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CITY OF NEWPORT, WASHINGTON/ WEST BONNER WATER DISTRICT NO. 1, IDAHO

94100548

WELLHEAD PROTECTION PLAN PHASE I

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MAY, 1994

Prepared By:
WELCH, COMER & ASSOCIATES, INC.
Consulting Engineers
Coeur d'Alene, Idaho

in association with
DR. JOHN A. RILEY
Consulting Hydrogeologist
Post Falls, Idaho

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WELLHEAD PROTECTION PLAN PHASE I

Funded in Part By:
Ecology/WQFA Grant #G-9200162
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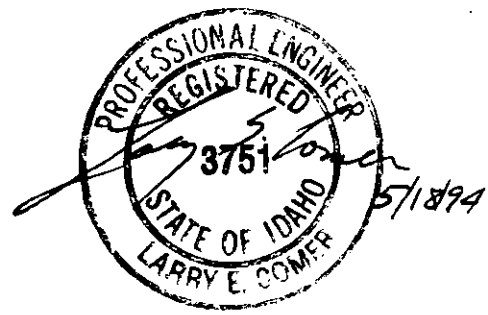

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I INTRODUCTION

I.1 Background

The City of Newport, Washington and the West Bonner Water District No. 1 in Oldtown, Idaho are served drinking water from an interconnected, interstate water supply. Most of the water serving both communities comes from the Idaho Springs located southeast of Oldtown, Idaho. A well field located on the south edge of Newport, Washington supplements the spring source production during the peak water demand periods each summer. Newport has separated its water system into high pressure and gravity feed portions. The high pressure system serves the hospital and the developments situated at higher elevations and is fed by two of the city wells.

In order to protect this inter-city, inter-state water supply, the City of Newport and West Bonner Water District entered into an intermunicipal agreement in 1992 to prepare a wellhead protection plan. Grants were received from the Washington Department of Ecology (DOE) and Idaho Division of Environmental Quality (DEQ) to assist in financing the testing and professional services required to complete the wellhead protection plan. The City of Newport and West Bonner Water District also contributed funds to match the grants for the planning project.

A Wellhead Advisory Board was formed which included elected officials, staff, regulatory agencies, and consultants representing both the Washington and Idaho communities. A listing of participants on the Advisory Board has been included in the ACKNOWLEDGEMENTS.

In January, 1993, Welch, Comer & Associates, Inc., Consulting Engineers, in association with consulting hydrogeologist, Dr. John A. Riley, were retained by the City of Newport and West Bonner Water District to perform professional services for completion of the wellhead protection plan.

I.2 Purpose and Scope

The purpose of the wellhead protection program is to prevent contamination of ground water used for drinking water supplies. This follows a pro-active truth that it is less expensive, best protects public health, and is in the public interest to prevent water supplies from being contaminated, rather than to add extensive treatment systems to water supplies after a source becomes contaminated.

In order to meet requirements of the Washington and Idaho wellhead protection plan guidelines, a wellhead protection plan must include the following components:

a) A wellhead protection area delineated for each well, well field, or spring;

b) An inventory of potential sources of ground water contamination;

c) A management plan to reduce the potential for contamination;

d) Contingency plans for alternate sources of water supply; and

e) Public participation and education during program development.

Implementation of a wellhead protection program is required for all Group A water systems in the State of Washington. In Idaho, wellhead protection plans are encouraged but not required.

I.3 Description of Water Supply System

The Idaho Springs source consists of three springs located 1 mile southeast of Oldtown, Idaho, and is sited on a plateau 150 feet in elevation above Oldtown and Newport. The springs are located on a 40 acre site owned by the West Bonner Water District. The three springs are collected by perforated pipes buried 8 feet deep to three concrete spring boxes. Water flows by gravity to a gas chlorination facility, and then to a 235,000 gallon concrete reservoir owned by the West Bonner Water District. The estimated combined production of all three springs is 450 gallons per minute. Also, a supplemental well referred to as Well A is located in Oldtown with rated production noted in the Figure I-1 below. This well is not presently connected to the distribution system.

The City of Newport owns and operates a field of 5 wells located on the south boundary of the city limits. The City of Newport activates the use of these wells in order to meet peak summer demands. The location of wells is presented on Figure 1-7. Two intakes are available for emergency use from the Pend Oreille River, although they are not now intended for use. Reservoir capacity serving Newport totals 2,200,000 gallons, and controls the pumping demanded from the city well field. The high pressure portion of the system operates independently from the reservoir levels and is connected directly to the well fields.

This intercity-interstate water supply serves approximately 1,753 people in Washington and 445 people in Idaho.

Figure I-1
NEWPORT/West Bonner Water District
WATER SUPPLY DATA

Source	Location	Depth	Capacity
Idaho Springs	Southeast of Oldtown	8 ft	450 gpm
Well A	Oldtown	160 ft	135 gpm
Well B	South of Newport	100 ft	80 gpm
Well C	South of Newport	100 ft	110 gpm
Well D	South of Newport	69 ft	180 gpm
Well E	South of Newport	90 ft	180 gpm
Well F	South of Newport	80 ft	75+ gpm

1 AQUIFER CHARACTERIZATION AND MAPPINGS

1.1 Regional Geology

The study area consists of aquifers and recharge areas surrounding the Idaho Springs and City of Newport well field. The area is located in western Bonner County, Idaho and eastern Pend Oreille County, Washington, and encompasses approximately 22 square miles.

The bedrock formations in the area consists of plutonic rocks in the upper and lower plates of the Newport fault. For the most part, in the study area, the mapped outcrops consist of exposures of Silver Point quartz monzonite. The Newport Fault is an east/west trending fault that cuts across the Pend Oreille River approximately a mile north of Newport.

The regional geology surrounding the Idaho Springs and Newport well field consists of glacial flood gravels which were deposited during the early Wisconsin period of Pleistocene age. They are related to the catastrophic flood outwashes that sped across Eastern Washington and Northern Idaho creating the Rathdrum Prairie, Spokane Aquifer as well as the scab lands southwest of Spokane. The depositional mechanism consisted of various episodes of a lobe of the glacier damming the rivers in the area and subsequently breaching. When the glacier breached and allowed the impounded water to escape, the energy of that water subsequently scoured some of the deposited sediments away and carried them down stream. As a result, a heterogeneous mixture of sands and gravels constitutes the alluvial material in the area.

The lobe of the glacier that dammed up the river, was part of the Cordilleran ice sheet. It advanced southward moving slowly from Canada into northern United States and covered much of the Rocky Mountains in Canada and parts of the mountains in Idaho. Melt waters from the glaciers formed streams that drained the lobes of the glacier, and carried large quantities of sand, gravel, silt and clay and deposited these materials in and along the lower river valleys. The deeply entrenched Spokane Valley was partially filled with these glacial materials.

1.2 Preliminary Aquifer Characterization

Aquifer characteristics as presented and discussed are based on well logs, field observations, and discussions with personnel and drillers who are familiar with the area. Field measurement of water elevations in selected wells are presented to determine general aquifer gradients.

Many more well logs were available in Idaho than in Washington. Therefore, aquifer extent and characteristics are better understood in Idaho. Figure 1-1 presents a summary of existing well logs organized by Section, Township and Range. A complete listing of existing well

logs is presented as well as copies of the well logs is presented under separate cover as Attachment "A" to this report.

1.2.1 West Bonner Aquifer

The aquifer in Idaho consists of heterogeneous mixture of sands, clays and gravels. Figure 1-2 presents the boundary of the Idaho and Newport aquifers, and probable recharge areas. The eastern and southern boundaries follow the topographic divide in the Hoodoo Mountains. The western boundary is inferred based on topographic and surface water discharges. The Pend Oreille River constitutes the northern aquifer boundary. No clays are continuous enough to protect the aquifer from contamination. The aquifer consists of these materials in a bathtub or bowl shaped configuration resting on the intrusive bedrock. The Hoodoo Mountains form the eastern edge of the West Bonner aquifer. Ground water is recharged by snow melt and rain runoff from the Hoodoo Mountains, and infiltration from undulating topography above the aquifer. Ground water discharges from a series of springs at the north end of the aquifer above the Pend Oreille River.

The eastern boundary of the aquifer recharge area is formed by the topographic divide in the Hoodoo mountains. That topographic divide also forms a portion of the southern boundary of the aquifer recharge area to the West Bonner aquifer. The remainder of the aquifer boundary probably consists of ground water divides and/or presence of lobes of the intrusive bedrock. The southern and western extent of aquifer is impossible to identify precisely due to the lack of detailed water elevations to use in delineation of the ground water divides.

A discontinuous clay layer exists in the general vicinity of Highway 41 in Sections 31 and 6, Township 56 North, Range 5 West and Township 55 North, Range 5 West, respectively. The clay layer is relatively continuous through those sections, represents the depth to which wells typically are drilled in the vicinity, and reduces the productivity of wells in that area. Wells that produce a few gallons per minute are sufficient for domestic needs are typical of this area.

Production of wells varies with depth of well and location in the aquifer. Two existing (in Section 36, Township 56 North, Range 6 West, west of Highway 41) wells have the capability of producing up to 1500 gallons per minute. These wells are the deepest wells that have been drilled in the area and penetrate over 200 feet of alluvial sediments without encountering bedrock. The wells are not being pumped to capacity at this time, because demand does not require high production.

Legend: No. – Section Number
No. – Number of Well Logs

Township 31 North, Range 45 East

6	5	4	3	2	1
7	8	9	10	11	12 1
18	17	16	15	14 3	13 3
19	20	21	22 3	23 2	24 13
30	29	28	27 9	26	25
31	32	33	34 3	35 2	36 4

T31N, R46E

6	
7	
18 4	
19 1	
30 4	
31 1	

Township 30 North, Range 45 East

6	5 1	4	3	2 5	1
7	8	9	10	11	12
18	17	16	15	14	13 1
19	20	21	22	23	24 2
30	29	28	27	26	25
31	32	33	34	35	36

T30N, R46E

6	
7	
18	
19	
30	
31 1	

T56N, R6W

1
12
13
24 4
25 6
36 6

Township 56 North, Range 5 West

6	5	4	3	2	1
7	8	9 1	10	11	12
18	17	16	15	14	13
19 8	20 2	21 3	22	23	24
30 14	29 19	28	27	26	25
31 23	32 9	33 3	34	35	36

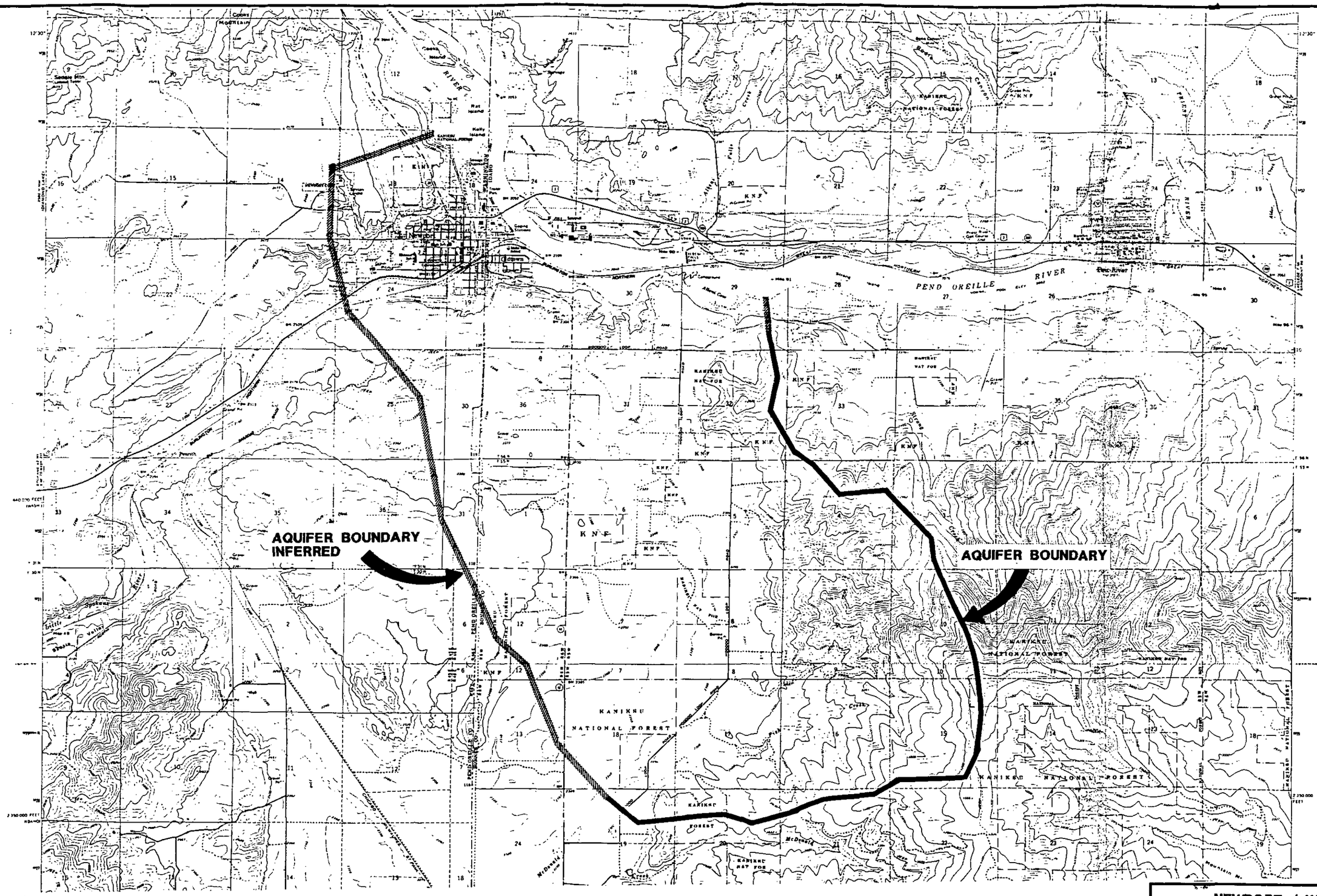
T55N, R6W

1 15
12 4
13 6
24 8
25 5
36

Township 55 North, Range 5 West

6 9	5 16	4	3	2	1
7 1	8 12	9	10	11	12
18 1	17 1	16	15	14	13
19 1	20	21	22	23	24
30 3	29	28	27	26	25
31	32	33	34	35	36

FIGURE 1-1
SUMMARY OF WELL LOGS BY SECTION



NEWPORT / WEST BONNER
WELLHEAD PROTECTION PLAN

FIGURE 1 - 2
NEWPORT / WEST BONNER
AQUIFER BOUNDARY

A lobe of the intrusive bedrock exists in the vicinity of the Idaho Hill Landfill in both Idaho and Washington. This is based on well logs in Washington and anecdotal evidence in Idaho. Well logs in Washington, Sections 30 and 31, Township 31 North, Range 46 East penetrate intrusive at depths between 139 and 249 feet below ground surface. Three wells exist at the Idaho Hill landfill. The wells were drilled approximately 25 years ago. Two wells are approximately 30 feet deep and one well is 190 feet deep. All three wells penetrate the intrusive bedrock and are reported to be dry. No well logs are on record for these wells. This information is based on conversation with Carl Pitts who drilled the wells. The existence of a lobe of intrusive bedrock can influence the direction of ground water flow. However, the precise influence is impossible to predict without more extensive information concerning the shape and extent of the intrusive, coupled with water level elevations.

1.2.2 Newport Aquifer

The Newport aquifer is less well understood than the West Bonner Aquifer. Only a few wells have been drilled in the Newport area, and many of those wells have been subsequently abandoned. Thus, only limited existing data are available to attempt to determine the Newport aquifer characteristics. Some generalizations are possible.

The alluvial aquifer in Newport consists of heterogeneous mixtures of sands, clays, and gravels similar to the deposits in Idaho. Like the West Bonner aquifer, the alluvium overlies intrusive quartz monzonite. Generally, the alluvial sediment is finer grained than what is reported in Idaho. The areal extent of the aquifer in the Newport area is probably smaller in size than that on the Idaho side.

The City of Newport has constructed five wells in a well field near the southwest corner of the city (See Figure 1-7). These wells penetrate approximately 100 feet of alluvial material before hitting bedrock intrusive. They are located at the base of a hill that rises approximately 120 feet from existing ground surface at the well field.

Recharge to the Newport well field probably comes from a combination of ground water flow from the bench south of the well field and limited recharge from the north side of Newport. The relative contribution of the two sources of recharge are impossible to quantify, based on the limited data available. The wetlands west of the Newport cemetery, unnamed on the 1986 U.S.G.S. 7 1/2 minute Newport quad map, are the head waters of the Little Spokane river. Those wetlands probably do not supply any significant recharge to the aquifer at Newport.

A bedrock ledge is reported to exist west of Newport running

essentially north/south in the vicinity of the new high school, and east of the head waters of the Little Spokane River. In some areas near the high school, the ledge exists 15 feet below ground surface. This ledge is probably the western extent of the aquifer for Newport. The southern extent of the aquifer for Newport is impossible to establish because of the lack of wells that have been drilled south of Newport.

Production at Idaho Springs has remained relatively constant at 450 gallons per minute (gpm) for many years. The ground water that is captured at the Springs does not represent the total ground water discharge of the aquifer. Many smaller springs exist that discharge an unknown quantity of ground water. Production of the wells in the Newport well field ranges from 100 to 300 gpm.

