

**Baseline Environmental and Pre-development Assessment (PDA) Program
BP Canada Energy Company Mist Mountain Coalbed Gas Project**

Introduction

In 2007, Matrix Solutions Inc. (Matrix) developed a baseline vegetation and ecosystem program for BP Canada Energy Company's (BP Canada's) Mist Mountain Coalbed Gas Project located in southeast British Columbia. The program was designed to collect baseline information in the Elk River, Michel Creek, and upper Flathead River Watersheds by collecting and evaluating existing research, knowledge, and data on vegetation and ecosystems within the study area.

Baseline surficial geology, soils and vegetation information and maps provide important background information on the distribution of at-risk plants and ecosystems, and wildlife habitat use as well information for reclamation planning. The vegetation and ecosystem program will provide a better understanding of the distribution of ecosystems in the study area and their ecological integrity as well as develop pre-development assessment (PDA) protocols. The PDAs were designed as a tool to look at each potential lease location to characterize soil, vegetation, aquatic resources and potential wildlife habitat on the well site and access road. Once characterized, specific environmental protection plans are developed to manage soil stripping and conservation, establish setbacks from water resources, and mitigate impact to wildlife through construction timing and siting.

Objectives

The objective of the program was:

- to gain a better understanding of the distribution of ecosystems in the study area and their ecological integrity;
- to develop pre-development assessment (PDA) protocols; and
- to conduct field-based PDAs for proposed exploratory well sites. An additional component, i.e., editing of the Vegetation Resource Inventory (VRI) maps was added subsequent to the original objectives.

Gap Analysis

A review and gap analysis of existing information was undertaken to focus future ecosystem-related activities for the Mist Mountain project. Included were historical baseline, research and monitoring data gathered from industry, government and academic sources, as well as unpublished data. The documents, databases and maps were reviewed to determine their utility or limitation in terms of content and spatial coverage, and then summarized. Maps were produced where appropriate. A needs assessment was conducted to determine if, where and when information gaps will need to be filled.

The specific areas of the ecosystem gap analysis included surficial geology, soils, ecosystems, species and ecosystems at risk, forest cover, fire history, forest tenure and harvesting, and mine and mine exploration activities.

The gap analysis was completed in the spring of 2008. The results of the gap analysis are described briefly. The availability of digital map products is limited, particularly for terrain and soils, although existing surficial geology and soils reports and maps can be used as background references for future studies. Knowledge of selected Engelmann Spruce – Subalpine warm moist (ESSFwm), Engelmann Spruce – Subalpine Fir warm moist woodland (ESSFwmw), Engelmann Spruce – Subalpine Fir warm moist parkland (ESSFwmp), Engelmann Spruce – Subalpine Fir dry cool parkland (ESSFdcp), Interior Douglas Fir unclassified (IDFun), and wetland/riparian ecosystems in the study area is limited. Additional sampling within specific units of these biogeoclimatic subzones and variants are conducted opportunistically as part of the PDA process. Derivative rare plant habitat potential, old growth, and sensitive ecosystem mapping would be desirable for the BP Canada Mist Mountain study area once the revised

Predictive Ecosystem Mapping (PEM) product is available. The PEM map will be available later in March (2009) from Ministry of Forests, Government of British Columbia, and should provide important mapping information and future guidance for the study area.

Pre-development Assessment (PDA) Protocols

There is no accepted practice for PDAs in British Columbia; Matrix personnel developed a PDA protocol specifically for this project. To complete this task, a review of terrain, soils, vegetation, wildlife habitat use and assessment sampling procedures was completed. Input from fisheries, surface water (hydrology and water quality) and hydrogeology specialists within Matrix were included in the design of the protocol. The resultant PDA approach is holistic and incorporates, at various levels of effort and spatial scales, hydrogeology, surface water, fisheries, terrain and soils, vegetation, and wildlife. The process incorporates a filter-funnel scoping exercise in which senior scientists review the initial lease location information provided by BP Canada to determine the breadth (discipline involvement) and the level of detail required for each PDA. Cross-trained individuals are employed to optimize historical data reviews and site-specific data collection. Appropriate checks and balances are embedded in the protocols to ensure that the personnel involved have the appropriate skill sets and that the data collected is of high quality. A feedback loop is incorporated in the process after each major step to ensure that the senior scientist have continued input into the information processing stage and to provide BP Canada with on-going planning inputs. Information derived from historic data, maps, and baseline studies models are incorporated at several steps in the PDA process. The incorporation of wildlife baseline study data provides an important wildlife habitat use context for each well site and identifies any issues that need to be addressed in the environmental protection plan (EPP). The information collected and summarized for each PDA is incorporated reflexively into the baseline program and ultimately into revisions of the Mist Mountain “constraints” maps.

The PDA process was finalized in early 2008 and utilized for specific sites.

Pre-development Assessments (PDAs)

PDA sampling was conducted at four proposed well sites starting in the late summer of 2007. The data collected in 2007 for some of the well sites were missing seasonal rare plant information so additional field work was completed in the summer 2008. As well, two new well sites were proposed in 2008. Therefore, the ecosystem-related activities conducted in 2008 included the following:

- field sampling at six sites; and
- completion of the PDA reports for the proposed well sites over the fall of 2008 and winter 2009.

The PDA protocol will continue to be used for any additional proposed well sites in 2009 and onward.

Vegetation Resources Inventory (VRI)

The original Vegetation Resources Inventory (VRI) data acquired from Tembec and the British Columbia government had a number of significant errors. The most egregious errors were corrected to the level thought necessary to construct wildlife habitat suitability models and maps for the baseline studies. For example, the majority of the inconsistencies in polygon delineation and polygon attribution details between the merged British Columbia government and Tembec products were corrected in a two-stage process. Once the new PEM is made available, and the existing map has been corrected, the VRI should be used as the base map for regional (Mist Mountain) ecosystem, sensitive ecosystem, rare plant and plant community, wildlife, environmental considerations, and cumulative effects mapping.

