71-120 75-130 76-125 76-127

ND means None Detected

Colin Ellritt Approved by_

CLIENT: Skagit County Health Dept. SUBMITTED BY: Ken Willis

SUBMITTED BY: Ken Willis PROJECT: Skagit County SAMPLE DESCRIPTION: Water DATE RECEIVED: 02/21/90 DATE ANALYZED: 03/05/90

WORK ORDER #: K90557

QA/QC Report
Matrix Spike Summary
Total Organic Halogens
EPA Method 9020

µg/L (ppb)

		Spike	Sample	Spike	Result		ike Recovery
Sample Name	Lab Code	<u>Level</u>	Result	MS	DMS	_MS	DMS
Well 13-I	577 - 2	100	18	115	115	98	98

ND means None Detected

Approved by	Colin	Ellrott	Date	3/20/90	

Feb. / Mar. 1990

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)ell# cod	e static u	Jater elev	sampled .	temp.	1 conductivity	PH
MW-15	138 10%		\			
MW-25		3/2/90			of asse	
-17W-4S	143' %"	3/2/90	all	to top	of asse	uply cap
Mน้-35		3/2/90		*		
Mw-26	150' 1"	3/5/90	2	//	//	• •
MW36	149' 10%	3/5/90			2	
MW-1G	36834	3/5/90	- to to	7 0/ Ca	s:-	
MW-46	133'	3/5/90	AM	Margn	. 1/6	
		1,57				- 4
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					as a n	
			(2)			
	٠			A	WV W 8	530 7
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					24	

Feb., 1990

				1.			
ell#	code	static b	Jater elev	date sampled	temp.	1 conductivity	PH
6-9	1-1		2/4/90	26190	48.0	873	6.52
B-4	2-I			2/6/90	48.4	366	7.12
B-10	3 <i>-I</i>			2/7/90	47.1	291	7.49
B-11	4-I			2/7/ 90	46.4	426	7,24
B-13	6-I			2/13/90	46.8	811	6.35
	5I			3/13/70	46.4	239	7.14
6-6	7.1			2/13/90	52,0	16.19	5.96
₿-1	\$T			भाउत्र	#15	203.	7.13
B-8	9-I	*		2/14/90	39.9	854	6.82
B-2	10-1			2/14/90	47.8	1511	6.04
9-3	1/- I			2-14-90	47.8	1002	6.12
humberl	in 14st	a B		2/20/90	50.9	4610	5.99
0W-0	12-I	J.		2/20/90	48.7	465	6.42
3.5	E T			re se for	41,5	279	710
3 3	172			2-20-96	48.2	439	C, 58
IAMes varker	1-5	Sank	2:	2-21-90	44.6	47.8	6.80
1- WC		↓		2/21/9.	47.1	185	6.15
MW-25	3-5	-	75.00	2/21/90	52.2	956	6.51
MW- Is	4-5			2/21/90	46.6	151	6.57
blank	5-5			2/22/90	NA	NA	NA
mant Mm. = stats	6-5			2/22/90	44.2	142	6.82

well # MW-3s	Code 7-S	2/2490	Temp 47.8	Cond 111	9H 6.11
Berg	8-5	42490	52.3	295	7.62
young	9-5	2/22/90	46.0	163	3
MW-ZG MW-36	1-G 2-G	2/26/90	52,7 49.6	729 603	7.88
MW-4G	3-G	2/28/90	<i>5</i> 3,1	727	8.42
19W-1G		9/4" 2/28/90 - baile	d>312hrs. 54		6.61
Field blank Hamter Well		2/28/90 2/28/90	NA 62.7	NA 575	NA 8.27
Dan Tibbles	7-G	2/18/90	49.6	543	7.85
Mark Tibyles	8-6	* 2/28/90	52.9	443	8.48