

# **Social, Environmental, and Economic Consulting Incorporated**

***Seeking Mutually Beneficial Solutions for the Environment, Society, and Economy***

## INTRODUCTION

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Dear Mayor Tewdew,

Washington coal began with a seam discovered under the present city of Bellingham and was transported to California for use in locomotives and steamships. Today, coal has found its niche in power generation and in 2007 provided 48.5% of America's electricity (EIA). Given this, currently only one coal power plant is in operation in Washington, the 1400MW Centralia Power Plant that was fed by the nearby Centralia Coal Mine. However, this mine was closed in 2006, causing 600 jobs to be lost and ending Washington's coal production. We at S.E.E.C (Society, Environment and Economic Consultants) have thoroughly reviewed the social, environmental, and economic issues of remining Clelyn and are recommending environmentally responsible remining to revitalize the city and repair the abandoned mine sites. We recommend three core requirements for Bigol's permit: remining abandoned sites using best management practices, advanced monitoring, and civic engagement.

The Federal Mining Control and Reclamation Act (SMCRA 1977) created the Office of Surface Mining (OSM) and also instated a tax per ton of coal paid into an abandoned mine land (AML) fund to be used by states and tribes for the reclamation cost of abandoned mines. However, the cost of reclaiming all the potential sites (estimated at several billion dollars) is hampered by the OSM's yearly budget of \$65 million (2007). Mining companies were hesitant about investing in remining sites until the 1987 Rahall Amendment to the Clean Water Act (Section 301.P), which mandates that operations must demonstrate the potential for improved water quality, without worsening the preexisting conditions. In order to maintain acceptable legal water quality, the following plan must be undertaken by Bigol Mining Company.

Our team of experts includes: Matt Ferguson, Ecotoxicologist who will discuss biomonitoring; Reid Haefner, Community Outreach Specialist, who will detail the role of civic engagement and community management; Derek Schruhl, Renewable Energy Expert, who will discuss the viability of state of the art green technologies; and Matthew Moroney, Remining Specialist who will discuss BMP use in our proposal.

## Remining Proposal Action Plan

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We propose an environmentally responsible remining operation to immediately reinvigorate Clelyn's local economy. This includes the Coal Remining Best Management Practices (BMPs) proposed by the Environmental Protection Agency. These are often successful in reducing the pollution load from the previous abandoned mine land. A major source of the water pollution from coal mining is acid mine drainage (AMD) which forms when a sulfide containing material (such as Pyrite contained in mine detritus) comes in contact with oxygen and water. The acidic discharge inhibits plant growth that would prevent infiltration of atmospheric oxygen and surface water. BMPs seek to minimize oxygen and water contact with mine rubble to prevent proliferation of iron-oxidizing bacteria, the source of environmentally damaging AMD. These practices serve to mitigate negative impacts of previous mining activities, and in most cases have been shown to environmentally improve the site with concurrent remining activities.

BMPs are most effective when they are site specific, so SEEC conducted a comprehensive site survey analysis prior to the production of our report. A major goal of our survey was to conduct chemical analyses of the coal, sulfur content of tailings and overburden, and each site's water quality (pH, dissolved oxygen, and metals). A geological analysis was simultaneously conducted that measured rate of water flow over and under the sites, the slope of topography, and coal depth. Additional considerations when the sites were examined were how to best segregate and store the coal, and speculations about required infrastructure upgrades to accommodate a modern mining operation. With the results of our survey, we suggest the following actions for Bigol to undertake prior to remining:

*Site One:* Reclaim the contaminated wetland prior to remining the 16 acre open pit. This will be achieved by removing the contaminated waste rock, which is covering the wetland, and transferring it into the open pit that plagues site two. Prior to placing the waste rock in the pit, it should be burned using Coal

Combustion Waste (CCW) technologies. Future waste rock generated by coal mining should be placed on site three until pits can be regraded and revegetated.

*Site Two:* Fill open pit with all waste rock from site one and the remainder with waste rock from site 3, then restore the existing stream and riparian habitat.

*Site Three:* Due to the size and potential extraction quantity of this site, we recommend remining based on the EPA's Best Management Practices guidelines (BMPs). Once coal extraction has occurred, waste rock should be returned immediately and restoration should follow.

Responsible remining effectively requires the following BMPs:

*Concurrent reclamation* immediately regrades and revegetates the site while the coal vein is excavated and followed. *Stockpile Pad Construction* reduces direct contact with ground water and can be made from low permeability clay found in onsite strata. The segregated refuse will be covered with a PVC capping material to reduce oxygen exposure and precipitation infiltration that causes oozing drainage. *Zero stockpiling of coal* onsite avoids creation acidic metal-laden water that can infiltrate groundwater. *Anoxic limestone drain (ALD)* fosters increased CO<sub>2</sub> concentrations, which in turn facilitates higher alkalinity production to neutralize runoff. This technique prevents metals from entering the water cycle. *Constructed wetlands* sequester metal precipitates that occur and can seep into ground water. *Alkaline coal combustion waste (CCW)* neutralizes acidic drainage. Old waste material is burned in an electrical cogeneration facility with limestone to generate electricity and heat. This burnt ash is alkaline and the amount of waste is drastically reduced.

SEEC will perform several inspections to investigate if the BMPs are functioning properly. Hydrologic flow will be measured to sample contaminant concentrations after mining to ensure compliance with the Rahall amendment and ensure mine effluent has not become more contaminated from the operations. The monitoring will continue biyearly for the next two years to allow exposure of problems to burst from the surface if they may arise.

