



Habitat Management Division
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Dartmouth, NS
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Your file *Votre référence*

Our file *Notre référence*

November 24, 2005

03-FCR-020

Mr. Paul G. Buxton, Project Manager
Bilcon of Nova Scotia
P.O. Box 2113
Digby, N.S.
B0V 1A0

Dear Mr. Buxton:

RE: Whites Point Quarry and Marine Terminal – Proposed Habitat Compensation Plan

The Department of Fisheries and Oceans (DFO) has reviewed your submission entitled “**FISH HABITAT COMPENSATION PLAN PROPOSAL**” dated September 16, 2005 (attached). Based on the preliminary information provided to date, DFO is satisfied that the overall components of this proposed habitat compensation plan would meet the requirements and objectives of the Policy for the Management of Fish Habitat under the *Fisheries Act*.

As you are aware, an environmental assessment under the *Canadian Environmental Assessment Act (CEAA)* is required once the need for a *Fisheries Act* Subsection 35(2) authorization is identified. The Whites Point Quarry and Marine Terminal project is subject to a Joint Panel Review under *CEAA* and the *Nova Scotia Environment Act*. The decision to issue a *Fisheries Act* authorization can only be taken after consideration of the Joint Panel report issued at the conclusion of the environmental assessment.

A final fish habitat compensation plan (including a detailed monitoring plan) and conditions would become an integral part of any potential *Fisheries Act* Subsection 35(2) authorization for the Whites Point Quarry and Marine Terminal project.

.../2

Mr. Paul Buxton

(2)

November 24, 2005

If you have any questions, please feel free to call me at (902) 426-4692.

Sincerely,

Phil Zamora
Habitat Management Division

Cc. S. Chapman
M. Freeman
T. Wheaton
M. McLean

FINAL DRAFT

September 16, 2005

FISH HABITAT COMPENSATION PLAN PROPOSAL

Project Information

Project Name: Whites Point Quarry and Marine Terminal
Location: Bay of Fundy, Little River, Digby County, Nova Scotia
Referral Title: Bay of Fundy, Whites Point, Digby Neck, Marine Terminal and Quarry Construction
HMD File No.: 03-FCR-020
FEAI (Federal Environmental Assessment Index) Ref. No.: 37211
Authorization No.: N/A
Effective Period: 2006 - 2011
Proponent: Bilcon of Nova Scotia Corporation
Contact: Name: Paul G. Buxton, P. Eng.
Address: 3-305 Highway 303, Digby, Nova Scotia
Telephone: 902-245-2567
Fax: 902-245-5614

Project Location

The Whites Point Quarry and Marine Terminal is located in Digby County, on Digby Neck, near the community of Little River – see Map 1-FHCP. PID number of the property is 30161160. The quarry site is outlined on topographic Map 2A-FHCP and aerial photo Map 2B-FHCP. Latitude and longitude coordinates of the marine terminal are 44°27'47"N, 66°08'31"W.

Project Description

The quarry property comprises approximately 380 acres. Land based infrastructure would occupy approximately 27 acres while marine based infrastructure would occupy approximately 10 acres. Quarrying would potentially take place on 300 acres. Quarry production would be approximately 2 million tons of processed aggregate per year. Approximately 10 acres of new quarry would be opened each year with reclamation of previously quarried areas every five years.

The main components of the project include the physical plant for construction aggregate processing and a marine terminal for ship loading of the aggregate.

Land based permanent structures would include rock crushers, screens, closed circuit wash facilities, conveyors, load out tunnel, support structures (shop, office, fuel tanks) and environmental control structures.

Marine facilities would include a conveyor, ship loader, berthing dolphins, and mooring buoys.

Conceptual layout of the land and water based infrastructure is shown on Figure 1-FHCP.

Conceptual plan and elevation of the marine terminal is shown on Figure 2-FHCP and Figure 3-FHCP.

Description of Planned Mitigation Measures

Land mitigation measures include a system of drainage channels and sediment retention ponds. A minimum 30 meter wide environmental preservation zone is proposed along the Bay of Fundy shoreline – see Figure 1-FHCP.

Marine mitigation measures include the use of pipe pile supports for the marine conveyor system, ship loader, and berthing dolphins. This construction method was chosen as having the least environmental impact when compared to other marine construction methods such as rock fill, infill sheet piling, or rock crib work.

Harmful Alteration, Disruption, or Destruction of Fish Habitat (HADD)

A permanent destruction of fish habitat will occur as a result of anchoring the pipe piles into the bottom of the intertidal and sublittoral zones in the Bay of Fundy. An alteration of fish habitat will occur as a result of the pipe piles displacing water column habitat and replacing it with fixed substrate habitat.

The type of habitat in the intertidal zone consists of the upper shore zone of exposed bedrock and the mid and lower shore zones with tide pools scattered throughout. Marine organisms include the dominate macroalgae (*Fucus* and *Ascophyllum*), red coralline algae (*Lithothamnion sp.* and *Phytolithon sp.*), limpets (*Acmaea testudinalis*), brown algae (probably *Ralfsia fungiformis*), periwinkles and amphipods (Brylinsky 2002) – see Map 9-FHCP. This intertidal habitat of macroalgal communities is a major primary producer and provides foraging and refuge habitat for many species of marine organisms (Brylinsky 2002). As many as 31 species of fish use rock weed habitat during summer and about 17 species are present as juveniles suggesting it is an important nursery habitat. Also, lobsters rely on macroalgal habitat during various stages of their life cycle.

The type of habitat in the sublittoral zone to be lost as a result of anchoring the pipe piles into the bottom consists of bedrock (Canadian Seabed Research Ltd. 2002) – see Map 9-FHCP. This sublittoral area is considered good lobster habitat (Ross 2005) supporting various life stages including spawning, nursery, rearing, and feeding. Also, this habitat supports various ground fish such as haddock, pollock, cod, and flounder.

The extent of habitat effected in the intertidal zone from anchoring the proposed 36 inch diameter pipe piles is .001 ha. The extent of habitat effected in the sublittoral zone from

anchoring the proposed 36 inch diameter pipe piles is .003 ha. for a total loss of .004 ha. of bottom fish habitat.

Baseline studies were conducted in the area of the HADD by:

Brylinsky, Michael. *Results of a Survey of the Intertidal Marine Habitats and Communities at a Proposed Quarry Site Located in the Vicinity of Whites Cove, Digby Neck, Nova Scotia.* 30 June 2002.

Canadian Seabed Research Ltd. *Geophysical Survey – Proposed Marine Development – Whites Point, Nova Scotia.* 28 February 2002.

Brylinsky, Michael. *Interpretation of a Sublittoral Benthic Survey Along the Shoreline of Whites Point, Digby Neck, Nova Scotia.* 28 February 2004.

Residual effects, after mitigation, are considered to be a permanent loss of .004 ha. bottom habitat and no reversibility is expected. The alteration of water column habitat is expected to result in no net loss as the fixed substrate will undergo productive changes over time as the pipe piles are colonized.

