

9.3.1 Heritage Resources

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3

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The site has 1.9 miles of coastline not 9 miles; distances should be reported in kilometres. (see Pg10, Paragraph 1).

RESPONSE

Comment noted.

Provide a current resume for the Archaeologist, Charles R. Watrall, Ph.D.

RESPONSE

Please refer to Appendix 1 in this section.

9.3.1.2 Analysis (Pg13, Paragraph 1) – Provide the personal communication between the Proponent and Robbie Bennett of Canadian Seabed Research Ltd.

RESPONSE

Please refer to Appendix 2 in this section.

9.3.1.3 Mitigation – The consultant, Gordon Fader (Reference Documents V.3 Tab 14, Pg11), states that “to prevent potential future damage or disturbance to the seabed of the large ridge trending east west adjacent to Sandy Cove north of the proposed marine terminal construction site, shipping routes will be positioned to avoid passage over the area. This will reduce unnecessary disturbance of the area and reduce the possibility of contact with the seabed from anchoring” Clarify whether the Proponent commits to this mitigation measure.

RESPONSE

Bilcon commits to positioning the shipping routes to avoid passage over the large ridge trending east west adjacent to Sandy Cove and north of the proposed marine terminal construction site. Please refer to Map SR-1 in Section 2 – Maps in this document.

WP 1641 Nova Scotia Tourism, Culture and Heritage

Marine Archaeology

The areas of concern for marine archaeology are marine shipwrecks and submerged First Nations archaeological sites.

The one recorded shipwreck in the area is the Newfield, and 1871 vessel wrecked in the Whites Cove area on September 22, 1900. Documentary research indicates that the wreck was salvaged and removed from the location shortly after the wreck event. Side scan marine survey failed to locate any other shipwrecks.

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The other marine archaeological resource consideration based on the accidental find of a Middle Archaic period, i.e., not Palaeo-Indian period, ulu (slate knife). This find is significant and the report presents a credible assessment of the past shoreline geography.

The department concurs with the mitigation recommendation to do a marine archaeology survey of the near-shore marine bottom. The survey must be conducted by a qualified marine archaeologist holding a heritage research permit through the Nova Scotia Special Places Protection Act.

RESPONSE

Comment noted. Bilcon acknowledges that the survey must be conducted by a qualified marine archaeologist holding a Heritage Research Permit through the *Nova Scotia Special Places Protection Act*.

Land Archaeology

Land archaeological assessment followed the identification of six zones of interest. The assessment strategy resulted in the recording of the Hersey House. No other archaeological resources were found.

*The major mitigation recommendation is to ensure monitoring within a 250 metre zone around the Hersey House. The size of this zone reflects the possibility of family related gravesites in this vicinity. The department suggests that a statement be added to the recommendation that the monitoring must be undertaken by a qualified archaeologist holding a heritage research permit through the *Special Places Protection Act*.*

A general recommendation for archaeological sensitivity training prior to construction is also endorsed. The department recommends further that the outline of this training be reviewed by Nova Scotia Museum archaeology staff.

RESPONSE

Bilcon intends to consult the Department with respect to the training program and will submit the outline of the program for review by Nova Scotia Museum archaeology staff.

9.3.1 Heritage Resources

Appendix 1

CV for Dr. Charles Watrall

Appendix 2

Personal Communication between Bilcon and Robbie Bennett of Canadian Seabed Research Ltd.

CURRICULUM VITAE

NAME Charles R. Watrall
BIRTHPLACE New York City, New York
DATE OF BIRTH January 1, 1944

CURRENT ADDRESS P.O. Box 446
Bridgetown, N.S. B0S 1C0

PHONE 902 665 4164

CURRENT APPOINTMENT Associate Professor, Department of Anthropology,
University of Regina, Saskatchewan,
Retired.

APPOINTMENTS

January – June 1992 Acting Head, Department of Anthropology

1986 – 1991 Instructor. Introduction to Silver-smithing,
Neil Balkwell Civic Arts Centre.

Summer 1983 – 1991 Summer Instructor. Nipissing University College,
North Bay, Ontario

1976 Associate Professor, University of Regina

Summer 1976 Instructor. University of Brandon

1978 -79 Post Doctoral Research Associate
Anthropology Department, University of Minnesota

1973 Assistant Professor, University of Regina

1971 Special Lecture, University of Regina

1971 Instructor. Lakewood Jr. College, White Bear, Minnesota

1970 Instructor. Macalaster College, St. Paul, Minnesota

1968 Instructor. Extension Division, University of Minnesota

1965 Teaching Assistantship. University of Minnesota

EDUCATION

1961 – 1965 Hunter College of the City University of New York.
1965 – 1970 University of Minnesota – Resident.
1970 – 1976 University of Minnesota – Thesis only.

DEGREES

1965 B.A., Anthropology, Hunter College.
1968 M.A., Anthropology, University of Minnesota.
1970 Ph.D., Candidate, Anthropology, University of Minnesota.
1976 Ph.D., Conferred, University of Minnesota.

AWARDS

1961 – 1965 New York State Regents College Scholarship.
1983 Transportation Funding, President's Fund,
University of Regina.

FIELDWORK

1963 – 1964 Three weeks part-time archaeological excavation on
Several Woodland sites in New Jersey and one Archaic – Early
Woodland site in western coastal Long Island.

Summer 1965 Eight weeks field experience in Posey Co., Indiana, on the
Mann Site, a Middle Woodland-Middle Mississippian
habitation site. Excavation under the direction of Dr. James H.
Kellar, Anthropology Department, University of Indiana

Summer 1965 Eight weeks excavation on the Orwell Site, Otter Tail
County, Minnesota, under the direction of Dr. Elden Johnson,
Anthropology Department, University of Minnesota.

FIELDWORK cont

- Three weeks archaeological site survey, Grant County, Minnesota, after completion of excavation on the Orwell Site.
- Summer 1966 Six weeks excavation as Archaeological Field Assistant on the Cooper Site (21-ML-9), a Late Woodland-Early Historic habitation site in Mille Lacs County, Minnesota, under the direction of Prof. Elden Johnson, Anthropology Department, University of Minnesota.
- Summer 1967 Twelve weeks excavation as Field Director in charge of archaeological operations at Fort Snelling, Hennepin County, Minnesota. This project consisted of the total excavation of refuse material in the Hexagonal Tower and in the determination of the foundation location of one other large building of this 1829's stone fort.
- Summer 1968 Four months Project Director of the Minnesota Highway Archaeological Reconnaissance Program. This project consisted of the initial formulation of a program of archaeological survey of proposed State and Federal Highway construction projects.
- October '68 – July '69 Part-time appointment as Project Archaeologist, Minnesota Highway Archaeological Reconnaissance Program.
- Summer 1969 Archaeological survey conducted in Savanna River Portage State Park, Aitkin County, Minnesota. Recommendations made for preservation, reconstruction, and constructional activities within the Park.
- June 1969 Project Director, Minnesota Highway Archaeological Reconnaissance Program.
- July – August 1969 Archaeological Field Director, University of Minnesota Archaeological project. Excavation of a Middle and Late Woodland habitation site, the Maplewood Site, Otter Tail County, Minnesota. Archaeological survey conducted in the surrounding area to provide data for regional chronological interpretations.
- July '70 – Fall '73 Intermittent archaeological survey on prehistoric sites in southern Saskatchewan. Such surveys will form the basis for future research on cultural adaptation to ecotone ecologies.

FIELDWORK cont

- February 2-13, 1972 Anthropology consultant for proposed Department of Northern Affairs in Saskatchewan under the direction of Mr. Ted Bowerman. Observations made in a variety of Chipewyan, Cree and Métis communities (Walliston Lake, Paturnak, etc.). Responsibilities consisted of acting in an advisory capacity only.
- 1974 Saskatchewan Timber Harvesting Project Archaeological Component Phase I – Short-term field study of proposed timbering areas in Northern Saskatchewan and timbering methodology. Initial report on archaeological component Phase I submitted to Saskatchewan Department of the Environment through Schultz International Co., British Columbia.
- Summer 1975 Director, Saskatchewan Timber Harvesting Project Archaeological component – Environmental impact study in proposed clear-cut timber harvesting project. Final report submitted to Saskatchewan Department of the Environment through Schultz International Co., British Columbia.
- Summer 1976 Six weeks intensive excavation at the Stott Site, southwest Manitoba, as Field Director for Brandon University, Department of Anthropology and Sociology, for “Field Methods in Archaeology”. Continued analysis and involvement with the results derived from this Blackduck phase village site will be utilized as evidence for a generic interpretation of Plains Periphery prehistoric adaptation patterns.
- Summer 1977 Six weeks investigation of Lake Midden Site (EfNg-1), a Late Prehistoric bison processing, fall-winter habitation site near Bulyea Saskatchewan. Initial investigations begun under “Qu’Appelle Basin Archaeological Project” title at the Lake Midden Site included establishment of datum and grid, initial test excavations, soil sampling, botanical inventory, and initial areal survey. Photographic documentation of ceramic materials from the Lake Midden Site in the collections of the National Museum of Canada was also completed during this initial investigation period.

FIELDWORK cont

- Summer 1978 Six weeks investigation at a variety of southern Saskatchewan sites (i.e. Medicine Wheels, Teepee Rings, Habitation Sites, etc.). These investigations will be conducted in conjunction with a class: Introduction to Field Methods in Archaeology (Anthropology 399). A portion of this class will be spent with continuing excavations at the Lake Midden Site.
- Summer 1981 Touchwood Hills, Provincial Park, Saskatchewan Archaeological Impact Study. Duration one week.
- Summer 1981 Bar G Ranch Project, White City, Saskatchewan Archaeological Impact Study. Duration one week.
- Spring 1982 Dallas Valley Ranch Project. Archaeological Impact Study near Lumsden, Saskatchewan. Duration one week.
- Summer 1982 Ducks Unlimited Saskatchewan Archaeological Impact Studies
1) Neale-Edmonds Basin Lloydminster; 2) Dumas, Saskatchewan. Project A and B; 3) Wellington Marshes. Duration four weeks.
- Summer 1990 Archaeological Survey of Iron Island Lake Nipissing, Ontario. Duration 2 days.

PAPERS

- November 1966 "Site 21-ML-9, A Late Woodland-Early Historic Site in Mille Lacs County, Minnesota", 24th Plains Conference, Lincoln, Nebraska.
- April 1967 "Deer and the Buffer Zone in the Late Prehistoric Period in Minnesota", Minnesota Academy of Science Annual Meeting.
- Spring 1968 "Analysis of the Unmodified Stone Materials from the Cambria Site", Minnesota Academy of Science Annual Meeting.
- Fall 1969 "Preliminary Report on the Maplewood Site", Council for Minnesota Archaeology Annual Meeting.

PAPERS cont

- Fall 1970 Chairman, Council for Minnesota Archaeology Meeting.
- Spring 1972 "Physical Anthropology and Archaeology", Annual Meeting, Regina Archaeological Society.
- Spring 1973 "The Social Consequences of Early Food Production", Biology Department Colloquia, University of Regina.
- Spring 1974 "The Arts of the Japanese Sword", Opening Address for exhibit (same title), Norman MacKenzie Art Gallery, Regina.
- Spring 1975 "Prehistoric Adaptation Strategies in the Ecotone Regina of West Central Minnesota", University of Regina Anthropological Mini-Conference (also Conference Chairman).
- Spring 1976 "Archaeological Survey of Northern Saskatchewan", Annual Meeting of Regina Archaeological Society.
- Fall 1976 "Implications of Ecotone Adaptations Strategies in the North-East Plains Periphery Region", Plains Conference.
- Fall 1976 "The 1976 Field Season at the Stott Site" Annual Meeting of Professional Archaeologists of Manitoba.
- Fall 1977 "Qu'Appelle Basin Archaeological Project: Initial Investigations at the Lake Midden Site", Qu'Appelle Basin Citizens Advisory Board.
- Fall 1977 Participant, Northern Plains Ceramic Symposium - Lake Midden Ceramics. Plains Conference, Lincoln, Nebraska.
- Spring 1978 "Recent Investigations at the Lake Midden Site", Regina Archaeology Society.
- Spring 1978 "Recent Investigations at the Lake Midden Site", Annual Meeting, Saskatchewan Archaeological Society, Saskatoon, Saskatchewan.
- Spring 1979 "Mimbres Pottery", University of Minnesota Fine Arts Gallery, Minneapolis.

PAPERS cont

- Fall 1980 "Namban Kodogu", Annual Meeting, Midwest Token Society, Milwaukee, Wisconsin.
- Spring 1981 "The Japanese: A View From the Prairie", Western Association Sociologists and Anthropologists, Winnipeg, Manitoba.
- Fall 1981 Namban Kodogu: Further Researches on the Kodogu of Higo and Hizen Provinces – Joint meeting Japanese Sword Society of United States and Token Study Group.
- Spring 1982 A Structural Comparison of the Maplewood, Stott and Lake Midden Sites. Solicited paper UNIC III Conference March 1982, University of Minnesota.
- Spring 1982 Ceramics in Their Social Context: Banff School of Fine Arts Workshop. Three day solicited workshop. Banff School, Banff, Alberta.
- Fall 1982 Southern Iron: Social and Economic Factors of Kyushu Affecting Kodogu Production During the Momomaya and Early Edo Periods. Joint JSSUS/Token Study Group Annual Meeting, Chicago, Illinois.
- Fall 1982 Southern Iron: Joint Coordinator Kyushu Kodogu Exhibit joint JSSUS-Token Study Group Annual Meeting.
- November 1983 "Mimbres Pottery from the Galaz Site, N. Mexico; A Community Assessment" Chocmool Conference, University of Calgary.
- August 1983 "Mimbres Pottery from the Galaz Site", Artsperience Ceramic Workshop, Canador College, North Bay, Ontario.
- August 1984 "Namban Kodogu", Nipissing College University
- August 1984 "Anthropology and Art", Radio Interview, North Bay, Ontario.

PAPERS cont

- October 1984 "Introduction to Japanese Pottery", Art Education Dept., University of Regina.
- 1984 "Public Interpretation of the Anthropology Community", WASA Conference, Opening lecture, Regina, Saskatchewan.
- 1984 "Anthropology and the Concept of Culture", Regina Police College, University of Regina (4 hour lecture).
- Fall 1990 "Anthropology and the Concept of Culture", Regina Police College, University of Regina (4 hour lecture).
- Fall 1990 "Prehistoric Dakota Culture", Saskatchewan and Early Historic, Saskatchewan Indian Federated College (4 hour lecture).
- Winter 1991 "Anthropology and the Concept of Culture", Regina Police College, University of Regina (4 hour lecture).

PUBLICATIONS AND REPORTS

- 1966 A Late Woodland-Early Historic Site in Mille Lacs County, Minnesota Archaeological Newsletter Nos. 10-11, Minneapolis, Minnesota.
- 1967 A Late Woodland-Early Historic Site in Mille Lacs County, Minnesota. Plains Anthropologist 12-36, Lincoln, Nebraska.
- 1968a Virginia Deer and the Buffer Zone in the Late Prehistoric-Early Protohistoric Periods in Minnesota. Plains Anthropologist 13-40, Lincoln, Nebraska.
- 1968b Analysis of the Bone, Stone and Shell Materials from the Cambria Focus. Unpublished M.A. Thesis, Department of Anthropology, University of Minnesota.
- 1968c Analysis of Unmodified Stone Materials from the Cambria Site. Journal of the Minnesota Academy of Science, Vol. 35(1), Minneapolis, Minnesota.

PUBLICATIONS AND REPORTS cont

- 1969a Final Report of the Commissioner 1968-69 for the Minnesota Highway Archaeological Reconnaissance Program. Printed by the Minnesota Historical Society for distribution to highway departments with Archaeological salvage programs in the U.S.
- 1969b Highway Archaeological Reconnaissance Program 1968-69. Archaeological Survey, Savanna River, Portage State Park, 1969, Minnesota Archaeological Newsletter, Minneapolis, Minnesota.
- 1974a "The Arts of the Japanese Sword", Exhibition Catalogue, Norman MacKenzie Art Gallery, Regina, Saskatchewan.
- 1974b Subsistence Pattern Change at the Cambria Site – A Review and Hypothesis. In: Aspects of Upper Great Lakes Anthropology – Papers in Honour of Lloyd A. Wilford, Minnesota Prehistoric Archaeology Series, Minnesota Historical Society.
- 1975a Introductory Remarks, Conference Schedule, University of Regina Anthropological Mini-Conference.
- 1975b Recent Activities of the Anthropology Department, University of Regina, Saskatchewan Archaeological Newsletter.
- 1975c Initial Report, Saskatchewan Timber Harvesting Project Phase I – Manuscript submitted to Saskatchewan Department of the Environment.
- 1976a Final Report – Saskatchewan Timber Harvesting Project, Archaeological Component Phase II – Manuscript submitted to Saskatchewan Department of the Environment.
- 1976b Ecotones and Environmental Adaptation Strategies in the Prehistory of North Western Minnesota. Unpublished Ph.D. Thesis, Department of Anthropology, University of Minnesota

PUBLICATIONS AND REPORTS cont

- 1976c Implication of Ecotone Adaptation Strategies in the North East Plains Periphery Region, Plains Conference Abstracts 1976.
- 1976d Abstract – The 1976 Field Season of the Stott Site – Archae Facts, Journal of the Archaeological Society of South West Manitoba.
- 1976e A Note on the Souris Gravels. Archae Facts: Journal of the Archaeological Society of South-Western Manitoba, Vol. 4(2), Brandon, Manitoba.
- 1976f The Stott Site: 1976 Field Report. Archae Facts: Journal of the Archaeological Society of South-Western Manitoba, Vol. 4(2), Brandon, Manitoba.
- 1977a Lorraine Malach: Saskatchewan Muralist. Arts West, Vol. 2(4), Calgary, Alberta.
- 1977b Randy Woolsey, Potter. Arts West, Vol. 2(5), Calgary, Alberta.
- 1978 A Note on the Japanese Spearhead From the Ruins of the Government Museum at Nagasaki. Central States Archaeological Journal, Missouri.
- 1979a Photo credits “Ezo Fittings Part I”, Bushido, Vol. I (1), July 1979.
- 1979b Photo credits “Ezo Fittings Part II”, Bushido, Vol.I (2)
- 1979c Lake Midden Preliminary Report – Prepared for Saskatchewan Department of Culture and Youth.
- 1980a Lake Midden Site Preliminary Report. Saskatchewan Archaeologist.
- 1980b Review: Kodogu Exhibit, Dunlop Gallery, Regina, Saskatchewan. Bushido, Vol. II.
- 1980c “Corn Ezo Menuki: a Commentary”. Bushido.

- 1981a Archaeological Impact Study: Touchwood Hills Provincial Park, Saskatchewan. Report submitted to Saskatchewan Department of Highways and Saskatchewan Department of Culture and Youth, Heritage Division.
- 1981b Archaeological Impact Study: Bar G Ranch Estates. Report submitted to Saskatchewan Department of Culture and Youth, Heritage Division.
- 1982a Archaeological Impact Study: Dallas Valley Ranch Project. Report submitted to Saskatchewan Department of Culture, Heritage Division.
- 1982b Archaeological Impact Study: Neale-Edmonds Basin, Lloydminster, Saskatchewan. Report prepared for Ducks Unlimited Saskatchewan. Submitted to Saskatchewan Department of Culture, Heritage Division.
- 1982c Archaeological Impact Study: Dumas Saskatchewan Project A and B. Report prepared for Ducks Unlimited Saskatchewan. Submitted to Saskatchewan Department of Culture, Heritage Division.
- 1982d Archaeological Impact Study: Wellington Marshes. Report prepared for Ducks Unlimited Saskatchewan. Submitted to Saskatchewan Department of Culture, Heritage Division.
- 1983 "Mimbres Pottery from the Galaz Site, N. Mexico; A Community Assessment", Chocmool Conference Abstracts, University of Calgary.
- 1983 / 85 "A Structural Comparison of the Maplewood, Stott, and Lake Midden Sites", UNIC III Conference, University of Minnesota. Reprints in Anthropology, Vol.31, J. and L. Reprint Co. Lincoln, Neb. (original publication, not reprint).
- 1990 "Environmental Impact Statement: A Brief Archaeological Survey of Iron Island, Lake Nipissing, Ontario.