1.2.3 Field Investigations and Sampling

Field investigations of limited extent were conducted on July 12, 13, and 14, 1993. The purpose of field investigations was to establish ground elevation at selected wells, measure depth to water at those wells, and take water samples from those selected wells. Permission was obtained from the land owners prior to any work at the wells. Carl Pitts, a licensed well driller, was contracted to assist with the field work. He pulled the covers off the wells and measured the depth to static water, and assisted in obtaining samples of water at some of the wells. Figure 1-3 indicates locations of wells that were part of field investigation. Figure 1-4 presents the water elevation and quality data that were collected. The well number on Figure 1-3 is referenced on Figure 1-4 as Field Sample Number.

Depth to water represents static water level as much as possible given operational limitations. The well owners were requested to refrain from using water as much as possible before depth to water measurement occurred. However, the wells were the only source of water for the houses and some water undoubtedly was used.

The depth to water measurements in conjunction with the ground elevation at the well head were combined to establish ground water elevation at the wells. The water elevation in turn was used to attempt to establish gradient throughout the recharge area of the aquifer that supplies the Idaho Springs.

A significant downward component to the gradient exists, indicative of a ground water recharge area. A downward component of the gradient is representative of a local recharge area overlying a regional aquifer. The shallow domestic wells are in the local ground water recharge area. The two deep wells west of Highway 41 and probably the Newport well field are representative of the regional aquifer.

Rat Island
Kelly Island
KANIKSU NATIONAL FOREST
Sewage Disposal
WASHINGTON
IDAHO
Trailer Park
BM 2057
Grange Hall
Albeni Falls
K N F
Gravel Pit
CITY LAND FILL
Reservoir
Sandpit
OLD CITY LANDFILL
Newport
(BM 2155)
Hospital
PO
Substation
Gaging Stations
Sawmill
Powerplant
USMM
Mile 90
ALBENI FALLS DAM
PEND OREILLE RIVER
BM 2109
BM 2073
Campground
Albeni Cove
Mile
High Sch
City Hall
Halsead Sch
Gravel Pit
Courthouse
BM 2152
Idaho Hill School
Oldtown
BURLINGTON NORTHERN
BM 2094
NEWPORT WELLS
Gravel Pit
BM 2304
IDAHO SPRINGS
HOODOO LOOP ROAD
JEEP TRAIL
KANIKSU NAT FOR
HOODOO LOOP ROAD
KANIKSU ROAD
T 56 N
T 55 N
T 31 N
T 30 N
PEND OREILLE CO
BONNER CO
KANIKSU NATIONAL FOREST
BM 2355
SCALE 1" = 2000'
20020503-V3

LEGEND

- 5 — DEPTH TO WATER
- 1 — DEPTH TO WATER AND SAMPLED
- AQUIFER BOUNDARY
- AQUIFER BOUNDARY INFERRED

NEWPORT / WEST BONNER WELLHEAD PROTECTION PLAN

FIGURE 1 - 3
LOCATION OF WELLS UTILIZED IN FIELD INVESTIGATION

FIGURE 1-4

NEWPORT/WEST BONNER WHPA FIELD WELL SAMPLING DATA

Log #	Owner	Field Sample No. (Fig 1-3)	Well TD	Field SWL	Log SWL	Ground Elev	Water Elev Field	Nitrates (mg/L)	Specific Conductivity (micromhos per cm)
IDAHO									
129	Dalke	1	73	60.8	52	2295	2235	0.969	411
145	DeForge	2	120	87.9	85	2324	2236	< 0.005	279
148	Krell	4	57	36.8	35	2299	2262	0.386	352
	Barney	15	130	62.8	65	2287	2225		
140	Engen	16	120	64.8	80	2287	2225	0.006	276
158?	Bilbe	23	92	89.7	70	2282	2192		
161	Yates	24	77	57.4	44	2290	2233	< 0.005	266
	Dillon	25		51.1		2364	2313	5.330	292
168	Stone	26	80	63.8	68	2330	2266	1.250	389
149	Moe	27	120		90	2337		< 0.005	269
143?	Womack	28	85	49.7	61	2319	2269	0.109	261
112	Taylor	29	218	165.8	175	2428	2262	< 0.005	282
24	Shults	30	125	101	103	2429	2328		
	Roseborough		271		190	2290			
171	Albeni Dam		125		17.8	2075			
	Oldtown Spring #1	12				2250	2245		
	Oldtown Spring #2	13				2250	2245		
	Oldtown Spring #3	14				2252	2247		
	Pitts #3	17	80	59.2		2291	2232	< 0.005	268
63	Pitts #2	18	66	48.8		2288	2239		
	Pitts #1	20	77	60		2296	2236		
61	Hamel	19	275	214.5		2296	2079	0.053	382
	Heibert	11		56.3		2290	2234	< 0.005	259
99?	Wells	3	278	30.3	65	2315	2285	5.650	292
	Pend Oreille River Up						2062		
	Pend Oreille River Down						2031		
WASHINGTON									
193	Newport C	5	120		12	2100			
196&191	Newport F	6	80	19.9	19	2110	2090		
194	Newport D	7	81	21	16	2114	2092		
248	Halsted School	8	175	48.4	48	2153	2104		
	Newport First St.	9				2167			
	Teufel	10		33.4		2142	2109		
	Jones #1	21				2255	2252		
	Jones #2	22				2265	2263		
192	Newport B		120		6				
195	Newport E		110		21				

The downward component makes quantitative determination of gradient difficult. Figures 1-5 and 1-6 illustrate the downward component of gradient. Figure 1-5 presents well depth versus depth to water. A linear trend exists with the depth of water increasing as well depth increases. The downward component of gradient and the limited number of wells that could be measured prevents construction of a meaningful contour map of water elevation.

Water samples were analyzed for nitrate concentrations and specific electrical conductance (EC). These two variables are indicative of water quality issues that need to be addressed in this study area. Potential for nitrate contamination exists from septic system leachate and fertilizer from yards and gardens. EC is an indicator of overall water quality. EC increases as more constituents are dissolved in the water. Thus, a high EC indicates contaminated water and a low EC indicates uncontaminated water.

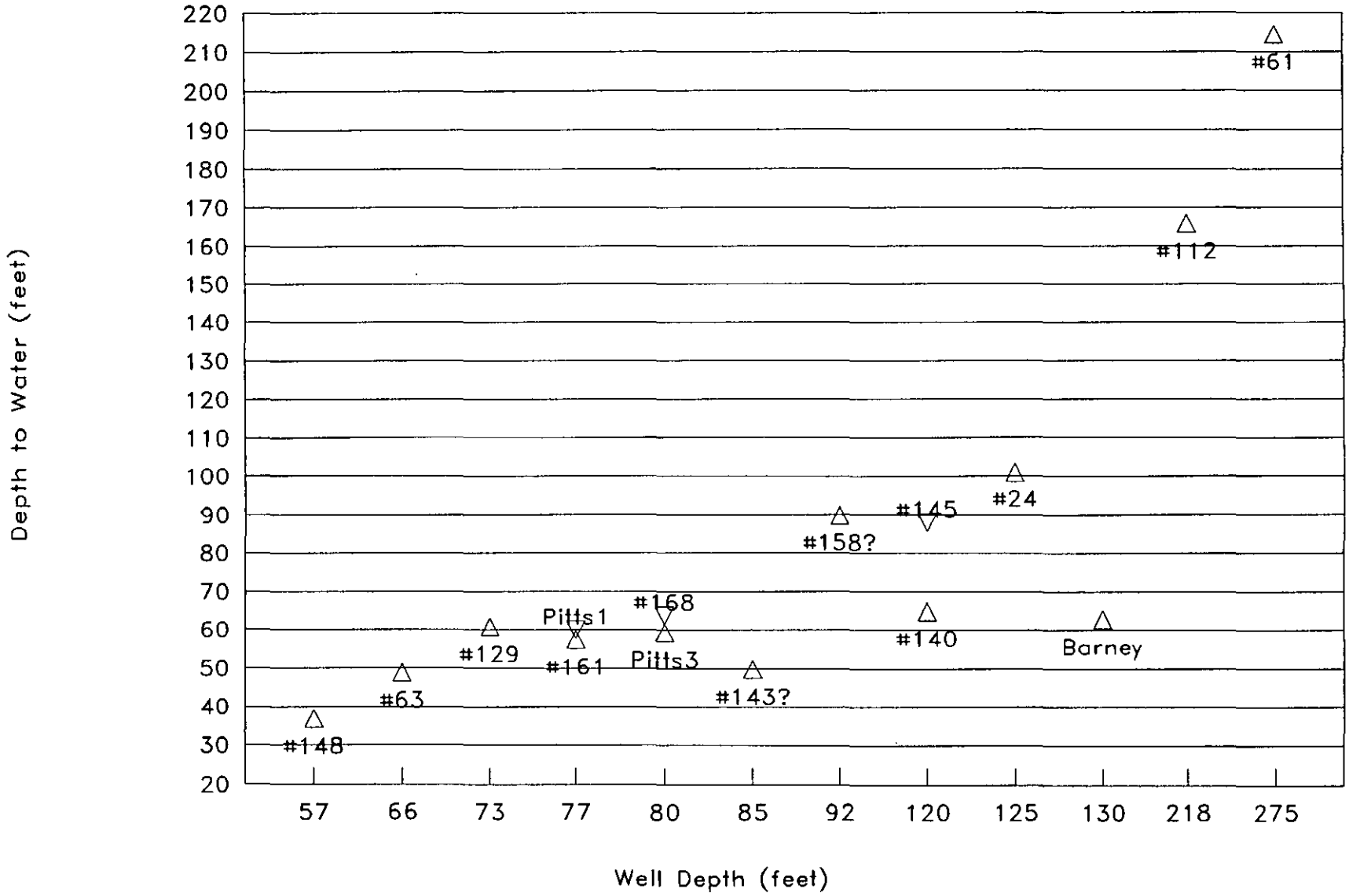
Both nitrate concentrations and EC are low in the study area. Nitrate concentrations range from below detection limit to 5.6 milligrams per liter (mg/L.). The health based maximum contaminant level for nitrate in drinking water is 10 mg/L. The range in EC in the study area is from 259 to 411 micromhos/cm. These EC readings are also quite low. Enforceable maximum levels for EC are not established. Generally EC less than 700 micromhos/cm are considered acceptable. Nitrate concentrations in the study area do not follow the trend in EC. That is, two samples exhibit high nitrate concentrations and only moderately elevated EC. Thus, EC cannot be used as an indicator of potential nitrate contamination.

The wells that exhibit the elevated nitrate concentrations generally are on the east side of the aquifer at the boundary of the Hoodoo Mountains. Specifically, Wells (Map Reference #3) and Dillon (Map Reference #25) are the two wells that exhibit nitrate concentrations in excess of 5 mg/L. No investigation was done in the field to evaluate the relative placement of the leach fields and water wells at these houses. The elevated nitrate concentrations could be coming from the leach fields. Alternately, some component of the runoff from the forested intrusive east of these houses may be contributing nitrates to the shallow aquifer in that area. The remainder of the wells downgradient towards the Idaho Springs exhibit much lower nitrate concentrations. This indicates that the elevated nitrate concentrations in the vicinity of the Wells and Dillon wells are a localized condition and currently do not pose any threat to the quality of water at the springs.

Figure 1-5

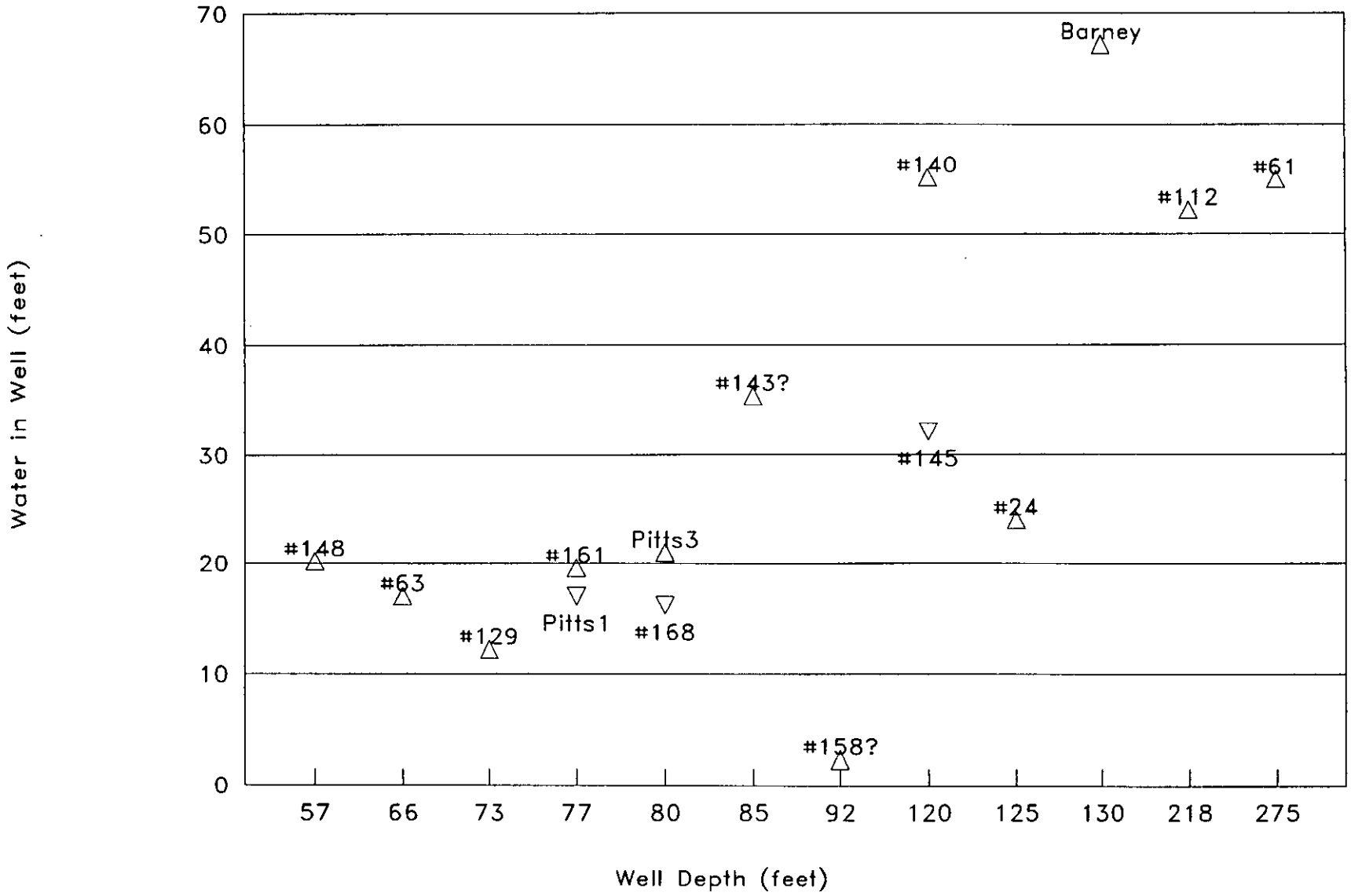
WELL DEPTH vs. DEPTH TO WATER

Newport/WBWD Well Head Protection



WELL DEPTH vs. WATER DEPTH

Newport/WBWD Well Head Protection



1.2.4 Lithologies and Gradient

Three cross sections are presented that illustrate the lithologies and ground water gradient in selected portions of the aquifers. Figure 1-7 presents locations of cross-sections. The lithologies on the cross sections are based on drillers logs on file with Idaho Department of Water Resources and Washington Department of Ecology. Cross section A-A' (Figure 1-8) is a generalized east-west cross section across the recharge area upgradient from the Idaho Spring. The cross section extends from a well completed in the intrusive on the flanks of Hoodoo Mountains, to the state line in Section 36. No wells are located in the vicinity of the cross-section in Section 30, west of the state line. Thus, the cross section ends at the Washington/Idaho state line.

The lithology indicated in Cross Section A-A' is heterogeneous. Sands and gravels or sand exists shallow in all of the wells, including the well on Hoodoo mountain. Below the shallow sand or sands and gravels, intervals of clay or lacustrine material exits. However, the clays are discontinuous and varying thickness from nonexistent to many tens of feet. The discontinuous nature of the clay indicates that the entire area illustrated by the cross section is susceptible to contamination from surface sources.

Cross Section B-B' (Figure 1-9) is a generalized north/south cross section with the Idaho Spring shown at the north end and the Wells well shown at the south end. The Wells well, is drilled through gravel and sand and clay into decomposed granite and unfractured granite. Many of the wells in the intrusive formation exhibit higher water elevations than the wells that are completed in similar locations, but only in the alluvium. A generalized gradient from south to north is evident in the water elevations shown in Cross Sections B-B'. However, the downward component in the gradient is illustrated again by the lower water elevation in the Barney well. The Barney well is the deepest well shown on the cross section. Even though no lithologic information is known about the well the total depth of the well is known.

Cross Section C-C' (Figure 1-10) is a second generalized east/west cross section with wells south of Idaho Springs at the east to Newport wells D and F at the west. The lithology illustrates the heterogeneous alluvium. Clay or sand and clay is in each well except Krell. The variability in depth and thickness of clay demonstrates that no protective confining layer exists. The Hamel well is representative of two deep well that have been drilled west of Highway 41. Water elevation in the Hamel well is 2079; normal pool elevation in the Pend Oreille River is 2031. A gradient from the deep regional aquifer toward the river exists. The Literogeneous nature of aquifer materials

and lack of information in certain areas prevents generalizaton of aquifer characteristics between or beyond wells shown on the three cross-sections.

Measured water elevations from the field investigations in July are presented on the cross sections. The water elevations generally are indicative of the downward component of the gradient. The shallow wells exhibit generally higher water levels, and the deeper the well is, generally, the deeper the water elevation is. This is clear in comparing well 63 to 58 and 61 for example. A slight gradient from east to west is exhibited in wells 168, 148, 63, and 61.