The residual effect of permanent loss of bottom habitat is determined to constitute a harmful alteration, disruption or destruction of fish habitat. The appropriate compensation ratio is proposed to be three times the actual loss. Therefore, the habitat replacement required to compensate this habitat loss is .012 ha.

Displacement of the water column by the steel pipe piles will alter the intertidal and sublittoral marine zones. The surface of the pipe piles will likely be colonized by marine organisms, attract pelagic fish, and create habitat diversity. In this regard, an opportunity exists to enhance a food source habitat for pelagic fish to further compensate this water column alteration. The intent would be to provide a surface more conducive for the attachment of marine organisms, as described below, than the smooth pipe pile surface.

Location of the Compensation Work

The location of the fish habitat compensation area is shown on Map 3-FHCP in the sublittoral zone of the Bay of Fundy. Latitude and longitude coordinates of the centre of the 20 meter by 20 meter compensation area is 44°28'01"N and 66°08'55"W. Adjacent land ownership is: Jason R. Lineberger and Lida C. Lineberger, and John A. Johnson and Joan L. Johnson with a 90 year lease to Bilcon of Nova Scotia Corporation. Access from Highway 217 is via the Whites Cove Road No. 422.

Description of the Compensation Work

The “hierarchy of preferences” selected for the compensation work is the first preference “to create or increase the productive capacity of like-for-like habitat in the same ecological unit”. “Productive capacity” is defined as “the maximum natural capability of

habitats to produce healthy fish, safe for consumption, or to support or produce aquatic organisms upon which fish depend". The compensation work is proposed to be done in close proximity to the permanent loss of habitat area – see Map 3-FHCP. The intent is to increase the productive capacity of a less productive bottom habitat. The compensation site is proposed for an area of a thin veneer of sand overlying bedrock. The size of the compensation area is approximately 20 meters by 20 meters in approximately 32 meters water depth as shown on Figure 4-FHCP. Twenty-eight lobster/fish shelters are proposed to be clustered within the compensation area. The location of the compensation area is a distance from the good lobster habitat areas and is not expected to compete with these habitat areas. Also, the array of the shelters is designed to create a "fringe effect" which actually expands the effective zone of influence around each shelter. The shelters are specifically designed without any "skylight effect". Attraction of other marine organisms such as ground fish, sea cucumbers, star fish, and benthic invertebrates is likely. Constructed of concrete, the shelters are approximately .28 meters high and .72 meters in diameter with six ports or entrances at the base and hollow inside. A variety of life stages of lobster and other organisms will be accommodated to ensure an addition to the overall populations. The shelters are presently produced by Jacques Whitford in Halifax. An application pursuant to the Navigable Waters Protection Act has been submitted for the placement of the fish shelters.

Enhancement of pelagic fish habitat would be accomplished by attaching a three meter length of polyvinyl chloride (PVC) coated wire mesh, similar to lobster trap wire, around the surface of the pipe pile. The wire would be attached leaving a four inch space between the pile and the wire. The expected life of the PVC coated wire is greater than 25 years. Three pipe piles in the intertidal zone and three pipe piles in the sublittoral zone would receive the "wire collars" at varying depths in the water column. Organisms likely to colonize this material would include various seaweeds, mussels, barnacles, marine worms, bryozoans, tunicates, and sponges thereby producing food sources for pelagic fish.

Existing habitat types are outlined in the immediate area of the compensation work on Map 3-FHCP. Existing habitat types such as the bedrock and concentrated boulders are considered to provide good lobster and ground fish habitat by producing food and shelter. The area of surficial sediments is located in close proximity to the good lobster habitat and placement of the lobster/fish shelters there could compete with existing habitat. Therefore, the less productive sand habitat area was selected for enhancement to approximate the type and quality of habitat lost.

Analysis of the lobster/fish shelters placed on the sand substrate with no visible sediments in area, indicate that once placed, the shelters will not be buried through sediment transport, settling, or alterations in sediment patterns. The current velocities of approximately 2.5 knots are not high enough to move the shelters and once stability is attained after placement, they will not move by bottom currents. Some limited settling into the sand substrate can be expected depending upon the existing depth of the sand. This analysis is based on the lack of bedforms and scour moats in the coarse sand around the large boulders in this area (ref. 9).

Based on the above rationale and proposed compensation plan, the first level (similar habitat and same ecological unit) of the hierarchy of preferences is expected upon implementation.

Planting of riparian vegetation is not proposed since the area above the mean high tide is exposed bedrock in the area of the proposed marine terminal.

No known habitat restoration-enhancement efforts are known to be occurring along this section of the Bay of Fundy coastline.

The compensation plan (lobster/fish shelters) will be implemented in a water depth of approximately 32 meters, while the wire collars on the pipe piles will be at varying depths in the water column. Compensation measures are located to not compete with existing productive habitat types in the immediate area. Therefore, the compensation should enhance this ecological unit and not adversely affect other natural resources.

Balance Sheet
HADD versus the compensation ratio requirement

<u>Project Effect</u>	<u>HADD Area</u>	<u>Compensation Ratio</u>	<u>Compensation Area Required</u>	<u>Compensation Proposed</u>	<u>Habitat Replaced</u>
Loss of intertidal and sublittoral fish habitat due to piling anchoring	.004ha	3x	.012ha	Fish Shelters	.012ha

Proposed Timing of Compensation Work

The timeline for implementation of the compensation plan will coincide with construction of the marine terminal. Marine construction activity will be done from floating platforms and during periods of low biological activity to further reduce direct effects on the marine environment. The wire collars on the pipe piles would be placed either before the piles are installed or soon after installation. Scheduling of placement of the fish shelters would be from late fall to early spring to avoid spawning periods and the presence of most sensitive marine mammals. Placement of the shelters will be done from the floating platforms.

Environmental Inspection and Monitoring Commitments

A conceptual environmental monitoring plan follows outlining procedures to be conducted before and during the compensation work and post compensation monitoring. It should be noted that benthic samples were taken in 2002 and analyzed (ref. 7).

Pre-compensation baseline data including benthic samples and video documentation will be taken before installation of the fish shelters.

Post-compensation baseline data including benthic samples (at the lobster shelter area), marine organism samples (at the pipe pile area) and video documentation will be taken for five consecutive years after the compensation plan is implemented. Pre and post compensation data will be compared to evaluate the success of the lobster shelter compensation work. Comparison of species diversity of organisms on the smooth pipe pile surface versus the wire collar sections on the pipe piles will also be completed. Since the shelters and wire collars are relatively new methods of habitat enhancement, a physical analysis of these structures will also be documented. A copy of the annual monitoring report of the compensation work will be provided to Fisheries and Oceans Canada – Habitat Management Division. In the event compensation measures fail because of natural causes, an assessment of the compensation and its effectiveness will be made at that time and adaptive management procedures will be discussed.

An “as built” report will be provided to Fisheries and Oceans Canada – Habitat Management Division within 90 days of implementation of the compensation work. This report will include pre-compensation baseline data and confirm the mitigation and compensation measures have been implemented.

