

YUKON GOVERNMENT

# Annual Data Report

2013/14

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Mount Nansen Site

04/23/2014

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## INTRODUCTION

Assessment and Abandoned Mines (AAM) has been given the responsibility of providing care and maintenance activities at the Mount Nansen site. Although it is classified as abandoned, there are still many daily operations that must be conducted to protect the environment and human health and safety at the site. The site is off of the electrical grid and powered by three 175 KVA generators which are rotated to provide power to the infrastructure. The following report will outline the data that AAM receives and interprets to provide information on the status of the site and the costs that are associated with maintaining the site. This report presents the data for the 2013-14 fiscal (April-March).

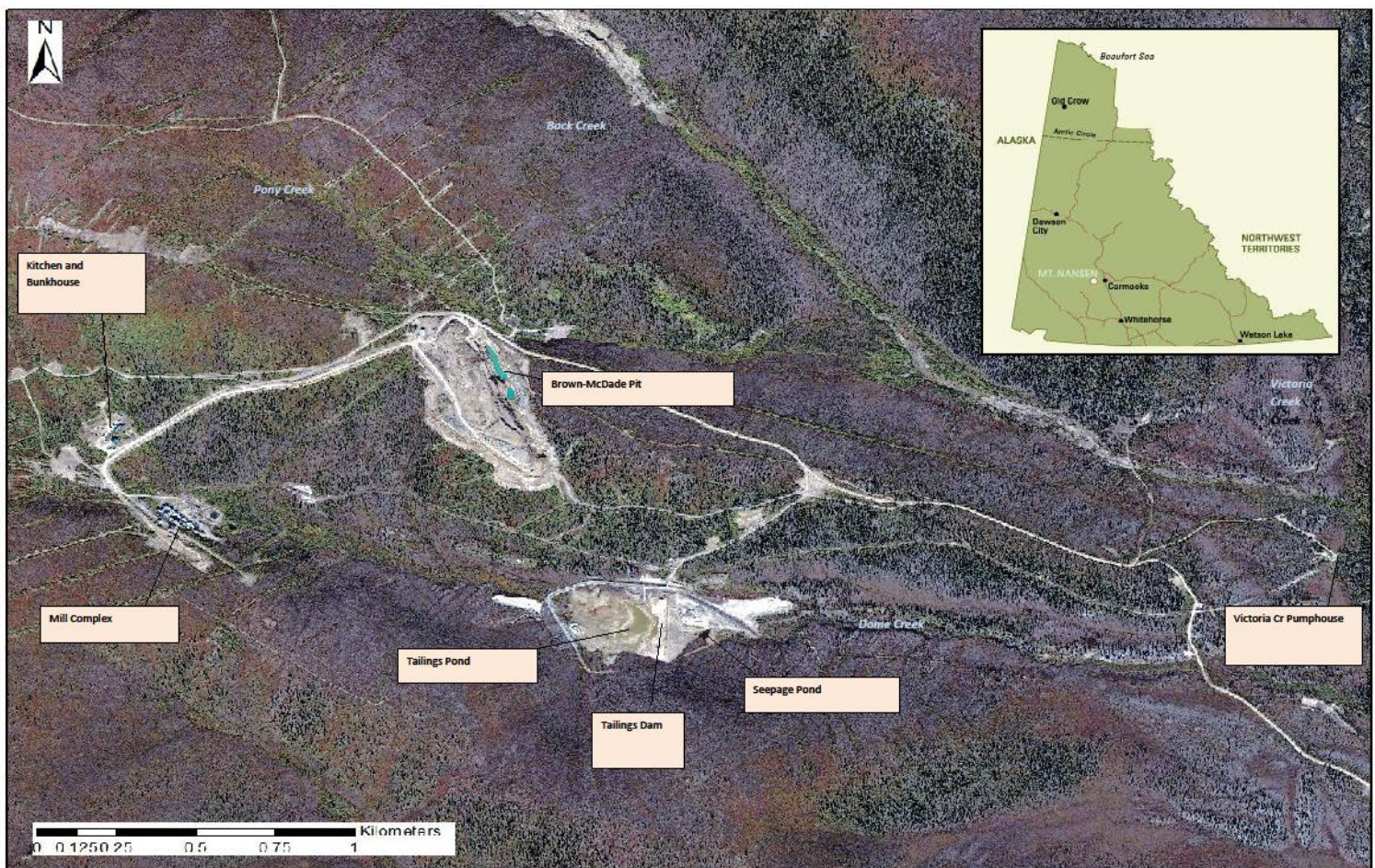
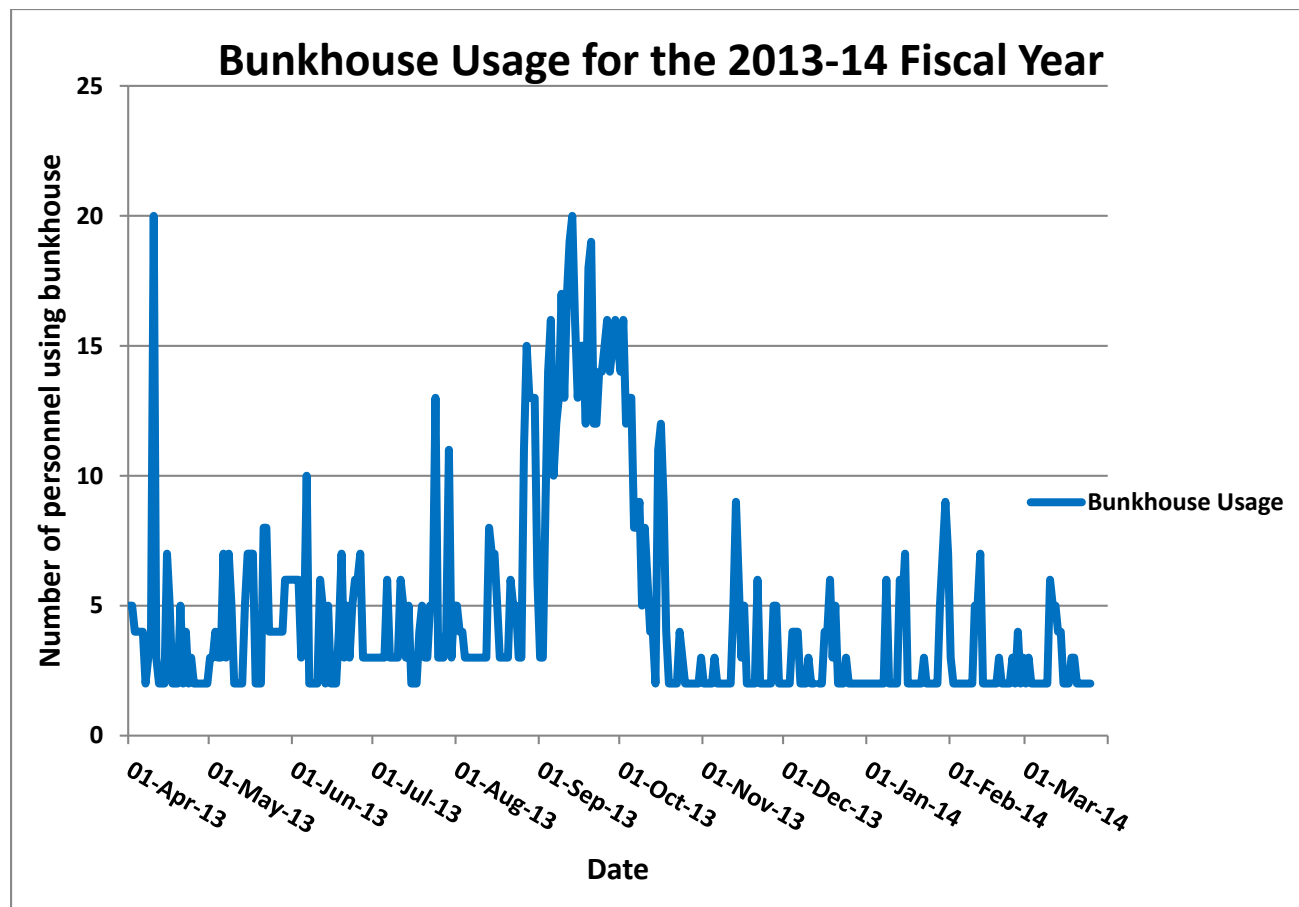


Figure 1 - Photos of Mount Nansen Site & the various components

## BUNKHOUSE USAGE

The Mount Nansen bunkhouse is the main building on site. It houses contractors and is where the Site Operations personnel reside and have their office. The kitchen is also located in the bunkhouse. In addition to the site operator personnel, consultants and contractors also utilize the bunkhouse when their activities warrant overnight stay. AAM has tracked the number of authorized contractors and personnel throughout the year by using the sign in/out sheet that everyone fills out when they arrive and before their departure from site.



The above Chart shows the usage of the bunkhouse facility over the 2013-14 year. Denison Environmental Services (DES) has two staff members on site at all times. During times when there are more than 10 contractors on site, the site operator has an Advanced First Aid Responder on site to cover first aid requirements.

Q1- during the month of April, there were many site visits by consultants and contractors. In early April, a site visit by AAM personnel, AANDC, AMEC and AE/Summit increase the number of personnel at the site to over 20. During this time, Arcrite was on site working on electrical deficiencies acknowledged by WCB during their site visit 2012/13. Many of the spikes on the

graph above are normal monthly site visits by AAM personnel and contractors that visit the site on a regular basis (EDI and North 60).

Q2- during Q2, the site became increasingly busy as the field and drilling program from AMEC began. In July, a large spike in the graph can be observed due to contractors on site carrying out field investigations (ELR), as well as a site tour for YESAB personnel by AAM staff. The AMEC site investigations began in late August and continued through into October.

Q3- during Q3, the field season was coming to an end and the number of personnel accessing the site quickly decreased. The AMEC field investigations were mostly completed by mid-October. As in the other quarters, many of the spikes in the graph during Q3 are the result of regular site visits by contractors such as EDI, Laberge Environmental Services (water quality and hydrology), as well as North 60 Petro (fuel deliveries).

Q4- during Q4, there were several contractors at the site conducting work. At the end of January, General Waste Management was on site to remove the fluids from many of the vehicles left abandoned when mining operations ceased, as well as many over pack containers containing used grease, oil, hydrocarbon contaminated soil that were found and placed in a containment area by site operations staff. Other contractors such as EDI, North 60 Petro, as well as AAM staff were also on site during Q4 and can be observed in the small spikes in the graph.

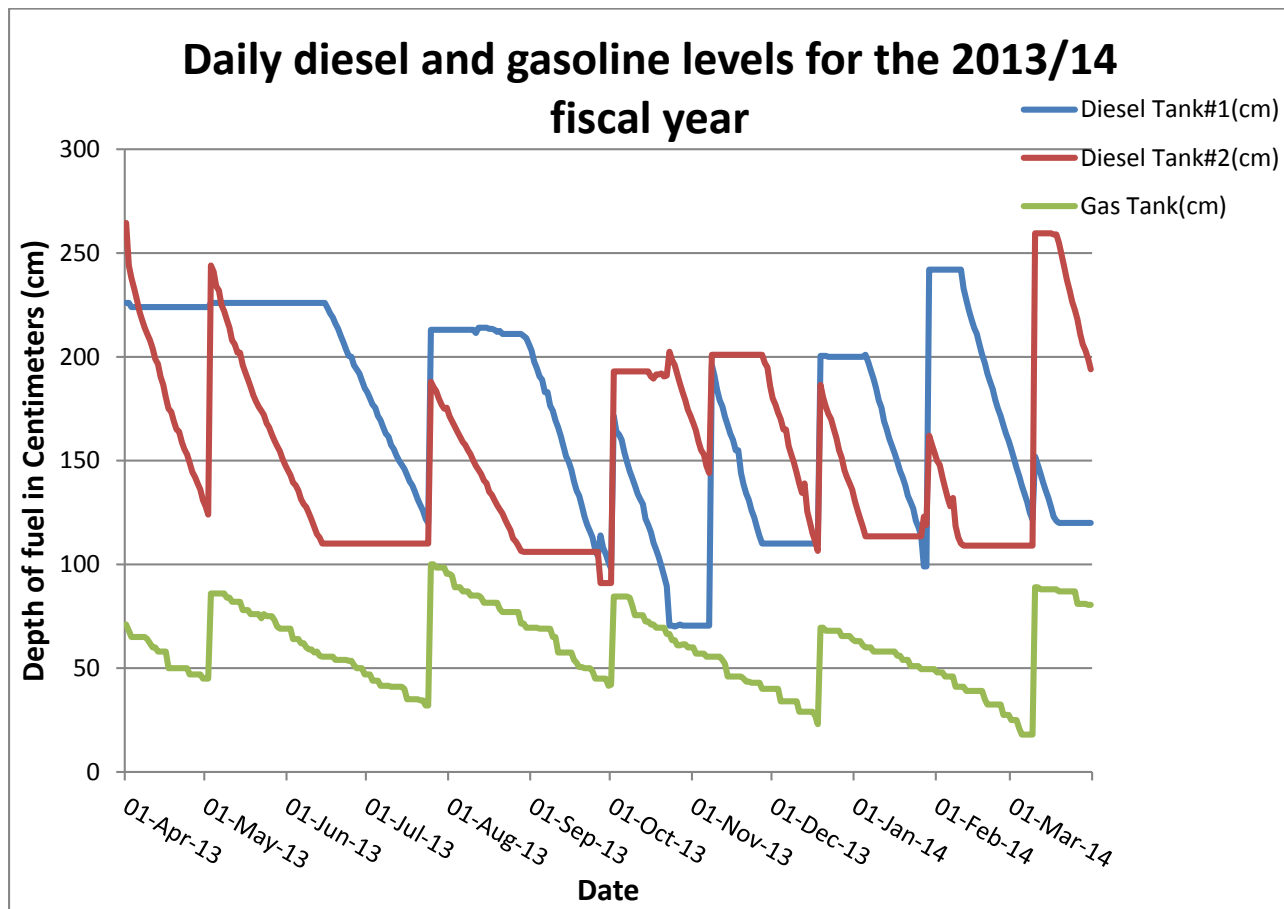


## FUEL TANK LEVELS

There is two diesel tanks located on-site, as well as one gasoline storage tank. The diesel tanks are located between the shop and the sea cans south of the mill complex. Each diesel tank holds roughly 49,000L of fuel. The gasoline tank is located by the bunkhouse beside the main access road to the site and can store approximately 4500 L of fuel.

Diesel levels drop daily as they supply fuel to the generators and other heavy equipment necessary to complete daily site operations. Gasoline levels do not change regularly as it is only needed when work trucks or other equipment (small pumps, ATV's) requires re-fueling.





The graph above illustrates the fuel levels for the diesel and gasoline tank. The Tanks are dipped daily to have an accurate reading (cm) of the fuel in each tank. With one generator running full time each day, the diesel tank that is in use will decrease approximately 5cm each day. Once one of the diesel tanks has dropped to approximately 100cm, it is turned off and the other tank is used. By keeping approximately 100cm in the tank allows the fuel to stay above the fuel lines to the generators and prevents the fuel pumps on the generator that is running from burning out as it tries to pull fuel for a long distance through the fuel lines.

Q1: during Q1, only one fuel delivery was made to site which occurred on May 3<sup>rd</sup>. Both diesel and gasoline were delivered to site on this date. Fuel consumption began to increase towards the end of Q1 as the site operations personnel began the site clean-up, which required all their heavy equipment working on a daily basis.

Q2: during Q2, one fuel delivery was made to site on July 25<sup>th</sup>. Both diesel and gasoline were delivered to site on this date. Site operations personnel were still working daily on site clean-up and the heavy equipment required regular re-fuelling.

