The Environmental Challenge Program

...a competition for university students

THE PROBLEM – 2006

November 8-10, 2006 - Victoria, B.C.

"Healthy Communities - Using Science-Based Solutions for Sustainability"

The Purpose

The Environmental Challenge gives teams the opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. We do not give you a lot of numbers to crunch. We are more interested to hear about the issues involved, how you interpreted the problem, how you got to your conclusions, and how well you can communicate your thoughts. We want you to have fun! This exercise gives us all a chance to participate and gets the professionals of tomorrow to interact with the professionals of today.

The Problem

The recently elected Energy Commissioner of Victoria has unveiled the Harbour Environmental Linkage Project (HELP) with a large biodiesel plant being the primary focus of the harbour revitalization project. In a recent press release about the project the Commissioner stated:

> "This region is a dynamic community with a wide range of industries, businesses, and activities with Victoria being the seat of the provincial government and a major tourist destination. Transportation of people and materials is a major consumer of energy and a large pollution problem for our beautiful city. The Harbour Environmental Linkage Project (HELP) will be an enormous step forward to promoting sustainability and reducing pollution on the island…"

The HELP is located near the majestic downtown waterfront of Victoria and will be utilized by the biodiesel plant site, a multi-modal public transportation facility and a major shipping hub for the island. A preliminary study was done for the project to identify the major aspects of the proposal and can be reviewed by looking at the preliminary summary report (Appendix A) and the proposed layout of the Project (Appendix B) that was prepared earlier this year.

In this problem your team represents a group of advisors who have been appointed by Victoria's Energy Commissioner to assess all the issues associated with the biodiesel facility. These include, and are not limited to, the location, the energy requirements,

environmental impacts, hazardous materials and related transportation issues to and from southern Vancouver Island.

Your team might all be engineers and scientists in real life but in this Problem you morph into whatever and whoever you think that you need to "win" the competition.

Your Assignment

The Energy Commissioner and the constituents of Victoria need to understand the feasibility of the proposed project. As advisors to the Commissioner you must understand the associated environmental risks and cost-benefits for the goal of attaining sustainability and pollution reduction for the island. While the Commissioner is not looking for absolute costs at this time, it is important to understand that there are limitations and spending less is always better. The Commissioner does want to get re-elected!

The Expectation

Numbers are not what is most important – logic train, process, conceptualizations, and creativity are keys. And then you have to present your thoughts in a public forum. Clarity of vision and logic of presentation are critical. Remember you can come up with assumptions, but they need to be able to pass the straight face test. This is like the real world!

We have expectations with regard to the Proposal (see below) and the Presentation (see below). The **Proposal** expectations include identifying team member by name and the role that they are going to have in the presentation (ie "Nilly Willy" is going to be engineer and will address waste issues, "Jim Bean" is going to be your air expert, "Justin Timberlake" is going to be our 'architect', and "Martha Stewart" is going to be your shaman etc, - you put in the disciplines that you think you need). In the proposal you should have an outline of the approach that you are going to take and the issues that you will be discussing. **Remember you will only have a maximum time of 15 minutes to present your plan and you have a two page limit for the proposal submittal.**

For the **Presentation,** your team will need to demonstrate your understanding of the issues that you addressed in your proposal. Sustainable approaches for these and other site issues are of great interest to the owners. Winning will hinge on approach, clarity, and creativity.

The Proposal

Each team will develop a proposal for problem solution to be submitted on the first day of the conference at registration on November 8. The proposal should include key elements such as areas of expertise, issues to be addressed, and the general approach to the project. The proposal should be in summary form and limited to two pages. The proposal will be a factor in the competition.

The Presentation

Teams should arrive at the conference on the 8th of November. Presentation of the team solutions to the problem will be held on Friday morning the 10th of November. When we know how many schools will be presenting we will develop a schedule, but figure on the presentations beginning at 8:30 AM. PNWIS will have a projector and a laptop (w/Microsoft Power Point). Please bring a data stick or disk burner so we transfer your presentation to the laptop. Plan on a 15 minute presentation with 5 minutes of questions and answers.

The Tweak

No matter how much you do and know, in real life things that are unexpected can and do occur. To this end you should expect when you pick up your registration package that there might be some late breaking information that might alter your approach and/or require your plan to evolve. The problem and the tweak will require that you find and talk to "experts" and attend the sessions for answers and important information.

APPENDIX A

PRELIMINARY SUMMARY:

HAROUR ENVIRONMENTAL LINKAGE PROJECT (HELP)

Vancouver Island is the largest island on the west coast of North America and is a major marine transportation and tourism centre. In January of 2006 Victoria's Energy Commissioner unveiled the Harbour Environmental Linkage Project (HELP) utilizing a multi-modal public transportation facility, a major shipping hub and a large biodiesel plant being the keystone of the project. The Project falls in line and exceeds the cities sustainability and pollution reduction strategic plan. The purpose of this preliminary summary is to identify the energy requirements and environmental impacts of transportation to and from southern Vancouver Island.