PAPERS AND PUBLICATIONS IN PREPARATION AND ONGOING RESEARCH PROJECTS

- Revision of "Ecotone Adaptation Strategies"
- Analysis of Fish Scales from the Maplewood and Stott Sites
- A note on Blackduck Double Mouth Mortuary Vessels
- A Reconstructed Ceramic Vessel from the Maplewood Site
- Re-Analysis of the Non-Ceramic Materials from the Cambria Site
- Analysis of Japanese Swords and Sword Fittings of Higo Province.
- In Preparation – A Note on Some Brief Investigations and Lithic Analysis at the Gompf Site
- Analysis of Mimbres pottery from the Galaz Site
- Bibliography of Oriental Ceramics published in European Languages

MAJOR RESEARCH INTERESTS AND AREAS OF EXPERTISE

- Ecological Analysis of Human Adaptation Patterns – ecological and subsistence pattern changes and their relationships to levels of socio-cultural integration, social stratification, craft and vocational specialization, etc.
- Ethnology and Archaeology of North America – especially Plains, Plains Periphery and North Eastern North America. Emphasis on analysis and theoretical frameworks of archaeological materials derived from ecotone environments, i.e., transitional ecotones in Wisconsin, Minnesota, Manitoba and Saskatchewan.
- Ethnology and Prehistory of Japan and China.
- North American Lithic Technology
- Ceramic Technology – North American and Far Eastern Focus
- Contemporary North American and Asian Studio and Folk Ceramics and Arts and Crafts.
- Ethnobotany: especially non-subsistence plant exploitation.
- Research Methodology.

SPECIAL SKILLS

- Ceramic Technology and Analysis
- Archaeological Faunal Analysis
- Geology – especially Paleontology

CONSULTATION ACTIVITY

- See Fieldwork Activities, February 1972, consultation duties for Department of Northern Saskatchewan.
- Fall 1972 – Member of Yoyogi Museum of Tokoyo KBTHK Cultural Attribution Board (Shinsa).
- Consultation on a continuing basis with Museum of Natural History, Regina, Saskatchewan, concerning both display and research activities.
- Consultation activities initiated Fall 1973 with Wild Animal Park, Moose Jaw, Saskatchewan. Consultative activities concerning acquisition, care and display of various primate species.
- Archaeological Consultant – Minnesota Historical Society / Minnesota Highway
- Department Consultation for Identification and Appraisal of Asian and North American Archaeological and Ethnographic Materials – Ongoing.
- Research Advisor, Saskatchewan Falconry Association, 1972-73.
- J.A.C. Struthers and Associates, January – June 1973.
- Qu'Appelle Basin Study – Archaeological and Historic Component, 1974-75, Saskatchewan Department of Tourism and Renewable Resources.
- 1975-76 Archaeological Consultant to Saskatchewan Department of the Environment (Subcontract through C.D. Schultz and Co., British Columbia).
- 1976 Consultant to University of Brandon – Stott Site.
- 1977 Director “Qu'Appelle Basin Archaeological Project”.
- 1978 Consultant to Saskatchewan Department of Culture and Youth – assessment contract for Lake Midden Site.

PROFESSIONAL AND PUBLIC SERVICE

- 1983-84 President Elect – Anthropology Section Western Anthropology and Sociology Association
- 1984 WASA - Anthropology Section symposium organizer for WASA annual conference, Regina
- Liaison consulting between Anthropology Department, U of R and Regina Archaeology Society.
- Member Regina Philatelic Society
- Special consultant to RCMP and coroner's office:
 a) identification and analysis of restricted animal parts;
 b) special (forensic and) consultant on autopsy work of coroners department (Fall 1983 – homicide victim analysis).
- Fall 1983 Southern Iron: Joint Coordinator Kyushu Kodogu Exhibit joint JSSUS – Token Study Group Annual Meeting.
- 1986 Anthropology Liaison to Saskatchewan Indian Federated College Health Care Program.
- 1990-91 Anthropology representative to Saskatchewan Indian Federated College – Joint Department Curriculum Development Museology Certificate Program.

PROFESSIONAL AND COMMUNITY ASSOCIATIONS

- Token Kenkyukai Shinsa Conference, Dallas Texas, 1972.
- Ex. Japanese Sword Society of the United States.
- Nihon Bijutsu Token Hozan Kyokai (Society for the Preservation of Japanese Swords).
- Midwest Token Group.
- Saskatchewan Weapons Collector Association.
- Council for Minnesota Archaeology.
- Ex. Society for American Archaeology.
- Sioux Archaeological Society (Honorary Member).
- Ex. Current Anthropological Association.
- Saskatchewan Archaeological Society.
- Plains Anthropological Society.
- University of Regina Faculty Association.
- Ex. Saskatchewan Falconry Association.

PROFESSIONAL AND COMMUNITY ASSOCIATIONS cont

- Regina Archaeological Society.
- Saskatchewan Archaeologists' Professional Group (Founding Member).

DEPARTMENTAL, UNIVERSITY AND COMMUNITY ACTIVITIES

- Social Science Faculty Colloguia, University of Regina, 1971
- "B" Member, Department of Sociology, University of Regina, 1971-72
- Chairman, Committee for Open House Arrangements, University of Regina Anthropology Department 1971.
- Shinsa Cultural Attribution Member, Token Kenkyukai, Dallas, Texas 1972
- Bijutsu Submissions Token KenKyukai, Dallas, Texas, 1972.
- Organizer, gallery exhibit, "The Arts of the Japanese Sword" Norman MacKenzie Art Gallery, Regina, Saskatchewan, 1974
- Participant, Anthropology in Saskatchewan – Conference of Anthropology Departments, University of Regina and University of Saskatchewan, 1974
- Search Committee for Associate Dean of Arts – Anthropology Department member, University of Regina, 1974
- Chairman 1974-75-76, University of Regina Anthropology Department Seminar Colloquium
- Member, Library Committee, 1972-present, Department of Anthropology, University of Regina
- Laboratory Supervisor, 1972-present, Department of Anthropology, University of Regina
- Chairman and Co-ordinator, University of Regina, Anthropological Mini-Conference, 1975
- Alternate Member, Executive Committee, Division of Social Sciences, University of Regina
- Chairman, Anthropology Department Subcommittee on Anthropological Displays, 1974-75
- Member, Faculty of Arts Review Committee, 1977-present
- Saskatchewan Professional Archaeologist Group
 - Founding Member
 - Member, Subcommittee, General Information
 - Member, Subcommittee, Antiquity and Heritage Legislation
- Committee on Admission and Studies, University of Regina, 1979-82

REFERENCES

George W. Arthur
3177 Pearks Road
Victoria, BC V9C 2L7

O. Elden Johnson
Department of Anthropology
University of Minnesota
Minneapolis, Minnesota USA 55455

Roman Brozowski
Dean of Arts
Nipissing University College
North Bay, Ontario

C. Thomas Shay
Department of Anthropology
University of Manitoba
Winnipeg, Manitoba

Leigh Simms
Curator of Anthropology
Museum of Man
Winnipeg, Manitoba

TEACHING EXPERIENCE

Teaching Assistant for Introductory Physical Anthropology and Archaeology (1A) and Introductory Cultural Anthropology (2A) 1965-66, 1966-67, 1967-69, 1969-70 (Total of twelve quarters at the University of Minnesota).

Research Assistant, Fall 1968 – Spring 1969.

University of Minnesota

- Fall 1968 - Anthropology 1A Semester – U of Minnesota
- Spring 1969 - Anthropology 1A Semester – U of Minnesota
- Fall 1969 - Anthropology 1A Semester – U of Minnesota
- Fall 1969 - Anthropology 1A Quarter – U of Minnesota
- Spring 1970 - Anthropology 1A Semester – U of Minnesota
- Spring 1970 - Anthropology 90 (North Archaeology) Semester
- Spring 1970 - Anthropology 2A Quarter
- Fall 1970 - Anthropology 1-001 (Introduction Physical Anthropology and Archaeology) Quarter, U of Minnesota
- Anthropology and Archaeology (Quarter, U of Minnesota)
- Ethnology of North America (Quarter, U of Minnesota)
- Cultural Ecology (Semester, Macalaster College, St. Paul, Minnesota)
- Winter 1971 - Anthropology 1-001 (Quarter, U of Minnesota)
- Introductory Cultural Anthropology (Quarter, Lakewood Jr. College, White Bear, Minnesota)
- Spring 1971 - Cultural Ecology (Semester, Macalaster College)
- Old World Archaeology (Quarter, U of Minnesota)

Department of Anthropology, University of Regina

- Fall 1971 - Anthropology 100 (Introduction of Anthropology)
- Anthropology 250 (Introduction to Physical Anth)
- Spring 1972 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Ethnology of Oceania)
- Anthropology 290 (Reading Class – Ethno-Ornithology)
- Summer 1972 - Anthropology 231 (Ethnology of North America)
- Fall 1972 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 250 (Introduction to Physical Anth)
- Anthropology 390 (Reading Class)
- Spring 1973 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Ethnology of Japan)
- Anthropology 390 (Reading Class, Paleo-ethnology of Australopithecenes)

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ADDENDUM

- Spring 1973 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Ethnology of Japan)
- Anthropology 390 (Reading Class, Paleo-ethnology of Australopithecenes)
- Spring 1973 - Anthropology 100 (Introduction to Anthropology)
Fall 1973 - Anthropology 233 (Ethnology of North America)
- Anthropology 250 (Introduction to Physical Anth)
- Anthropology 391 (Reading Class, Australopithecinae)
- Anthropology 490 (Reading Class, North American Ethnology)
- Spring 1974 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Ethnology of Japan)
- Anthropology 390 (Reading Class)
- Summer 1974 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 250 (Introduction to Physical Anth)
- Anthropology 233 (Ethnology of Oceania)
- Spring 1975 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 322 (Theory and Method in Archaeology)
- Anthropology 304 (Partial Theory in Anthropology)
- Anthropology 490 (Directed Reading Class)
- Summer 1975 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 250 (Introduction to Physical Anth)
- Anthropology 226 (Archaeology of China, Korea, Japan)
- Anthropology 492 (Directed Reading Class)
- Anthropology 496 (Directed Reading Class)
- Anthropology 498 – 499 (Honours Thesis)
- Spring 1976 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 239 (Ethnology of Japan)
- Anthropology 499 (Honours Thesis)
- Summer 1976 - Field Methods in Archaeology – Brandon University
Fall 1976 - Anthropology 250 (Introduction to Physical Anth)
- Anthropology 234 (Introduction to North American Ethnology)
- Anthropology 390 (Reading Class)
- Spring 1976 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Archaeology of Eastern North America)
- Anthropology 250 (Introduction to Physical Anthropology)
- Social Studies 491 (Reading Class)
- Spring 1977 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 232 (Eastern North American Archaeology)
- Anthropology 390 (Reading Class)
- Summer 1977 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 390 (Reading Class)
- Anthropology 397 (Field Methods in Archaeology)

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ADDENDUM

- Fall 1977 - Anthropology 221 (Introduction to Prehistory in the Americas)
- Anthropology 226 (Archaeology of China, Korea, Japan)
- Anthropology 390 (Reading Class)
- Spring 1977 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 239 (Ethnology of Japan)
- Anthropology 390 (Reading Class)
- Spring 1978 - Anthropology 890 (Graduate Reading Class)
- Anthropology 100 (Introduction to Anthropology)
- Anthropology 239 (Ethnology of Japan)
- Anthropology 390 (Reading Class)
- Anthropology 399 (Introduction to Archaeological Field Methods)
- Fall 1979 - Anthropology 208 (Art and Culture)
- Anthropology 250 (Human Evolution and Development)
- Spring 1980 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 239 (Ethnology of Japan)
- Anthropology 390 (Reading Class, Ethnozoology)
- Fall 1980 - Anthropology 208 (Art and Culture)
- Anthropology 226 (Archaeology of China, Korea, Japan)
- Anthropology 391 (Analysis of Prehistoric Fish Remains)
- Anthropology 490 (Reading Class)
- Winter 1981 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 209 (Pre-Industrial Agriculture)
- Anthropology 392 (Reading Class)
- Anthropology 498 (Honours Thesis)
- Fall 1981 - Anthropology 208 (Art and Culture)
- Anthropology 250 (Human Evolution and Development)
- Anthropology 392 (Reading Class)
- Anthropology 499 (Honours Thesis)
- Winter 1982 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 239 (Ethnology of Japan)
- Anthropology 390 (Reading Class)
- Anthropology 490 (Reading Class)
- Anthropology 499 (Honours Thesis)
- Fall 1982 - Anthropology 391 (Reading Class)
- Anthropology 400 (Seminar)
- Anthropology 498 (Honours Thesis)
- Winter 1983 - Anthropology 100 (Introduction to Anthropology)
- Anthropology 208 (Art and Culture)
- Anthropology 499 (Honours Thesis)
- Fall 1983 - Anthropology 208 (Art and Culture)
- Anthropology 250 (Human Evolution)
- Anthropology 390 (Reading Class)
- Anthropology 400 (Seminar)

CURRICULUM VITAE
CHARLES R. WATRALL
PAGE 20
ADDENDUM

- Anthropology 490 (Reading Class)
- Anthropology 498 (Honours Thesis)
- Winter 1984
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 226 (Archaeology of China, Korea, Japan)
 - Anthropology 390 (Reading Class)
 - Anthropology 491 (Reading Class)
 - Anthropology 499 (Honours Thesis)
- Summer 1984
 - Anthropology 397 (Reading Class)
- Fall 1984
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 239 (Ethnology of Japan)
 - Anthropology 392 (Reading Class)
- Winter 1985
 - Anthropology 490 (Reading Class)
 - Anthropology 208 (Art and Culture)
 - Anthropology 322 (Theory & Method in Archaeology)
 - Anthropology 498 (Honours Thesis)
 - Anthropology 499 (Honours Thesis)
- Fall 1985
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 250 (Human Evolution & Development)
 - Anthropology 491 (Reading Class)
 - Anthropology 492 (Reading Class)
 - Anthropology 498 (Honours Thesis)
- Winter 1986
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 208 (Arts and Culture)
 - Anthropology 499 (Honours Thesis)
- Fall 1986
 - Sabbatical Leave
- Winter 1987
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 239 (Tradition Japanese Society)
 - Anthropology 491 (Reading Class)
- Fall 1987
 - Anthropology 208 (Art and Culture)
 - Anthropology 250 (Human Evolution & Development)
 - Anthropology 491 (Reading Class)
- Winter 1988
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 226 (Archaeology of China, Korea, Japan)
 - Anthropology 491 (Reading Class)
 - Anthropology 493 (Reading Class)
- Fall 1988
 - Anthropology 221 (Intro to Prehistory of North America)
 - Anthropology 239 (Traditional Japanese Society)
 - Anthropology 390 (Reading Class)
 - Anthropology 493 (Reading Class)
- Winter 1989
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 209 (Pre-Industrial Agriculture)
 - Anthropology 499 (Honours Thesis)

- Fall 1989
 - Anthropology 208 (Art and Culture)
 - Anthropology 250 (Human Evolution & Development)
 - Anthropology 400 (Seminar)
 - Anthropology 490 (Reading Class)
 - Anthropology 498 (Honours Thesis)
 - Anthropology 499 (Honours Thesis)
- Winter 1990
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 226 (Archaeology of China, Korea, Japan)
 - Anthropology 491 (Reading Class)
 - Anthropology 499 (Honours Thesis)
- Fall 1990
 - Anthropology 239 (Traditional Japanese Society)
 - Anthropology 250 (Human Evolution & Development)
 - Anthropology 390 (Reading Class)
 - Anthropology 498 (Honours Thesis)
- Winter 1991
 - Anthropology 100 (Introduction to Anthropology)
 - Anthropology 208 (Art and Culture)
 - Anthropology 394 (Reading Class)
 - Anthropology 492 (Reading Class)
 - Anthropology 499 (Honours Thesis)
- 1991 – 1999
 - Associate Professor, Anthropology, University of Regina
- 1998 – 1999
 - Taught in Department of History and Department of Fine Arts, University of Regina
- 1999 – present
 - Associate Professor of Anthropology (Retired)

Directed Reading and Research Classes

- Ethno-Ornithology
- Paleo-Ethnology of Australopithecenes
- Australopithecinea
- Ethnology of Chippewya and Plains Cree
- Saskatchewan Ethnology
- Advanced Economic Anthropology
- Ecology in Anthropology
- Statistical Techniques of Ceramic Analysis
- Introduction to Primatology
- Soils Analysis and Archaeology
- Northern Plains Ceramics
- China / Japan Pottery

Courses in Preparation

- 200 level
 - Anthropology and Science Fiction Literature
 - European Archaeology of Egypt
- 300 level
 - Introductory Ethnobotony
- 400 level
 - Social Stratification in Archaeological and Ethnological Perspective
 - World Survey Ceramic Technology
 - Ceramic Experimentation
 - Ceramic Analysis

Thesis Advisor and Reader

G. Neil, Honours – April 1974
R. Hersche, Honours – December 1975
B. Balon, Honours – August 1976
S.B. Ebell, Honours – September 1976
J. Light, Honours – September 1976
R. Grace Morgan, M.A. – February 1978
Bohdan Szuchewycz, Honours – 1978 (Reader)
Lauree Garvin, Honours – 1979
Edwin Rodger, Honours – 1980 (Reader)
Marvin Thomas, Honours – 1981 (Supervisor)
Joanna Rummens, Honours – 1982 (Supervisor)
Carol Dorman, Honours – 1982 (Supervisor)
Oliver Brass, Ph.D. – 1983 (Supervisor)
Thora Cartlidge, M.A. – 1983 (Supervisor)
Dale Walde, Honours – 1983 (Supervisor)
Donald Dean Smith, Honours – 1984
Donalee Deck, Honours – 1984 (Supervisor)
Daryl Trithart, Honours – 1985
Eric Wood, Honours – 1985 (Supervisor)
Hendrikus VanGinneken, Honours – 1987
John Lind, Honours – 1987
Sean Goldsmith, Honours – 1989 (Supervisor)
Joan Kanigan, Honours – 1989 (Supervisor)
Raymond Ambrosi, Honours – 1989 (Supervisor)
Kirsten Fromback, Honours – 1990 (Supervisor)
Vanessa Thorson, Honours – 1991 (Supervisor)
Kirsten Frombach, Honours – 1991 (Supervisor)
Tammy McJannet, Honours – 1992 (Supervisor)
Mark Lawrence, Honours – 1992 (Supervisor)

Other Teaching

- | | | |
|-------------|---|---|
| Summer 1983 | - | Nipissing College University, North Bay, Ontario Introduction Cultural Anthropology "Peoples of the World" |
| 1984 | - | Introduction to Physical Anthropology and Human Evolution |
| | - | Introduction to Archaeology |
| 1985 | - | Human Evolution |
| | - | North American Indians |
| 1986 | - | Peoples of the World |
| | - | Introduction to Archaeology |
| 1987 | - | Introduction to Physical Anthropology and Human Evolution |
| | - | North American Indians |
| 1988 | - | Peoples of the World |
| | - | Introduction to Archaeology |
| 1989 | - | Peoples of the World |
| | - | Introduction to North American Indians |
| 1990 | - | Peoples of the World |
| | - | Introduction to Archaeology |



CANADIAN SEABED RESEARCH LTD.
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Canada B3E 1G2

Telephone: 902-827-4200
Fax: 902-827-2003
Email: csr@csr-marine.com

ATTENTION: Paul Buxton
COMPANY: Nova Stone Exporters
RE: shipwrecks
FAX NO: 902-638-3522

DATE: October 8, 2003
PAGE: 1 of 2
FROM: Pat Campbell

Paul;

I spoke with David Kearns yesterday regarding the presence of shipwrecks in the survey area. Attached is a letter stating we did not observe any shipwreck like targets on the sidescan sonar data.

I will send the original letter to you by mail.

Sincerely,


Pat Campbell



CANADIAN SEABED RESEARCH LTD.

Environmental And Engineering Geophysics

341 Myra Road, Porters Lake, Nova Scotia, Canada, B3E 1G2

Telephone: 902-827-4200 Fax: 902-827-2002 Email: csr@csr-marine.com

Paul Buxton
P.O. Box 98
Annapolis Royal, NS
B0S 1A0

Dear Mr. Buxton

A geophysical survey was performed by Canadian Seabed Research between June 25th and June 30th, 2002, at White's Point, Nova Scotia. This survey utilized a Klein 595 side scan sonar system operating at 100 kHz to collect side scan data in the survey area. The side scan sonar data collected during this survey was then analyzed by a geophysicist. The results of the interpretation of the data were displayed in a surficial geology map prepared for Nova Stone Exporters. No shipwreck-like features were observed in the side scan sonar data.

Sincerely,

Robbie Bennett
Marine Geophysicist
Canadian Seabed Research

9.3.2 Aboriginal Land and Resource Use

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3.3

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9.3.2 Aboriginal Land and Resource Use

WP 1431 – Joint Review Panel

9.3.3 Aboriginal Land and Resources Use

The study by the Confederacy of Mainland Mi'Kmaq indicates that "the historic Indian Hill Camp" was located at the northeast section of the site. The location of Indian Hill Camp is not identified on Map 27. Describe how the Proponent investigated this.

