

Subject: LFA 34 Mgmt Bd Whites Point Quarry Document  
From: "L. Wayne Spinney" < >  
Date: Fri, July 13, 2007 1:43 pm  
To: Comments@WPQ-JointReview.ca  
Cc: -

I apologize if this is a repeat email as dial up connection is very slow.  
The outbox shows the connection was broke before the email was completed so am trying again. It is difficult to send pictures on 'snail email' therefore I have deleted the picture from page 2 of the document.  
I will forward the picture separately to those who request a copy.  
Wayne

Attention: Joint Review Panel  
Whites Point Quarry and Marine Terminal Project

The document attached has been approved by and is submitted on behalf of the LFA 34 Management Board.

Below are points for clarification to questions asked on June 27, 2007 following the presentation to the Joint Review Panel

Was the material presented approved by members?  
My response was in regard to whether the document had followed customary practice of Board approval. Timing was an issue for the volunteer board members to meet prior to the Joint Review Panel Hearing. The executive felt it was important that a presentation be made on behalf of our membership with the agreement that the final document submitted to the Panel would be approved by the Board of Directors.

Membership involvement:  
Seven regional workshops were held for LFA 34 lobster fish harvesters during July 2006.  
Various types of coastal and marine industrial development were discussed at each workshop. These discussions included industrial rock mining/quarry projects along with issues relating to this particular development.

Number of Fish harvesters that Quarry operations may have an effect on.  
It is difficult to give exact numbers of fish harvesters who's livelihood may be threatened as a result of quarry operations because the commercial fisheries management is not ecosystem based but split/managed according to species, then by gear type, by vessel size, and by zones.

My verbal response of approximately 200 fish harvesters in this Port Cluster does not reflect harvesters in fleets such as groundfish fixed gear (longliners, handliners, gillnetters, or mobile gear - flounder generalist, under 45' fleet and under 65' fleet), scallop, herring, weir, etc.

Fish harvesters from the Upper Bay of Fundy traditionally fish the waters around Digby Neck and Islands. Fish harvesters from Pubnico also fish these waters. The number of 300 fish harvesters used in this document may be a more realistic number for quarry impact purposes.

Further scientific studies are required to determine the quarry impact area that will be determined by Fundy currents.

#### Sediment

Sediment movement in the Bay of Fundy and Fundy inlets is common and is dictated by environmental factors. This sediment movement consist of existing beach cover that is moved by storms and resettles along the coastline. Land erosion adds to the quantity of sediment in the Bay of Fundy. To our knowledge the only additional human activity that adds sediment to marine habitat in this area comes from aquaculture sediment (fecal and food).

If the Joint Review Panel has further questions or points that require clarification, please contact me by phone, fax, or email provided below.

Yours truly,  
Wayne Spinney  
For the LFA 34 Management Board  
L. Wayne Spinney  
Melanjo Enterprises Ltd.

# LFA 34 Management Board

Presentation to

The Joint Review Panel

Whites Point Quarry and Marine Terminal Project

Presentation Public Hearings June 27, 2007

Submitted July 12, 2007

By

L. Wayne Spinney, Executive Director

For

The LFA 34 Management Board

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# LFA 34 Management Board

## Executive Summary

The lobster industry is the economic, social and cultural foundation of southwestern Nova Scotia. The lobster fishing industry in southwestern Nova Scotia is known as the most productive lobster fishery in the world and is noted to have landed 40% of the Canadian lobster in 2005 with these landings accounting for near 25% of the world's lobster catch (CSAS 2006; DFO 2004; Kenneally 2006). The 2005 landed catch in Lobster Fishing Area 34 was 18,362 metric tonnes with a wharf value of \$266,005,000 million dollars (DFO 2006 preliminary figure see Appendix A). It is the belief of the LFA 34 Management Board that fifty plus years of Whites Point quarry operations will result in an accumulation of sediment that poses a high risk of smothering critical nursery and juvenile habitat of lobster. This rock quarry poses several threats to the lobster industry. The impact of rock mining includes, quarry chemicals/minerals/metals run-off, and the extremely high risks of quarry transport vessels inadvertently introducing foreign invasive species, an invasion of bacterial infection that causes crustacean shell disease, or the introduction of a parasitic paramoeba that is fatal to lobsters (paramoebiasis). Industrial development that results in marine habitat destruction and the killing of marine life is unacceptable.

Sediments from the proposed quarry will settle on tidal ground and cause habitat destruction. Quarry chemical/mineral drifts in Bay of Fundy currents pose a high risk of mortality for lobster larvae and may cause egg-bearing lobsters to abort and possibly to die. Quarry chemical/mineral/metal effects on marine life must be tested in DFO Scientific studies. Examples of possible scientific models include Waddy 2002, Drinkwater 2001, and Burrige 1999. The number and diversity of invasive organisms that have the potential to devastate this region is unacceptable. The question is not 'if an invasive species is introduced - but when?' Evidence is clear that the probability is extremely high for an invasive species from New Jersey waters to enter and thrive in the Whites Point area if the quarry operation is approved (Mallett, 2003; Balcom and Howell 2006; Van Patten 2006, Fitzgerald pers. comm., 2007).

