VILLAGE POINT IMPROVEMENT DISTRICT

Preliminary Report on the Drilling of Well 19

Background:

The 2020 budget included a project to drill a new well at a cost of $10,000. In preparation for the project, Red Williams agreed to meet Ian Cocker and Mike Sywulych at the Tank Farm in July, 2020 to look at areas suitable for drilling a new well. Three potential sites were investigated. The preferred site was on the west side of the VPID right of way leading into the Tank Farm. The selection was made on the basis of ease of access and proximity to the Treatment Plant. In addition, this site lined up with known producing wells in the area from Crane Point to the top of Deacon Hill Road. As Red Williams identified, there is no guarantee of success but having good wells nearby is a good sign.

Three companies were contacted to provide quotes on drilling a well: Red Williams, Fraser Valley Drilling and Drillwell Enterprises. The quotes received are attached. Costs were compared for drilling a 350 foot well and the contract awarded to Red Williams as his company was the lowest bidder.

Concerns were raised as to the reasonableness of the selected site and what measures could be taken to improve the chances of success. Philippe Kruchten contacted his daughter Alice Kruchten, an environmental engineer who works for Stantec Inc. and has access to hydrologists. Her advice was that the hiring of a hydrologist and conducting a study is expensive. Relying on the experience of drillers and looking at existing wells and their capacity is more affordable. The selected site lined up quite well with the existing wells and the decision made to proceed.

Letters were prepared and sent to the nearest neighbours, identifying the drilling would commence that week, would take 2 to 3 days and would be noisy. An acknowledgement was received from one of the owners.

Phase I – Drilling the Well:

On September 25, two men with a drilling rig and a truck to carry water and equipment arrived at the site at 7:30 am and set up for drilling. Manager Ian Cocker and Technician Phil Donnelly had marked out the area within the VPID right of way and the location of the pipelines from well 15 and the line from the Plant to 320 East West Road. This was done to ensure no damage to the 2 existing pipelines. Drilling began and it soon became apparent that there was a great deal of watery clay coming out of the well hole which needed to be diverted. A barrier was set up and the material guided into the Treatment Plant where a depression existed.

Water was found at 346 feet, with an estimated flow rate of 5 gallons per minute. A sample of the water was collected, was allowed to sit overnight to clear and then sent for chemical

analysis. Drilling continued in the hope of finding more water. Although several more fractures were hit, no additional water was found. After drilling to 420 feet, the operation ceased at 3:30 pm in order that the crew could catch the 5:20 pm ferry as one crew member had a previously scheduled commitment. The delay had no effect on drilling costs.

Prior to departing, a discussion with the driller ensued. Travis identified that they would return on Monday. In the meantime, VPID needed to decide whether to continue drilling and/or to conduct a soft hydro fracking. Travis identified that a good fracture was reached in the last 20 feet. Although it was empty, it was a positive sign of more water available. At this stage, the project cost VPID $15,000 due to the additional 70 feet of drilling.

The question was posed to the Trustees and a motion was passed to drill up to 40 more feet and do a soft hydro fracking if necessary pending expert advice from Red Williams. Subsequently, Red Williams was contacted and advised against hydro fracking.

The crew arrived at the site around noon on Monday, September 28. The standing water was measured to be at 200 feet. When drilling began, it became obvious that the rock was much harder and the penetration slower than before. Approximately another 2 gallons per minute was realized and drilling stopped. After conversing, it was decided to cease drilling. The crew sealed the well shaft, attached ID plate number 43941 and packed up their equipment to relocate to another site on Mayne Island.

Ian requested a quote from Thomas Williams for the cost to line the well and a cost to do the pump test. On Friday, October 2nd, Ian noticed a Red Williams truck leaving the ferry terminal and contacted Mike Sywulych to investigate. Twenty-four 4" pipes had been dropped at the well site. Mike was able to find Red at another site and questioned him on timing. Red identified that based on what Travis told him, the well needed to be lined right away to prevent loose stones from falling into the well and he would be there to do the job on Saturday. By doing it now, VPID would save the mobilization cost.

The question was presented to the Trustees and a motion passed to line the well for a cost up to $3,000. The well was lined on the Saturday and equipment removed. The well is 291 feet above sea level, is 440 feet deep and the base is 149 feet below sea level. On October 8, Jeff Hansen brought his backhoe to the Tank Farm and with Ian and Phil's assistance the residual blue clay was scraped off the road and placed in the depression within the fenced Tank Farm area.

