Avalon Rare Metals Inc.

RESPONSE TO THE OCTOBER 26, 2012 ROUND 2 INFORMATION REQUESTS FROM THE MACKENZE VALLEY REVIEW BOARD FOR THE THOR LAKE RARE EARTH ELEMENT PROJECT DEVELOPER'S ASSESSMENT REPORT (EA1011-001)

Submitted To:
MACKENZIE VALLEY ENVIRONMENTAL IMPACT REVIEW BOARD

October 31 2012

Avalon Rare Metals Inc. (Avalon) is pleased to provide the following responses to the second round of Information Requests conveyed by the Mackenzie Valley Environmental Impact Review Board, Board (MVEIRB) dated October 26, 2012. Avalon's responses are found after each information request.

MVRB Request #1 – Influent/Effluent

Preamble:

The description of the treatment process appears to state that the influent stream to the process was water containing the Day 5 decant concentrations and that the treatment system would treat water discharged from the TMF. Avalon is requested to:

(a) Provide a precise table of the water quality parameters and concentrations in the influent and effluent streams entering and exiting the treatment system

(b) Identify the specific treatment methodologies involved

(c) Identify any chemicals used in the treatment process

(d) Identify and describe any precipitates or other residues resulting from the treatment process

(e) Confirm whether the treatment system, if built, would treat the water discharged from the TMF or treat water before discharge into the TMF.

Avalon Response #1

In responding to this series of questions, Avalon would initially wish the Board to note that the current proposed water treatment system will be located within and will be an integral component of the Flotation Plant. The primary purpose of the in-plant treatment system will be to treat any incoming mine-water from the underground mine works and recycled process water in the Flotation Plant.

This water treatment system will not be treating water from the TMF since the current plan does not involve direct recycling of water from the Tailings Management Facility (TMF) back into the Flotation Plant.

(a) The following can be utilized to assess the TMF influent. As noted in the updated water balance previously provided to the MVEIRB and re-presented here as Attachment 1, the water from the underground mine will be treated and used in the Flotation Plant (note 4 in KP Figure 1). As such, the predicted influent water treatment for the mine water into the TMF is estimated as being equivalent to the treated final effluent water quality. As previously discussed, it is logical to assume that the influent water quality from the mine to the in-plant water treatment system will be much cleaner than the tailing water, and as such the proposed treatment system will readily meet the water quality predicted and reported.

The decanted and untreated water quality from the pilot plant effluent, as identified in Table 1 is considered to be representative of the water from the tailing discharge, and is compared to the treated effluent water quality previously provided. It should be noted that although the concentration of aluminum in the Treated Effluent and Mine Water column of Table 1 is predicted to be marginally above the CCME guideline value for the downstream receiving environment, this predicted effluent concentration is prior to the anticipated mixing with Drizzle Lake water which is on average between 3-4:1. Thus in all cases, the CCME guideline values and proposed SSWQO's will be met at the outlet from Drizzle Lake.

TABLE 1: TAILING WATER QUALITY BEFORE AND AFTER TREATMENT

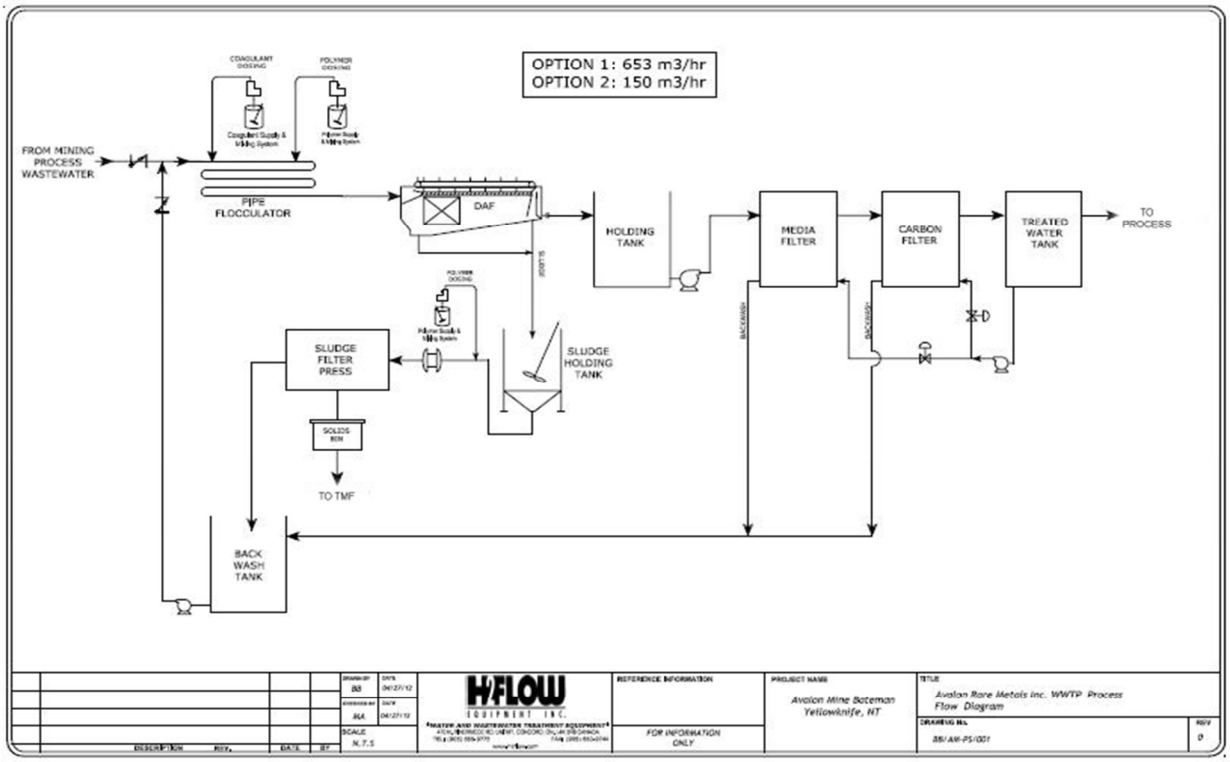
Parameter	Untreated Tailing Water (µg/L)	Treated Effluent and Mine Water (µg/L)	Drizzle Lake	Thor Lake	Proposed SSWQO [For Drizzle Lake] (µg/L)	CCME Guideline (µg/L)
			Background Mean (µg/L)	Background Mean (µg/L)		
Aluminum (Al)	1000	120	8.30	3.3	100	100
Arsenic (As)	<2	0.9	0.92	0.77	5	5.0
Cadmium (Cd)	0.04	0.003	0.01	0.02	Background	0.052
Chromium (Cr)	<5	<0.5	<0.5	<0.5	8.9	8.9
Copper (Cu)	<5	1.9	0.25	0.36	3	2-4
Iron (Fe)	2080	44	1091	69.5	Background (seasonal)	300
Lead (Pb)	1.3	0.92	0.028	0.05	4	1-7
Mercury (Hg)	<0.1	<0.1	<0.01	<0.01	0.026	0.026
Molybdenum (Mo)	13	6.2	1.27	2.1	73	73
Nickel (Ni)	5	2	<0.5	<0.5	110	25-150
Selenium (Se)	10	<1	<1.0	<0.1	1	1
Silver (Ag)	>0.1	<0.01	<0.01	<0.01	0.1	0.1
Thallium (Tl)	<2	0.017	<0.1	<0.1	0.8	0.8
Uranium (U)	2.8	0.01	0.08	0.36	15	15
Vanadium (V)	0.4	0.19	<1.0	<1.0	6	6
Zinc (Zn)	8	28	0.90	1.43	Background	30