Invasive Species and/or the introduction of bacteria that causes shell disease to crustaceans pose an unacceptably high risk to the lobster industry and to other commercial and recreational fisheries in the Bay of Fundy and beyond. These risks, if realized, would devastate the social, cultural and economic foundation and end a historical way of life in Southwest Nova Scotia.

Dr. Chris Taggart's presentation spoke about the killing impact of sediment drift on plankton and zooplankton which are key components of feed for whales. They are also the foundation of the food-chain. Herring is another critical link in the marine food web of this area. The long term influence of quarry operations on the local herring population is a concern to fish harvesters. It is wrong to trivialize the importance of a localized biomass of herring to the ecology of the Whites Point area. DFO studies have determined that ecosystems that appear to be great distances apart are interdependent and, like the ripple effect of a 'pebble', a loss of lobster larvae through chemical kill or pre-mature moult (abort) of egg-bearing lobsters caused by quarry chemicals within a localized area is far reaching. This regional ecological interdependence is a major factor missing in the

# LFA 34 Management Board

quarry assessments. Studies identified below show the interdependency of Lobster Production Area 7 (LFA 34, 35, 36, 38, 41, and the western half of LFA 33).

The 'area of impact' from the Whites Point Quarry and Marine Terminal can only be determined by scientific studies that build data on current drifts, lobster larvae drifts, and the impact of quarry chemicals/minerals/metals on lobster larvae, egg-bearing and adult lobsters, on plankton, zooplankton, marine plants, etc. These studies should be based on the scientific models developed by DFO and referenced within this document. There must be a base study of the existing marine habitat and species within the coastal waters of the proposed Whites Point Quarry and Marine Terminal. Local fish harvesters must not be forced from their traditional fishing grounds as a result of loss of the ability to earn a livelihood or a reduction of income based on the requirements imposed on their fishing enterprise operations to allow quarry operations to take place. This displacement of existing local jobs is not warranted and unacceptable.

## **Summary of Recommendations**

### **Complete a base study of the marine environment in the Whites Point area**

We ask the Joint Review Panel to recommend that, prior to quarry approval, a baseline study of the coastal waters in the proposed quarry impact area be completed. It is a well known fact and community belief that industrial developers prefer that monitoring of an area be carried out simultaneous with the industrial development because without the baseline study it is impossible to prove a negative impact on the area is directly linked to the industrial development.

### **Displacement of local fish harvester by quarry operations is unacceptable**

No fish harvesters should be displaced from their traditional fishing grounds, lose their livelihood or a portion of their livelihood as a result of quarry operations. This region can survive without the quarry but the economic sustainability of the area cannot be maintained without a viable commercial fisheries and the tourism industry. Working fishing wharfs are a component that adds to the areas successful tourism industry.

The proposed quarry mediation plans must incorporate the loss of livelihood to a large number of fish harvesters that fish different species in the Whites Point area or those that fish in other areas but dependent on the larvae spawned in or dependent on the survival of fish larvae that are carried by currents through Whites Point coastal waters. A quarry chemical kill of a year class or several year classes of lobster larvae spawned in the Whites Point area, or the impact of egg bearing females that prematurely molt as a result of chemicals/minerals released or leaching into the Whites Point tidal water from the quarry would devastate numerous livelihoods and undermine the economic foundation of coastal communities.

### **True assessment of sediment flow and chemical/mineral drifts impact area**

The Bay of Fundy currents that flow from the proposed Whites Point Quarry determine the marine ecosystem at risk from quarry operations. The area of quarry impact must reflect fishing grounds dependent on marine life that originate from spawn released in or on marine life that pass through the Whites Point nearshore waters. Studies need to be carried out in the Whites Point area to determine sediment flow, chemical/mineral/metal

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drifts, and lobster larvae drifts. The impact of quarry chemicals/minerals on lobster larvae, on egg-bearing and adult lobsters, on plankton and zooplankton must be tested. The following DFO scientific models to be implemented in the Whites Point tidal waters:

- Initiate a study to determine the direction and possible distance of sediment flow and chemical/mineral drifts in the Fundy currents from the quarry site based on the model used by Fred Page (2004);
- Chemicals/minerals used in or produced by the quarry operations should have to undergo impact testing based on the two models of scientific studies carried out by Waddy et al (2002) and Burridge et al (1999) to determine the effect of quarry chemicals/minerals on lobster larvae, egg-bearing and adult lobsters.
- Use the Drinkwater et al (2001) model to study lobster larvae drift to determine the settlement areas of lobster larvae produced in the White Point fishing grounds.