RESPONSE

Bilcon is committed to further investigation with respect to the location of the historic Indian Hill Camp referenced in the study by the Confederacy of Mainland Mi'kmaq.

On September 7, 2006, Bilcon wrote to Michael Cox, Director, Lands, Environment and Natural Resources, of The Confederacy of Mainland Mi'kmaq requesting clarification of the location of the historic Indian Hill Camp. Not having received a response, Bilcon wrote another letter on October 26, 2006 again requesting information on the location of the Indian Hill Camp. To date, Bilcon has not received a response. Bilcon will continue to request more specific information from the Confederacy.

Please refer to Bilcon's responses in Section 3.1 – Traditional and Community Knowledge and in Section 8.2 – Public Consultation in this submission.

9.3.4.4 An appropriate archaeological recovery monitoring and recovery program should be identified as part of the environmental management plan.

RESPONSE

Bilcon commits to the development of an appropriate archaeological recovery and monitoring program as part of the environmental management plan, discussed in Chapter 11.0.1 in the EIS.

WP 1542 – Health Canada

Traditional Knowledge and Social Impacts on First Nations' Quality of Life and Well Being

The TKS elaborated by the Confederacy of Mainland Mi'Kmaq states that: "the Mi'Kmaq have used Digby Neck and its surrounding waters since before the arrival of Europeans and continue to use the area for traditional purposes to this day" (Appendix III, Tab #16 – Confederacy of Mainland Mi'Kmaq 2005, page 3), and "there is significant traditional current Mi'Kmaq use in OOsitookum (Digby Neck) and its surrounding waters" (page 21). No further information is provided regarding the potential impact the project site itself may have on the traditional use of land for camping, harvesting of wood, stones, clay, food plants, berries, wild fruit, quills, seashells, or the hunting of ducks and deer, or the use of the

9.3.2 Aboriginal Land and Resource Use

surrounding waters to fish for haddock, lobster, halibut, urchin, trout, Pollock, mackerel, herring scallop and crab (Appendix III, Tab #16 – Confederacy of Mainland Mi’Kmaq, 2005, page 21).

Realizing previous consultation difficulties encountered by the proponent, Health Canada would like to see more information about whether the project may limit access to traditional hunting/gathering or fishing grounds used by local First Nations people.

RESPONSE

Access to the quarry site proper (which is in private ownership) will be subject to some restriction due to safety considerations. Access to the shoreline will remain unimpeded either via the existing Whites Cove Road or by an alternate access, which would be constructed by Bilcon should the Whites Cove Road be acquired by Bilcon.

Please refer to Bilcon’s responses in Section 3.1 Traditional and Community Knowledge and in Section 8.2 Public Involvement in this submission

WP 1630 – Environment Canada

Item #5 Consideration of Traditional Ecological Knowledge and Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples

Information Request

Provide clarification on status of First Nation Consultations. Provide clarification on how the Mi’kmaq Knowledge Study will be incorporated into the analysis of potential project impacts as well as proposed environmental management and mitigation measures.

RESPONSE

Even though the Panel’s Guidelines for the Preparation of the EIS infer First Nations consultation is the responsibility of the proponent, the Confederacy of Mainland Mi’Kmaq does not agree. In this regard, reference is made to their Comments on the EIS. “In our view the consultation for this project needs to be completed by the Government of Canada and Nova Scotia. To initiate this, Bilcon was advised that the Governments need to contact the Mi’Kmaq Rights Initiative. Consultation does not rest with the proponent”. Bilcon is not aware whether consultation between the Confederacy and Governments has been initiated.

Please refer to Bilcon’s responses in Section 3.1 Traditional and Community Knowledge and Section 8.2 Public Involvement in this document.

9.3.2 Aboriginal Land and Resource Use

WP 1441 – Confederacy of Mainland Mi'Kmaq

1. *In Section 6.4.4 Stakeholders there is no mention of First Nations in the Section. First Nations needs to be added so that meaningful participation in the panel process will be realized.*
 2. *In Section 2.0 Information Disclosure and Public Consultation, Bilcon states that they sought to carry out consultations. Please be advised that letter, phone calls, e-mail, fax's do not constituted consultation. In our view the consultation for this project needs to be completed by the Government of Canada and Nova Scotia. To initiate this, Bilcon was advised that the Governments need to contact the Mi'Kmaq Rights Initiative. Consultation does not rest with the proponent. The section also talks to a study on traditional community knowledge. Please be advised that this study did not involve First Nations. This section spells Mi'Kmaq wrong and initiative wrong. Also for clarity, CMM provided the report titled "Mi'Kmaq Use of Oositookum (Digby Neck), its Surrounding Water, and the Mainland Shore of St. Mary's Bay" to the Panel.*
 3. *Table C-1 Commitments Table -9.1, 9.2, 9.4-CMM requests to be involved in the monitoring of archaeology, advised of the training provided, and be involved in the communication strategy in the event that archaeological resources are identified. CMM is also interested in being involved in the underwater archaeology.*
 4. *Table C-1 Commitments Table 12.4 – Bilcon should consider involving the Mi'Kmaq as observers for marine mammals and species at risk.*
 5. *Table C-1 Commitments Table 17.1- it states that "Bilcon will continue its efforts to involve the Design First Nations in the project"? CMM request clarification on what this means.*
- 6.8.2.4 Specific Activities Meetings With Indigenous Peoples – Bilcon is in error when they suggest that they did not provide any further public consultation because of the study (mentioned above) was ongoing. The study provided by CMM is not consultative in nature- rather the intent of the study is to provide potential Mi'Kmaq concerns with the project related to Mi'Kmaq use and occupation. The proponent was advised of this several times and in no way should have limited or impacted Bilcon's work plan. The section also states that Chapter 9.3.5 has additional information but the section doesn't exist with the EIS. This section needs to be dramatically changed to be accurate and CMM takes exception to its current content.*

RESPONSE

9.3.2 Aboriginal Land and Resource Use

Please refer to Bilcon's responses to the Panel and Agencies in this section and also refer to Section 3.1 Traditional and Community Knowledge in this document.

9.3.3 Aesthetics

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3

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9.3.3 Aesthetics

WP 1452 – Joint Review Panel

9.3.6 Aesthetics

The Panel requires additional information drawn from traditional knowledge or documented evidence regarding the type, frequency, duration and geographic location of various uses of the waters offshore of Whites Point, especially for recreation and adventure tours.

RESPONSE

Personal communications (fall 2006) were conducted with whale watching organizations operating out of the East Ferry/Tiverton ports by Dwayne Theriault on behalf of Bilcon. The objective of this investigation was to gather information on the recreational and adventure tour use of the waters offshore of Whites Point. Four whale watching operators, operating six boats, participated. All participants have been involved in the whale watching tourism industry for many years. The area most frequently visited was the area along Long Island and Brier Island in the Bay of Fundy. However, it should be noted that other areas of the Bay are also visited depending upon where the whales are on a particular day.

The total duration of a typical whale watching tour trip is approximately 2 to 4 hours. Depending upon demand, two trips per day could be taken during the peak tourist season. Following is a summary of the findings:

| Whale Watch Tour # | Trips North of Petite Passage | Location – Offshore of | Distance from Whites Point |
|--------------------|-------------------------------|--------------------------|----------------------------|
| 1 | 60 | Whale Cove to Sandy Cove | <5 km |
| 2 | Quite a lot | All areas of the Bay | Varies |
| 3 | 25 | Sandy Cove Ridge | >10 km |
| 4 | 50 to 60 | Whale Cove to Sandy Cove | >15 km |

Little information and no quantitative evidence are provided concerning the effect of the Project on aesthetic (views) from the Bay of Fundy. Identify the areas from which the marine terminal will be visible along the coast and into the Bay. Provide analysis, propose mitigation and make supportable conclusions on the potential effects of the Project (specifically from the quarry and from the marine terminal) on aesthetics from the Bay.

Pg 104 concludes with the comment that “views of the quarry and marine terminal from tour boats will not be common”. From its own offshore inspection of the proposed quarry site, however, the Panel noted that Whites Point is visible from the exit of Petit Passage where tour boats leave the harbour. Resolve this discrepancy. Provide a view-shed analysis of the quarry and marine terminal site from the water during clear conditions.

9.3.3 Aesthetics

Consider alternate mining plans or mitigation strategies to reduce the visual effect of the quarry from the water.

RESPONSE

As indicated in paragraph 9.3.6.2 of the EIS, the proposed onshore infrastructure (processing plant) and marine terminal development will be visible from the Bay of Fundy waters and coastline. This response will focus on the extent of visibility related to tourism use of the nearshore waters and by recreational use of the coastline by hikers. Brief commentary will also be made concerning offshore water use by cruise ships and the Digby/Saint John ferry. Other commercial use of nearshore waters by fishers is presented in response to Fisheries and Oceans Canada comment on paragraph 9.3.13.

Background

Whale watching, as well as other tourism activities on Digby Neck and Islands is seasonal. The duration of the season is generally 90 to 120 days from June to October. Several whale watching tour operators are based in East Ferry on Digby Neck and Tiverton on Long Island. These operators enter the Bay of Fundy from Petite Passage which is approximately 8 km south of Whites Point. Several factors will influence the effect of the marine terminal and quarry on aesthetics (views) from the Bay of Fundy waters and coastline. Primary factors include:

- visibility based on existing weather conditions
- distance of observer to the marine terminal or processing plant
- location or geographic position of the observer to the marine terminal or processing plant

To a lesser degree, however, but still important, are the following secondary factors that influence aesthetic views:

- height of observer in relation to the object viewed, e.g. marine terminal or processing plant
- shape, height, and profile of the object viewed
- colour, illumination, and reflective qualities of the object viewed

Factors

Visibility for the months of June, July, August, and September are presented in Bilcon's response to the Panel's comment regarding paragraph 9.1.1.1.2 of the EIS. According to this Environment Canada data, during the whale watching tourism season, visibility greater than 9 km is likely to occur 70% of the time. This amounts to approximately 65 days out of the 90 day season. This is an indication of the potential clear days with good visibility in this area of the Bay.

9.3.3 Aesthetics

Distance is another primary factor that will influence aesthetic views of the marine terminal and processing plant. Cruise ships destined for Saint John will pass the marine terminal and quarry in the inbound and outbound shipping lanes. If in the future, the Town of Digby hosts cruise ships, one would speculate that their passage past the quarry would be via the designated shipping lanes. In this regard, the closest a cruise ship will be to the marine terminal is approximately 13 km. The Digby/Saint John ferry route will be even further away from the marine terminal at Whites Point. The direct sight line to the quarry from the ferry, either leaving or entering Digby Gut, has been estimated to be approximately 42 kms at its nearest point. The closest Bay of Fundy tourism activity in relation to the marine terminal and processing plant will likely be from whale watching tour boats. A popular whale watching area, identified through traditional knowledge, lies approximately 8 km offshore – see **Map 36**. The closest recreational activity in relation to the marine terminal and processing plant will most likely be coastal hikers.

Geographic location or position in relation to the marine terminal and processing plant will influence the aesthetic view. The marine terminal will extend 200 m into the Bay from the coastline. Digby Neck in this area presents a nearly linear coastline. Thus, it is plausible that the marine terminal could be visible from the water or coastline at any position along the coast. Additionally, the marine terminal will be more prominent when viewed from a north or south location. This is due to the position of the terminal and ship loader at right angles to the viewer. As the viewer moves away from the coastline and out into the Bay, the prominence of the terminal will visually diminish as it is viewed against the back drop of the coastline and land. The view of the marine terminal and ship loader from the water and coastline is an approximate 180 degree view plane (view shed) – see **Map 36**. In regard to the processing plant area, the processing plant is 300 m inland from the coastline. The plant area is also “notched” into the side of the mountain at the 30m elevation. As a result of its inland position, the view plane from the water or coastline is approximately 90 degrees. This is due to the view from the water being partially obstructed by topography and the treed environmental protection zone – see **Map 37**.

Generally, the higher the eye level of the observer, the further away an object can be seen. The height or eye level of the observer will basically have no influence on the aesthetic effect of the marine terminal in this particular situation. The terminal will be entirely visible by a person walking along the coastline with an eye level of 1.6 m or from a boat with an eye level height of 2 m. The aesthetic view of the processing area of the quarry will vary according to the eye level and position of the observer. A person walking along the coastal zone with an 1.6 m eye level will not see the processing area when a thick stand of existing evergreen trees in the environmental protection zone or newly planted trees reach a height of 10 m. Assuming a thick stand of evergreen trees 10 m high, a person in a boat in nearshore waters at mean sea level 200 m offshore may only see the top of aggregate stockpiles at the processing plant located at the 30 m land elevation. However a person in a boat 1 km

9.3.3 Aesthetics

offshore would see the aggregate stockpiles and the buildings on the 30 m level. The sight lines shown on **Figure SL – 1** illustrate a worst case scenario since the observer view is perpendicular to the processing plant. Sight line “A” illustrates a person walking along the coastline, sight line “B” illustrates a person on a boat 200 m in nearshore waters, and sight line “C” illustrates a person on a boat 1 km offshore.

Visual Perception

Visual perception is very subjective. What one person perceives to be beautiful, another may term as ugly. The preconception appears to be that all people viewing the marine terminal and quarry processing plant while partaking in whale watching tours will be negatively affected. This assumption probably cannot be substantiated.

Research is lacking on a definitive distance that an observer can see and readily identify an object. Bilcon, based on unpublished data, has assumed that a person without visual aids (binoculars) can see and distinguish objects at a distance of approximately 5 km. This is dependent upon the factors presented previously that make certain profiles, shapes, colours etc more prominent in the landscape. Beyond 5 km, the object may still be visible but may not be recognizable.

The shape of an anthropogenic object in the landscape will stand out more if it has a vertical profile, e.g. a church steeple or a lighthouse as compared to a horizontal profile such as a row of low profile houses. Also, the taller the object, the more dominant it will appear and the further away it can be seen, e.g. a row of wind turbines or a communications tower. The above objects become more dominant if illuminated, made of reflective materials such as a galvanized steel roof or are painted white. These objects become even more dominant if the landscape background is a dark evergreen forest or dark gray rock outcrops. A prominent example is the Boars Head Lighthouse in Tiverton, which is intended to be dominant by its location, height, colour, and illumination.

It is quite conceivable that the coastline of the Whites Point quarry is visible from Petite Passage. However, it is expected that at a distance of about 3 km the terminal will begin to visually blend in with the background. At a distance of 8 km (Petite Passage), it may still be possible to see the quarry site if an active effort is made by a viewer to find the site. However, it will not represent a dominant feature in the view shed and is unlikely to adversely affect the aesthetic quality of the view. It is further conceivable that a person whose intended purpose was whale watching, would not be concerned if a marine terminal did exist at Whites Point.

Mitigation

Some factors, from an aesthetic standpoint, are inherent in the proposed development and contribute to a limited visual impact.

9.3.3 Aesthetics

1. the marine terminal presents basically a horizontal profile which will tend to blend it into the form of the coastline especially when viewed perpendicularly;
2. the processing plant presents a horizontal row of buildings interspersed with stockpiles of gray aggregate;
3. the trees in the environmental preservation zone to remain will block views of the processing plant at some viewer locations;
4. priority reclamation is along the coastal zone with evergreen tree growth on the sediment pond berms to be established as soon as possible in this sensitive sight line area.

To further minimize adverse visual impacts, it is proposed that

- The buildings at the processing plant be gray or dark green in colour and made of non-reflective materials to blend with the surrounding forest and rock outcrops.
- The ship loader components are to be a “battle ship” gray colour to blend with the marine environment.
-

Conclusion

The primary tourism use of the marine waters of the Digby Neck and Islands is whale watching. Successful whale watching trips are dependent upon sightings of whales for visitor fulfilment. The following research by Bilcon and others indicate the majority of whale observations are not in waters adjacent to the Whites Point marine terminal and quarry, and whale watching tours do not frequent this area. The following is offered to substantiate the preceding statement.

1. Bilcon contracted an experienced whale watching captain to conduct observations by boat in the Bay of Fundy. Weekly observations were conducted from East Ferry to Sandy Cove from July through September 15. A total of three minke whales were the only whales observed during these trips – see **Map 21**.
2. Traditional knowledge indicates one “popular whale watching area”, approximately 8 km offshore in the vicinity of Whites Point is known – **Map 4**.
3. Observations of North Atlantic right whales, finback whales, humpback whales, and minke whales from Maritimes Fisheries and Oceans Canada’s St. Andrews Biological Station sightings database indicates the greatest density of these species are not in waters adjacent to the Whites Point quarry site – see **Maps 38A, 38B, 38C, and 38D**.
4. The right whale observation database housed at the University of Rhode Island which includes 13,508 right whale sightings from the Bay of Fundy between September 1971 and October 2005 indicates this species does not generally frequent the waters adjacent to Whites Point – see **Maps 41 and 42A, 42B, 42C, and 42D, 42E and 42F**.
5. The North Atlantic right whale database of right whale sightings per unit of effort (2002) indicates the greatest density of right whales is not in the waters adjacent to Whites Point.

9.3.3 Aesthetics

The greatest concentration of right whales is in the North Atlantic right whale Conservation Area approximately 13 km from the proposed marine terminal at Whites Point – see **Map 25**.

Based on the previous view shed analysis and the above data regarding whale observations, Bilcon believes the statement “views of the quarry and marine terminal from tour boats will not be common” is a valid conclusion. At this time, the mitigation measures outlined above to reduce the visual effect of the marine terminal and processing plant area from the water are proposed.

With the proposed mitigation measures the adverse visual impact are considered not significant. The magnitude of the effect is limited. Most potential receptors (whale watching tourists) will experience views of the facility from a distance at which it will not be visually intrusive and blend in with the visual background. The effect extends over an area of the Bay of Fundy with a radius of approximately 3 km, which is far outside of the areas most frequently visited by whale watching tour boats. Beyond this distance, the Project site may still be visible, but is not considered to have any impact on the visual landscape quality. The effect will last for the duration of the Project, but is considered reversible.

References

VisualImpactAssessmentGuidebook.

<http://www.for.gov.bc.ca/TASB/LEGSREGS/FPC/FPCGUIDE/visual/via10017.htm>

EIS Volume VI, Chapter 9.3.7.1 Demographic Profile

WP 1641 - Nova Scotia Tourism, Culture and Heritage

Visual Aesthetics

The Environmental Impact Statement states that there will be no view of the quarry and the marine terminal from Highway 217. The view of the quarry will be from the water. Pleasure cruisers and people on whale watching expeditions will view the quarry. There will be ships travelling weekly to the quarry to load the 40,000 tonnes of basalt which will be mined each week.

Visitor perception of the normally pristine, “un-industrialized” are of the Bay of Fundy will change when visitors experience a quarry and industrial shipping in the area. The perception that the area is not protecting the integrity and quality of our coastal assets may be the conclusion of the visitor. One of our department’s strategic priorities for this year is to “Deliver SMART Tourism”. The SMART (Sustainable Marketable Assets Relevant to Tourism) Strategy coordinates ongoing tourism initiatives that support the sustainable management of our natural resources. The key to our province’s continued success in realizing tourism growth is the integrity of our natural environment and, in particular, our coastal assets. This undertaking may not be compatible with the department’s approach to growing tourism in the area.

9.3.3 Aesthetics

The Nova Scotia Tourism Brand essentially entails what others think and feel when they hear our province's name. Our brand positioning statement outlines the unique benefits visitors can expect to experience as a result of visiting the province. The department markets this brand and promotes ourselves as Canada's seacoast destination. The Whites Point Quarry has the potential to impact Nova Scotia's Tourism Brand.

Given the location of the quarry in the Bay of Fundy, consideration be given to the impact that this undertaking will have on visitor perception and experience.

RESPONSE

Nova Scotia's Tourism Brand

Concern has been expressed that the Whites Point Project may have an impact on Nova Scotia's Tourism Brand.

Environmental considerations will be ongoing and of critical importance. All possible environmental impacts and associated mitigating actions and precautions to be taken have been outlined in the Environmental Impact Statement for the project, and all direction received from the Panel which is reviewing the project will be followed.

Given this carefully managed approach, Bilcon does not believe the quarry and marine terminal project will damage the integrity of Nova Scotia's natural environment. The project will operate in a similar fashion to other quarries in the province, meaning that few individuals considering visiting our province will hear about it prior to coming to Nova Scotia or during their visit.