The water elevation in the Idaho Spring is 2245 feet. The wells in the eastern portion of this cross section have water elevations higher than the Spring discharge elevation, whereas the wells in the western portion of the cross section exhibit water elevations at lower elevation than the Idaho Spring. This suggests that the wells in the western portion of the cross section, probably do not feed the Spring, but discharge north or northwest to other springs along the bench above the Pend Oreille River.

The gradient from the City of Newport wells toward the river also is illustrated. A difference of 2 feet in water elevation is indicated between Newport wells D and F. This is within the precision of the altimeter used during field investigations. Thus, the water elevations may be nearly equal.

The general gradient in the West Bonner aquifer is from south to north. Gradient to the northwest may exist in the vicinity of Highway 41 and Old Priest River Road. Generally, the gradient in the vicinity of the Newport well field appears to be from the well fields towards the Pend Oreille River. The northerly gradient south of the well fields probably contributes some components of ground water flow to the well fields.

The western boundary of the aquifer(s) is poorly characterized. This is because of a lack of wells west of Highway 41 in many areas and the downward component to the gradient. Additional investigations would be required to refine the definition. Possible avenues to explore for this level of investigation would be graduate research at University of Idaho or Eastern Washington University, or the USGS.

Rat Island
Kelly Island
KANIKSU NATIONAL FOREST
Sewage Disposal
K N F
WASHINGTON
IDAHO
Trailer Park
BM 2057
Reservoir
Sandpit
Newport
(BM 2155)
Hospital
High Sch
City Hall
Halsead Sch
Gravel Pit
Courthouse
BM 2152
Gaging Stations
Substation
Idaho Hill School
Oldtown
BM 2109
PEND OREILLE RIVER
BURLINGTON NORTHERN
BM 2094
Sawmill
Grange Hall
Falls
Albeni
K N F
Gravel Pit
USMM
Powerplant
Mile 90
ALBENI FALLS DAM
BM 2073
Campground
Albeni Cove
Mile
Gravel Pit
BM 2
JEEP TRAIL
JEEP TRAIL
Gravel Pit
BM 2377
T 56 N
T 55 N
T 31 N
T 30 N
BM 2366
BM 2355
PEND OREILLE CO
BONNER CO
KANIKSU NATIONAL FOREST
K N F
HOODOO LOOP ROAD
KANIKSU NAT FOR
BARNEY
Borrow Pit
B IDAHO SPRINGS
SCALE 1" = 2000'
A
A'
B
B'
C
C'
D
E
F
61
63
PITTS 1
158
149
151
146
148
168
170
32
129
140
120
119
118
MUNICIPAL WELLS

NEWPORT / WEST BONNER WELLHEAD PROTECTION PLAN

FIGURE 1 - 7
LOCATION OF CROSS SECTIONS

900705O3--VI

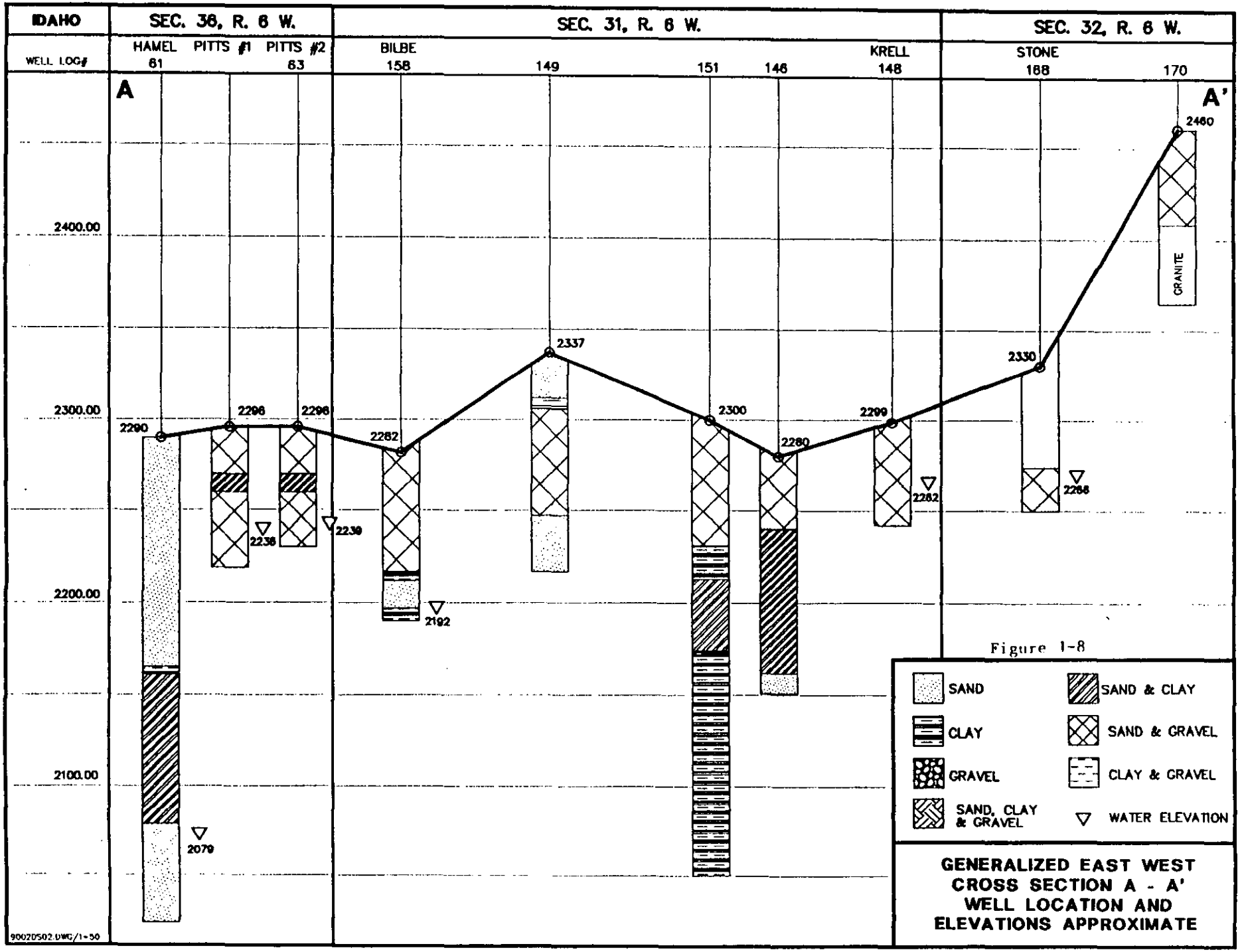

IDAHO
SEC. 36, R. 6 W.
SEC. 31, R. 6 W.
SEC. 32, R. 6 W.
WELL LOG#
HAMEL
61
PITTS #1
PITTS #2
63
BILBE
158
149
151
146
KRELL
148
STONE
188
170
A
A'
2400.00
2300.00
2200.00
2100.00
2290
2296
2296
2282
2337
2300
2280
2299
2330
2460
2236
2239
2192
2079
2282
2268
GRANITE
SAND
SAND & CLAY
CLAY
SAND & GRAVEL
GRAVEL
CLAY & GRAVEL
SAND, CLAY & GRAVEL
WATER ELEVATION
GENERALIZED EAST WEST CROSS SECTION A - A'
WELL LOCATION AND ELEVATIONS APPROXIMATE
90020502.DWG/1-50

Figure 1-8

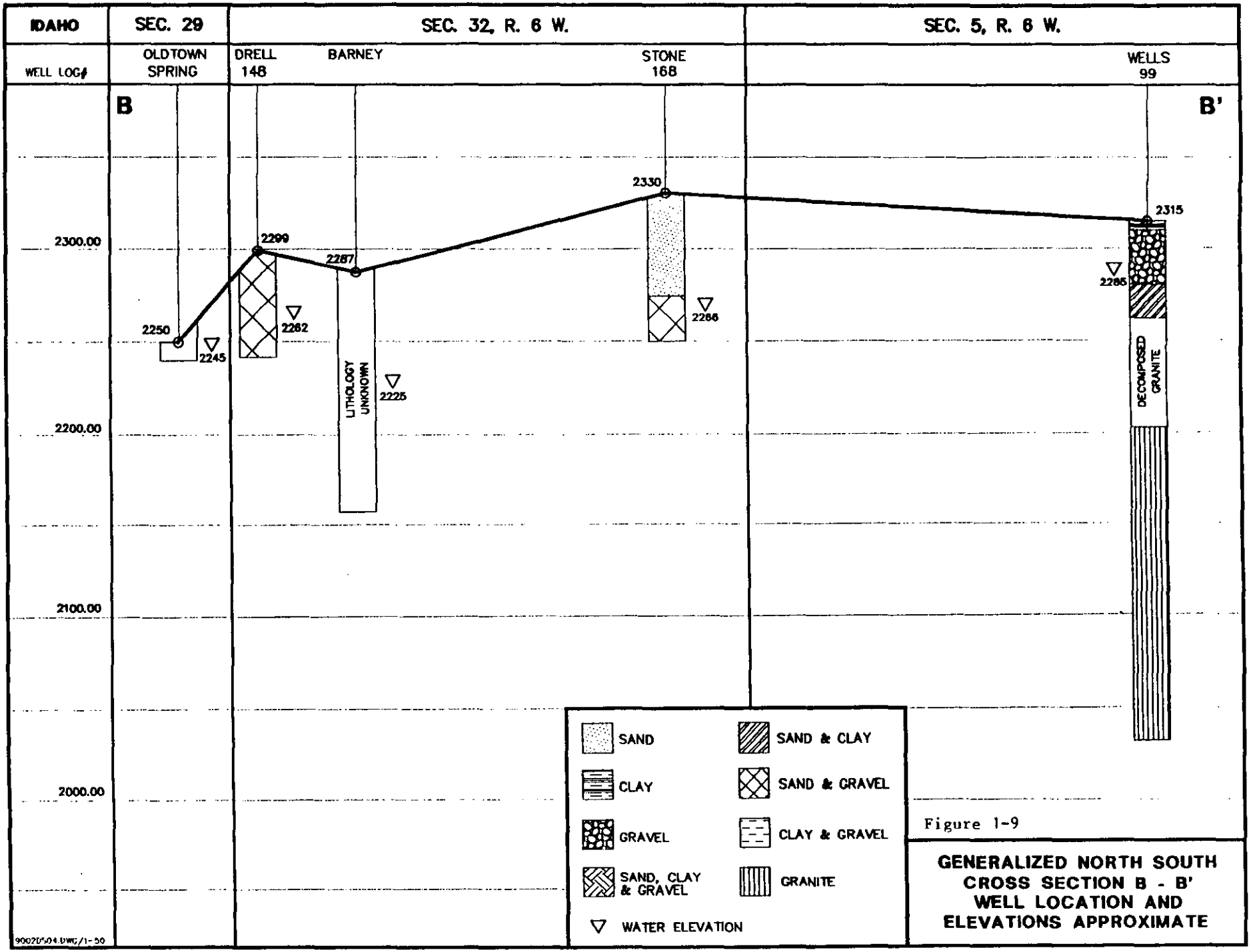


Figure 1-9

GENERALIZED NORTH SOUTH CROSS SECTION B - B' WELL LOCATION AND ELEVATIONS APPROXIMATE

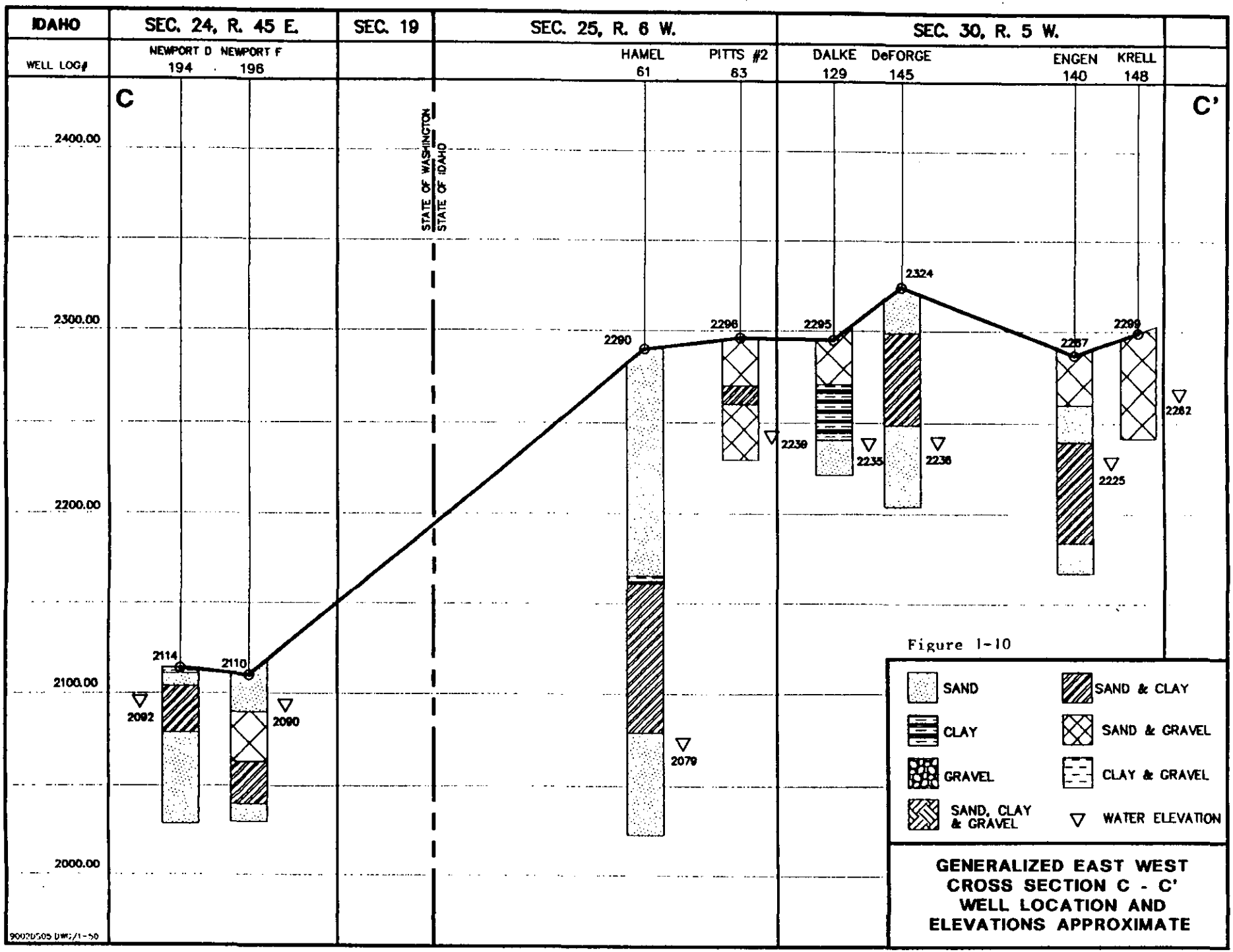

IDAHO
SEC. 24, R. 45 E.
SEC. 19
SEC. 25, R. 6 W.
SEC. 30, R. 5 W.
WELL LOG#
NEWPORT D 194
NEWPORT F 196
HAMEL 61
PITTS #2 63
DALKE 129
DeFORGE 145
ENGEN 140
KRELL 148
C
C'
STATE OF WASHINGTON
STATE OF IDAHO
2400.00
2300.00
2200.00
2100.00
2000.00
2114
2110
2092
2090
2290
2079
2298
2239
2295
2324
2235
2238
2287
2299
2225
2282
SAND
SAND & CLAY
CLAY
SAND & GRAVEL
GRAVEL
CLAY & GRAVEL
SAND, CLAY & GRAVEL
WATER ELEVATION
GENERALIZED EAST WEST CROSS SECTION C - C'
WELL LOCATION AND ELEVATIONS APPROXIMATE

Figure 1-10

1.2.5 Time of Travel Zones

Time of travel zones are presented as overlays to the base topographic map. Separate efforts are presented for the Idaho Springs and Newport well field. The computational model is the MWCAP or GPTRAC module of Blanford and Huyakom, WHPA Version 2.1, April 1992. The model is distributed by International Ground Water Modeling Center, Golden, Colorado. MWCAP is used to model the Newport well field. GPTRAC is used to model the West Bonner Aquifer. The modules are similar in their calculations. GPTRAC is capable of modeling more complex boundary conditions than is MWCAP. Input to model is presented in Appendix A.

No flow boundaries are used in each model effort to simulate the Hoodoo Mountains east of the West Bonner aquifer, and the intrusive ledge reported west of the City of Newport. A no-flow boundary exists north of the Oldtown Springs because of topographic relief. This boundary has been simulated in GPTRAC by using a pumping well 400 feet north of the springs that discharges the same amount of water as the springs.

Aquifer hydraulic properties are based on tests when possible and estimated when test data are not available. Porosity is estimated as 0.2 for both aquifers, based on lithology. Aquifer thickness is based on well logs. Transmissivity is estimated to be 1,000 foot^2 per day for the West Bonner Aquifer, based on lithology. Transmissivity of 300 foot^2 per day for the Newport well fields is calculated from short pumping and recovery tests that were conducted by James A. Sewel, and Associates, Consulting Engineers, Newport, Washington. Both transmissivity values are order of magnitude estimates. No pumping data are possible for the Idaho Springs because they are gravity draining. Pumping tests at the Newport well field were short duration and had non-constant discharge rates.

The gradient used in modeling of contaminant travel time and capture zone for the West Bonner Aquifer is based on gradients from selected wells to the Springs. The wells chosen are drilled to similar depths in the aquifer to minimize the effect of the downward component. The gradient for the Newport well fields is based on water elevations in the well field and the Pend Oreille River.