It is critical for management to know the potential area of impact and type of impact from quarry operations. This can only be known if the appropriate studies are completed to determine where the quarry sediment flows, settles, where and how far quarry chemical/mineral-drifts travel and the effect of quarry chemicals/minerals on marine life. The completion of these appropriate scientific studies would confirm or dispel the fears of fish harvesters, communities, and environmental groups for high risk areas of sediment flow and chemical/mineral leaching or controlled chemical/mineral releases on the lobster stocks and the district's marine ecosystem. Studies must, of course, consider "worst-case scenarios" when assessing impacts.

## **The introduction of an Invasive Species or the introduction of the Parasitic Paramoeba or the Introduction of Bacteria that Cause Crustacean Shell Disease**

There is a high risk of invasive species, parasites that kill lobsters or bacteria that causes shell disease being brought into the area by hitch hiking on hulls, anchors, etc. of sea going vessels or in the vessels' ballast and bilge water. Prevention measures to include:

- An assessment to determine the potential risk of transport of the parasitic paramoeba (causes fatal lobster disease) and bacteria (causes shell disease) to Whites Point/Fundy region.
- An assessment on the polluted waters of New Jersey and other jurisdictions through which the rock quarry vessels will be taking on and exchanging ballast water to determine the increased level of risk for invasive species from this area being transported and introduced to Bay of Fundy waters by quarry transport vessels
- Given the economic, social and cultural dependency of the Scotia-Fundy region on the lobster industry, an extreme precautionary approach must be applied when determining the potential impact on the Fundy marine environment from invasive species, parasites and potential shell disease-causing bacteria from the quarry operation.

**Conclusion** The decision to approve/deny quarry operations in Whites Point must reflect the long-term economic impact on the Fundy ecosystem and on the people in this region who are dependent on this marine environment for their livelihoods. It is essential to take a precautionary approach to the long term impact on current and future generations. To do this the above recommended scientific studies must be completed.

# LFA 34 Management Board

To the Joint Review Panel  
Whites Point Quarry and Marine Terminal Project  
Public Hearings June 27, 2007

“The Bay of Fundy, on the east coast of Canada, has a unique and important biological, physical, and oceanographic environment which supports many commercial and non-commercial species (Chou et al 2003: 1).”

## **Executive Summary**

### **Summary of Recommendations**

- 1. LFA 34 Mgmt Board and Lobster Industry’s Importance to region**
- 2. Ecosystem management areas / the region’s interdependence**
- 3. Impact concerns about the Whites Point Quarry**
  - i - Sediment – run-off and airborne**
  - ii - Chemical/Mineral run-off**
  - iii - Invasive species**
  - iv - Displacement of fish harvesters**
  - v - Blasting**
  - vi – Environmental monitoring**
- 4. Conclusion**
- 5. References**
- 6. Appendix**

**1. Lobster Fishing Area 34 (LFA 34) Management Board** – represents approximately 985 fish harvesters who hold a valid lobster licence to fish in LFA 34. In 2005, the LFA 34 landed catch of 18,362 metric tonnes and had a landed value of \$266,005,000 million dollars (DFO 2007, Appendix A). Exporters of lobster products in 2002-2003 had a record value for their products at nearly a billion dollars (DFO 2004). There are approximately 12,000 Atlantic lobster licences with approximately 32,000 jobs created by the Atlantic lobster industry (Spinney v. Can. 1999; FRCC 1995). Fisheries and Oceans Canada credits Lobster Fishing Area 34 (LFA 34) for catching forty percent or more of the Atlantic lobster (CSAS 2006). This fishery is notably the social, cultural, and economic driving force of Southwestern Nova Scotia (CSAS 2006; Kenneally 2006; McInnis 2003; Spinney v. Can. 1999). The coastal waters that border the proposed White Point Quarry lies within the LFA 34 fishing grounds.

### **2. DFO Identified Management Areas:**

In ecosystem-based management, it is necessary to take into consideration that human activities in one area have an influence on the overall ecosystem in that region.

#### Gulf of Maine ocean management area

White Point Quarry lies within the Gulf of Maine which was announced to be one of Canada’s proposed large ocean management areas (LOMA) by Faith Scattolon of Fisheries and Oceans Canada at the 2004 Gulf of Maine Summit. Canadian and United States fish harvesters, scientists, DFO and US marine managers have held their fourth

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annual Lobstermen TownHall Meeting to discuss research and management of their linked lobster fishery ecosystem. It is believed by Lobster TownHall participants that the future health of the lobster stocks within the international Gulf of Maine waters depends on a collaborative management approach.

## Lobster Production Area 7

In 1995, DFO designated Lobster Fishing Areas 34, 35, 36, 38, and 41 that includes the waters of the Bay of Fundy Saint Mary's Bay to the Hague Line (the US / Canada ocean border as Lobster Production Area 7 (LPA 7) (FRCC 1995).