Parameter	Untreated Tailing Water (µg/L)	Treated Effluent and Mine Water (µg/L)	Drizzle Lake	Thor Lake	Proposed SSWQO [For Drizzle Lake] (µg/L)
			Background Mean (µg/L)	Background Mean (µg/L)	
Cerium (Ce)	221	0.92	<0.05	<0.05	3.2
Dysprosium (Dy)	16.2	0.63	<0.05	<0.05	16.2
Erbium (Er)	6.8	0.022	<0.05	<0.05	19.1
Europium (Eu)	3.2	0.014	<0.05	<0.05	11.2
Gadolinium (Gd)	26.5	0.11	<0.05	<0.05	15
Hafnium (Hf)	0.8	0.005	<0.1	<0.1	4.4
Holmium (Ho)	2.9	0.010	<0.05	<0.05	0.7
Lanthanum (La)	94.2	0.41	<0.05	<0.05	1.8
Lutetium (Lu)	0.5	0.002	<0.05	<0.05	2.9
Niobium (Nb)	2.2	0.045	<0.1	<0.1	2.6
Neodymium (Nd)	114	0.49	<0.05	<0.05	14.3
Praseodymium (Pr)	29.7	0.11	<0.05	<0.05	3.5
Samarium (Sm)	26.1	0.11	<0.05	<0.05	7.4
Scandium (Sc)	1.2	0.82	0.9	0.5	2.9
Tantalum (Ta)	0.6	0.009	<0.1	<0.1	0.2
Terbium (Tb)	3.5	0.014	<0.05	<0.05	8.4
Thulium (Tm)	0.73	0.003	<0.05	<0.05	6.9
Ytterbium (Yb)	4.2	0.012	<0.05	<0.05	6.9
Zirconium (Zr)	9.7	0.07	<0.1	<0.1	11.2
* Based on 10% of 7-day (Chronic) Testing of *H. Azteca* (Borgmann et al 2005)					

(b) From the water quality testing completed during the pilot plant, a schematic of the design of the water treatment system is provided in Figure 1. It should be noted that the treated water will be recycled to the extent practical in the Flotation Plant.

The first stage of the water treatment process includes flocculation and coagulation followed by clarification for removal of fines from solution. This is followed by media filtration (activated clay) to further remove particulates and some metals, followed by solution polishing by carbon filtration to ensure adequate removal of reagents. Following ongoing recycling of the treated water within the Flotation Plant some of this treated water and the tailings solids will subsequently be discharged to the TMF.

Figure 1: Water Treatment Process Schematic



(c) Reagents to be used in the water treatment system will be Norfloc 230 and Magnafloc LT 340. MSDS sheets for these reagents are provided in Attachment 2.

(d) Solids from the clarifier will be filtered for disposal in the TMF, as the material is anticipated to be a diluted tailing-like material. Periodic back-flushing of the filters will be required to maintain and regenerate their treatment efficiency and flushed materials will be recycled back to the head end of the treatment system.

(e) As previously indicated, the water treatment system will be located within and will be an integral component of the Flotation Plant. The primary purpose of the in-plant treatment system will be to treat the incoming water (including water from the underground mine works and recycled process water in the Flotation Plant. This allows maximum internal water recycle and minimizes fresh water use. For this reason, this water treatment system will not be treating water from the TMF since the current plan does not involve direct recycling of water from the TMF back into the Flotation Plant.

MVRB Request #2 – Trigger/Threshold for Treatment and Mitigation

Preamble:

Avalon's response to MVRB IR 2.01 states in part "Avalon has stated it will treat its effluent to achieve these criteria and guidelines if deemed to be necessary". Based on the tracer modeling results, it already appears that treatment of the TMF discharge would be "necessary in order to meet the proposed SSWQOs".

Is Avalon making a definite commitment to treat the TMF discharge or does it have a different criterion in mind to trigger the necessity of the treatment plant? If so, what are the specific criteria which Avalon will use to decide when the treatment plant is necessary? Justify and explain any criteria proposed for this purpose.

Avalon Response #2

For the purposes of this response, we will utilize, as per MVEIRB request, the updated information from the much more representative actual pilot plant effluent (previously provided in response to MVRB IR 2.01, rather than the laboratory- generated 5 day decant water quality information previously presented in the DAR and elsewhere. As reported provided in response to MVRB IR 2.01, the pilot plant effluent provided remains a worst case scenario, but does constitute a more representative solution.

It remains worst case due to the very high reagent use employed due to the two objectives of the pilot plant – to obtain sufficient concentrate for further testing of subsequent downstream processes and to obtain water for effluent quality and treatment testing, including the requested toxicity testing previously provided. The updated process reagent list has also been previously provided along with information indicating that overall reagent use has been substantially reduced.

This "worst case" process solution from the pilot plant was treated, and the effluent results have been previously provided to MVEIRB on several occasions. This is supported with an ongoing commitment to treat effluent to facilitate meeting MMER standards in the TMF effluent and the CCME Guidelines and conservative SSWQO's generated for rare earth elements in the Drizzle Lake discharge.