Time related capture zones for the Idaho Springs and Newport well field are presented in Figure 1-11. Capture zones are presented showing only one pumping well for Newport, even though multiple wells exist in the well field. The capture zones that result from using two pumping wells are nearly identical to those that result from using one. Visually, the results from using two wells are more difficult to interpret than using one well. Therefore, the figures present results of one pumping well.

Two year time of travel corresponds to WHPA Zone IB; five year time of travel corresponds to WHPA Zone II; ten year time of travel corresponds to WHPA Zone III. All zones are designed to prevent indirect microbial or chemical contamination of a well. Zone IB protects the area of contribution where the ground water velocity is likely to be controlled by the cone of depression caused by pumping. Zone II protects the area of contribution where the ground water velocity is generally dominated by the regional hydraulic gradient. Zone III is designed to provide planners and decision makers with a boundary within which to prohibit high risk sources of potential contamination, and outline the long term source of drinking water.

Time of travel zones for both sources of water encompass relatively undeveloped property. Zone III, the largest zone, extends approximately one mile south of the Idaho Springs. Zone III extends approximately one half mile southwest and one third mile northeast of the Newport well field. This area is predominantly rural residential, and presents little risk of contamination to the aquifers under current land use.

Existing sources of potential contamination within Zone III for the West Bonner Aquifer include small low risk shops and a transportation corridor - Old Priest River Road. Existing sources of potential contamination within Zone III for the Newport well field include the Burlington Northern Railroad right of way and a transportation corridor - U.S. Highway 2, and a small portion of the City of Newport.

Existing sources of potential contamination within Zone II for the West Bonner aquifer include a transportation corridor - Old Priest River Road. Existing sources of potential contamination within Zone II for the Newport well field include the Burlington Northern Railroad right of way and a transportation corridor - U.S. Highway 2, and a small portion of the City of Newport.

Existing sources of potential contamination within Zone IB for the West Bonner aquifer include a transportation corridor - Old Priest River Road. Existing sources of potential contamination within Zone IB for the Newport well field include the Burlington Northern Railroad right of way.

1.3 Recommendataions for Future Aquifer Characterization

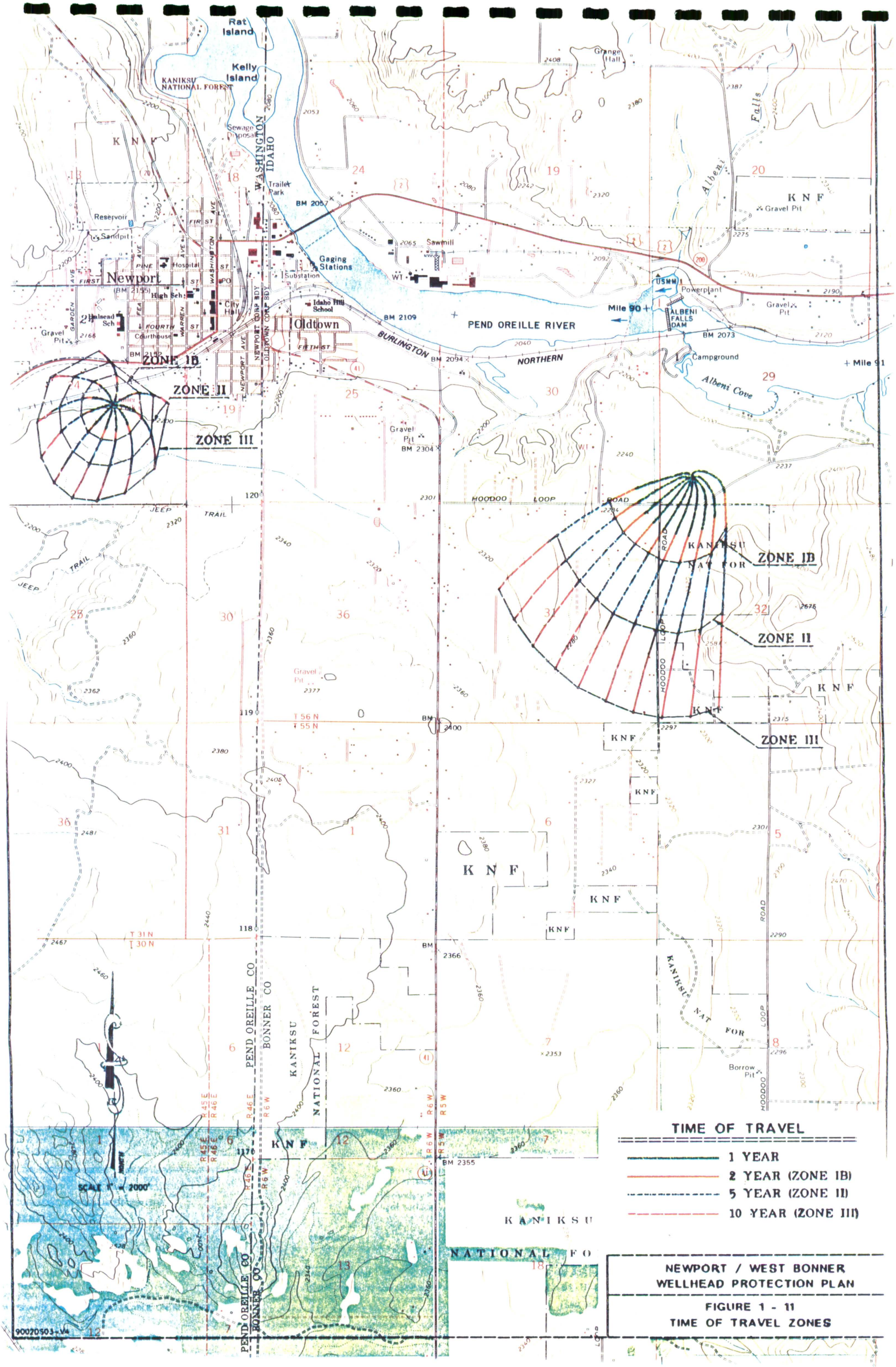
Aquifer characterization is based on existing information except establishment of ground water elevation and quality in selected wells. The data are sufficient to produce a reasonable characterization of the aquifer. The characterization is sufficient to delineate Critical Recharge Areas (as discussed in Chapter 3). Improvements in aquifer characterization are certainly possible. The approach taken in the present study is to use existing information and implement a protection plan until better understanding of the aquifers can be

obtained.

Additional investigations should be considered to improve understanding of the aquifers that may lead to refinements or revisions in Critical Aquifer Recharge Areas. In addition, specific investigations should occur in relation to development of alternative water supplies. Additional studies should include:

- Improvement of gradient determinations in both aquifers,
- Better delineation of the western boundary of the West Bonner Aquifer, and the relative connection of the two aquifers,
- Constant rate pumping tests of the Newport aquifer,
- Constant rate pumping tests of one of the deep wells in the West Bonner Aquifer,
- Constant rate pumping tests and water quality characterization of the Sawmill Well,
- Construction of detailed cross-sections to improve understanding of acquifer physical characteristics and gradient,
- Numerical modeling of impacts on West Bonner Springs under the influence of full residential development upgradient of the Springs,
- Determination of whether leachate is migrating from Idaho Hill Landfill.

The decision whether to undertake any of these investigations (or others) should be based on the needs, priorities and budgets of West Bonner Water District and the City of Newport. Any of these investigations will improve the understanding of the aquifers and the adequacy of the Critical Aquifer Recharge Areas. However, it is more important to begin protection of the aquifers, based on the current study, than to conduct additional investigations.



TIME OF TRAVEL

- 1 YEAR
- 2 YEAR (ZONE IB)
- 5 YEAR (ZONE II)
- 10 YEAR (ZONE III)

NEWPORT / WEST BONNER WELLHEAD PROTECTION PLAN

FIGURE 1 - 11
TIME OF TRAVEL ZONES

2 POTENTIAL SOURCES OF GROUND WATER CONTAMINATION

Figures 2-1 and 2-2 present a tabulation of existing and future potential sources of contamination, categorized according to the WHP criteria from Idaho and Washington. Figure 2-3 summarizes the prioritized risks that are indicated on the land use map presented in Figure 2-4. The following narrative discusses each of these potential sources.

2.1 Land Uses

Land use and zoning are key factors in determining the present and future reliability of an uncontaminated ground water supply. Although the service area of West Bonner and Newport water system is primarily urban or suburban in nature, the actual aquifer and recharge areas which supply these water sources are rural. Refer to Figure 1-2 for delineation of these areas.

Land uses in the recharge area in Idaho are regulated by Bonner County. Land uses in the designated recharge area in Washington are regulated by Pend Oreille County.

2.1.1 Bonner County Land Use and Sewage Disposal

The present zoning of nearly all of the critical aquifer and recharge area for the Idaho Springs is designated as RURAL. This zone restricts residential uses to a maximum density of one dwelling unit per five acres. All common agricultural uses such as forestry, cultivation, and storage of agricultural equipment and products are permitted. Commercial and industrial uses are prohibited in the rural zone in Bonner County. However, other potential sources of contamination such as landfills, cemeteries, gravel mining, and wrecking yards may be allowed under a Conditional Use Permit.

Figure 2-4 presents a map of the parcels platted in Idaho with land uses denoted. Included in Appendix B are tables summarizes the land uses in each Section. This data was derived from information provided by the Bonner County Assessor's Office dated August, 1992. The West Bonner Sewer District sewer collection system does not serve the critical aquifer or recharge areas. Therefore, every existing residential or commercial use denoted by the land use map utilizes an on-site septic tank and drainfield for sewage disposal. Figure 2-1 presents a tabulation of the number of existing septic tanks/drainfields in each of the recharge zones, as well as a projection of the number of on-site systems which would be located in each recharge zone if every existing plotted lot or parcel was occupied by a single residence. According to Bonner County and the Panhandle Health District, any legally created parcel with soils capable of proper percolation, can receive a permit for an on-site septic tank and drainfield.

Figure 2-1

INVENTORY OF POTENTIAL SOURCES OF CONTAMINATION
IDAHO SPRINGS

Category I
Sources Designed to Discharge Substances

SOURCE	EXISTING	FUTURE/POTENTIAL
Septic Tanks/Drain fields:		(Assumes 1 Household per 5 Acres)
Zone IA (50' Radius)	0	0
Zone IB (2 Year Travel)	2	16
Zone II (5 Year Travel)	9	80
Zone III (10 Year Travel)	23	220
Septic Sludge Disposal	Idaho Hill Septage Sludge Disposal Ponds	Leachate from Sludge Ponds
Stormwater Injection		Future Stormwater Drywells

Category II
Sources Designed to Store, Treat, or Dispose of Substances; Discharge Through Unplanned Release

SOURCE	EXISTING	FUTURE/POTENTIAL
Landfill	Idaho Hill Landfill	
Wrecking Yards	Mr. D's Wrecking Yard Yates Wrecking Yard	
Animal Wastes	Minor Family Farm Uses	
Above Ground Fuel Storage	Private Vehicle Use	
Underground Fuel Storage	Bud's Service Station	

Category III
Sources Designed to Retain Substances During Transport or Transmission

SOURCE	EXISTING	FUTURE/POTENTIAL
Vehicles Carrying Hazardous Materials	Highway 41 and Old Priest River Road	

Category IV
Sources Discharging Substances as a Consequence of Other Planned Activities

SOURCE	EXISTING	FUTURE/POTENTIAL
Pesticide/Fertilizer Applications	Low Intensity Agricultural Lands, Tree Farm	
Logging	Petroluem Spills During Fueling or Tank Rupture	
Auto Repair	Tucker Automotive Mr. D's Automotive	
Commercial Trucks	Pitt's Well Drilling	

Figure 2-2

INVENTORY OF POTENTIAL SOURCES OF CONTAMINATION
NEWPORT WELLFIELD

Category I
Sources Designed to Discharge Substances

SOURCE	EXISTING	FUTURE/POTENTIAL
Septic Tanks/Drain fields:	(Estimated due to limited available data)	
Zone IA (50' Radius)	0	0
Zone IB (2 Year Travel)	2	10
Zone II (5 Year Travel)	5	40
Zone III (10 Year Travel)	13	160
Septic Sludge Disposal	Idaho Hill Septage Sludge Disposal Ponds	Leachate from Sludge Ponds
Stormwater Injection	Drywells Used in City Streets	Future Stormwater Drywells
Aeorate	Aeorate Pole Treating Pond	Aeorate Leachate

Category II
Sources Designed to Store, Treat, or Dispose of Substances; Discharge Through Unplanned Release

SOURCE	EXISTING	FUTURE/POTENTIAL
Landfill	Old City Landfill	
Wrecking Yards	Mr. D's Wrecking Yard Yates Wrecking Yard	
Animal Wastes	Minor Family Farm Uses	
Above Ground Fuel Storage	Private Vehicle Use	
Transformer Leaks Oils, Solvents	Inland Lights Husquvanna Saw Shop	

Category III
Sources Designed to Retain Substances During Transport or Transmission

SOURCE	EXISTING	FUTURE/POTENTIAL
Vehicles Carrying Hazardous Materials	Burlington Northern Rail Line	

Category IV
Sources Discharging Substances as a Consequence of Other Planned Activities

SOURCE	EXISTING	FUTURE/POTENTIAL
Pesticide/Fertilizer Applications	Low Intensity Agricultural Lands	
Logging	Petroluem Spills During Fueling or Tank Rupture	

Figure 2–3

PRIORITIZED CONTAMINATION RISKS

IDAHO SPRINGS

LAND USE MAP CODE (Figure 2–4)	RISK PRIORITY	SOURCE	POTENTIAL CONTAMINANT
1–A	1 – High	Idaho Hill Landfill	Landfill Leachate
1–B	1 – High	Idaho Hill Septage Disposal Ponds	Sewage Sludge Leachate
1–C	1 – High	Old Priest River Road	Transportation Spills
2–A	2 – Moderate	Bud's Service Station	Underground Fuel Storage
2–B	2 – Moderate	Mr. D's Wrecking Yard	Petroleum Leaks
2–C	2 – Moderate	Yates Wrecking Yard	Petroleum Leaks
2–D	2 – Moderate	Tucker Automotive	Petroleum Leaks, Solvents
General	2 – Moderate	Logging	Petroleum Spills
3–A	3 – Low	Pitts Well Drilling	Petroleum Spills
All Occupied Parcels	3 – Low	Septic Tanks/Drainfields	Sewage Effluent

NEWPORT WELL FIELD

LAND USE MAP CODE (Figure 2–4)	RISK PRIORITY	SOURCE	POTENTIAL CONTAMINANT
1–D	1 – High	Burlington Norther Railroad Yard	Hazardous Chemical Spills
1–E	1 – High	Creosote Pole Treating Pond	Creosote
3–B	3 – Low	Inland Lights	Transformer Leaks
3–C	3 – Low	Husquvanna Saw Shop	Oils, Solvents, Abandoned Fuel Tanks
3–D	3 – Low	Old City Landfill	Landfill Leachate
General	3 – Low	Logging	Petroleum Spills

Rat Island
Kelly Island
KANIKSU NATIONAL FOREST
Sewage Disposal
WASHINGTON
IDAHO
K N F
Trailer Park
BM 2057
Reservoir
3-D
Sandpit
Newport
Hospital
High Sch
City Hall
Halstead Sch
Courthouse
Gravel Pit
BM 2152
ZONE IB
3-C
1-D
NEWPORT WELLFIELD
ZONE III
NEWPORT WELLS
Water Tank
1-E
Gaging Stations
Substation
Idaho Hill School
Oldtown
SUBDIVISION
3-B
Sawmill
WT
BM 2109
BURLINGTON NORTHERN
BM 2094
Mile 90 +
USMMI
Powerplant
ALBENI FALLS DAM
BM 2073
Campground
Albeni Cove
+ Mile 91
Gravel Pit
Grange Hall
Falls
Albeni
20
29
30
SILVER BIRCH ORCHARDS
Gravel
STATE
BM 2304
SUBDIVISION
WBWD
IDAHO SPRINGS
VC
KANIKSU NAT FOR
ZONE IB
USFS LAND EXCHANGE
ZONE II
US GOV'T
K N F
USFS
ZONE III
2-D
SOLAR ACRES
SOLAR ESTATES
3-A
2-A
2-B
2-C
1-A
1-B
STATE OF IDAHO
Pit
SILVER BIRCH ACRES
SHULTS ACRES
US GOV'T
K N F
US GOV'T
K N F
US GOV'T
T 31 N
T 30 N
T 56 N
T 55 N
JEEP TRAIL
JEEP TRAIL
PEND OREILLE CO
BONNER CO
KANIKSU NATIONAL FOREST
K N F
BM 2355
KANIKSU NATIONAL FOREST
Borrow Pit
SCALE 1" = 2000'
0020503-V2

LEGEND

- FOREST/AGRICULTURAL
- RURAL RESIDENTIAL/VACANT
- OCCUPIED RESIDENTIAL
- COMMERCIAL/INDUSTRIAL

NEWPORT / WEST BONNER WELLHEAD PROTECTION PLAN

FIGURE 3 - 3
BONNER COUNTY LAND USE MAP

2.1.2 Bonner County Stormwater Ordinance

Bonner County, Idaho recently adopted a stormwater management ordinance which requires control of stormwater, erosion, and sedimentation from road construction, industrial, commercial, and residential subdivisions, as well as individual building permits on sites over 15% slope or 300 feet from surface water. This ordinance does not presently apply to stormwater disposal, including shallow injection wells, for residential uses over the critical aquifer or recharge areas.

