STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
November 29, 1999	G2-29893		

NAME
Grays Harbor County

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 West Broadway Ste 31	Montesano	Washington	98563-3614

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #3 (Hogan's Corner Well Field)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	1000	885

QUANTITY, TYPE OF USE, PERIOD OF USE		
885 Acre-feet per year	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
New well to be located in Parcel Number 181214320000, approximately 1000 feet Noth of SR 109.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼ SW¼	14	18	2W	22	Grays Harbor

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The area to be served by the Grays Harbor County North Beach Regional Water System, which includes the coastal area extending from the City of Ocean Shores in Ocean City and Copalis Beach. RCW 90.03.386 may have the effect of revising the place of use of this water right.

If you require this publication in an alternate format, please contact Water Resources at (360) 407-6300, or TTY (for the speech or hearing impaired) 711 or 800-833-6388.

DESCRIPTION OF PROPOSED WORKS

New well to be designated as Well #3.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
October 1, 2005	January 1, 2030	January 1, 2030

REPORT

On November 29, 1999, Kevin Varness submitted four water-right applications, including the subject application, on behalf of Grays Harbor County. Each application requested a water allocation of 1,000 gallons per minute and 1,613 acre-feet per year for municipal water supply. The applications were duly accepted by the Washington Dept. of Ecology and assigned numbers G2-29891, G2-29892, G2-29893, and G2-29894. The applications were advertised on November 20 and November 27, 2003, in the Daily World of Aberdeen, WA. No protests or objections were received.

The subject application, G2-29893, originally proposed a point of withdrawal to be located within the S 1/2 of Sec 2, Township 18 North, Range 12 West.. On April 4, 2005, Grays Harbor County submitted an amendment for the subject application to change the proposed point of diversion to that of application G2-29892, in the NW ¼ of the SW ¼ of section 14, Township 18 North, Range 12 West, near well PW-1 (**Figure 1**). The changes were advertised from April 26 through June 2, 2005, in The Vidette, a weekly newspaper. No protests or objections were received.

The proposed place of use for this application is the area served by Grays Harbor County in the North Beach Planning Area, which includes the coastal area extending from the City of Ocean Shores to Copalis Beach, as described in Gibbs & Olson (2003, see references below).

Grays Harbor County owns several water rights (**Table 1**) in the Ocean City area. These are all small water systems and it is not known whether the full quantities of the water rights have been perfected.

This application was processed under a cost reimbursement agreement between Grays Harbor Country and Department of Ecology, as authorized under RCW 90.03.265 and related Washington Administrative Code. The procedures used during the processing of this application are based on RCW's 90.44.060 and 90.03.250-340, and related Washington Administrative Codes.
A State Environmental Policy Act (SEPA) checklist leading to a determination of nonsignificance was filed by Grays Harbor County on June 29, 2005.

BACKGROUND:

The following reports were reviewed for this report of examination:

Burkle, B., 1997. *Connor Creek Juvenile Salmonid Investigation.* Washington Dept. of Fish and Wildlife. Montesano, WA. Memorandum to Sue Patnude, WDFW. September 22.

Burkle, B., 2004. Email to Jean Caldwell, Caldwell & Associates. June 21.

Caldwell, J.E., 2004. *Evaluation of Fisheries Habitat Issues on Lowest Reaches of Cranberry and Connor Creeks, Grays Harbor County, Washington.* Caldwell & Associates, Technical Memorandum for Grays Harbor County/Hogan's Corner Water Right Analyses.

Caldwell, J.E. and Denman, B., 2004. *Connor Creek Field Reconnaissance – September 2004.* Caldwell & Associates, prepared for Pacific Groundwater Group and Dept. of Ecology, Olympia, WA, October 15.

CH2M Hill, 1999. *Connor Creek Hydrologic and Hydraulic Analysis.* Technical Memorandum to Grays Harbor County

Dion, N. P. and Sumioka, S. S., 1984. *Seawater Intrusion into Coastal Aquifers in Washington.* WA Dept. of Ecology, Water-Supply Bulletin 56.

Eddy, P. A., 1966. *Preliminary Investigation of the Geology and Ground-Water Resources of the Lower Chehalis Valley and Adjacent Areas, Grays Harbor County, Washington.* WA Dept. of Conservation, Water-Supply Bulletin 30.

Gibbs & Olson, Inc., 2003. *Grays Harbor County, Hogan's Corner Well No. 1, Source Approval Report.* December.

Logan, R. L., 1987. *Geologic Map of the South Half of the Shelton and south Half of the Copalis Beach Quadrangles, Washington.* WA Dept. Natural Resources, Div. of Geology and Earth Resources, Open File Report 87-9.

Rau, W. W. and McFarland, C. R., 1982. *Coastal Wells of Washington.* WA Dept. Natural Resources, Div. of Geology and Earth Resources, Report of Investigation 26.