In an effort to further clarify and be very specific, Avalon's commitment means we will treat the final effluent from the TMF discharge, if necessary, with some or all of the components of the in-plant treatment process previously identified, to meet these commitments. Avalon must, however, reiterate that based on ongoing optimization of the process, the treatment of the mine water, the fact that the thickened tailing will trap a significant portion of the tailing effluent water within the tailings, the mixing of natural runoff water from the TMF drainage basin and the over 30 day retention time in the TMF at all times that allows for additional settling, we remain confident that further treatment will not be required.

Given that there will be over 1 year of storage capacity in the TMF prior to discharge of the final effluent from the TMF, there will be more than sufficient time to determine if treatment of the final effluent will be required to meet the proposed effluent quality and receiving water quality parameter concentrations presented in Table 1. Depending on the parameter or parameters of concerns at that time, some or all of the components of the treatment plant design could be utilized.

It is anticipated that the proposed effluent quality and receiving water quality parameter concentrations will be further addressed and perhaps refined in the subsequent Mackenzie Valley Land and Water Board proceedings leading to the issuance of the future Water Licence. Avalon envisages that this future process will include commitments to regular monitoring during the initial period of operations, and a decision point regarding the possible need for additional water treatment made approximately 6 months in advance of the time when a discharge will be required.

This will be based on actual water quality for meeting Water Licence parameters, the MMER requirements, and predicted water quality for meeting CCME and SSWQO's for the Drizzle Lake discharge, based on our existing model. The model will consider the background concentrations in Drizzle Lake. Clearly where background concentrations for CCME guideline and SSWQO parameters are already naturally exceeded in Drizzle Lake, overall there will be no negative impact on the associated downstream ecosystems.

Avalon is unclear where the conclusion that "based on the tracer results, it already appears that treatment of the TMF discharge will be necessary" originated. Tracer studies (modeling) have not been completed on the treated effluent utilizing the water quality from the treated pilot plant effluent. The reason for this is the very clean water quality obtained and provided from the water treatment system is such that prediction of meeting the water quality guidelines is obvious for all parameters and modeling is not required.

As stated in the updated water balance, treatment of the mine water is planned, there is significant clean natural water volume reporting to the TMF for mixing, reagent use has already been significantly reduced and further optimization studies are still ongoing with respect to optimizing regent use in the process. It seems impossible that the overall success of these activities can be predicted at this time.

For this reason, the commitment to treat if necessary has been made in the event that it is needed. If an approximation can be made with respect to when water treatment is required, and not considering background water quality in Drizzle Lake, a simple rule of thumb would be that if the effluent concentration in the TMF final discharge is approximately 3 times or more than the CCME guideline or the proposed SSWQO's, treatment will be required. This will ensure the highly conservative CCME Guidelines and proposed SSWQO's are met in the Drizzle Lake discharge.

MVRB Request #3 – Referenced Technologies for Water Treatment

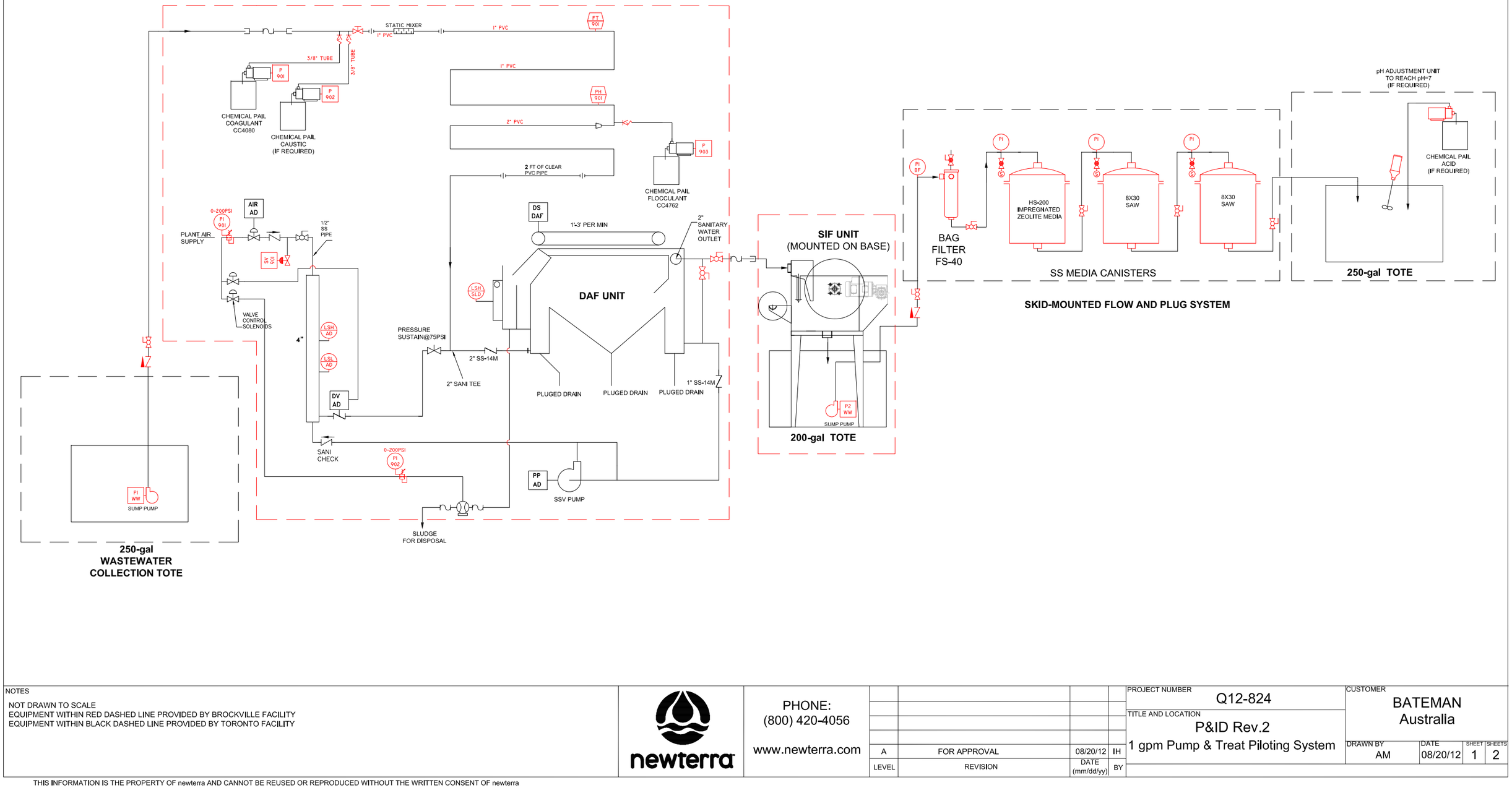
Preamble:

In the event that Avalon's proposed water treatment technologies fail to meet water quality objectives, Avalon has stated that other proven technologies exist to treat mine effluent. Please provide specific information about these other technologies. Demonstrate that they have been proven effective in treating rare earth elements in solution.