Bilcon believes it will be possible to continue to effectively market Nova Scotia's brand and to promote the province as Canada's seacoast if the Whites Point quarry and marine terminal project proceeds. Tourists are generally aware that there is commercial and industrial development in any destination they visit, and Nova Scotia is no different. Whites Point however, may in fact be less visible than many other industrial sites in the province.

Bilcon is willing to explore with interested parties how to enhance opportunities for tourism and recreation related activities in the area. This could include such efforts as the provision of a public trail section along the waterfront of the Bilcon quarry property. The trail could include interpretive information (interpretive boards, pamphlets) on the area's flora, fauna, geology, history, First Nations, the quarry operation and the associated environmental management features. An expansion of this concept could involve guided tours and information on the regional economy and aggregate industry. Similar approaches have been successfully implemented elsewhere in Canada and abroad.

9.3.3 Aesthetics

WP 1625 – Partnership for Sustainable Development

Deficiency Statement 73

EIS Guidelines

10.3.3.2 - Tourism and Recreation - 'Describe and evaluate the predicted effects the Project will have on current and projected tourism and recreation activities and opportunities in the region and the province (e.g. whale watching, bird-watching, kayaking, coastal trail development, tourism-related businesses). Discuss the effects of the quarry operation on landscape aesthetics and views from land and water.' 10 - Environmental Impact Analysis - 'The assessment must recognize not only the complexity and inter-connectedness of all the parts that comprise a single environmental entity (e.g. the physical environment), but also the broader, even more complex, inter-connectedness between the physical, biological and human components.'

EIS

The EIS identifies that 'the proposed onshore infrastructure and marine terminal development will be visible from the Bay of Fundy waters.' It is argued that the environmental effects from this will be minimal, given that there are few whales and correspondingly few whale-watching boats in this area.

The EIS fails to identify other important receptors for visual impacts that may be associated with the Project. The Princess of Acadia ferry crosses daily between Digby and Saint John, New Brunswick, serving as principle entry route tourists to southwestern Nova Scotia. During 2006, the Port of Saint John is scheduled to receive 33 cruise ships, carrying 90,400 visitors. This represents a very significant tourism population to region, which will pass the quarry site twice, as they enter and leave the Bay of Fundy.

The Town of Digby have made active strides to attract cruise ships to the Port of Digby. If successful, cruise ships calling at Digby would pass along the North Mountain coast of the Bay of Fundy, in viewing distance of the proposed Project site.

The EIS clearly fails to address the visual, light and noise impacts on current and future visitors to the region travelling by ferry and cruise ship. The EIS requires amendment to consider both the direct impacts on these visitors and the secondary impacts on tourist's perceptions of the region as an eco-tourism destination.

RESPONSE

Please refer to responses to the Panel and Agencies in this section.

Deficiency Statement 74

EIS Guidelines

10.3.3.2 - Tourism and Recreation - 'Describe and evaluate the predicted effects the Project will have on current and projected tourism and recreation activities and opportunities in the region and the province (e.g. whale watching, bird-watching, kayaking, coastal trail development, tourism-related businesses).'

9.3.3 Aesthetics

8.1 – *Methods* – ‘Identify and justify any assumptions made. Indicate the degree of certainty in the impact predictions and determination of significance (identify measures used).’

8.2 - *Public Participation* – ‘Identify and report on key issues raised, and describe how those issues have been addressed.’

EIS

Many residents of the Digby Neck are concerned that the Project will alter tourist perceptions of the area as an eco-tourism destination, with a corresponding adverse effect on the economy. This view was expressed at the Scoping Meetings and is documented in the EIS Concordance Table. In addressing this concern, the EIS draws heavily on the case of the Cape Breton Visitor Centre, which lies across the Canso Strait from the Cape Porcupine quarry. In particular, the EIS states ‘The manager [of the Visitor Centre] has not heard anyone express a view that the quarry operation has ruined their opinion of Cape Breton and deter them from making a return visit.’

Based in part on this evidence, the EIS concludes that: ‘Since the quarry operation will not be visible from surrounding land tourist attractions and views from the water from adventure tours boats are anticipated to be infrequent, this would result in a long term, insignificant negative effect, of regional scale.’

The EIS fails to investigate the perceptions of tourists visiting Digby Neck in general as well as those that are specifically seeking an eco-tourism destination. Digby Neck is much smaller and arguably a more fragile tourism destination than Cape Breton. The applicability of the Cape Breton case study is therefore limited.

The quote from the Manager of the Cape Breton Visitor Centre only refers to those tourists that travelled to Cape Breton and choose to share their comments with Visitor Centre staff. This statement provides no information on those tourists that choose to stay away and why. The comments by the Manager are not referenced nor is there any statement given the adequacy of the comments as a basis for the conclusions.

The EIS has therefore failed to fully examine the potential impacts of the Project on current and future tourism in the area. In order to address this deficiency, the Proponent should:

- consult visitors to Digby Neck on their holiday intentions, specifically addressing the potential impact of the Project on the perceptions of eco-tourism visitors,*
- cite relevant and comparable case studies,*
- provide quantifiable, referenced conclusions, with an estimation of certainty provided.*

RESPONSE

Please refer to responses to the Panel and Agencies in this section.

9.3.4 Transportation

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3.8

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9.3.4 Transportation

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9.3.4 Transportation

**WP 1452 – Joint Review Panel
9.3.8 Transportation – Land and Marine**

Quantify the expected increases in truck traffic along Highway 217 during construction and decommissioning of the project. Explain how it is possible for the Project to “effectively eliminate heavy truck traffic from the quarry” given the need to bring in some materials and remove wastes by road.

RESPONSE

As stated in the EIS paragraph 9.3.8.2, the context for “effectively eliminate heavy truck traffic from the quarry” refers to the transportation of quarried rock products produced at the Whites Point quarry on rural Highway 217 over the 50 year operational life of the project. Many quarries transport rock products using local roads. The Whites Point quarry intends to transport rock products exclusively by water.

Data on existing truck traffic using Highway 217 in the area of the proposed quarry is not available from the Nova Scotia Department of Transportation and Public Works. However, the quarry is expected to generate increased truck traffic during construction, operation, and decommissioning. Following is the anticipated truck and barge loads during these project phases.

Construction – Marine

| Equipment | Bargeloads |
|--|-------------------|
| Ship loader components (conveyor, stacker, trusses, pilings, elec. motors) | 15 |

Construction - Land

| Mobile Equipment | Truckloads |
|-------------------------|-------------------|
| 3 – Cat 773 rock trucks | 6 |
| 1 – Cat 990 loader | 3 |
| 2 – Cat 988 loaders | 6 |
| 1 – Cat D9 bulldozer | 1 |
| 1 – Cat 345 excavator | 1 |
| 1 – Cat 914 loader | 1 |
| 1 – 75 ton crane | 1 |
| 2 – water trucks | 2 |
| 1 – service truck | 1 |
| 2 – welding trucks | 2 |

9.3.4 Transportation

| | |
|-------------------------------------|---|
| 4 – welders | 2 |
| 2 – compressors | 1 |
| 2 – flatbed trucks | 2 |
| 2 – Cat skid steer loaders | 1 |
| 1 - drill rig – check dk's original | 1 |

| Plant Equipment | Truckloads |
|---|------------|
| Portable crushers | 2 |
| Concrete batch plant | 4 |
| Jaw crusher | 2 |
| Rock box and supports | 4 |
| Cone crushers | 2 |
| Aggregate and sand screens | 7 |
| Sand process equipment and clarifier tank | 10 |
| Generators | 4 |
| Conveyor truss panels | 10 |
| Conveyor belts | 6 |
| Water lines and pumps | 8 |
| Electrical transformers | 2 |
| Fuel tank and pumps | 3 |
| Plant enclosure siding and girts | 10 |
| Drainage structures | 6 |
| Geoteck | 2 |
| Shop and office materials and equipment | 20 |
| Sewage disposal tank | 1 |
| Fencing | 10 |

| Materials | Truckloads |
|--------------------------------------|------------|
| Asphalt pavement | 30 |
| Sand and dry bulk cement | 120 |
| Explosives | 312 |
| Sewage disposal system sand | 40 |
| Power poles | 3 |
| Reinforcing steel | 5 |
| Construction steel | 50 |
| Concrete forms | 3 |
| | <u>707</u> |
| Contingency @ 20% | <u>141</u> |
| Total Construction Truckloads | 848 |

9.3.4 Transportation

This amounts to an increase of 10 – 12 trucks per week during the 18 month construction phase of the project.

Operation – Marine

| Quarry Products | Bulk Carrier Loads |
|------------------------|--------------------|
| Aggregate, sand, grits | 44 per year |

Operation – Land

| Materials and Supplies | Truckloads |
|--------------------------------|-------------|
| Explosives | 88 per year |
| Fuel | 44 per year |
| Oil and grease | 52 per year |
| Miscellaneous | 22 per year |
| | 206 |
| Contingency @ 20% | 41 |
| Total Yearly Truckloads | 247 |

This amounts to an increase of approximately 5 trucks per week during the year.

Decommissioning – Marine

| Equipment | Bargeloads |
|--|------------|
| Shiploader components, elec. motors, etc | 10 |

Decommissioning – Land

| Equipment | Truckloads |
|---|------------|
| Mobile | 31 |
| Plant | 68 |
| Demolition | 175 |
| | 274 |
| Contingency @ 20% | 55 |
| Total Decommissioning Truckloads | 329 |

9.3.4 Transportation

This amounts to an increase of approximately 6 trucks per week during the 12 month decommissioning phase of the project.

How does the Proponent propose to mitigate or compensate the inconvenience its activities will cause lobster and other fishers during the ship berthing and loading periods?

RESPONSE

Licensed lobster fishers who attended the three meetings specifically noted that they did not see inconvenience as an issue. It should be noted that the attendees were lobster fishers who fished specifically in the in-shore Whites Cove area. Discussions have yet to be held with lobster fishers or other fishers who fish off-shore Whites Cove with respect to inconvenience.

The mitigation proposed to limit inconvenience is to ensure that the vessel uses the same designated route inbound and outbound for every transit enabling fishers to avoid this area.

What mechanisms will be used to alert fishers to activities on the site and offshore?

RESPONSE

Bilcon will implement a dedicated toll free number for fishers to call to receive status reports. These reports will be updated daily.

9.3.8.3 Mitigation

Provide details regarding the "lobster trap fund" the Proponent commits to financing, including details of the consultation process that was followed to develop a plan for the fund, and the conflict dispute mechanism to be employed. Clarify what losses it will cover.

RESPONSE

Three meetings were held with licensed lobster fishers who traditionally fish in the nearshore Whites Cove area. Agreement was reached on the establishment, in consultation with lobster fishers of a designated inbound and outbound route, the increase in turning radius of the ship immediately adjacent to the Whites Point terminal and the establishment of a compensation fund to be administered by a committee of lobster fishers. No specific details of the compensation plan have been established pending a meeting with the Lobster Fishing Area #34 Management Board.

A letter requesting a meeting to clarify details was sent on September 20th, 2006 but to date no response has been received.

9.3.4 Transportation

WP – 1498 – Nova Scotia Department of Environment and Labour Pollution Prevention Branch

7. *There is no information provided on ship refuelling or storage of fuel for ships at the site. It should be made a condition of the release from the EA that no ship fuel will be stored or dispensed at the site.*

RESPONSE

Bilcon has stated elsewhere in the document that no ship refuelling will take place at the site, nor will there be any storage of fuel for ships at the site.

WP 1524 – Transport Canada

1) *General – Proponent to ensure any changes made in EIS are carried through the document where applicable and that changes are reflected in the Plain Language Summary*

RESPONSE

Comment noted.

2. *Proponent is encouraged to complete, in conjunction with Transport Canada Marine Safety Group, a Port Procedures Manual (Manual). Manual should be completed at least six (6) months in advance of the arrival of the first ship.*

RESPONSE

Bilcon will complete a Port Procedures Manual at least six (6) months in advance of the arrival of the first ship, in conjunction with the Transport Canada Marine Safety Group.

3. *In regards to mandatory pilotage at the proposed project site, under the present rules, there will be no mandatory pilotage, however, in order to determine if mandatory pilotage may be necessary the Atlantic Pilotage Authority must conduct a Pilotage Risk Assessment Methodology.*

RESPONSE

On the completion of the Environmental Assessment Process, Bilcon will request that the Atlantic Pilotage Authority conducts a Pilotage Risk Assessment Methodology.

9.3.4 Transportation

4) *Vol. I Page 8 – Proponent to clarify Transport Canada’s role in the proposed Project as described above.*

RESPONSE

The following paragraph is added to Volume I, Plain Language Summary, under 4.0 - Environmental Assessment Process for Whites Point Quarry and Marine Terminal:

“On March 29, 2004, responsibility for the NWPA Program was transferred from Fisheries and Oceans Canada to Transport Canada, and Transport Canada, as of this date, became a Responsible Authority. Transport Canada is responsible inter-alia for marine safety and pilotage.”

5) *Vol. IV Table ECM – 1 Project Phase should demonstrate that phases such as Modification, Decommissioning and Abandonment were considered.*

RESPONSE

No particular Project works and activities have been identified that are associated with a Project modification. Should any modifications to the construction, operation or decommissioning become necessary, these will be addressed through the adaptive management approach.

Decommissioning (including abandonment) has been addressed explicitly in Table 2 (Mitigation Commitment Summary) presented in the responses to Section 11 (Environmental Management).

6) *Vol. IV – Table ECM – page 21 – Does Environmental Component for Recreation include marine based activities?*

RESPONSE

Use of the marine terminal for recreation activities will not be permitted. Access to the beach from the water by, for example, kayakers, will not be affected by the quarry or marine terminal operations.

7) *Vol. IV Table ECM – 2 Project Phase should demonstrate that phases such as Modification, Decommissioning and Abandonment were considered.*

RESPONSE

No particular Project works and activities have been identified that are associated with a Project modification. Should any modifications to the construction, operation or decommissioning become necessary, these will be addressed through the adaptive management approach.

9.3.4 Transportation

Decommissioning (including abandonment) has been addressed explicitly in Table 1 (Follow-up and Monitoring Programs – Summary) presented in Section 11 (Environmental Management).

8) *Vol. IV – Table ECM – 2 Page 4 – Environmental Component for Transportation – Marine states that no regulatory requirement exists. NWPA applies to “works” in any navigable waterway in Canada and is a regulatory requirement.*

RESPONSE

Comment noted. Please refer to Table 2 – Mitigation/Commitment Summary in Section 11.0 of this document.

9) *Vol. IV – Table ECM – 2 Page 4 – Does Environmental Component for Recreation include marine based activities?*

RESPONSE

Use of the marine terminal for recreation activities will not be permitted. Access to the beach from the water by, for example, kayakers, will not be affected by the quarry or marine terminal operations.

10) *Vol. IV – Table CEM -1 – Project Phase should demonstrate that phases such as Modification, Decommissioning and Abandonment were considered.*

RESPONSE

Bilcon’s cumulative effects assessment has been revised. Please refer to the information presented Section 10 (Cumulative Effects).

11) *Vol. IV – Table CI-1 – Page 2 Commitments Table should indicate exact permits/authorizations required. (i.e. TC-NWPA).*

RESPONSE

Comment noted. This has been addressed in Section 6.1 Regulatory Environment.

12) *Vol. IV – Section 6.4.2 – Page – 36 – List of Key Events should include TC becoming an RA via the NWPA program transfer.*

RESPONSE

Volume IV, Section 6.4.2, Page 36 - The following paragraph is added to Section 6.4.2 – Key Elements, Milestones and Actions:

9.3.4 Transportation

“On March 29, 2004, responsibility for the NWPA program was transferred from Fisheries and Oceans Canada to Transport Canada and, as of that date, Transport Canada became a Responsible Authority.”

13) *Vol. IV – Section 6.4.3 – Page – 37 – The Panel will also deliver their report and recommendations to the Minister of Transport as well as to the Ministers of DFO and EC.*

RESPONSE

Bilcon acknowledges that the Panel will also deliver their report and recommendations to the Minister of Transport as well as to the Ministers of Fisheries and Oceans and Environment Canada.

14) *Vol. IV – Table 6A – Page 48 – TC is the sole responsible federal department for NWPA (DFO no longer has any involvement).*

RESPONSE

It is noted that Fisheries and Oceans Canada no longer has any involvement with NWPA and DFO should be removed under the Agency column.

15) *Vol. IV – Table 6B – Page 51 – TC is the sole responsible federal department for NWPA (DFO, CCG no longer has any involvement)*

RESPONSE

It is noted that neither DFO nor CCG have any involvement with NWPA and that TC is the sole responsible department with respect to permitting for construction within navigable waters.

16) *Vol. IV – Table 6B – Page 51 – Explosives Transportation Permit is not a CEAA EA trigger therefore remove TC reference as an RA for this.*

RESPONSE

TC is incorrectly referred to as the regulatory agency with respect to Explosives Transportation Permit. Licensing of the process vehicle for the delivery of explosives is by Natural Resources Canada.

17) *Vol. V – Section 8.2.4 – Page – 21 – Meetings with Indigenous Peoples – Bilcon notes that MKS report not received as of November 2005. Has Bilcon received this report as of yet? Is this report contained in Appendix 16?*

RESPONSE

Bilcon has received the MKS report and it is included in the EIS in Appendix 16.

9.3.4 Transportation

18) *Vol. VI – Section 9.2.2.1 – Page 45 – Reference is made to a north water course and south water course. The Proponent is requested to contact TC – Navigable waters Protection Program (Mr. Jon Prentiss) to determine the navigability of these waterways.*

RESPONSE

With respect to the navigability of the north and south water course, Bilcon refers to Reference Document Volume II, Table 10, 4.4 – Brooks. The author, Dr. Michael Brylinsky characterizes the water courses as follows:

“The lower portion of the north brook (Figure 4.4.1) is about 0.7 – 1.0 metre in width and, at the time of the survey, had a moderate flow of water. Water depths averaged about 0.2 metres, but in some places there were small pools, generally less than one metre in diameter and 0.5 m in depth. The bottom of the stream was mainly bedrock with a few small areas that contained cobbles. There was little evidence of any sandy or gravelly areas that would serve as suitable spawning habitat for salmonids. Two surber samples taken in an area containing a cobble substrate, contained only a few caddis fly larvae, and visual examination of the undersides of submersed rocks failed to reveal the presence of any other types of aquatic invertebrates. It is unlikely that this stream serves as a significant habitat for salmonids.

The south brook is only about 0.2 – 0.5 metres in width at its lower end and flows over a very steep gradient containing a number of small waterfalls. Water depths were only 5-10 centimetres at the time of the survey. Its steepness and small size make it unlikely to be a significant habitat for salmonids.”

20) *Vol. VI – Section 9.2.13.4 – Page – 133 – Which existing TC regulatory requirements are being referred to in this section?*

RESPONSE

The existing TC regulatory requirements Bilcon referred to in this section can be found in the *Canada Shipping Act – Eastern Canada Vessel Traffic Services Zone Regulations*.

21) *Vol. VI – Section 9.2.14 – Page 134 – Proponent to ensure TC marine Safety (Mr. Mihai Balaban) is consulted with in regard to Ballast Water Exchange.*

RESPONSE

In June 2006, following submittal of the Environmental Impact Statement, regulations came into force with respect to ballast water exchange. Bilcon will consult with Mr. Mihai Balaban, Transport Canada Marine Safety, with regard to these regulations.

9.3.4 Transportation

22) *Vol. VII – Table ECM – 1 – Page 21 – Does Environmental Component for Recreation include marine based activities?*

RESPONSE

Use of the marine terminal for recreation activities will not be permitted. Access to the beach from the water by, for example, kayakers, will not be affected by the quarry or marine terminal operations.

23) *Vol. VII – Table ECM – 2 – Page 4 – Component for Transportation – Marine states that no regulatory requirements exists. NWPA applies to “works” in any navigable waterway in Canada and is a regulatory requirement.*

RESPONSE

Comment noted. Please refer to revised Table ECM – 1 in this submission.

WP 1525 – Natural Resources Canada

C-Comments from Reviewer 3

Ship traffic in the area will increase considerably and there is little shelter for ships against storms in the immediate area. Given that a marine oil spill can occur as a consequence of a marine accident, NRCan did not see any detailed preparation plans for shoreline cleanup or containment of marine oil spills other than the short section in Chapter 11 pg 21 which states spill response teams are available. The rough nature of the coastline and marine conditions will likely make this a very difficult area to conduct an oil spill clean-up or contain it to a small area. An adequate knowledge of these shoreline and marine conditions is relevant to determining how long it would take for response teams to reach the site and the adequacy of spill response. This knowledge should be brought to bear during spill response planning.