2.1.3 Pend Oreille County Land Use and Sewage Disposal

The Newport well field site is located within the city limits of the City of Newport, although the primary recharge area is located in the County south of Newport. Pend Oreille County is not zoned per se', but employs performance standards for subdivisions. The minimum size parcel which may be split without filing a subdivision plat is 20 acres which also must front a county road. Temporary storage of hazardous waste on private property is restricted to 30-90 days, depending on the type of waste.

Limited land use information was provided by the Pend Oreille County Assessor in the form of an assessor's print-out by section for areas surrounding the City of Newport. A tabulation of these land uses is included in Appendix C. No land use mapping was available in the vicinity of the well field recharge area. The City of Newport indicates that all residences and business within the city limits, with only isolated exceptions, are converted to the municipal sewer system. Therefore, use of septic tanks/drainfields do not appear to be a present water quality concern on the Washington side of the recharge area.

2.2 Idaho Hill Landfill and Septage/Sludge Ponds

Bonner County began use of the Idaho Hill Sanitary Landfill around 1972. The site consists of approximately 18 acres of solid waste covered in an area fill/cell concept (Site 1-A and 1-B on Figure 2-4). Bonner County has developed a closure plan to comply with Subtitle D, the deadline for which has been extended to October 9, 1994.

The landfill closure plan consists of covering with a 20 mil PVC liner with surface drainage and vegetative cover. The drainage off the liner will go into the ground. If closed before October, 1994, Bonner County will not be required to install monitoring wells or perform a ground water monitoring program in conjunction with its landfill closure plan. Three test wells were attempted to be drilled about 15 years ago, however, each hole was reported to be dry due to the location of an intrusive bedrock mound under the landfill site.

Another significant potential source of contamination is the septage sludge disposal ponds also located at the Idaho Hill Landfill site. Semi-liquid sewage sludge is accepted by Bonner County for disposal in open bottomed drying beds. The Panhandle Health District estimates that a total of 1 to 3 million gallons of septic sludge is disposed in Bonner County annually in its 3 landfills, although there are no estimates of how much is received at Idaho Hill. There are 10,000 rural households in Bonner County using septic tanks.

Bonner County is not required under Subtitle D to close or cover the septage sludge ponds, although the county does intend to abandon the practice when the landfill is closed in 1994. Without proper closure or cover, these sludge beds could continue to generate leachate to the recharge area.

2.3 Automobile Wrecking Yards

Two small wrecking yards are located over the recharge area off of Idaho State Highway 41 (Sites 2-B and 2-C on Figure 2-4). Wrecked autos can be a significant source of contamination from draining fluids such as gasoline, oil, and radiator fluid. Many modern wrecking yards drain and recycle all fluids from incoming wrecked cars. However, it is doubtful that this practice was followed at either of these two wrecking yards. Petroleum based fluids are likely to still be found in many of these wrecked autos.

2.4 Underground Fuel Storage

Bud's service station has operated for many years at the intersection of Highway 41 and Old Priest River Road (Site 2-A on Figure 2-4). Although this gas station is presently not in operation, it does contain underground fuel storage tanks. IDEQ reports that the owner intends to permanently close the station and remove the tanks. Mary's Beauty Parlor across Highway 41 from Bud's is a former gas station. Underground storage tanks probably exist at this location also.

There are two known bulk petroleum plants that were abandoned in Newport approximately 15 and 25 years ago. These plants utilized underground fuel storage tanks. One of the plants was located where the Husquvanna Saw Shop is currently and the other in the same vicinity. Any known bulk petroleum plant sites should be should be researched to insure the storage tanks were removed and properly disposed of to eliminate possible petroleum contamination of the well fields.

2.5 Above Ground Fuel Storage

Several private above ground fuel tanks are located on the Idaho recharge area, for use by home based logging or construction enterprises.

2.6 Pole Treatment/Dipping Yard

Poles Incorporated, located on 1st Street in Oldtown, has three 20,000 gallon steel tanks for pole treatment, and one 10,000 gallon steel tank for storage (Site 1-E on Figure 2-4). All the tanks are above ground and situated on concrete pads. The pentachlorophenol chemicals utilized in the pole treatment process are a potential source of contamination. The facility is regulated by the EPA with frequent inspections. Therefore, the likelihood of contamination is minimal. Poles Incorporated is located in the vicinity of W. Bonner District Well A which is currently not being utilized. If Well A is considered to be reincorporated into the domestic water supply system, the quality should be thoroughly analyzed and the site should be assessed for possible contamination for the pole yard.

2.7 Agricultural

No large scale farming or concentrated feedlot uses were observed over the recharge area, only small family farms are noted. Pesticide and/or fertilizer application may be practiced on some of these farms.

2.8 Transportation

Idaho State Highway 41 tranverses the recharge area. Old Priest River Road, under the control of Bonner County, passes within 1/4 mile of the Idaho Springs (Site 1-C on Figure 2-4). Potential spills from vehicles carrying hazardous materials or petroleum products is a serious potential source of contamination.

2.9 Timber Harvesting/USFS Land Exchange

The majority of the critical aquifer and recharge area is in timber production. Bonner County is currently completing a transaction with the U.S. Forest Service to exchange land for ownership of 69 acres in Section 32, located adjacent to the south of the Idaho Springs. The county has agreed to hold and manage this property as an aquifer protection area. The county anticipates preparation of a timber management plan allowing selective harvesting under very controlled conditions to avoid potential ground water contamination.

The USFS and Bonner County are considering the addition of 180 acres in Section 6, 1 1/2 miles south of the Idaho Springs, in the land exchange. This exchange is anticipated to be completed in the Spring of 1994.

3 PROPOSED DEFINITION OF CRITICAL RECHARGE AREA

Aquifer recharge areas are established to be used a management tools to protect water quality in aquifers. The areal extent of aquifer recharge areas is based on several considerations, including:

1. Aquifer vulnerability
2. Time of travel zones, and
3. Sources of potential groundwater contamination

Washington Department of Community Development (DCD) guidance indicates that Wellhead protection zones can be used to define a Critical Aquifer Recharge Zone (CARA). Other site-specific conditions, such as sources of potential contaminants, dense development, heavy industry, and intensive agriculture need to be included in the definition of a CARA.

Both the Newport and West Bonner aquifers are vulnerable to contamination from surface activities for two reasons. First, no extensive clay layers exist to protect the aquifers from downward migration of contaminants. Second, the depth to ground water is shallow in both aquifers, as discussed previously.

Sources of potential contamination include domestic septic discharge, septage disposal, drywells, light industry and agriculture, fuel tanks, and transportation corridors. These potential sources are distributed widely over both aquifers. No heavy industry or intensive agriculture exists above the aquifers at this time.

Critical aquifer recharge areas should be established at a minimum as coincident with the 10 year time of travel zones (Zone III) discussed previously. This is based on the vulnerability of the aquifers to contamination, and the widespread distribution of potential contaminant sources. The area of the proposed recharge zone for Newport is approximately one half square mile. The area of the proposed recharge zone for the West Bonner aquifer is approximately one square mile.

Consideration should be given to include other specific areas in the ultimate definition of a Critical Aquifer Recharge Area under the Growth Management Act. For example, the area within the cities of Newport and Oldtown should be considered for inclusion because of the existence of stormwater runoff and drywells. However, these issues are beyond the scope of this report.

4 RECOMMENDED MANAGEMENT PROCEDURES

4.1 Prioritized Risk of Potential Contamination Sources

Figures 2-1 and 2-2 presented a listing of potential contamination sources identified in the inventory. The sanitary landfill, septic sludge disposal ponds, and potential transportation spills were rated as the highest risk of contamination to the aquifer.

4.2 Bonner County Land Use Tools

The purpose of Wellhead protection programs in Idaho is to prevent contamination of ground water used as drinking water supplies. The Idaho Plan meets the requirements of the Safe Drinking Water Act Amendments of 1986 Section 1428, and the requirements of the Idaho Ground Water Quality Plan.

Wellhead protection areas that are developed can be adopted by local governments to protect water quality. However, the adoption of wellhead protection areas is optional in Idaho. It is highly recommended that wellhead protection areas for the West Bonner Aquifer be adopted for three reasons:

1. The hydrogeologic vulnerability of the aquifer,
2. The fact that protection of water quality is much less expensive than treatment of contaminated ground water, and
3. The distribution of water to the City of Newport, Washington.

Establishment of Critical Aquifer Recharge Areas is mandatory in Washington as described below.

Critical Aquifer Recharge Areas should be established as coincident with the 10 year time of travel zones (Zone III) at a minimum. This is based on the vulnerability of the aquifers to contamination, and the widespread distribution of potential contaminant sources. Buffer zones around the 10 year time of travel should be considered to provide additional long-term protection of water quality because of the lack of protection based on hydrogeologic conditions.

It is recommended that the present zoning of the aquifer and recharge area remain designated as a RURAL ZONE. With a maximum density of one house per five acres using septic tank/drainfield sewage systems, nitrate concentrations should not become a public health concern. However, a less dense zoning may be appropriate in Section 32 south (upgradient) of the Oldtown Springs. Reduction in discharge of the Springs could occur if many wells were pumping simultaneously. Numerical modeling would be required to evaluate this possibility. It is not recommended that central sewer service be extended to the aquifer or recharge areas, since sewers often allow higher intensity residential and commercial land uses. Secondary impacts from intense land uses poses more of a threat to the aquifer than drainfields at low densities.

The aquifer and recharge area appears to be most vulnerable to accidental spills or intentional dumping of chemicals or petroleum products. Although special use permits for certain commercial activities are allowed in the Bonner County rural zone, it is suggested that commercial activities be kept to a minimum over the aquifer recharge area, and include only enterprises with little chance of creating chemical or petroleum spills. Current commercial users with a potential for contamination, such as wrecking yards, should not be expanded.

A zoning mechanism which could help assure that the sensitivity of the aquifer and recharge area is protected, is to create an Aquifer Protection Overlay District which follows the recharge area boundaries. This overlay zone could further direct land uses to rural and non-commercial activities.

The institution of a Sewage Management Area (SMA) by Panhandle Health District restricting the use of septic tank/drainfields would not be necessary if Bonner County zoning remained RURAL as presently defined.

4.3 Pend Oreille County Land Use Tools

Wellhead protection programs complement several other programs in Washington. These programs include the Ground Water Management Area Program, Critical Aquifer Recharge Area and others. Wellhead protection areas do not replace or supersede management options under these other programs.

The Ground Water Management Area Program was established in 1985 and is described in Chapter 173-100 WAC. A Ground Water Management Area (GWMA) establishes a regional ground water management unit. A GWMA can encompass multiple aquifers that are being used for several beneficial uses - not just drinking water supply. Wellhead protection Zones often are a component of a GWMA. However, the emphasis of a GWMA is management on the scale of a complete watershed, rather than a well-specific area.

Local jurisdictions planning under the Growth Management Act are required to identify Critical Aquifer Recharge Areas. A Critical Aquifer Recharge Area (CARA) is required to protect "areas with critical recharging effect on aquifers used for potable waters." Washington Department of Community Development (CDC) guidance indicates that Wellhead protection zones can be used to define a Critical Aquifer Recharge Zone (CARA). However, buffer zones around Wellhead protection areas can be established to provide important protection of long-term water quality. Other site-specific conditions, such as sources of potential contaminants, dense development, heavy industry, and intensive agriculture need to be included in the definition of a CARA.

Critical Aquifer Recharge Areas should be established as coincident

with the 10 year time of travel zones (Zone III) at a minimum. This is based on the vulnerability of the aquifers to contamination, and the widespread distribution of potential contaminant sources. Buffer zones around the 10 year time of travel may be considered to provide additional long-term protection of water quality because of the lack of protection based on hydrogeologic conditions.

Negotiations are currently on-going between Pend Oreille County and the City of Newport to define the Urban Growth Area. It is recommended that an Aquifer Sensitive Area be designated which includes unincorporated portions of the aquifer recharge area in Washington. Then the City of Newport could request the County to treat the well recharge/sensitive area with a restricted rural zoning.

As discussed previously, limiting the use of on-site septic tank/ drainfields to one per five acres, and restricting commercial activity in the aquifer recharge area can help reduce the opportunity for contamination.

4.4 Stormwater Disposal

Use of grassed percolation areas to contain and absorb the first half inch of a storm event, is a system being used over other sensitive aquifers in the region. Stormwater runoff from parking lots, loading docks, or other impermeable surfaces which can accumulate contaminants, can cause ground water contamination particularly if disposed directly into drywells without treatment.

Bonner County stormwater ordinances require any new commercial activity within the aquifer recharge area to pre-treat the first 1/2 inch of stormwater from impermeable surfaces through grassed percolation areas.

4.5 Critical Materials

Commercial activities which store, handle, or process materials listed as critical under SARA Title 3 should be prohibited over the aquifer recharge area. Existing commercial activities should be encouraged to provide secondary containment of any materials on the OSHA Workplace Substance listing in the event of spills. This would include gas station fueling areas.

4.6 Sanitary Landfill and Sludge Beds

Bonner County is not required to perform a ground water monitoring program since it intends to close the Idaho Hill Landfill in accordance with Subtitle D requirements prior to October, 1994. However, it is recommended that the Wellhead Protection Advisory Board include annual monitoring of several private wells directly north of the landfill in its routine monitoring program for the domestic water supply. This background data base could provide early notice if leachate contaminants begin to migrate in the aquifer.

Further, although the septage sludge ponds also located at Idaho Hill Landfill are not required to be closed per Subtitle D, Bonner County should be encouraged to cap these ponds to a standard similar to the landfill to minimize the opportunity for leachate production from the accumulated sludge materials.

4.7 Transportation

Spills of critical materials and petroleum products are perhaps the greatest risk for contamination of the Idaho Springs and Newport well field. Idaho State Highway 41 traverses the western third of the aquifer recharge area. Although it would not be practical to restrict trucking activity on Highway 41, a spill response plan for this area which recognizes the sensitivity of the aquifer area is recommended. A spill response plan is discussed further in Section 6.

The Old Priest River Road, which is owned and maintained by Bonner County, passes within several hundred feet of the Idaho Springs at a location where the depth to water table is most shallow (around 10 feet). It is recommended that the Committee approach Bonner County Commissioners to restrict transportation of critical materials or petroleum products in bulk over Old Priest River Road between Highway 41 and Priest River. This restriction could exclude local deliveries required by residents or existing commercial uses.

The greatest risk of contamination of the Newport well field is potential spills from the Burlington Northern Rail Line which passes within a few hundred feet of the wells. Again, a spill response plan which recognizes the sensitive zone over the aquifer recharge area, is recommended. Refer to Section 6.

4.8 Wrecking Yards

Presently, there are two wrecking yards in the Newport/West Bonner recharge area. The State of Idaho presently has no requirements for draining stored vehicles, however, it is our recommendation that all commercial properties which have nonfunctioning vehicles stored on site should be required to drain all fluids from the vehicles previous to storage. While coolant and fuel are the major concern, it is recommended that transmission and engine lubricants, brake fluid, and steering fluid also be drained. Batteries should be removed from the vehicles and stored preferably off-site or in a sealed container according to Federal and State regulations. All drained fluids should be drummed, transported and disposed of in a legal manner and not stored on site.

4.9 Additional Management Practices Required

Implementation of a Wellhead Protection Plan which protects the long-term water quality of the Idaho Hill Aquifer and the Newport well field must include awareness and coordination among the numerous

corporate and public agencies with regulating authority over activities posing potential risks to the aquifer(s). In the case of the Newport/West Bonner aquifer, this becomes more important yet more difficult, since the aquifer and water supplies involve two states, two cities, and two counties.

The final Wellhead Protection Plan must include definitive steps for implementation including efforts to coordinate and advise the appropriate jurisdiction in both states as to the sensitivity of the aquifer and management strategies. These agencies include, but are not limited to:

STATE OF WASHINGTON	STATE OF IDAHO
Washington Dept. of Health	Idaho Dept. of Water Resources
Washington DOE	Idaho DEQ
Pend O'Reille Co. Health District	Panhandle Health District
City of Newport	City of Oldtown
	West Bonner Water District #1
	West Bonner Sewer District #1
Pend O'Reille Co. Commissioners	Bonner County Commissioners
Pend O'Reille Co. Planning Dept.	Bonner Co. Planning Dept.
Pend O'Reille Co. Planning Comm.	Bonner Co. Planning Comm.
Washington State Police	Idaho State Police

COMMON TO BOTH STATES

U.S. Forest Service
Burlington Northern Railroad

5 CONTINGENCY PLANS FOR ALTERNATE WATER SUPPLIES

5.1 Contingency Plan

The water system infrastructure which serves the City of Newport and West Bonner Water District is ideal to provide flexibility and backup in case of contamination or loss of one of its sources.

The estimated production from the Idaho Springs is 480 gpm, and the total rated production of the Newport Wells B through F is 650 gpm. Records from the City and Water District demonstrate that the system water demand during non-irrigating lower demand seasons can be met by either source. Also, the Newport and West Bonner water system is interconnected with its reservoir datum at similar elevations.

If contamination or interruption of one of the water supplies should occur, public notification of the need for water conservation, or water rationing during the irrigation season, could help assure that either the Idaho Springs or Newport Wells or a combination of parts of the two could temporarily supply the water needs of both communities.