Avalon Response #3

Avalon has stated that if the technologies presently being evaluated in the process optimization ongoing fail to provide adequate water quality in the TMF, it would implement further water treatment at the end of the TMF, but does not recall stating that it has developed and proven more than one treatment option. While there are many treatment options available depending on the parameter of concern, it is not clear why more than one treatment option is required.

Avalon has worked with two different recognized and experienced water treatment specialists and both have provided treatment options with similar results. Avalon has already demonstrated and provided to MVEIRB the analysis of the best water treatment technology we have found to date, proven that it is adequate to meet very conservative water quality criteria on a highly representative but conservative tailing effluent sample and provided this information in Table 1. Figure 2 provides a second treatment option from an alternative supplier that has also been demonstrated to be effective.



NOTES

NOT DRAWN TO SCALE
EQUIPMENT WITHIN RED DASHED LINE PROVIDED BY BROCKVILLE FACILITY
EQUIPMENT WITHIN BLACK DASHED LINE PROVIDED BY TORONTO FACILITY

newterra

PHONE:
(800) 420-4056

www.newterra.com

LEVEL	REVISION	DATE (mm/dd/yy)	BY
A	FOR APPROVAL	08/20/12	IH

PROJECT NUMBER	Q12-824
TITLE AND LOCATION	P&ID Rev.2 1 gpm Pump & Treat Piloting System
CUSTOMER	BATEMAN Australia
DRAWN BY	AM
DATE	08/20/12
SHEET	1
SHEETS	2

Attachment 1

Updated Water Balance 2012

Knight Piésold CONSULTING

www.knightpiesold.com

MEMORANDUM

To:	Mr. David Swisher	Date:	August 23, 2012
Copy To:	Rick Hoos	File No.:	NB101-390/3-A.01
From:	Una McCullagh	Cont. No.:	NB12-00424
Re:	Thor Lake Project TMF Water Balance - Update for MVEIRB		

The feasibility level water balance analysis has been updated for the Avalon Rare Metals Inc. (Avalon) Thor Lake Project for the revised Tailings Management Facility (TMF) operating scenario and flows. In response to the undertakings from the August technical sessions, this memo provides the preliminary flow sheet (Figure 1) for the updated water balance and summarizes the changes that have been incorporated into the water balance with respect to earlier versions as presented in the Developers Assessment Report (DAR) on Figure 4.7-10.

As reported in the July 2012 letter to MVEIRB "SEA1011-001: Avalon Thor Lake Project - Summary of Changes to Project Description", a number of modifications/optimizations were made to the project. The changes/updates that have the greatest effect on the water balance include:

- Current plan is to commission paste backfill plant during Year 1 to be at full production by Year 2. Previously paste backfilling commenced after Year 4.
- Total tailings volume reduced from 4.67 million m^3 to 3.37 million m^3 due to the resulting increased paste backfill and concentrate production ratios
- Further reduction in tailings water resulting from an increase in tailings slurry solids content from 50% to 65%
- Added treated Mine Water and Plant Site Runoff as separate stream to TMF
- Removed reclaim system from TMF (instead internal recycle in the plant resulting in increased slurry solids content)
- Optimizations to layout and deposition strategy resulting in updates to the runoff areas and runoff coefficients
- Updates to meteorological inputs (Knight Piésold memo Cont. No. NB12-00307)

Figure 1 illustrates the distribution of water through the Flotation Plant and TMF. The flows represent the average annualized flows over the life of operations (i.e. 20 years), including the average total annual volumes (thousand m^3/yr) and average annual flow rates (m^3/hr) for each component of the water balance. In summary the following compares the key TMF flows to those reported in the DAR:

- Total water with Tailings: 115,500 m^3/yr, versus 536,600 m^3/yr previously
- Water locked in Voids: 84,300 m^3/yr, versus 128,200 m^3/yr previously
- Total Facility Precipitation Runoff: 320,700 m^3/yr, versus 365,700 m^3/yr previously
- Total Facility Evaporation: 213,300 m^3/yr, versus 360,500 m^3/yr previously
- Mine Water/Plant Runoff to TMF: 170,000 m^3/yr, versus 0 m^3/yr previously
- Recycle from TMF to Plant: 0 m^3/yr, versus 261,500 m^3/yr previously

- Total Facility Seepage loss: 1,800 m^3/yr, versus 3,600 m^3/yr previously
- Total Discharge to Drizzle Lake: 321,300 m^3/yr, versus 148,300 m^3/yr previously

NOTES:

1. The results of the updated water balance are preliminary. Some of the actual volumes may change slightly as the operating plan is optimized. The variation is not expected to be significant.
2. The updated water balance has a net surplus of water discharged vs. inputs which accounts for displacement of the existing lakes due to tailings solids.
3. The values reported above for the previous water balance are based on the average total annual volumes over the life of operations, i.e. average of combined years 1 - 4 and years 5 - 20.

Year 20 - Operating Levels

In response to an additional request during the technical sessions, the following outlines the operating levels/volumes at the end of operations (Year 20):

- Minimum Crest Elevation: 252.0 m
- Spillway Invert Elevation: 250.0 m
- Maximum Operating Level: 249.3 m
- Normal Operating Level: 248.5 m

- Volume between Max Operating Level and Spillway: 179,500 m^3 (El. 249.3 m to 250.0 m)
- Operating Volume (i.e. between normal and max levels): 154,900 m^3 (EL. 248.5 m to 249.3 m)

- Peak 30 day Process, Mine and plant runoff inputs: 21,310 m^3
- Peak runoff month in Year 20 (April): 97,000 m^3
- Environmental Design Storm Volume: 52,400 m^3

The peak monthly input of 118,310 m^3 is well below the available operating volume in Year 20 (154,900 m^3). The fact that tailings discharge to the TMF will only occur 35% of the time creates additional flexibility in assuring clarification of these flows. To add to this, the available storage above the Maximum operating level of 179,000 m^3 is in excess of the peak monthly inflows combined with the EDS. This provides added conservatism and flexibility approaching the end of operations when the TMF is nearing its capacity.