References

1. Fisheries and Oceans Canada. *Recommended Format for the Fish Habitat Compensation Plan Proposal*. January 2004 Revision.
2. Fisheries and Oceans Canada. *Habitat Conservation and Protection Guidelines*. Habitat Management and Environmental Science. Second edition 1998.
3. Ross, J. *Compensation Options for Lost Marine Habitat as the Result of an Authorization under s35(2) of the Fisheries Act for Digby Quarry at Whites Point, NS*. April 26, 2005.
4. Brylinsky, Michael. *Results of a Survey of the Intertidal Marine Habitats and Communities at a Proposed Quarry Site Located in the Vicinity of Whites Cove, Digby Neck, Nova Scotia*. 30 June 2002.
5. Canadian Seabed Research Ltd. *Geophysical Survey – Proposed Marine Development - Whites Point, Nova Scotia*. August 8, 2002.

6. Atlantic Marine Geological Consulting Ltd. *Marine Geological Report for the Proposed Quarry and Marine Terminal at Whites Point, Digby Neck, Nova Scotia.* March 8, 2005.
 7. Brylinsky, Michael. *Interpretation of a Sublittoral Benthic Survey Along the Shoreline of Whites Point, Digby Neck, Nova Scotia.* 28 February 2004.
 8. personnel communication – S. Belford. 5 April 2005.
 9. Atlantic Marine Geological Consulting Ltd. *Marine Geological Report for the Proposed Quarry and Marine Terminal at Whites Point, Digby Neck, Nova Scotia.* June 2005.
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APPENDIX D

**Paul G. Buxton, Project Manager
Bilcon of Nova Scotia Corporation
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Digby, Nova Scotia
Telephone: 902 245-2567**

Whites Point Quarry and Marine Terminal

Fish Habitat Compensation Plan

Legend

- - - Compensation Area

● Fish Shelter

▒ Sand

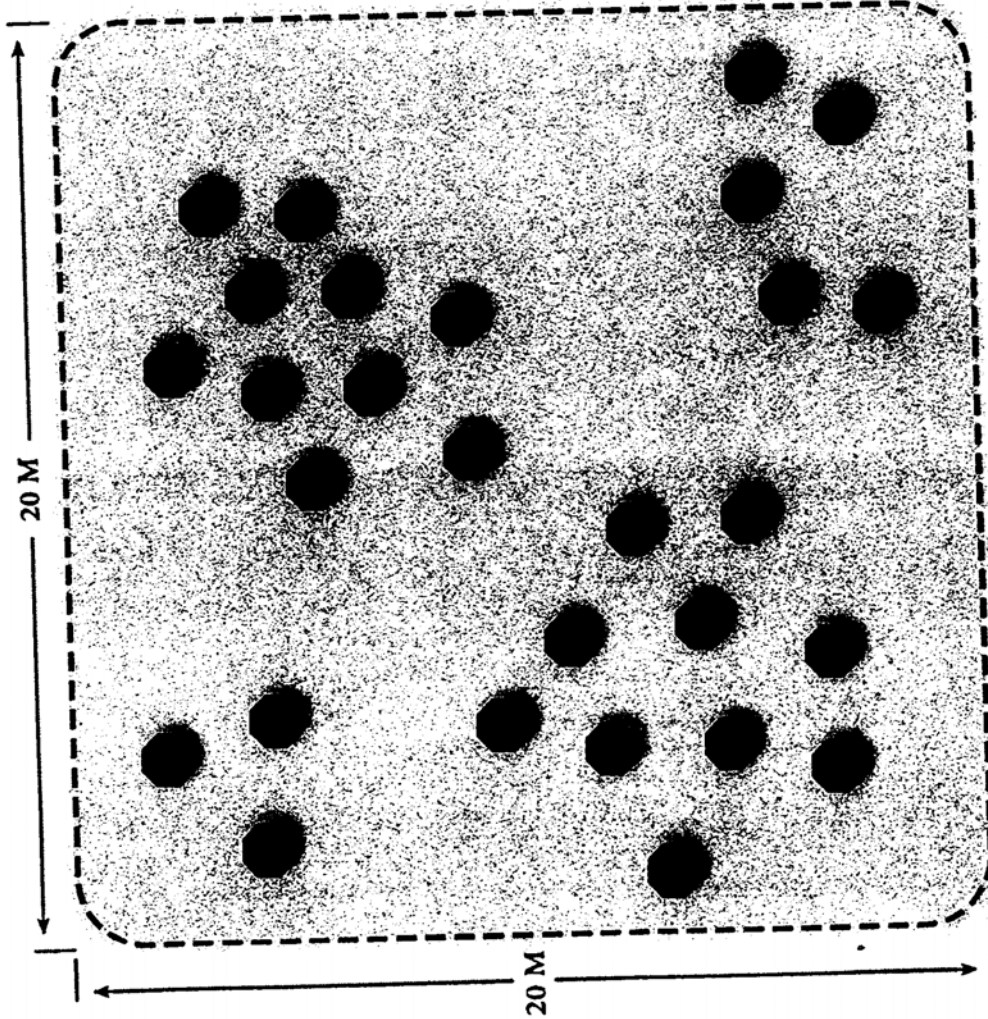
Produced for: Bilcon of Nova Scotia Corporation

Fish Habitat Compensation Area

Figure 4 - FHCP

Graphic Design by Mark Pease, Bear River, N.S.