The LFA 34 Management Board believes that the Joint Review Panel should acknowledge and recommend that decision-makers take into serious consideration the interconnectedness of the ecosystem within Lobster Production Area 7 and the long-term quarry impact on this region. The **'impact area of quarry operations'** currently excludes all Fundy waters fed by currents that flow beyond the narrowly defined quarry impact site.

The example below gives evidence that illustrate the distance currents will carry material introduced into the Fundy from human activities. This example also demonstrates that these Fundy currents are the driving force of the interconnectedness of this region and shows that what happens on one side of the Bay of Fundy directly impacts the other side of the Bay as well as up or down the Bay depending on direction of tidal flow.

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- **In 2005 an aquaculture cage broke free from Blacks Harbour, New Brunswick and drifted ashore at Salmon River just below Cape Saint Mary – St. Mary's Bay.**
- **Likewise, settlement of quarry sediment, chemicals, metal drifts will be determined by Fundy currents.**

**3 -i. The impact of sediment settlement** from mining and quarries on lobster nursery and juvenile grounds is a concern for lobster fish harvesters (LFA 34 2006). DFO scientists and management have identified protecting critical lobster nurseries and juvenile habitat as a priority concern. This type of protection is a requirement to sustain the abundance of lobster pre-recruits that are the foundation of a successful inshore lobster fishery in LFA 34. The following statements give evidence to these concerns.

- At a LFA 34 Management Workshop (2000: 12) Bill Congleton, a Scientist from the University of Maine explains the term "critical habitat" as "habitat necessary for the survival of juveniles, in the case of lobster, this means a cobble type bottom."
- Doug Pezzack, a DFO Scientist, repeats his concern regarding the impending risks suggesting that "precautionary measures to protect the ecosystems and habitats should be a priority. There are some serious concerns" ... Pezzack warns



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- that “if we are not willing to pay a high price later, we should begin addressing these concerns now” (LFA 34 2000: 12). This was 7 years ago and still nothing has been done to protect ecosystems and habitat in LFA 34.
- Peter Lawton, a DFO Scientist, confirms the need for immediate action to protect ‘critical lobster habitat’ in LFA 34 when he stated: “If the critical habitat of a species disappears, so does that species” (LFA 34 2000: 12).
  - The DFO Lobster Conservation Strategy (2004) outlines the concern about abundance of pre-recruits and the fear that with the industry’s dependence on new recruits that if a year class failure occurs this would have an immediate effect on the landings and on future recruitment.
  - Drinkwater (2002) suggests there is a strong correlation between the abundance of lobster larvae settlement to recruitment.
  - The 2001 Caddy Report (43, 44) speaks to the need to protect juvenile lobster habitat because “juvenile lobster pass a significant phase in their pre-recruitment life in crevices in cobble bottom where they are protected from predation. ... the limit to recruitment could be the absence of crevices of suitable size.”

Evidence is clear that lobster settlement areas (cobble ground) need to be protected. It is also well known that the quarry impact area is habitat for egg-bearing lobster. We ask that the Joint Review Panel recommend that decision makers err on the side of caution. The accumulation of sediment over fifty or so years pose a high risk to nurseries, juvenile lobster habitat that is also habitat of other marine life. The identified impact area of the proposed quarry site is known to be habitat for egg-bearing females. Adult lobster will not return to an area where silt covers hiding places and where there is no food. Lobster in larval stage four (stage of settlement) will by-pass an area where sediment accumulation covers cobbled or rocky habitat. The coastal waters and seafloor adjacent to the proposed quarry site are habitat to lobster and many other species. This marine habitat must be protected from all rock quarry operation chemical/mineral/metal releases. What are the assurances that there will be no sediment accumulation in this area from the long term results of rock quarry production?

### **Recommendations**

Initiate a study to determine the direction and possible distance of sediment flow and chemical/mineral/metal drifts in the Fundy currents from the quarry site. This study should be based on the model used by Fred Page (2004), a DFO scientist at Saint Andrews Biological Station.

Such a study would either confirm or put to rest the fears of fish harvesters, community, and environmental groups concerning the potential sediment and chemical/mineral drifts that would result from the proposed Whites Point Quarry operation.

### **3 -ii. Chemical/Mineral Release from the quarry site into the Fundy waters**

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Chemicals are an essential component used in rock mining/quarry operations and aggregates, including basalt, may contain a wide range of minerals including asbestos. The high risk of chemicals/minerals/metals entering the water column either through quarry controlled releases or as a result of inclement weather or atmospheric storms is a known problem from this type of industrial development. The introduction of chemicals/minerals/metals into the marine environment poses an unacceptable risk to the lobster industry and to other fisheries.