Robinson & Noble, Inc. (1999) *Hogan's Corner Hydrogeologic Evaluation*, May.

Robinson & Noble, Inc. (2002) *Hogan's Corner Construction and Testing of Production Well 1*, April.

Robinson & Noble, Inc. (2003a) *Summary of Hydrogeologic Investigations.* Attachment to letter of Oct. 1, 2003, from Kevin Varness, Grays Harbor County, to Scott Boettcher, Dept. of Ecology.

Robinson & Noble, Inc., 2003b, *Section II Hogan's Corner Production Well 1 72-Hr Pumping Test. In* Gibbs and Olson, Inc., *Grays Harbor County, Hogan's Corner Well No. 1, Source Approval Report.* December.

Robinson, Noble & Saltbush, Inc., 2005. *Grays Harbor County Water Right Applications.* Technical Memorandum, *Analysis of Stream Impact Implications.* March.

Walters, K., 1971. *Reconnaissance of Sea-Water Intrusion along Coastal Washington, 1966-68.* WA Dept of Water Resources, Water-Supply Bulletin 32.

Geographic Setting

The revised proposed point-of-diversion for G2-29894 is located about 2,000 feet north-northeast of the village of Hogan's Corner, on the northwestern margin of Grays Harbor. Grays Harbor County installed test well TW-3 and production well PW-1 at this site.

The site lies within the watershed of Connor Creek. This low-lying area is dominated by sandy beaches, dunes, and the coastal plain west of the Olympic Mountains, with elevation rarely exceeding 20 feet. In the foothills on the eastern side of the watershed, elevations rise to less than 260 feet. Extensive marshlands extend inland along the creeks for up to two miles from the coast.