In summary, the TMF will have more than adequate capacity and flexibility to manage flows and maintain a 30 day retention time, if required based on water quality, including at the end of operations. Prior to year 20, capacity for water management and retention is significantly greater.

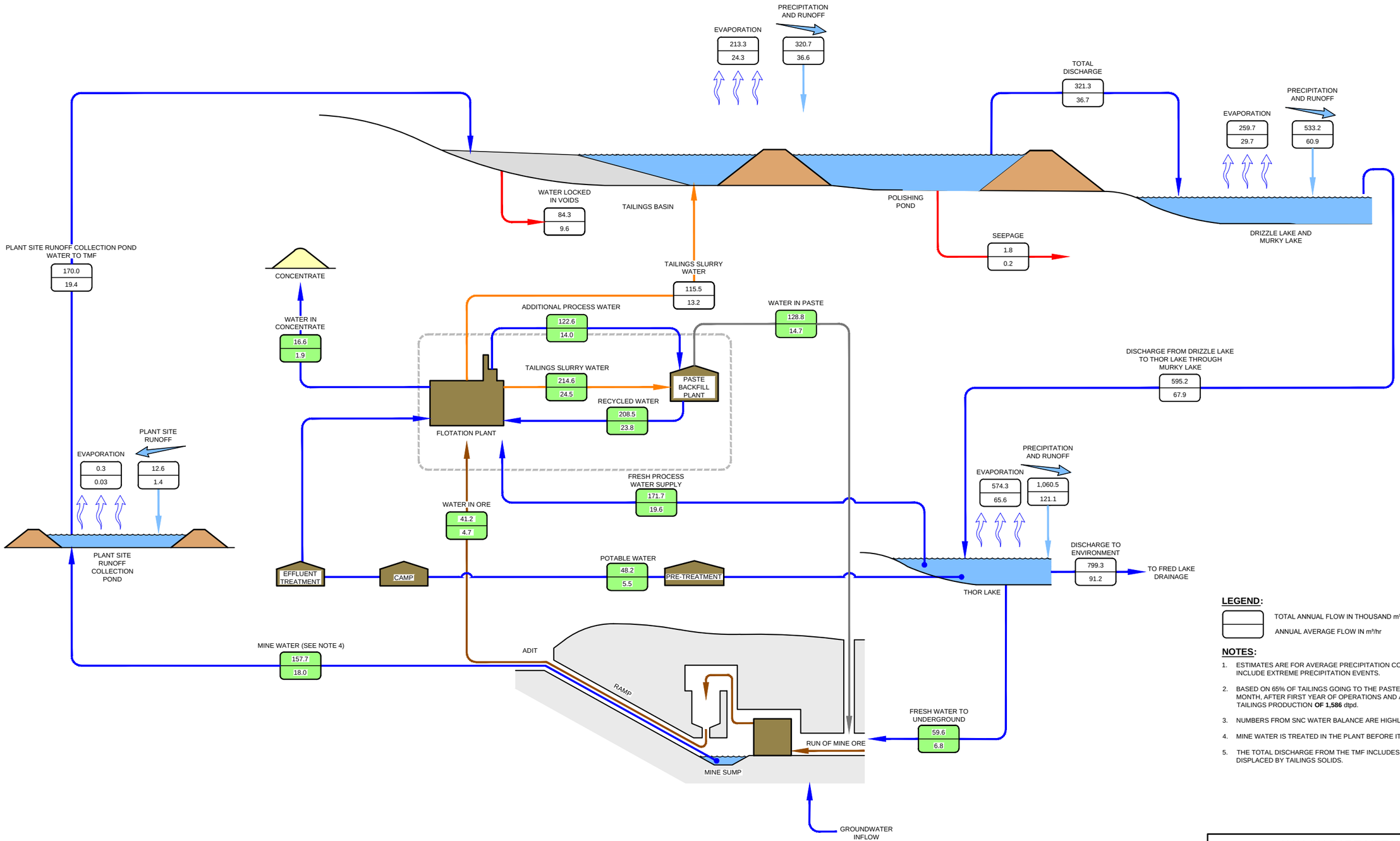
We trust this provides you with sufficient information. Please feel free to contact us with any questions or comments.

Signed: _____
Una McCullagh, P.Eng.
Project Engineer

Approved: _____
Kevin Hawton, P.Eng.
Specialist Engineer/Project Manager

Attachments:
Figure 1 Rev 0 Water Balance Flow Sheet - Average Precipitation Conditions (Years 1-20)

/ubm



LEGEND:

TOTAL ANNUAL FLOW IN THOUSAND m^3/yr

ANNUAL AVERAGE FLOW IN m^3/hr

NOTES:

1. ESTIMATES ARE FOR AVERAGE PRECIPITATION CONDITIONS AND DO NOT INCLUDE EXTREME PRECIPITATION EVENTS.
2. BASED ON 65% OF TAILINGS GOING TO THE PASTE BACKFILL PLANT PER MONTH, AFTER FIRST YEAR OF OPERATIONS AND AN AVERAGE TOTAL TAILINGS PRODUCTION **OF 1,586** dtpd.
3. NUMBERS FROM SNC WATER BALANCE ARE HIGHLIGHTED IN GREEN.
4. MINE WATER IS TREATED IN THE PLANT BEFORE IT ENTERS THE RCP.
5. THE TOTAL DISCHARGE FROM THE TMF INCLUDES THE VOLUME OF THE LAKES DISPLACED BY TAILINGS SOLIDS.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	23AUG'12	ISSUED FOR INFORMATION	UBM	SIR	KEH	-

AVALON RARE METALS INC.