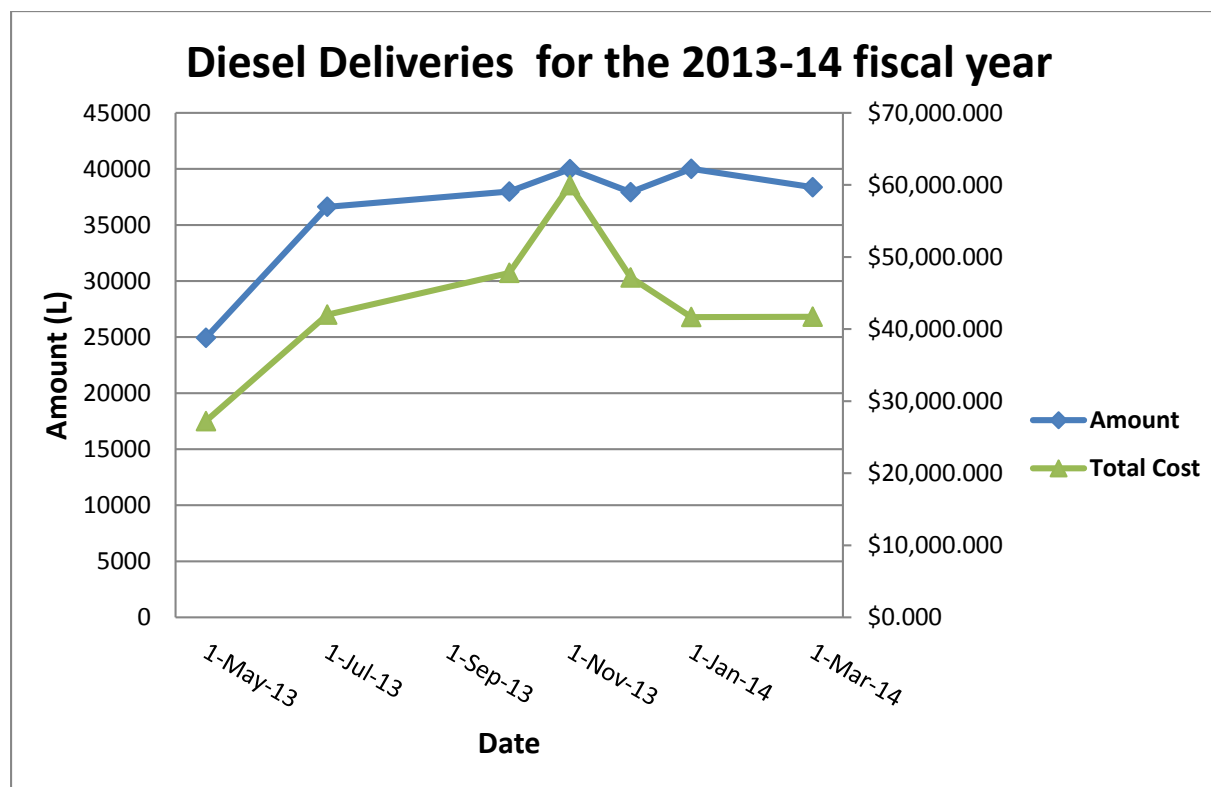
Q3: during Q3, there were three deliveries of diesel made to the site (October 2<sup>nd</sup>, November 8<sup>th</sup> and December 19<sup>th</sup>). There were two deliveries of gasoline made to the site (October 2<sup>nd</sup> and December 19<sup>th</sup>). More diesel fuel was delivered during Q3 in preparation for the winter months when the Nansen Road is unpredictable and access to site with heavy trucks can be difficult or impossible at times.

Q4: during Q4, two deliveries were made to site (January 29<sup>th</sup> and March 10<sup>th</sup>). Only diesel was delivered in January, and both diesel and gasoline were delivered in March in preparation for freshet. Typically, the road becomes very difficult for heavy equipment to travel between April and May as the spring melting causes muddy and overflow conditions on the road. In early April, the road can be accessed by heavy trucks (e.g. fuel trucks) in the early morning hours when the road is still firm from cool temperatures at night.



## DIESEL DELIVERY

The Mount Nansen Site is dependent on the consumption of diesel. Diesel fuels the three generators which power the entire site (only one generator runs at one time). There are also water pumps that need to be running continuously to keep water levels below a certain threshold in order to ensure the integrity of the tailings and seepage pond facility. Diesel is also needed for fueling heavy equipment on site to complete daily site operations.

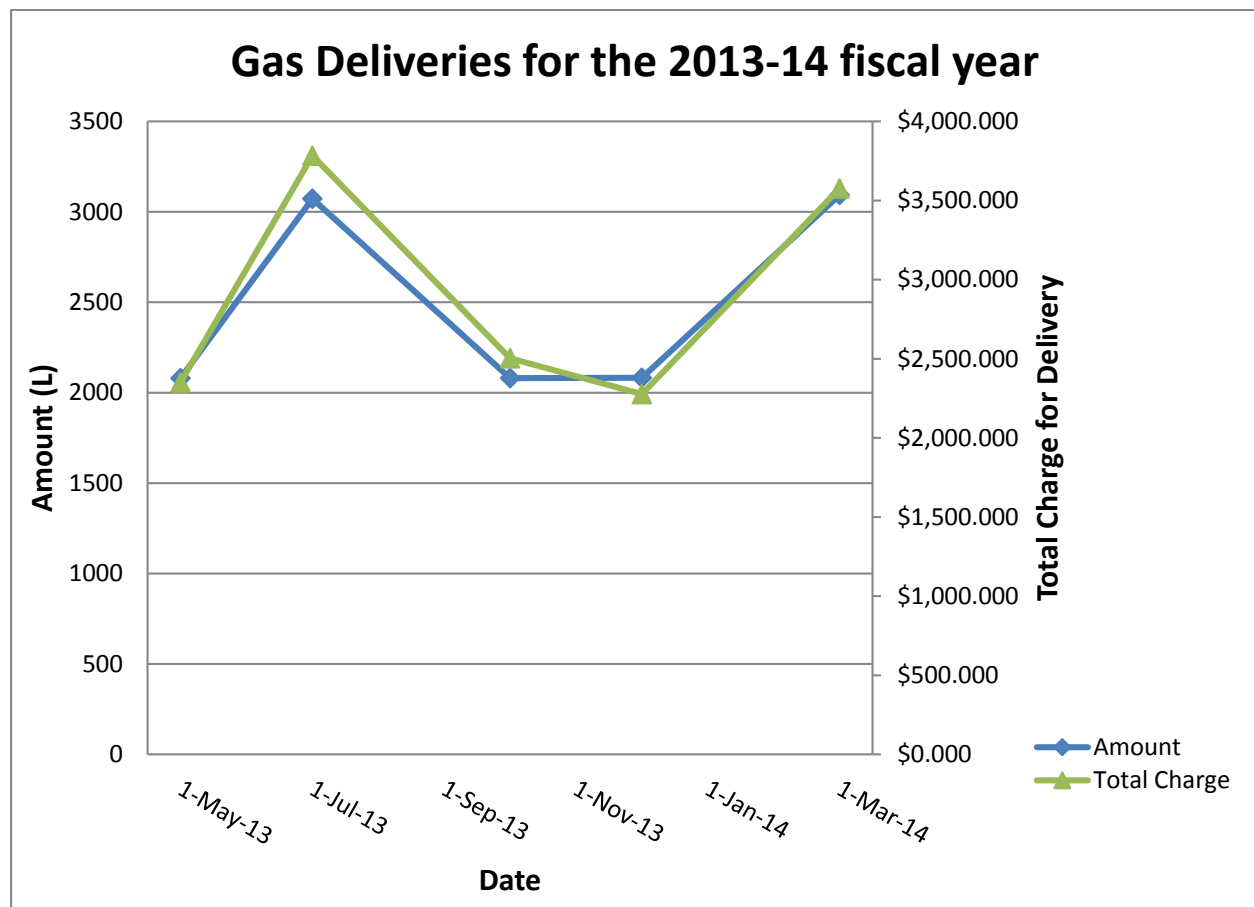


The above chart shows the diesel delivery over the 2013/14 fiscal year. Fuel is usually delivered before the beginning of the new fiscal year due to poor road conditions during the early months of spring. Diesel consumption will increase in the winter months as the diversion needs to be excavated on a regular basis (removal of ice). Snow fall is another factor as the roads need to be plowed regularly. Excavation of the diversion and plowing the site roads began in October and will continue to be completed on a regular basis for the duration of the winter months.

For the 2013/14 fiscal year, a total of 255,815 L of diesel was consumed on the site. Electrical generating equipment, as well as heavy equipment used on site to perform daily site operations activities consumed the diesel at the site.

## GAS DELIVERY

There is one gasoline storage tank on-site. It is used mainly to fill DES work trucks, the UTV, and small pumps in order to conduct daily inspections of the site. Gas consumption is considerably less than diesel.



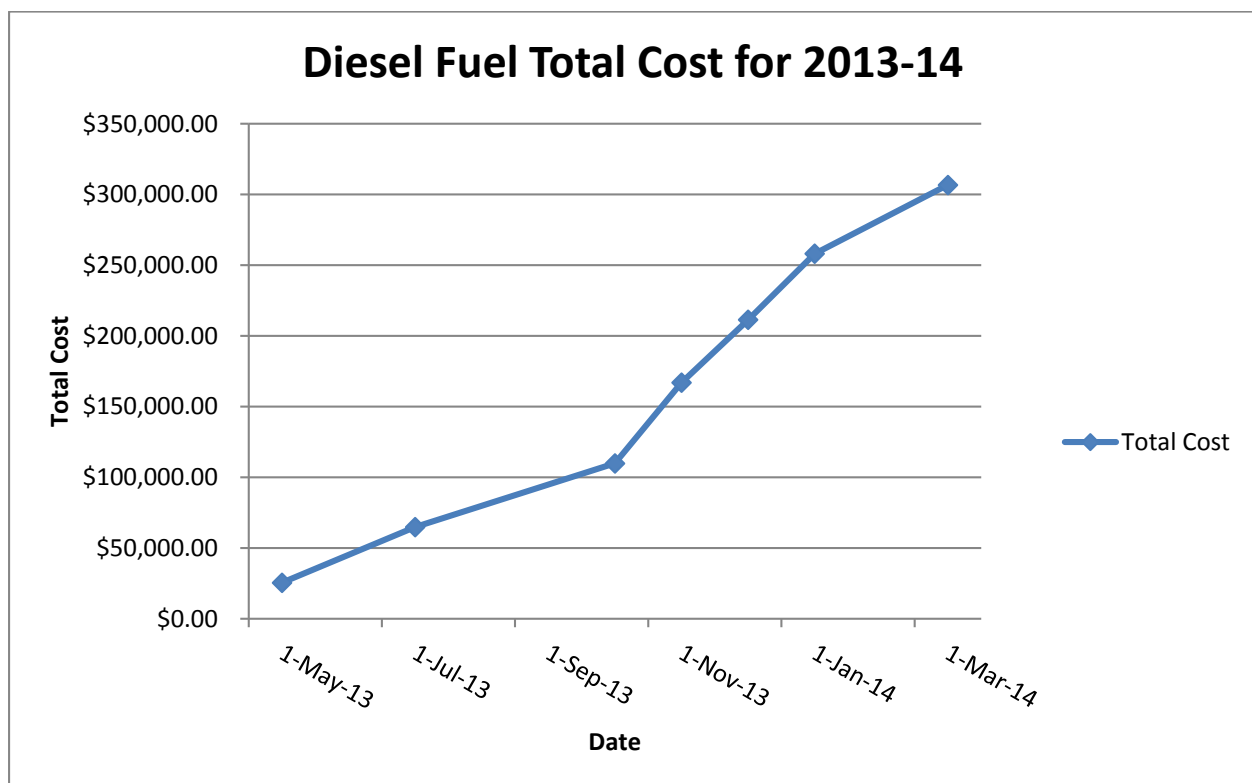
The above chart shows the deliveries of gasoline for the 2013/14 fiscal year. Gasoline costs and consumption are lower than the diesel costs since there is only one tank on-site and do not get used on a daily basis.

The total amount of gasoline consumed on the site for the 2013/14 fiscal year was 12,411 L. The site operator uses the gasoline to fuel their light vehicles such as pick-up trucks, ATV, and small pumps and generators.

## DIESEL TOTAL COST

The graph below illustrates the total cost of the diesel consumed at the Mount Nansen site for the 2013/14 fiscal year. Each delivery is marked on the line graph with a square and an accumulative total to show the final cost at the end of the year.

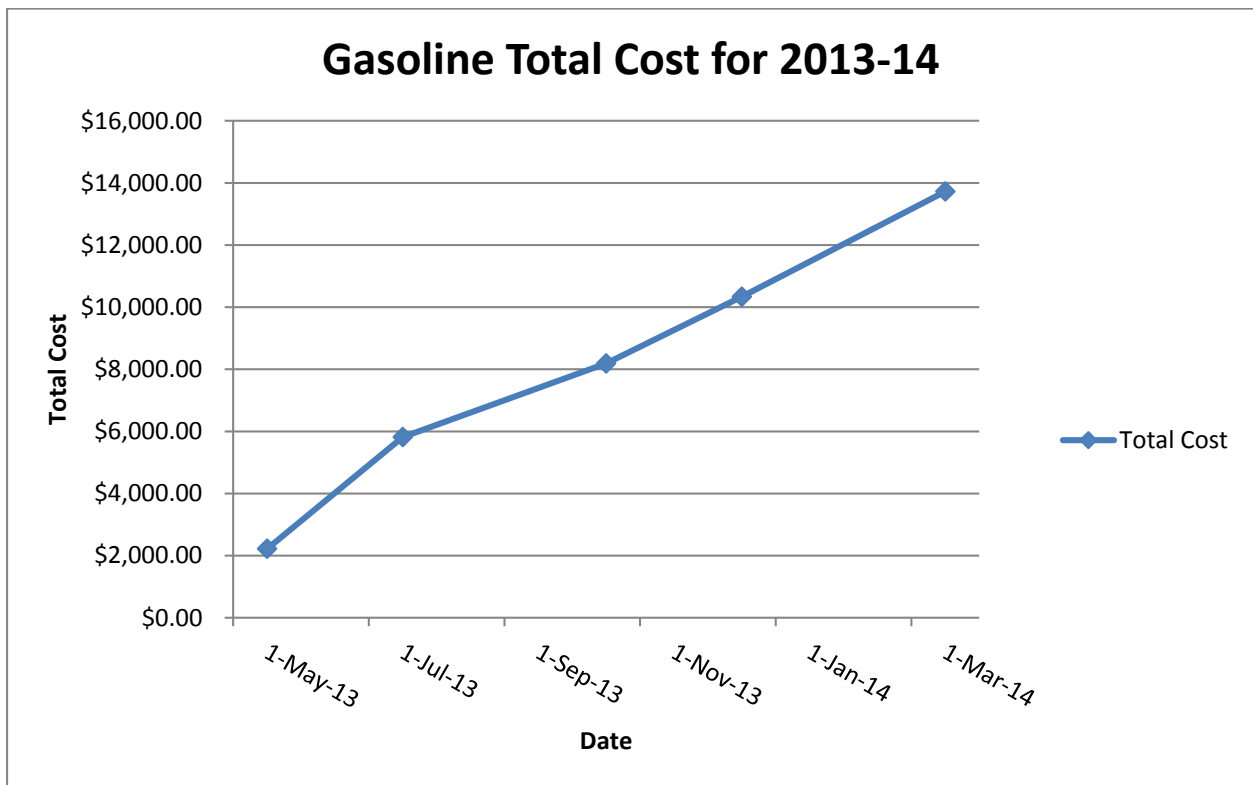
The total cost for diesel for the 2013/14 fiscal year was \$306,732.44. This total does not include the cost of delivery of fuel to the site. The cost of fuel for this year was greater than what was budgeted. The cost of fuel increased which was not accounted for, as well as additional fuel used by site operations staff for the site clean-up activities may have contributed to the increased usage of fuel on the site.



## GASOLINE TOTAL COST

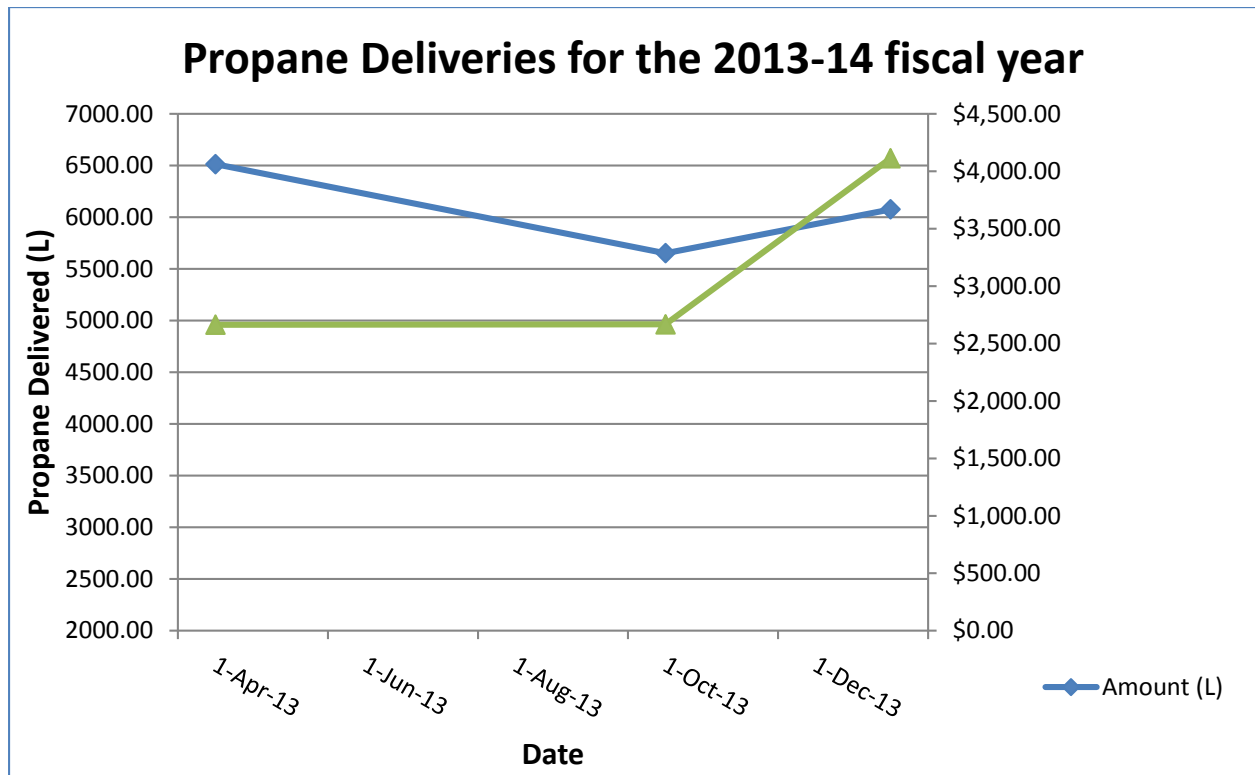
The graph below illustrates the total cost of the gasoline consumed at the Mount Nansen site for the 2013/14 fiscal year. Each delivery is marked on the line graph with a square and an accumulative total to show the final cost at the end of the year.

