Baker Lake Water Intake System Inspection & Maintenance July 18, 19th. 1996 Progress Report

July 17/96 Wednesday.

We arrive at Baker Lake at 15:00 hours, two divers but no equipment - our six pieces of gear has been bumped in Rankin Inlet and held for tomorrows flight which will arrive around 14:30 on Thursday July 18th . The total weight for this project is 341 kgs, which is the lightest we can travel with our compressor and a diving crew of two . In the late afternoon hours we check out the pump house and hold a meeting with the Hamlets Superintendent, we also find that the piping system has a inlet for air to be blown into the intake pipes . On this same date a small air compressor is brought on site for our inspection in the late afternoon and evening hours of Thursday - when our gear arrives.

July 18/96 Thursday.

Our equipment arrives at 15:00 hours and is picked up and trucked over to the Pump house. We have decided to do a short dive at 16:00 hours to locate all the areas in question for our filming- four red marker floats were brought with us for this purpose . The first area will be at the first flange about fifty feet from the shore line,the next location will be the beginning of the sandbar - the exact spot where the cast iron pipes are covered . The last and final marker buoy will indicate where the screen unit is located .

At 16:00 hours two divers enter the water and commence marking the locations as mentioned above, all are marked, except the intake was not found on this dive . We did notice that more cast iron pipes are exposed than in 1984, we counted 10 exposed pipes rather than 7 as in the past .
After supper we returned at 19:00 hours and started filming with our video equipment . During this filming the Intake structure was found RE/ counter number at 17:55 * *as per VHS tape supplied with report.* During this filming air was being pumped into the intake line through the pump house piping system, no air was seen escaping through the intake pipe RE: / counter number 24:00 . It was decided not to disturb the dresser coupling due to heavy rust corrosion and general poor condition as one can see on the video tape and 35mm stills. The sandbar has moved and exposed more cast iron pipe judgeing from our 1984 inspection > but has only moved about 15 feet towards the Intake screen leaving almost 15 feet exposed until the Intake stand, which sits off the bottom about 3 feet, twenty feet of water is over the screens. Our observations of the angle of the sandbar indicate about 6 feet of sand cover and even more in some areas At the top of the sandbar we had depths of eight feet going down to the intake area with a depth of 23 feet just under the intake legs , probably there is over 180 feet of covered victrolic pipe , with the exception of one half exposed section

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July 18/96 Thursday.

at the Intake structure . The intake screen is now marked off for future filming with 35 mm stills , this will be accomplished tomorrow early in the morning as it is the last task of the project. A judgment call had to be made as far as disconnecting the two couplings for a visual inspection, this was discussed with our on site project engineer and it was decided that it would be best to leave well enough alone, as one can see by the photographs the corrosion on both couplings has reached an extreme level and would create a problem in securing the system back up. Tomorrow we will witness the system while under use and find if there is a good suction flow from the end of the intake pipe just under the screen section.

July 19/96 Friday .

On this date another full inspection is made using a 35 mm still camera, all major couplings are photographed and each section of pipe is recorded until they are buried in the sand . At the Intake screen both inspection divers witness a medium flow of water being sucked into the intake pipe - this was in the early morning hours while trucks were at the fill station with pumps fully operating . Photographs were also taken of the Intake structure and screen. On looking at the size of mess on the intake structure , the first thing that comes to mind is the screen size is much to big > during storm situations as we mentioned in the introduction we feel that accumulations of sand will probably settle in the storage tanks or in piping system in the pump house, this can be easily rectified with screens designed for this very problem. At 10:30 am all diving operations halted and equipment was packed for the return flight to Rankin Inlet and then on to Yellowknife, late afternoon.