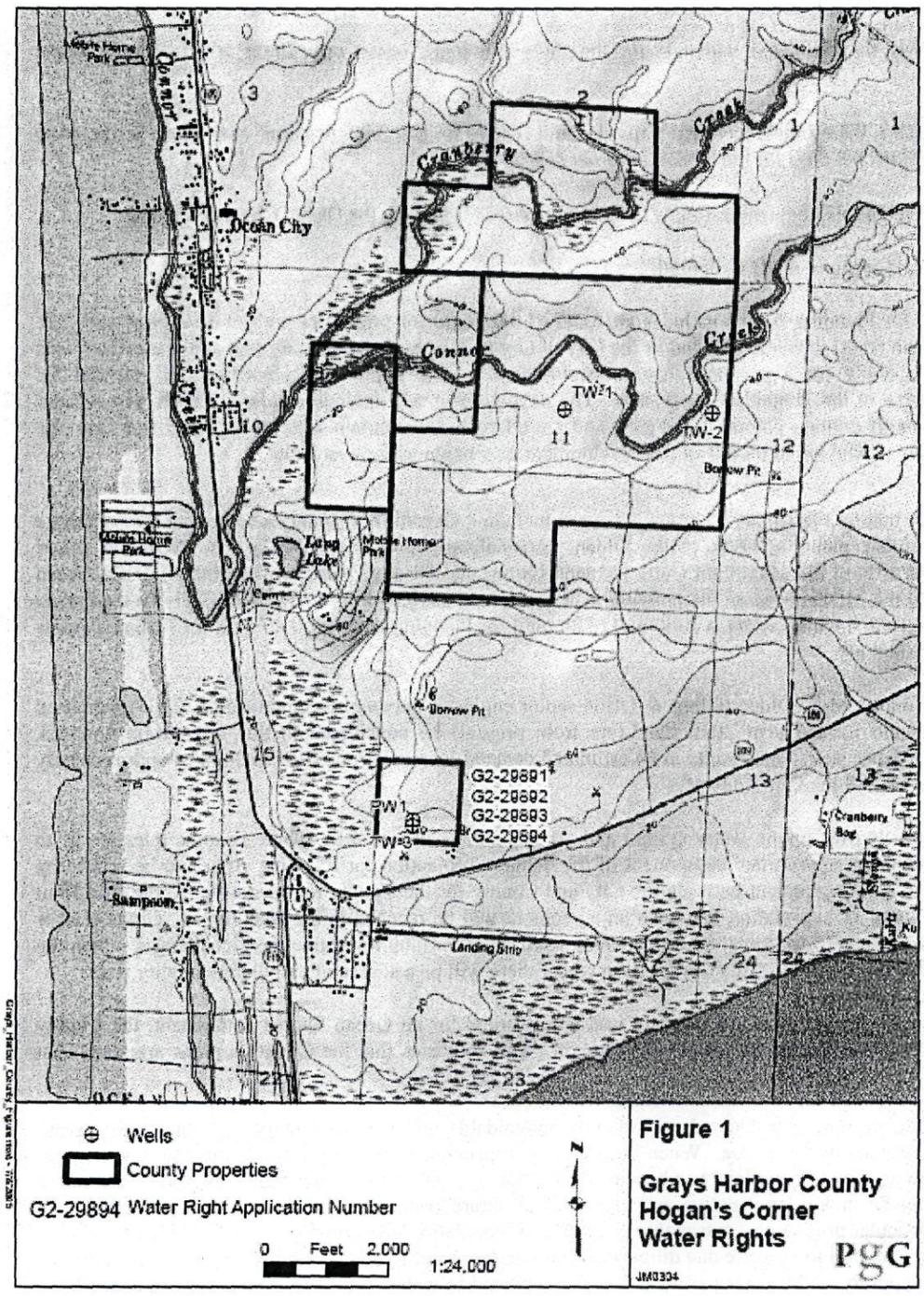

Figure 1: Grays Harbor County Hogan's Corner Water Rights (Source: Pacific Groundwater Group)

Estimated Future Water Demand

At the request of Washington Dept. of Health, Gibbs & Olson prepared a Source Approval Report for Hogan's Corner Well No. 1 (2003). This report also included water demand estimates for the North Beach area, encompassing coastal communities

from Ocean Shores to Copalis Beach along the SR 109 corridor. There are 62 water systems in the area, including 34 Group A and 26 Group B systems. The area has a host of drinking water problems, including lack of capacity, lack of adequate pressures, and poor aesthetic quality. Grays Harbor County has not yet prepared a WSP for the North Beach area because the water system for this area is only in the planning stage.

For water-supply planning purposes, Gibbs & Olson (2003) subdivided the North Beach area into three planning sub-areas:

- Planning Area I is Hogan's Corner, including City of Ocean Shores,,
- Planning Area II is Ocean City,
- Planning Area III is Copalis Beach.

The 20-year growth in water demand for the North Beach area was originally estimated in a feasibility report for Grays Harbor County in 2000, using 1999 as the base year, which formed the basis for the 2003 demand projections. Potential high demands for the Hogan's Corner sub-area associated with service to a proposed large development, as well as potential service to the City of Ocean Shores, are shown in Table 6 of that report. Estimated population for the year 2019 includes 1,129 permanent and 6,391 seasonal residents. The analysis assumed average daily demands of 100 gpd (gallons per day) and 50 gpd for permanent and seasonal population, respectively.

Gibbs and Olson's report lists the estimated demands for the three sub-areas, based on current and estimated future population for 2019.

- For Planning Area I, the estimated average daily demand (ADD) for the "high demand" scenario is predicted to be 2.28 mgd (gallons per day) for the Hogan's Corner sub-area.
- The combined average-day demand estimate for Planning Areas II and III, the Ocean City and Copalis
- Beach sub-areas, is approximately 0.40 mgd.

The "high demand" scenario for Planning Area I includes an ADD of 0.03 mgd for properties with existing uses and 2.25 mgd for potential demands from resort development and/or the City of Ocean Shores. A preliminary plat application has been submitted to Grays Harbor County for a proposed resort development. The application identifies the potential for development of up to 500 acres in the Hogan's Corner area. The development will include residential units, resort hotel accommodations, an 18-hole golf course, indoor water park and commercial and tourism support facilities and may use approximately .75 mgd or more. The initial phases of the development may begin as soon as 2006

Water demand projections not met by the Hogan's Corner sub-area, including Ocean Shores, may also be met through more intense development in the other planning areas (Mike Olden, personal communication, 2005). The ADD for resort development was estimated at 50% of the Maximum Daily Demand (Gibbs and Olson, Table 5), while the ADD for Ocean Shores was estimated to equal the MDD based on the potential that any future service to the City would likely be a constant wholesale type service. Therefore, the total ADD is 2.68 mgd (2.28 mgd for Planning Area I + 0.40 mgd for Planning Areas II and III), or approximately 3,000 afy.

On behalf of Grays Harbor County, Mike Olden (Gibbs & Olson senior engineer, personal communication, 2005) requested that the estimated water demand for the year 2030 (25 years from present) be considered in this water-right analysis, assuming a growth rate of 1.5% per year. This results in an estimated demand increase from 2019 to 2030 of approximately 18% and a total 2030 demand of 3.16 mgd, or 3,540 afy.

The City of Ocean Shores has its own public water system and corresponding service area. There is some question as to whether Ocean Shores represents an appropriate component of the demand projection for Planning Area I to be served by Grays Harbor County, as there is no agreement between the City and County for the County to serve water to the City from the proposed wells. Nor is there an expectation that such an agreement will be reached in the near future. Grays Harbor County stated that if water is not served to Ocean Shores – which itself faces various water treatment challenges – then the demand may occur north of the city in the Hogan's Corner Area where there will be a source of ample high quality water.

However, the County also acknowledged that if a quantity was not awarded for an Ocean Shores component, the County would have to reconsider demand estimates for all planning areas. This indicates that the County's plans are somewhat indefinite.