Gasoline costs are considerably less than the diesel due to only smaller vehicles and pumps requiring the use of gasoline on site. The total cost for gasoline on site during the 2013/14 fiscal year was \$13,723.05. This total cost as described above, does not include the cost of delivery to site.

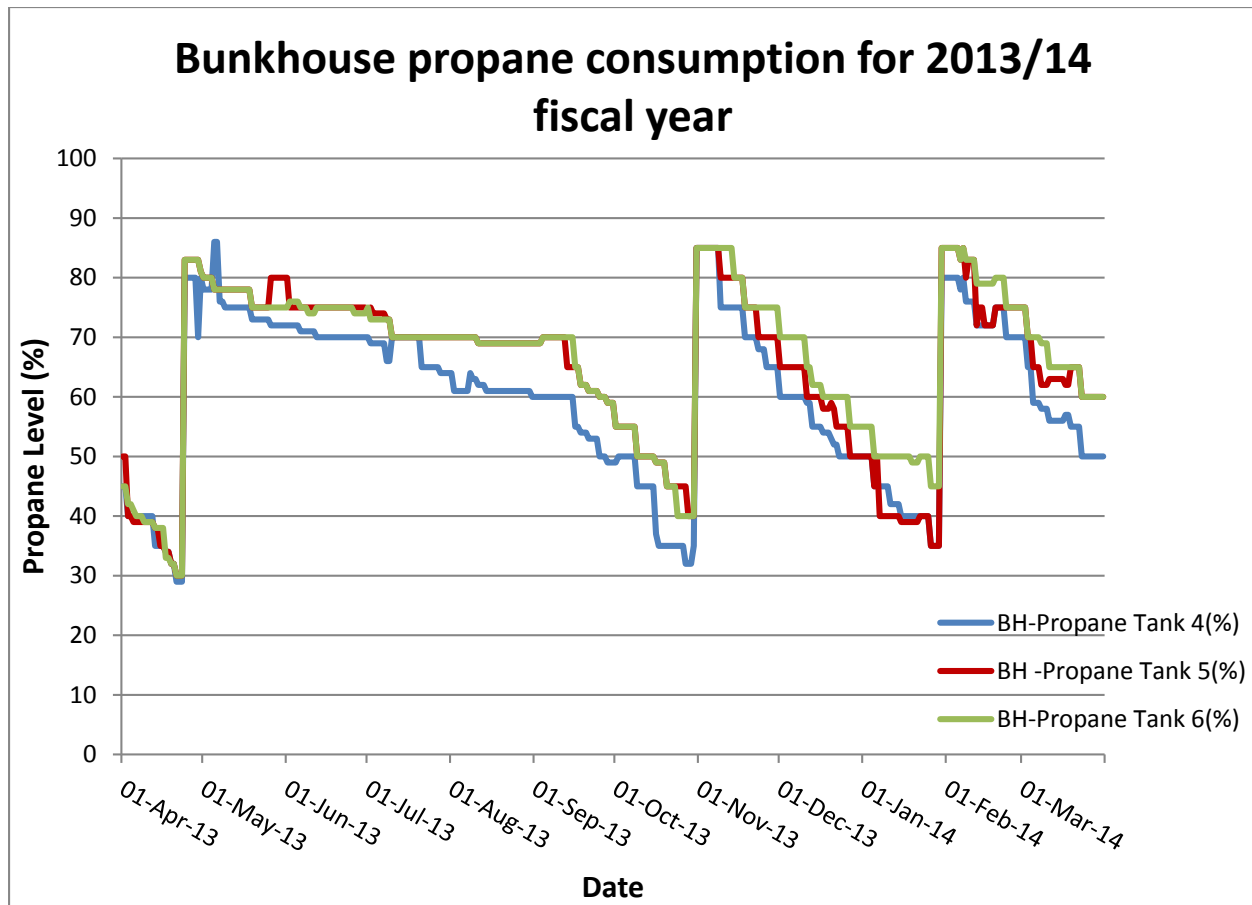


## PROPANE CONSUMPTION

Propane is another source of fuel used at the Mount Nansen Site. The bunkhouse uses three propane tanks that are located approx. 50m from the bunkhouse. Propane is used to run the two boilers in the bunk house which provide heat and hot water to the facility. For the 2013/14 fiscal year, a total of 18,241 L of propane was consumed at the site, with a total cost of \$9,445.28







The chart above shows the propane use at the bunkhouse. All three tanks diminish at a similar rate as they are all connected by a central line. This also prevents one tank from going completely empty. The tanks need to have at least 5% remaining in order to keep the tank pressurized. These propane tanks are not to be filled past 85% full to compensate for expansion of the propane during summer months.

As there are three propane tanks that provide fuel to only the bunkhouse to run the boilers for heating the building and for hot water, the deliveries required for propane are far less than for diesel or gasoline.

Q1: during Q1, one propane delivery was made to site on April 24<sup>th</sup>. During the spring and summer months, propane consumption decreases dramatically because the propane fuels only the boilers and hot water at the bunkhouse. Once the boilers are not running to provide heat for the bunkhouse, it is only the hot water tank that requires propane during this time.

Q2: during Q2, no propane deliveries were necessary for the site. As noted above, once the summer months arrive, propane consumption is decreased considerably as only the hot water tank needs propane.

Q3: during Q3, one propane delivery was made on October 31<sup>st</sup>. As the cooler temperatures require the boilers to run to provide heat to the bunkhouse, the consumption of propane begins to rise again.

Q4: during Q4, one propane delivery was made on January 30<sup>th</sup>. The bunkhouse uses much more propane during the fall/winter months as the boilers run regularly to provide heat to the bunkhouse.

## GENERATOR USAGE CHARTS

The Mount Nansen Site has three generators that are used to power the site. They are cycled through one at a time. They each run for approximately 10 days continuously before they require servicing, at which time another generator will be brought on-line to power the site. Generators are required to run full time due to the generators being the only power source. The pump at the seepage pond must remain operational 24/7 to keep the seepage pond at safe operating level. Failure to do this would result water overtopping the dam, resulting in structural damage or complete failure of the seepage pond dam.

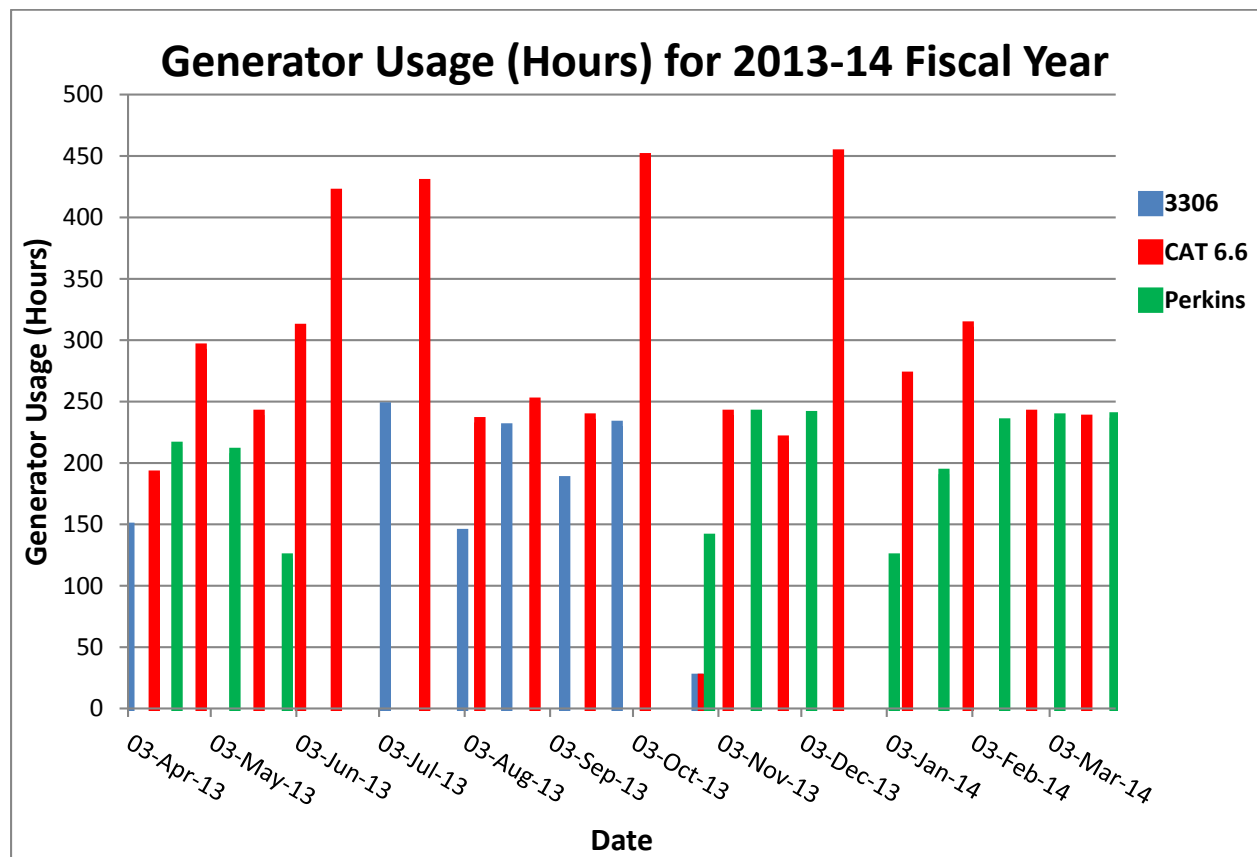
The total usage (in hours) for each generator for the 2013/14 fiscal year is as follows:

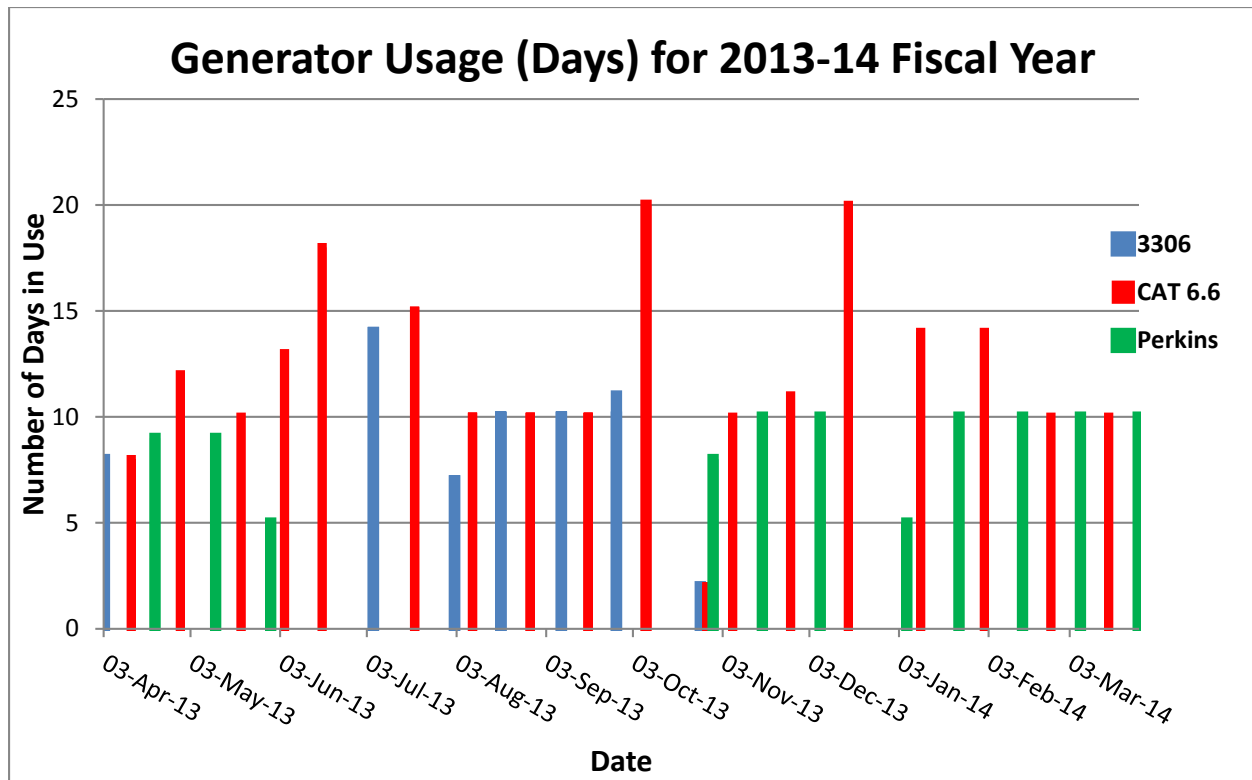
CAT 6.6: 5,237.5 hours

CAT 3306: 1,201 hours

Perkins: 1,940 hours

The problems and issues with each generator that accounts for the hours on each generator are described below in the breakdown of each quarter.





The above charts show the number of hours/days the generators are being used. In some occasions the generators will run longer than the two week period, but will receive an oil change and will be put back online. When repairs need to be conducted a generator may run past the two week mark as well. As shown above you are able to see the number of days each generator ran and the number of hours.

The total usage (in days) for each generator is as follows for the 2013/14 fiscal year:

CAT 6.6: 216 days

CAT 3306: 61 days

Perkins: 86 days

The problems and issues with each generator are described as necessary in each quarter for the 2013/14 fiscal year.

Q1: during the first quarter, there were issues with the operation of the 3306 generator. An electrical contractor was on-site installing block heaters on the three generators. The heater on the 3306 was installed incorrectly, causing coolant to leave water jacket of the engine and enter

the internals of the engine. The engine immediately quit and was then taken out of operation. After this incident, only the 6.6 and the Perkins were used.

Q2: during Q2, it was found that the block heater was installed incorrectly and the site operations staff began to diagnose and repair the damages to the 3306. Once all of the fluids had been drained, replaced and the heater removed, the unit was started and eventually put back into service. At this time, it was unknown if any internal damage had been caused by the incorrect install of the heater. In July, the Perkins also had issues which were caused by a faulty alternator and a leaking water pump. AAM personnel spent many days trying to track down parts for the Perkins unit, eventually finding all of them by the end of Q2.

Q3: In Q3, the 3306 overheated during the night, causing the unit to shut down. As there are no emergency shut downs on this unit, it appeared that the unit became so hot it boiled the fuel in the lines. The failure of this unit is believed to be contributed to the incorrect install of the block heater in Q1. Although no thorough investigation was completed on the unit, it is believed that severe damage was caused in Q1 and was only a matter of time before it quit permanently. Once again, power was provided to the site with the CAT 6.6 and the Perkins.

Q4: during Q4, the CAT 6.6 and the Perkins shared the responsibilities equally to provide power to the site. In January, the Perkins was not providing enough power to the site and the CAT 6.6 was put on-line. After diagnosis, it was determined that the high winds may have been shaking the lines, causing a breaker to trip in the Perkins c-can. Once the breaker was re-set, the Perkins was once again fully operational. During Q4, a new generator was procured to replace the non-operational 3306. The new generator is anticipated to arrive at site and installed early in Q1 of the 2014/15 fiscal year.