Biodiesel Plant

The Harbour Environmental Revitalization Project (HELP) proposes to construct and operate a biodiesel production facility that could produce as much as 200 million litres a year of biodiesel fuel. This is the keystone to the HELP. The production facility will include process equipment to convert vegetable oil into biodiesel and storage tanks for vegetable oils, reagents, catalysts, and refined products. Methanol is used as a reagent and sodium methylate is used as the catalyst. Glycerin is produced as a byproduct.

Energy

The population on Vancouver Island has grown 20% since 1992 and energy requirements are expected to grow by 30 – 40 MW annually. With the recent addition of a natural gas-fired Cogeneration Plant, local generation currently meets 33% of Vancouver Island's power needs. The remainder is supplied from generation on the Mainland via submarine cables, many of which are due for retirement. Most gasoline and other petroleum-based fuels are shipped in via barges and tankers. Due to the operations and maintenance costs in supporting the current infrastructure to support the island, the island plans on producing 75% localized energy by 2020. The local government is still developing ideas for other feasible forms of alternative energy.

Tourism

Tourism is a primary economic driver in Victoria. Eco-tourism and Agri-tourism is also on the rise with the revolutionary developments in and around the city. Unfortunately, a recent study has shown that decreases in visibility, increases in human refuse and poor public transportation systems have had a substantial impact on the number of individuals visiting the city. Noise, marine traffic, and increases in over-all vehicular traffic are all associated with the reduction in tourism.

Marine Transportation

The HELP is home to ferry, ocean-going vessel, float plane and pleasure craft traffic. Harbour traffic has been growing steadily with population. Without this transportation much, if not all, of the island would be in an economic crisis. In recent years poor air quality in the region is associated with marine traffic, specifically ocean going vessels and ferry traffic (directly and indirectly). A recent fuel spill contaminated a large portion of the shore within the harbour.

Public Health and Safety

The City of Victoria thrives on its clean environment and levies enormous fines in situations where citizens, tourists and the environment are put in dangerous situations. The proposed facility submittal for pollutions reduction was minimal and did not detail any information regarding control technologies to address waste management and air quality. The submittal also did not address the impacts of a catastrophic event.

Generally, Victoria environment is relatively pristine, but the increases in population and needed supplies have spawned concern for waste management and increases in air pollution.

Land Use Planning

HELP is located on a 10-acre parcel that was built up using fill dirt from a mining operation from the interior of the island. Originally, the site was the home of a smelting operation and has since been capped. The HELP site is commercial and residential mixed-use along the edges and the land is set aside for luxury condominiums and extravagant tourist attractions. All other nearby land outside of the city where the site could be situated is already being developed for housing.

OTHER ISSUES NOT ADDRESSED IN THIS PRELIMINARY SUMMARY

- Source of fuel and contracts
- Environmental Management System (EMS)
- Community relations
- Training for employees
- Emergency response plan(s)
- Potential for pollution offsets

APPENDIX B


Proposed Site
British Columbia
Vancouver Island
Nanaimo
Vancouver
Victoria
Anacortes
Port Angeles
Washington State
Seattle
LEGEND
Rail
Major Road
Ocean Vessel Traffic
Ferry Traffic
N

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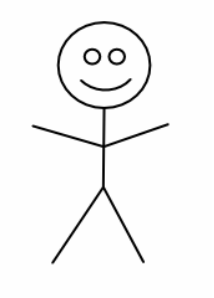
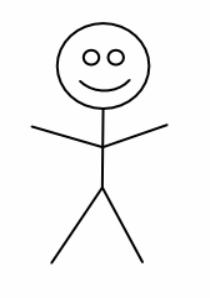
THE PLAYERS

In order to grasp a complete understanding of the project in its entirety your team must acknowledge that there is a large amount of interest in the Harbour Environmental Revitalization Project (HERP). Sustainable cost-effective approaches for the site and complementing uses are of great interest to the constituents and project planners. "Winning" will hinge on approach, clarity and creativity.

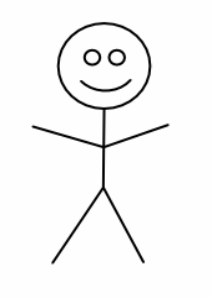
Owner - Biodiesel Plant
TBD



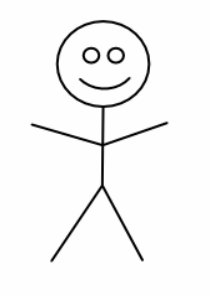
Energy Commissioner - Victoria
TBD



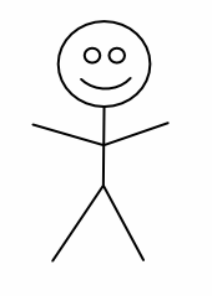
Regulator – Vancouver Island
TBD



Ministry of Transportation & Tourism
TBD



ENGO – Local
TBD



The Environmental Challenge (EC) is hosted by the Pacific Northwest International Section (PNWIS) of the Air & Waste Management Association. For more information see www.pnwis.org