Buxton & Kern



Whites Point Quarry
 Little River, Digby County
 Nova Scotia

**Environmental Assessment/
 Impact Statement**

Legend

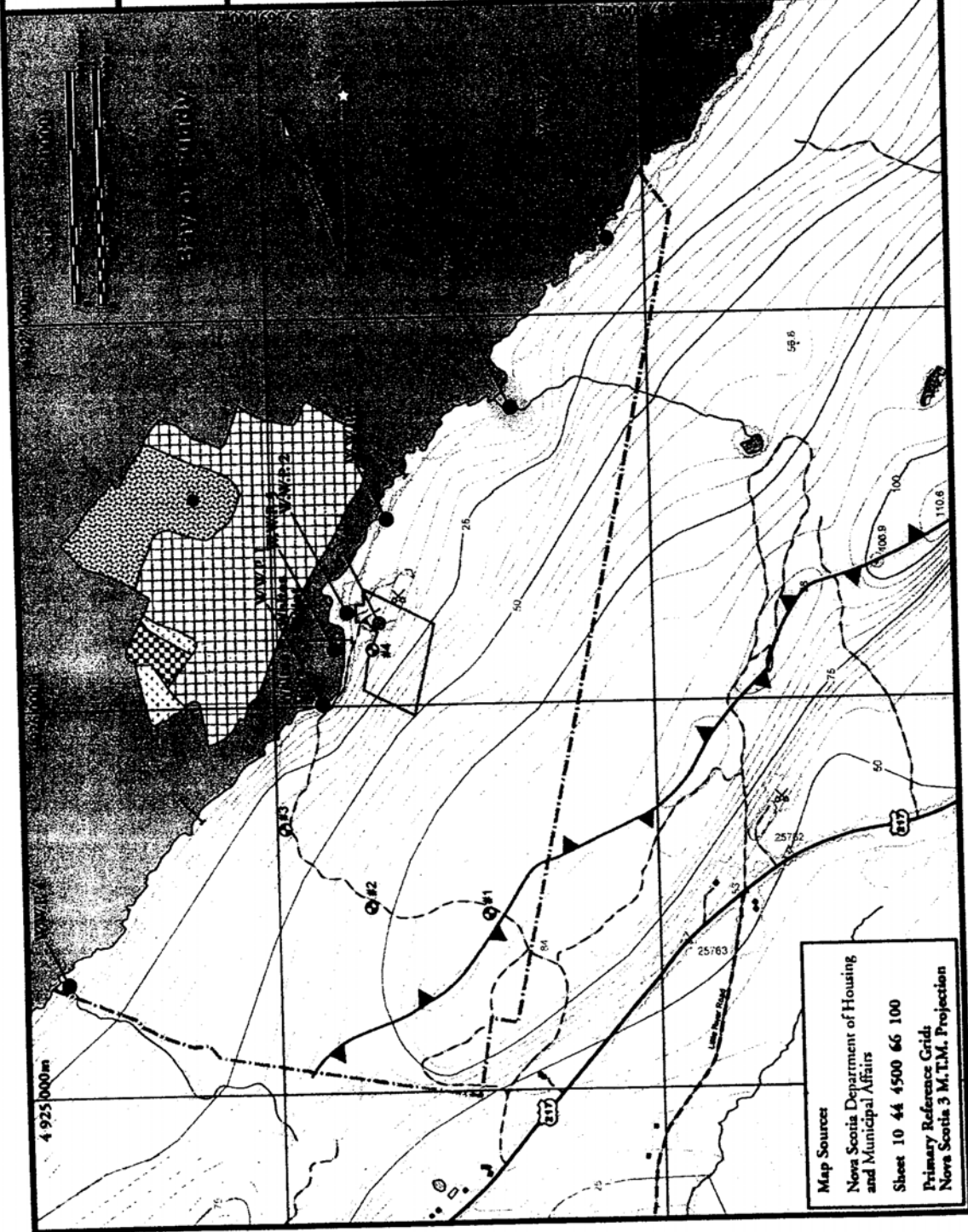
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- Gravel Road
- Property Line
- Coastal Bog
- Intermittent Watercourse
- W.W.P. # - Water Sample Station
- Watershed Divide
- S.W.P. - Soil Sample Location
- Bore Hole Location
- Near Shore Habitat & Surficial Geology
- Bedrock
- Thin Veneer of Sand Overlying Bedrock
- Concentrated Boulders
- Surficial Sediments
- Fish Habitat Compensation Area

Source of Information:
 Canadian Seabed Research Ltd. June 2002
 Link, John, B.Sc. Geol. Eng. - M. Sc. Geo.,
 "Whites Cove Geological Assessment" Dec. 2002

Produced for: Bilcon of Nova Scotia Corporation
 Fish Habitat Compensation Plan

Physical Resources
 Map 3 - FHCP

Graphic Design by Mark Huser, Bay View, N.S.
 Houston & Kern



Map Source
 Nova Scotia Department of Housing
 and Municipal Affairs
 Sheet 10 44 4500 66 100
 Primary Reference Grid:
 Nova Scotia 3 M.T.M. Projection

