



Village Safe Water Trip Report

*Alaska Department of Environmental Conservation
Division of Water - Facility Construction & Operation
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REPORT DATE: 08/26/2012

REPORTER: Prashant KC, VSW Engineering Assoc.

TRIP DATES: 08/15/2012 to 08/16/2012

LOCATION: Stevens Village (SVS)

PURPOSE: Inspection of 2011 scope of work completed by Summit consulting and perform a detail observation, gather data pertaining to deficiencies in existing lift station, water quality measures, and Water treatment plant modifications.

CONTACTS: Henry Smoke, WTP Operator, Stevens Village
William Tritt – Warbelows Agent, Stevens Village
Joshua Ortiz, Power Plant Operator, Stevens Village
Giovanna Stevens, Administrative Assistant, Stevens Village
Rosemary (Dee) Wiehl, post office clerk, Stevens Village
Tim Smoke, Natural Resource, Stevens Village

ACCOMPANIED BY: Arlo Bante, RMW for SVS

TRAVEL INFORMATION: Alaska Air, Warbelows Air

ACCOMPLISHMENTS, FINDINGS & RECOMMENDATION:

On Wednesday morning August 15, 2012, I arrived ANC at 8:15 A.M. I departed ANC on time at 10:00 A.M, and arrived FAI at 10:55 A.M. Mr. Arlo Bante RMW for SVS came to pick me up from Fairbanks airport. We were supposed to check in at 1:45 P.M in Warbelows air and depart at 2:45 P. M. so we went to RMW office to get some information. There I met Pat McAree from RMW who made a recent visit to Stevens Village on May 15, 2012 regarding the discolored potable water due to the absence of WTP operator Henry smoke. Power plant operator Joshua Ortiz was acting as a substitute who didn't have much of the knowledge about the water treatment plant. The village didn't have a back up operator, and according to provided information the city is in the process of hiring one. While having conversation with Pat, he expressed his critical concerns for Water treatment plant and existing lift station which can be found in detail on his trip report. I also met with other RMW personals and introduced myself.

We left Fairbanks at 2:55 PM, and arrived Stevens village airport at 3:40 P.M. Upon arrival we met Mr. William Tritt and Ms. Rosemary (Dee) Wiehl, and we proceeded to water treatment plant. On our way to the plant we asked Henry Smoke to meet us. There we decided to go through the water treatment plant, lift station, other outside works such as the pad, retaining wall, and wastewater lagoon respectively. So here are the findings as mentioned below.

Water Treatment Plant:

- The access to the manway needs an overflow pipe to be adjusted or door needs to open inside which contradicts with design.



Proposed man way access



Narrow Space available for man way access

- There is no drain on the raw water tank to clean the sludge. The present outlet is elevated approximately 2" from the bottom of raw water tank which will filled with sludge, so there should be a provision incorporated in the tank to fulfill the purpose. This raw water tank was potable water tank before the upgrade so it has a confined top with 24" hatch for the access inside the tank which in my understanding in not enough. Operator Henry Smoke mentioned that he is scared to go inside the tank. The converted raw water tank needs frequent cleaning, at least once after every batch of water filtered. So the top cover should be modified to provide enough access for cleaning purpose. The access to the man way ladder of raw water tank has been restricted by preway oil heater. I could hardly fit through that passage, so that needs to be relocated or removed since it is not functional.



Existing drawline



Raw water tank cover with 24" hatch



Narrow access to the man way ladder



Rear view of the access blocked by oil heater

- Differential pressure gauges for polishing and backwash filter are not working at all. There are leaks in plumbing around the gauges.



Differential gauge for cartridge filter



Differential gauge for mixed media filter

- Flow meters for backwash, potable water, school, clinic, and watering point were changed in 2011.



Flow meters changed in 2011

- All the waste water plumbing inside the plant was working well. Henry said that he did not discover any leaks so far. Operator recommended changing boiler #2, since it was not functional for a while. Arlo mentioned that he cleaned two boiler (#1 and #3), but boiler #2 was not operational at that time either due to a mechanical problem. Operator mentioned that they did not have enough fuel to run the boilers, so none of the boiler were running at that time, so all the heating requirement were fulfilled by waste heat from the power plant. Supplement heating was provided by small water heater. We also discovered that photovoltaic panels were installed in WTP roof and was connected to big water heater.