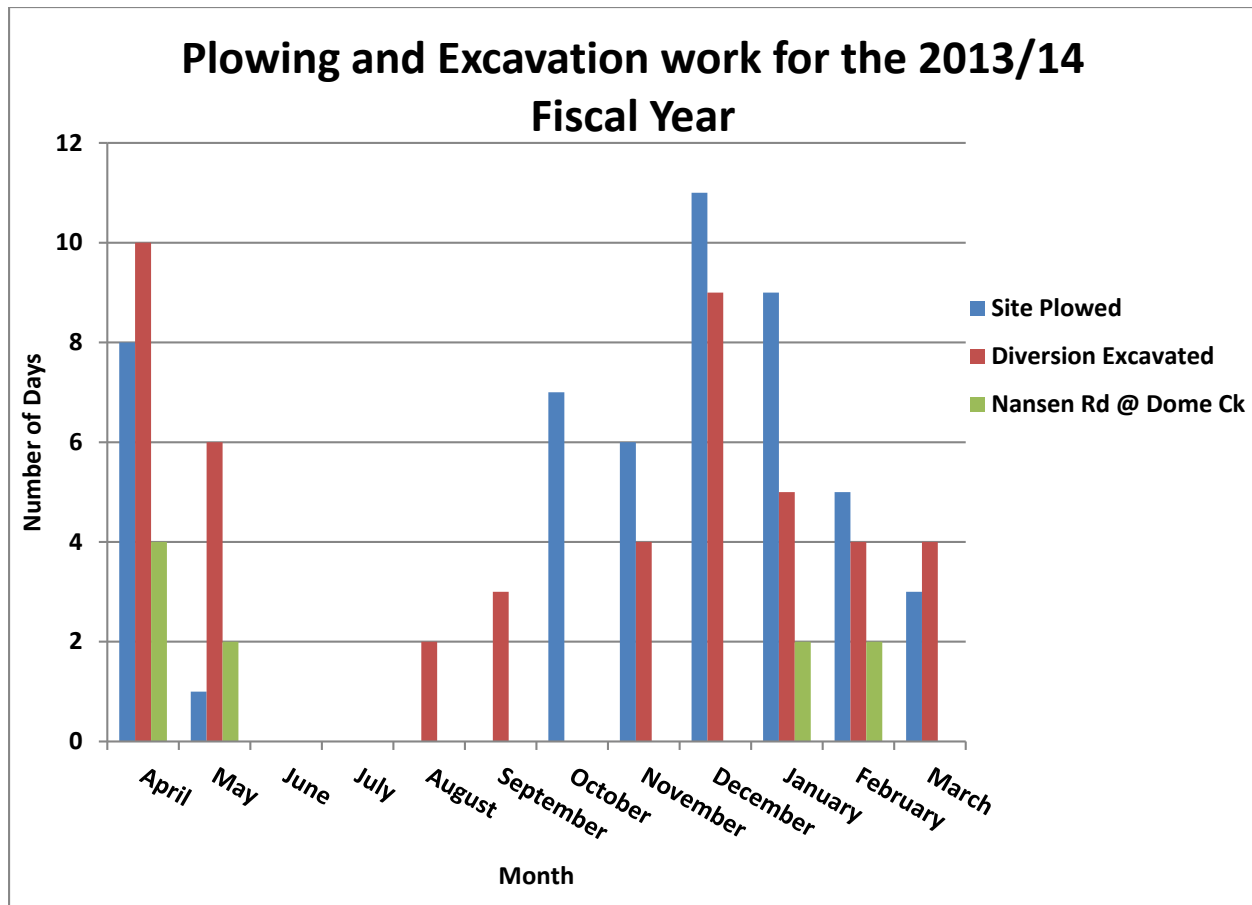
## SITE EXCAVATION/SNOW REMOVAL WORKS

The Mount Nansen Site requires excavation for a variety of tasks throughout the year. The Dome Creek Diversion Channel requires excavation to remove silt from the diversion bed to allow the water to flow under the ice once winter comes. The diversion needs to be excavated regularly during the winter months as overflow builds up and causes glaciation within the diversion channel. If the ice/water level is not maintained, the tailings facility could become damaged or compromised from the water/ice overtopping the diversion channel. Snow removal is also required throughout the winter months in order to keep all site roads accessible. At the end of August, the diversion channel was surveyed and the silt was excavated from the diversion channel to keep a constant grade and water flowing at a continuous rate. In September, temperatures at the site dropped considerably causing the diversion to freeze to the bottom. This caused an overflow and required excavation by the site operator. The diversion channel was excavated multiple times over the winter months to keep water flowing in an established channel. Detailed information is contained in the paragraphs below, as well as in the breakdown of each quarter below the accompanying graph.

For the 2013/14 fiscal year, the site operations personnel spent 47 days excavating the diversion channel. This was to keep an established channel open to allow water to flow freely without obstruction. Two of the days noted above were spent excavating silt from the diversion channel during the summer months to keep a constant grade in the channel to allow a steady stream of water to flow.

The site operations personnel spent 51 days during the fiscal year plowing the roads and keeping them safe and accessible.

The site access road at Dome Creek has glaciation issues during the winter months that occasionally need to be addressed by the site operations personnel when the Highways crew are not able to get to site when needed. For this reason, the site operations personnel spent 10 days during the fiscal year addressing the glaciation issues at the Dome Creek crossing.



Q1: during the first quarter, site operations personnel spent many days plowing snow on and away from site roads in anticipation of freshet. The diversion channel was also excavated numerous times to ensure there was adequate room for the spring melt and that there were no ice blockages in the channel that could cause erosion or overtopping issues. The access road at Dome Creek was also excavated several times as the culvert typically freezes off, causing water to overtop the road in this location. Site operations personnel kept the road clear of glaciation so access to the site was relatively, particularly for fuel deliveries (gas/diesel and propane).

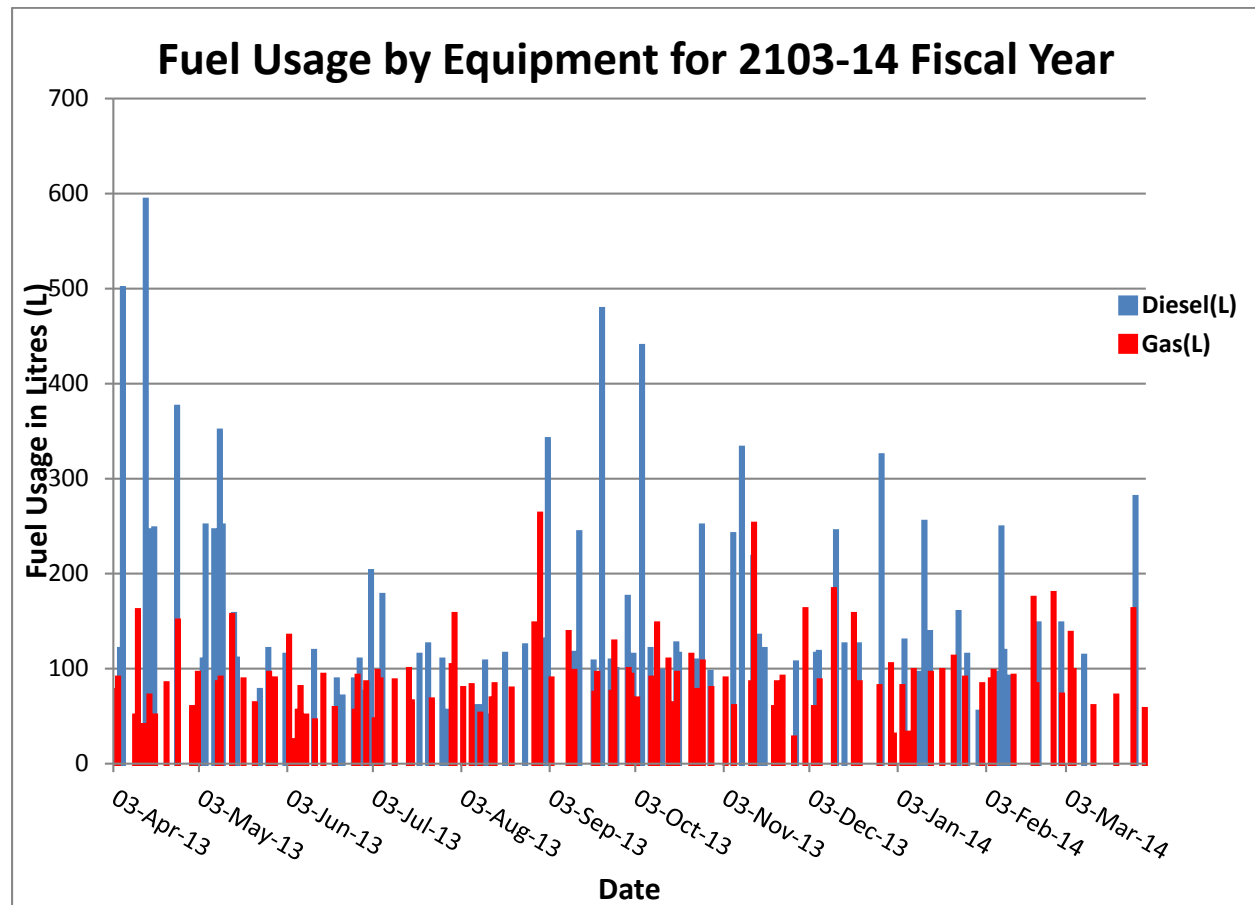
Q2: In Q2, as there is no plowing of site roads required, this quarter was relatively quiet. The diversion channel was excavated twice during this quarter. The first excavation was to address some sloughing of the banks that was noticed during the EBA geotechnical inspection. The other excavation was the silt removal in the diversion channel to keep a steady grade from the top to the bottom. Boreal Engineering surveyed the diversion channel and placed grade stakes along the length of the channel and site operations personnel excavated the desired depth of silt.

Q3: The site roads were plowed 24 times during this quarter. The diversion channel was excavated 4 times in November and was excavated regularly thereafter.

Q4: during Q4, the diversion channel was excavated regularly to keep water flowing freely without obstruction. With the warming/cooling temperatures experienced this past season, the overflow and glaciating of the diversion channel kept site operations personnel busy monitoring daily and excavating almost on a weekly basis. The site roads were plowed regularly as well. On site due to its location in the Dome Creek valley, drifting snow occurs regularly and must be plowed on a regular basis so allow access to the entire site.

## EQUIPMENT FUEL CONSUMPTION

Various types of equipment are needed on-site to complete site operations at the Mount Nansen site. DES has four pieces of equipment to complete various tasks as per the site operations contract. This table below looks at the consumption of fuel (L) that each piece of equipment uses when needed.



The above chart shows the fuel usage on-site. Diesel is used mainly with the heavy equipment that the site operator needs to perform daily site operations tasks. The gas is used mainly to transport around site in the work vehicles and to travel back and forth from Whitehorse as the site operations personnel complete their shift changes.

Q1: during Q1, diesel consumption was quite high. The site operations contractor had several large pieces of equipment on site during this time that was used moving snow and prepping the diversion channel for freshet. Later in Q2, these pieces of equipment were removed and replaced with smaller equipment on site. Also during Q1, the site operations personnel had begun the site wide clean-up which required all of their heavy equipment to be utilized.

Q2: during Q2, fuel consumption was moderate. The site operations personnel were still work on the site wide clean-up, but smaller pieces of equipment such as their F-550 dump truck and the 420 backhoe were completing a majority of the work. It was also during Q2 the site operator ran into issues procuring an adequate excavator for site usage. For most of July, only the 420 backhoe and F-550 dump truck were available on site for the clean-up.

Q3: during Q3, the site wide clean-up continued and needed the backhoe and excavator to operate regularly as the abandoned pipelines around the site were gathered and placed in the appropriate staging areas. The repairs to the spillway took place during Q3 which required many hours of sorting suitable rip rap materials and many hours of equipment running to complete the repairs. In addition, as temperatures cooled, the diversion channel began to freeze off which required numerous excavations, particularly toward month of December.

Q4: during Q4, the majority of the equipment was used to plow snow and clear all site roads, hauling water for camp and completing regular excavations of the diversion channel. With the fluctuations in temperature during the year, the diversion channel needed numerous excavations to allow water to flow without restriction through the diversion channel.

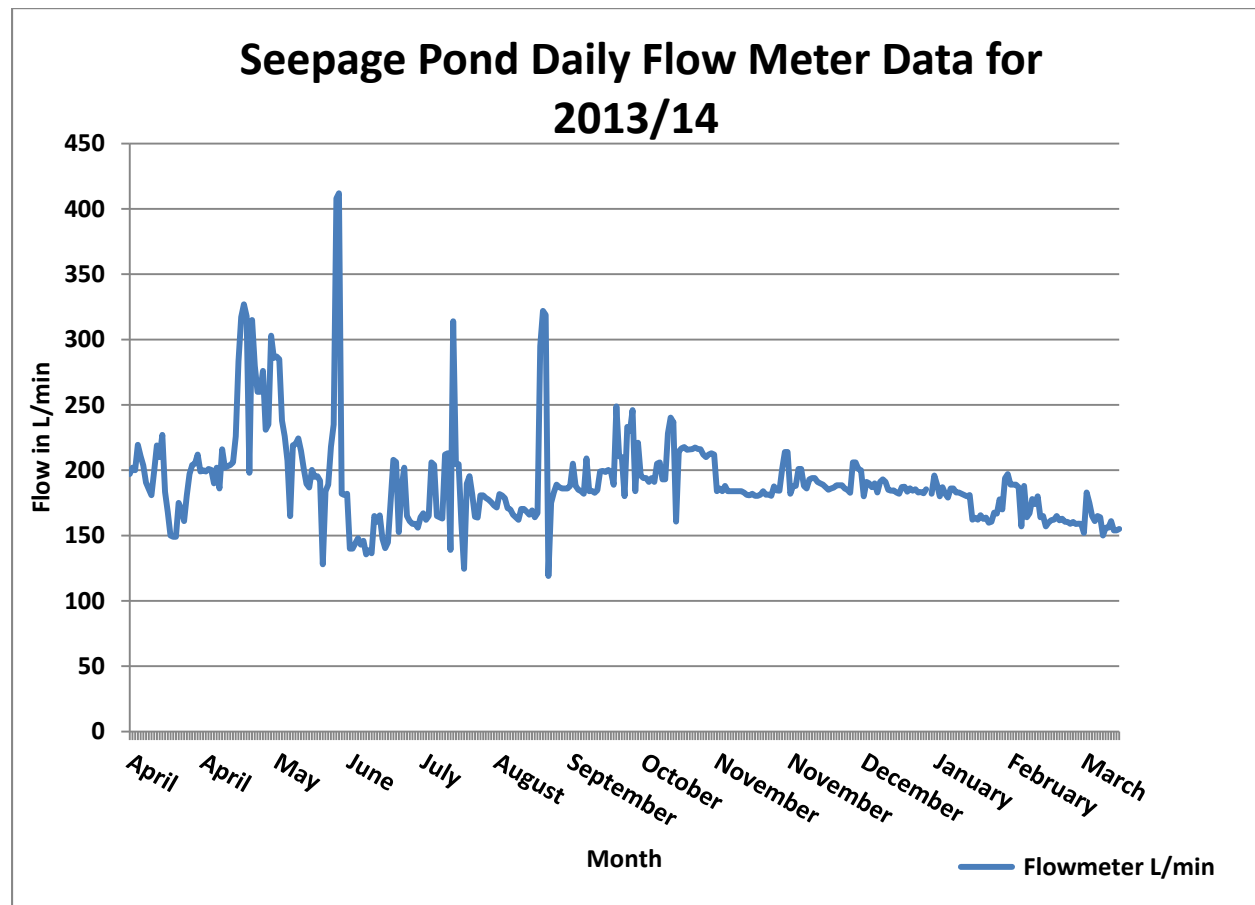
For the 2013/14 fiscal year, 13,703 L of diesel were used by heavy equipment to complete daily site operations activities. For other site operations activities that required gasoline (light duty trucks, ATV, small pumps/generators), 9,782 L of gasoline was consumed.

The total amount of fuel delivered to site was 255,815 L. Site operations equipment consumed a total of 13,703 L for daily site operations activities. The remaining 242,112 L would be consumed by the 3 generators on site that provide power to the entire site.



## FLOW METER @ SEEPAGE POND

The seepage pond at the Mount Nansen site is located below the tailings pond. It requires a pump to run 24/7 in order to keep the seepage pond level at a safe, steady operational level. A flow meter located inside the seepage pond pump house and is read daily by the site operator. Flow is adjusted daily to maintain a suitable level in the seepage pond.



Q1: during Q1 is when noticeable changes in flow typically occur as freshet begins and brings fresh melt water through the site. Through the month of April the flow fluctuated slightly as the warmer temperatures began to occur on a regular basis. In May, the main melting event occurred which can be seen in the large spike on the graph. The main seepage pond pump was operating at full capacity (350L/min). An additional Flygt pump was utilized to maintain a stable level in the seepage pond until the event began to subside and the seepage pump could maintain the level on its own.