## Advanced Monitoring

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Water quality is not the only factor for potential environmental damage from coal mining; air quality is also an important factor to consider. The air quality concerns of the citizens will be addressed through advanced bio-monitoring monitoring techniques. Our proposed method involves the use of lichen due to its direct interface with the atmosphere. Toxicant content in lichen thalli are equivalent to atmospheric conditions and thus indicate the amount of airborne pollution from nearby activities. The U.S. Forest Service (USFS) has already developed an air quality biomonitoring program in Region 6, which includes the city of Clelyn. This technique provides a rapid alert system for the mine owners to detect detrimental environmental effects resulting from the coal mine's activities. This method is dynamic, allowing problems to be caught rapidly and not escape observation. These organisms are modern day "canaries" to quickly alert Bigol about emerging effects resulting from the coal mine's atmospheric emissions.

## Civic Engagement and Action

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In order to improve economic, environmental, and social conditions in Clelyn, we propose a community-based natural resource management approach. This approach demands gauging public opinion, so that current and future mining-related decisions best reflect the overall community. Specifically, public presentations and subsequent community hearings must be implemented to both educate the community and provide an opportunity for their voices to be heard. Given our proposed remining actions, ultimately the mine-related decisions should reflect the opinion of the general community. To achieve educated, community-based decisions all involved stake-holders should be brought to the discussion table. These include city and county officials, citizens, tribal leaders, business owners, and industry representatives.

## Alternative Energy Proposal

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We propose Clelyn develop a public/private partnership to form a solar panel and inverter factory and use the panels to develop a community solar project. This project could be operated through a partnership with non-profit organizations such as the Bonneville Environmental Foundation and Northwest SEED, and private

investors. Community solar projects provide economic benefit, increased local awareness of renewable energy, increased support through collaborative efforts, reduced cost due to economies of scale, and lower entry cost and risk. Washington’s Renewable Energy Production Incentive Program (2005) created a credit of \$0.54 per kWh generated by solar panel if both the solar modules and the inverters are manufactured in Washington. If Clelyn forms a community solar project the credit is \$1.08/kWh up to \$5,000 per participant in the program. The demand for Clelyn’s solar panels would be extremely high because no factory currently produces solar panels and inverters in Washington. In addition, future requirements for renewable energy in utility portfolios will bolster a large demand in the public and private sectors throughout the state. The demand for coal will eventually decrease based on upcoming cap and trade legislation in the senate limiting GHG emissions.

The community solar project could blossom into a complete renewable energy cooperative including wind power, which now employs more workers than coal mining. Numerous methane seeps from the heavy underground mining operations which are currently being untapped (Fig. 1). Energy from geothermal and methane seep the solar panels and inverters and its extraction is already occurring all over the United States and can be used in manufacturing. Money saved by the use of existing local energy sources reduces the use of foreign fossil fuels and creates local jobs while reducing the greenhouse gas impact of methane seeps.

These sources of energy can complement coal production and beginning the transition toward a renewable energy economy

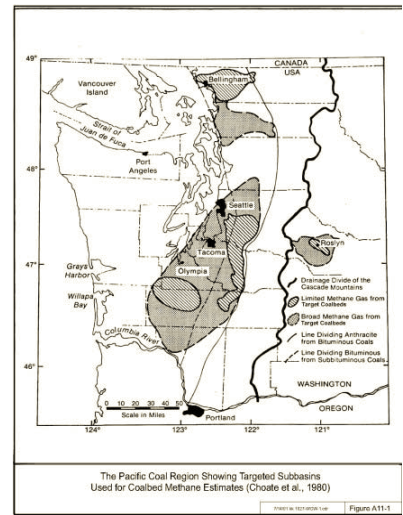


Figure 1. Coal bed Methane Regions

## CONCLUSION

Verifying proper implementation of our suggested techniques is crucial to remediation of the discharge pollution. Remining should be conditional upon agreement to active BMP use, full reclamation as mandated by law, and a community values agreement that enhances the relationship between the community and the mining company in a mutually beneficial way. With these steps, remining can offer both an economic boost and a better future environment for the community. Uncontrolled drainage or air pollution will not be condoned by SEEC, the local government, or the people of Clelyn. Any deviation from our implementation plan by Bigol should be assessed with the possibility of immediate permit denial to avoid irresponsible corporate activity.

Numerous environmental impacts are created by coal mining and electricity production from coal. Water pollution such as acid mine drainage and dissolved metal contaminants negatively affect native plant growth and drinking water. Coal mining creates massive amounts of waste and the tailings from past mines in Roslyn County can be seen from space. Electricity from coal is the primary source of power in America, but also the largest source of air and water pollution. However, with a properly managed remining operation the land can improve with no cost to the fiscally strained OSM AML fund so the money can be used in more urgent locations in W. Virginia and Pennsylvania. The mines will be repaired and revegetated concurrently and water quality will not worsen, and if our suggested techniques are rigorously followed, can improve the otherwise ignored abandoned mine sites. Without responsible remining, there is no economic incentive to clean-up the damaged sites.

Coal fired electricity has improved over the last several decades due to a public outcry against acid rain caused by the sulfur content of coal and nitrogen oxides created by its combustion. A cap-and-trade system was created (Title IV of CWA, 1990) to limit these emissions. This has spurred modernized coal power production technology including flue gas desulfurization and reuse of fly ash as an economic product. As a result, although coal burns cleaner than when first mined in the late 19th century, it is still a major source of world GHG emissions. Mine Mouth Power Plant will capture fly ash and use advanced technology to improve air quality.

In closing, we ask the Mayor and City Council: What is Clelyn’s legacy? Will Clelyn be known as a boom and bust town, left with the social and environmental refuse from coal mining and no long term capital gains, or will Clelyn become the leader in Washington efforts for renewable energy production and be a nexus in the state’s emerging green economy.