**Response to Comments from Draft Report Version (as Received November 25, 2014).**

| **Comment No.** | **Page** | **Comment** | **Response** |
| --- | --- | --- | --- |
| 1 | 4 | In previous report, it stated that the well was damaged.... | CH-P-13-03/10 was damaged at the top coupler of the PVC pipe, the field crew was able to successfully repair the well during the fall. The well casing material (sand) was missing and presumed to have fallen into the well (this was also observed in the spring), as indicated by the DTB measurement of 5.2 m which was less than that previously documented DTB (10 m). Re-developing the well and removing the sand was not possible using a hydrolift due to an absence of groundwater. Due to the variation in DTB the well was recorded as ‘blocked’, but we have changed the status to Damaged to better represent the condition observed.  |
| 2 | 4 | In the previous report, stated that obstruction may be a plastic bailer. Can this be removed? | During both the spring and fall sampling events the field crew described a hollow plastic sound when measuring depth-to-blockage at this location. The blockage was assumed to be a plastic bailer, although this was not confirmed. Efforts were made to remove the blockage during the fall event with no success. A small diameter camera could be used during future monitoring events to investigate the blockage in more detail.  |
| 3 | 5 | Previous report stated that there was an obstruction. | Sample location MW09-01 could not be sampled due to an excessive quantity of tailings present in the groundwater. Presence of tailings may indicate the well screen has been damaged or compromised. |
| 4 | 5 | Is it repairable? | CH-P-13-02/10 needs to be re-developed. Although sample site CH-P-13-02/10 was recorded as a dry well, ~90 ml of standing water was measured. This volume was determined to be insufficient for sampling. Bentonite was also present at the bottom of the well. Standing water volume was insufficient for re-development of this well.  |
| 5 | 9 | AAM's | Report has been revised accordingly. |
| 6 | 9 | consultant (AMEC) prior to the....... | Report has been revised accordingly. |
| 7 | 9 | AAM's consultant (AMEC) and employed...... | Report has been revised accordingly. |
| 8 | 10 | What about dissolved oxygen? | Report has been revised accordingly. |
| 9 | 10 | Notation appears to be in the wrong spot. | Report has been revised accordingly. |
| 10 | 10 | Where's number 2? | Report has been revised accordingly. |
| 11 | 11 | Please ensure notation are correct. | Notation has been revised accordingly. |
| 12 | 14 | Why are we comparing to October 13 data? Shouldn't we not be comparing to June 14 (the most recent)? Or is it a seasonal reason for why we choose October 13.  | Table 3-1 is a summary of parameters collected for October 2014. The table title has been revised accordingly. |
| 13 | 17 | Why is it measured as a percentage? | The meters used to measure headspace gases were sourced from two rental companies and each unit had been setup differently, therefore units for CO2 varied. One meter malfunctioned in the field and also reported CO2 in % rather than ppm. Only four measurements were taken using this meter, and the readings did not appear to be accurate. These have been removed from the final version.  |
| 14 | 17 | What is the size and are all the drive points the same size? | All drive points were ½” in diameter.  |
| 15 | 18 | Ensure to make changes once analytical data (table A and B) has been reviewed with respects to comments provided. | Analytical tables have been reviewed and no changes to CCME guideline exceedances were required.  |
| 16 | 18 | Is this common practice? | It is common practice for the laboratory to use dilution to analyse samples that contain elevated quantities of certain materials. No evidence exists to suggest that these samples exceed CCME guidelines and the results are therefore not flagged as exceedances.  |
| 17 | 20 | Can it be removed? | As stated in comment 2, the blockage was assumed to be a plastic bailer. Efforts were made to remove the blockage during the fall event with no success. Further efforts could be made to remove the blockage, including using a camera to investigate the obstruction in more detail. Once we get a better look at the obstruction we can decide on the most effective approach for removal.  |
| 18 | 20 | Were you able to go deeper? And was this an issue during the last event? | The blockage was observed at the same depth during the spring and fall sampling event. We were not able to get below the obstruction, a bailer was lowered to the depth of the blockage to confirm there was no water in the accessible portion of the well.  |
| 19 | 22 | Says in table that it's damaged.....? | This well was listed as damaged due to the bentonite observed in the bottom of the well. This well should be redeveloped. Due to the low volume of standing water present in the well, redevelopment was not possible during the October 2014 sampling event.  |
| 20 | 23 | This seems high. Does it mean MP09-05 results should be disregarded? | We do not recommend disregarding the MP09-05 sample altogether. RPD values for sulphate and total cyanide (25.8% and 22.9%) are only slightly above the 20% threshold and should therefore be considered satisfactory. RDP values for TOC however were 63.3%, in this case, the TOC value recorded may not be representative and additional sampling may need to be completed to confirm TOC concentration. No variations from laboratory or field methods were identified that may have caused sample variation. Although turbidity was at an acceptable level in this sample (7.68 NTU), it is possible that sediment and/or particles in the water sample and duplicate varied, which could give a different TOC value. It is also possible that when the lab implements their sampling protocol we could see variations (i.e. they may shake the bottle right before analysis). |
