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Note – Completion Report at back.

GROUNDWATER STUDY
KATIT INDIAN RESERVE
RIVERS INLET, BRITISH COLUMBIA

FOR

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

BY

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1.0 INTRODUCTION

On May 25 and 26, 1977, Mr. H. Reed of this office visited the Katit Indian Reserve. A site reconnaissance was carried out in the company of Messrs. N. Johnson and W. Walkum. Residents of the village were helpful in providing information on past and present experience with their water supply systems.

2.0 HYDROGEOLOGY

The village is situated on a gravel plain of fluvio-glacial origin and lies in a bedrock valley between Owikeno Lake and the Rivers Inlet. A creek above and to the north of the village has deposited a large gravel fan with the village lying at the base. The creek flows from a steep bedrock valley fed by snow melt water, but infiltrates and disappears at the head of the fan deposit soon after leaving bedrock.

3.0 EXISTING WATER SUPPLY

3.0 Spring.

The village presently draws a potable water supply from a spring issuing from bedrock fractures, located as shown on the attached drawing. Water from this spring is captured in a small concrete holding structure from which a wood stave storage tank is gravity fed.

3.0 EXISTING WATER SUPPLY, cont'd.

3.1 Spring, cont'd.

At the time of the inspection the spring was delivering an estimated 10 to 15 gpm. This flow is reported to decrease in dry periods and during freeze-up when water shortages are experienced.

When the flow is adequate this system operates trouble free. Periodic cleaning of the concrete catchment and storage tank is necessary.

3.2 Shallow well.

The existing well penetrates the gravel plain deposits. The well was hand dug and cribbed with 4-foot diameter corrugated culvert. The present pump overcomes sufficient head to return water to the storage tank at the spring.

The residents report the following problems with this system:

i. The pump operates only 10 to 15 minutes before lowering the water level to suction. The pump then has to be primed and restarted.

ii. The automatic controls are difficult to maintain in working order.

3.0 EXISTING WATER SUPPLY, cont'd.

3.2 Shallow well, cont'd.

iii. Water becomes brackish at high tide.

iv. Power supplied by diesel generator has failed at times.

Three or four hand dug wells were used in the village in the past and these wells also produced salty water at high tide.

4.0 FURTHER DEVELOPMENT

4.1 Deepen and screen shallow well.

The present well is dug in a permeable gravel deposit from which large quantities of water can be obtained. This well could be deepened, screened and developed with a drilling rig. However, the doubtful water quality makes this the least desirable option.

4.2 Drill new well at village.

A deep well at the village site, preferably on the north side of the main road, may be successful if an impervious layer exists below the gravel

4.0 FURTHER DEVELOPMENT, cont'd.

4.2 Drill new well at village, cont'd.

plain. Such a well would obtain water from a deeper zone that would be recharged from higher up the fan. We estimate the chances of a successful deep well producing potable water at 80%.

4.3 Drill new well on upper fan deposit.

The upper area of the gravel fan is sufficiently high and near to a recharge source that potable water should be obtained. A well in this vicinity would be in the order of 100 feet deep. The probability of success of this option is estimated to be 95%.

4.4 Infiltration gallery on upper fan deposit.

It appears feasible to construct a horizontal intake near the head of the fan deposit which would provide gravity fed water to the present system. The best location for this collector is noted on the enclosed drawing.

The collector would consist of perforated or louvred intake pipes laid in a trench beside the stream channel but not across the channel.

4.0 FURTHER DEVELOPMENT, cont'd.

4.4 Infiltration gallery on upper fan deposit, cont'd.

An infiltration gallery beside the stream is preferable to an intake directly in the stream bed because the water would be naturally filtered by the permeable gravel. We have noted that direct stream intakes are prone to silting problems during high runoff periods in similar settings.

This system could be excavated and constructed by caterpillar and would require trenching 4 to 5 feet below the stream bed depth.

The advantage of this option is that it would provide a potable water supply to the existing system by gravity feed. This would eliminate problems of power, pump and control maintenance. The probability of success is estimated to be 85%.

5.0 COST ESTIMATES

The estimates below do not include power and water-main connections to existing systems or standby time for equipment.

5.0 COST ESTIMATES, cont'd.

5.1 Drill deep well at village.

5.1.1	Mobilize and demobilize drilling rig, men and equipment from Vancouver to Rivers Inlet.	$9,300.
5.1.2	Drill, case, screen and develop 200-foot well.	$9,500.
5.1.3	Supply pump to deliver 40 gpm to 40 psi system pressure with controls (230 volt single phase).	$1,050.
	Total	$19,850.

5.2 Drill well on upper gravel fan.

5.2.1	Mobilize and demobilize drilling rig, caterpillar, men and equipment from Vancouver to Rivers Inlet.	$9,300.
5.2.2	Construct access to drill site, estimate 20 hours at $50.00 per hour.	$1,000.
	Sub total	$10,300.

5.0 COST ESTIMATES, cont'd.

5.2 Drill well on upper gravel fan, cont'd.

Brought forward		$10,300.
5.2.3	Drill, case, screen and develop 100-foot deep well.	$ 7,800.
5.2.4	Supply pump delivering 40 gpm to 40 psi system pressure with controls (230 volt, single phase).	$ 1,050.
	Total	$19,150.

5.3 Construct infiltration gallery on upper fan.

5.3.1	Mobilize and demobilize caterpillar, men and equipment to Rivers Inlet.	$ 9,300.
5.3.2	Construct access to site, estimate 20 hours at $50.00 per hour.	$ 1,000.
	Sub total	$10,300.