RESPONSE

Please refer to Bilcon’s response in Section 11.0 Accidents and Malfunctions in this submission.

WP 1541 – Fisheries and Oceans Canada

Volume I – Plain Language Summary

Page 33 - The proponent states that “North Atlantic right whale sightings in the Whites Cover area will be communicated to the ships captain before the ship exits the inbound shipping lane (see Map 4) or leaves the marine terminal for the outbound shipping lanes.” Who will do the sightings and at what times? If a North Atlantic right whale is sighted, what would be the course of action, understanding that Bilcon of Nova Scotia is not the operator of the vessels? What will be the accuracy of a trained observer in poor weather conditions? Is there a contingency plan for this situation?

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RESPONSE

As noted elsewhere in this document, the ship will leave the shipping lanes at or less than a speed of 12 knots. This speed will diminish as the ship nears the terminal to a speed of 1 knot. Contact with the ship's captain will be maintained throughout this transit and if a project employee observes marine mammals or waterbirds in the designated lane from the shipping lane to the terminal, this information will be transmitted to the ship's captain. The ship's captain will have two alternate strategies. During the lobster season the captain will further reduce speed and outside of the lobster season, the captain may alter his course or reduce speed or both. These conditions will be stipulated in the contract with the shipper. Observations from the shoreline will clearly vary with the distance to the shipping lanes and with weather conditions. It should be noted again, that the primary mitigation measure is the slow speed of the ship in the area between the marine terminal and the shipping lanes.

With respect to poor weather conditions which are still suitable for the ship to berth safely, should visibility hinder the accuracy of the trained on-shore observer, the contingency plan will be for the work boat to examine the designated shipping route ahead of the arriving or departing vessel.

Volume IV – Chapter 1

Table ECM-1-Page 20- Coordination of shipping with local fishers – Will there be exclusion zones setup during inbound/outbound shipping, approaches and departure?

RESPONSE

The ship will approach Whites Point and return to the shipping lanes on a very specific bearing which will be discussed and agreed to with local fishers and whale watch operators. All ships will use this specific route. While this is not an exclusion zone, fishers will know that there is some risk to setting nets or traps directly in this lane.

Volume VI – Chapter 9

9.2.13 Ship Interactions – North Atlantic Right Whale – also in 9.2.3 – Aquatic Ecology - Marine

Page 128 – Section 9.2.13 – The EIS defines the possible area of effects for ship/whale interactions as the area between the shipping lanes and the quarry. This area is chosen because “Vessels arriving and departing the Whites Point marine terminal are ‘rule’ vessels (vessels >20m in length and >300 gross registered tonnes)”. However, the guidelines for the EIS acknowledge that the spatial boundaries of the assessment will vary depending on the VEC and will extend beyond the project site in many instances. One of the criteria proposed for determining appropriate boundaries is “the physical extent (terrestrial and marine) of the proposed Project, including any offsite facilities or activities (such as shipping).” Based on the data provided in the EIS, it would appear more likely that vessels en route to or from the quarry would interact with whales while in the shipping lanes rather than after turning in

9.3.4 Transportation

towards the marine terminal. Also, it is unclear why the size and weight of the vessels is the appropriate determinant of the area of effects for ship/whale interactions.

RESPONSE

Map 25 contained in the EIS indicates the density of right whales sightings per unit effort (SPUE) in the Bay of Fundy. Also, **Maps 38A through 38D** indicate sightings of right whales, finback whales, humpback whales and minke whales in the Bay and **Maps 42A through 42F** indicate historic sightings (2000-2005) of right whales. The latter two series of maps are contained in Section 2 - Maps. Based on these maps, there appears to be a greater number of SPUE and sightings of whales in general in other areas of the Bay than between the shipping lanes and the marine terminal at Whites Point. The low density and infrequent sightings were an important determining factor for the proposed shipping route selection between the inbound/outbound shipping lanes and the marine terminal.

The inbound/outbound shipping lanes were relocated in 2003 to reduce the possibility of ship/right whale interactions in the Bay of Fundy and to avoid to the extent practicable, the concentration of right whales and other species of whales frequenting the right whale conservation area. The size of vessels transporting quarry products entering and exiting the Bay of Fundy are required to use the inbound/outbound lanes with no alternatives. Bilcon would agree that there may be a possibility of whale/ship interactions in the shipping lanes as presently located. Since no alternatives exist to the inbound/outbound lanes, appropriate mitigation measures must be relied upon to avoid interactions such as ship speed reduction and avoidance.

Page 128 – Section 9.2.13 – Ship Interactions, North Atlantic Right Whale – The EIS indicated that sightings of North Atlantic right whale in the area of proposed operation are relatively low compared to other areas of the Bay of Fundy. DFO and Right Whale Consortium hold sighting data additional to the SPUE data analyzed in the EIS. These data suggest that right whales are seen occasionally in the area.

RESPONSE

Sightings of North Atlantic right whales in the area of proposed quarry operations are relatively low compared to other areas in the Bay of Fundy. Right whale sightings from 1971 through 2005 from the database file housed at the University of Rhode Island were reviewed. A total of 13,509 sightings are recorded in this database for the 30 year period (1971-2005). Right whale sightings in addition to the SPUE data, from the University of Rhode Island database for the years 2000 through 2005 are shown on **Maps 42A through 42F**. Also, an aggregate of right whale sightings from the Maritime Fisheries and Oceans Canada, St. Andrews Biological Station Sightings Database is shown on **Map 38A**. These databases indicate that right whales were sighted very infrequently in the area of the proposed ship route between the inbound/outbound shipping lanes and the marine terminal at

9.3.4 Transportation

Whites Point. As indicated on Map 38A, 1 sighting of a right whale was recorded during an approximate 30 year period in this area of the ship route.

Page 133 – The proponent should explain what the statement “this route will be designated” means.

RESPONSE

The proposed shipping route from the inbound/outbound shipping lanes and marine terminal is shown on Map 25 in the EIS and on Map SR-1 in Section 7.0 – Revised Project Description. The term “designated route” is intended to be the course which the master of the ship will adhere to unless safety considerations for ship and crew or marine mammal sightings indicate a variance is necessary.

Page 133 – The section on mitigation measures for shipping impacts on Right Whale requires some clarification and further details. It is not entirely clear from the first paragraph, whether the proposed mitigation activities will be carried out or may be carried out. This section proposes that the presence of whales along the proposed ship route be monitored through communication with research and whale watching vessels operating around the project area. Specifics on how the quarry will maintain communication with research vessels and whale watchers, whether the latter have agreed to cooperate with the quarry operators, and whether they are likely to be present in the project area with any frequency is needed (see note below Fundy Traffic reports). Also, details should be provided on the mitigation measures that will be taken if whales are sighted. And as noted above, research and whale watching may not be conducted year round, unlike quarry operations.

RESPONSE

Mitigation measures proposed by Bilcon are specific to the ship route between the inbound/outbound shipping lanes and the Whites Point Marine Terminal. As mentioned previously, Fundy Traffic Services provide vessel captains with regular advisories on right whale locations in the Bay of Fundy.

As an additional precautionary measure, Bilcon intends to request any right whale sightings from whale watching tours operating in the area between the shipping lanes and marine terminal. Provision of right whale sightings to Bilcon by tour operators would be voluntary. It is quite likely, due to the historic infrequent sightings of right whales in this area, that whale watching tours may not frequent this area on a regular basis. Also, tour operators generally do not provide tours throughout the year when shipping of aggregate products are proposed. Therefore, a more reliable source of information may be from Fundy Traffic and their advisories which would provide a more comprehensive observation source.

9.3.4 Transportation

Implementation of mitigation measures, if right whales are sighted, is the responsibility of the ship's captain. In this regard, mitigation measures are presently being considered in certain waters in the United States (National Oceanic and Atmospheric Administration (NOAA) 2006). The intent of these proposed regulations is to reduce the risk of collision between ships and endangered northern right whales. These proposed rules were published in the Federal Register/Vol.69, No. 105/Tuesday June 1, 2004/Proposed Rules. A key aspect of the proposed rule by NOAA Fisheries service is a uniform, mandatory vessel speed reduction to 10 knots or less in specific locations along the U.S. East Coast during times when whales are likely to be present.

Page 133 – Commercial vessels operating in the shipping lanes and approaches are advised to contact Coast Guard Fundy Traffic if they sight right whales. Fundy Traffic then issues reports to all ships in the area. This would provide a more comprehensive observation source, supplemented by whale watchers and researchers. Also, the main period of concern is May-November for these animals.

RESPONSE

Comment noted. Bilcon agrees with the approach that Coast Guard Fundy Traffic be the primary source of right whale sightings, supplemented by whale watch tour operators. Also, the main period of concern is May – November for the right whale.

Page 133 – The EIS states only that shipping activity will be monitored (i.e., keeping records of arrivals and departures, fulfilling Transport Canada monitoring requirements). SARA requires monitoring of the effect on species at risk. Monitoring measures for shipping impacts on marine species at risk should be added. This should include monitoring the effectiveness of mitigation measures and confirming the effect predictions.

RESPONSE

In addition to monitoring shipping activities at the marine terminal, Bilcon will monitor any sightings and/or ship interactions by the shipping company with right whales between the shipping lanes and the marine terminal. The intent of this monitoring would be to determine the effectiveness of the mitigation measures being implemented but it should be noted that this sea area will be frequented by other boats so that only the mitigation by Bilcon will be able to be assessed rather than the overall effect on species at risk as listed by SARA by all shipping activities in the area.

Section 9.2.14 Ballast Water

Page 134 – The summary of invasive species in section 9.2.0 does not mention concerns about the potential for the introduction of disease organisms. Among those mentioned in the reference document (Reference Document 13) is the pathogen thought to be responsible for lobster disease in New Jersey:

9.3.4 Transportation

“The greatest immediate concern for the Whites Point ecosystem and fishing community would be the potential introduction of the “pathogen” responsible for the mass lobster mortalities observed in the Long Island Sound area in 1999. Evaluating this risk is, however, very difficult given the current status of the research on this issue” (Carver and Mallet, 2003).

The potential for the transport of this pathogen could be addressed by experts in aquatic animal disease. This potential for introduction of pathogens and other invasive (such as the Asian crab) by this project may be no different than that from existing shipping but this does not appear to be addressed.

RESPONSE

Bilcon assumes that the new regulations introduced by Transport Canada in 2006 will negate the potential for the introduction of pathogens and other invasive species. However, Bilcon will conduct monitoring as set out in the following response.

Page 136 – The proponent states that they will employ a “reputable bulk carrier” which is required to follow ballast water exchange guidelines. They agree to conduct monitoring at the receiving terminal, and submit a written report to Environment Canada upon completion of the investigations. However, they provide no details of what “upon completion of the investigations” means. The proponent should be more specific about this. They conclude that no mitigation is required and the impact is neutral. While current practices for ballast water management do not eliminate all risks, there is no compelling reason to disagree with their position regarding ballast water control.

RESPONSE

Notwithstanding the fact that new regulations under Transport Canada are now in place, monitoring in marine waters adjacent to the Whites Point Marine Terminal is proposed on a voluntary basis in order to contribute and add to the knowledge base as to the effectiveness of the regulations, please refer to EIS Volume VI, Chapter 9.2.14.4. Monitoring would be conducted seasonally during the first year of shipping activities. Thereafter, monitoring would be conducted once a year for the next five years. After five years, an evaluation of the monitoring results would be conducted to determine if continued monitoring is warranted. Written reports will be prepared at the end of the first year (seasonal) and at the end of the five year period. Coordination will be maintained with Environment Canada and Fisheries and Oceans Canada.

Section 9.2.14.1 – Ballast Water Research – This section should note that the Ballast Water Control and Management Regulations do not retain designation for “vulnerable area” as contained in the draft Annex V of the “Guidelines for the Control of Ballast Waster

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Discharge from Ships in Waters under Canadian Jurisdiction” (200). As such, the Bay of Fundy is not formally considered a vulnerable area for the purpose of ballast water management and regulation.

A more detailed description of the Ballast Water Control and Management Regulations should be provided by the proponent, particularly the provision requiring the management of ballast water on vessels operating between points south of Cape Cod, Massachusetts and Canadian waters.

The proponent should also note that invasive species may be transferred via hulls of ships, although the primary vector and risk is expected to be via ballast water.

RESPONSE

It is noted that the Ballast Water Control and Management Regulation have changed from the 2001 Draft.

The provision for ballast water management on vessels operating between points south of Cape Cod, Massachusetts and Canadian waters is contained in the Ballast Water Control and Management Regulations (Canada Shipping Act, Ballast Water Control and Management Regulations SOR/2006-129). In the case of shipping at the Whites Point Marine Terminal, paragraphs 6 (Ballast Water Exchange – Transoceanic Navigation) and paragraph 7 (Ballast Water Exchange – Non-Transoceanic Navigation) of the Regulations should be referred to.

In addition to potential for invasive species carried via ballast water, it is noted that invasive species may be transferred via hulls of ships.

Section 9.2.14.3 – Ballast Water Mitigation – The proponent should state that mitigation will occur through ballast water management on vessels using the marine terminal. The proponent should also discuss the potential for a ballast water management plan to be incorporated into any shipping agreement.

RESPONSE

Since regulations governing ballast water management on vessels are in effect, this would constitute a mitigation measure. A ballast water management plan is a requirement of these regulations and Bilcon does not intend to have any additional requirements incorporated into any shipping agreement.

Page 136 – The requirement for monitoring is not based on community and stakeholder concerns about invasive species resulting from ballast water discharges. The requirement for monitoring is based on the risk of invasive species associated with marine traffic at the

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terminal. While the commitment to monitoring is recognized, the proponent will have to provide a detailed monitoring plan for review by DFO and other relevant agencies if the project proceeds.

RESPONSE

Bilcon's proposed monitoring in marine waters adjacent to the Whites Point Marine Terminal is a voluntary precautionary measure and not a requirement of the Ballast Water Control and Management Regulations. As previously mentioned, monitoring is proposed seasonally for the first year of shipping activity and once a year thereafter for five years. A detailed monitoring plan will be coordinated with Environment Canada and Fisheries and Oceans Canada

Page 136 – The impact statement is likely valid provided that vessels operate in compliance with ballast water management and control measures. However, the ongoing risk of invasive species posed by vessel traffic in the area should be acknowledged. The determination of magnitude of effects is challenging in that one successful invasion/colonisation (i.e., from one vessel discharge) can lead to local and regional effects.

RESPONSE

Bilcon concurs with this paragraph and acknowledges that all vessel traffic in the Bay of Fundy poses a risk of invasive species introduction. In this regard as a precautionary measure, Bilcon intends to monitor marine waters in the vicinity of the Whites Point Terminal to determine the effectiveness of ship mitigation measures involving ballast water control and management during the first six years of project shipping activities.

Page 137 – 9.2.15 concludes that noise from shipping will have a long term, insignificant negative effect on marine organisms. The EIS does not specify which organism will be affected but it can be assumed that this would include locally occurring species at risk, and especially at risk marine mammals, which are considered to be sensitive to noise. Ambient/ship induced noise is identified as a potential limiting factor for right whales in the COSEWIC Status Report

No mitigation for ambient noise is proposed but SARA Section 79 requires that measures be taken to reduce or avoid adverse effects on species at risk. The EIS does note that vessels will reduce their speed after they turn in from the shipping lane, and implies that this will result in noise reduction. This could be viewed as an effort to reduce the adverse effect of noise, as required by Section 79. If so, the proponent should provide more detail on the expected noise levels at the speed at which the vessels will be travelling.

The proposed monitoring of noise levels is supported, but DFO recommendations (in Appendix 9 of EIS) regarding noise monitoring need to be considered. Also, unless it can be

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clarified that the negative impact of noise will only affect marine organisms that are not SARA listed, monitoring of the effect of noise on species at risk will be required. This could involve for example, coupling passive acoustic monitoring and/or visual behavioural monitoring with the noise monitoring system to determine whether the movement of ships is affecting marine mammals

DFO supports the proposal for sound and vibration monitoring in the water column near the marine terminal but more detail should be provided by the proponent (e.g., target frequencies, duration, seasonality, reporting, continuance etc). There also seems to be a disconnect between this section and the earlier one on blast monitoring (9.2.11.4). If the proponent is going to install a semi-permanent acoustic monitoring system, it should be designed so that it can be used to monitor blasting noise as well as more general sound from the terminal operation.

RESPONSE

The effect of noise from shipping was primarily directed to marine mammals at risk, which may be sensitive to noise. It is recognized that ambient/ship-induced noise has been identified as a potential limiting factor for right whales (COSEWIC Assessment and Update Status Report 2003). Further clarification is offered for the previous statement.

“It has been suggested that the constant hum of shipping noise in the North Atlantic has habituated right whales to ship sounds, making them less likely to avoid oncoming vessels. It is also possible that the higher levels of ambient noise in the ocean have reduced the ability of right whales to hear mating calls over large distances, perhaps reducing mating opportunities” (COSEWIC Assessment and Update Status Report 2003).

Sound levels and frequency characteristics are generally related to ship size and speed. The primary sources of sounds are propeller cavitation, propeller singing and propulsion equipment. Propeller cavitation is usually the dominant noise source (Ross 1976). Both propeller cavitation and singing originate outside the hull of the vessel while noise from propulsion machinery originates inside and reaches the water via the vessel hull. Large vessels create stronger and lower frequency sounds because of their greater power, large drafts and slower turning engines and propellers. Commercial vessels such as the bulk carriers that will carry aggregate products from the Whites Point quarry produce high sound levels mainly at low frequencies. Noise also increases with ship speed (Richardson et al 1995). Expected noise levels for a vessel traveling at 10 knots would be 152 dB re $1 \mu\text{Pa}^2/\text{Hz}$ at 100 Hz near the source (Urick 1975). It should be noted that this data is based on a freighter of that time period and at 1m from the vessel. More modern vessels may produce greater noise levels. Speed between the shipping lanes and the marine terminal, a distance of approximately 13k, would range from 10 to 0 knots. Reduction in speed generally results in a decrease of noise. Thus, continued speed reduction will result in continued noise reduction

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as the ship approaches the terminal. When the ship departs the terminal, loaded, there may be an increase in noise as compared to the unloaded ship approaching the terminal.

Large commercial ships could be quieted with the application of certain vessel quieting technologies, however, there is apparently no consensus as to whether the need for this is clear, based on current understanding of impacts. Also, the application of these technologies whether in new construction or retrofitting existing vessels is expensive. It therefore appears that any mitigation measures such as quieting technologies to reduce noise from vessels presently lies with the shipping industry in either new construction or retrofitting.

An ecosystem-based approach to conservation management regarding marine pollution, which could include noise, appears to be emerging under IMO as well as other conventions and agreements. However, there are currently no explicit and binding international guidelines or regulations regarding the impacts of anthropogenic noise sources, including vessels, on marine mammals (NOAA 2004. "Shipping Noise and Marine Mammals: A Forum for Science, Management and Technology").

Vessel speeds in the shipping lanes are expected to be approximately 14 to 15 knots. Reduction from these speeds upon approach to the marine terminal at Whites Point would begin approximately 24km from the terminal. Expected speed upon exiting the inbound shipping lane would be less than 10 knots and 2 to 5 knots while beginning manoeuvring to the marine terminal, depending on sea conditions. There are presently no speed restrictions for vessels operating in or outside the shipping lanes in the Bay of Fundy. Ship speed is at the discretion of the ship's master in accordance with ship and crew safety considerations.

As stated in the EIS, Bilcon has indicated that monitoring of noise levels from vessels arriving and departing the marine terminal will be conducted. Also, as stated in Bilcon's Blasting Protocol, background noise monitoring in the Bay at the edge of the Right Whale Conservation Area will be conducted at the time of monitoring the initial blast. Bilcon is not aware of any regulations requiring monitoring of noise from vessels in marine waters. This proposed monitoring would be done on a voluntary basis. Details of the proposed monitoring program will be coordinated with DFO and could involve visual behavioural monitoring of marine mammals in conjunction with the noise monitoring. Bilcon's intention would be to incorporate appropriate equipment for monitoring noise from vessels, at appropriate frequencies, at the monitoring stations proposed for monitoring blasting noise and vibration in the vicinity of the marine terminal and at the edge of the Right Whale Conservation Area.