THOR LAKE PROJECT

WATER BALANCE FLOW SHEET
AVERAGE PRECIPITATION CONDITIONS
(YEARS 1-20)

Knight Piésold CONSULTING

P/A NO. NB101-390/3 | REF NO. NB12-00424

FIGURE 1 | REV 0

SAVED: I:\10\NB\390\3\DA\Acad\FIGS\B22_r0, 8/23/2012 11:45:04 AM , NLIBERTY PRINTED: 8/23/2012 11:47:46 AM, YR02, NLIBERTY
XREFS: (BS) IMAGE FILE(S)

Attachment 2

Material Safety Data Sheets

MATERIAL SAFETY DATA SHEET

Emergency Telephone Number:
"Use in case of a CHEMICAL EMERGENCY ONLY"
CANUTEC: 1-613-996-6666

SECTION 1: MATERIAL IDENTIFICATION AND USE

Product Name : NORFLOC 230
Product Use : Coagulant
Chemical Family : Inorganic salts
Synonyms : None

SECTION 2: HAZARDOUS INGREDIENTS

COMPONENT C.A.S. NO. % TLV
mg/m3
LC50
mg/m3
LD50
(ORAL, MOUSE)
mg/kg
Not applicable

SECTION 3: PHYSICAL DATA

Physical State : Liquid
Odour and Appearance : Clear, beige-amber colour; slight odour
Specific Gravity(water=1) **:** 1.33-1.35
Vapour Pressure (mm Hg) **:** 17 @ 20oC (68oF)
Vapour Density (water=1) **:** 1.3
Evaporation Rate(water=1) **:** Not available
Solubility in Water : Soluble
Boiling Point (oC) **:** 105oC (221oF)
Freezing Point (oC) **:** -5oC (23oF)
% Volatile (by volume) **:** Not available
pH (100% Solution) **:** 3.5-4.1
Coefficient of Water/Oil Distribution: Not applicable

SECTION 4: FIRE AND EXPLOSIVE HAZARDS OF MATERIAL

Flammability: Non-flammable.
If Yes, Under What Conditions: Not applicable
Means of Extinction: As appropriate for surrounding materials.

2460 Anson Drive, Unit #9
Mississauga, Ont. L5S 1G7
Tel: (416) 410-1918
Fax: (905) 676-0582

Special Procedures: Wear full protective equipment including self-contained breathing apparatus. Cool
fire exposed containers with water spray.
Flash Point and Method: None (PMCC)
Hazardous Combustion Products: Hydrogen chloride gas
Upper Explosive Limits: Not applicable
Lower Explosive Limits: Not applicable
Autoignition Temperature: Not applicable
Explosive Data Sensitivity to Chemical Impact: Not applicable
Rate of Burning: Not applicable
Explosive Power: Not applicable
Sensitivity to Static Discharge: Not applicable

SECTION 5: REACTIVITY DATA

Chemical Stability: Stable
Conditions to Avoid: High temperature decomposition.
Hazardous Polymerization: Will not occur.
Incompatibility to Other Substances: Alkalis, metals (i.e. zinc and aluminum).
Reactivity and Under What Conditions: Reacts with zinc and aluminum to form hydrogen gas. Heat and
toxic vapours can be formed when in contact with strong alkalis.
Hazardous Decomposition Products: Thermal decomposition may release hydrogen chloride gas.

SECTION 6: HAZARDS IDENTIFICATION

Routes of Entry: Eyes, skin, inhalation, ingestion.

EFFECTS OF ACUTE EXPOSURE:

Eyes: Contact causes painful burning, stinging, watering, inflammation of the conjunctiva.
Skin: Contact may cause irritation, swelling.
Inhalation: Vapors or mists may cause irritation to the respiratory tract.
Ingestion: May be harmful if swallowed. Can cause nausea and vomiting. Ingestion of large quantities may
cause ulcerations and necrosis of the mucous membranes in the throat, mouth and esophagus. May also
cause liver or kidney damage, intense thirst.

EFFECTS OF CHRONIC OVEREXPOSURE:

Skin: Prolonged or repeated exposures can cause dermatitis.
Inhalation: Prolonged and repeated breathing of mist will irritate the respiratory tract.
Toxicological Findings:
Does not contain any carcinogens, mutagens or teratogens.
Medical conditions aggravated by exposure to this product: No data.
Irritancy of Material: Moderate skin and eye irritant.

SECTION 7: PREVENTATIVE MEASURES

PERSONAL PROTECTION INFORMATION:

Gloves: Impervious. (Neoprene recommended)
Respiratory: NIOSH/MSHA approved respirator if misting occurs.
Eye: Chemical goggles or face shield as required.
Clothing: Chemical resistant clothing.
Footwear: Rubber.
Other: Eye wash and safety shower.
Engineering Controls: General or local ventilation to keep TLV below recommended limits.

LEAK AND SPILL PROCEDURES:

Wear recommended protective equipment. Ventilate if possible. Contain spill. Prevent discharge into streams or sewers. Transfer material into suitable container for reuse or disposal. Neutralize remaining material with soda ash and absorb onto inert absorbent. Scoop into labeled disposal container. Flush residual with volumes of water.

WASTE DISPOSAL:

Dispose of in accordance with Federal, Provincial and local regulations.

SECTION 8: FIRST AID MEASURES

Eyes: Immediately flush with water for 15 minutes while holding eyelids open. Get medical attention immediately after flushing.
Skin: Remove contaminated clothing. Wash affected area thoroughly with soap and water. If irritation persists, get medical attention. Launder clothing before reuse.
Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention.
Ingestion: Do not induce vomiting. Give 2 glasses of water. Never give liquids by mouth if person is unconscious or convulsing. Get immediate medical attention.

SECTION 9: REGULATORY INFORMATION

W.H.M.I.S.

W.H.M.I.S. CLASSIFICATION: Not controlled
H.M.I.S. CLASSIFICATION: Health 1 Flammability 0 Reactivity 0

TRANSPORTATION OF DANGEROUS GOODS

Shipping Name : Not regulated
Class :
UN Number :
Packing Group :

SPECIAL SHIPPING INFORMATION

None.

MATERIAL SAFETY DATA SHEET

NORFLOC 230

SECTION 10: HANDLING AND STORAGE INFORMATION

HANDLING

Avoid contact with eyes and skin. Wear appropriate protective equipment when handling. Wash thoroughly after handling.

STORAGE

Store in dry, rubber-lined, plastic or FRB containers. Store between 10 and 30^{o}C. Do not store near incompatible materials. Keep container closed when not in use. Product should be used within one year.

SECTION 11: PREPARATION INFORMATION

Prepared By: Technical Department

Revision Date: Sept. 18, 2009

DISCLAIMER:

The information supplied is presented in good faith and has been derived from sources believed to be reliable. However, no warranty is extended regarding its accuracy or the results obtained from its use. Products supplied by our company are sold under the conditions that liability for any personal injury or damage whatsoever to any property real or personal arising from the handling or use will, in all cases, remain with the handler or user.