Whites Point Quarry
Little River, Digby County
Nova Scotia

**Environmental Assessment/
Impact Statement**

- Legend**
- Highway 217
 - - - Gravel Road
 - · - · Property Line

Produced for Bilcon of Nova Scotia Corporation

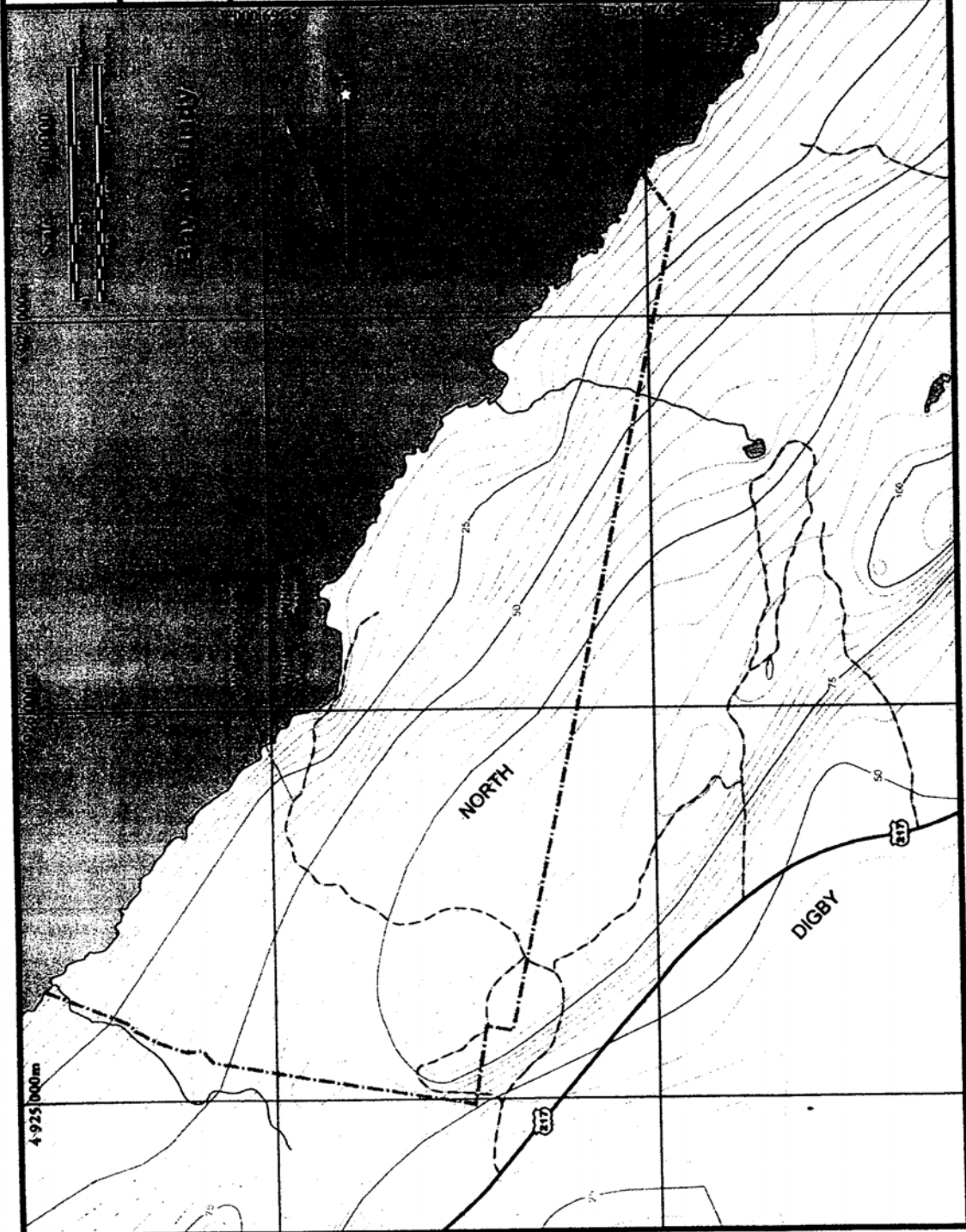
Fish Habitat Compensation Plan

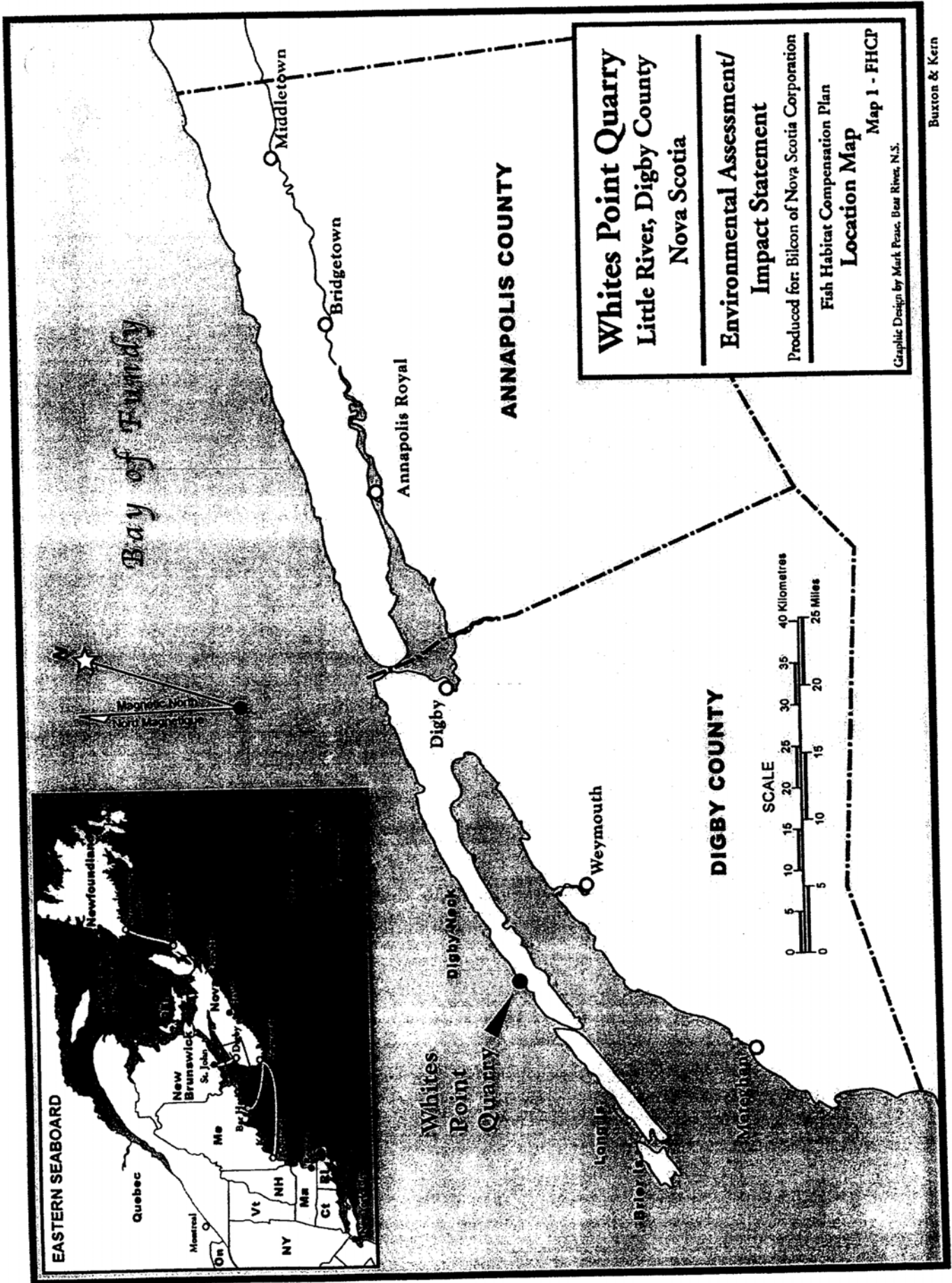
Topographic

Map 2A - FHCP

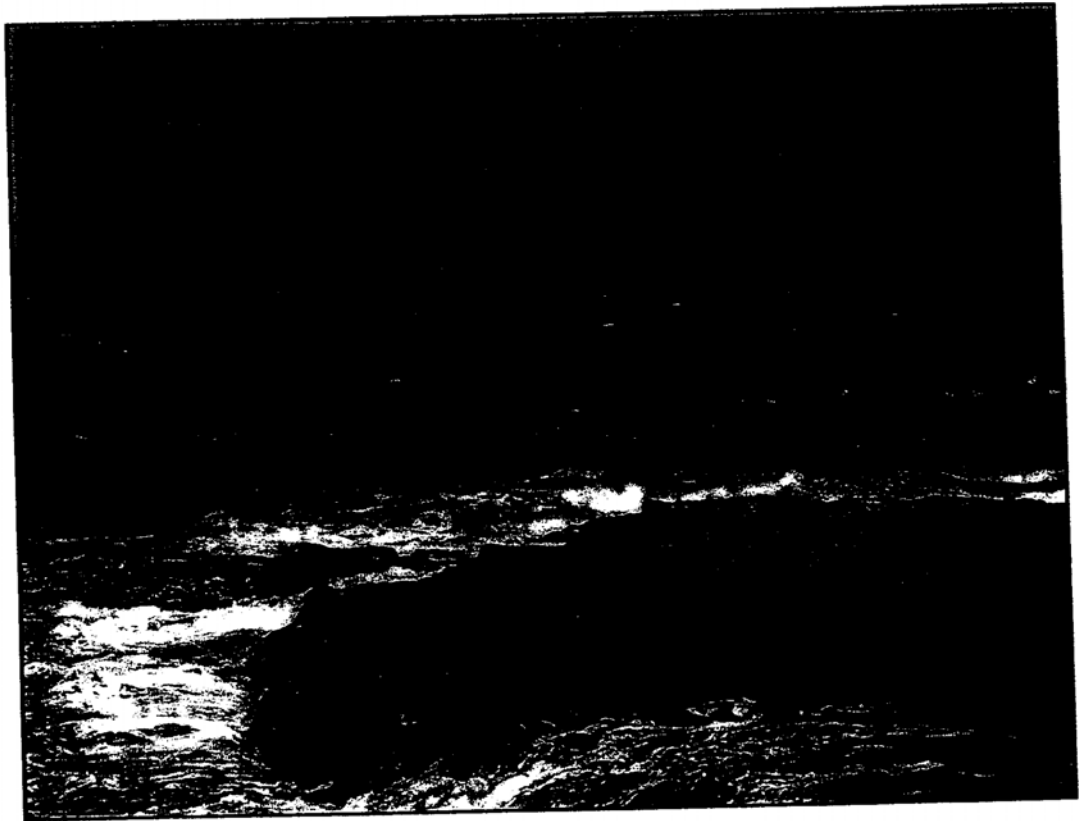
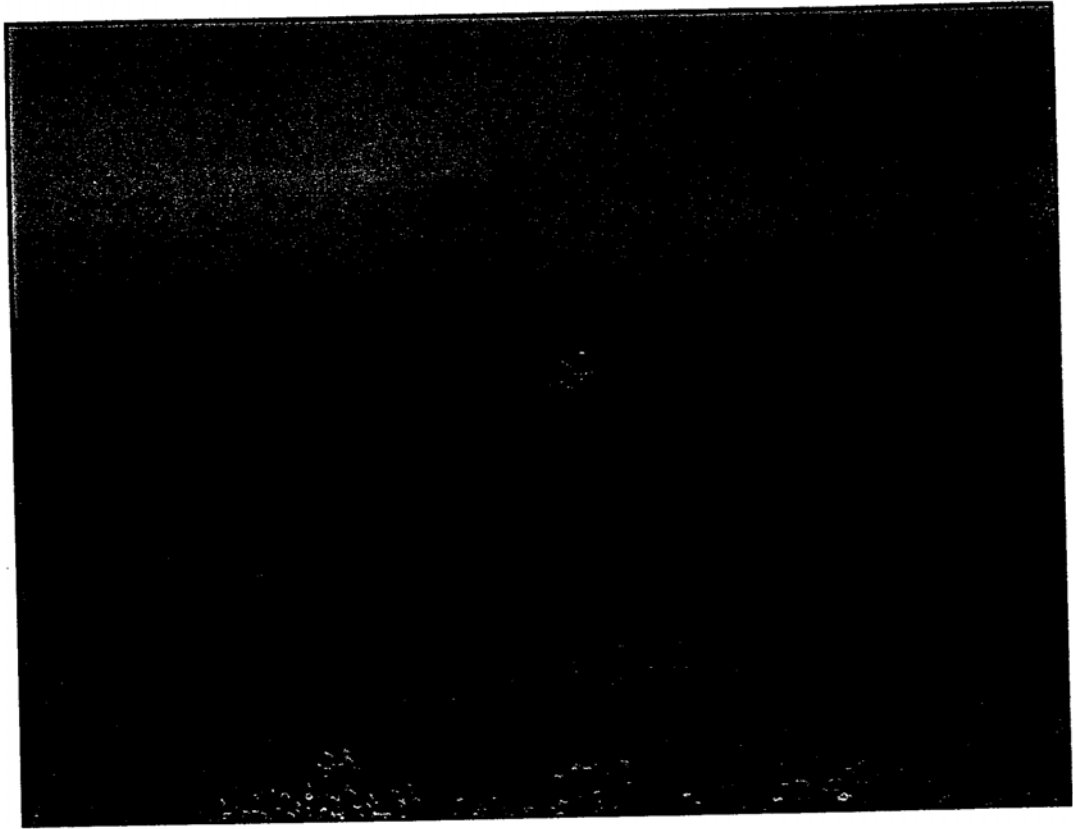
