

AQUIFER CLASSIFICATION WORK SHEET

DATE: February 3, 2007.

AQUIFER MAPPER: William S. Hodge, P. Geo.

AQUIFER LOCATION: Powell River, BC.

AQUIFER NUMBER: 839

NTS MAP SHEET: 92F/16

BCGS TRIM MAP: 092F.078, .079 and 092F.089

CLASSIFICATION: IIC

RANKING VALUE: 8

Aquifer Size:

12.9 km².

Aquifer Boundaries:

This unconsolidated aquifer was delineated based on well log lithology and geologic boundaries. Because the aquifer is associated with a low degree of certainty where it is bounded by well lithology, a dashed line has been used. The aquifer is associated with a high degree of certainty where it is bounded by the ocean.

Geologic Formation (overlying):

Well records indicate that the unconsolidated aquifer is confined by silt, clay or hardpan (till) and underlies Aquifer 836.

Geologic Formation (aquifer):

Glaciofluvial or outwash deposits of sands and gravels (drift). Stratified.

Major Aquifer System Type:

4b – Confined sand and gravel aquifer of glacial or pre-glacial origin (glaciofluvial or glaciolacustrine deposits).

Confined / Partially Confined / Unconfined:

Confined by silt, clay or hardpan (till).

Vulnerability:

Low. The vulnerability of this deep unconsolidated aquifer is considered low. Confining material ranges between 1.5 and 90.8 m (5.0 and 298.0 ft. thick). The average, median and geometric mean confining layer has been determined as 27.1, 24.7, and 20.8 m (89.1, 81.0, and 68.2 ft). The aquifer is mainly highly confined by silt, clay and / or till.

Productivity:

Low. The productivity of this deep unconsolidated aquifer is considered low. Reported well yields range between 0.03 and 1.6 L/s (0.5 and 25.0 USgpm). The average, median and geometric mean estimated well yields have been determined as 0.42, 0.31, and 0.30 L/s (6.6, 5.0, and 4.7 USgpm) respectively. Reported well yields are based on short-term air tests (up to 2 hours) and are not considered as reliable as long-term pumping tests.

Depth to Water Table:

Shallow to moderately deep. Considered overall as shallow. Reported groundwater levels range between flowing and 39.6 m (130.0 ft) below ground level. The average, median and geometric mean depth to groundwater is 14.5, 10.0, and 5.9 m (47.7, 33.0 and 19.4 ft.) respectively. As groundwater levels vary seasonally, these measurements likely do not represent local water table conditions throughout the year.

Direction of Groundwater Flow:

There is insufficient data to determine the direction of groundwater flow. Groundwater is anticipated to follow the topographic gradient from high elevation to low elevation (i.e. southerly towards the ocean).

Recharge:

Wells are recharged from the infiltration of precipitation (rain and snow).

Domestic Well Density:

Moderate. There are 9 domestic wells per km² reported.

Type of Well Use:

Domestic.

Reliance on Source:

Well water is the only reported source of water for domestic use.

Conflicts Between Users:

None documented.

Quantity Concerns (type, source, level of concern):

None documented.

Quality Concerns (type, source, level of concern):

None documented. Although elevated arsenic was evident in some of the deeper bedrock wells (e.g. intrusive igneous granodiorite) elevated arsenic was not evident in the deep unconsolidated deposits (Carmichael, et. al, 1995). However, because several wells in this highly confined unconsolidated aquifer are deep, further water quality sampling is required.

Comments:

For the purpose of standardization and to achieve all objectives of the aquifer mapping program, the document *Guide to Using the BC Aquifer Classification Maps* (Berardinucci and Ronneseth, 2002) was referenced in the preparation of this worksheet.

References:

Berardinucci J. and K. Ronneseth, 2002. *Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater*. BC Ministry of Water, Land and Air Protection, Water, Air and Climate Change Branch, Water Protection Section.

Carmichael, V., L. Clarkson, and L. Ringham, 1995. *Well Water Survey for Arsenic in the Powell River and Sunshine Coast Communities of BC*. Gibsons, BC: Coast Garibaldi Community Health Services Society.

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Powell River, BC.

AQUIFER NUMBER: 839.

CLASSIFICATION: IIC

RANKING VALUE: 8

Classification Component:

Level of Development: Moderate. Moderate level of demand in relation to low aquifer productivity.

Level of Vulnerability: Low level of vulnerability to surface contamination.

Ranking Component:	Ranking Value
Productivity:	1
Vulnerability:	1
Size:	2
Demand:	2*
Type of Use:	2
Quality Concerns:	0
Quantity Concerns:	0
<u>Total =</u>	8

* Demand is based on domestic well density, number and type of wells, and general knowledge of well use and land use in the area. Demand assumes that the reported well capacity is the amount of water used, which can be misleading. The reported well capacity can be higher than actual use.

Number of water wells = 103

Statistical Analyses of Well Data for Aquifer 839

	Well Depth		Depth to Water		Depth to Bedrock		Reported Est. Well Yield		Est. Thickness of Confining Materials	
	m	ft	m	ft	m	ft	L/s	USgpm	m	ft
Number of Wells	103	103	79	79	0	0	86	86	103	103
Maximum	103.0	338.0	0	0	unk	unk	1.6	25.0	90.8	298.0
Minimum	12.2	40.0	39.6	130.0	unk	unk	0.03	0.5	1.5	5.0
Average	38.6	126.8	14.5	47.7	unk	unk	0.42	6.6	27.1	89.1
Median	33.5	110.0	10.0	33.0	unk	unk	0.31	5.0	24.7	81.0
Geometric Mean	34.5	113.3	5.9	19.4	unk	unk	0.30	4.7	20.8	68.2

unk = unknown or not reported

- = insufficient data to determine