Some uncertainty in predicting the ultimate demand for water is unavoidable and it is customary for water right permit decisions to be based on an estimate of future use. When the water appropriation is finally perfected, the quantity of water that has been appropriated and applied to beneficial use becomes the actual measure of the water right. Nevertheless, future plans to use water should not be unduly speculative and estimates of future water use should be based on at least the predicted water needs of a particular project or a reasonable projection of population growth within a defined area of service. Water right permit holders are required to exercise due diligence in putting the water to beneficial use. Water not actually put to use by the County could be put to use by other parties if it is not allocated to water right permit holders with no intent to actually use the water.

I am concerned that the County's plans are not as definite as they should be. To better insure against speculation, I recommend that Grays Harbor County be required to formally consult with the City of Ocean Shores as a condition of demonstrating due diligence in putting the water to beneficial use. The objective of the consultation should be to formally determine whether the City is willing to be served water by the County. This permit will be conditioned such that the County must file a report with the Department of Ecology within three years of the issuance of this permit documenting the outcome of the consultation. The report will be required to address the following issues:

1) Whether the City and County have achieved, or are working to achieve, a formal agreement pursuant to which the City would receive water from the County.
2) The terms of the agreement, if an agreement exists.
3) Whether the City has plans to obtain water from a source other than from the County (e.g., as evidenced by the filing of its own water right applications).
4) Whether other parties have made commitments or developed firm plans to use water supplied by the Hogan's Corner well field.
5) Whether the County has any new information that would alter the projection of future water demand.

If the City and the County have not reached an agreement within 5 years of the issuance of this decision, the County shall notify Ecology whether water demand elsewhere in its service area is sufficient to compensate for the quantity that otherwise would have been served to Ocean Shores. Ecology will issue a superceding permit reducing the total Qa if it appears that the water use demand is speculative.

Hydrogeology

Robinson, Noble, & Saltbush (1999; 2002, 2003a, 2003b, 2005) conducted background research and water-supply exploration drilling of wells PW-1, TW-1, TW2, and TW3 (**Figure 1**). These reports incorporated all available information, including dozens of well logs. They identified an aquifer source with substantial yield in the area between the villages of Hogan's Corner and Ocean City, and within 1 to 2 miles of the Pacific Coast.

The shallow, but confined, aquifer consists of sediments found in the upper part of a sequence of Pleistocene deposits that is 200 to 1,000 feet thick and overlies marine volcanic and sedimentary rocks. This unit underlies a surficial aquitard unit that generally consists of fine-grained silty sand and gravel, with occasional cleaner lenses of sand and gravel. To the west, toward the Pacific Ocean, the confined aquifer transitions to an unconfined aquifer consisting of Holocene beach sand deposits.

Conceptual Model of the Hydrologic System and Groundwater/Surface-Water Interactions

Western Grays Harbor County experiences a characteristic marine climate, having short, cool, dry summers and prolonged, mild, wet winters. The mean annual precipitation at Grayland, WA, located 10 miles south of Hogan's Corner, is 74.6 inches, and is 67.9 inches at Hoquiam, WA, located ten miles inland.

Groundwater in the confined aquifer is recharged by rainfall in the higher inland areas of the watershed, and then migrates westward to discharge into creeks, wetlands, and the Pacific Ocean. The topography is relatively flat and low lying in the western 1/3 of the watershed. In the middle 1/3 of the Conner Creek watershed, where the surface soils are fine-grained, only minor groundwater discharge to surface water probably is expected. In the higher elevation, eastern 1/3 of the watershed, the coarser surface soils provide much of the baseflow to Connor and Cranberry Creeks.

Seawater Intrusion Potential

Studies by Walters (1971) and Dion and Sumioka (1984) of seawater intrusion in Grays Harbor County found no indication of seawater intrusion into wells in the Hogan's Corner area.

Deep production wells in the City of Ocean Shores, several miles to the south, have experienced increasing seawater intrusion during the last decade. These wells tap aquifers that lie several hundred feet below sea level, beneath a coastal spit that probably does not receive regional groundwater recharge, and therefore, would have less freshwater water flow toward the sea than does the area north of Hogan's Corner. Assuming a large groundwater withdrawal, approximately that at Ocean Shores, the Hogan's Corner to Copalis Beach area is less likely to experience seawater intrusion, given the high rate of underflow to the ocean. Nearby North Bay of Grays Harbor is a very shallow freshwater body (mouth of Chehalis River), with extensive tide flats due to tidal influence on the river mouth.

Two one-dimensional analytical models were used to assess the potential for seawater intrusion at the proposed point-of-diversion for this application.