Graphic Design by Matt Thoms, Bear River N.S.

Burston & Kern





Buxton & Kern



**Whites Point Quarry
Little River, Digby County
Nova Scotia**

**Environmental Assessment/
Impact Statement**

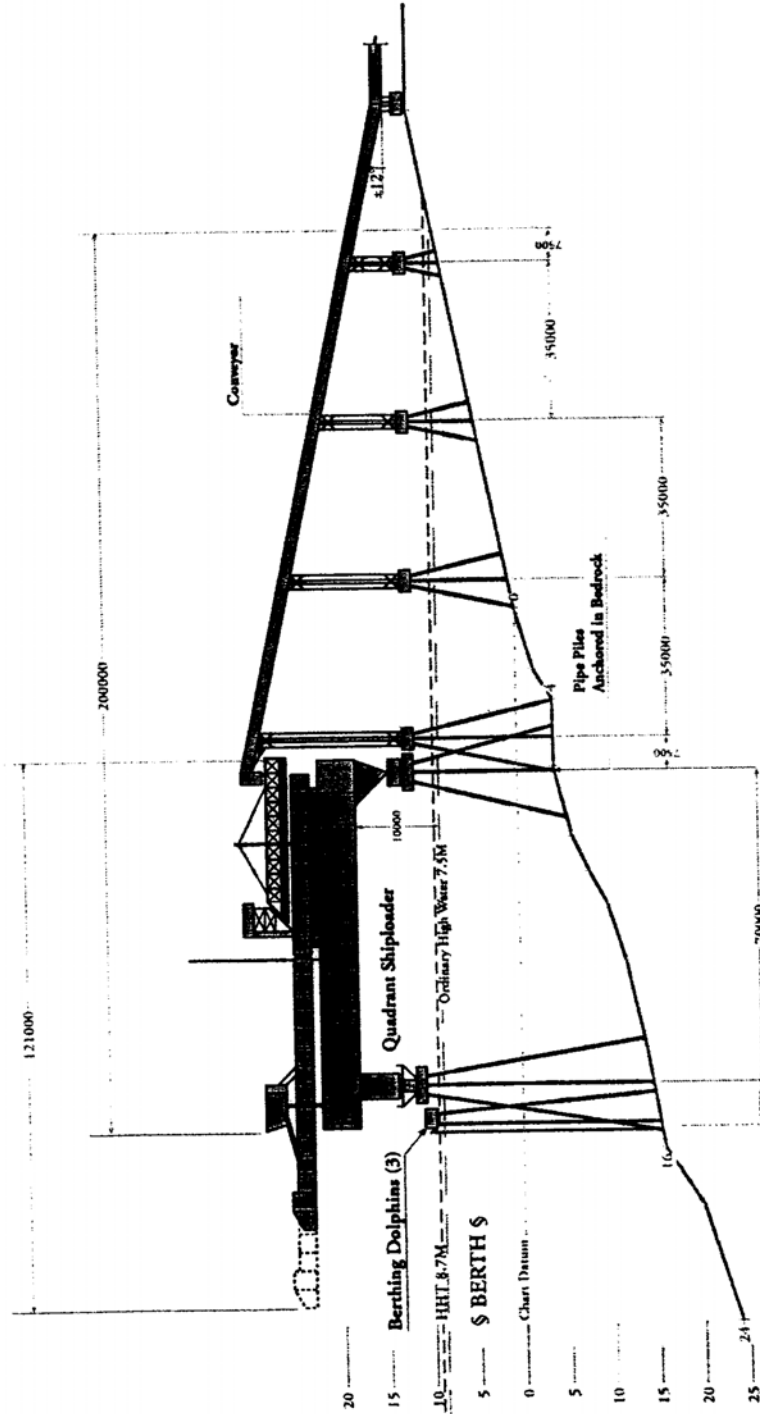
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Fish Habitat Compensation Plan

**Marine Terminal
Elevation**

Figure 3 - FHCP
Graphic Design by Mark Power, Bear River, N.S.