5.2 Water Rights

Newport, Washington

The water rights and capacities for the well field in Newport are as follows:

Well Designation	Known Capacity (gpm)	Water Right Capacity (gpm)
Wells 1&2	100	70
Well B	80	344*
Well C	110	344*
Well D	180	270
Well E	150	150
Well F	75+	75

* Wells B & C are listed for a combined total of 344 gpm on the same water right

West Bonner Water District #1, Idaho

The water rights and capacities for the springs and well in Oldtown are as follows:

Well Designation	Known Capacity (gpm)	Water Right Capacity (gpm)
Well A	135	121
Springs	480	450

At present there is no documented figure on actual water demand for the combined service areas. However, based on anecdotal experience, the peak usage is estimated to be in the range of 750 gpm. This number is based on an observed drawdown in the Oldtown reservoir over a 12 hour period in addition to an assumed use of 170 gpm in the high-pressure system in Newport.

5.3 System Limitations

This study did not include a detailed hydraulic analysis of the entire water system, however several pertinent points should be mentioned;

The 10" line running from the Oldtown reservoir to the primary service area may become a bottleneck if the capacity and demand of the springs were increased.

The present system does not make use of an available 50,000 gallons of storage in the Oldtown reservoir due to an elevation difference with the Newport reservoir. Some study might be given to this problem to see if the additional capacity could be harnessed.

Both Newport and Oldtown would be well served to collect more extensive and accurate data on demand/use during winter and summer, and on the dimensions, elevations, and capacities of the present system.

Based on the above assumptions and data, it is apparent that the water needs of Newport and Oldtown are adequately served at the present time and that the system has a great deal of built-in flexibility with which to meet a shutdown of one or more sources. It is doubtful, however, that the system is capable of producing the flows which are listed in the water right, particularly in the case of the wells in Newport. Some expansion of the spring capacities may be possible, particularly if low head pumps were employed at the Idaho Spring collection headworks. However, the water right would have to be increased for any additional flow developed.

6 SPILL RESPONSE PLAN

6.1 Emergency Response Plan

Response to a spill of a hazardous material should occur in the following fashion:

a. Local Police or Fire Department is notified by the dispatch.
b. Washington State Department of Ecology (DOE) or Idaho State Department of Environmental Quality (IDEQ) must be notified, depending on jurisdiction.
c. Regional authorities (WSP or ISP) are notified in their jurisdiction is involved.
d. Most of the initial response responsibility falls on the local fire department in Newport and ISP or Bonner County Fire in Oldtown.
e. The chemical nature and extent of the spill are determined by those involved in the initial response effort (local fire department or ISP).
f. If the local response effort has the resources to handle the spill, it will dispatch the appropriate equipment and manpower to the site. A private contractor (Roartech in Spokane) or a neighboring county agency (Spokane City or Fire Station No. 1 in Bonner County) may be called for emergency cleanup response if the spill is beyond the expertise and/or resources of the local response. DOE also has access to cleanup equipment which may be mobilized.
g. Personal Protection Levels and approach strategies are decided on and when sufficient equipment is on site, a **safe** effort will be made to contain the spill (and stop it if it is ongoing) to keep it from spreading while cleanup equipment is being mobilized.

    - The site is secured from public access to a safe distance.
    - Manholes and Dry Wells are blocked off if there is a threat that the spill will enter them.
    - The spill is diverted away from interaction with any surface water sources.
    - The leaking vessel(s) and the area of the spill are isolated to the extent possible and the leak is stopped if it can be done safely with the equipment at hand.

h. When the proper equipment reaches the site;

    - Vacuum Trucks, Backhoes, Loaders, Pumps or other appropriate pieces of equipment are used to collect the hazardous material and drum it for disposal.
    - Skim Booms and pads are used to corral and/or contain the spill if it has reached surface water. All collectible oils, fuels or other floating materials are gathered to the degree possible, and drummed for disposal.
    - Vessels still containing product or waste are pumped off and the material is drummed for disposal.

i. Site is decontaminated;

- The leaking vessel or vehicle is decontaminated (or at least stabilized so that it will not spread contaminants during transport) and removed from the site.
- Contaminated soils are remediated.
- Streets or buildings are pressure washed and the rinsate collected and drummed for appropriate disposal.
- Equipment is decontaminated (either on or off-site depending on safety, appropriateness of location and temporary facilities). Rinsate is collected and drummed for disposal.

Pend Oreille County, Washington

The City of Newport has a Department of Emergency Management which as developed and adopted an Emergency Services Operations Plan and a Hazardous Materials Plan to outline the responsibilities and authority of the various state and local agencies which would respond during a spill event. The Hazardous Materials Plan is intended to meet the Federal requirements set out in the Superfund Amendments and Reauthorization Act (SARA) Title III.

Newport also has a mutual aid agreement with the Pend Oreille Newsprint Company in Usk, Washington, in the event of a railroad spill involving chemicals travelling to or from their pulp plant. The Pend Oreille Newsprint Company also provides technical information and occasional assistance to the local authorities. The county and local volunteer fire departments (in Washington) has some members who are employees of the Pend Oreille Newsprint Company's fire and safety units. These personnel have permission to use Pend Oreille Newsprint Company equipment in the event of a spill.

Bonner County, Idaho

Bonner County does not at present have a Hazardous Materials Plan developed and relies primarily on ISP's Hazardous Materials Specialist, IDEQ, and Bonner County Fire to coordinate any spill response efforts. The State of Idaho has a Hazardous Materials Incident Command and Response Report Plan in effect, however none of the local agencies contacted in the West Bonner area were aware of its existence. If a spill event occurs which is beyond the capabilities of the local authorities to handle, it should be the policy that the emergency response hotline is called (1-800-632-8000). Calling this number will activate and notify the appropriate state and federal agencies. It is also recommended that a copy of this report be obtained by the local police and fire departments for information on training requirements and response procedures and command structures.

6.2 Recommendations

The obvious primary concern during any hazardous materials spill is immediate public safety. After a site has been isolated from public contact and the public is not facing any immediate threat from the spill, including airborne vapors, the second concern should be to keep the spill from contaminating water supplies and posing any extended health risks or environmental degradation.

The most effective means of assuring that appropriate actions are taken during a spill event are by developing and instituting a Hazardous Materials and Spill Response Plan in accordance with SARA Title III and by training local authorities and emergency response personnel. Newport, Washington, has made substantial progress in meeting spill response preparedness. In the interest of preserving the quality of the water supply of both Newport and Oldtown, it would be prudent for Oldtown to begin developing such a program, possibly in coordination with Newport.

While it is not the purpose of this report to outline an emergency spill response program in detail, it is important to emphasize that the following measures be addressed in the programs developed for the Newport-Oldtown area in order to better protect the water supply of both communities;

1. Material Safety Data Sheets (MSDS) on all hazardous materials which are either stored or transported through the area regularly should be kept on file at the local fire departments, the Department of Emergency Management, the local police departments and any other appropriate offices. Names and addresses of the businesses or agencies storing or transporting these materials should also be included in the MSDS files.

    - An effort should be made to find out how these materials will react when introduced to water if the MSDS does not do so, and the answer should be attached to the MSDS.
    - Special attention should be paid during training to those chemicals which are identified as being of the greatest health threat if introduced into the water supply. Handling and cleanup measures should be clearly defined.

2. Efforts must be made to keep any spilled hazardous materials from entering the stormwater disposal system.

    - Drywells, manholes, and catch basin must be covered and isolated from the spill.
    - Spilled material should not be allowed to enter any surface water sources.
    - Washing down any spill site is highly undesirable and should be avoided unless an adequate system has been set up to collect all rinsates from the site.

3. Any soil which has been contaminated during a spill should be removed and replaced with clean soil.

   - The contaminated soil must be handled and disposed of in an appropriate manner.
   - No water should be allowed to pass over, through, or stand on contaminated soils including precipitation, runoff, snow melt, or rinsates. The soil should be covered with plastic if precipitation is expected before removal can be accomplished.

4. All clean up efforts must comply with federal (OSHA, EPA), state (PHD, IDEQ, DOE, Environmental Health) and local standards.

7 POTENTIAL SOURCES OF ALTERNATE WATER SUPPLIES

Additional water supplies may be required in the future as development occurs in the Newport-Oldtown area. One of the ideas behind developing a Well Head Protection Area plan is to identify area outside of the recharge area that is currently in use that could be used if contamination occurred in the currently used aquifer. There are areas both inside and outside of the recharge area of the Idaho Springs that indicate that additional water supplies may be available. Options for alternate supplies in Washington are slightly more limited than in Idaho.

Alternatives in Idaho include locations west of Highway 41, and east of Oldtown across the River. Two deep wells have been drilled in Section 25, Township 56 North, Range 6 West. The production capacity of those wells has been estimated to approach 1500 gallons per minute. Other wells drilled in that area probably would have high production capability.

Water quality information for Solar Acres Subdivision has been supplied by Panhandle Health District. This is one of the deep wells in Section 25. Total coliform bacteria are absent. The following constituents are present at below detection limits: Volatile Organic Compounds (VOCs), Trihalomethanes (THMs), Synthetic Organic Compounds (SOCs), Chlorinated Herbicides, Carbamates, Glyphosate, Endothall, Diaquat, Ethylene dibromide, Dibromochloropropane, Pesticides and PCB's. No data were supplied concerning primary inorganic constituents, nitrate or nitrite. However, the Hamel well, sampled as part of this project, contains nitrates well below the MCL. Thus water quality appears to be excellent at this time.

Another area in Idaho that has potential for future development of water is across the Pend Oreille River from Oldtown in an alluvial valley on the north side of Highway 2. Three wells have been drilled in that alluvium to supply Diamond Height subdivision on the hill above the valley. The well logs all have Frank Anselmo or Frank Anselmo, Jr. as the name of the well owner. One well was abandoned because the casing broke. The other two wells are still in production. Water quality is excellent and production has been estimated in the 100 to 300 gallon per minute range. Maximum capacity of these wells cannot be determined because no drawdown information is available.

Water quality information for Diamond Heights Water Association has been supplied by Panhandle Health District. Total coliform bacteria are absent. The following constituents are below detection limits: Volatile Organic Compounds (VOCs), Trihalomethanes (THMs), Synthetic Organic Compounds (SOCs), Chlorinated Herbicides, Carbamates, Glyphosate, Endothall, Diaquat, Ethylene dibromide, Dibromochloropropane, Pesticides and PCB's. Primary inorganic constituents, nitrate and nitrite are all well below maximum

contaminant levels (MCLs). Thus water quality is excellent at this time.

The sawmill well is in the same general area as the Diamond Heights wells. Converting that well to municipal use is dependent on several factors. Production capacity and associated drawdown are unknown, and would need to be determined. Construction details would have to be evaluated to determine whether the well meets construction standards for municipal wells. Possible sources of contamination at the sawmill must be identified and evaluated.

Areas that could be considered for additional water supply in Washington are in Section 24 or 19 on the bench south of the city of Newport. These areas lie immediately west of the high productivity wells that had been drilled in Idaho. Additional wells in the Newport well field are another possible option.

Production in three Newport wells is near maximum capacity. Pumping rates and drawdown measurements are available for wells D, E, & F. Sewell and Associates pumped the wells at approximate rates of 175, 125, and 75 gpm, respectively. Drawdown in the wells was approximately 30, 60, and 45 feet, respectively. The drawdown in the wells brought the pumping level to within 7, 6 and 5 feet of the top of the well screens. Thus, little or no additional drawdown is available to increase production capacity.

Pros and cons exist to developing water in any of the areas discussed previously. Additional investigations would be required to prioritized those areas. Examples of adverse conditions are the existence of the Idaho Hill landfill in the possible recharge area for any wells that would be drilled on the bench south of Oldtown and Newport. If a well were drilled on the north side of the Pend Oreille River it would require constructing a pipe line across the river to supply Newport and Oldtown. Additional wells drilled in the existing Newport Well field may produce more interference than has been experienced previously. The density of wells in the well field is increasing as wells are drilled. As a result, risk of interference drawdown between two pumping wells is increasing.

No investigations have been conducted to date to determine whether leachate is migrating from the Idaho Hill landfill. Thus, no estimate of the potential for contamination from landfill leachate to wells drilled on the bench is possible. Thusfar, no evidence of contamination of domestic wells north of Idaho Hill landfill exists. However, most unlined landfills produce leachate in some quantity.

Quantitative aquifer tests should be conducted in the Newport well field prior to drilling additional wells in the field. Aquifer testing can determine the amount of well interference that exists and the production potential of the aquifer.

Investigations of potential leachate migration from the Idaho Hill landfill should be considered. Geophysical methods may be cost effective because of the reported shallow depth to bedrock. However, other methods may be required.

8 PUBLIC PARTICIPATION AND EDUCATION

8.1 Public Participation

Public awareness of the location and sensitivity of the Newport/West Bonner aquifer and recharge area will be a key factor in implementing the long-term ground water protection plan. Fortunately, current land uses within the aquifer and recharge areas are primarily rural with no significant commercial or industrial activities.

Securing cooperation and participation of residents and businesses within the recharge area will be based upon a rational and reasonable approach to disseminating information. It is important for residents and business owners to recognize that the water table they live and conduct business over supplies the water that they drink as well as their children and families within the Cities of Oldtown and Newport.

Public participation in the Wellhead Protection Plan was initiated with a news release, which is enclosed in Appendix D, and a public informational meeting held on March 10, 1993, at the Idaho Hills School. The purpose of the public informational meeting was to describe the scope of the proposed well protection planning effort and to seek input from residents on issues related to drinking water quality. Approximately 15 people were in attendance at the informational meeting.

In addition, during the course of the ground water monitoring phase of the wellhead project, 60 notices were mailed to owners of ground water wells within the recharge areas of the Idaho Springs and Newport well field requesting permission to perform water level depth and water quality measurements. These notices, a copy of which is enclosed in Appendix D, also notified property owners of the wellhead protection study which is underway.

It is the intent of the Wellhead Advisory Committee to hold two more public informational hearings on the wellhead protection plan and to present the final plan to the city of Newport City Council and the West Bonner Water District Board of Directors for adoption.

8.2 Public Information and Education

Once the final wellhead protection plan is adopted by both governing boards, a public information and education program should be instituted to expand public awareness of the location of the aquifer and recharge areas and its sensitivity. Methods to consider to implement this information and education program include preparation of an inexpensive 2-page brochure which delineates the aquifer and lists reasons it should be protected and ways in which property owners and business owners can assist in this ground water protection effort. This information can be published in the paper as well as disseminated to schools, service groups, and be left in public places such as both city halls, libraries, and government offices.

Personal visits to each of the commercial activities identified in the inventory of potential contamination sources is also recommended to seek cooperation and cognizance in on-site management procedures which can help protect the aquifer from unintentional contamination.

Additional public participation and information would occur through public hearing procedures if Bonner County and Pend Oreille County should elect to implement aquifer-sensitive overlay zones through its zoning procedure. In addition to implementing an important land use tool in protection of the aquifer, the process of implementing an aquifer overlay zone would heighten awareness of elected officials and property owners who participate in the hearings in the need to protect the aquifer and recharge area of their own drinking water supplies.

Ed Adams of WSU cooperative extension in Spokane has been instrumental in modifying a midwestern ground water protection program for use in Washington. The Washington program is called HOME*A*SYST. It is to help homeowners in rural area to assess the potential risk to the home or farm well from sources like septic tanks and storage tanks for fuel, pesticides, or herbicides. Arranging for Ed to describe the program to local residents should enhance local ground water protection education efforts. Liz Cody, Idaho Wellhead Protection Coordinator, has provided additional references and material relevant to implementation of local wellhead protection plans. That material is supplied in Appendix E.

Additional informational materials could be distributed by permit issuing government offices with authority for building construction or other activities which may have detrimental impact on ground water sources. Available information could include reference material prepared by government agencies or trade groups such as the Associated General Contractors, which includes information on Best Management Practice and Pollution Control/Prevention Methods.

APPENDIX A

MWCAP AND GPTRAC MODEL INPUT

This appendix contains summaries of input used to determine 2, 5, and 10 year time of travel for the Idaho Springs and Newport well fields. The computational model is the MWCAP module of Blanford and Huyakom, WHPA Version 2.1, April 1992. The model is distributed by International Ground Water Modeling Center, Golden, Colorado.

No flow boundaries are used in each model effort to simulate the Hoodoo Mountains east of the West Bonner Aquifer, and the intrusive ledge reported west of the City of Newport. A pumping image well is used to simulate the large topographic relief north of the West Bonner Aquifer. This simulation requires the use of GPTRAC rather than MWCAP. Transmissivity is estimated for the West Bonner Aquifer. Transmissivity for the Newport well fields is calculated from short pumping and recovery tests that were conducted by James A. Sewel, and Associates, Consulting Engineers, Newport, Washington.

