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, 2007 – December, 2007

Project Synopsis:

During this period, no additional meetings were held with any of the stakeholders in any of the drainages in which watershed-based permitting has already been initiated (Lower Tongue River, Crazy Woman Creek, and Dead Horse Creek), or for which watershed-based permits have been advertised in public notice but not issued (Clear Creek and Fence Creek). One reason is that the three watershed-based permits/plans that were originally issued (Pumpkin Creek, Willow Creek, and Fourmile Creek) are currently under appeal. WDEQ administrators and other higher-level personnel have deemed it prudent to await the outcome of these appeals before issuing other watershed-based permits, in the hope that any changes that may be required as the result of the appeals may be addressed prior to issuance of any new watershed-based permit. Another reason is that the appeals challenged the authority of the WDEQ to issue watershed permits. Currently, these appeals are in the pre-hearing phase. However, during this period, one of the appellants requested summary judgment on a number of legal issues. Those issues included the allegation that the watershed permits should have been promulgated as rules, that the WDEQ does not have the authority to issue general permits, and that the watershed permits do not meet state requirements for general permits. Summary judgment on all these issues was denied.

An additional reason that no further action has been taken on pending watershed permits is that the WDEQ is currently considering restructuring the watershed-based permitting process, as the current process may be somewhat redundant, and there may be some efficiencies, now that the WDEQ has experienced several of these processes in various drainages, that could potentially be incorporated into the watershed-based permitting process.

However, some progress has been made in other areas of the proposal.

1. The Powder River Assimilative Capacity Allocation Process has been implemented. Several operators have completed the registration process, which involves submitting ArcGIS compatible shapefiles of their leaseholdings, and having their percentage of total Powder River Basin coal calculated. Many of the larger CBM leaseholders within the Powder River Basin have submitted information required in the assimilative capacity registration process, and have been allocated assimilative capacity within the Powder River. Currently, this information is being tracked in both a geodatabase (leasehold information), and in an excel spreadsheet (allocation information).

2. The WDEQ has begun the process of developing protocols to allow the use of existing data available in the WYPDES database and from USGS in an ArcHydro model. In addition, one WDEQ employee has attended ArcHydro training at ESRI headquarters in Redlands, CA. The WDEQ has also, within the last month, acquired 10-meter digital elevation models (DEMs)for most of the Powder River Basin. Acquisition of the DEMs provides a basis for the next step in the

development of an ArcHydro model, the WDEQ is at this time evaluating the DEMs and attempting a test model utilizing the DEM data.

3. The WDEQ has investigated the use of an additional tool, a software package called Feature Analyst, that would allow the use of color infared raster images in identifying downstream irrigation uses. Once identified, the irrigated areas could then be automatically digitized, polygons extracted, and shapefiles created that could be imported into GIS compatible software for mapping, identification, and quantification purposes. The advantage of utilizing Feature Analyst is that the WDEQ would no longer be required to rely on anecdotal information, or information from other agencies that only identifies a subset of the information being sought by the WDEQ. In addition, by utilizing an automated method of digitalization, a great deal of subjectivity is removed from the identification process, the process is greatly sped up, and WDEQ personnel are freed to work on other projects that cannot be automated. A recommendation to purchase the Feature Analyst software and an additional, higher-end computer needed to process the large amounts of data inherent in both the Feature Analyst and ArcHydro utilizations has been made. At this time, the recommendation has not yet been approved.

4. As channel surveys quantifying CBM discharge flows that could be handled in several drainages (Fence Creek and Lower Tongue River drainages) have been completed, the WDEQ requested the channel survey contractor to attempt to use the data collected to develop a model that could be utilized in lieu of the time, resource, and labor-intensive channel survey methodology that was used to obtain allowable flows in the Fence Creek and Lower Tongue River drainages. This modeling work was completed as of July 31, 2007. Preliminary results from the modeling work are promising, and the WDEQ is in the process of trying to obtain additional field data to corroborate the model.

Narrative Discussion:

Currently, the WDEQ is brainstorming on restructuring the watershed-based permitting process to reduce redundancy and streamline the process. However, due to the ongoing appeals on the watershed permits that were issued, the restructuring process is not expected to be complete for another month or so. WDEQ has scheduled a meeting for January 17, 2008 to consolidate the restructuring process.

Watershed permitting may also be further delayed due to some other ongoing appeals between Wyoming and Montana. However, it is too early in the appeal process to speculate on what those changes might be and how they might impact the WYPDES Program.

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.

Based upon uncertainties due to the ongoing appeals and the fledgling modeling effort, the WDEQ forsees an increasing possibility that it may be necessary to extend the grant period and restructure the grant. At this time, DEQ is beginning the process required to extend/restructure the grant, and anticipates submittal of the extension/restructuring proposal within the next month.

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	1/30/2008	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	6/30/2008	WDEQ also seeks to purchase an additional higher-end computer to process memory-and-CPU intensive ArcHydro modeling efforts. The WDEQ is currently in the process of attempting to build a small-scale ArcHydro test model.
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	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.

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	Ongoing	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.
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). All of these permits/plans are under appeal. Watershed permits are pending for the following drainages: Clear Creek, Fence Creek, (draft permit advertised in public notice)- Lower Tongue River, Crazy Woman Creek, and Dead Horse Creek (draft permit under development). The following drainages are also slated for watershed -based permitting implementation: Wild Horse Creek, Bitter Creek, LX Bar Creek, SA Creek, Flying E Creek, Indian Creek, Kinney Draw, Coal Gulch, Deadhorse Creek, and numerous small, unnamed ephemeral tributaries of the Powder River

Financial Report

At this point, the only expeditures have been for modeling efforts directed towards developing a model that would allow for rapid and efficient estimation of allowable CBM discharge flows, and for ArcHydro training for WDEQ employee Kathy Shreve.

Expenditure Summary

Budget Category	Approved Budget	Spent this Quarter	Cumulative to Date
Travel	$ 8,000.00		$ 0.0
Contracts	$ 190,000.00	$ 1,425.00	$ 9,247.00
Total		$ 7,822.00	$ 9,247.00

Expenditure Breakdown:

Modeling (efficient and rapid CBM flow estimation)	$ 7,822.00
ArcHydro training	$ 1,425.00

Proposed Future Expenditures:

Item	*Cost*	*Status*
Feature Analyst software	*$ 4,990.00*	*pending*
New desktop computer (needed to run RAM-and-CPU intensive Feature Analyst and ArcHydro software)	*$ 1,870.00*	*pending*
Total	*$ 6,860.00*	

Department of Environmental Quality

WYOMING

FAX COVER PAGE

To: Gerald Filbin Fax#: 202 - 566 - 2220

From: Kathy Shreve Pages: 6

Date: 1 · 22 · 08 cc:

Re: Watershed permitting grant P1978078-01

☐ For Review ☐ Please Comment ☐ Please Reply

Comments:

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