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Whites Point Quarry
Little River, Digby County
Nova Scotia

**Environmental Assessment/
 Impact Statement**

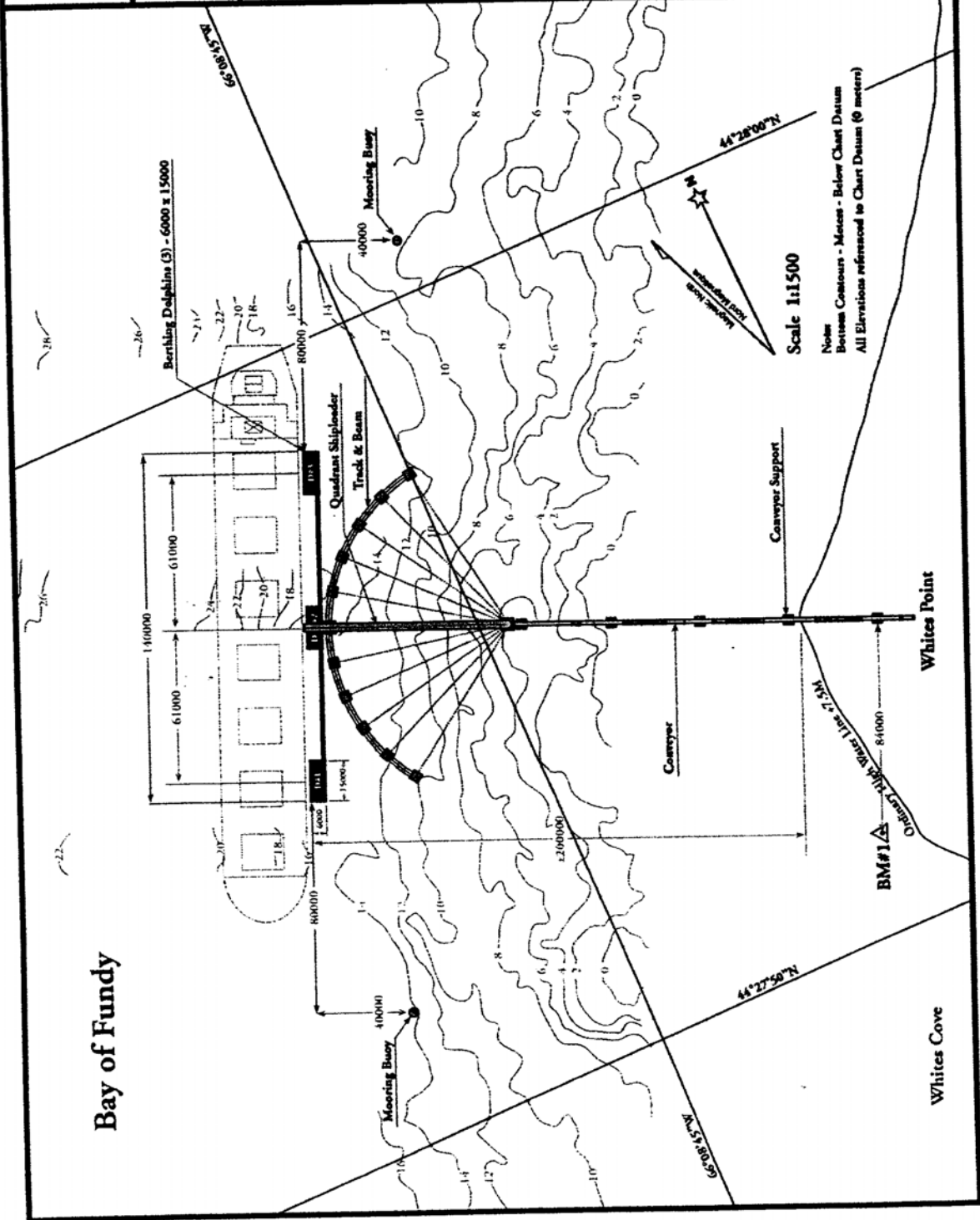
Legend

- △ BenchMark # 1, Elevation 9.5M
 44°27'55"N 66°08'56"W
- D#1, D#2, D#3, - Berthing Dolphins

Produced for: Bilcon of Nova Scotia Corporation

Fish Habitat Compensation Plan
Marine Terminal
Plan

Figure 2 - FHCP
 Capital Design by Mull Thum Bear River N.S.
 Houston & Kern



Whites Point Quarry
 Little River, Digby County
 Nova Scotia

**Environmental Assessment/
 Impact Statement**

- Legend**
- Environmental Preservation Zone
 - Existing Contour Lines
 - Permanent Drainage Channel
 - Temporary Drainage Channel
 - Conserved Wetland
 - Reforestation - Wildlife Plantings
 - Grass - Legumes
 - Private Land

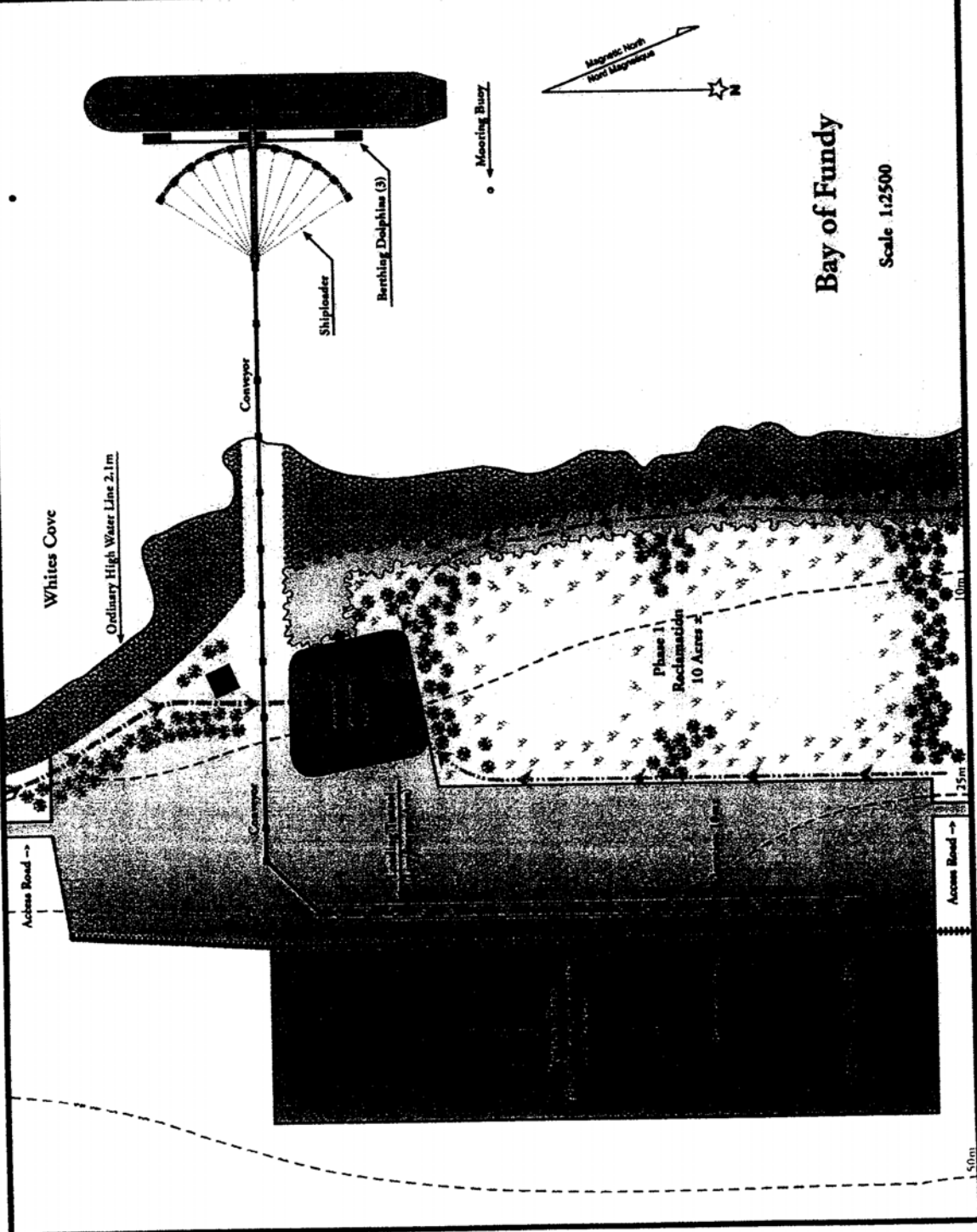
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Fish Habitat Compensation Plan

