

BOARDMAN RIVER ENGINEERING AND FEASIBILITY STUDY

SCOPE OF WORK

For

ECONOMIC AND SOCIAL ANALYSIS COLLECTION AND ANALYSIS OF AVAILABLE BASELINE DATA

22 March 2007

SUMMARY

The ECT Economics Team, under the lead of Matt Bingham, will begin efforts to identify baseline social economic conditions within the study area from which to evaluate impacts of proposed changes to the river system. This initial effort will involve the identification and evaluation, collection and organization of existing data and previous studies. This effort will also identify areas where critical data is not available, and will make specific recommendations of what additional efforts are required to establish the baseline conditions for the social-economic component of the overall engineering and feasibility study. This initial effort will be completed within four months at a cost of \$34,900.

BACKGROUND

The Boardman River Dams Committee (BRDC) is undertaking an Engineering and Feasibility Study to evaluate future options for the Boardman River System, including the possible removal of the existing impoundments. Environmental Consulting and Technology, Inc. (ECT) has been chosen as the engineering and environmental consultant to perform the feasibility study, and a detailed Scope of Work (SOW) for the feasibility study has been approved by the BRDC. This economic and social component of the analysis will be performed by Veritas Economic Consulting and led by a principle of that organization, Matthew F. Bingham. It will be overseen by ECT.

The SOW provided for an evaluation of alternatives based upon environmental, engineering, economic, and societal impacts. The initial phase of the Engineering and Feasibility Study will focus on the development of data to document the historic and current conditions within the study area. This information will be used to formulate, evaluate, and compare alternative measures that address identified problems and opportunities within the study area and study scope. This baseline information will also serve to develop an understanding of how the various areas of concern (environmental, engineering, economic, and societal) will respond as a result of proposed alternatives.

The contract between the BRDC, with the Great Lakes Water Studies Institute acting as fiduciary, and ECT, signed on January 25, 2007, states that ECT will perform specific tasks associated with the approved SOW only in accordance with approved Work Orders. Further,

Work Orders will be approved only when funding is available, and any specific funding source requirements will be identified by BRDC in the Work Order.

Because of limited current funding, initial study efforts will be directed

The Scoping Team has directed that funding from the City, County, and Traverse City Light and Power be utilized to initiate the Economic and Societal effort of the approved SOW.

OBJECTIVE

The purpose of this effort is to begin building the data structure that will permit the evaluation of economic and social implications of alternatives selected for analysis. Specifically, the ECT Team will identify data needs and availability for a social welfare analysis based on accepted economic and public policy evaluation principles.

Socioeconomic outcomes will be evaluated using a model that links baseline conditions to potential outcomes and quantifies associated changes in stakeholder satisfaction through simulation. This first effort will focus only on identifying and collecting information required to identify baseline conditions with particular emphasis on the economic and social implications of the alternatives.

Task 1: Identify Relevant Available Data

Evaluating the social and economic impacts of changes to the Boardman River dam requires compiling a significant amount of information. Tasks focusing on identifying data needs and availability for supporting the study of the economic and social impacts are set out below.

Baseline Data for Profiling Impacted Population Groups

People will enjoy the benefits and bear the costs of the alternatives selected for analysis and evaluation. Thus, it is important to identify and profile the affected individuals under baseline conditions. In practice, evaluating impacts to individuals typically focuses on similarly affected population subgroups or cohorts. For the first task, we will evaluate the available data to establish relevant population cohorts. We expect that the stakeholders of interest are confined to the residents of Grand Traverse and Kalkaska Counties. Data availability for the following characteristics in those two counties will be identified:

- Demographics
- Economic conditions
- Property ownership
- Recreational activities
- Government income and expenditures

Baseline Data for Assessing Impacts

Social and economic impacts will be quantified through assessment and valuation of changes in hydrological, ecological, and economic systems where these changes are measured from baseline. Thus, parsimonious collection of data to support socioeconomic evaluation requires focusing on baseline conditions that are expected to change under various dam alternatives. For example, if catch rates are expected to change, baseline catch data should be identified. Baseline data for relevant hydrological, ecological, and economic conditions will be evaluated.

The hydrological impacts (water quality, quantity, temperature) will directly impact on the aquatic and adjacent terrestrial ecosystems. Of particular importance are the composition and abundance of threatened and endangered species and of economic and ecologically significant species. On the system output side, changes in the ecosystem will directly impact the population cohorts and indirectly impact them through the economic systems. The direct linkages of the ecological system to the population cohorts include those related to recreational activities and aquatic and terrestrial species of direct interest.

The economic system determines the prices, consumption/production, and exchange of all market commodities. This system consists of the local and extra-local subcomponents. This system is linked to the other systems (hydrological and ecological), to the alternatives, and to the organizations and individuals that produce and purchase commodities at the retail and pre-retail stages of production. The Economic Team will develop baseline values for the prices and quantities of all key commodities from published data. Extant local economic models will be evaluated to determine their applicability to this project. Markets of particular interest include residential and commercial property, electricity, flood insurance, commercial fishing, tourism services and hospitality, manufacturing, labor services, and recreational goods and services.