First, the analytical model of Strack (1976) was used to estimate the "critical freshwater head" at which seawater intrusion would occur. Wherever groundwater elevations exceed this critical head, the "toe," or leading edge of the freshwater-saltwater transition zone (a. k. a., saltwater wedge) will not intrude further inland. The Strack method also indicates where the undisturbed toe of the freshwater/seawater interface will lie. This method is based on the density difference between fresh water and seawater. Freshwater was assumed to have a density of 1.00 gram per cubic centimeter (gm/cc). Seawater in the Pacific Ocean was assumed to have a density of 1.025 g/cc.

Westward from Hogan's Corner, the upper confined aquifer transitions to an unconfined aquifer, probably within 1,000 to 2,000 feet to the west of well PW-1. For unconfined conditions, the Strack model (**Figure 2**) indicates both the critical freshwater head and the hydraulic gradient line between Grays Harbor County's Well PW-1 and the shoreline of the sea, as mapped on the U. S. Geological Survey topographic map. The Strack method calculations indicate that the critical head at Grays Harbor County's well PW-1 is 1.6 feet above mean tidal level (mean tidal level for this part of the Pacific Coast is 0.52 feet above mean sea level for the NGVD29 reference level).

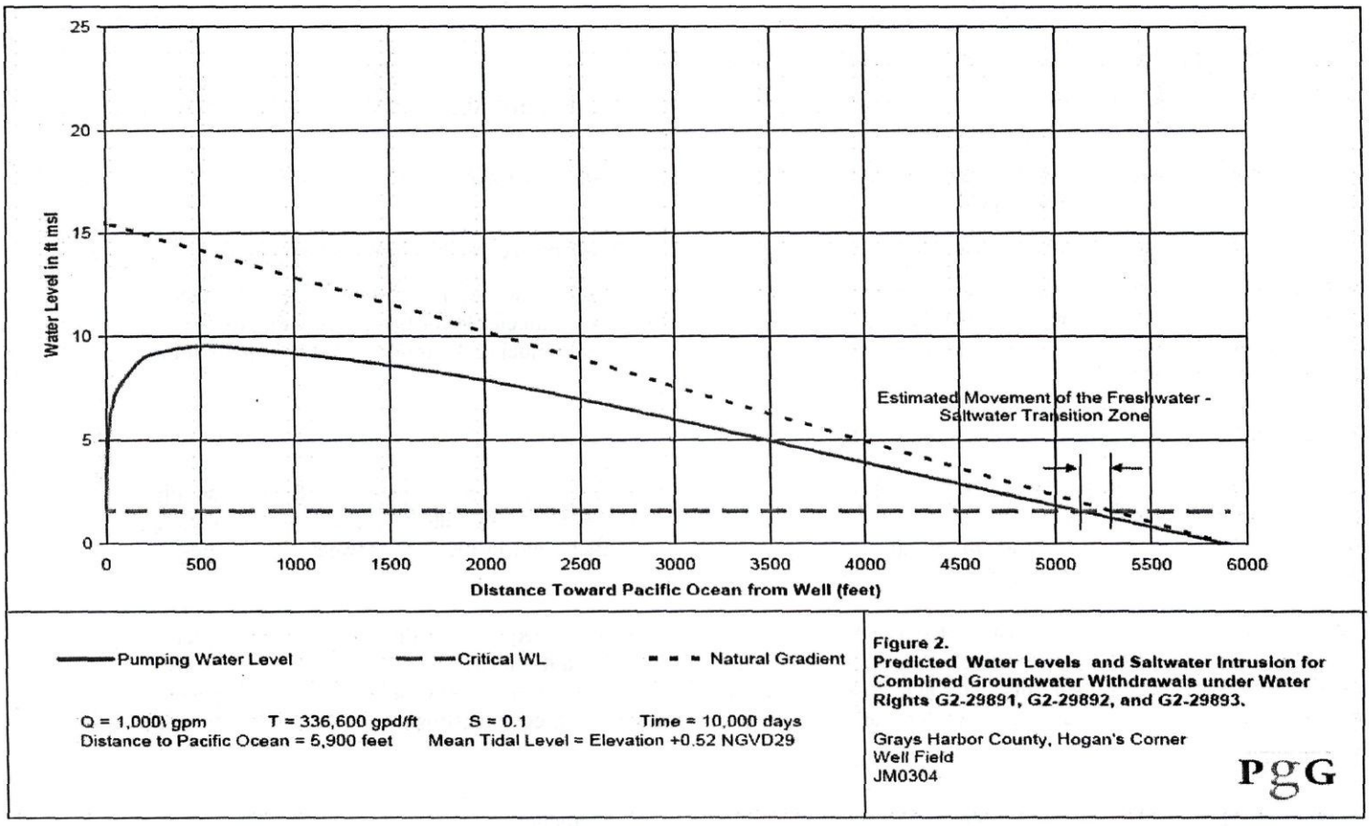

Figure 2: Predicted Water Levels and Saltwater Intrusion for Combined Groundwater Withdrawals

The shoreline of the Pacific Ocean lies about 5,900 feet from the well. Therefore, the aquifer was assumed to crop out at the shoreline of the ocean, at a distance of 5,900 feet from PW-1. The lowest measured head in the well was 15.5 feet above mean tidal level. The pertinent hydraulic gradient is represented as extending from the well to the shoreline. **Figure 2** indicates that the undisturbed hydraulic gradient line crosses the critical head line at a point about *5,300* feet from the well and about 600 feet inland of the shore; this is the estimated position of the toe of the freshwater/seawater transition zone for natural, undisturbed conditions.