West Bonner (Idaho Spring) Aquifer with Barrier to simulate Hoodoo Mountains.

```
UNITS USED FOR SIMULATION = 1
     0 = METERS AND DAYS
     1 = FEET AND DAYS
COORDINATE LIMITS OF STUDY AREA
     XMIN =      -8000.00
     XMAX =       4000.00
     YMIN =     -10000.00
     YMAX =       4000.00
MAXIMUM STEP LENGTH = 50.00
NUMBER OF WELLS = 1
```

WELL NUMBER 1

```
                          X COORDINATE =          0.0
                          Y COORDINATE =          0.0
                       WELL DISCHARGE =      86000.0
                       TRANSMISSIVITY =       1000.0
                  HYDRAULIC GRADIENT =          0.004000
               ANGLE OF AMBIENT FLOW =         90.00
                    AQUIFER POROSITY =          0.20
                  AQUIFER THICKNESS =         60.00
                       BOUNDARY TYPE = BARRIER BOUNDARY
      DISTANCE FROM WELL TO BOUNDARY =       1000.00
ORIENTATION OF LOCAL COORDINATE SYSTEM =        180.00 NORTH-SOUTH
                                              LOCATED EAST OF SPRINGS
        SELECTED CAPTURE ZONE OPTION = TIME-RELATED
                  TRAVEL TIME VALUE =        365.00 DAYS
                  TRAVEL TIME VALUE =        730.00 DAYS
                  TRAVEL TIME VALUE =       1825.00 DAYS
                  TRAVEL TIME VALUE =       3650.00 DAYS
CAPTURE ZONE BOUNDARY PLOTTING OPTION = NO
                 NUMBER OF PATHLINES =         10
```

Newport Well Field 1

UNITS USED FOR SIMULATION = 1
0 = METERS AND DAYS
1 = FEET AND DAYS
COORDINATE LIMITS OF STUDY AREA
XMIN = -6000.00
XMAX = 6000.00
YMIN = -7000.00
YMAX = 7000.00
MAXIMUM STEP LENGTH = 50.00
NUMBER OF WELLS = 1

WELL NUMBER 1

X COORDINATE =	0.0
Y COORDINATE =	0.0
WELL DISCHARGE =	26000.0
TRANSMISSIVITY =	300.0
HYDRAULIC GRADIENT =	0.010000
ANGLE OF AMBIENT FLOW =	40.00
AQUIFER POROSITY =	0.20
AQUIFER THICKNESS =	50.00
BOUNDARY TYPE =	BARRIER BOUNDARY
DISTANCE FROM WELL TO BOUNDARY =	2000.00
ORIENTATION OF LOCAL COORDINATE SYSTEM =	0.00 NORTH-SOUTH
	LOCATED WEST OF NEWPORT
SELECTED CAPTURE ZONE OPTION =	TIME-RELATED
TRAVEL TIME VALUE =	365.00 DAYS
TRAVEL TIME VALUE =	730.00 DAYS
TRAVEL TIME VALUE =	1825.00 DAYS
TRAVEL TIME VALUE =	3650.00 DAYS
CAPTURE ZONE BOUNDARY PLOTTING OPTION =	NO
NUMBER OF PATHLINES =	10

APPENDIX B

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 36
TOWNSHIP 56 NORTH **RANGE** 6 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	1	3	0	0
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	0	7	0	0
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	1	1	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	0	1	0	0
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	0	5	0	0
PURPLE	OTHER RURAL LAND/WASTE	1	1	0	0
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	0	0	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 32
TOWNSHIP 56 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	0	0	3	0
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	0	1	1	3
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	0	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	0	1	1	3
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	0	0	3	0
PURPLE	OTHER RURAL LAND/WASTE	0	0	2	1
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	0	2	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 30
TOWNSHIP 56 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING				
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)				
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)				
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)				
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)				
PURPLE	OTHER RURAL LAND/WASTE				
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9				

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 29
TOWNSHIP 56 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING				
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)				
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)				
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)				
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)				
PURPLE	OTHER RURAL LAND/WASTE				
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9				

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 25
TOWNSHIP 56 NORTH **RANGE** 6 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	0	1	0	1
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	3	0	1	3
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	0	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	0	0	0	0
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	1	2	1	1
PURPLE	OTHER RURAL LAND/WASTE	0	2	2	0
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	0	0	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 6
TOWNSHIP 55 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	3	7	0	2
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	1	1	2	1
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	0	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	1	2	0	3
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	3	3	0	0
PURPLE	OTHER RURAL LAND/WASTE	4	4	3	8
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	1	1	0	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 5
TOWNSHIP 55 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	3	1	2	1
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	5	2	3	8
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	0	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	1	1	3	4
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	3	0	2	1
PURPLE	OTHER RURAL LAND/WASTE	7	2	10	6
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	1	0	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 1
TOWNSHIP 55 NORTH **RANGE** 6 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	2	1	0	0
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	2	1	0	1
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	0	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	1	0	0	0
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	0	1	0	0
PURPLE	OTHER RURAL LAND/WASTE	2	0	0	1
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	0	0	0

NEWPORT WELLHEAD PROTECTION STUDY

SECTION 31
TOWNSHIP 56 NORTH **RANGE** 5 WEST

COLOR	LAND USE TYPE	NW 1/4	NE 1/4	SW 1/4	SE 1/4
BLACK	MANUFACTURED HOUSING	7	8	6	3
RED	IMPROVEMENTS ON CATEGORIES 10 AND 12 (RESIDENTIAL)	9	9	0	6
BLUE	IMPROVEMENTS ON CATEGORY 13 (COMMERCIAL)	1	0	0	0
GREEN	CATEGORIES 1–6 (FOREST, AGRICULTURAL)	1	0	1	3
ORANGE	CATEGORIES 12–14 (RURAL RESIDENTIAL, COMMERCIAL AND INDUSTRIAL TRACTS)	5	4	6	3
PURPLE	OTHER RURAL LAND/WASTE	3	16	6	13
BROWN	BARE FOREST LAND VALUE/HOMESITE VALUE ON RURAL INVSTMNT LAND CAT. 1–9	0	0	2	0

APPENDIX C

NEWPORT LAND USE COUNT

SECTION 13–31–45

RESIDENTIAL – SINGLE UNIT (Incl. Mobiles)	33
UNDEVELOPED & UNUSED LAND AREA	6
DESIGNATED FOREST LAND	9

SECTION 14–31–45

RESIDENTIAL – SINGLE UNIT (Incl. Mobiles)	4
UNDEVELOPED & UNUSED LAND AREA	7
DESIGNATED FOREST LAND	5
AGRICULTURAL (OPEN SPACE)	1

SECTION 23–31–45

RESIDENTIAL – SINGLE UNIT (Incl. Mobiles)	8
UNDEVELOPED & UNUSED LAND AREA	10
DESIGNATED FOREST LAND	3
AGRICULTURAL (OPEN SPACE)	1
CLASSIFIED FOREST LAND	4
RAILROAD RIGHT–OF–WAY	1
MINERAL INTEREST ONLY	1

SECTION 24–31–45

RESIDENTIAL – SINGLE UNIT (Incl. Mobiles)	13
UNDEVELOPED & UNUSED LAND AREA	23
DESIGNATED FOREST LAND	2
RAILROAD RIGHT–OF–WAY	2
MINERAL INTEREST ONLY	2
BUILDING MATERIALS	1

SECTION 25–31–45

UNDEVELOPED & UNUSED LAND AREA	4
DESIGNATED FOREST LAND	3
CLASSIFIED FOREST LAND	1

SECTION 26–31–45

UNDEVELOPED & UNUSED LAND AREA	4
DESIGNATED FOREST LAND	3
RAILROAD RIGHT–OF–WAY	1
AGRICULTURE (OPEN SPACE)	1
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	6

SECTION 35–31–45

UNDEVELOPED & UNUSED LAND AREA	15
DESIGNATED FOREST LAND	7
MINERAL INTEREST ONLY	1
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	2
CLASSIFIED FOREST LAND	1

SECTION 36–31–45

UNDEVELOPED & UNUSED LAND AREA	11
DESIGNATED FOREST LAND	1

SECTION 1–30–45

UNDEVELOPED & UNUSED LAND AREA	1
DESIGNATED FOREST LAND	3
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	
CLASSIFIED FOREST LAND	2

SECTION 2–30–45

UNDEVELOPED & UNUSED LAND AREA	5
DESIGNATED FOREST LAND	6
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	11
CLASSIFIED FOREST LAND	1
AGRICULTURE (NOT CLASS OPEN SPACE)	1
AGRICULTURE (OPEN SPACE)	5

SECTION 20–30–45

DESIGNATED FOREST LAND	3
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	4
CLASSIFIED FOREST LAND	1
RAILROAD RIGHT–OF–WAY	1
AGRICULTURE (OPEN SPACE)	1

NE 1/4 SECTION 13–30–45

DESIGNATED FOREST LAND	1

SECTION 6–30–46

UNDEVELOPED & UNUSED LAND AREA	2
DESIGNATED FOREST LAND	5

SECTION 7–30–46

UNDEVELOPED & UNUSED LAND AREA	1
DESIGNATED FOREST LAND	2

NE 1/4 SECTION 18–30–45

DESIGNATED FOREST LAND	1

SECTION 18–31–46

UNDEVELOPED & UNUSED LAND AREA	1
DESIGNATED FOREST LAND	1
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	7
MINERAL INTEREST ONLY	1

SECTION 19–31–46

UNDEVELOPED & UNUSED LAND AREA	11
DESIGNATED FOREST LAND	1
RESIDENTIAL–SINGLE UNIT (Incl. Mobiles)	3

SECTION 30–31–46

UNDEVELOPED & UNUSED LAND AREA	7
DESIGNATED FOREST LAND	2

SECTION 31–31–46

UNDEVELOPED & UNUSED LAND AREA	6
DESIGNATED FOREST LAND	3

APPENDIX D

NOTICE OF PUBLIC MEETING

CITY OF NEWPORT/WEST BONNER WATER DISTRICT NO. 1

DRINKING WATER QUALITY PROTECTION STUDY TO BE DISCUSSED

The City of Newport and West Bonner Water District No. 1 will hold a Public Informational Meeting at 7:00 P.M., on March 10, 1993 at the Idaho Hill Elementary School, in Oldtown, Idaho.

The purpose of the Public Informational Meeting will be to discuss the scope and schedule of a Well Protection Study which the City of Newport and West Bonner Water District No. 1 are currently working on as a cooperative venture.

The Consulting Firm of Welch, Comer and Associates and Dr. John Riley, Hydrologist have been retained to conduct the Wellhead Protection Study. The Consultants will be in attendance at the Meeting to discuss the details of the Study and the importance of the community's developing a Wellhead Protection Plan to help assure the long term quality and cost efficiency of drinking water for the City of Newport and West Bonner Water District users. All water users from the City of Newport and West Bonner Water District service areas are cordially invited to attend as well as other property owners in the vicinity of the Newport and West Bonner Water District spring water shed recharge area and individuals that are generaly interested in water quality protection.

Further information regarding the Newport/West Bonner Wellhead Protection Plan may be obtained from: Jack O. Henderson, City Administrator, Newport, by calling 447-5611 or Gwen Knowles, Clerk of the Board, Oldtown, by calling 437-3833.

/s/ Jack O. Henderson
City Administrator

Published in the Newport Miner February 24, 1993

Published in the Priest River Times February 24, 1993

PUBLIC NOTICE

THE CITY OF NEWPORT AND WEST BONNER WATER DISTRICT NO. 1 ARE JOINTLY SPONSORING A WELLHEAD PROTECTION PROGRAM PAID FOR WITH LOCAL FUNDING AND STATE GRANT FUNDS FROM THE DIVISION OF ENVIRONMENTAL QUALITY, STATE OF IDAHO AND DEPARTMENT OF ECOLOGY, STATE OF WASHINGTON. THIS IS PHASE I OF A TWO PHASE WELLHEAD PROTECTION PROGRAM. PHASE I IS THE PLANNING AND INFORMATIONAL PHASE; PHASE II IS THE IMPLEMENTING AND INFORMATIONAL PHASE. THE COST OF THE WELLHEAD PROTECTION PROJECT TO COMPLETE PHASE I IS APPROXIMATELY $60,000. PHASE I WILL BE COMPLETED ON OR BEFORE OCTOBER 31, 1993.

WHAT IS A WELLHEAD PROTECTION PROGRAM

A WELLHEAD PROTECTION PROGRAM (WHPP) IS DESIGNED TO PROTECT THE AREA CONTRIBUTING GROUNDWATER TO A PUBLIC WATER SUPPLY WELL FROM CONTAMINATION. SHOULD ACCIDENTAL CONTAMINATION OCCUR, THE WHPP PROVIDES REMEDIAL ACTION AND A CONTINGENCY PLAN.

HOW THE NEWPORT/WEST BONNER WATER DISTRICT WHPP WILL BE DEVELOPED

A WELLHEAD ADVISORY BOARD HAS BEEN ESTABLISHED THAT CONSISTS OF INTERESTED GOVERNMENTAL ENTITIES AND PRIVATE INDIVIDUALS THAT WILL MONITOR AND ASSIST NEWPORT AND WEST BONNER WATER DISTRICT TO MEET THE WHPP TASKS IDENTIFIED IN CONTRACTS WITH THE DIVISION OF ENVIRONMENTAL QUALITY AND DEPARTMENT OF ECOLOGY.

A HYDROGEOLOGIST WILL BE RETAINED TO CONDUCT THE TECHNICAL SCOPE OF WORK, SUCH AS DELINEATION OF THE SOURCE AQUIFERS, TIME OF TRAVEL SHOULD CONTAMINATES BE IDENTIFIED IN THE WELLHEAD PROTECTION AREA, PROCEDURES TO PROTECT WATER SUPPLIES, IDENTIFY POTENTIAL FUTURE SOURCES OF DRINKING WATER, AND LAND MANAGEMENT PLANS.

INVOLVE THE PUBLIC BY DEVELOPING AN EDUCATIONAL WELLHEAD PROTECTION PROGRAM.

ADOPTION OF THE WELLHEAD PROTECTION MANAGEMENT PLAN BY THE STATE OF IDAHO, STATE OF WASHINGTON, WEST BONNER WATER DISTRICT NO. 1 AND THE CITY OF NEWPORT AND MAKE APPLICATION FOR GRANT FUNDING TO COMPLETE PHASE II OF THE WELLHEAD PROTECTION PROJECT.

WELLHEAD ADVISORY BOARD MEETING

THE FIRST WELLHEAD ADVISORY BOARD MEETING WILL BE HELD AS FOLLOWS:

TIME:	7:00 PM
DATE:	JUNE 24, 1992
LOCATION:	NEWPORT FIRE HALL, W309 2ND AVE. NEWPORT, WASHINGTON

SUBSEQUENT MEETINGS AND PUBLIC HEARINGS WILL BE SCHEDULED BY THE WELLHEAD ADVISORY BOARD.

ALL CONCERNED CITIZENS ARE ENCOURAGED TO ATTEND THE MEETING. FOR FURTHER INFORMATION, PLEASE CALL NEWPORT CITY HALL AT 447-5611 OR WEST BONNER WATER DISTRICT AT 437-3833.

PUBLISH IN THE NEWPORT MINER: JUNE 10, 17, 1992
PUBLISH IN PRIEST RIVER TIMES: JUNE 10, 17, 1992

WELCH, COMER & ASSOCIATES, INC.
CONSULTING ENGINEERS and LAND SURVEYORS

MEMORANDUM

TO: Jack Henderson - City of Newport
Lonnie Orr - West Bonner Water District
Brian Orr - City of Oldtown
Dr. John Riley

FROM: Maureen McCunn
DATE: July 14, 1993
SUBJECT: Wellhead Protection Project

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Attached hereto is the list of property owners that were mailed the letter requesting permission to access their well for the above referenced project. Also included is the form of the letter and the permission slip.

Letters were mailed to Washington property owners on July 13th and Idaho property owners on July 14th.

220 Harbor Plaza • 610 W. Hubbard Ave. • Coeur d'Alene, Idaho 83814 • (208) 664-9382 • Fax (208) 664-5946

NEWPORT/W. BONNER WATER DISTRICT
WELLHEAD PROTECTION PROJECT

POSSIBLE WELLS TO USE FOR SAMPLING

IDAHO:

OWNER	LOCATION	TOTAL DEPTH	STATIC WELL LEVEL	Well Log Ref. No.
Stone, Bruck Rt 2 Box 306 Oldtown, ID 83822	Sec 32 T56N R5W NW 1/4 – SW 1/4 (56N05W325900)	80	68	165
Malm, Helmer*	Sec 5 T55N R5W SW 1/4 – SW 1/4	162	140	97
Fricker, Gary*	Sec 5 T55N R5W NW 1/4 – NW 1/4	377	60	100
Utty*	Sec 30 T56N R5W SE 1/4 – SE 1/4	120	80	140
Hughes, Jim*	Sec 30 T56N R5W SE 1/4 – SW 1/4	135	100	132
Moe, Ben Rt 2 Box 245 Oldtown, ID 83822	Sec 31 T56N R5W NE 1/4 – SW 1/4? (56N05W312500 & 2550)	120	90	149
de Forge, Kenneth PO Box 1344 Newport, WA 99156	Sec 31 T56N R5W NE 1/4 – NW 1/4 (56N05W312571)	120	85	145
Ockert, Marvin*	Sec 31 T56N R5W NE 1/4 – NW 1/4	72	55	150
Ray, Bill H Box 84 Connell, WA 99326 (55N052069300) Haworth, Ralf D PO Box 308 Newport, WA 99156 (55N05W069600)	Sec 6 T55N R5W SE 1/4 – SE 1/4 Lent, Orville	80	63	107
Taylor, Carol Rt 2 Box 9 Oldtown, ID 83822	Sec 6 T55N R5W NE 1/4 – NE 1/4 (55N05W063301)	218	175	112
Clark, Bob*	Sec 25 T55N R6W NE 1/4 – SE 1/4	215	190	40

Lourence, Alford*	Sec 25 T55N R6W NW 1/4 – SE 1/4	211	160	43
Turner, Burton H*	Sec 36 T56N R6W NW 1/4 – NW 1/4	66	47	63
Dualy, Joe*	Sec 36 T56N R6W NW 1/4 – NE 1/4	70	50	58
R–H Roseborough*	Sec 36 T56N R6W SE 1/4 – NW 1/4	271	190	61
Dualy, Joe*	Sec 36 T56N R6W SE 1/4 – SE 1/4	78	60	59
Doolittle, David J*	Sec 1 T55N R6W SE 1/4 – NE 1/4 Silver Birch Acres	270	100	11

WASHINGTON:

OWNER	LOCATION	TOTAL DEPTH	STATIC WELL LEVEL	Well Log Ref. No.
Posk, Phillip and/or John 1912 Sansone Drive Santa Rosa, CA 93402	Sec 24 T31N R45E NW 1/4 – SE 1/4	165	130	505
Teufel, Daniel PO Box 1363 Newport, WA 99156	Sec 24 T31N R45E NW 1/4	58	23	389
Hoepfer, Norman D HC 01, Box 194 Nordman, Idaho 83848	Sec 24 T31N R45E	375	5	265
Wells, Robert 55452 Hwy 13 Meeker, CO 81641	Sec 30 T31N R46E NW 1/4 – SW 1/4	325	0	167
Bebow*	Sec 30 T31N R46E Gov Lot 8, Blk 1	146	120	334
Wells, Robert 55452 Hwy 13 Meeker, CO 81641	Sec 30 T31N R46E SW 1/4 – SW 1/4	289	0	182
Cornell, Charles 21515 189th S.E. Monroe, WA 98272	Sec 31 T31N R46E	375	208	467

* Unable to locate current address or owner.

