Wyoming Department of Environmental Quality (WDEQ), Water Quality Division, WYPDES Permitting Program
Watershed-Based Permitting for the Powder River Basin, Wyoming
State Innovation Grant Program – PI978078-01
Quarterly Report
October 1 – December 31, 2008

Project Synopsis:

WDEQ is in the beginning phases of additional watershed-based permitting, the next three drainages slated for watershed-based permitting are Bitter Creek, Spotted Horse Creek, and Wild Horse Creek. The WDEQ is in the beginning data collection and analysis phase for the Wild Horse Creek and Spotted Horse Creek drainages, a second watershed permitting meeting was held with landowners in the Bitter Creek drainage, and a draft permit for the Bitter Creek drainage is under construction.
Further progress has been made on items discussed in the First Quarter, 2008 watershed grant report:

1. Using the Feature Analyst software, a shapefile of potentially irrigated acreage has been extracted from available color infrared imagery for the entire Little Powder River drainage, and work has begun for similar data extraction for drainages within the Powder River drainage.
2. Further work on Powder River assimilative capacity allocation continues, with all the major and most of the minor CBM companies having made preliminary submittals.

Narrative Discussion:

The WDEQ is moving forward with watershed permitting in a streamlined manner. It is expected that Bitter Creek, Wild Horse Creek, and Spotted Horse Creek will require at most 3 stakeholder committee meetings to complete the process. The WDEQ expects that watershed permits will be in effect for these drainages by late spring, 2009. The WDEQ has not selected the next series of watersheds in which to begin watershed permitting efforts once the Bitter Creek, Wild Horse Creek, and Spotted Horse Creek watershed permits are near completion.

Work continues on the ArcHydro modeling front. However, it may still be necessary, based on the complexity of the modeling effort, which still remains to be seen, to hire either a contractor to develop the model, or a consultant to aid WDEQ personnel in model development.

Project Tasks and Milestones
The following is a list of project goals, descriptions, milestones, and timelines.

Task/Goal	Description	Start Date	End Date	Status/Comments
Baseline Water Quality Assessment	Assess available water quality data and channel morphology	11/9/2004	Ongoing throughout project	Each watershed incorporated into watershed permitting requires separate analysis as to availability and type of water quality data available/needed.
Identify water quality parameters	Identify water quality parameters first to exhibit a detectable response to effluent discharges, allowing for efficient assessment of model inputs and needed effluent limits (discharge limitations)	11/9/2004	Ongoing throughout project	Each watershed incorporated into watershed permitting requires separate analysis as to parameters of concern and allowable loads/concentrations.
Compile/interpret data gathered as a result of completion of above two tasks.		11/9/2004	Ongoing throughout project	Each watershed incorporated into watershed permitting requires separate water quality data analysis.
Develop ArcHydro data format protocols	Clarify inputs needed for ArcHydro model and data transfer protocols from other data sources (WYPDES database, USGS, NOAA)	10/1/2007	12/31/08	DEMs have been acquired, and are currently being evaluated for use in ArcHydro modeling efforts.
Develop transferrable ArcHydro model to quanitfy CBM impacts within the Powder River Basin.	Develop a modeling tool that will allow assessment of Powder River Basin end goals (flow, concentration, and load)	2/1/2008	03/31/2009	A computer dedicated to ArcHydro and Feature Analyst modeling has been put to use, currently it is being used exclusively almost around the clock to extract shapefiles defining potentially irrigated lands, preventing use for ArcHydro modeling at this time.
Quantify existing and reasonably foreseeable potential future industrial development in PRB of Wyoming	Acquire future CBM development forecasts, use forecasts to model development impacts	3/22/2007 (data obtained from BLM)	6/14/2007 (05/30/08)	CBM development forecasts obtained from BLM, Kathy Shreve developed spreadsheet model that combines water chemistry reported in the course of WYPDES permit self-reporting, GIS to assign estimated water quality data to CBM wells on a spatial basis, reported ambient water quality concentration and flow at USGS stations within the Powder River Basin, and basic mass balance equations to model flow and concentration in time series to obtain modeled CBM impacts within the Powder River Basin. 2007 data has been incorporated into the model.

Task/Goal	Description	Start Date	End Date	Status/Comments
Identify potential assimilative capacity within the Powder River Basin		11/9/2004	10/9/2007	Assimilative capacity (available loading) for dissolved sodium and total dissolved solids calculations complete.
Conceptual outline for assimilative capacity allocation		11/9/2004	7/14/2006	Concept document for Powder River assimilative capacity process posted on WDEQ website.
Permitting approach/mechanism for Powder River point source discharges	Could include general permits, sychronized permitting, assimilative capacity.	11/9/2004	7/14/2006	Includes general watershed permitting/permit plans under which individual permits will be issued and assimilative capacity.
Implement Powder River assimilative capacity approach		10/1/2007	06/30/10	The WDEQ has contracted with the Wyoming Geological Survey to calculate total coal resources within the Powder River basin (cubic tons), and each CBM operator's portion (percent) of the coal resource utilizing GIS and leasehold shapefile submittals from CBM operators. The WDEQ has developed a geodatabase to track assimilative capacity credits, and plans to post the geodatabase using a GIS server to allow all operators access. *Assimilative capacity approach fully implemented, ongoing maintenance regarding lease tracking (lease sales and trades) ongoing throughout project.*
Watershed General permit implementation	Implement watershed-based general CBM permitting within the Powder River Basin	1/11/2005	Ongoing	To date, the WDEQ has issued watershed-based permits/plans for three watersheds (Pumpkin, Willow, and Fourmile Creeks). These permits will be revised according to the final EQC decision once WDEQ receives the final written order. Watershed permits are pending for the following drainages: Clear Creek, Fence Creek, (draft permit to be revised and re-advertised in public notice) Lower Tongue River, Crazy Woman Creek, and Dead Horse Creek watershed permits being prepared for public notice. The WDEQ has determined that the next watersheds slated for watershed permitting will be Bitter Creek, Spotted Horse Creek, and Wild Horse Creek. Bitter Creek general permit currently under construction.
Extraction of shapefiles delineating potentially irrigated lands within the Powder River basin using Feature Analyst software		8/2008	Ongoing	Data extraction complete for the Little Powder River drainage, work beginning on various sub-watersheds within the Powder River proper.

Financial Report

Expenditure Summary

Budget Category	Approved Budget	Spent this Quarter	Cumulative to Date
Travel	**$ 15,991.00**		**$ 1,425.00**
Equipment	**$6,269.60**		**$6,269.60**
Supplies	**$4,000.00**		**$ 1,870.00**
Contracts	**$171,739.40**		**$ 7,822.00**
Total		**$0**	**$17,386.60**

Expenditure Breakdown, 4th Quarter, 2008

No new expenses this quarter