Safety Data Sheet
MAGNAFLOC→ LT340

1. Product and Company Identification
24 Hour Emergency Company Response Information
BASF Canada Inc.
100 Milverton Drive
Mississauga, ON L5R 4H1, CANADA
CANUTEC (reverse charges): (613) 996-6666
BASF HOTLINE: (800) 454-COPE (2673)

2. Hazards Identification
Emergency overview
Signal word: NOTICE! !
Colour: off-white
Appearance: powder
State of matter: solid
Odour: odourless
Health: This product has no known adverse effect on human health.
Physical/Chemical hazards:
Slip hazard when wet., Organic powders may be capable of generating static discharges and creating explosive mixtures in air. Handle with caution., Refer to MSDS Section 7 for Dust Explosion information.
Potential health effects
Primary routes of entry:
Eyes, Skin, Inhalation, Ingestion
Chronic exposure:
Eye contact may cause slight irritation and/or redness. Repeated or prolonged exposure may cause slight skin irritation.
Inhaled dust may cause respiratory irritation.

3. Composition/Information on Ingredients
This material does not contain any hazardous components that are reportable according to WHMIS criteria.

4. First-aid Measures
Inhalation:

Remove to fresh air, if not breathing give artificial respiration. If breathing is difficult, give oxygen and get immediate medical attention.

Skin:

After contact with skin, wash immediately with plenty of water and soap.
Get medical attention if irritation occurs.
If clothing is contaminated, remove and launder before reuse.

Eyes:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Ingestion:

Do not induce vomiting. If vomiting occurs naturally, have casualty lean forward to reduce the risk of aspiration. Seek medical attention immediately.

5. Fire-fighting Measures

Suitable extinguishing media:

carbon dioxide, dry powder, foam

Unsuitable Extinguishing Media:

If water is used, restrict pedestrian and vehicular traffic in areas where slip hazard may exist.

Hazardous combustion products:

Carbon and nitrogen oxides.

Hazards during fire-fighting:

Standard procedure for chemical fires.
Dust in sufficient concentration can result in an explosive mixture in air. Handle to minimize dusting and eliminate open flame and other sources of ignition.

Protective equipment for fire-fighting:

Wear self-contained breathing apparatus and chemical-protective clothing.

6. Accidental Release Measures

Cleanup:

Sweep up and shovel into suitable containers for disposal.
Avoid raising dust.
Wear suitable protective equipment.
Should not be released into the environment.
Product becomes slippery and difficult to handle when wet.

7. Handling and Storage

Handling

General advice:

As with all industrial chemicals, use good industrial practices when handling. Avoid eye, skin, and clothing contact. Do not inhale. Do not taste or swallow. Use only with adequate ventilation. Slip hazard when wet. Clean up spills promptly

Protection against fire and explosion:

Avoid creating dust. Organic powders may be capable of generating static discharges and creating explosive mixtures in air. Handle with caution. Handle with caution.

General advice:

Keep container tightly closed in a dry, cool and well-ventilated place.
Avoid extremes of temperature.
Avoid buildup of dust.
Avoid wet or humid conditions.
> for industrial use only <

8. Exposure Controls and Personal Protection

Engineering Controls:

Work in well ventilated areas. Do not breathe dust.
Ensure good ventilation and local exhaust.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified respirator as necessary.

Eye protection:

Wear safety goggles (chemical goggles) if there is potential for airborne dust exposures.

Body protection:

Wear chemical resistant gloves and protective clothing.

General safety and hygiene measures:

There are no OSHA or ACGIH exposure guidelines available for component(s) in this product.

9. Physical and Chemical Properties

Colour: off-white
Form: powder
State of matter: solid
Odour: odourless
pH value: Not tested
Evaporation rate: Not tested
Flash point: Not applicable
Melting point: Not applicable
Boiling point: Not applicable
Vapour pressure: Not tested
Density: Not applicable
Relative density: 0.8
Bulk density: 0.75 g/cm3
Vapour density: Not tested
Partitioning coefficient noctanol/
water (log Pow):
Not applicable
Viscosity, dynamic: Not tested
% Volatiles: not determined
Solubility in water: Forms a viscous solution
Solubility in other
solvents:
soluble, Forms a viscous solution

10. Stability and Reactivity
Stability:
Stable.
Conditions to avoid: Avoid humidity. Avoid temperature extremes. Avoid electro-static discharge. Avoid sources of ignition. Avoid handling conditions that create dust.
Substances to avoid: Strong oxidizing agents., (may degrade polymer)
Possibility of Hazardous Reactions: Product has a high minimum ignition energy; however, dust may be ignited under some conditions.
Hazardous decomposition products: Carbon oxides.

11. Toxicological Information
Acute oral toxicity:
LD50 / oral / rat: > 2,000 mg/kg
(based on similar product)
Acute inhalation toxicity:
by inhalation:
Not tested
Acute dermal toxicity:
dermal:
Not tested
Skin irritation:
not determined
Eye irritation:
May cause some irritation which should cease on removal of product.
Skin Sensitization:
Not tested
Chronic toxicity:
not determined
Subacute Toxicity:
not determined
Subchronic Toxicty:
not determined
Genetic toxicity:
Not expected to be mutagenic
Carcinogenicity:
None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.
Reproductive toxicity:
No data for product. No effects anticipated
Developmental toxicity/teratogenicity:
No data for product. No effects anticipated.

12. Ecological Information

Toxicity to fish:
Brachydanio rerio/96 h/LC50: 357 mg/l (OECD 203; ISO 7346; 92/69/EEC, C.1)
From tests on a product range

Toxicity to aquatic invertebrates:
Daphnia magna/48 h/EC50: 212 mg/l (OECD 202/EC C.2)
From tests on a product range

Toxicity to aquatic plants:
Chlorella vulgaris/72 h/EC50: > 1,000 mg/l (OECD 201/EC C. 3)
From tests on a product range

Toxicity to microorganisms:
Pseudomonas putida/24 h/EC50: 892 mg/l
From tests on a product range

Biodegradation:
Not tested

Other ecotoxicological advice:
Product not considered toxic to aquatic organisms.

13. Disposal Considerations

Waste disposal of substance:
Dispose of in accordance with national, state and local regulations.

14. Transport Information

TDG (Canada) Road transport
Special shipping information: Not classified as a dangerous good under transport regulations.

International Air Transport Association (IATA)
Special shipping information: Not classified as a dangerous good under transport regulations.

International Maritime Dangerous Goods Code (IMDG)
Special shipping information: Not classified as a dangerous good under transport regulations.