PERMISSION SLIP MAILED TO THE FOLLOWING PROPERTY OWNERS SELECTED FROM 1992 ASSESSOR ROLL

Name & Address	Parcel No.	Legal Description
Ockert, Arvin Rt 2 Box 335 Oldtown, ID 83822	55N05W050751	5–55–5W N2NW GOV LOT 2 Hoodoo Loop Road
Stinedurf, LeRoy Rt 2 Box 337 Oldtown, ID 83822	55N05W052850	5–55–5W N2SE Govt Lot 3
White, Paul PO Box 1821 Newport, WA 99156	55N05W053751	5–55–5W W2SWNW Less Tax 3 Hoodoo Loop Road
Grandchamp, Christian PO Box 981 Newport, WA 99156	55N05W055600	5–55–5W N 132' of W2SWNWSW
Wells, Sherrie & Tony PO Box 816 Oldtown, ID 83822	55N05W057950	5–55–5W NWNWSE Less E 255' of Road
Hughes, James Rt 2 Box 359 Oldtown, ID 83822	55N05W059010	5–55–5W N2SESE
Goldberg, Theil PO Box 1800 Oldtown, ID 83822–1521	55N05W063401	6–55N–5W Tax 4
Jamison, Grover PO Box 1021 Newport, WA 99156	55N05W066700	6–55N–5W W2NESESW
Lent, Matthew Rt 2 Box 347 Oldtown, ID 83822	55N05W0667650	6–55N–5W SENESE
Malm, Hilmer Rt 2 Box 361 Oldtown, ID 83822	55N06W011501	1–55–6W S2 of E 660' of Gov Lot 4 SWSWNE
Shults, Byron Rt 2 Box 200 Oldtown, ID 83822	55N06W012250	1–55–6W S 780' of E 572' of E2SENE
Schaff, Michael PO Box 1631 Oldtown, ID 83822	55N06W014350	1–55–6W Tax 2
Malakowsky, Martin Rt 2 Box 203 Oldtown, ID 83822	55N06W019100	1–55–6W Tax 1
Schutt, Gladys Rt 2 Box 273 Oldtown, ID 83822	56N05W302250	30–56N–5W S 850' of Govt Lot 6 Less Tax 41

Dalke, Robert PO Box 1243 Newport, WA 99156	56N05W305700	30–56N–5W Tax 46
Humrich, Dennis P Rt 2 Box 263 Oldtown, ID 83822	56N05W307200	30–56N–5W NESE & N2SESE Less Tax 5 & R/W
Engen, Bjarne Rt 2 Box 256 Oldtown, ID 83822	56N05W308990	30–56N–5W Tax 34 Blackthorn Road
Krell, Gerald Rt 2 Box 281 Oldtown, ID 83822	56N05W310050	31–56N–5W Tax 34
Meek, Dennis PO Box 1371 Priest River, ID 83856	56N05W310700	31–56N–5W Tax 3
Barney, Tonnie Rt 2 Box 300 Oldtown, ID 83822	56N05W311100	31–56N–5W Tax 27
Billbe, Patricia Rt 2 Box 237 Oldtown, ID 83822	56N05W313000	31–56N–5W E2NE Govt Lot 1
Yates, Ralph Rt 2 Box 228 Oldtown, ID 83822	56N05W313800	31–56N–5W Tax 17
Womack, Gary Sr Rt 2 Box 229–B Oldtown, ID 83822	56N05W315850	31–56N–5W SE of Govt Lot 3
Elliott, Grant Rt 2 Box 307 Oldtown, ID 83822	56N05W319140	31–56N–5W SENESESE E 66' of SWNESESE
Clewitt, Frank Clewitt Betty Rt 2 Box 149 Oldtown, ID 83822	56N05W320600	32–56N–5W W2NE
Dillon, Eugene Rt 2 Box 332 Oldtown, ID 83822	56N05W328701	32–56N–5W SWSWSE
Campbell, Walter Rt 2 Box 130 Oldtown, ID 83822	56N06W254801	25–56N–6W Tax 40 Less Tax 47, NWNWSE Less S 15', Pt of Silver Birch Orchards
Jones, Jack Rt 2 Box 129 Oldtown, ID 83822	56N06W255701	25–56N–6W Tax 49
Campbell, Walter Rt 2 Box 130 Oldtown, ID 83822	56N06W257801	25–56N–6W NENWSE Less Pts SENWSE Less Tax 43 & 44

Crone, Lloyd Jr Rt 2 Box 133 Oldtown, ID 83822	56N06W258300	25–56N–6W Tax 43, N 30' NESWSE
Pitts, Carl Rt 2 Box 145 Oldtown, ID 83822	56N06W360100	36–56N–6W Tax 6
Burnham, Frank Rt 2 Box 152 Oldtown, ID 83822	56N06W360301	36–56N–6W S2NENE Less Tax 3 & 7
Kuprienko, Wolodja Box 1663 Newport, WA 99156	56N06W361200	36–56N–6W E 198' of NESWNE
Hiebert, Rudolph Rt 2 Box 156 Oldtown, ID 83822	56N06W361850	36–56N–6W S 350' of N 515' of NESENE
Bartels, William PO Box 528 Newport, WA 99156	56N06W362100	36–56N–6W SWSENE
Bell, Rose Marie PO Box 275 Newport, WA 99156	56N06W362300	36–56N–6W SESENE, NESENE, Less N 51' and Tax 1

July 12, 1993

Dear Property Owner:

Our engineering firm has been employed by the West Bonner Water District and the City of Newport to perform a study of the watershed which supplies water to the West Bonner springs and city wells.

In order to determine the groundwater table direction of flow, gradient, and background quality, we are requesting your permission to allow a local certified well driller to measure the depth and water in your well and take a water sample from your faucet.

If you decide to allow us to perform this depth and quality check, we will contact you again to arrange a convenient time to perform this check which would take about 1/2 hour. The results of the wellhead study will be presented at several public meetings scheduled in September and October, 1993.

Please feel free to contact our firm or the following representatives of the city and/or the water district if you would like further information:

Lonnie Orr, Chairman – West Bonner Water District	(509) 447–5611
Jack Henderson, City Administrator – City of Newport	(509) 447–5112

If you are agreeable to allow us to sample your well, please sign the enclosed form and return it in the self–addressed, stamped envelope provided by July 28th. Also, please provide us with directions to your property and your phone number so we may contact you. Thank you for your consideration of this request.

Sincerely,
Welch, Comer & Associates, Inc.

Larry E. Comer

Larry E. Comer, P.E./L.S.
Principal Engineer

LEC:spm
Enclosure

c:\9–misc\9002–prop.wr1

WEST BONNER WATER DISTRICT/ CITY OF NEWPORT WELLHEAD PROTECTION STUDY

PERMISSION FORM

_____ , Owner of property described as:

(Property Owner)

(Legal Description) _____

_____

hereby grant permission to the West Bonner Water District and City of Newport, to allow its agents/consultants to measure the depth and quality of our well at a time pre-arranged with us. The well sampling will be performed by a lisenced well driller using proper sanitary methods. Results of the study will be mailed back to me after the analysis is complete.

Permission granted by:

_____ _____

(Signature)

_____

(Mailing Address)

_____ _____

(Date) (Phone Number)

Directions to Property: _____

_____

_____

_____

(PLEASE SIGN AND RETURN IN ENCLOSED ENVELOPE)

APPENDIX E

IDAHO DEPARTMENT
OF HEALTH AND WELFARE

DIVISION OF
ENVIRONMENTAL QUALITY

1410 North Hilton, Statehouse Mail, Boise, ID 83720-9000, (208) 334-0502

Cecil D. Andrus, Governor

March 8, 1994

Dr. John Riley
Consulting Hydrogeologist
P.O. Box 453
Post Falls, Idaho 83854-0543

Dear Dr. Riley;

Over the past few years, I have been collecting general information that may help us on implementation of local wellhead protection plans. Here are some possible references:

John Miller - CH2M Hill; Tampa, Florida; (813) 281-0777

John gave a presentation to an advisory committee that assisted in developing the delineation policies for the state plan. He has worked with many communities throughout the planning and implementation process. He brought a useful handout, a flowchart showing the different group types and the general processes that are undertaken (see attachment).

He indicated that the ordinance committee is usually made of attorneys and city and county planners. The public participation committee is made of a wide variety of people and he stressed that this is important.

Jon Witten - Horsley & Witten, Inc.; Barnstable, Mass.; (508) 362-5570

Jon is an environmental planner that has been working closely with the wellhead protection program on a nation level with EPA as well as providing consulting services to communities across the nation. Since he is a planner, he has worked with communities throughout the implementation process and may have excellent insight acquired only by experience.

Barry Beyeler - City of Boardman; Boardman, Oregon; (503) 481-9252

Barry is the director of the city public works department. The city completed their EPA demonstration project sometime last year, which was similar in scope to the Newport/West Bonner Water District project (delineation, sources of contamination, suggested management strategies, etc.). They probably are in the process of implementation and could discuss their chosen procedure.

Barbara Barber - City of Weiser; Weiser, Idaho; Phone #?

The city of Weiser has recently passed a wellhead protection ordinance with the leadership of Barbara, who is a city council person. It took them a bit of time due to a change in mayors as well as some of the concerns of their attorney. They have chosen to enforce their ordinance using the city building site inspector.

Charlie Vandam - Land and Water Consultant; Missoula, Montana; Phone #?

Mr. Vandam was at the conference at Coeur d'Alene and his presentation was titled "Development of a Wellhead Protection Ordinance for Missoula, MT". Might be another good reference as they have been through the process.

Designs for Wellhead Protection in Central Wisconsin

Remembered that I had this document and found some relevant material which is attached to the letter. It is a copy of implementation guidance developed for two communities in Wisconsin, Weston, Wisconsin Rapids and Grand Rapids.

Hope this information will be helpful. If you have any questions, please give me a call at (208) 334-5860.

Sincerely,

Elizabeth Cody

Elizabeth Cody
Wellhead Protection Coordinator

Attachments

TYPICAL FLOW CHART

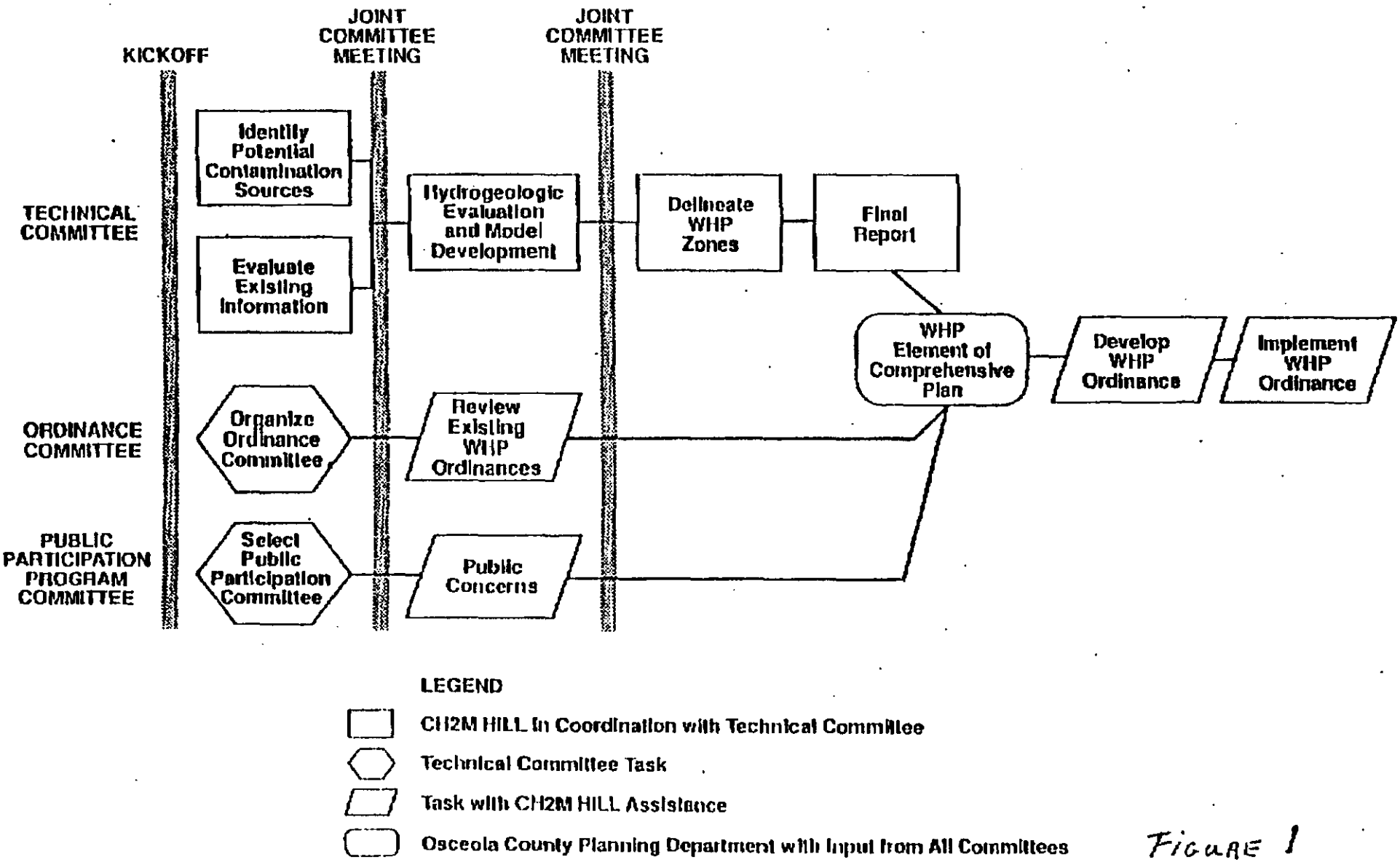

Figure 1

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Implementation guidance for Wisconsin Rapids and town of Grand Rapids

Following are suggestions of actions Wisconsin Rapids, the town of Grand Rapids and the county may take to begin the process of approving and implementing a WHP plan. Completion of this report is only the beginning step, providing information on the ZOC, potential contaminant sources and management choices. Local governments and the communities may decide what level of WHP is desired and how it will be achieved.

Joint implementation by the city and town:

* Establish a joint study committee composed of government officials and interested citizens.

  - Review, comment on the report and suggest modifications and further actions to be taken.

  - Solicit public comment and/or hold a public hearing.

  - Examine other ground water plans. Examples are the "Portage County Groundwater Plan" (Portage Co., 1987), "Marathon County Groundwater Plan" (Marathon Co., 1988), "Groundwater Protection Principles and Alternatives for Rock County" (Zaporozec, ed., 1985) and the Rib Mountain Municipal Well Recharge Area Overlay District (Rib Mountain Sanitary District, 1985).

* Jointly establish WHPA management zones.

  - Establish WHPA management zones based on the ZOCs, TOTs, potential contaminant source characteristics, major roads and civil boundaries.

* Jointly prioritize management options and potential contaminant sources.

  - Review options and select one or more for implementation. Refer suggestions to the appropriate personnel or agencies for further modifications.

* Designate a joint committee to implement selected management options or a comprehensive management plan.

  - Rely on local officials, interested citizens and local resource personnel in various agencies such as UWEX, Wood County Health Department, Wood County Planning and Zoning, SCS, LCC and DNR.

  - Hire or contract with a ground water specialist for additional assistance.

Implementation with county involvement:

* The city and town request the county to assist the implementation of ground water protection measures for both city and private wells.

* The city and town cooperate with the county in the development of a countywide groundwater protection plan or ordinances.

Implementation by each community:

* Any suggestion discussed above may also be implemented by either community separately.

* Obtain legal assistance from a municipal attorney, UWEX and/or other agencies.

* Revise plan if needed and submit it for official governmental approval, adoption and/or action.

* Conduct further investigative studies.

  - Install monitoring wells and/or use existing wells to conduct ground water studies. For example, monitoring can be used to help better define the ZOC or TOT lines.

  - Conduct monitoring as an early warning system, to monitor for indicator parameters (such as nitrate) and to help identify the source of a potential contaminant.

  - Conduct more detailed inventories of sources to better estimate their numbers in the ZOC.

Alternative water supplies

The city of Wisconsin Rapids currently operates three collector wells spaced about 3,500 to 5,000 ft apart. The ZOCs for the three wells overlap a short distance upgradient from the wells. The city has difficulty meeting recent high demand periods even with all three wells operating at higher than desired rates. Studies contracted by the city for installation of a fourth well are complete but construction is awaiting completion of permitting and legal review. The proposed new site would be unaffected by contamination of ground water at the current wellfield.

Although use of water from the Wisconsin River may be possible, additional treatment would be required and costs would be very high (Wilson, pers. comm., 1989). Water supply options for Wisconsin Rapids include water conservation, temporary water treatment facilities such as an air stripper and installation of one or more new wells.