Page 137 – Section 9.2.15 – Noise and Vibration, Marine – In Sub-section 9.2.15.2 it is stated that for a one day sonobuoy deployment within the North Atlantic right whale Conservation Area, sound levels were elevated at both 500 and 100 Hz, the measurement

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period coinciding with verified high levels of shipping in the area. Upon examination of the literature, the measured noise levels reported in Sub-section 9.2.15.1 at 100 Hz appear to be as much as 10 dB higher than normally expected in corresponding heavy shipping areas in the deep ocean and 20 – 25 dB higher than those anticipated in the same deep ocean areas both measured a sea state zero. The sonobuoy levels are somewhat comparable to older historical acoustic levels measured in shallow waters of New York harbour (Urick 1975) however; one day of recording does not provide a representative sample of baseline noise.

It is reasonable to assume that two bulk carrier transits per week through or close to the Conservation Area would not add greatly to average incremental exposures in the Conservation Area itself. However it should be emphasized that for any individual vessel passage the locally observed noise level and any specific animal exposure will be very dependent on the distance to the vessel and also, at increasing ranges, water depth and other physical variables. As an example, for a freighter traveling at 10 knots Urick (1975) quotes a 100 Hz spectral noise level of 152 dB re 1 VPa²/Hz at 1 yd, which is about equivalent (within 1 dB) to a reference viewing distance of 1m. Crudely assuming single vessel noise to fall-off at a 20 log R rate up to a distance comparable to the water depth, say 200m in the Grand Manan Basin, and at a 10 log R rate for distances beyond 200m, vessel acoustic levels comparable to the above reported 93 to 81 dB ambient would be approached at ranges of 4 to 60 km. What this implies is that at observation ranges up to at least a few kilometers the noise levels from a large ship will almost certainly be above the measured (elevated) ambient background. The last sentence in Sub-section 9.2.15.2 stating “background noise levels are therefore expected to be less than noise levels recorded in the North Atlantic right whale Conservation Area study previously mentioned” is difficult to interpret. This is no doubt true providing acoustic levels are highly averaged over time and space. Levels from one or two close bulk carrier passages will no doubt average to something close to the otherwise ambient levels provided the averaging period is long enough (e.g., one week).

The last sentence in Sub-section 9.2.15.2 stating “background noise levels are therefore expected to be less than noise levels recorded in the North Atlantic right whale Conservation Area study previously mentioned” is difficult to interpret. This is no doubt true providing acoustic levels are highly averaged over time and space. Levels from one or two close bulk carrier passages will no doubt average to something close to the otherwise ambient levels provided the averaging period is long enough...

If this project were to proceed, it would be advisable to make baseline measurements of bulk carrier noise around the terminal and nearby areas of potential environmental sensitivity. It should be noted that it is not entirely certain that modern bulk carrier generated noise levels would closely approximate those of a “freighter at 10 knots” nor if the general ambient noise levels close to Whites Point would be similar to those measured in the Conservation Area during a period of high shipping density.

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RESPONSE

In response to the first paragraph of the comment: Bilcon would agree that one day of recording noise levels in the North Atlantic Right Whale Conservation Area does not provide a representative sample of baseline noise. Regarding ambient noise levels in the Bay of Fundy, Bilcon was unable to access contemporary data. If Fisheries and Oceans Canada has reliable contemporary data, Bilcon would appreciate being provided references.

In response to the second paragraph of the comment: It should be noted that the proposed ship route from the inbound/outbound shipping lanes to the marine terminal at Whites Point does not pass through the right whale conservation area. Based on the infrequent shipping schedule of two transits per week, and the reduced ship speeds (below 10 knots entering or exiting the shipping lanes, the predicted effect of quarry induces shipping would constitute an insignificant negative effect (EIS Volume VI, Chapter 9.2.15.5). This predicted effect is for the marine waters between the inbound/outbound shipping lanes and the marine terminal. Bilcon agrees with DFO's analysis that the ship would produce noise levels comparable to that recorded in the Right Whale Conservation Area based on the presented assumptions. However, other variables such as vessel speed (less than 10 knots), duration (travel time to and from the shipping lanes to the marine terminal), water depth, season, etc. should be considered.

In response to the third paragraph of the comment: Bilcon would agree that shipping activities at the Whites Point Quarry will add to the ambient noise levels in the Bay of Fundy. Also, there appears to be a lack of quantifiable data existing on ambient noise levels in various areas of the Bay. Since no regulations exist concerning noise level emissions from ships in marine waters, Bilcon has voluntarily proposed monitoring at the marine terminal (EIS Volume VI, Chapter 9.2.15.5). Also, as indicated in Bilcon's Blasting Protocol, monitoring at the edge of the Right Whale Conservation Area will be conducted for the initial blast. Background/ambient noise monitoring would be conducted prior to and after the initial blast. This response should be read in conjunction with the previous response.

It should be realized that sources other than large ships contribute to ambient noise in the area of the Bay. Natural environmental forces such as wind driven waves and surf and other anthropogenic sources such as fishing and whale watching boats also contribute to ambient noise. The fishing and whale watching boats in coastal regions contribute significant sound, adding to aggregate noise. Since fishing boats comprise the largest number of vessels operating in the Bay, and have higher-speed engines and propellers than large ships (Richardson et al 1995), their contribution to ambient noise may far exceed the noise generated by two bulk carrier transits per week.

References

Richardson et al. "Marine Mammals and Noise". 1995

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Gisiner, Robert C., Ph.D. Marine Mammal Science Program Office of Naval Research. "Proceedings – Workshop on the Effects of Anthropogenic Noise in the Marine Environment". 10-12 February 1998.

Final report of the National Oceanic and Atmospheric Administration (NOAA) International Symposium: "Shipping Noise and Marine Mammals: A Forum for Science, Management, and Technology". 18-19 May 2004. Arlington, Virginia, U.S.A.

In summary, at the present time, Bilcon is not aware of any regulation requiring noise/vibration monitoring in the marine environment. Bilcon intends to operate in accordance with the Fisheries Act and Species at Risk Act and other applicable acts. Bilcon also intends to follow the criteria/thresholds regarding blasting contained in the "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters". As a precautionary measure, Bilcon will voluntarily monitor an initial blast at the Whites Point site to verify the CONWEP model results and DFO's formulas upon which the "Guideline" criteria are based. Once this initial data has been gathered and analyzed, any effects of concern regarding marine animals would be identified. If the criteria/thresholds contained in the "Guidelines" are achievable based on the results of the initial findings, a reasonable time frame for "significance" monitoring would be established. Bilcon proposes a one year (4 season) time frame to further verify original predictions of change either positive or negative. This monitoring would be conducted during the first year of quarry construction.

Regarding spatial boundaries for monitoring, Bilcon believes it reasonable that the suggested "far-field" monitoring would only be implemented if significant near-field monitoring results are deemed of concern, i.e. if the results of the initial blast conclusively exceed the model and DFO's guideline criteria/thresholds. If DFO's guideline criteria/thresholds in the near-field where the greatest effect is most likely, it would appear unreasonable to continue monitoring in the far-field after the one year verification period, provided there were no new scientific standards or regulatory requirements. If, during the 50 year life of the project new standards or regulations come into effect, Bilcon would take an adaptive management approach in coordination with the regulatory authority.

Wharf Construction - the proponent should describe the impact of drilling rock sockets (as compared to pile driving)? Also the impact of the terminal operation, ship loading and the drilling of blast holes should be described.

RESPONSE

Please refer to Bilcon's response to Fisheries and Oceans Canada, in Section 9.1.7 – Noise and Vibration.

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WP 1641 – Nova Scotia Department of Tourism, Culture and Heritage Transportation of Materials (Trucking and Shipping)

Trucking

The department understands that there will not be an increase in trucking traffic, given that most of the material will be shipped from the marine terminal and transported by water.

RESPONSE

Please refer to Bilcon's response to the Panel in this Section 9.3.4.

Increased Shipping

The tourism industry in the Digby Neck area offers many nature based experiences resulting from the Bay of Fundy eco-system. For example, there are ten whale watching operators in the area. The visitors coming to this area are attracted by the pristine outdoor scenery. Whale watching and birding are two of the experiences which are offered by the Digby Neck area. According to a recent "Birding Opportunities" study, this area has been identified as one of the best all-round birding sites in Atlantic Canada because of its geographic position. The Digby Neck area is highlighted in our Annual Plan as an area where the "birding" market is emerging and growing.

This area is also the summer home to the endangered right whale population. The world population of this species is currently estimated to be around 300 – 350. Increased industrialization in this area may have a negative impact on whale watching and visitor perception may impact the attraction of the area. Although some whale watching operators state that the whales are not usually in the water directly in front of the proposed quarry site, the whales are in the area and will be in the shipping lanes which will be crossed by the ships.

The threat for the whales increases with the increased industrial shipping in the area. Since whale watching is the dominant product in the area, the tourism industry is very concerned that this may negatively impact their businesses.

RESPONSE

With respect to the comment on whale watching, recent research has found that this activity may be responsible for damaging changes in the mammals' behaviour and could be putting them off feeding. A study of killer whales by researchers from the University of St. Andrews in Scotland and Dalhousie University in Halifax, Nova Scotia has revealed that the approach of boats disturbed the animals to such an extent that they decreased their food intake by up to 18%.

Rob Williams, a sea mammal researcher from St. Andrews, based on Pearse Island, British Columbia, who led the killer whale research, said that although all boat traffic within an

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average of five square kilometres disturbed the whales behaviour, whale watching boats were the only vessels that actively searched for the mammals.

“The most contentious example of human disturbance may be commercial whale watching operators”, said Mr. Williams. “The exponential increase in commercial whale watching activity has caused some to question the benign nature of that industry. This study provides indirect evidence that feeding activity is disrupted by the presence of boats, which could lead to a substantial decrease in energy gain opportunities. Overall, whales reduced their time spent feeding from 13% to 10% when boats were present. They showed not only a lower probability of continuing feeding, but also a lower probability of initiating a feeding bout.”

Conservation groups believe that the effects of whale watching boats on killer whales also apply to other whale populations. They fear that dwindling food stocks are forcing whales to spend more time searching for food and, if they are frightened away from a good feeding spot by whale watching activity, they become weaker and could even starve.

Vanessa Williams-Grey, the head of the Responsible Whale Watching Program at the Whale and Dolphin Conservation Society, said: “researchers over the last few years are starting to notice whale population being displaced from favourite feeding or resting areas by the presence of too many vessels.”

Please refer to the article “Why Watching Whales Does More Harm Than Good, by Richard Gray, Science Correspondent, Sunday Telegraph, 19/11/2006.

Please refer to Section 9.2.3 – Aquatic Ecology – Marine in this document.

Potential Growth of the Development

Blasting noises and increased industrial shipping and loading of basalt will impact visitors to the area.

RESPONSE

Please refer to Section 9.1.7 Noise and Vibration and Section 9.3.3 – Aesthetics.

WP 1652 - Nova Scotia Department of Transportation and Public Works

Comment

Whites Cove Road (hereinafter referred to as the “Road”) is a publicly listed but unmaintained gravel road (Class K).

RESPONSE

Comment noted.

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The existing entrance to the Road where it intersects Highway 217 has been checked for Commercial Stopping Sight Distance (SSD) and it meets the requirements of TPW at that point. However, as the width of the right of way (ROW) on the Road is believed to be only 33 feet wide, it may be difficult for tractor trailers to exit Hwy 217 onto the Road safely. Discussions must take place between the proponent and TPW via the local Area Manager, with respect to upgrades to the Road as well as the intersection of the Road and Hwy 217, before any upgrades take place. Should additional ROW be required to properly design the Road this would normally be at the cost of the proponent.

RESPONSE

Comment noted. Bilcon will consult with TPW should any upgrades of the Whites Cove Road be contemplated. Bilcon has acquired the land to the north of the Whites Cove Road so that should additional ROW be required for design considerations, it is in place.

Should upgrades or changes to the Road be necessary, "Access to Property" and "Breaking Soil" permits are required from TPW. Any changes to the present Road must be done according to TPW standards or as directed by TPW. Changes to the Road which result in environmental or other problems will be the responsibility of the proponent.

RESPONSE

Comment noted.

An upgraded Road will only be maintained if the Road is brought up to maintainable appropriate government standards and the maintenance standards would be as per the normal priorities for the area.

RESPONSE

Bilcon has noted in the EIS that a paved access road will be constructed to the quarry property to reduce dust in the local area. The Whites Cove Road or an alternate access road will be built to the appropriate government standards and paved.

Gated access on a public road is not standard government policy. Gated access to a private road constructed and maintained by the proponent is at the discretion of the proponent.

RESPONSE

The Whites Cove Road would not be gated at any location along the road since it is a public road. Access would be restricted only during a blasting operation. Should a new access road be developed on private property, it would be gated.

Due to siltation problems along the present Road, any construction which aggravates sediment and erosion control issues on this Road especially on the down grade near the

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shore of the Bay of Fundy should be first addressed with the local Area Manager and must meet the requirements of the Department of Environment and Labour and Federal Department of Fisheries and Ocean officials.

RESPONSE

Bilcon is very well aware of the siltation issue on the down grade portion of the Whites Cove Road near the Bay of Fundy shoreline and has assisted TPW in trying to solve this issue. Unless Bilcon acquires the Whites Cove Road from the quarry property line to the Bay of Fundy shore, any quarry operations affecting the Whites Cove Road will be coordinated with NSDTPW's Area Manager.

9.3.5 Economy

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3.17

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WP 1452 – Joint Review Panel

9.3.9 Economy – WPQ and Marine Terminal

9.3.9.1 – Provide details on the EcoTec Economic Impact Model and a summary of its inputs, outputs and assumptions.

RESPONSE

The economic impacts for the study have been estimated using an interprovincial input-output model which was developed by Marcel LeBreton (Masters Economics) and is owned by EcoTec Consultants. The model has been in development for over 20 years and is constantly being updated and upgraded with new capabilities.

This model is based on Statistics Canada input-output tables and data from the 1999 to 2002 period. The input-output matrices are at the Large Level aggregation of 476 commodities and 117 industries. Both open (indirect impacts) and closed (induced impacts: consumer expenditures) versions of the models were used to calculate the impacts.

The model is a mixed input-output and econometric model with a number of econometric modules operating around the input-output core. The modules intervene at each round of expenditures to modify coefficients in the input-output tables, resulting in a non-linear model. The model is also dynamic and can generate impacts spread over as many as 15 years after initial expenditures. All Input-Output data as well as the data series used to calculate the coefficients for the econometric modules are from Statistics Canada.

The role of the econometric modules is to reduce the linearity of the input-output core, to have a model that behaves more closely to the actual economy and to provide statistics on economic impacts that go beyond what is traditionally available from input-output models. The two most important econometric modules in the model are :

- A labour market module that uses the statistics generated by the input-output core to calculate the impact on the number of unemployed workers as well as the impact on the unemployment rate by province.
- An elasticity module for consumer expenditures modifies at each round of expenditures the pattern of households expenditures according to changes in per capita income in the previous round of expenditures.

The model estimates economic impacts due to change in economic activity related to (in this case) the construction and the operation of the quarry. The main outputs of the model are:

- Sales by industry;

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- Gross Domestic Product;
- Employment by industry;
- Federal and provincial tax revenues;
- Labour market impacts

Model Assumptions

The main assumptions of the model are:

- No economies of scale resulting from the construction or the operation of the quarry. Given the small size of the quarry with regard to the Nova Scotia economy, this seems like a reasonable assumption.
- The technology used by industries in Digby County as well as in Nova Scotia that are impacted by this project is similar to the technology used in other parts of the province and for other projects. Bilcon has no particular reason to believe that this is not the case: firms working for the quarry (either for construction or as suppliers to operations) are unlikely to have production technologies that are materially different from elsewhere in the province.
- The quarry project will have no measurable permanent impact on wage levels, productivity or consumer behaviour, in aggregate, in either Nova Scotia or in Digby County. Again, this is reasonable given the transitional nature of the construction and the relatively small scale of the quarry once in operation (compared to the total provincial economy).

A simulation always estimates the incremental level of economic activity (as measured by sales, employment, GDP, etc.) resulting from an increase in demand. This increase in demand is represented by the direct expenditures on construction and on the annual operations of the quarry. Figure 1 shows an outline of the structure of the model.

Leakages

One of the most important notions to understand in local and regional economic development is that of leakages. Leakages are in essence the different ways by which money spent in the area will leave the local economy for other parts of the province, the country and the world.

Leakages are an important determinant of the actual economic benefits of a given expenditure. High leakages will result in relatively low impacts in a local economy and vice versa. For example, the economy of regions such as Southern Ontario is efficient at generating employment because of its ability to keep money spent in the region for a longer period of time.

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The bold red arrows in Figure 1 represent the flows of money leaving the local economy. There are three main sources of leakages that reduce the amount of money available in the local economy: (1) Imports of goods and services, (2) Government taxes, and (3) Savings and retained earnings. Each of the three sources are discussed in more detail below.

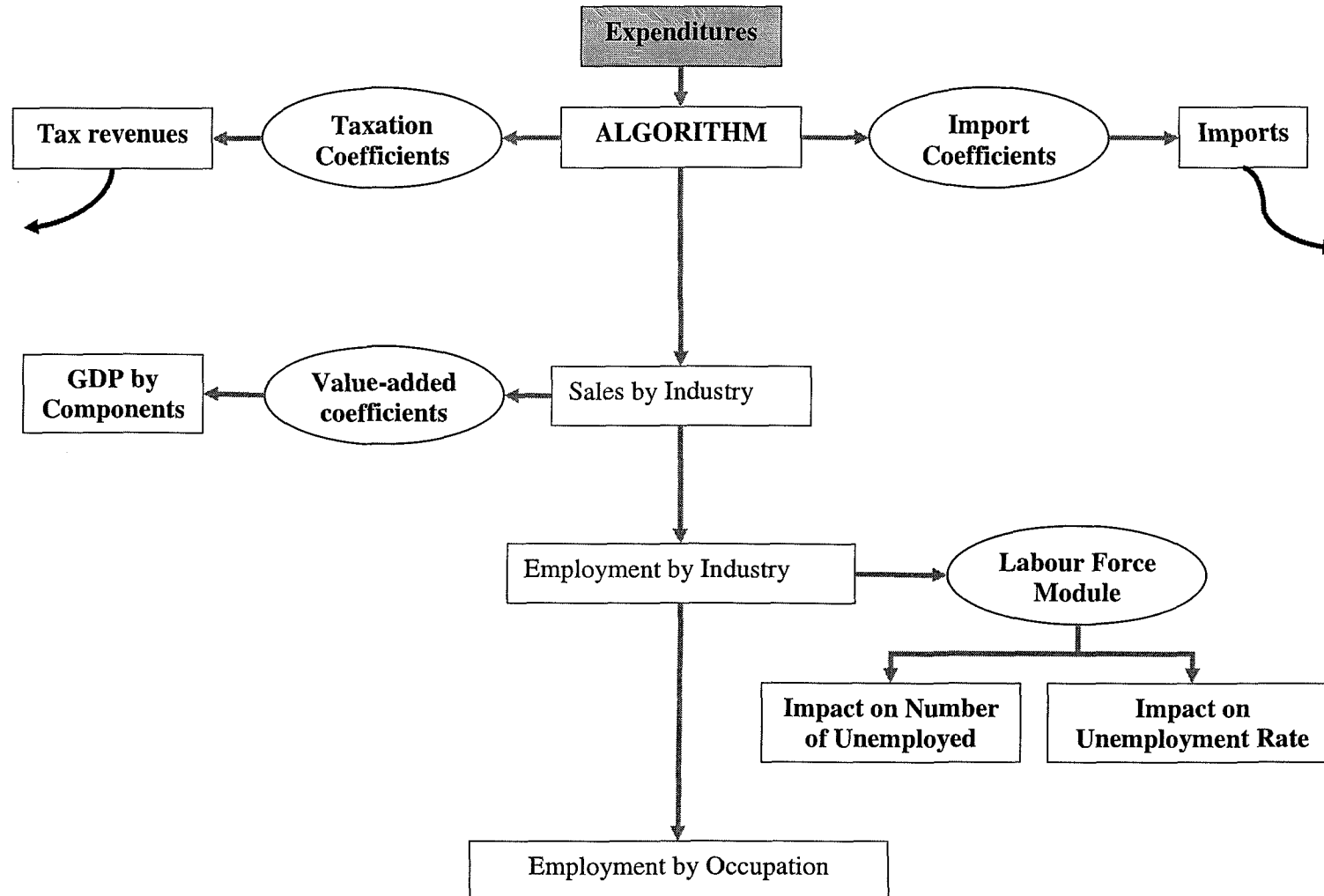
Imports of goods and services

Imports of goods and services from outside Digby County or Nova Scotia are the most important cause of money leaking out. The vast majority of goods and some services consumed in any given economy are not made locally: they are imported from elsewhere. The smaller an economy is (and the less developed its manufacturing, retail trade and services sectors are), the higher its imports (proportionally) from outside the region. Imports of goods and services take two different routes: either through the retail sector or direct purchases (shopping trips, internet, tourism expenditures, etc.)