Second, the drawdown cone created by pumping PW-1 at 2,193 gpm (equivalent to 3,540 afy) for 10,000 days was estimated using the Theis analytical model for transient drawdown in an unconfined aquifer, with a constant head boundary at the coastline. This worst-case pumping rate incorporates the full pumping effect of pumping sufficient water to meet the estimated demand for the North Beach area for 2030. The transmissivity of the aquifer was assumed to be 336,600 gpd/ft (or 45,000 ft^2/d), based on the County's aquifer testing (Robinson, Noble & Saltbush, 2005). Storativity of the aquifer was assumed to be 0.1, also based on published values. For the very long assumed pumping duration (10,000 days), the choice of the storativity value is nearly irrelevant, because the drawdown curve approaches a steady-state position. The drawdown profile was superimposed upon the estimated undisturbed head profile to estimate the head profile under pumping.

In **Figure 2**, the downgradient part of the drawdown cone between the well and the sea is represented with a solid red line. The predicted lowered head profile crosses the critical freshwater head (dashed horizontal line) at a distance of about *5,150* feet from PW-1 and about *750* feet inshore of the coast. Thus, the freshwater/seawater transition zone would be expected move inland about *150* feet. Given that the beach is approximately 1,000 feet wide, the proposed pumping is not likely to induce lateral seawater intrusion into existing wells.

Impairment of Senior Water Rights

There are no surface-water rights for lands within 1 mile of any of the proposed point-of-withdrawal.
There are three groundwater rights for lands in Section 15, one at Hogan's Corner and one about 0.8 mile north, but none along the coast (Robinson and Noble, 1999). There are 5 groundwater rights for multiple domestic use in Section 10, west of the confluence of Cranberry and Connor Creeks. There are four groundwater rights for multiple domestic use in Section 3, west of the Cranberry Creek watershed. Also, there is one large groundwater right for irrigation in the southeastern corner of section 35, which is just west of the northern part of the Cranberry Creek watershed. Dozens of exempt domestic wells are located within the North Beach area.

The cone-of-depression (water-level drawdown) around the proposed well was estimated by the confined, non-leaky aquifer model of Theis. Actual drawdown will probably be slightly less due to leakage from the overlying surficial aquitard. In this model, well PW-1 was pumped at 2,193 gpm (equivalent to 3,540 afy) for a long period. For the two closest neighboring wells, which lie about 5,900 feet north from well PW-1, the estimated interference drawdown would be approximately 9 feet, based on the Theis equation for a confined aquifer. The nearby constant-head boundary at the ocean will probably reduce the drawdown to less than this value. The sea-level aquifer contains sufficient available drawdown that this amount of interference drawdown will not impair the yield of the nearby wells.

Potential Capture and Impairment of Streamflow

The hydrologic and hydraulic analyses by CH2M Hill assessed only the peak flows and peak stages of Connor Creek downstream of SR109. They describe three reaches of lower Connor Creek as being 100 to 200 feet wide, during the assessment. Streamflow was not measured. The report noted that all of Connor Creek downstream of SR109 is tidally influenced, which means that it exhibits stage oscillations corresponding with the tides.

Grays Harbor County's production well PW-1 lies about 800 feet east of a large, regional wetland, about 4,500 feet south of Connor Creek (SR109 bridge), and about 2,400 feet northwest of small, unnamed creek that is tributary to Grays Harbor in the SW quarter of section 14. The testing by Robinson and Noble (2002, 2003b, 2004) has indicated that the wetland is somewhat hydraulically isolated from the pumped aquifer. When well PW-1 was pumped and the water disposed of nearby, the groundwater levels responded in a way that indicated surface loading of the aquifer, rather than actual percolation of the water down to the aquifer.

Robinson, Noble & Saltbush (2005) estimated the streamflow capture from Connor and Cranberry Creeks, upstream of their confluence, which would be caused by pumping the proposed wells. A two-dimensional analytic element model (GFLOW 2000™) was used to model the pumping effects and incorporated the confined source aquifer, leakage from the overlying aquitard, and surface-water features. The model assumed steady-state conditions, equivalent to steady pumping for long periods. The model used relatively conservative (in the sense of higher resulting capture) hydraulic assumptions.

