

**BBECA SCIENTIFIC ADVISORY PANEL MEETING**  
**Monday, April 19 2010, 5:00 pm – 7:30 pm**  
**Tilbury Meeting Room, Delta Municipal Hall,**  
**4500 Clarence Taylor Crescent, Delta, BC**

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**Attendees**

Geoff Freer (Gateway)	Sarah Howie (Corp of Delta)
Richard Sims (Gateway)	Cassandra Counce (Ministry of Environment)
Mauricio Herrera (Gateway)	Mitch Sokalski (Metro Vancouver)
Gabor Vasarhelyi (Gateway)	Markus Merkens (Metro Vancouver)
John Jeglum (SAP)	Wendy Warn (Metro Vancouver)
Alan Dakin (SAP)	Loger Aure (Metro Vancouver)
Richard Hebda (SAP)	Francis Buys (Metro Vancouver)
Paul Whitfield (SAP)	Maria Bacani (Metro Vancouver)
Mike Brotherston (Corp of Delta)	Heather Sinclair (Metro Vancouver)

**Regrets**

Jennifer McGuire (Ministry of Environment)  
Angela Danyluk (Corp of Delta)  
Greg Paris (Metro Vancouver)

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*Note: SAP Members participated in a workshop for Delta Council in the Annacis Room from 4:15 pm – 5:20 pm.*

**Meeting Chair: Mitch Sokalski**

1.0 Introductions

- Francis was introduced as the new full-time Park Operator for the BBECA
- Maria was introduced as the new administrative support for the Scientific Advisory Panel meetings

2.0 Review Agenda and February 1, 2010 Meeting Notes

3.0 Action Items from the Previous Meeting

- MV staff to work with SAP and Angela Danyluk to create Delta Council information package. –*Completed*
- MV to invite City of Vancouver landfill staff to discuss capping plan at a future meeting. –*Completed*
- MV to set meeting with Gateway, Corp. of Delta, Canadian Wildlife Service, and Ministry of Environment regarding East-West Ditch Drainage Plan – *Carried forward*
- Markus to distribute the Draft Research Strategy electronically in both Word and PDF versions for comment. – *Completed February 2, 2010*
- Sarah to invite Gateway representatives to the next SAP meeting to present the Water Balance Model to the Panel. – *See Item 4.0.- Completed*
- MV will follow up with Golder and Associates and EBA Environmental regarding exactly what they are measuring in the northern boundary area— *See Item 4.0 - Completed*

4.0 Presentation of Gateway's Water Balance Model and the Delta Watershed Model

- Geoff Freer (Gateway) began the presentation with an update on the status of the South Fraser Perimeter Road project, indicating that construction was underway on preloading, utilities, and other background work
- The current focus is on the environmental aspects of the project, including hydrology, wildlife, vegetation, air quality, and sediment monitoring
- In response to Alan Dakin's question, he noted that the main road building contract still has not been awarded but that it should be very shortly; there was considerable change in the approach as a result of the economic downturn as parts of the project were taken out of the main contract to be accelerated in order to create construction industry jobs (examples include the Highway 17 overpass and groundwork for utilities including Terasen, Kinder Morgan, and GVSDD)
- Geoff Freer also noted that they are constructing a system to collect leachate and methane at the northern boundary and hope this will encourage neighbouring properties to make use of this system and close their landfills properly
- Richard Sims continued the presentation with an update on the status of the berms, of which the 80<sup>th</sup> street berm is approximately 50% complete while the rest are between 30-50% complete; construction on the landfill berm has not commenced as they are waiting on the landfill closure plan
- Water well monitoring, including pressure transducer downloads every two months and groundwater sampling twice a year (January/wet season and September/dry season) have provided good baseline data
- Groundwater elevation data has now been collected for four years, providing enough data to observe what is "normal"; this year was not significantly different from the previous three years
- Horizontal gradients between select pairs have continued to confirm general radial outward flow from the bog, especially near the bog boundary during the dry season
- Bog water types have been identified for shallow peat monitoring locations and monitored from 2006-2009, with no significant changes year over year
- John Jeglum asked whether they had completed paired comparisons of transects across the East-West ditch for potassium and calcium, to which Richard's replied that they had reviewed this data and that no significant change was apparent
- Collectively, the data from these transects did not show overall progression of mineral water into the interior of the bog, but Richard S. also advised that the most current data was still being reviewed by Golder and Associates and he therefore could not speak to it's contents
- At the DLC sites, there had been progression into the BBECA
- During the wet season, the entire range of readings shifted significantly in pH, which appeared to be a positive sign that massive precipitation was pushing bog water radially outward; Richard Hebda cautioned that this effect might be due only to dilution of mineralized water by the precipitation
- The net effect on groundwater has been the same from 2008-2009, with the same mineralization seen year over year
- The Water Budget Model (WBM) was presented by Mauricio Herrera
- The main objective is to develop and calibrate the model for the management of the BBECA