End of Inspection

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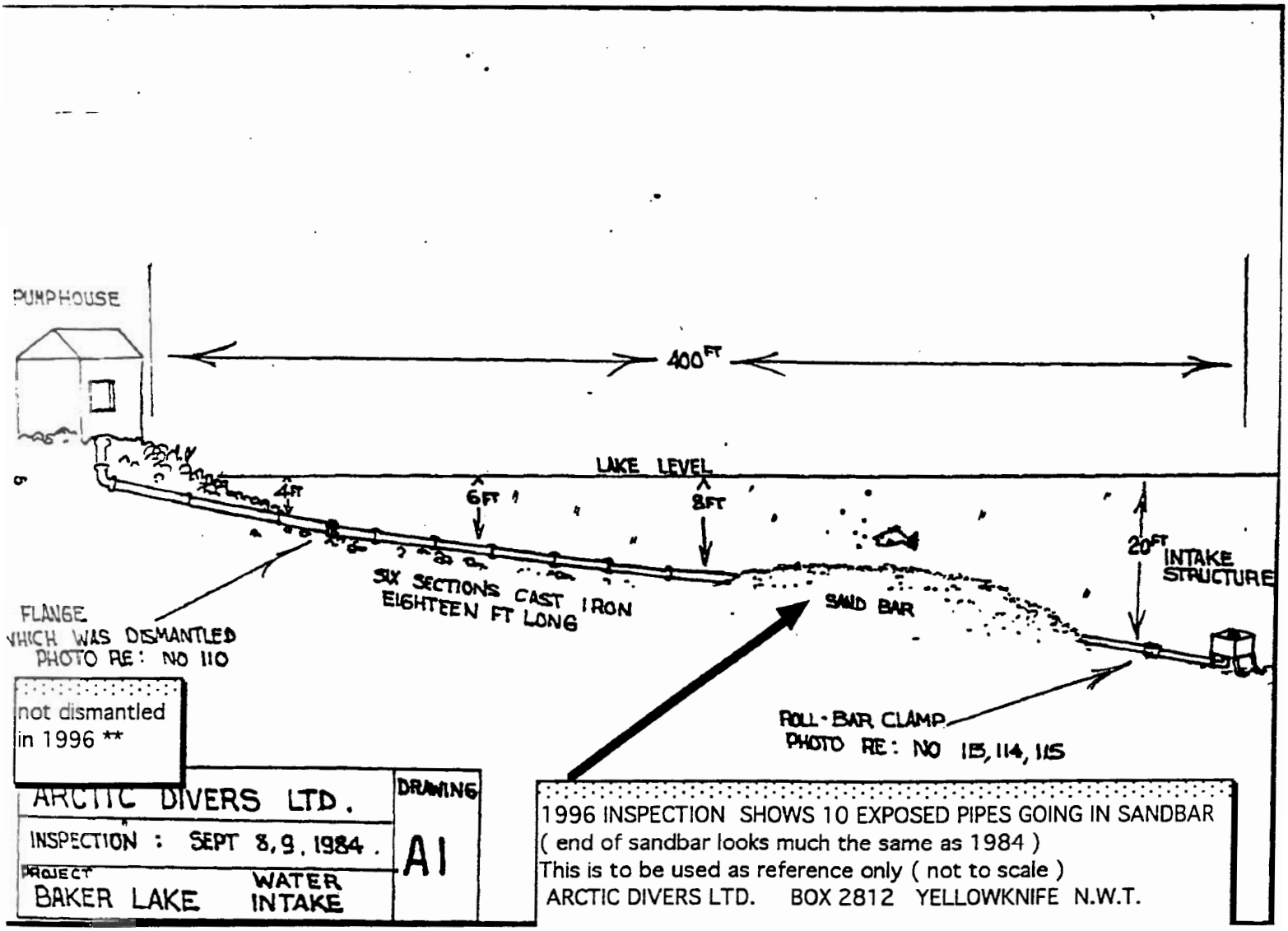
Conclusions and Recommendations

As on can see by the 35mm stills and video tape there is extensive corrosion on the cast iron sections, these are exposed to a lot of sunlight and through the years of being exposed to shallow water, have taken their toll on the metal. The sandbar covering the Victrolic pipes has only moved about 50 feet towards the Intake structure but has not really extended towards the the sections which tie in the Intake screen, this has not really changed * *looks much like the orginal drawing - which we have submitted* . The depths on top of the sandbar are less as they were in 1984, as one can see in Photo Re: ***page 9 C*** That the marker buoy is sitting in 15 feet of water at the end of the exposed pipe and the beginning of the sandbar .

After our investigation it is our opinion that the line itself is working with a Medium draw as far as suction, with a four inch diameter pipe and the possibility of sand buildup it is probably reaching its maximum amount of flow and could slow down even more in the winter months , with ice buildup inside the exposed sections. As a result of our findings and conclusions it is recommended that a new line be installed. One hundred and fifty feet should be buried from the pump house fully insulated with heat tape installed . We would recommend Eight inch PUC 80 series each section would be weighted down with concrete weights - which can be made up on site. At the present time there seems to be a problem when trying to backwash the system , there is provisions for an air line to be hooked into the piping system but somehow air is not getting into the underwater piping .

Spring would be the best time of year to install a new line , working with an extension on a back-hoe one could cut through the sandbar and bury most of the line except for the last fifty feet where the line could sit in 25 feet of water with a proper sand screen. In order to execute this project in safety and expeditiously late March and April would be the best time frame , at this time of year the ice depth is safe and provides a solid platform for our personnel to work from . In closing we would like to recommend that air should be injected into the intake line, somehow if the problems could be solved with the piping and with a stronger compressor - i n the range of at least 125 psi be installed - this would clear a lot of sand and increase the water flow to its capacity, with this amount of air a steady stream of bubbles should be seen at the Intake end.

THE END.


PUMPHOUSE
400FT
LAKE LEVEL
4FT
6FT
8FT
20FT
INTAKE STRUCTURE
SIX SECTIONS CAST IRON EIGHTEEN FT LONG
SAND BAR
FLANGE WHICH WAS DISMANTLED PHOTO RE: NO 110
not dismantled in 1996 **
ROLL-BAR CLAMP PHOTO RE: NO 113, 114, 115
ARCTIC DIVERS LTD.
INSPECTION : SEPT 8, 9, 1984.
PROJECT
BAKER LAKE WATER INTAKE
DRAWING
A1
1996 INSPECTION SHOWS 10 EXPOSED PIPES GOING IN SANDBAR
(end of sandbar looks much the same as 1984)
This is to be used as reference only (not to scale)
ARCTIC DIVERS LTD. BOX 2812 YELLOWKNIFE N.W.T.