15. Regulatory Information

US: Toxic Substances Control Act (TSCA): All component(s) comprising this product are either exempt or listed on the TSCA inventory

Canada: Domestic Substances List (DSL): All components either exempt or listed on the DSL

Canada Regulations

Workplace Hazardous Materials Information System (WHMIS Classification):
This product is not WHMIS controlled.

Significant New Activity Conditions (SNAC):
This product does not contain any components subject to a SNAC Notice.
International Regulations
Chemical Weapons Convention:
No components listed.

16. Other Information

Product Safety Contact:
Prepared by: Ginette Rambié (905) 812-7280
Phone number of preparer:
Date / Revised: Generation date
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Due to the merger of CIBA and BASF Group all Material Safety Data Sheets have been reassessed on the basis of consolidated information. This may have resulted in changes of the Material Safety Data Sheets. In case you have questions concerning such changes please contact us at the address mentioned in Section I.
END OF DATA SHEET**744 Gordon Baker Road Toronto, Ontario M2H 3B4 Tel: (416) 490-7848 Fax: (416) 490-0974 www.filterinnovations.com**

MATERIAL SAFETY DATA SHEET

Section I – Identity
Identity (As used on Label and List): Activated Carbon (Powdered, Granular or Pelletized)
Manufactures Name: Filter Innovations Inc.
744 Gordon Baker Road
North York, ON M2H 3B4
Tel: 416.490.7848
Date Prepared: September 6, 2010
Section II – Hazardous Ingredients/Identity Information
Hazardous Components – (Specific Chemical Identity: Common Names)
Material Name: Polyester
Chemical Name: Polyethylene terephthalate (PET)
Not considered hazardous by the criteria of the OSHA Hazard Communication Standard
(29 CFR 1910.1200) (USA)
CAS #: 25038-59-9
Section III – Physical/Chemical Characteristics
Boiling Point: N/A
Vapor Pressure (mm Hg): N/A
Vapor Density (AIR = 1): N/A
Specific Gravity: (water = 1) 1.3
Melting Point: N/A
Evaporation Rate (Butyl Acetate = 1): N/A
Solubility in Water (20°): Negligible, below 0.4%
Appearance and Odor: White staple fiber; odorless
Odor Threshold: N/A
Section IV – Fire and Explosion Hazard Data
Flash Point (Method Used): Unknown
Flammable Limits in Air % by Volume: N/A
Flammability: Polyester staple will burn if exposed to flame
LEL: N/A
UEL: N/A
Extinguishing Media: Agents approved for Class A hazards (e.g. halogenated agents, foam, steam), or water fog.
Special Fire Fighting Procedures: Fire Fighters and personnel should protect themselves from smoke I inhalation, decomposition and combustion products.
Unusual Fire and Explosion Hazards: None under normal conditions of use.
Hazardous Combustion Products: May include carbon, hydrogen and oxygen. The exact composition will depend on the conditions of combustion.
Section V – Reactivity Data 744 Gordon Baker Road Toronto, Ontario M2H 3B4 Tel: (416) 490-7848 Fax: (416) 490-0974 www.filterinnovations.com 2/2
Stability: Stable; sticks at 440° - 445° F (227° - 229° C), melts at 500° F (260° C), disintegrates in strong alkalis at boil.
Conditions to Avoid: N/A
Reactivity: Good resistance to most organic and mineral acids, and to weak alkalis. Moderate resistance to strong alkalis at room temperature.
Incompatibility (Materials to Avoid): Dissolves by strong alkalis at high concentrations and temperatures and with partial decomposition by concentrations solutions of nitric, sulphuric and carbolic acids. Unsuited for some phenolic compounds and affected by cyclohexanone at 313° F (156° C).
Hazardous Decomposition: May include carbon monoxide and other toxic gases. Decomposition products generated from molten polymer may be subject to autoignition
Hazardous Polymerization: N/A
Section VI – Toxicological Properties
Effects of overexposure: None in our experience under normal conditions of handling and use.
Carcinogenicity: No component of the product is identified as a carcinogen by NTP, IARC or OSHA.
Irritancy of Material: No significant irritation expected other than possible mechanical irritation; dense dust generated by the handling and/or processing of this material may be irritating to the eyes, skin, nose and throat.
Section VII – Preventative Measures
Leak and Spill Procedure: Contain and remove by mechanical means
Waste Disposal Method: Disposal must be in accordance with applicable federal, state of local regulations
Storage Requirements: No special requirements
Special Shipping Information: Not classified as hazardous materials for transportation purposes
Label Information: Does not require any hazard warning label under the OSHA Hazard Communication Standard.

Section VIII – Protection Measures
Respiratory Protection: If dust is generated and ventilation is inadequate, use NIOSH/MSHA certified respirator, which will protect against dust
Ventilation: Ventilation is recommended to minimize exposure to finish mists. Maintaining finish mist below 5mg/m^3
Protective Gloves: None required
Eye Protection: None required; however use of safety glasses is good industrial practice
Other Protective Equipment: None required
Section IX – First Aid Measures
Eyes: Flush eyes with plenty of water. Get medical attention if irritation persists
Skin: Flush exposed skin with plenty of water
Inhalation: None required
Ingestion: None required
****** The information contained herein is accurate to the best of our knowledge. Filter Innovations Inc. makes no warranty with respect hereto said information and disclaims all liability from relianc***

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Melting Point: N/A
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Appearance and Odor: White staple fiber; odorless
Odor Threshold: N/A
Section IV – Fire and Explosion Hazard Data
Flash Point (Method Used): Unknown
Flammable Limits in Air % by Volume: N/A
Flammability: Polyester staple will burn if exposed to flame
LEL: N/A
UEL: N/A
Extinguishing Media: Agents approved for Class A hazards (e.g. halogenated agents, foam, steam), or water fog.
Special Fire Fighting Procedures: Fire Fighters and personnel should protect themselves from smoke I inhalation, decomposition and combustion products.
Unusual Fire and Explosion Hazards: None under normal conditions of use.
Hazardous Combustion Products: May include carbon, hydrogen and oxygen. The exact composition will depend on the conditions of combustion.
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Flammable Limits in Air % by Volume: N/A
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LEL: N/A
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Extinguishing Media: Agents approved for Class A hazards (e.g. halogenated agents, foam, steam), or water fog.
Special Fire Fighting Procedures: Fire Fighters and personnel should protect themselves from smoke I inhalation, decomposition and combustion products.
Unusual Fire and Explosion Hazards: None under normal conditions of use.
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