In addition to the market model, the impacted revenues and expenditures of local, state, and federal governments will also be identified. These include tax revenues (income, property, sales) and the specific expenditures (dam maintenance, reconstruction, decommissioning, grants to property owners) of interest to BRDC. The Economic Team will investigate the availability of these data and collect them.

Finally, the linkages will be identified between the economic system, including government, and 1) the alternatives, 2) the other systems, and 3) the population cohorts.

The direct linkages of the ecological system to the population cohorts include those related to:

- Capital and operating costs
- Electricity generation
- Financing method (user fees, taxes)
- Riparian rights.

These linkages will be explored, described, and characterized using economic theory and extant data.

Baseline Preference and Value Information

Changes in the well-being of each population cohort with the implementation of an alternative will depend on the size and pattern of the hydrological, ecological, and economic impacts generated and the values each cohort holds for each impact.

Precisely determining the values each cohort holds for hydrological, ecological, and economic impacts can require extensive collection of primary data. A less involved approach employs the results of existing economic models to develop estimates of the values held by the population of interest. Using the valuation results of one study and applying them to another scenario is called “benefits transfer.” The economics literature has established two important criteria for the underlying studies employed in benefits transfer (EPA 2000; Brookshire and Neill 1992; Smith 1992; Desvousges, Naughton, and Parsons 1992; McConnell 1992; and Boyle and Bergstrom 1992; Desvousges, Johnson, and Banzhaf 1998). These criteria include the similarity of the study population and soundness of the underlying study.

Similarity recognizes that values from existing studies are most relevant when those values reflect a similar change for a similar population. For example, if we are interested in the values held for various types of fishing, a study of fishing demand would be preferred to a study of values for general outdoor recreation trips. Other things equal, a study conducted in Michigan would be preferred to one conducted in another area. In practice, there is always some degree of dissimilarity. A calibrated benefits transfer can be used to reflect the study population. The accuracy of this methodology is limited only by the analyst’s ability to calibrate a previously estimated preference function to a different population using appropriate economic methodologies (Smith et al. 2000).

Soundness refers to the overall quality of a study. Soundness is a primary criterion for applying the results from one study to another situation. This quality encompasses all aspects of a study, such as data, methodology, survey protocols, and analysis technique. The soundness criterion effectively asks whether the original study is sufficiently sound to pass scientific muster. If the results were not based on reliable data, rigorous protocols, and valid analyses, then the results are not reliable and should not be used. Sound economic studies must employ a common measure of the intensity of the values and preferences held by each cohort for those impacts. The preferred measure of preferences is the one set out in several federal executive orders and in the literature of applied public policy evaluation: willingness to pay (WTP) for the change or impact.

The Economic Team will review the appropriate literatures for information that can be transferred to the current problem to estimate the WTP for the expected impacts. These literatures include other significant studies, published papers, and papers in development and review. The availability and suitability of economic valuation studies in the following areas will be evaluated:

- Property on or near the water
- Electricity
- Structure modification and movement
- Water-based and other recreation activities, such as fishing, boating, swimming

- Historic structures, archeological assets, local culture, amenities
- Environmental quality and amenities
- Ecologically significant resident and migratory aquatic and terrestrial species
- Quality of life, such as transportation systems and congestion, population displacement
- Risk to property, structures, and life from flood, ice regimes.

Task 2: Characterize Data Gaps and Collection Costs

It is likely that the evaluation of available baseline data will indicate certain deficiencies in available information. In Task 2, we will identify these deficiencies, assess their impact on quality of the ultimate project, and identify associated collection costs.

DELIVERABLES AND SCHEDULE

The deliverable for this effort will be a report documenting the available applicable data that can be used to establish baseline social-economic conditions, the applicability of existing economic models that could be used to predict changes as a result of system changes, and the identification of critical data gaps that would impact the alternative evaluation phase of the engineering and feasibility study.

The data sets to be developed include representative financial statements for local businesses types that may be impacted by any potential change to the Boardman River system. These statements will be developed for model or typical enterprises and in each industry segment. They will characterize the baseline conditions for a typical recent year. In the subsequent analyses, modeling will be developed to show how the values in these statements are expected change with each alternative.

The data sets will also include financial data (revenues and expenditures) for area governments that may be impacted by the alternatives. Again, these will be statements will characterize the baseline conditions for a typical recent year. In the subsequent analyses, modeling will be developed that will show how the area governments' revenues and expenditures are expected change with each alternative.

Finally, the data sets will also be developed to characterize the area households. As permitted by the data, subgroups will be developed for reasonably homogeneous set of households (e.g., by demographics, income, property ownership near the river, types of recreation activities, employment, etc.) again for a baseline year. These characterizations will be designed to also be incorporated in an economic model, to be developed in a later phase. In this model linkages between the alternatives and the households will be developed so that the impact on households can be estimated.

The schedule for providing these deliverables is 4 months after receiving written authorization to proceed.

Status reports will be provided to the BRDC at their regularly scheduled monthly meetings.

BUDGET

The above services will be provided for a cost of \$34,900.

Monthly invoices will be submitted for this work order in accordance with the approved contract.