Three Boilers



Heat exchanger for waste heat from P.P



Active Water Heater



Passive water heater

- We tried to isolate the potable water connection for boiler fluid, but the valve did not hold the pressure so left it as is for follow up.



Potable water line for boiler



Backflow preventor

- According to Arlo the copper levels were high above the ok value at all points. The last test was done at two locations, one at start of distribution point (WTP sink) and second at farthest point of distribution (school sink). Arlo had a conversation with Analytica lab to find out at which point the level were high. We found corroded copper pipe recently replaced in schools boiler room where all other potable water plumbing are. So we decided to do the zoning for the water sampling to figure out if it is just the school that's causing the higher copper levels. We went to school boiler room to find the sampling point before the water enters into the school plumbing. Unfortunately there wasn't any. So we didn't have option but to repeat the test with same locations. The recent copper level test is a two day test, water sampled twice at same two locations the operator was trained to do the test. We also conducted the free chlorine test with color comparison and the result was close to 0.2mg/l.



Attempt to do the sampling at school



School Boiler room

- All the boiler pumps are manual. The second pump for freezer building and WTP building heat has to be turned on manually. The pumps run continuously which hurts the energy consumption.



Boiler return pumps

- There were four washers altogether and among them two were running and two were under maintenance. Two stacking dryers were installed in 2011 and were working fine.



Existing washers



New stacking dryers



New dryer plumbing

Lift Station:

- Lift station well doesn't have enough volume to hold the back wash discharge and at the same time the lift station pumps are unable to keep with backwash flow rate. We did two separate tests to conform the findings. The results were:
Time taken to fill the wet well from low level to high high level (254 gal) = 2 min 40 sec, flow rate=95.25gpm
Time taken to drain the wet well from high high level to low level (254 gal) = 4min 30sec, flow rate = 56.4 gpm

So basically the flow rate of existing lift station pumps are approximately 60% of back wash discharge which results to overflow, short runs of backwash cycle , and more than 30 mins (to avoid the overflow) to complete the recommended backwash cycle (10-12 mins). So care should

be taken for new wet wells and the pumps installed to overcome above mentioned situations with considerable factor of safety.



Existing lift station pumps

- Susceptibility of cross contamination of school water line which was lying on the lift station floor and goes around the wet well. Also the lift station is below 2009 flood plain.



School Water line lying on the floor



School Water line next to waste water line

- Clinic waste water line appeared to be below the invert of the gravity outfall to wet well, but no measurements were taken.



Clinic waste water line

Outside Work:

- Retaining wall is going through approximately 6"-8" of settlement. The base of the wall was buckling and some of the key stones were falling apart through the active pressure of infill materials. The alignment of the wall was not straight and was leaning inwards. The retaining wall and pad work was not completed in 2011 season



Retaining wall settled 6"-8"



Retaining wall stones falling apart



Another settled section of retainign wall



Improper wall alignment

- The wet well was insulated by 2" board stock instead of pour foamed and there were lots of gaps in between the pieces of board stock. These gaps needs to be filled depending upon how far it goes or take the visible portion of existing insulation apart and do the pour foam.



Gaps on wet well insulation



Incomplete pad and retainign wall

- The pipe inside the utilidor underneath the clinic has freezing issues. The utilidor was wide open and the operator said has been doing maintenance on copper piping, and joints cracks during winter.



Exposed utilidor underneath clinic



Exposed utilidor for maintenance

- We could not locate the thermosyphon sleeves. Upon having the conversation with one of the labor who worked on that in 2011 we came to know that it was buried underneath the pad and I am not sure if there are any swing ties for them.
- Vegetation growth in lagoon berms was not uniform. It needs to be properly seeded. I noticed that there was erosion in couple of places. Looking at the design the erosion was at the anchor points of erosion control mat on top width of lagoon. Since the gate was locked, I wasn't able to look around the lagoon, so there might be other eroded sections. The lagoon needs to be investigated and maintained as needed.



Eroded section of lagoon



Non uniform vegetation growth

- The well house and well head seems working fine as per the conversation with Henry and Arlo.



Well Head



Existing well house

- The building was under the creep loading from a long time, so noticed some sag underneath the building. The section of building floor was repaired in 2011 season where old raw water tank was located.



Photo Log Location: G:\Water\FACILITIES\Photo\Photo_Volume _1\VSW 2012\Stevens Village\Site Visit (Prashant) August 15-16, 2012

FOLLOW-UP: Schedule site visit when construction resumes for 2012 season.

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