Following calibration to known conditions, the groundwater model calculated the steady-state streamflow capture that would occur for a 1,000 to 4,000 gpm (8.9 cfs) withdrawal, in 1,000 gpm increments, from a well at the site of PW-1, near Hogan's Corner. Two thousand gpm is slightly less than the 2,193 gpm needed to produce the 3,540-afy demand. For 2,000 gpm, the model estimated that 0.08 cfs (36 gpm) would be captured from both creeks upstream of the confluence, a 13% reduction in flow compared to the model-calculated steady-state baseflow of 0.62 cfs. The estimated streamflow capture amounts to less than 2% of the pumping rate. The amount of capture was not computed for Connor Creek from the confluence to the mouth at the Pacific Ocean, because the flow in that reach is tidally affected and any surface-water capture would have insignificant effects on aquatic habitat.

Perry Lund (personal communication, Dept. of Ecology wetlands scientist, 2004) indicated that the effect of groundwater withdrawal on the large wetlands in the area are not of significant concern.

Fisheries Conditions and Potential Habitat Effects Due to Surface-Water Capture by the Proposed Wells

Coho salmon and sea-run and resident cutthroat trout are known to be present in Connor Creek at this time (Caldwell, 2004). Additional resident species include stickleback, sculpins, and Olympic mudminnow. The Olympic mudminnow is listed by the state as a "sensitive species." During 1997, Burkle (2004) documented juvenile salmonids in Connor Creek downstream (westward) of SR 109. All accessible areas in Connor and Cranberry Creeks can be assumed to be used by the species listed above.

Below SR109, the mouth of Connor Creek has been migrating northward since about 1990. Burkle (2004) stated that the creek had migrated another mile north since the 1997 investigation, and that high tides back up water upstream as far as the Surf Crest Condominiums, which are located downstream of SR109 (distance not given). He noted that rearing juvenile coho salmon had been observed as far downstream as Benner Road. Burkle also was of the opinion that "there may be high connectivity between surface and subsurface water…" along Connor Creek.

Caldwell and Denman (2004) assessed the stream channel and fish habitat condition in Connor Creek above its confluence with Cranberry Creek. Access to Cranberry Creek could not be arranged due to private land holdings and gated access roads. At a point approximately 0.4 miles upstream of the Cranberry Creek confluence, the stream channel was found to be wide (60 feet bankfull width) and relatively deep (at least 6 feet bankfull depth), with imperceptible water movement, similar to the hydraulic condition in an open water wetland. At two sites farther upstream (approximately 1.1 and 1.6 miles upstream of the confluence), the channel's bankfull width was 40 to 65 feet, and bankfull depth was 1.5 to 2 feet. These sites contained scattered patches of fine gravel and a weakly developed pool-riffle character. This part of Connor Creek provides some salmonid spawning habitat.

Streamflow measurements were not possible at any of the sites, due to low water velocities, braided channels, and instream brush. Using stream gage records from the Raft and Moclips Rivers, Caldwell and Denman estimated the combined mean August discharge to be 9.4 cfs for the two creeks (5.1 cfs Connor Creek and 4.3 cfs Cranberry Creek) at the confluence, based on comparison with the flow of the Moclips River. They also estimated the combined 7-day lowflow to range from 1.2 to 4.0 cfs (0.65-2.17 cfs in Connor Creek; 0.55-1.83 cfs in Cranberry Creek). No discharge measurements are available for Connor Creek, which makes these estimates somewhat uncertain.

The estimated streamflow capture of 0.08 cfs above the Connor Creek/Cranberry Creek confluence for a 2,000 gpm withdrawal (Robinson, Noble & Saltbush, 2005), discussed above, is less than 1% of the estimated mean August streamflow and 2 to 7% of the estimated 7-day low flow (Caldwell and Denman 2004). Given that the capture analysis is likely to be less than calculated, due to conservative assumptions of the modeling, the percentage of streamflow captured appears to be relatively small. Therefore, the effect on fish habitat is likely to be small above the Cranberry Creek confluence and negligible below the confluence due to the tidal influence.

FINDINGS AND RECOMMENDATIONS:

I find that the proposed use is beneficial because water use for municipal water supply is considered beneficial pursuant to RCW 90.54.020.

I find that water is available in the amount requested because the water is physically available and can be withdrawn without impairing other water rights.

I find that senior water rights will not be impaired because the sea-level aquifer contains sufficient available drawdown and that this amount of interference drawdown will not impair the yield of the nearby wells.

Finally, I find that the proposed groundwater withdrawal will not be detrimental to the public welfare as it will not induce saltwater intrusion and will have a barely quantifiable effect on nearby surface waters. Wetland scientists indicated there is not currently a concern over the effect of groundwater withdrawals on area wetlands. In addition, the withdrawal promotes a regional public water supply, as is encouraged by RCW 90.54.020(8).