Government Tax Revenues

Federal and provincial tax revenues are the second most important source of leakages for a local economy. Households are the most important source of government revenues with income tax paid on salaries and sales tax (a form of indirect tax). The private sector is the other source of tax revenues through taxes on corporate profits and indirect taxes on production.

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Savings and Retained Earnings

The third and least important source of leakages is income that either households or businesses have available for purchases but that is set aside for future use. In the case of households this phenomenon is called savings and for businesses it is labelled as profits in the diagram.

Main Algorithm

A simulation starts with a shock to the economy which enters the model as a data set containing expenditures by goods and services to (in this case) either build the quarry or operate it. The main algorithm is essentially used to allocate the expenditures on each and every goods and services to the industries that produce them. They (the industries) in turn purchase goods and services required to produce the items that have been purchased initially, etc. Figure 2 shows the logical structure of the main algorithm that estimates the volume of sales by industry.

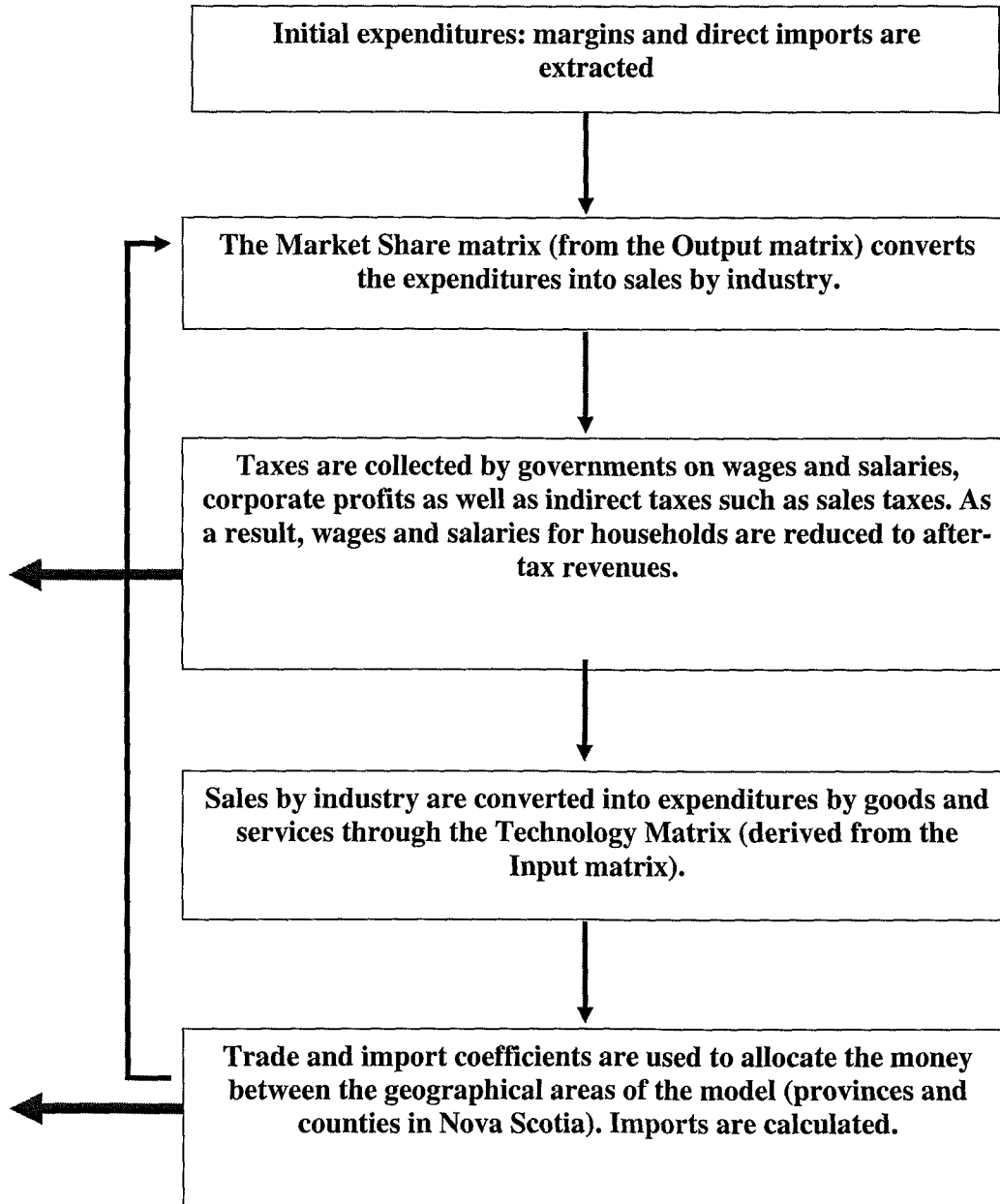
The core of the model operates with a standard input-output algorithm. When expenditures first enter into the model, retail, wholesale and transportation margins are extracted and reallocated to the retail trade, wholesale trade and transportation industries. Import coefficients are applied to the remaining dollar amounts to leak out expenditures for items which are not produced in the province. The dollars remaining in the province are allocated to the industries which produce the commodities. In turn, those industries will consume commodities used to produce the commodities purchased to build and operate the quarry. An interprovincial trade flow matrix is used to allocate production by industries by provinces.

The model continues to iterate until there is no money left in the model (imports, taxes and savings are all leakages which eventually reduce to zero the amount of money spent to either build or operate the quarry). The model then stops and the total impacts by industry are added up from all iterations. The statistic generated by the Input-Output model is called the Gross Production (sales) by industry. Employment is calculated by extracting salaries data by industry from the Gross Production table and dividing it by the average annual salaries by industry for each province.

The Gross Domestic Product (GDP) is calculated by extracting from the Gross Production by industry the primary inputs components: indirect taxes (for example GST), subsidies, salaries and benefits for employees, profits and depreciation for the private sector. Extraction of both (i) salaries to calculate employment and (ii) GDP components is based on coefficients contained in the Use (Technology matrix) tables.

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Figure 2: Structure of the Main Algorithm



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Types of impacts

There are three main types of economic impacts: direct, indirect and induced. The direct impacts are simply the initial expenditures with which a simulation is done: \$50 million in construction costs, \$20 million per year in operating expenditures, etc. Direct employment is, for example, the employees of the quarry working directly for the quarry owner.

Indirect impacts

Any expenditure made by a given industry can be divided into two main categories: wages and salaries and non-wage items (goods, services and indirect taxes). Indirect impacts result from inter-industry purchases of goods and services.

After-tax industry expenditures can be split between profits (in fact retained earnings) and other expenditures on goods and services. These expenditures will either be made locally or will be purchased directly outside the local economy. Most businesses, especially in the manufacturing sector, purchase a significant amount of goods and services directly from wholesalers or from the producers of those goods and services that are located outside the region.

The local purchases that go directly to local producers of goods and services will remain within the local economy and will be re-spent on wages and salaries, taxes and other goods and services. For example, if initial expenditures made by the quarry involve money spent at a local firm for routine repair and maintenance, this expenditure will initially stay in the local economy.

Other local purchases will be made through retail stores. An example of such expenditure will be a local firm buying office supplies at a local stationary store. The stationary store will keep a portion of the sales (its gross profit margin) and will send the rest of the money outside the region to the manufacturers of the office supplies purchased by the local firm. The stationary store will in turn spend its gross profit margin on items such as wages for employees, taxes, rent, etc.

The portion of the initial expenditure that stays in the local economy for the next round of expenditures is composed of the gross retail trade margins collected on sales in local stores plus the money given directly to local businesses (often mechanical repair shops and business services firms).

The next round of expenditures will go through the same process for non-salary expenditures. This money will be re-spent as expenditures that will again be split into taxes, salaries and expenditures on goods and services other than salaries. This iterative process will continue until the leakages (and taxes and savings) reduce the initial amount of money spent in the local economy to zero. The total amount of money by industry that was collected by local

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firms through all the rounds of expenditures represents the indirect sales. All the other impact statistics (employment, GDP, etc.) will be calculated from these indirect sales.

Induced impacts

The sole source of money for induced impacts is household income. The most important source of household income is wages and salaries. The amount of wages paid by an industry (for example the quarry) is reduced by personal income tax collected at the source on behalf of senior levels of government. The resulting after-tax income is divided into two portions: the largest one are expenditures on goods and services with the rest going towards savings. Most consumer expenditures is made locally with the rest going towards purchases outside the region (shopping trips, tourism or Internet). Local expenditures are split three-ways:

- Shopping in local stores, where governments collect sales taxes. Stores will keep a gross retail margin that will be re-spent locally as salaries and other operating expenses. The rest of consumer purchases will either go to local producers (mostly for personal services) or leak outside the region to pay the producers of goods and services bought by consumers. The latter is the most important source of leakages for a local economy;
- Residential rent. The income received by local landlords will be re-spent into the local economy;
- Some household expenditures are made directly with the producers of goods. For example agricultural products such as U-Pick strawberry operations, local handicraft, etc.

As it was the case for indirect impacts generated by non-salary expenditures, only a small proportion of consumer expenditures stay in the local economy for a second round of expenditures: rent paid to landlords, retail trade margin and the local production of some goods and services purchased by households. After a few rounds of expenditures, the original amount of wages and salaries spent in the local economy will be reduced to zero by the combined effects of imports, taxes and savings.

Total sales by industry that result from the initial amount of wages and salaries spent in the local economy (from initial spending until no money is left in the local economy) is called induced sales by industry. From these sales the model calculates employment by industry and Gross Domestic Product.

The Panel is surprised that the number of individuals employed in "mining, quarrying and oil well" is so low that it rounds down to zero for all census years shown in Table E-1 (pg 70). Since there are at least two other quarries in the area, verify these figures. Explain why tourism and ecotourism are not included as industries, either separately or together in Table E-1, Pg 70.

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RESPONSE

The data contained in Table E – 1 of the EIS is modeled from Statistics Canada, Census of Population 1991, 1996, and 2001. The figures presented in Table E – 1 are correct – see reference for Table E – 1. As verification, the Census of Canada Profile data for 2001 Dissemination Areas for Digby Neck and Islands were reviewed. No indication of any employment in mining, quarrying, or gas well was recorded.

There are two other basalt quarries – one in Rossway and one in Tiverton on Long Island. A possible explanation as to why the mining, quarrying, and oil well industries show zero labour force is that these quarries were recently permitted for operation and after Census data was compiled. The Tiverton quarry was permitted March 24, 2003 and the Rossway quarry approved July 28, 2000 with an Amendment approved May 22, 2002 (*pers. com.* Jacqueline Cook, NSDEL 2006). The data in Table E – 1 represents population 15 years of age and over who worked at some time since January 1, in the year prior to the Census. In this case, the 2001 census would not have included the workforce at these two recently permitted quarries. Unfortunately, the 2006 Statistics Canada Census of Population has not yet been compiled. So more current statistics are not available.

Statistics Canada uses North American Industry Classification Codes (NAICS) for industry sector identification and there is no primary or subcategory for tourism or ecotourism. Therefore separate labour force data is not contained in Table E – 1 for tourism and ecotourism. Certain sectors of the tourism industry, such as accommodations, food and beverage services, retail trade and other services may be included under these NAIC industry categories.

9.3.9.1.2 Identify the “local planning strategy” referred to at the bottom of Pg 80.

RESPONSE

The local planning strategy in this context does not mean a development plan or land use by-law, since they are not in place in the Municipality of Digby. It would have been better to refer to the local economic development strategy.

9.3.9.1.2 Provide evidence to substantiate the statement that “similar operations in Nova Scotia have not affected the tourism industry in those areas” (Pg 80).

RESPONSE

The EIS in Volume VII, pages 103 - 104 of 9.3.14 Economy–Tourism, sets out evidence with respect to the quarry operation at Cape Porcupine.

Further evidence is set out in Reference Volume VI, Tab 32, Appendix I and II, and provides evidence with respect to Cape Porcupine and Hantsport, Nova Scotia.

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The Case Studies completed on Strait of Canso and the Town of Hantsport provides information to help address this question. A summary follows:

Strait of Canso, Nova Scotia

Situation

Martin Marietta operates a major aggregate quarry at Cape Porcupine near the Canso Causeway in the Strait of Canso. This quarry exports a significant volume of product on an annual basis to the United States. The ocean-going vessels are similar to those proposed to be used at White's Point. This operation is of interest to Bilcon due to its prominent location and its visibility to tourists. The marine aspect is also of interest due to the interaction between the marine shipping activity and the lobster fishery.

- The Strait of Canso Superport is 20 km long and can handle vessels up to 500,000 dwt. It is central to North America and international shipping routes.
- In 2004, total cargo handled at all facilities was 24.8 million tonnes making it the second largest cargo port in Canada.

Tourism

The Canso Causeway provides the only road access to Cape Breton Island. The vast majority of visitors access the Island by crossing the Causeway. Cape Breton Island is a world-renowned tourism destination. Conde Naste Traveller, a National Geographic magazine, recently recognized it as second place in the world as an island travel destination.

The Cape Breton "Tourism Road Map" Destination Development Plan prepared for the Cape Breton Growth Fund Corporation in March 2003 is the most comprehensive document available on the tourism industry on Cape Breton Island.

Their market analysis shows:

- 1 million person-trips take place annually in Cape Breton
- Majority 2/3 are by Nova Scotians
- Visitors from mainland Nova Scotia are their largest market
- Cape Breton – 25%
- Other NS – 41%
- New England – 5%
- Ontario – 8%
- Other US – 11%
- Other Atlantic – 6%
- Other – 4%
- Port Hastings (where the Causeway enters Cape Breton) has the highest visitor traffic flow – 430,000 person trips.
- Behind visiting friends and relatives, sightseeing is the number one activity visitors participate in – 36%

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To assess the impact the quarry operation at Cape Porcupine has on the tourism industry, Gardner Pinfold consulted with the manager of the Nova Scotia Visitor Centre located just across the Causeway on the Cape Breton side. This centre is the busiest in Nova Scotia. Visitors to the Centre have a direct view of the quarry located about 2 km across the Strait.

Gardner Pinfold understands that the quarry operation does generate a number of questions from visitors. Although quantitative data is not kept, the manager estimated that on a typical busy day with 2,000 visitors, approximately 40 might ask a question about the quarry. The nature of the questions vary greatly. About half would concern just general curiosity about the operation, where the product goes, etc. The other half could concern questions related to the environment.

Tourists also show genuine concern when dust levels are high and a cloud of dust is visible moving down the Strait. Calls by staff to the operation are usually heeded and dust levels are brought under control.

The Visitor Centre also monitors the blasting schedule so they can post warnings to visitors that they are not experiencing an earthquake. The manager has not heard anyone express a view that the quarry operation has ruined their opinion of Cape Breton and will deter them from making a return visit.

Hantsport, Nova Scotia

Situation

Fundy Gypsum currently ships about 1.5 million tonnes of gypsum out of the small port of Hantsport on an annual basis. Hantsport is located in the Minas Basin and vessels transit through the Bay of Fundy to reach the berthing facility. Vessels must arrive in Hantsport just prior to high tide, load within three hours, and depart. The port facilities and storage area for gypsum are located virtually in the downtown. Gypsum arrives at the port via train. It is stored in a storage shed dockside and then is loaded via a new loading system reputed to be the fastest system in North America.

Gardner Pinfold reviewed operations in Hantsport from three perspectives. The impact the cargo handling has on property values, the interaction between the community and the company, and the impact the operation has on the tourism industry.

Tourism

Hantsport is one of several picturesque small towns that lie in the Annapolis Valley. It is said to be steeped in history of wooden ships and iron men. It actively promotes visits to the Churchill House where the history of ship building is chronicled. Also prominent in its tourism literature is a visit to the community wharf. To quote "one of nature's most extraordinary spectacles the rise and fall of the world's highest tides. These tides lift fishing

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boats and tugboats alike skyward at high tide and then ever so gently sets them on the ocean floor at tide's ebb. Hantsport is set to be, this fall, the home of North America's fastest ship loading facility. With every freighter that arrives, 40,000 tonnes of raw gypsum must be loaded and the boat departed within three hours, at full tide." – (Written just prior to completion of new facility).

Another positive tourism/mining industry interaction relates to the rail service in the area. The local rail line is owned by Windsor Hantsport Rail Company. Much of its business relates to providing rail service from the gypsum mines to Hantsport. Up until two years ago, this rail line offered tourists a special trip on a rail car to tour from Windsor to Grand Pre Park. Unfortunately service had to discontinue not because of a lack of customers, but due to equipment problems that were too expensive to fix.

Bilcon believes its findings related to the work done to review circumstances in Sechelt also provide information that helps address this question.

Sechelt, British Columbia

Situation

Construction Aggregates operates a 1,000-acre pit on the Sechelt peninsula located about 30 miles northwest of Vancouver. Sechelt is home to the largest open pit mine and gravel mine operation in North America. Opened by Construction Aggregates Ltd. (CAL) in 1989, the mine is located on the Sechelt Indian Band lands and now has an expected 40-year life span.

The community of Sechelt is home to about 8,000 residents and is located at about the mid point of the Sunshine Coast peninsula.

At full capacity, the quarry produces about 6.6 million tonnes per year, and ships somewhere between one million and three million tonnes per year to the United States. The Sechelt Nation receives about \$3 million per year in royalties.

Gardner Pinfold has reviewed Sechelt's experience as host to major quarry operations and its impact on the tourism industry. Following are findings regarding tourism/recreation at Sechelt:

Tourism

Since the early 1890s, visitors have come to the Sunshine Coast for holidays, creating Sechelt's early reputation as a tourism destination that continues to this day. Surrounded by ocean, Sechelt provides access to the Strait of Georgia and Sechelt Inlet, gateway to the popular sailing destinations of Jervis Inlet and Princess Louisa Inlet. The local mountains provide numerous opportunities for hiking, mountain biking and backcountry snowsport activities.

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The aggregate marine loading facility operates in an area where there is both recreational and some fishing vessel activity.

The Sechelt Nation has a small marina that is currently used by some of the Band's fishing boats and is available for recreational boaters to use. It does not get heavy use because there are no services. The Sechelt area currently has a Marine Access program aimed at re-connecting with the waterfront to increase its attractiveness and use for recreational and tourist purposes. Two projects are in their initial stages, both within a few hundred metres of the marine loading facility. One project is the creation of a waterfront park that will have a focus on children. The other project is to expand the current marina to a 125-slip marina to attract permanent and transient boaters. Attracting small pocket cruise ships to this facility is part of the thinking. There is heavy cruising traffic on the Georgia Strait off Sechelt that currently passes by without stopping because of the lack of adequate marina facilities. Another proposed project is to install a floating wharf off the concrete wharf for day traffic. The concrete wharf is not functional now other than for pedestrians.

A local tourism consultant provided the following comments related to impact of the quarry operation on the tourism industry. Noise is noticeable at times and could be a factor, but it is mainly in the background. The noise from the quarry operation is much less of an issue than the engine roar associated with the take-off of float planes (two companies) that start about 07:30 when bed and breakfast clients apparently wish to be sleeping. Her view was that the Sunshine Coast is still a resource-based community and the gravel operation is part of the mix. She does not see it as a deterrent to further tourism development and in fact would like the company to develop a tour package for visitors so that the gravel operation could serve as a tourism asset.

9.3.9.2 Analysis, Construction – Provide a breakdown of capital expenditure from the Project that the Proponent commits to spend in Canada, in Nova Scotia and in Digby County, compared to that committed elsewhere. Provide the same breakdown for construction employment estimates.

RESPONSE

Following is a breakdown of the proposed capital expenditures for mobile equipment, plant/infrastructure, and marine terminal infrastructure for the Whites Point Quarry and Marine Terminal project. The "source" column identifies where the particular item will be procured. All costs are in 2004 Canadian dollars.