Burridge et al (1999) noted that chemical patches drift in currents. Lobster larvae drifts in those same currents. Studies carried out by Burridge et al (1999) show that aquaculture pesticides are lethal to lobster larvae. Studies by Susan Waddy (2002: 1096) warns that aquaculture pesticides cause egg-bearing females to abort and in some cases result in death of the animal. A demand for similar testing based on Waddy and Burridge models to assess the impact of quarry related chemicals/minerals on the various life cycles of lobster is a reasonable expectation given the importance of this resource to the cultural, social, and economy of the region.

Chou et al (1991) claims “the American Lobster (*Homarus americanus*) is known to accumulate high concentrations of metals from the environment and to synthesize metallothioneins [metal-binding proteins] which bind metals in their digestive glands.” Studies by DFO Scientists show that lobsters in various areas of the Bay of Fundy have accumulated several of the following contaminants in their tissues: Silver (Ag), Copper (Cu), Cadmium (Cd), Zinc (Zn), Mercury (Hg), and organic contaminants such as PCBs and PAHs (Chou et al 2004; Chou et al 2003; Legrand et al. 2005). In order to monitor the impact of quarry operations on marine environmental quality it is necessary to know the current health of lobster in the Whites Point area. This base line knowledge will establish whether contaminants exist in the tissues of lobster pre-quarry operations. Chou et al (2003: 4, 5) suggests that lobster would be a reliable species for use as an indicator species for monitoring contaminants and metals.

Larvae drift studies carried out in 2001 by Drinkwater et al (1-12) provide evidence for the importance of spawning areas at a distance from juvenile habitat and to fishing grounds. Lobster that spawn within the proposed impact area of the Whites Point Quarry produce the larvae that settle further up, further down, or further out from the proposed impact area. Death of lobster larvae as a result of quarry chemical/mineral releases will impact the livelihood of numerous fish harvesters from other areas of the Bay of Fundy.

The Canada Oceans Act (1996) requires decision makers to assess the eco-health of the marine environment to provide accurate, reliable measurement of environmental quality. Fisheries and Oceans Canada Scientists have carried out a number of studies to identify species that are indicators of marine environmental quality. These studies are relevant to assist decision makers to formulate necessary steps to complete the baseline study of Whites Point prior to quarry operations; to determine the threat of chemicals/minerals and metals on lobster and other marine life prior to their release into the marine environment; to establish necessary data to approve or to deny the quarry operation; to establish data

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base necessary to set benchmarks to know when to halt quarry operations should contaminants cause negative impacts on lobster and other marine life (Chou et al 2003).

## **Recommendation**

Chemicals used in (and minerals released from) the quarry operations should have to undergo impact testing based on the model of scientific studies carried out by Burridge et al (1999) and Waddy et al (2002) to determine the effect on lobster larvae, egg-bearing and adult lobsters.

Current drift studies based on the Page (2004) model should be carried out in the Whites Point area to determine the area of impact from chemicals/minerals released from the quarry.

## **Fundy Currents**

**3 i-ii.** Fundy currents and other environmental factors determine the marine impact area from sediment and chemicals/minerals/metals released by quarry production. Chou et al (2003:5) affirms that physical environmental factors such as tides and currents are associated with contaminant exposure to lobster and other marine life. Chris Taggart's (2007) findings from a buoy drift study in tidal currents showed the direction and distance of surface currents during low and high tides for a two week period from the White Point area. Other factors that determine the direction and distance of movement by sediment, chemical/mineral/metal includes the movement of currents below the surface, wind, tide heights, weather and substance density of material introduced from human activities.

LFA 34 Management Board does not believe that the Fundy currents cause quarry sediment to disappear. Quarry sediment introduced to the Fundy waters will at some point settle to the ocean floor. The speed of tidal flow differs from near shore to mid-Bay throughout the tidal period. The Fundy tidal currents and undercurrents slow and stop four times in every twenty-four hour period with sediment settling to the Fundy seafloor as tidal flow slows, stops, and changes direction. This fact of sediment settling and accumulating in areas beyond the near shore area adjacent to the quarry has not been acknowledged by quarry proponents.

Taggart spoke to quarry sediment drift and its destruction of vital plankton and zooplankton in the context of the loss of a food source for whales. Many species are dependant on plankton and zooplankton as a food source. Lobster larvae spend the first three to ten weeks in a Planktonic Phase near the surface and drift helplessly in currents like plankton and zooplankton (FRCC 1995). During these early life stages the lobster larvae are dependent on plankton as their only source of food.

If quarry sediment and chemicals/minerals kills the plankton and zooplankton what impact will they have on lobster larvae using the same currents? For larvae that avoid the drifting sediment/chemicals/minerals will there be plankton to sustain them? For lobster larvae that survive these threats will there be cobble ground not covered in sediment to settle in? We know that chemicals introduced from other industrial sites kill lobster

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larvae that share the same currents. Have studies been carried out to determine the impact of chemicals/minerals used in or released by the quarry operation on various stages of lobster larvae, egg-bearing females and other adult lobsters? Would chemicals/minerals released from the quarry impact on plankton, zooplankton, kelp and other marine plants in the quarry impact area?