Q2: during Q2, the level seepage pond level was kept relatively stable. There are many small spikes in the graph where the flow rate changes. Many times this occurs when the site operations personnel shut down power at the site to check, or service generators. During this

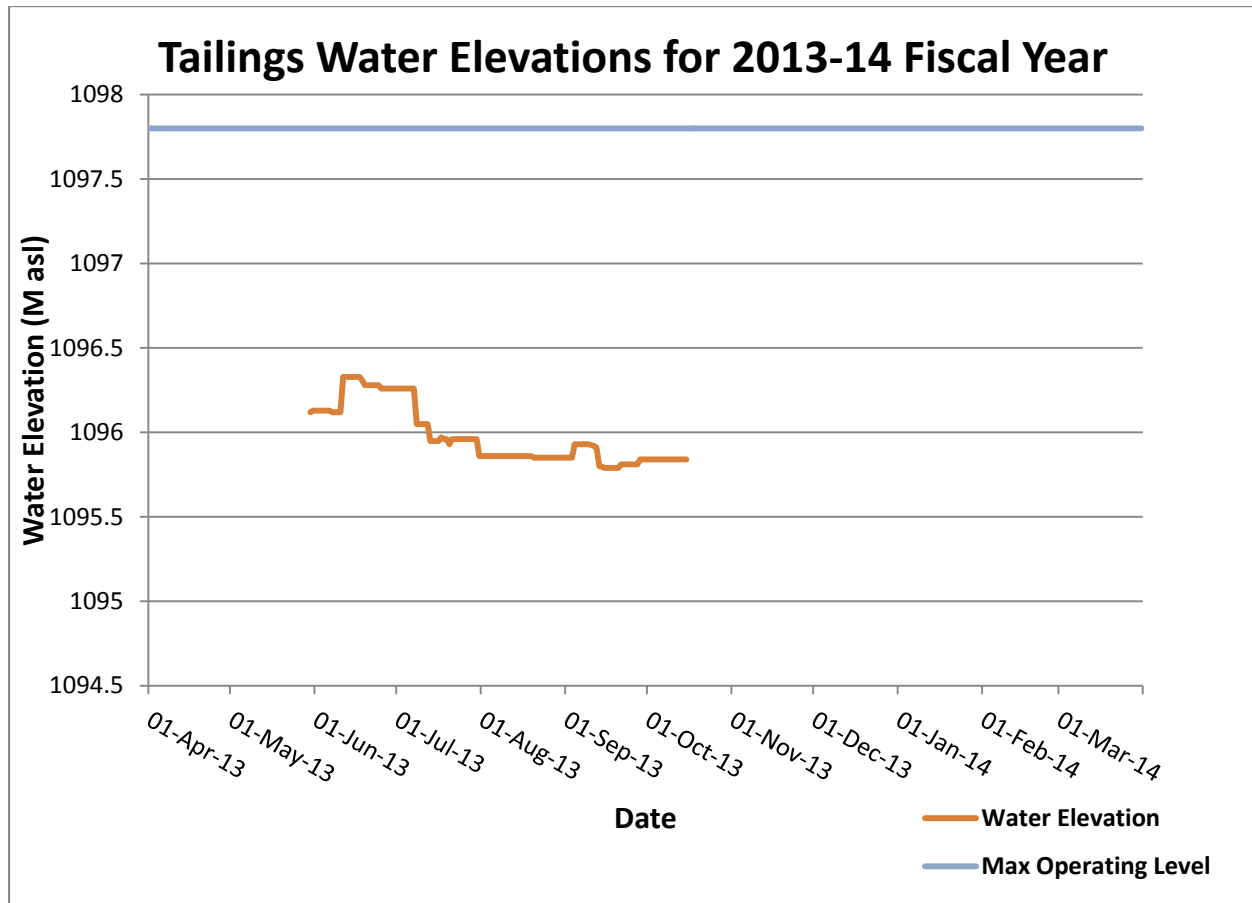
time the pump no longer runs at the seepage pond. The piping has been modified in the seepage pump house so it will syphon on its own, but is not enough to maintain a steady level. Once the power is restored, many times the pump will be turned slightly to increase the flow and bring the pond level back to its normal operating level. A large spike is seen on the graph in the month of July which was resulted in the site operations personnel pumping the pond down to a much lower level for the geotechnical inspection could be completed by EBA. The second spike on graph during this quarter was the result for having the power off at site for a considerable amount of time while Arcrite completed many of the electrical deficiencies at the site. Once they were completed, the flow rate was increased to bring the pond back down to the normal operating level.

Q3: Seepage pond levels stayed relatively normal throughout the quarter. As the temperature cools and the site begins to freeze, the seepage flow stabilizes and is easier to maintain at a constant level.

Q4: As with the third quarter, this quarter saw stable flow rates similar to the third quarter. As freshet approaches, site operations personnel will prep equipment and pipelines increased flows and additional pumps and pipelines are on standby if necessary.

## TAILINGS POND WATER LEVELS

The Mount Nansen site has two bodies of water that have staff gauges installed. The tailings pond is always monitored to ensure the water level stays below the maximum operating level. If the water was to reach the maximum operating level, there could be failure to keep the water contained which would jeopardize the dam.



The above chart shows the water level of the tailings pond. It is safely below the maximum threshold. The staff gauge is read monthly. There are no readings in the late fall and winter months due to ice formation on the tailings pond. The tailings pond was re-surveyed on July 17, 2013 so the elevations will differ slightly from previous measurements.

Q1: during the first quarter, the tailings pond remained frozen until May 30<sup>th</sup>, at which time the staff gauge could be read.

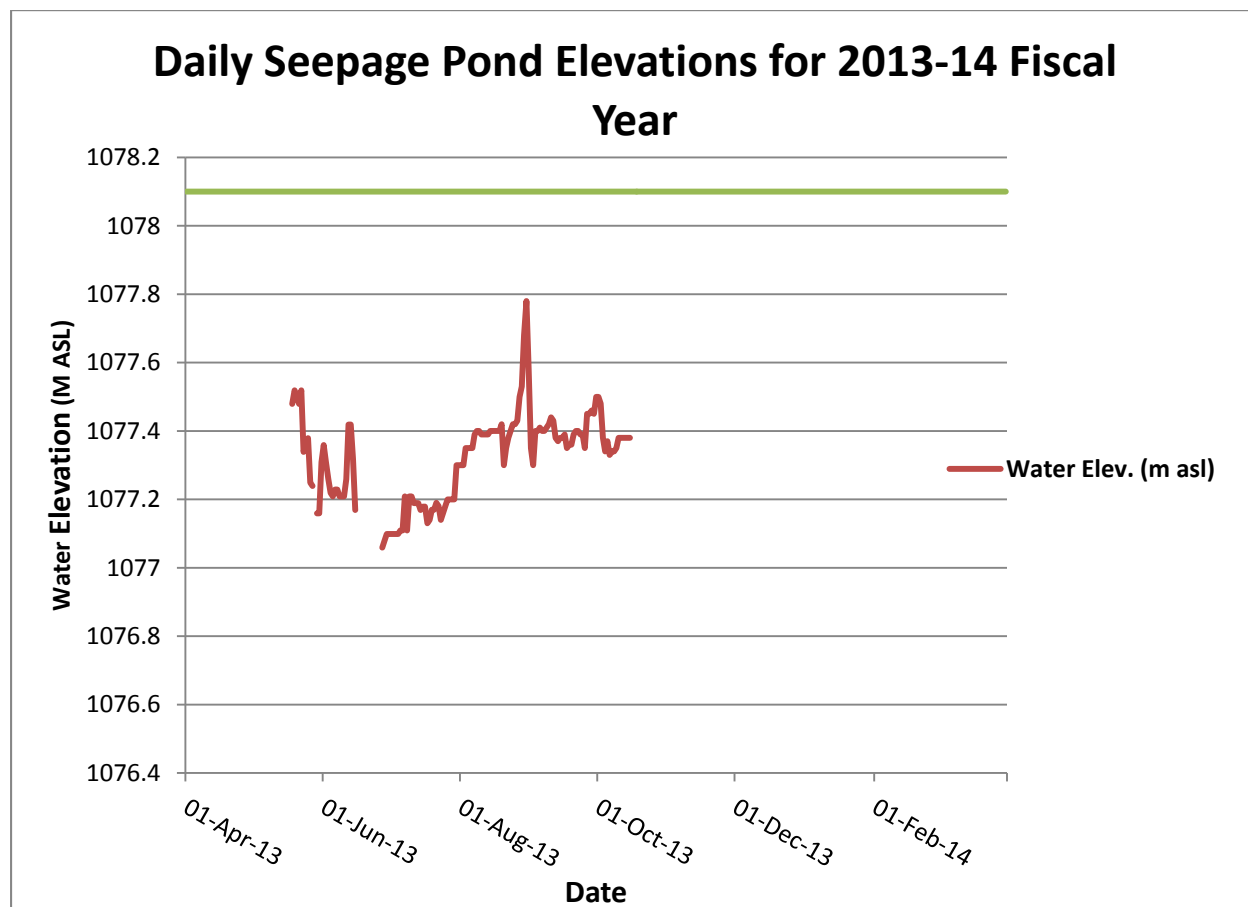
Q2: In the second quarter, the water level rose in the beginning as freshet and melting ice in the tailings pond affected the water level. As the end of the second quarter was reached, the water level had dropped considerably.

Q3: In the third quarter, there was a slight increase in the water level due to several days of steady rain at the beginning of September. Once this subsided, the tailings pond returned to a more normal level. During this quarter, the temperatures began to cool and eventually ice began to form on the tailings pond. The final reading for the season was recorded on October 15<sup>th</sup>. After this date, the ice was too thick and no more staff gauge readings could be recorded.

Q4: during the fourth quarter no readings were recorded as the pond was completely frozen over.

## SEEPAGE POND WATER LEVELS

The seepage pond is the other body of water monitored on-site. Unlike the tailings pond, the seepage pond has a pump running 24/7. Without the pump running continuously every day, the seepage pond would reach the maximum operating level within hours of the pump ceasing to operate.



The above chart outlines the seepage pond water level for the 2013/14 fiscal year. We are operating at the recommended level as we are still below the maximum threshold. We are only able to collect data for the open water months (May-October), as ice will form on the ponds and readings cannot be collected. This staff gauge is also read daily. The seepage pond was re-surveyed on July 17, 2013 so the elevations will differ from previous measurements. The flow is adjusted daily to keep the pond at the recommended operating level.

Q1: during the first month of Q1, no pond elevations were recorded in the seepage pond as it was still covered with a large volume of ice. In the middle of May, the ice had almost completely melted as freshet was underway. As June approached, the seepage pond water elevation began to decrease, but spiked a two dates during June due to large rain events and



the last of the snow melt running out of the mountains. Toward the end of June, no seepage pond water elevations were recorded as the seepage pond water level was below the staff gauge. The seepage pond was pumped down in preparation for the annual geotechnical inspection completed by EBA.

Q2: In Q2, the water level slowly began to rise back to operating level that is maintained by the site operations personnel once the geotechnical inspection was completed. There are several spikes in the graph where the water level was decreased. This was due to several times when the seepage pond pump was shut down. The piping at the seepage pond had to be repaired at one point, as well as a shut-down was required by the electrical contractor to perform the necessary electrical upgrades in the seepage pond area. The water would rise during these power outages and once restored, the flow of the pump would be increased to bring the water back down the proper operating level.

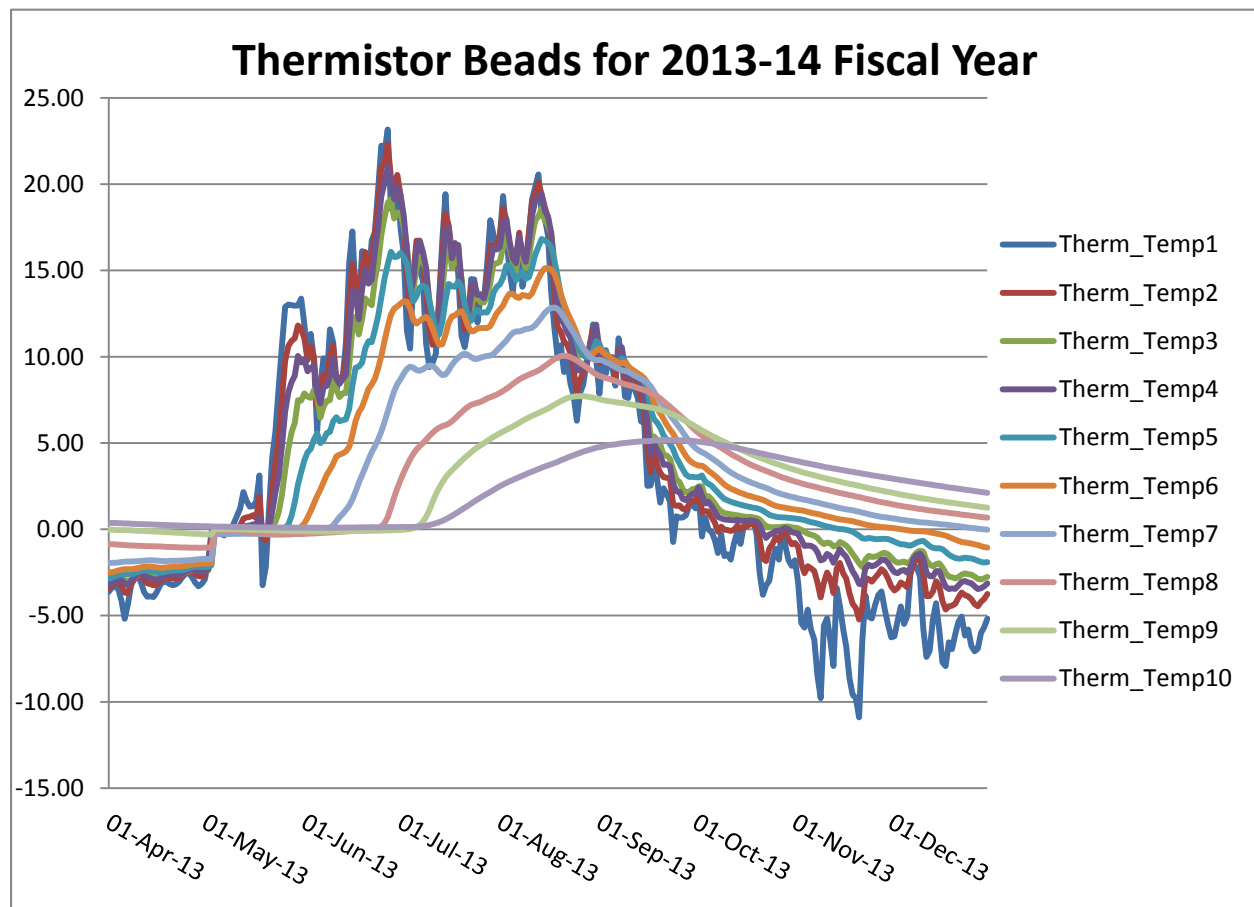
Q3: during Q3, the water level stayed relatively stable. There are several small spikes in the graph during this quarter, typically attributed to power shut-downs for generator checks/switching, or if the seepage pipeline needed to be flushed of accumulated debris inside. The last seepage pond water elevation was recorded on October 10<sup>th</sup>. After this date, as with the tailings pond water elevation level, there was a large layer of ice on both ponds and water elevations could not be recorded after this date.

Q4: There was no seepage pond water elevations recorded during this quarter due to winter conditions. Once the ice has formed on the seepage pond, accurate water elevations can no longer be collected from staff gauge located on the outside of the seepage pond building.

## WEATHER STATION

The Mount Nansen Site has one weather station that collects data and sends it remotely via satellite to a contractor who extracts the raw data and provides AAM with a spreadsheet. The weather station records a variety of parameters to inform AAM if there are any sudden changes. The data can be graphed to monitor any increasing/decreasing trends.

## THERMISTORS



The above chart shows the Thermistors temperatures for the 2013/14 fiscal year. There is a lot fluctuation from the thermistor beads that are near the surface. The beads near the surface are affected by air temperature outside the well casing. The following table is shows the bead number and its depth in the well casing. The beads within a metre of the surface will fluctuate regularly with the rising and decreasing air temperatures.

|         |      |
|---------|------|
| Therm1  | 0.0m |
| Therm2  | 0.1m |
| Therm3  | 0.2m |
| Therm4  | 0.3m |
| Therm5  | 0.5m |
| Therm6  | 0.7m |
| Therm7  | 1.0m |
| Therm8  | 1.5m |
| Therm9  | 2.0m |
| Therm10 | 3.0m |

Looking at the graph and the beads depths above, it can be seen that there are 7 thermistor beads that are within the 1.0m depth. These beads fluctuate up and down regularly with the changing air temperature outside the well casing. The other 3 beads, located below the 1.0m mark, move more gradually and tend to remain at one temperature for a longer period of time. These beads are not as affected by the outside air temperature as the beads at and above the 1.0m mark.