| 21 | 23 | spelling | Report has been revised accordingly. |
| 22 | 23 | Provide overall QA/QC conclusion. Are they acceptable or not? | Conclusion section has been added. |
| 23 | 24 | Identify how many wells require this and which ones? | Location ID for wells at risk of contamination have been added to the report recommendations.  |
| 24 | 24 | I thought that this was going to be addressed during this program? | CH-P-13-03/10 was damaged at the top coupler of the PVC pipe, the loose PVC stickup was repaired (glued) at the end of the spring 2014 program. The well casing material (sand) was missing and presumed to have fallen into the well, as indicated by the DTB measurement of 5.2 m which was less than that previously documented DTB (10 m) during the spring sampling event. Re-developing the well and removing the sand was not possible using a hydrolift due to an absence of groundwater. Removal of nearly 5m column of sand/sediment that extents over the water table may be challenging. A potential way to clear out the sand includes filling the well with water and simultaneously air-lifting the water (with an air compressor). Depending on the well’s hydraulic conductivity large volumes of water may be required. For example, if the well accepts large volumes of water without significant pooling inside the well, an air-lift redevelopment method may be effective. An alternative approach (better but much more expensive) would include using a hydrovac with narrow tubing (1.5”) to vacuum the sand/sediment out of the well.  CH-P-13-04/35 had blockage at 6.505 m below the surface. As mentioned earlier, this blockage could potentially be equipment associated with a previous piezometer installation. A deployable camera would be recommended to be used during future monitoring events to further investigate the blockage. MW09-01 could not be sampled due to an excessive quantity of tailings present in the groundwater. Presence of tailing may indicate the well screen has been damaged or compromised. Not much can be done to remedy this well other than reinstalling it if the condition persists.CH-P-13-02/10 had only 90 ml of standing water present in the well. This volume was determined to be insufficient for sampling. Bentonite was also present at the bottom of the well. CH-P-13-02/10 was treated as dry well and therefore not sampled. Again, this well should be redeveloped but requires a larger quantity of standing water to complete the task. Similar redevelopment method as described above could be employed. |
| 25 | 24 | How many locations? | The majority of monitoring wells have slits installed in the PVC casing that release headspace gases. Each well varies slightly in where and how these slits were installed. A complete record of these features were not captured during the 2014 events. If fitting these wells for proper headspace gas monitoring is of interest to AAM, this detail could be added to field forms for a future monitoring event. This would help to generate an inventory of how this could be completed for individual wells. The DP sites are properly sealed with threaded caps.  |
| 26 | 24 | For 5 and 6..... Shouldn't this not be a requirement? Is this common practice.... does it follow typical procedure? | It is not common procedure, and Hemmera/ELR have made this as a suggestion only as AAM’s Consultant (AMEC) have designed the monitoring program through 2014. In our opinion, these suggestions would help to collect more representative samples, particularly at a site where there is significant metal contamination (i.e. an abandoned hard rock mine). The reason we would recommend field-filtered samples for acidity, alkalinity and hardness is because it reduces the particles that metals could attach to. If there are metals attached to the particles this could impact the acidity, alkalinity and/or hardness that would result in the groundwater. We recommend collecting alkalinity samples separately in a bottle with zero headspace because when the water sample interacts with oxygen there is the possibility of ion transfer that could result in an artificial alkalinity results.  |
| 27 | 28 | You will see that we went through all the data and highlighted ones that we thought needed clarity (either should of been highlighted or were highlighted when they didn't need to be).... Could you guys do a check and based on any errors found, please change any analytical results provided in the previous section. | We have reviewed each of the values highlighted in the table and found that no changes to CCME exceedances were necessary.  |
| 28 | 29 | Please insert detection limit column... | We have not included a detection limit column due to inconsistencies in detection limit among samples. Due to the need to dilute some samples, detection limits vary from sample to sample and cannot be provided in a single column.  |
| 29 | 29 | Insert field test parameters here too! | Table has been revised accordingly. |
| 30 | 29 | Is there parameters missing here? (i.e. TSS) | No parameters were found to missing. TSS was not included in the original scope of work.  |
| 31 | 30 | On notes sheet, rage for cadmium is given at 0.04 - 0.37. why is it at 0.016 - 0.37 here? | The ranges for parameter exceedences were listed according to the actual range of guideline levels based on individual site conditions. As per discussions with AAM, these ranges have now been replaced with the text “Varies” and a reference to guideline details. |
| 32 | 33 | Where is CH-P-13-02? | Table has been revised accordingly. |