### **Recommendation**

Chemicals used in the rock quarry operations should undergo impact testing based on the model of scientific studies carried out by Burrige et al (1999) and Waddy et al (2002).

### **3 –iii Invasive species**

Potential invasive species in the polluted water from New Jersey where quarry transport vessels would take on ballast water were examined by Mallet Research Services and reported in the EIS. As discussed in her presentation to the Review Panel, Fitzgerald noted that a minimum of 21 invasive species from that area could potentially reestablish in Whites Point tidal waters. 'Next to habitat destruction, alien species are the leading cause of extinctions worldwide, according to a study published in 2006 in the scientific journal *Frontiers in Ecology and the Environment*. These mass extinctions are a serious threat to biological diversity in regions and can also impact industries such as fishing and agriculture that rely on native plant and animal species. ... In May, a U.S. environmental group called Healing Our Waters-Great Lakes Coalition called for a moratorium on international shipping, saying the damage caused by invasive species tops \$5 billion US annually' (Jay, 2007).

Over the past 30 years, nearly 50 invasive species have entered the Great Lakes despite preventive measures in place to stop ships that enter the Saint Lawrence Seaway from introducing alien species. DFO's June 20<sup>th</sup> presentation to this panel made clear that DFO can do nothing to contain invasive species once they are here. DFO's only option to deal with invasive species is to explore 'preventative' measures. The Saint Lawrence Seaway efforts show that a preventative approach to manage invasive species is not a reliable strategy to protect the Great Lakes from invasive species (Jay, 2007).

Invasive species from the ballast water, bilge water, or by hitch-hiking on the hull, anchors, or chains of transport vessels have the potential to displace lobster and other native marine species from their habitat. These same vessels may transport a form of bacteria that causes lobster shell disease. Either of these conditions in Southwestern Nova Scotia could result in an economic and social disaster. Thousands of jobs would be lost and hundreds of communities would be devastated. These are extremely high risks to Southwestern Nova Scotia.

The area from which the vessels engaged to transport the Whites Point Quarry production must be taken into consideration. These vessels travel through the waters where a parasitic paramoeba is thought to have caused a fatal lobster disease (paramoebiasis) that devastated the Long Island Sound lobster industry. A bacterial infection known as a

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lobster shell disease has infected greatly increased numbers of lobster in Connecticut, Massachusetts and Rhode Island (Balcom and Howell 2006, Van Patten 2006). The Whites Point quarry vessels will travel through these waters and the coastal New Jersey waters that are known as the most polluted waters on the eastern seaboard of the Atlantic Ocean (Mallet 2003).

The claim by Bilcon to create a very few local jobs at a rock quarry does not warrant the high risk of the intrusion of species, parasites, or a bacteria that may wipe out marine life and 1000s of fishery related jobs. The communities on Digby Neck can survive without the few quarry jobs but Southwestern Nova Scotia cannot survive without the inshore fisheries. It is fact that invasive species or disease-carrying bacteria cannot be contained to the current zoned quarry impact area.

## **Recommendations**

- Include data on Long Island Sound lobster shell disease and determine the potential risk of the bacterial infection to be carried to the Whites Point region.
- Include data on the polluted waters in which bulk carriers will be taking on ballast water and through which the rock quarry vessels will be traveling to determine the increased risk level of invasive species being transported and introduced to Fundy waters by quarry transport vessels
- Use a precautionary approach to determine the potential impact on the Fundy marine environment from invasive species, parasites and potential shell disease causing bacteria.

## **3 –iv. Displacement of fish harvesters by the Quarry Project**

The fishing season in LFA 34 takes place from the last Monday in November to the end of May. This is a fishing season that has a limited number of days at sea because of inclement weather conditions that include high winds, storms, and extreme cold.

It is our understanding that lobstermen will be told by Bilcon that blasting will occur on a particular day approximately every two weeks and they are required to move their fishing gear from the area. Once the gear is moved and fog sets in the blast will be delayed and another day will be set for blasting. Stormy weather may also cause several days delay before fishermen can move their gear back onto the fishing grounds. There is also the added cost of fuel and labour to these fishing enterprises to move gear out of and back onto the fishing grounds and fishing days lost in order to move gear for blasting.

Decision makers in this process must take into consideration that nature already limits the number of fishing days during the months from December to May. Days spent moving gear will substantially reduce the actual income for those fish harvesters:

i) loss of fishing days from moving gear in and out of the area because of blasting; ii) cost of fuel and labour to move gear; and, iii) lost gear due to quarry vessels. These factors most likely will result in those fishermen being permanently displaced from their traditional fishing grounds, and this displacement for a few jobs in a rock quarry is not warranted.