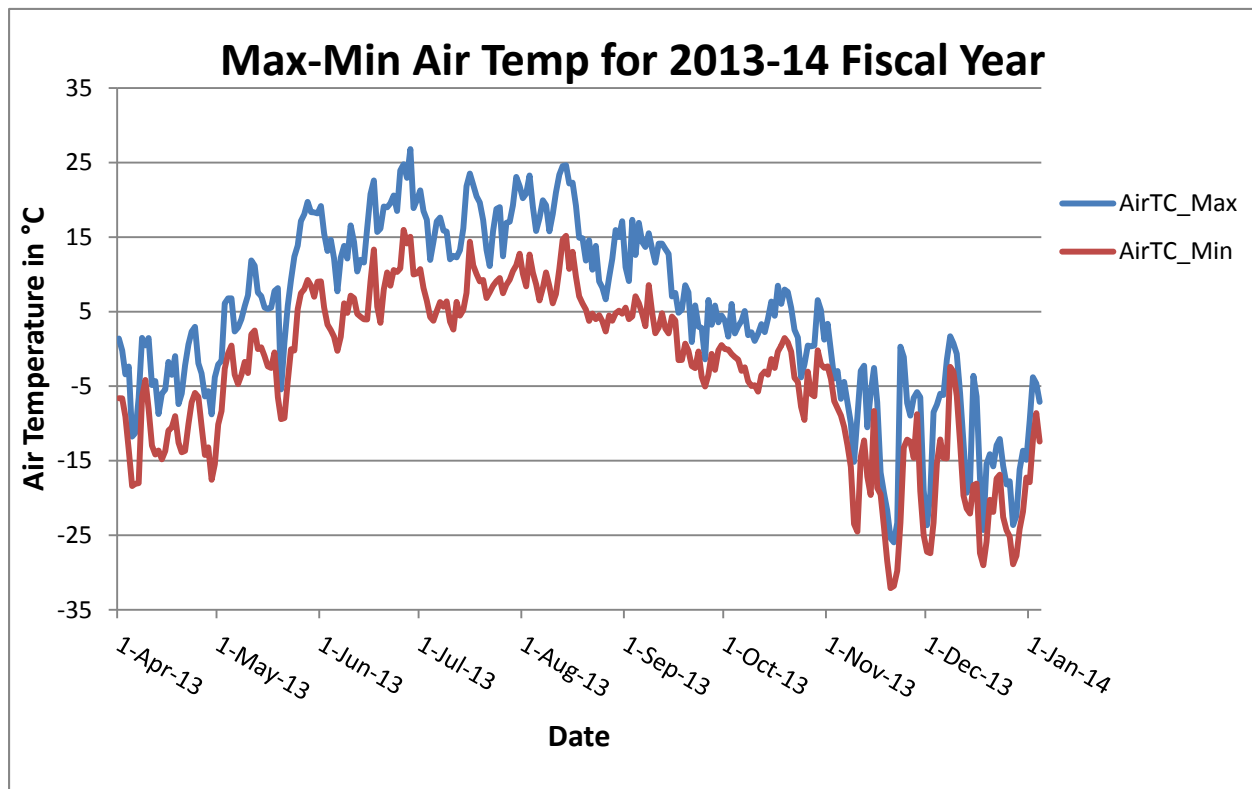
Q1: During Q1, all of the beads are at, or below the freezing mark. Beads 8-10 remain on a stable line and do not fluctuate a great deal with the rising and cooling temperatures. By the end of Q1, the upper beads are fluctuating dramatically and are affected directly by the increasing outside air temperatures.

Q2: During Q2, all the beads in the well are affected by the outside air temperature. The beads closest to the bottom create a gradual increase and trend over a longer distance on the graph. The upper beads in the well casing are more sharply up and down as the temperatures increase and decrease throughout the months in the second quarter.

Q3: During Q3, The upper beads are still affected dramatically by the rising and cooling air temperatures as the winter months approach. The beads near the bottom of the well begin to trend towards the freezing mark again as the winter months approach.

Q4: As the weather station was disabled for calibration testing, there was no data recorded during Q4.

## AIR TEMPERATURE



The above chart shows the Min and Max air temperatures for the 2013/14 fiscal year.

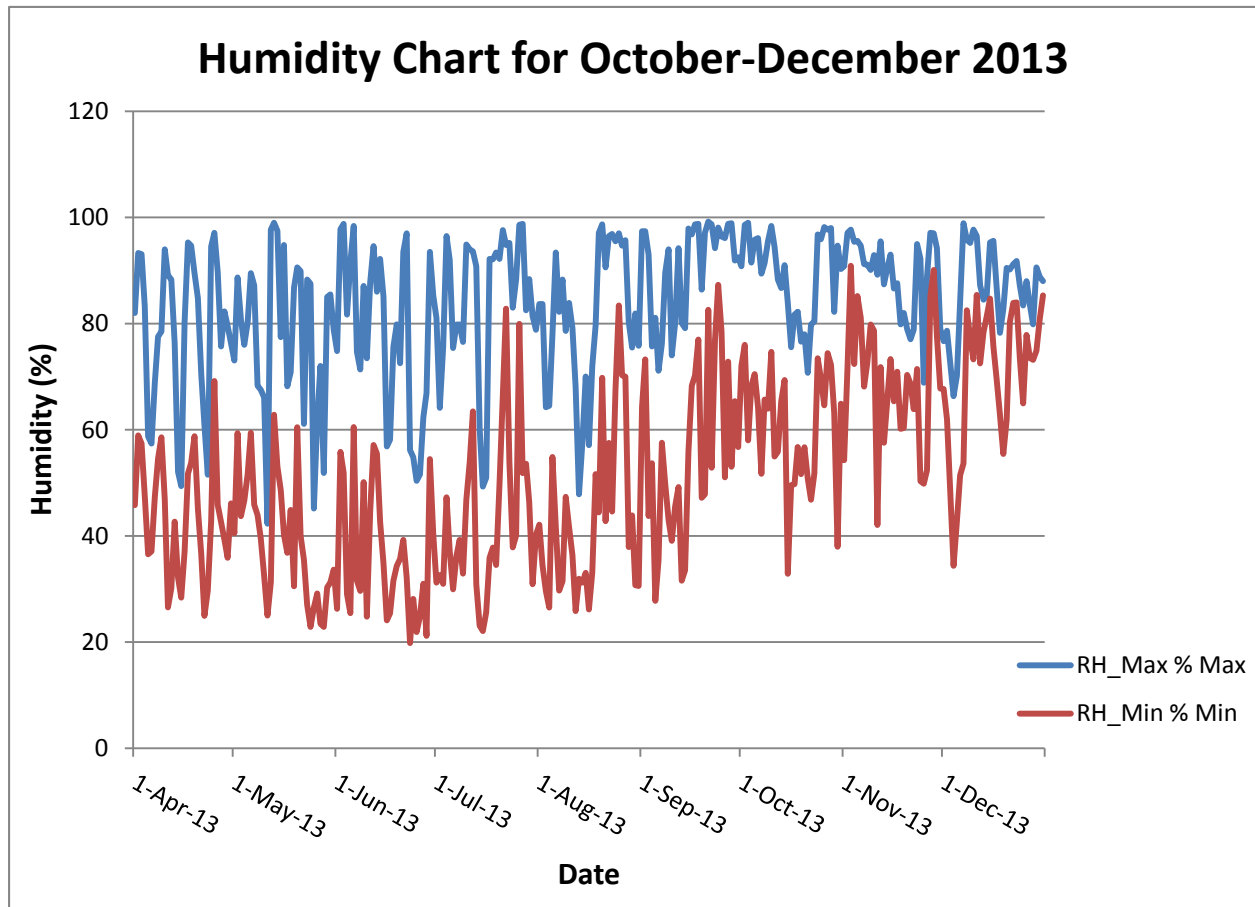
Q1: during Q1, there is still a noticeable difference between the temperatures in the afternoon and during the evening. At the end of Q1, the difference between the max/min temperatures begins to decrease as the summer months approach.

Q2: In Q2, the maximum temperatures were well into the high 20's, with the minimum temperatures overnight staying well above the freezing mark. The temperature began to drop again towards the end of August and into September. Even into September with the temperatures falling below the freezing mark at night, the daytime temperatures stayed above the freezing mark allowing places such as the diversion channel thaw and flow freely through the day.

Q3: The range between the month max/min temperatures during the month of October did not differ much. Once into the month of November, the difference between daytime and night temperatures changes significantly. As we move into the winter months, the sun is out only for a few hours per day, causing longer, cooler night time temperatures.

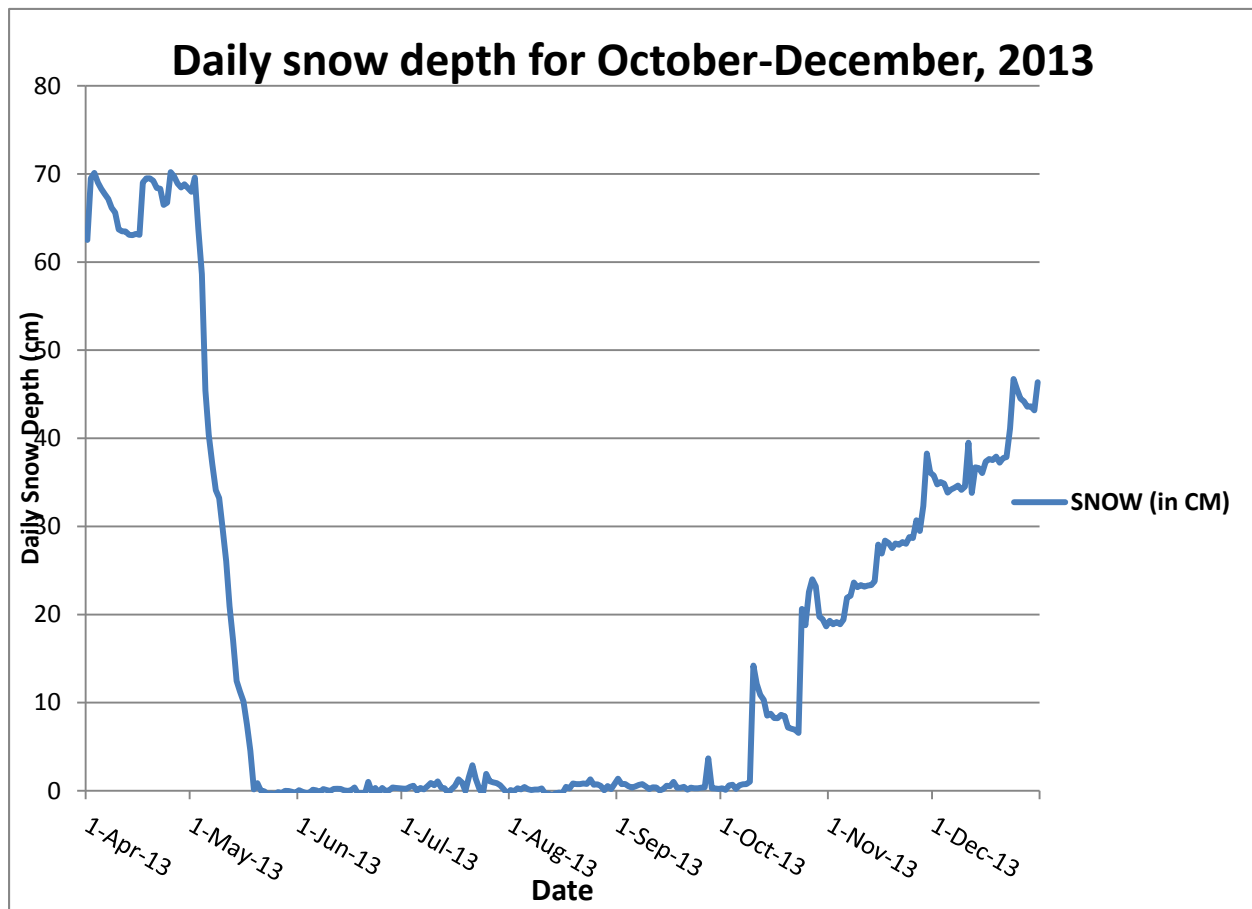
Q4: The weather station was shut down to re-calibrate some of the instrumentation, so there is no data recorded for Q4.

## HUMIDITY



The above chart shows the humidity for the 2013/14 fiscal year.

## SNOW DEPTH



The chart above shows the snow depth for the 2013/14 fiscal year. The weather station shut down in early January to have components sent away to be re-calibrated. As such, most of the equipment on the weather station stopped taking readings on January 4<sup>th</sup>, 2014.

Q1: during Q1, snow had already begun to melt. During the first week of May, temperatures warmed considerably, causing a large majority of the snow to melt by mid-May. By the end of May, almost the entire area was free of snow.

Q2: There were a few isolated snow events in Q2, but nothing significant that stayed on the ground.

Q3: Temperatures began to cool again in September, but no real accumulations of snow occurred until mid-October. During the month of December, a large accumulation of snow was visible on-site. During this month, site operations spent a majority of their time plowing site roads to allow easy access to the site.

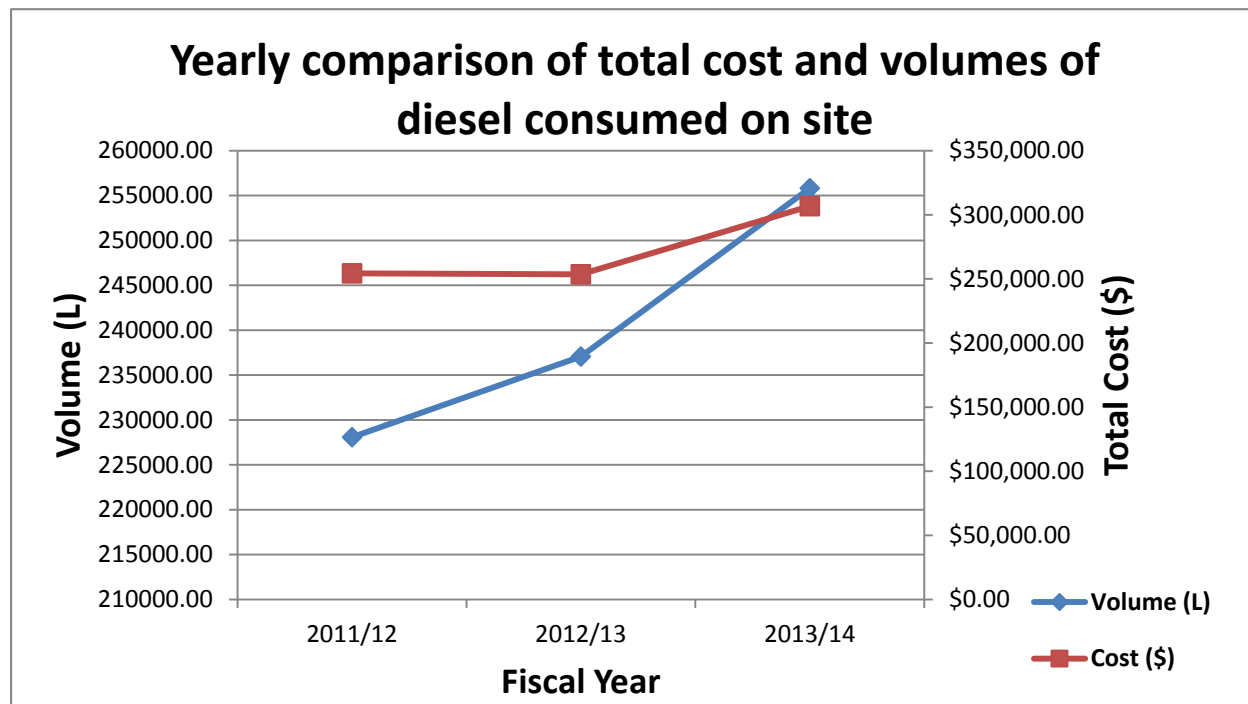
Q4: As the weather station stopped collecting data in early January, there is no data for Q4.

## **APPENDIX A**

**Fiscal year comparison of selected data  
from the Mount Nansen site.**

The following report is a comparison of data collected from the Mount Nansen site during 2013/14 fiscal year and years previous to this. Graphs detailing the information will be accompanied by a brief description.

#### DIESEL USAGE (TOTAL VOLUME AND COST FOR EACH FISCAL YEAR)

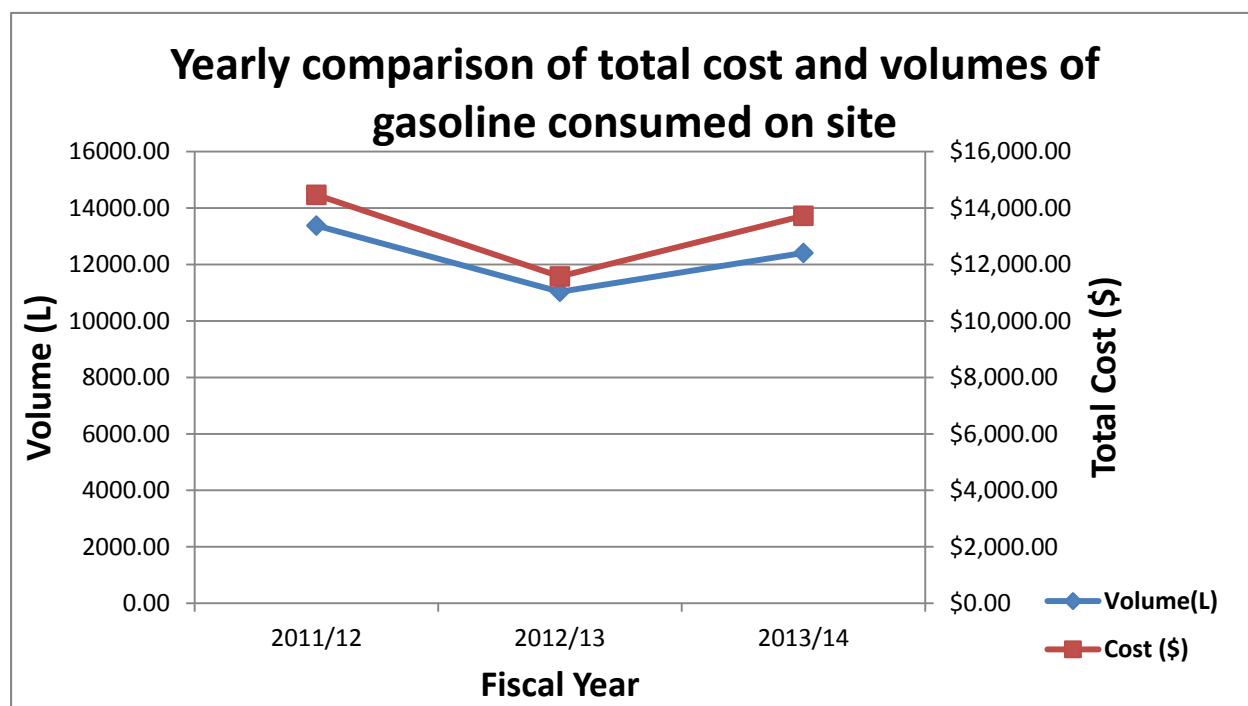


From the graph above it can be seen that the demand for diesel on site and the total cost per fiscal year has increased since 2011. During the 2013/14 fiscal year, the site operations personnel had numerous pieces of heavy equipment operating simultaneously during their site wide clean-up, including the backhoe, excavator and 3-ton dump truck. Over the past 3 fiscal years, it was noticed in the database that the cost of diesel per liter has increased as well. As more activity was required on the site, the consumption of fuel also increased.