- The short-term application of the model is to support the design of the hydrological control structures for the BBECA
- The long-term application of the model is for long-term maintenance of and research on the BBECA
- The GSSHA model was used for this WBM, which allows the integration of surface and sub-surface flow
- The grid was assigned based on the geography as represented by the Lidar data, and includes information such as vegetation, soil type, infiltration, etc.
- The grids communicate with one another; groundwater moves laterally, but the ditches are treated as linear conductors
- This two-dimensional model was described as being more sophisticated than traditional simple hydrological models
- Mauricio Herrera (Gateway) noted, in response to Richard Hebda's question, that they ground truthed that the water flow projected by the model was accurate
- The advantage of the grid design of the model is the ability to assign parameters to every cell, integrating the vegetation, soil type, etc. into the model
- The difficulty with this model is that the drainage patterns can change quickly in the bog, especially as a result of beaver dams, ditch blockages, etc.
- The size of grid cell for this model is 20mx20m
- Model calibration has only been conducted for the 96<sup>th</sup> street catchment basin thus far
- Richard Hebda pointed out that, according to the chart provided, the model leads the actual data in predicting water outflow and raised the issue that the GSSHA model was developed for use with mineral soil systems, not necessarily with peat
- Richard Sims agreed that it was very difficult to calibrate the model for peat, including evapotranspiration, and very difficult even to determine a baseline, let alone adjust to exactly account for changing bog conditions
- Mauricio Herrera (Gateway) noted that the calibration of the model would always be subject to improvement based on ongoing research
- Paul Whitfield raised his concern about the peaks in the chart which the model had apparently not predicted at all
- The SAP members all expressed concern about the considerable seasonal variability in hydrological conductivity as a result of such things as the elevation of the water table, the temperature affecting bacterial activity, etc. as this will affect the model during the dry season, given that it appears to be based on wet-season data
- The model is based on two hydrological conductivities, the vertical and lateral
- Gabor Vasarhelyi (Gateway) presented the next steps in the application of the model
- In the short term, the model is intended to assist in determining water level controls at the northern boundary of the Bog
- The long-term objectives include model reinforcement, such as improved parameters and improved system geometry by refining the grid size (though the computational requirements for this might make it unfeasible outside of academia where computing systems have sufficient power)

- The other long-term objective is model expansion, including modelling other areas of specific interest and modelling the entire bog (this, too, would require huge computational power)
  - For the water level controls at the northern boundary, the type of control needs to be determined (i.e. fixed, manually adjustable or automatic), as well as the gate dimensions and parameters
  - The WBM cannot handle control structures, tidal influences, etc.
  - The Delta Watershed Model (DWSM) is able to account for these influences, but the two models can't be simply put together; it is necessary to run one, then adjust the data accordingly in the other
  - Each model has it's strengths:
    - WBM could improve the hydrological parameters for the DWSM
    - DWSM could be used to determine the maximum acceptable water surface elevation of the East-West Ditch
    - WBM could determine optimum water surface elevations at the control structures to maximize water retention in the BBECA, particularly during the transition from the wet to dry season
    - DWSM could help to determine the type, dimensions and parameters of gates
  - The two models together could assist in evaluating specific areas of interest, such as determining the optimum location of peat dams for maximum water retention and evaluating surface/sub-surface water interactions between adjacent sub-basins
  - Richard Hebda raised the question of whether control structures should actually move with the water level as this method doesn't mimic the workings of a natural bog, which is desired ultimate outcome of BBECA management
  - The ideal situation would be to have the bog naturally regulate its own water levels
  - Richard Hebda also expressed concern that there wasn't flow monitoring at key outflow points as part of the development of the model, as Gateway had previously committed, which could make verification of the model more difficult
- ACTION: MV to follow up with Gateway on why more outflow points weren't used as was suggested earlier and report back to SAP next meeting.***

#### 5.0 Review Outcomes of SAP/Delta Council Workshop

- Mike Brotherston will get direction from Council regarding more information on what Delta can do for water monitoring and management
- Paul Whitfield and Allan Dakin emphasized the need for access to and compilation of the data being collected at the Bog, especially given that creation of such a database was included in the BBECA Management Plan; there is a great deal of information in a number of hands, and there should be one data-collecting authority to ensure all data are safely accumulated
- Data collection standards are also needed in order to ensure compatibility of the data into a single database
- Loger Aure noted that MV's IT department is still in discussion to make this a possibility for MV to be the collection point
- Richard Hebda pointed out that there is urgency because the information currently being collected by Gateway could be very useful to SAP right now but they are not being provided that data

***ACTION: Loger to follow up with MV IT department regarding the process required to put this system in place and update Delta and SAP at future meeting***

#### 6.0 Vegetation Monitoring

- Thomas Munson has been hired to monitor sphagnum growth and tree vigour during 2010, contract has been modified to meet needs for 2010

#### 7.0 Vancouver Landfill Meeting Debrief

- As the height of the landfill has increased, the amount of garbage being wind-blown into the Bog has also increased
- Much of the refuse is in the immediate vicinity of the vegetation research area
- The landfill will provide crews to clean up the garbage
- There is bone and other organic matter in and around the research plots
- There is a lot more work to be done to clean up this site; clean-up has been complicated by the fact that there are many safety issues, including the fact that the trees in the area are dying and could be hazardous
- The Landfill staff would like to present the Vancouver Landfill capping plan to SAP at a proposed meeting in May, prior to Lynn Belanger's maternity leave
- Markus Merkens noted that currently the landfill has outflow pipes running directly into the inner ditch of the BBECA, he advised the landfill that outflow from these could be detrimental to the bog and should be carefully regulated
- Allan Dakin suggested that the Landfill should develop a plan that addresses the concerns raised by SAP, MV, and Delta and then present the proposal to the SAP

***ACTION: MV will provide SAP members with the report from City of Vancouver Landfill including the broader hydrology plan, and provide Lynn Belanger with specific questions that SAP would like addressed in the CoV presentation at next SAP meeting.***

#### 8.0 Committee Reports

- The Research Strategy Report and Ramsar Designation Report were presented to the Board, and the Board has deferred action on them until June 2010

#### 9.0 Adjourn