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The number of four or five fish harvesters recognized by Bilcon as being eligible for compensation/mitigation should there be loss of livelihood is unacceptable (Bilcon 2007). Lobster fish harvesters from as far away as West Pubnico and the Minas Basin are known to fish in the White Point area. Lobster is not the only species fished in this area. Specialists and multi-species fish harvesters fish a diversity of gear types and target various species of fish. A closer estimate of quarry operations impact would be a minimum of 300 fishermen.

The total number of fish harvesters that will be impacted by quarry sediment run-off, chemical/mineral/metals run-off, and displacement from or loss of fishing grounds is unknown since no studies have been done to determine in what areas the lobster spawned in the current defined impact zone of White Point will eventually settle. Therefore, it is unknown what fishing grounds will be impacted by quarry operations. The 2001 Drinkwater study explains how the larvae of lobster that spawn in one area, such as the White Point will drift in tidal currents and become the lobster harvested a distance up or down the Bay. Lobster larvae drift great distances in ocean currents (Drinkwater 2000).

Should sediment and chemical/mineral drifts kill larvae or cause egg-bearing females to abort within the proposed Whites Point Quarry, it will have a far-reaching impact in the Bay of Fundy and Saint Mary's Bay fishing grounds.

## **Recommendations**

Call for a study using Drinkwater et al (2001) model to study lobster larvae drift to determine the settlement areas of lobster larvae produced in the White Point fishing grounds. Test the effect of quarry chemicals/minerals on lobster, lobster larvae and other species. Deal with the communities, fish harvesters, and environmental concerns before approval of quarry operations.

### **3 – v. Blasting**

In the DFO (June 20<sup>th</sup>, 2007) presentations to this Joint Review Panel it was stated that blasting may change the feeding and behavioral patterns of marine animals. DFO also stated that blasting may change the feeding and behavioral patterns of lobster. Lobsters migrate to the near shore waters to molt, to mate, and to spawn. Females need nutrition prior to a molt and after the molt. Will any changes in feeding patterns weaken the female lobsters during this critical stage of their life cycle? Will other behavioral changes impact on the breeding rituals and practices? Will behavioral changes impact on male lobsters and their role to fertilize the female or as the protector of a female during the vulnerable stage during and after the molt? Disruption of feeding and behavior patterns may impact on the life cycle of these lobsters.

Some scientists claim lobsters do not hear but have organs similar to ears that detect barometric pressure by which they determine when to migrate inshore or offshore. Blasting creates a water pressure that may negatively affect the sensory mechanisms of lobster. This, along with the feeding and other behavior changes, is not a healthy environment for lobster in the Whites Point area. There are too many uncertainties.

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## 3 –vi. Environmental and marine life monitoring

DFO's plan to study the impact of the quarry on lobster once the quarry becomes operational is unacceptable. This does not take into consideration the ecosystem-based approach or a precautionary approach to ocean management. This quarry proposal has been on the table for some time. Why has DFO not moved forward to intervene on behalf of the ecosystem to ensure that a base line study, and other studies mentioned above are completed before the proposed industrial development begins production?

The Department of Fisheries and Oceans Canada, Maritimes Region is not allocated the financial resources or the human resources to carry out necessary scientific studies prior to a start-up of quarry operations or to effectively monitor the quarry impact on the marine environment in follow up studies to quarry operations (Kenneally 2006).

- Has DFO presented to the Joint Panel Review a plan on how they intend to monitor lobster or marine health and marine habitat in this area? Not just for the short term but for the long term?
- Has Environment Canada presented to the Joint Panel Review a plan on how they intend to monitor the health of lobster and other marine species and marine habitat in this area? Not just for the short term but for the long term?
- Is it clear what government department(s) will monitor the impact on marine life and marine habitat? What department(s) is/are going to finance the monitoring?
- A DFO representative's response to the question: Who will monitor the impact of quarry operations on marine life and their ecosystem? Answer: Monitoring the quarry's impact is the responsibility of the Department of Environment. It is Fisheries and Oceans mandate to protect the ocean environment, fish, and fish habitat.
- Are there clear boundaries to determine how these government departments will work together and share responsibilities to protect critical marine habitat and ecosystems?
- These questions must be answered before quarry operations begin.

Fish harvesters know from experience that the only science or monitoring of the quarry's impact on the lobster fishery will have to be done by them. With the exception of a few lobster surveys that DFO carries out on board a scallop dragger, lobster recruitment science is carried out by volunteer lobster harvesters in partnership with the Fishermen Scientists Research Society. DFO in Scotia-Fundy region do not have an adequate budget to carry out the necessary science studies and monitoring. Fish harvesters have little faith in the current government system to ensure protection of our fisheries or fish habitat.

There may be good intention and interest by DFO to do the necessary science and monitoring but without designated financial and human resources for this work, good intention does nothing to protect our renewable natural resources.