During the 2011/12 fiscal year, the price of diesel was below \$1.00/L. In the 2013/14 fiscal year, the average cost of diesel was \$1.18/L. Over an entire fiscal year, this is a significant increase.

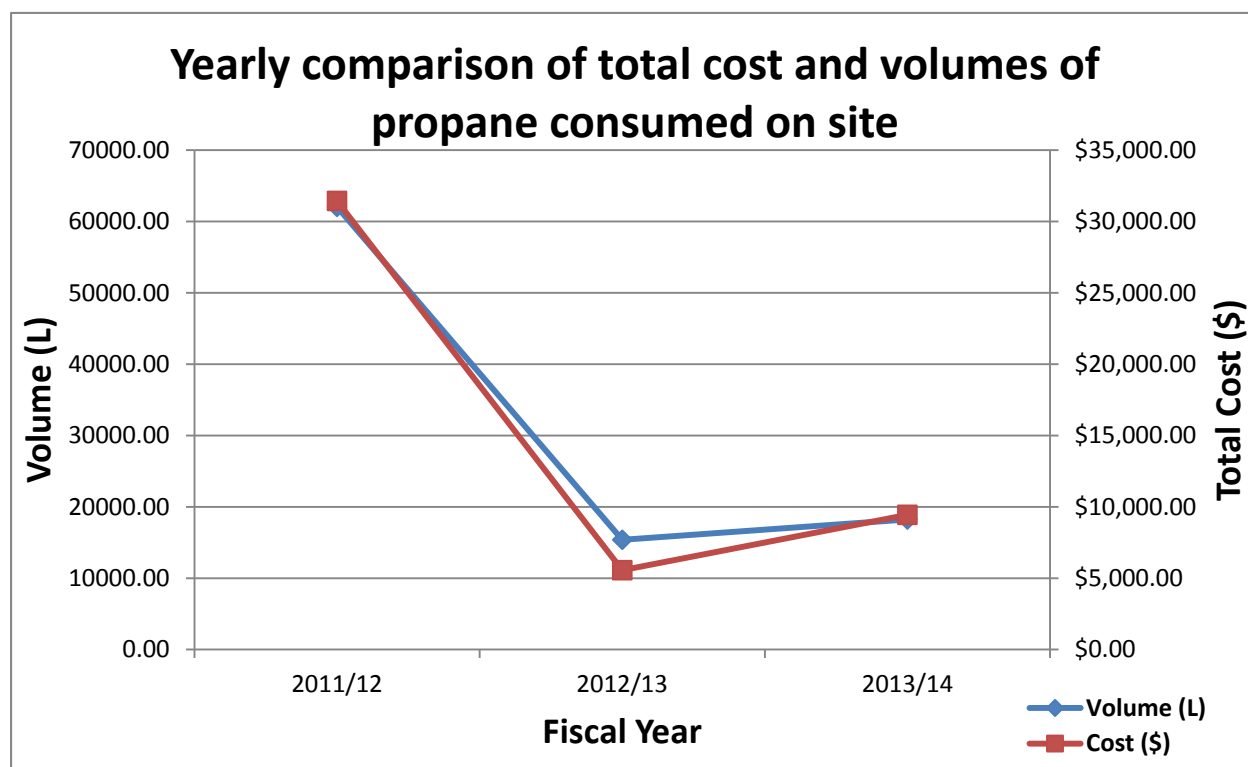


## GASOLINE USAGE (TOTAL VOLUME AND COST FOR EACH FISCAL YEAR)



Looking at the graph above, it can be seen that the consumption of gasoline on site has not changed dramatically over the past 3 fiscal years. As there are only a few light-duty trucks, ATV's, pumps and generators that require the use of gasoline, the volumes consumed are significantly less than those of diesel. As seen on the graph, more gasoline was consumed during the 2011/12 fiscal year when compared to the following two fiscal years. In early 2012, there was a transition of site operations contractors. During this time there were many vehicles on-site and could be one reason for the increased consumption of gasoline during this fiscal year.

## PROPANE USAGE (TOTAL COST AND VOLUMES FOR EACH FISCAL YEAR)

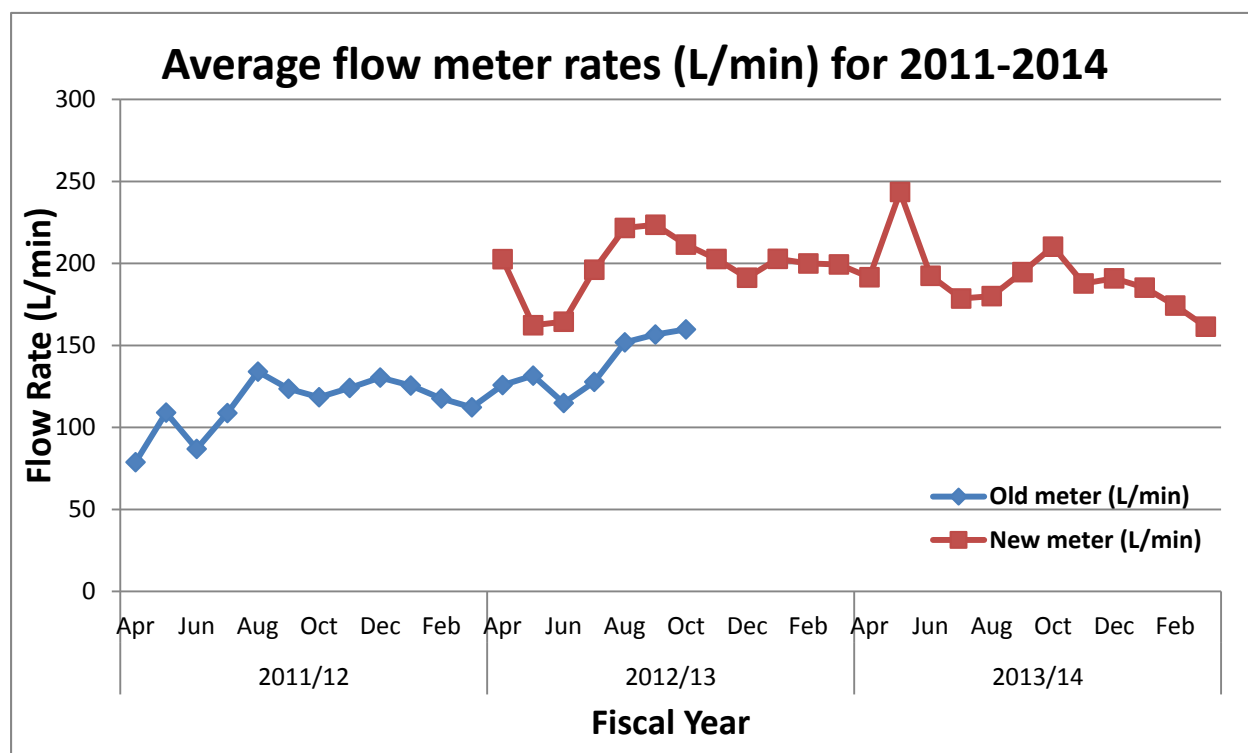


Looking at the graph there is a very significant decrease in the consumption of propane at the site. During the 2011/12 fiscal year, the old cookhouse was still in operation and served as the kitchen and dining area. In early 2012, the bunkhouse was renovated and retrofitted with a more functional and updated kitchen area. As a result, the cookhouse was no longer needed. The cookhouse used propane to fuel the boilers for heat, as well as to provide hot water and fuel for the oven/grill. Once the cookhouse was closed, the only area left on site that consumed propane was the bunkhouse. The bunkhouse also uses propane for the boilers and the hot water tank, but now the updated kitchen has 2 electric stoves.

The consumption looks as though it dropped significantly between 2012/13 and 2013/14 also, but there are some items that show up in the database that may explain this. First, a large delivery of propane was sent at the end of the 2011/12 fiscal year. For this reason, there were only 2 deliveries during the 2012/13 fiscal year. During the 2013/14 fiscal year, there were 3 deliveries, which added to the overall amount of propane delivered during this time.

During the 2013/14 fiscal year, the propane increased from an average of \$0.47/L, to over \$0.60/L. This increase in the price per litre of propane was not anticipated resulted in our budget for the fiscal year to be too low. These prices will be monitored in more detail and will be recognized when planning for the consumption of propane for the 2014/15 fiscal year.

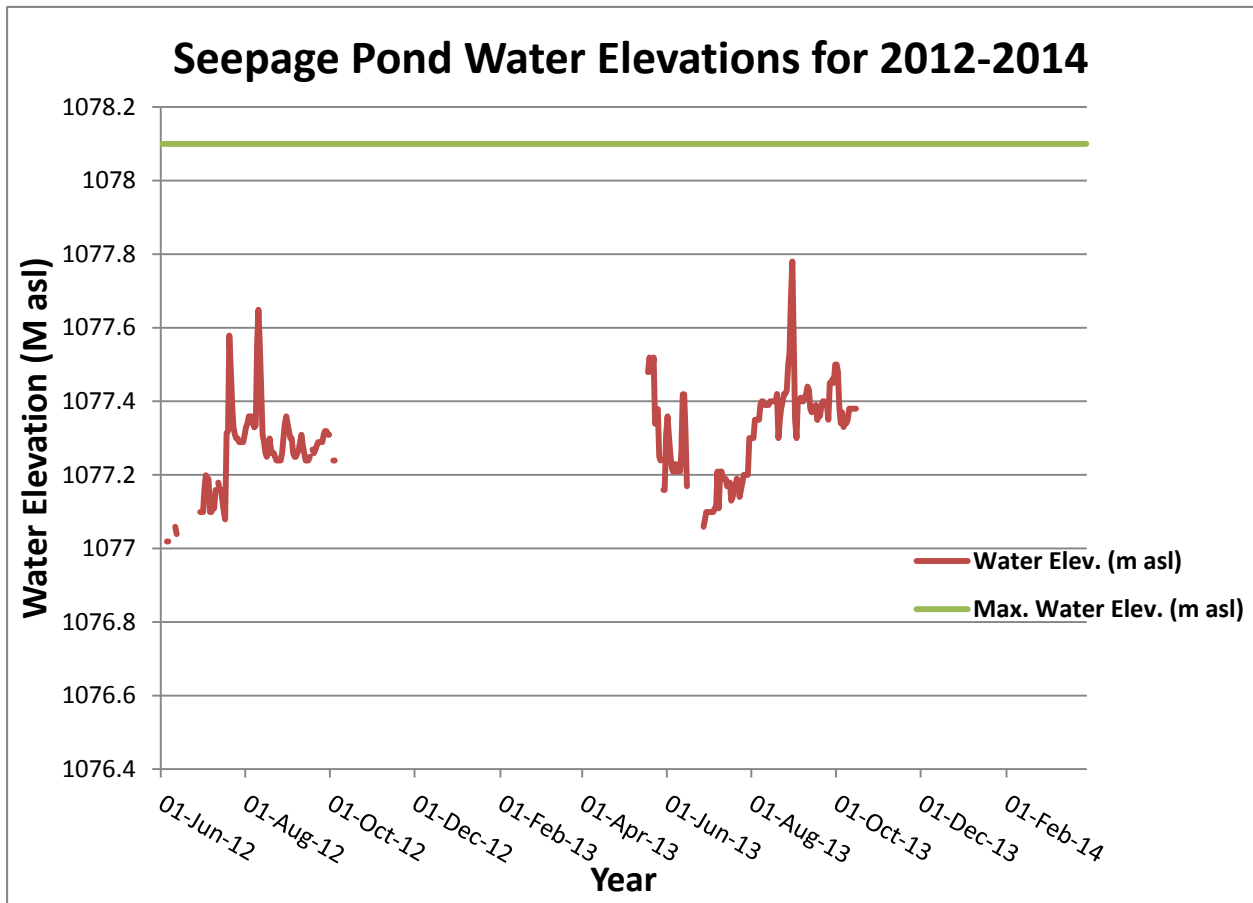
## SEEPAGE POND FLOW METER RATES (L/MIN)



From the graph we can see there is a significant difference between the old flow meter and the new flow meter. The flow meter was positioned outside of the seepage pump house in a small building with a heater to prevent it from freezing. It was located at a 90 degree bend in the pipe which would collect sediment carried in the pipeline. No-one could remember if the old flow meter was ever calibrated or not, which made the meter rather un-reliable. A new flow meter was installed in 2012 inside the seepage pond pump house and in a proper position within the length of the pipeline. This flow meter was calibrated and set to record the flow rate in L/min. It is unsure if the old flow meter was actually recording in L/min, or in G/min (gallons).

The flow rate in seepage pond pump house is adjusted daily to keep the seepage pond water elevation at a constant level. There are spikes in the graph, particularly in the 2013/14 fiscal where freshet can be seen. The flow increased greatly as the spring melt occurred. This melt only lasted a few days, but is clearly seen on the graph. With better reporting and daily water level and flow rate recordings, freshet can be observed and planning can be estimated for when the following freshet will occur in the next fiscal year.

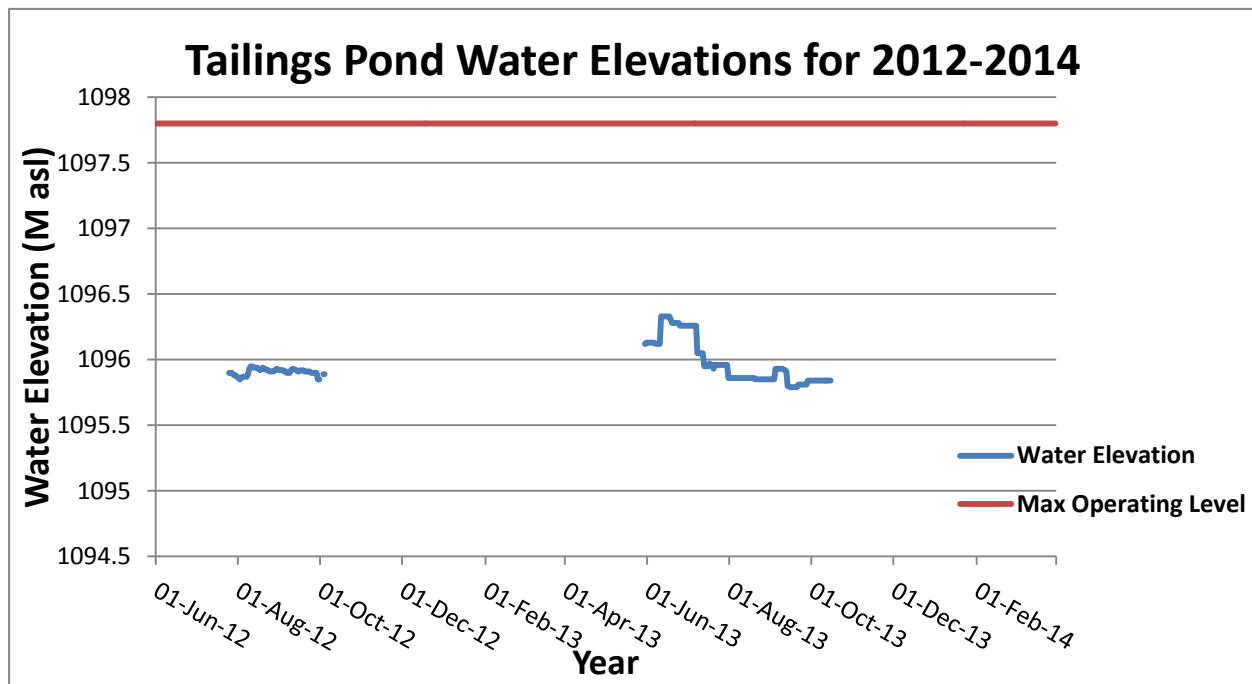
## SEEPAGE POND WATER ELEVATIONS



The staff gauge was installed in the seepage pond during the field season of 2012. The staff gauge enables the site operations personnel, or other consultants/contractors to take accurate water level readings. The seepage pond staff gauge, along with the tailings pond staff gauge are surveyed annually to ensure they remain in the same place. With the ice pushing against these staff gauges in the winter months, sometimes the gauges move, and when this happens the elevation correlated to the staff gauge reading is no longer accurate.