Therefore, I recommend that this application be approved for 1,000 gpm and 885 acre-feet/year. The recommended acre footage is 25% of Grays Harbor County's estimated future demand of 3,540 acre-feet/year. The other 75% will be provided by the other three wells. Though the Qi is higher than needed to provide the annual quantity, it is needed for peak demand periods. The County's currently owned primary water rights of 96 acre-feet/year are not debited against this future demand, because the amount is small and it is possible that the quantities are fully used.

PROVISIONS:

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, prior to any new construction or alterations of a public water supply system.

The applicant is advised that the quantity of water allocated by this permit may be reduced at the time of final certification to reflect system capacity and actual usage.

A certificate of water right will not be issued until a final investigation is made.

Water use data shall be recorded weekly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units, maximum rate of diversion including units, monthly meter readings including units, peak monthly flow including units, Department of Health WFI water system number and source number(s), purpose of use, well tag number, open channel flow or pressurized diversion and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

In accordance with Chapter 173-160 WAC, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Installation and maintenance of an access port as described in Chapter 173-160 is required. An air line and gauge may be installed in addition to the access port.

The subject well has been tagged with a well identification number. This unique well number shall remain attached to the well, please reference this number when submitting data.

Permittee or certificate holder, and its successor(s) shall provide data on chloride concentrations for the well authorized by this permit or certificate with analysis performed by a state accredited laboratory. Accreditation information may be obtained from Ecology's Quality Assurance Program at (360) 895-4649. Sampling shall occur in April and August of each year, with a copy of the laboratory results for both sampling events submitted by October 15 of the same year, to the Department of Ecology, Southwest Regional Office, Olympia, Washington.

If pumping of the well authorized by this permit or certificate causes chloride concentrations to exceed 100 milligrams per liter, immediate action shall be required to prevent concentrations from increasing (such as reducing the instantaneous withdrawal rate (gpm) of the well). If corrective measures fail to prevent chloride concentrations from exceeding said level

in the future, permittee or certificate holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

The Water Quality Monitoring data shall be submitted in digital format and shall include the following elements:

1. Unique Well ID Number
2. Sampling date and time
3. Chloride concentration (mg/L)
4. Submit paper copy of laboratory report

The Water Resources Act of 1971, Chapter 90-54 RCW specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Favorable consideration of this application has been based on sufficient waters available, at least during portions of the year. However, it is pointed out to the applicant that this use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

"The holder of this permit must file a report with the Department of Ecology within three years of the issuance of this permit documenting whether Grays Harbor County has consulted with the City of Ocean Shores regarding providing water to Ocean Shores using the Hogan's Corner wellfield. The report shall address the following issues:

1) Whether the City and County have achieved, or are working to achieve, a formal agreement pursuant to which the City would receive water from the County.

2) The terms of the agreement, if an agreement exists.

3) Whether the City has plans to obtain water from a source other than from the County (e.g., as evidenced by the filing of its own water right applications).

4) Whether other parties have made commitments or developed firm plans to use water supplied by the Hogan's Corner well field.

5) Whether the County has any new information that would alter the projection of future water demand.

If the City and the County have not reached an agreement within 5 years of the issuance of this decision, the County shall notify Ecology whether water demand elsewhere in its service area is sufficient to compensate for the quantity that otherwise would have been served to Ocean Shores. Ecology will issue a superceding permit reducing the total Qa if it appears that the water demand projection is speculative."

Table 1. Grays Harbor County Water Rights in the North Beach Area.

Water Right	Status	Type	Qi (gpm)	Qa (acre-ft/yr)	Location	WRATS Owner Name	Comment
G2-73509CL	Claim		250	25	18N/12 W-10	John W. Betrozoff	Reassigned to GH County
G2-*11320C (Old #7496)	Certificate	Primary	35	56	19N/12 W-34	Fred Menath	Purchased by Grays Harbor Co.
G2-25992	Certificate	Supplemental	115	56	19N/12 W-34	Sea View Estates	Supplemental to 7496
G2-27562	Permit	Primary	200	15	18N/12 W-10	Charles R. Bigley	Purchased by Grays Harbor Co.
G2-29172	Permit	Supplemental	115	56	19N/12 W-34	Grays Harbor County	Supplemental to 7496 and G2-25992
			485	**96**			**Total Primary (assumes valid claim)**
			115	**56**			**Total Supplemental**

Report Continued

REPORTED BY: Jeffrey Illiat Date: Sept. 12, 2005

FINDINGS OF FACT AND DECISION

Upon reviewing the above report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER a permit be issued under Ground Water Application Number G2-29893, subject to existing rights and indicated provisions, to allow appropriation of public ground water for the amount and uses specified in the foregoing report.

Signed at Olympia, Washington, this 19th day of September, 2005.

Thomas Loranger

Thomas Loranger
Water Resources Section Manager
Southwest Regional Office