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LFA 34 Management Board has concerns for the long term impact on the overall ecosystem and marine life in this region from the quarry operation:

Kelp beds and marine plants are spawning areas for various species and is a place of protection for other species. Marine plant life is vulnerable to chemical/mineral releases from the quarry as well as from the churning of near shore waters caused by large ocean going transport vessels.

Herring in this locale of the Fundy is a very significant component of the food chain in this area's ecosystem. It is unacceptable that this panel accept the remark by a DFO representative on June 20<sup>th</sup> who claimed that herring in this area "is not significant" and referred to the herring on German Bank as the main biomass. The herring in this region is a significant component of the food chain for marine animals in this area and to those who harvest them for their livelihood. Fish harvesters include herring-set netters, weirs, and herring seiners.

Horse muscles: A rare bed of horse muscles is situated within the Bay of Fundy above the proposed quarry site and is considered a sensitive habitat area. What is the long-term risk to this habitat being a place of sediment accumulation from the rock quarry? Is this area within the range of currents that may carry chemical drifts that form from the chemicals / minerals/ metals released into the Bay of Fundy from the quarry operations?

Sharks – the Bay of Fundy is known to be the home of a diversity of shark species. There are more species of sharks in the Bay of Fundy during the summer months than anywhere else in the world. Sharks are considered an endangered species. The important role of shark in the food chain, their role in maintaining healthy oceans, and their rate of depletion beg for a precautionary approach to industrial development in the Bay of Fundy region. It is believed that a possible change in the migratory paths of herring stocks in this region as a result of quarry operations will impact on the Fundy shark population.

## Conclusion

Federal and provincial governments have an opportunity to gather good scientific data prior to approval of industrial coastal development. This scientific information would support their final decision to approval or deny rock mining in the coastal zone. Meanwhile it is imperative that scientific studies begin to determine how quarry chemicals/minerals/metals impact on marine life in the area of Whites Point. It is critical that current drift studies determine the true range of the impact area from sediment, chemical, mineral and metal drifts that would occur as a result of a basalt rock quarry operations. This quarry operation is proposed to occur for fifty years and beyond.

The DFO Science Branch have scientists with the knowledge, the technical capabilities and the science models needed to carry out the larvae drift and the sediment / chemical /mineral/metal current drift studies and the impact of quarry chemicals/minerals/metals on lobster larvae, egg-bearing and adult lobsters. A demand for similar testing based on



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Waddy and Burrige models to assess the impact of quarry related chemicals/minerals on the various life cycles of lobster is a reasonable expectation given the importance of this resource to the cultural, social, and economy of the region.

Invasive species, parasites fatal to lobster, or bacterial infections that cause shell disease in lobsters and other crustaceans are most likely to be transported to this area by quarry vessels. This fact must be taken into serious consideration during the decision making process. Quarry vessels travel through known polluted waters that contain invasive species that would thrive in the Whites Point and Bay of Fundy waters; quarry vessels travel through waters where parasites fatal to lobsters are believed to be the cause of the Long Island Sound lobster fishery crisis; quarry vessels travel through the coastal waters of several U.S. states where bacterial infections that cause shell disease in crustaceans have spread.

The Departments of Environment (federal and provincial) and Fisheries and Oceans Canada must use the precautionary and sustainable development principles within an ecosystem-based management approach to coastal and marine development in the Bay of Fundy region. The Canada Oceans Act (1996) obligates responsible decision makers to take a precautionary and sustainable approach when determining the impact of development on the ocean environment and the economic impact on current and future generations. It is unacceptable that traditional users of the Whites Point waters and local small businesses be displaced or undermined to allow quarry operations. A base study that documents marine ecology in the Whites Point area along with studies to thoroughly test the impact of chemicals, minerals and metal that will be released or that will leach into the Bay of Fundy on marine life must be completed prior to any approval of industrial quarry operations at Whites Point Digby Neck.

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## Appendix A

### **Lobster Fishing Area 34 – Landed quantities and Values Calendar Year, 1985-2005**

Source: 2007 DFO Maritimes Region, Commercial Data Division

<b>Landed Quantities</b>		<b>Landed Values (\$000)</b>	
<b>(Metric Tonnes - Live Weight)</b>			
Year	34	Year	34
1985	5,797	1985	47,328
1986	7,473	1986	68,751
1987	7,585	1987	77,065
1988	7,888	1988	68,403
1989	8,017	1989	68,980
1990	10,807	1990	74,072
1991	11,562	1991	81,728
1992	8,482	1992	85,023
1993	8,663	1993	84,738
1994	11,117	1994	108,715
1995	10,312	1995	119,402
1996	10,214	1996	122,819
1997	11,627	1997	130,934
1998	11,360	1998	149,446
1999	14,602	1999	201,686
2000	14,438	2000	192,879
2001	18,938	2001	242,768
2002	17,577	2002	252,786
2003	17,879	2003	266,638
2004	16,677	2004	227,902
2005p	18,362	2005p	266,005

**2005 Preliminary**