APPENDIX A
Bow River Project Participants

MEMBER	REPRESENTATIVE(S)
Alberta Agriculture and Rural Development	Roger Hohm Bob Riewe
Alberta Environment	Kent Berg Dave McGee Heather Sinton John Taggart Tom Tang
Alberta Sustainable Resource Development	Allan Locke Andrew Paul Jim Stelfox
Alberta Tourism, Parks and Recreation	Joey Young
Alberta Water Research Institute	David Hill
Bow River Basin Council	Mark Bennett
Bow River Irrigation District	Richard Phillips
Calgary Regional Partnership	Colleen Shepherd Natalie Guy, Dave Pernitsky (CH2M Hill)
City of Calgary	Paul Fesko Frank Frigo John Jagorinec
County of Newell	Kevin Stephenson
Ducks Unlimited Canada	Tracy Scott
Eastern Irrigation District	Earl Wilson
Rocky View County	Jorie McKenzie
Trout Unlimited Canada	Brian Meagher
Water and Environmental Hub	Alex Joseph Bruce MacArthur Mike Nemeth
Western Irrigation District	Erwin Braun Jim Webber
EXPERT RESOURCES	
Alberta Sustainable Resource Development	Paul Christiansen
Alberta Water Research Institute	Val Mellesmoen
University of Lethbridge	Dr. Stewart Rood
PROJECT FACILITATION, MODELLING AND SUPPORT	
Alberta WaterSMART	Mike Kelly Gary Reavie Kim Sturgess Megan Van Ham
HydroLogics Inc.	Dan Sheer Mike Sheer Sam Lebherz
Green Planet Communications	Kim Sanderson

APPENDIX B
Bow River Operational Model Base Case

SECTION 1. MODEL ORIGIN

The Bow River Operational Model (BROM) is built on foundations lain by the South Saskatchewan River Basin (SSRB) model. Constructed for the University of Lethbridge, the SSRB model emulates the license-based operations of Alberta Environment's Water Resources Management Model (WRMM). The BROM diverges from the SSRB model, however, in that it attempts to more accurately model existing and potential future operations beyond the constraints of a strict licensing system. Data sources are described later, but like the SSRB model much of it comes from Alberta Environment (AE) and Alberta Agriculture (AA).

As the Bow River region officially operates under the metric system, internal model units are in metric. The primary volumetric unit is cubic decameters (cdm) with primary flow in cubic meters per second (cms). The model is capable of converting to or from metric "on the fly" however, as many users in the area prefer imperial units.

For those wishing to evaluate and examine the SSRB model, it is available through the University of Lethbridge at the following URL: http://www.uleth.ca/research/node/432/. Questions regarding that model and its development should be directed to either Mike Nemeth of the University of Lethbridge at (403) 332-4038 and mike.nemeth@uleth.ca.edu or Dean Randall of HydroLogics, Inc. at (410)715-0555 and DRandall@hydrologics.net.

SECTION 2. DATA SOURCES

*Note: Due to the limitations faced by earlier modeling efforts, the BROM has data current only from 1928 to 1995.

PHYSICAL SYSTEM & INFLOWS

Lower Bow River

Most data regarding the physical system downstream of node 210 (i.e. the Bow River from Calgary all the way to the confluence with the Oldman) was copied directly from the SSRB model. Refinements were made, however, after discussion with specific stakeholders. Bow River Irrigation District (BRID) provided significant information regarding the diversion limitations of the structure at Carseland, as well as noting minimum flow requirements for pass-by flow at the BRID headworks and the dead storage level at McGregor Reservoir. Glenmore reservoir, absent from the original SSRB model, was added according to data provided by the City of Calgary. "Glenmore SAE & Ops.xls" collects data provided over a series of personal conversations and is attached.

Upper Bow River

The data for the Upper Bow River comes largely from TransAlta Utilities (TAU). Storage-Area-Elevations are collected from the Draft Report on the Calculation of Weekly Natural Flows (1987 to 2007) for the Upper Bow River Basin produced by Golder Associates. This report is named "Report for TransAlta Phase I.pdf." Turbine capacity and maximum/minimum flows were also provided by TAU and can be found in the file "Reservoir and Conveyance Info.xls." Natural flow data was acquired from TAU as well (filename "Hbdf for TAU (May 2010).txt"), though it was originally produced by Alberta Environment. Since these flows were provided on a weekly timestep, HydroLogics, Inc. converted the records to better reflect reality under a daily model. This was performed by adding statistical "noise" that preserved weekly totals while reintroducing stochasticity. Further documentation on this process can be found Section 5 of this Appendix.

It is important to note that Smith-Dorian Creek, Kent Creek, and Ghost River have diversion canals that can allocate partial river flows to upstream reservoirs in the system. For modeling purposes, BROM uses historical diversion records to allocate these flows. Remaining river flow continues to the traditional reservoir. For Smith-Dorian and Kent Creek, the diversions are represented as inflows to OASIS nodes 075 and 140 respectively. Remaining flows (to 145 – Lower Kananaskis and 155 – Barrier) are adjusted in the inflow calculations to account for this (see set_inflows.ocl). Ghost River is treated similarly, though the diversions are handled slightly differently by forcing diversion flows using OASIS target statements in "set_TAU_div_flows.ocl."