5.0 COST ESTIMATES, cont'd.

5.3 Construct infiltration gallery on upper fan, cont'd.

Brought forward........................		$10,300.
5.3.3	Trench, construct intake and backfill - estimate 50 hours at $75.00 per hour.	$ 3,750.
5.3.4	Perforated pipe and fittings.	$ 800.
	Total..........................	$14,850.

6.0 CONCLUSIONS

6.1 The nearest assured source of potable water to the village is the upper area of the gravel fan. The best method of extracting this water is a drilled well as outlined in 4.3 above.

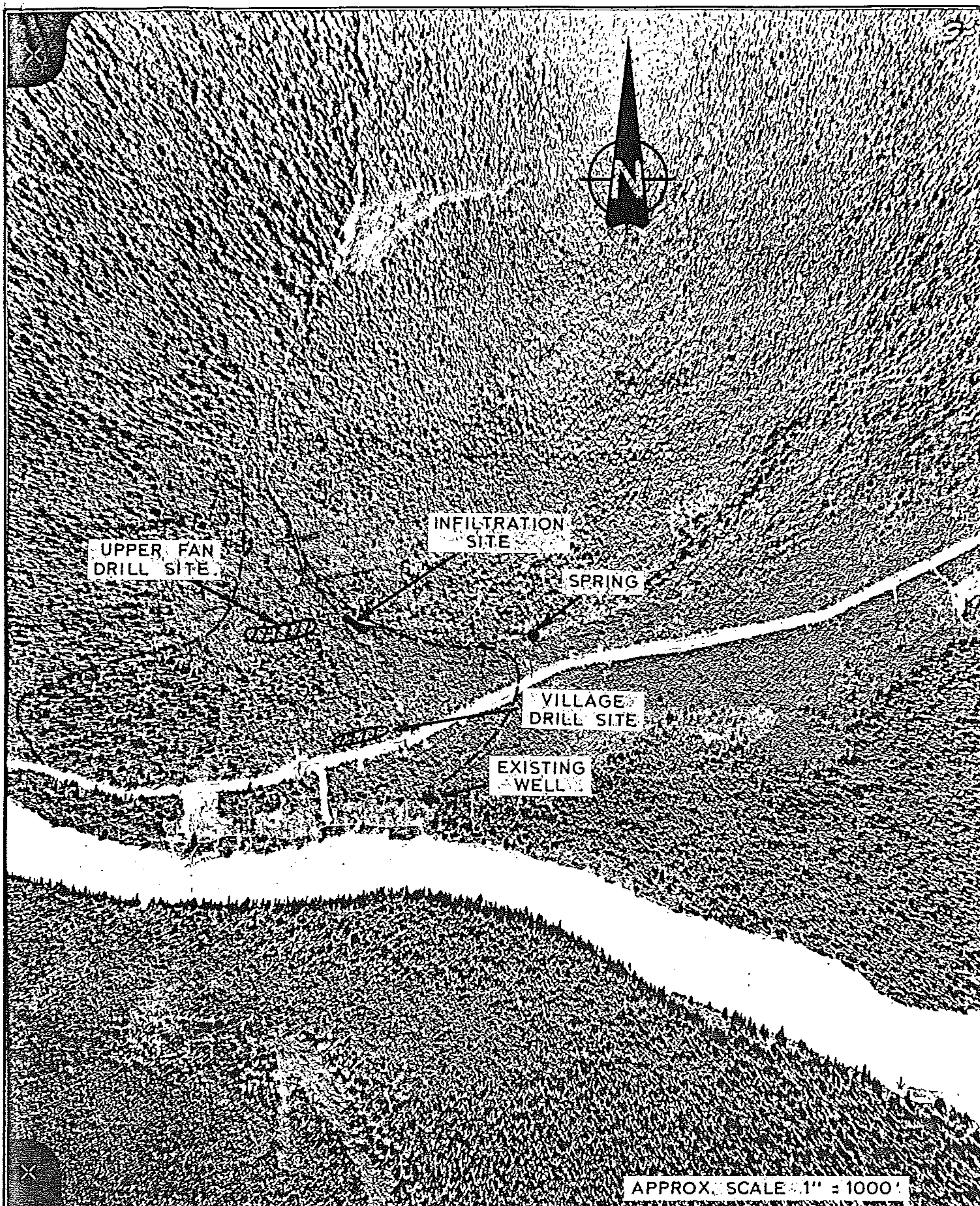
6.2 A deep well at the village has the least chance of success in terms of potable water. However, a well near the village has the advantage of proximity to existing power and water-mains. If a decision is made to drill a well on the upper fan, it would still be worth while to use the drilling

6.0 CONCLUSIONS, cont'd.

6.2 cont'd.

rig to put down a test hole at the village while access to the upper fan was being constructed. In the event that a deep source of potable water was found the savings in rig standby time, power and water-main costs would more than offset the access road construction costs.

6.3 An infiltration gallery intake on the upper gravel fan area has the advantage of low operating and maintenance costs.



OWIKENO VILLAGE KATIT INDIAN RESERVE	INTERNATIONAL GROUNDWATER CONSULTANTS LTD. NORTH VANCOUVER, BRITISH COLUMBIA		
RIVERS INLET BRITISH COLUMBIA	SITE SKETCH	BY: HWR JOB: 77-031	DATE: 27-5-77 DWG: 1