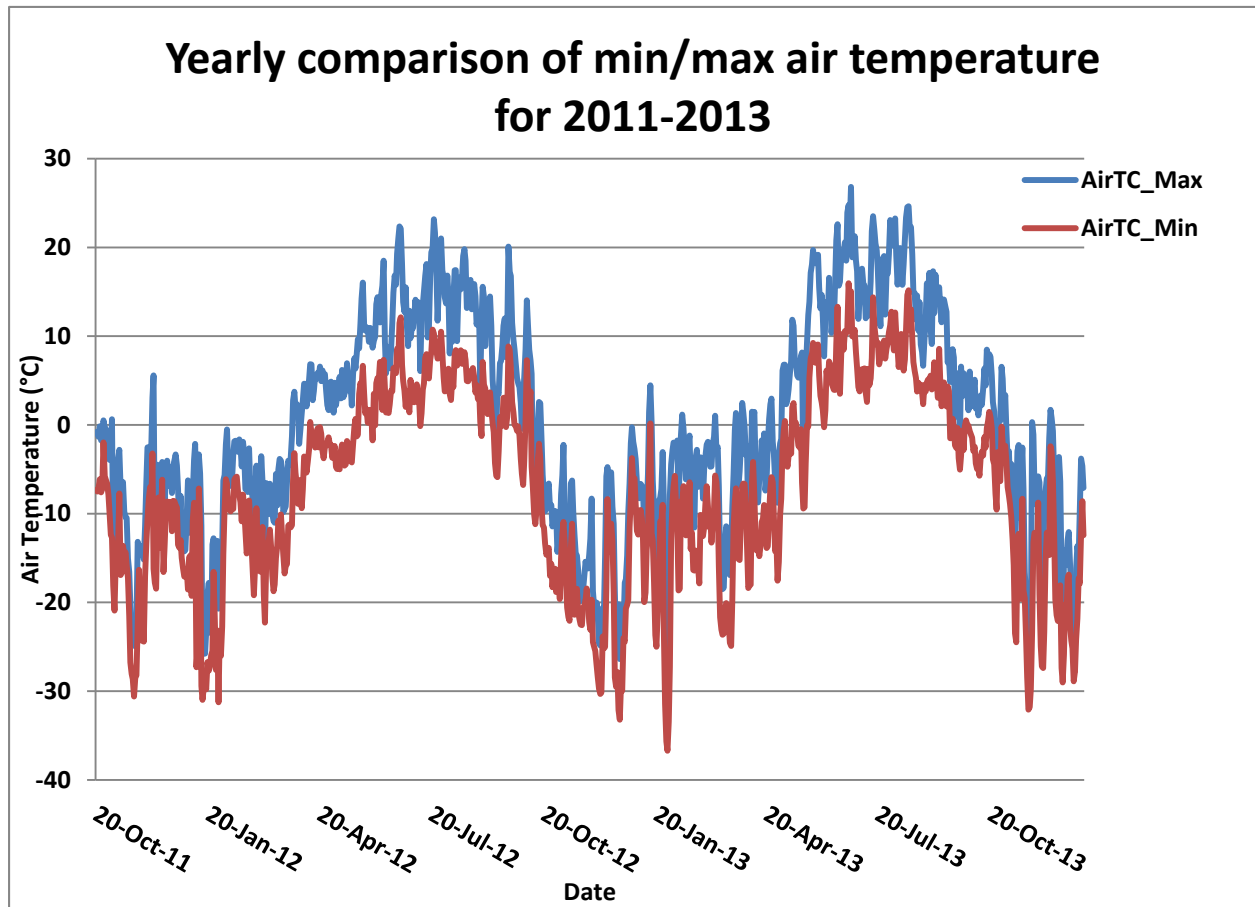
The seepage pond water elevation moves up and down frequently. Factors such as heavy rain events, freshet and power outages play large roles in the increase/decrease of water elevations in seepage pond.

## TAILINGS POND WATER ELEVATIONS



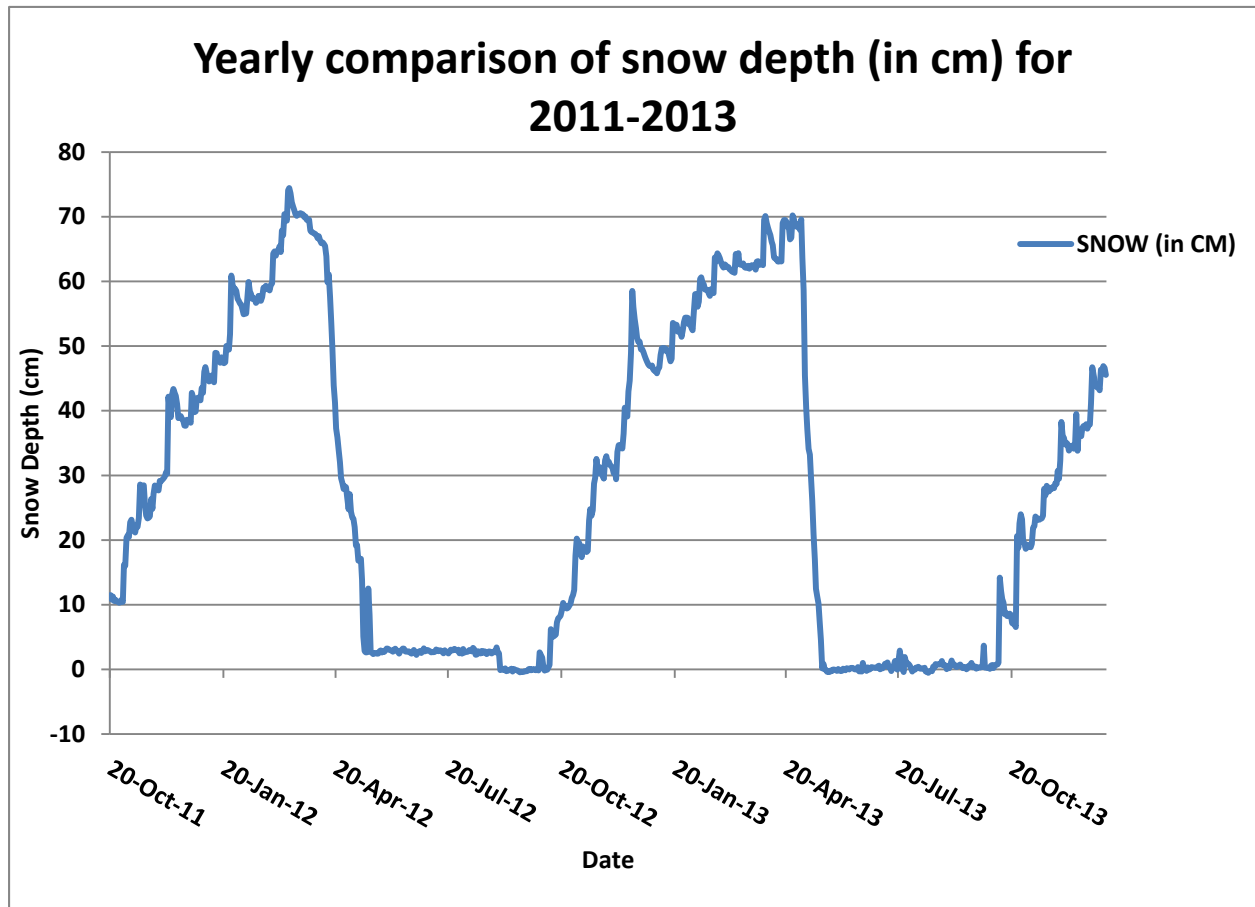
There are several gaps in the staff gauge readings on the tailings pond. This staff gauge was also installed in 2012. Due to the deep water and difficulty of finding a suitable area to secure the staff gauge in the pond, it fell over early in the field season in 2012 and no readings were taken during the month of June. In July, a new staff gauge was installed and fastened to an existing well casing. Although the staff gauge is not securely fastened, the well casing moves annually with the ice movement and with any movement of the tailings below the water. For this reason the staff gauge is surveyed annually to ensure water elevations recorded are accurate.

During the early open water season of 2013, a third staff gauge was installed in the tailings pond directly beside the existing gauge on another well casing. At this time, the water was high due to freshet and the staff gauge normally read was underwater. Site operations installed another staff gauge and levelled it in place so that the bottom of staff gauge was level with the top of the existing gauge so accurate water elevations can be recorded during high water events.

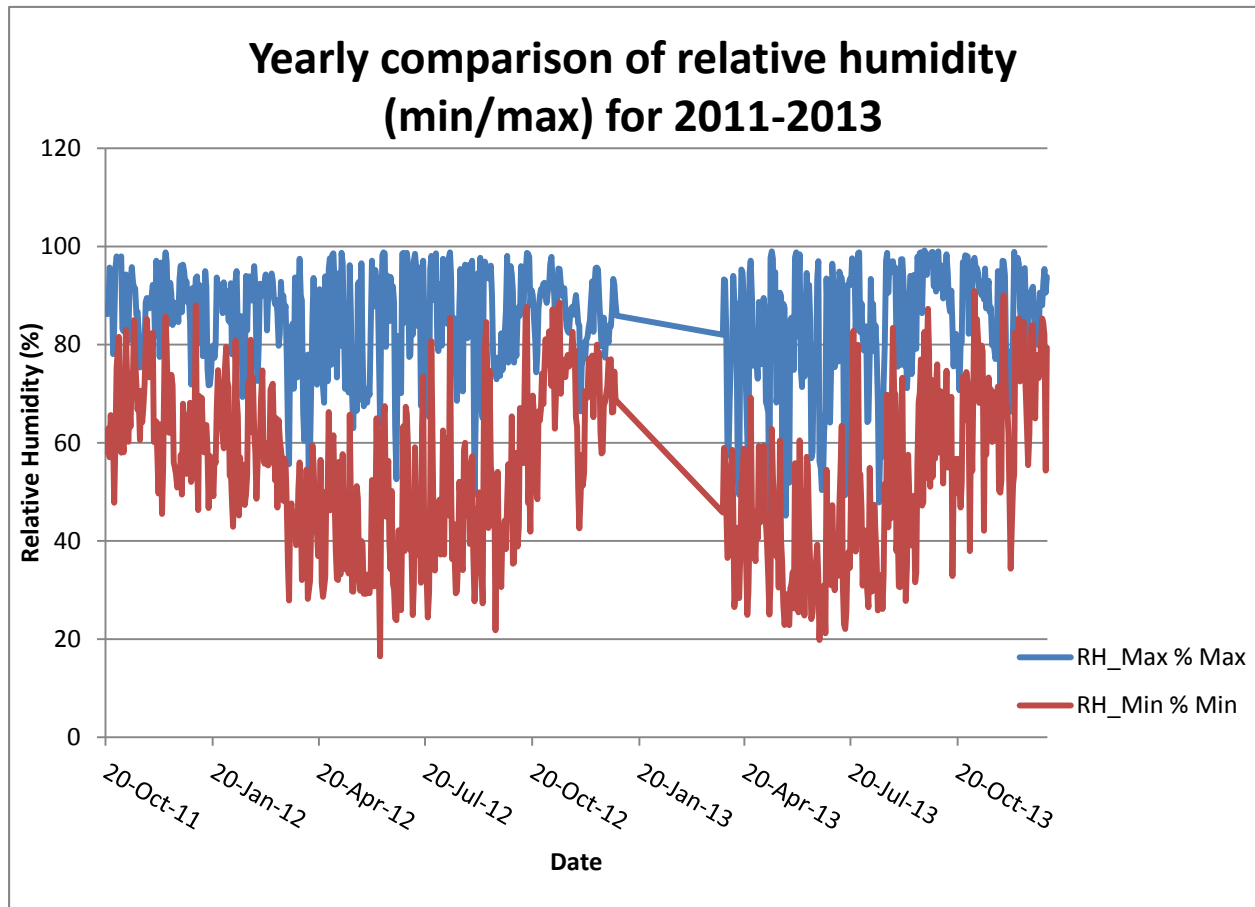


Comparison of the min/max air temperatures from 2011-2013 shows the temperature staying relatively the same when looking at each season.

## SNOW DEPTH (IN CM)



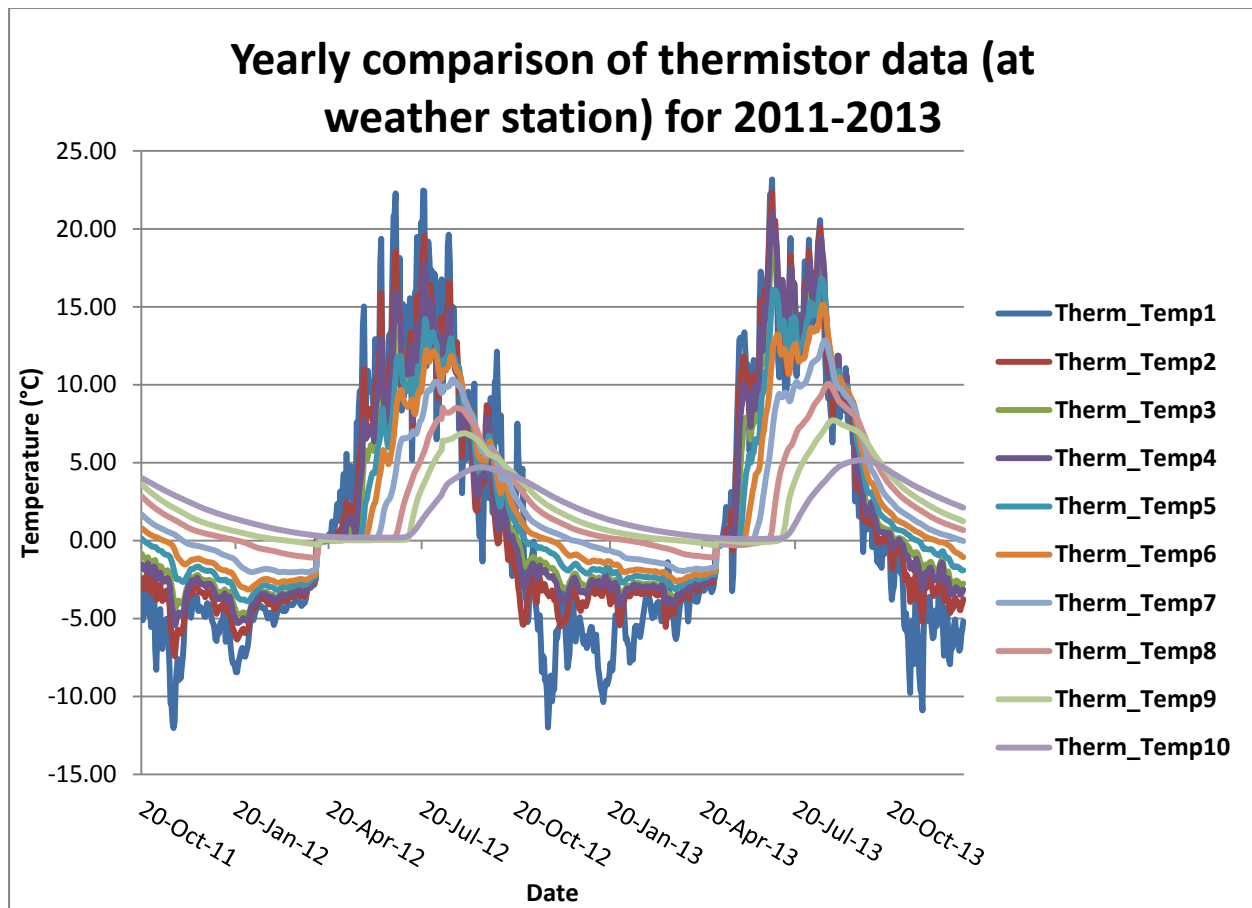
Comparison of the snow depth from 2011-2013 indicates similar snow accumulation between the years. Unfortunately, the data for the 2013/14 fiscal year ended on December 31<sup>st</sup> when the weather station was shut down for calibration. The weather station was not downloading data again until early in March, 2014.



The graph above shows the humidity data from 2011-2013.



## THERMISTORS



Comparison of the thermistor data shows little change in the thermistor beads. Each season, when compared between the years, has not changed significantly. The beads closest to the surface exhibit the most fluctuation as they are influenced greatly by the outside air temperature. The beads in the mid-range and the lowest beads fluctuate more gradually and change gradually, rather than the sharp spikes as the beads in the upper portion of the well.