Phase 2 – Completion:

Ian contacted Wesley Mulvin, Southern Gulf Island Electric Ltd to discuss electrical requirements. Wesley identified that the container located near the Tank Farm entrance already has 220-volt wiring. The well control panel can be located on the South wall of the container near the doorway. All associated equipment such as pump tech, flow meter, control box, pressure tank and switch and gauges will be located on that wall. Wiring can be placed underground in a sound tube from the well to the container. Wesley is also able to lower the

pump into the well, complete with wiring and appropriate piping. Wesley was asked to provide an estimate for his portion of the project.

A trench must be dug from the well to the container to bury piping and wiring. From the container, a trench needs to be dug along the East side of the lateral storage tanks, then to the North side of storage tank #1 where it will connect with the 2 well pipes that deliver the water into the Treatment Building. The connection will be done in a manner to allow well 19 water to flow into either line. All trenching can be done by Jeff Hansen and pipe laying by Ian and Phil.

In early 2021, with Wesley's assistance a new VPID pump will be lowered into the well with appropriate wiring and plumbing to conduct a pump test. Wiring will be temporary and a generator used for the supply of power. Ian and Phil will conduct the pump test and if the quantity of water proves to be sustainable in the 5 to 10 gallons per minute, the project will proceed.

Ian will make the necessary arrangements to obtain government source approval. A water sample for Island Health's approval will be taken during the pump test. The sample taken during the drilling operation was within Canadian Drinking Water Standards with the exception of high iron content, which was caused by the drilling bit. Work will be scheduled to ensure the well is producing by May 1st, 2021. An estimate for 2021 budget purposes to complete the well is in attachment #3.

Attachments:

1. Well Drilling Comparison
2. Well Drilling Cost Update
3. Phase 2 Cost Estimate

Submitted by Ian Cocker, Al Maxwell and Mike Sywulych

ATTACHMENT 1

Well Drilling Comparison

	Red Williams	Drillwell	Fraser Valley
	($)	($)	($)
Mobilization	2,500	2,500	1,200
Surface seal	600	800	800
Well cap	95		180
Casing (20 feet)	440	980	400
Drill per foot	27	26	35
Drill 350 feet	9,450	9,100	12,250
Drive shoe	200	350	250
Development per hour	275		
Per day 2 men	125	1,000	
Ferry		500	500
Consulting	_____	_____	2,000
Total cost	14,085	15,230	17,630

1. Mobilization could be less for Drillwell and Red Williams if a second customer can be found.
2. Consulting fee for Fraser Valley is to divine the area for a suitable location. Claim is a 95% accuracy rate.
3. The development cost for Red Williams is to pump the well for typically 2 hours.

ATTACHMENT 2

Well Drilling Cost Update

	Original Estimate ($)	Revised Cost ($)
Mobilization	2,500	1,200
Surface seal	600	600
Well cap	95	95
Casing (20 feet)	440	440
Drill per foot	27	27
Drill 350 feet	9,450	11,880 (440 feet)
Drive shoe	200	200
Development ($275per hour)	550	1,000
Living out allowance	250	125
Installing a 4 “liner		2,883
Ian and Phil’s time		593
Jeff Hansen		188
Miscellaneous	___	103
Total cost	14,085	19,307

1. Mobilization cost reduced due to other customers on Pender Island as well as the Housing Society on Mayne Island.
2. The 2020 budget was to spend $10,000 on the new well.
3. Originally the well liner was expected to be done in 2021. Concern raised by Red Williams that loose stones may cause problems inside the well and it should be done immediately to protect the well integrity.

ATTACHMENT 3

Phase 2 Cost Estimate

Wesley's estimate to include:	
1- 1.5 hp 5 gpm pump	
1" polyethylene pipe	
SS safety line	
Conduit and wiring	
Pump tech& control box	
Mechanical timer	
High pressure switch and gauge	
Pressure tank	
Wiring in container	
Wesley's labour	$9,000
Trenching	900
Piping from well to container to Plant	from inventory
Sand in trench	1,100
Eco 660 water level measuring device	500
Labour	1,000
Contingency	2,500
Total Estimate for Phase 2	$15,000