**Quarry Infrastructure
 Plan**

Figure 1 - FHCP

Graphic Design by Mark New, Bar River, N.S.
 Buxton & Kern



**Whites Point Quarry
Little River, Digby County
Nova Scotia**

**Environmental Assessment/
Impact Statement**

Legend

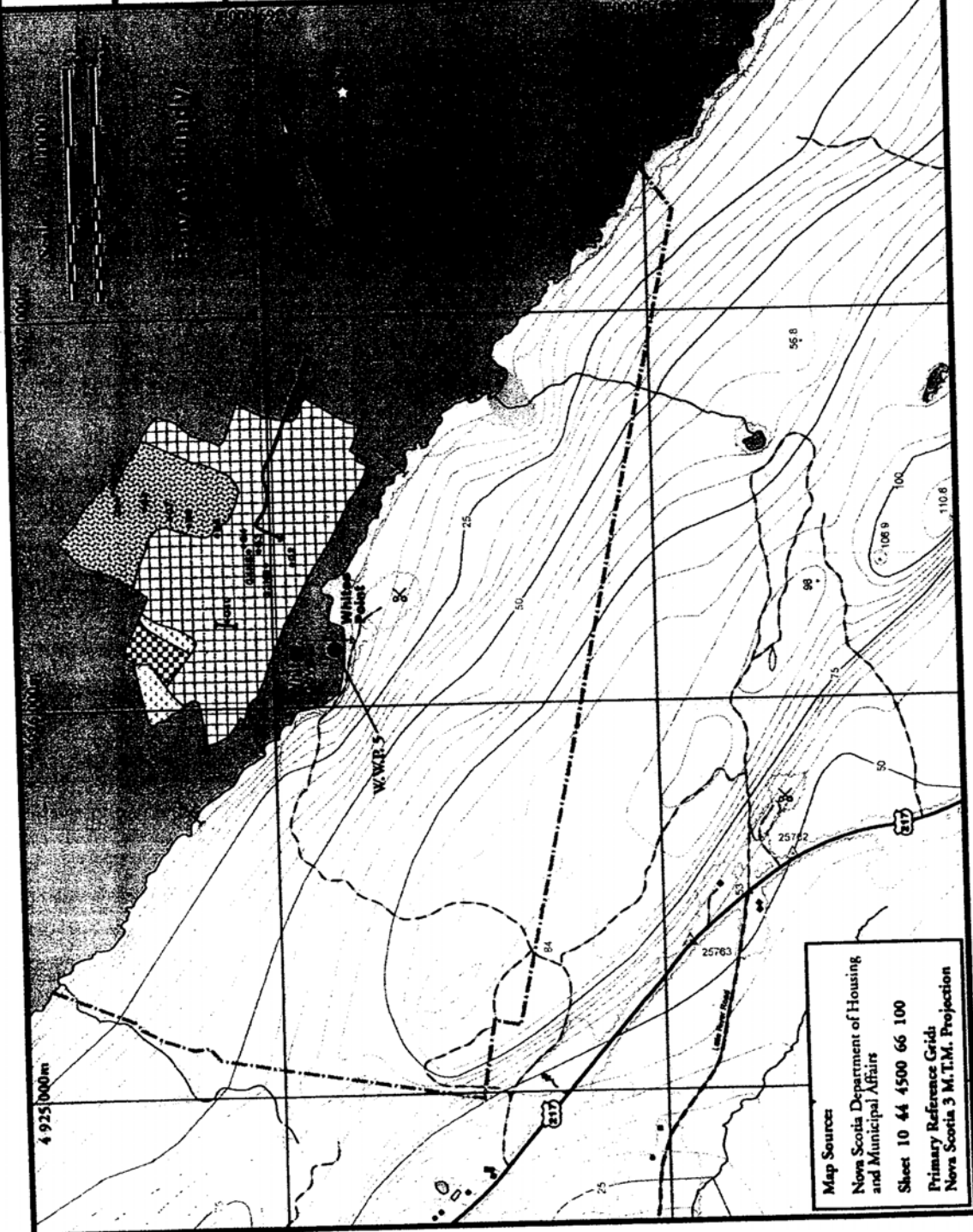
- Highway 217
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- ~ Intermittent Watercourse
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- · - · Intertidal Transects
- · - · Near Shore Habitat & Surficial Geology
- ▬ Bedrock
- ▬ Thin Veneer of Sand Overlaying Bedrock
- ▬ Concentrated Boulders
- ▬ Surficial Sediments
- ⊙ Bottom Grab Sample Location
- ⊙ Video Transect

Source of Information:
Brylinski, Michael, Ph.D. "Results of a Survey of
the Intertidal Marine Habitat and Communities
at a Proposed Quarry Site Located in the Vicinity
of Whites Cove, Digby Neck, Nova Scotia" 30
June 2002
Canadian Seabed Research Ltd., June 2002

Produced for: Bilcon of Nova Scotia Corporation

**Fish Habitat Compensation Plan
Aquatic Ecology
Marine
Map 9 - FHCP**

Graphic Design by Mark Thorne, Bore River, N.S.
Buxton & Kern



Map Sources:
Nova Scotia Department of Housing
and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

Whites Point Quarry
Little River, Digby County
Nova Scotia

**Environmental Assessment/
Impact Statement**

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Fish Habitat Compensation Plan

**Aerial Photo with
Property Line**

Map 2B - FHCP

Graphic Design by Mark Pease, Bear River, N.S.

S.W. CORNER 01306 71 L-21 01-07-29 21B/6 1:10 000

Buxton & Kern