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Quarry Mobile Equipment

| Equipment | Source | Cost |
|--|-------------|------------------------|
| 1 – Caterpillar 990 loader (new) | NS (dealer) | \$ 1,248,000.00 |
| 2 – Caterpillar 773D rock trucks (new) | NS (dealer) | \$ 1,492,480.00 |
| 1 – Caterpillar 773D rock truck (used) | NS (dealer) | \$ 512,000.00 |
| 1 – Caterpillar D9R bulldozer (used) | NS (dealer) | \$ 512,000.00 |
| 1 – Caterpillar 345B excavator (used) | NS (dealer) | \$ 348,000.00 |
| 1 – Caterpillar 988F loader (new) | NS (dealer) | \$ 736,000.00 |
| 1 – Caterpillar 980F loader (used) | NS (dealer) | \$ 160,000.00 |
| 1 – Caterpillar 914 loader (new) | NS (dealer) | \$ 112,640.00 |
| 2 – 4000 gallon water trucks (used) | NS | \$ 172,800.00 |
| 1 – 75 ton crane (late model used) | NS | \$ 512,000.00 |
| 1 – service truck for oil, grease, fuel (used) | NS | \$ 147,200.00 |
| 2 – welding trucks (used trucks, new welders) | NS | \$ 57,600.00 |
| 2 – trailer mounted welders (new) | NS | \$ 35,840.00 |
| 2 – 125 cfm compressors (new) | NS | \$ 35,840.00 |
| 2 – skid mounted welders (new) | NS | \$ 23,040.00 |
| 1 – site flatbed truck (used)Dig | by Co. | \$ 12,800.00 |
| 1 – site flatbed truck (new) | Digby Co. | \$ 48,640.00 |
| 1 – Caterpillar 232B skid steer loader (new) | NS (dealer) | \$ 40,960.00 |
| 1 – Caterpillar 252B skid steer loader (new) | NS (dealer) | \$ 46,080.00 |
| 1 – work boat (used) | NS | \$ 250,000.00 |
| 1 – barge (used) | NS (dealer) | \$ 125,000.00 |
| 1 - drill rig T4BH 400psi @ 1200 cfm (new) | NS(dealer) | \$ 500,000.00 |
| | | \$ 7,128,920.00 |
| | freight @5% | \$ 356,446.00 |
| Total mobile equipment | | \$ 7,485,366.00 |

| Plant/Infrastructure | Source | Cost |
|--|--------|------------------|
| 1 – jaw crusher w/feeder and 150 ton rock box | U.S. | \$ 960,000.00 |
| 1 – 7' Nordburg standard crusher (used) | U.S. | \$ 384,000.00 |
| 1 – HP 500 Nordburg crusher (new) | CDN | \$ 544,000.00 |
| 3 – TD screens (new 8x24) | CDN | \$ 307,200.00 |
| 40 – conveyors (misc. length and width) | NS | \$ 3,072,000.00* |
| concrete foundations (1400cu.yds. @\$250.00) | Digby | \$ 350,000.00* |
| sand processing equipment | CDN | \$ 249,600.00 |
| water lines and pumps | NS | \$ 95,000.00* |
| 1 – water clarifier tank, pumps, erection (used) | U.S. | \$ 160,000.00 |
| dewatering screens for sand products | CDN | \$ 102,400.00 |

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| | | |
|--|-------|------------------------|
| 1 – 600 kw generator | NS | \$ 108,800.00 |
| freight on equipment | CDN | \$ 250,000.00 |
| site work – drilling and blasting | NS | \$ 200,000.00* |
| site work – grading and hauling | Digby | \$ 200,000.00* |
| plant construction and erection | Digby | \$ 1,250,000.00* |
| electrical work | NS | \$ 1,000,000.00* |
| shop, warehouse, office building (8000 sq.ft.) | Digby | \$ 480,000.00* |
| 1 – 20,000 gallon double wall fuel tank | NS | \$ 40,000.00 |
| install fuel tank | NS | \$ 40,000.00* |
| misc. shop and service equipment | NS | \$ 85,000.00 |
| misc. welding equipment | NS | \$ 20,000.00 |
| compound site development (fencing, well, septic, parking) | Digby | \$ 100,000.00* |
| environmental control structures | Digby | \$ 50,000.00* |
| site reclamation | Digby | \$ 28,000.00* |
| load out tunnel (1000'x12'x12') | Digby | \$ 1,200,000.00* |
| automation and control | Digby | \$ 350,000.00 |
| lighting | NS | \$ 250,000.00* |
| upgrade access road (Hwy #217 to property line) | Digby | \$ 100,000.00* |
| power and communications (Hwy #217 to property line) | Digby | \$ 60,000.00* |
| | | \$12,036,000.00 |
| contingency @10% | | \$ 1,203,600.00 |
| *engineering and design @10% | | \$ 847,500.00 |
| Total plant and infrastructure | | \$14,087,100.00 |

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Marine Terminal and Infrastructure

| Steel Pipe Pile Dolphins | Source | Cost |
|---|------------------------------|------------------------|
| mobilization, demobilization, pile driving templates | NS | \$ 630,000.00 |
| steel pipe piles – driving, infill, jackets, rock anchors, test | NS | \$ 2,220,000.00 |
| cast in place concrete – pile caps and curbs | Digby | \$ 600,000.00 |
| fender piles, fenders, bollards, ladders, kisby | NS | \$ 765,000.00 |
| catwalks, bridge, bridge abutments | NS | \$ 475,000.00 |
| armour stone | NS | \$ 120,000.00 |
| | | \$ 4,810,000.00 |
| | Contingency @10% | \$ 481,000.00 |
| | | \$ 5,291,000.00 |
| | Engineering and design @15% | \$ 793,650.00 |
| | | \$ 6,084,650.00 |
| Marine Conveyors and Radial Arm Ship Loader | Source | Cost |
| civil works | NS | \$ 5,222,400.00 |
| ship loader and conveyors | NS | \$7,833, 600.00 |
| | | \$13,056,000.00 |
| | Total Marine Terminal | \$19,140,650.00 |

Construction Employment

Following is a breakdown of the construction workforce for the marine and land components of the Whites Point Quarry and Marine Terminal. The source column indicates the geographical area for obtaining the necessary workers. It is anticipated that marine construction will take one year and land construction will take two years.

Marine Construction Workforce

| Occupation | Source | Person Years |
|---------------------------------|---------------|---------------------|
| steel fabricators (ship loader) | NS/Maritimes | 36 |
| off-site marine contractor | NS/Maritimes | 5 |
| On-site marine contractor | Digby Co./NS | 14 |
| Electrical | Digby Co./NS | 4 |
| Mechanical | Digby Co./NS | 3 |
| Engineering | NS/Maritimes | 9 |
| Environmental monitoring | Digby Co. | 2 |
| | | 73 |

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Land Construction Workforce

| Occupation | Source | Person Years |
|--------------------------------------|--------------|--------------|
| Land clearing | Digby Co. | 2 |
| Survey | Digby Co. | 1 |
| Sitework | Digby Co. | 12 |
| Portable crushing plant (aggregates) | Digby Co. | 12 |
| Steel fabrication and erection | Digby Co. | 32 |
| Painting | Digby Co. | 2 |
| Electrical work | Digby Co./NS | 20 |
| Concrete construction | Digby Co. | 12 |
| Engineering | Digby Co./NS | 2 |
| Safety and environmental inspector | Digby Co./NS | 2 |
| Supervisor | Digby Co. | 2 |
| Environmental controls and landscape | Digby Co. | 3 |
| Training, job skill and safety | Digby Co./NS | 2 |
| Erect multi-plate tunnels | Digby Co. | 2 |
| Building construction | Digby Co. | 8 |
| | | 114 |

Total construction workforce equals 187 person years (1 person - year equals 2000 hours)

9.3.9.2 Analysis, Operation – Provide a breakdown of the calculations concerning employee salary and requirements to allow the Panel to verify and understand the situation. Include, for example, a listing of the jobs and their respective salaries, the requirements of different jobs, the hours of work and any benefits included in the salary and those that are in addition to the salary. Clarify whether the “annual salary” is based on actual earnings over 44 weeks (as projected for the operating season). How many workers will be laid off during the non-operating season and how many assigned to other tasks?

RESPONSE

Following is a breakdown of the employment schedule for the Whites Point Quarry and Marine Terminal. The breakdown identifies the type of job and anticipated hourly wage rate for each. Forty-four weeks of production and eight weeks of site development and annual maintenance are planned. The work-week is based on forty-eight hours. During the forty-four weeks of production, a total of thirty-four employees and two shifts will be required. During the eight week period of site development and annual maintenance, one shift of sixteen employees will be required. All employment is expected to be from the Digby County region with the majority from the local community. Wages are based on 2004 wage rate estimates.

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Production Employment and Wage Schedule

| First Shift (0600 to 1400 hours) | | Shift Total 20* |
|--|-------------|------------------------|
| # | <i>Rate</i> | <i>Annual Salary</i> |
| 1 – plant operator | \$15.00/hr. | \$ 31,680 |
| 1 – quarry face loader operator | \$16.00/hr. | \$ 33,792 |
| 2 – quarry rock truck drivers | \$13.50/hr. | \$ 57,024 |
| 1 – class A mobile equipment mechanic | \$17.00/hr. | \$ 35,904 |
| 2 – ground persons/labour | \$12.50/hr. | \$ 52,800 |
| 1 – electrician (back up plant operator) | \$17.00/hr. | \$ 35,904 |
| 1 – quality control tech | \$14.00/hr. | \$ 29,568 |
| 1 – fuel man/greaser | \$13.50/hr. | \$ 28,512 |
| 1 – water truck driver | \$13.00/hr. | \$ 27,456 |
| 2 – heavy equipment operators | \$15.00/hr. | \$ 63,360 |
| 1 – office clerk | \$14.00/hr. | \$ 29,568 |
| 2 – welder repair & fabrication | \$15.50/hr. | \$ 65,472 |
| 1 – rock driller | 17.00/hr. | \$ 35,904 |
| 1 – rock driller assistant | \$13.50/hr. | \$ 28,512 |
| 1 – environmental tech | \$20.00/hr | \$ 42,240 |
| | | \$ 597,696 |

Operations Manager included in total – Salary excluded from table.

| Second Shift (1400 to 2200 hours) | | Shift Total 14 |
|--|-------------|-----------------------|
| # | <i>Rate</i> | <i>Annual Salary</i> |
| 1 – plant operator | \$15.50/hr. | \$ 32,736 |
| 1 – electrician (back up plant operator) | \$17.50/hr. | \$ 36,960 |
| 2 – ground persons/labour | \$13.00/hr | \$ 54,912 |
| 2 – welder repair & fabrication | \$16.00/hr. | \$ 67,584 |
| 1 – quality control tech | \$14.50/hr | \$ 30,624 |
| 1 – shift foreman | \$18.50/hr. | \$ 39,072 |
| 1 – mechanic, fuel, greaser | \$14.00/hr. | \$ 29,568 |
| 1 – quarry face loader operator | \$16.50/hr | \$ 34,848 |
| 1 – heavy equipment operator | \$15.50/hr. | \$ 32,736 |
| 2 – quarry rock truck drivers | \$14.00/hr. | \$ 59,136 |
| 1 – water truck driver | \$13.50/hr. | \$ 28,512 |
| | | \$ 446,688 |

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Annual Maintenance Employment and Wage Schedule

| Maintenance Shift (0600 to 1400 hours) | | Shift Total 16* |
|--|-------------|-----------------|
| # | Rate | Annual Salary |
| 1 – quarry face loader operator | \$16.00/hr. | \$ 6,144 |
| 1 – class A mobile equipment mechanic | \$17.00/hr. | \$ 6,528 |
| 1 – ground persons/labour | \$12.50/hr. | \$ 4,800 |
| 2 – electrician | \$17.00/hr. | \$ 13,056 |
| 1 – quality control tech | \$14.00/hr. | \$ 5,376 |
| 1 – office admin | \$14.00/hr. | \$ 5,376 |
| 4 – welder repair & fabrication | \$15.50/hr. | \$ 23,808 |
| 1 – shift foreman | \$18.00/hr. | \$ 6,912 |
| 1 – mechanic, fuel greaser | \$13.50/hr. | \$ 5,184 |
| 2 – quarry truck drivers | \$13.50/hr. | \$ 10,368 |
| | | \$ 87,552 |
| Total wages | | \$ 1,131,936 |

Operations Manager included in total – Salary excluded from total. It should be noted that benefits are not included in the above wages.

The following table is derived from a Labour Market Information from Human Resources and Social Development. The table outlines wage rate averages for Southwest Nova Scotia for various disciplines applicable to the quarry operation.

Table WR – 1
Wage Rate Averages – Southwest Nova Scotia

| Occupation | NOC Code | Avg. Wage (\$/hr.) | High Wage (\$/hr.) | Low Range (\$/hr.) | Reference Period |
|--------------------------|----------|--------------------|--------------------|--------------------|------------------|
| Supervisors, Quarry | 8221 | 19.60 | 37.85 | 16.00 | 2005 |
| Mining Engineers | 2143 | 17.42 | 28.85 | 10.25 | 2005 |
| Heavy Equipment Op. | 7421 | 13.75 | 20.80 | 10.70 | 2004 |
| Crane Operators | 7371 | 22.05 | 28.50 | 10.60 | 2004 |
| Material Handlers | 7452 | 13.15 | 16.50 | 7.15 | 2006 |
| Truck Drivers | 7411 | 16.30 | 23.65 | 9.00 | 2004 |
| Welders | 7265 | 17.15 | 20.50 | 11.90 | 2004 |
| Heavy Equipment Mechanic | 7312 | 16.75 | 20.00 | 10.00 | 2004 |
| Industrial Electricians | 7242 | 19.45 | 31.55 | 10.50 | 2004 |
| Drillers and Blasters | 7372 | 11.90 | 18.00 | 9.00 | 2004 |
| Admin. Officer | 1221 | 16.05 | 22.15 | 8.50 | 2005 |

Source: Labour Market Information Bulletin from Service Canada

9.3.5 Economy

9.3.9.2 Clarify the basis upon which the estimates of taxation revenues to federal and provincial governments are derived.

RESPONSE

The tax revenues are calculated by using taxation coefficients derived from Statistics Canada and the Canada Revenue Agency publications about federal and provincial tax revenues by province. The taxation coefficients are applied to salaries, profits and are also used to allocate indirect taxes between both senior levels of governments.

At each round of expenditures of the model, tax revenues for the provincial and federal governments are calculated and subtracted from the model before the money is allowed to flow to industries. These tax revenues include: personal income tax, tax on corporate profits, sales taxes and other indirect taxes.

Taxes are collected on wages and salaries and corporate profits through the use of taxation coefficients while indirect taxes are added to the government tax revenues and indirect taxes. The indirect taxes are split between the federal and provincial governments according to the latest data from the National Accounts (Statistics Canada).

The amount of money collected by governments is subtracted from wages and salaries and profits at each round of expenditures. The formulas are:

$$\text{Income tax revenues} = \text{Income tax coefficients} \times \text{Wages and salaries}$$

$$\text{Net wages and salaries that are available for households to spend} = \\ \text{Wages and salaries} - \text{Income tax revenues}$$

$$\text{Tax on corporate profits} = \text{Corporate tax coefficients} \times \text{Profits}$$

$$\text{After-tax profits} = \text{Profits} - \text{Tax on corporate profits}$$

A total of 32 personal income tax coefficients (16 federal and 16 provincial) are in the model for 16 different income brackets. These are effective taxation rates, e.g. they are calculated by dividing federal and provincial income tax revenues by total income of tax filers by income bracket. The workers of the 95 industries in the model that provide employment are submitted to different tax rates depending on the average salary in each industry.

It should be stressed here that tax revenues calculated by the model have very little to do with the profitability of the project which is the subject of an economic impact simulation. By far, the largest source of government tax revenues is personal income tax, followed by indirect taxes such as sales taxes.

9.3.5 Economy

9.3.9.3 *Given the level of concern raised in the community over the Project's potential effects on the economy of fishing and tourism, what possible community mitigation measures has the Proponent considered?*

RESPONSE

While it is recognized that there is concern in the community over the Project's potential effects on the economy of fishing and tourism, Bilcon's position is that there will be no negative effect. Accordingly, Bilcon has not considered mitigation measures.

9.3.10 *Harvesting of sea cucumbers and dulse occurs in the area. Are these fisheries and harvesting activities included in proposed compensation plans?*

RESPONSE

An active sea cucumber fishery has been observed in nearshore waters off Whites Point. This is an "exploratory" fishery with no additional licenses presently being considered (*pers com.* Ann Sweeney, DFO). Sea cucumbers are fished during the non-lobster fishing season with mobile gear (dragging) in nearshore waters. One boat has been observed fishing off Whites Point. Since this is a mobile gear fishery, shipping schedules from and to the Whites Point Terminal would be made available, upon request, to sea cucumber fishers in the area. No compensation plan is presently being considered by Bilcon for this mobile gear fishery.

Traditional knowledge investigations indicate dulse harvesting can take place in the Bay of Fundy including the waters off Digby Neck and Islands (*pers com.* Wanda VanTassel). Although Bilcon has not observed dulse harvesting at Whites Point, the presence of dulse was identified during intertidal investigations. Dulse harvesting in this area is generally conducted from land, preferably in the vicinity of easy access or from boats only in sheltered areas along the coast. Bilcon has not observed active dulse harvesting along the quarry coastline nor does traditional knowledge indicate the area is a popular harvest area. This is due mainly to the inaccessibility of the shoreline by land and the exposed coastline for boats. As mentioned in the EIS, Bilcon intends to allow fishers access to the coastline and an improved quarry road is planned to provide easier access. This road would be accessible to shore fishers upon gaining permission from the quarry manager. Based on this proposed access to accommodate dulse or periwinkle harvesters, no compensation plan is presently being considered by Bilcon.

In addition to the above fishery and harvesting activities, an active gill net fishery was also observed in nearshore waters off the Whites Point quarry coastline in 2002. This "fixed gear" fishery has not been observed operating along the Whites Point coastline in the past few years. It is our understanding that this fisherman has retired. Therefore, no compensation is presently being considered by Bilcon.

9.3.5 Economy

9.3.14 During the scoping sessions, members of the public suggested that the effects on tourism could extend beyond the immediate project area, and might affect a large region of Southwest Nova Scotia. Justify the boundaries chosen.

RESPONSE

While it is noted that tourism is an important component of the local economy, the effect is mitigated by the fact that the quarry will not be visible from surrounding land-based tourism attractions and that the majority of tourists from adventure tour boats will experience views of the quarry site from a distance at which the site will no longer dominate the view shed or be visually intrusive. The magnitude of the effect is low, the geographic extent is regional and the overall effect has been determined not significant.

Please refer to Impact Evaluation Table 3-16 – Economy, in Section 8.1 Impact Assessment Methodology in this submission.

9.3.14.2 Describe what is known about the gender and household characteristics of employees in the tourism sector in the region. (For instance, how many households have more than one member employed in the tourism sector?) What proportion of tourism businesses are family-run and owned?

RESPONSE

In 2003/2004 Elgin Consulting and Research investigated tourism businesses on Digby Neck and Islands. Following is a list of tourism businesses operating at that time by name, type, location, operational structure, season of operation and employees. The general gender composition of restaurant and accommodation employees is female and well over 90%, while gender composition of adventure tour operator's employees is generally 50% female and 50% male. Nearly all of the tourism businesses operating on the Neck and Islands are family owned and operated. Employees are generally from the local community.

Crafts/Gifts/Galleries

| | |
|---|--|
| Spruce Grove Arts & Crafts – Centreville | Family operated with 2 full-time employees |
| Brambles & Roses Gifts – Freeport | Family operated with 2 full-time employees |
| Gallery by the Sea – Tiverton | Family operated with 2 full time employees |
| Ice House Gift Shop – Westport | Family operated with 2 full-time employees |
| Well House Curios – Central Grove | Family operated with one artist |
| Small Ideas Crafts & Gifts – Freeport | Family operated with 2 full-time employees |
| The Olde Lamplighter Gift Shop – Westport | Family operated with 2 full-time employees |

9.3.5 Economy

Accommodations and Restaurants

| | |
|---|---|
| Graham's Pioneer Retreat – Centreville | Open May to September Operated by 2 family members |
| Olde Village Inn – Sandy Cove | Open June to September Operated by 2 family members Has 6 restaurant employees |
| Rambling Rowes – East Ferry | Open May to September Operated by 2 family members <i>(closed 2005)</i> |
| Direct Descendants Guest House – Tiverton | Open May to September Operated by 2 family members |
| Fisherman's Needle – Bear Cove | Open May to September Operated by 2 family members |
| Seacliff Bed & Breakfast – Tiverton | Open May to September Operated by 2 family members |
| Ruggles Guest House – Central Grove | Open May to September Operated by 2 family members <i>(This establishment was closed for the majority of the previous season)</i> |
| Tiny tattler – Central Grove | Open April to October Operated by 2 family members Has 6 restaurant employees |
| Freeport House Bed & Breakfast – Freeport | Open April to October Operated by 2 family members <i>(This establishment closed at the end of the 2004 season)</i> |
| Sunset Over the Bay – Freeport | Open May to September Operated by 2 family members |
| Brier Island Lodge – Westport | Open April to October Has 37 employees |
| Dock & Doze – Westport | Operated by 2 family members <i>(This establishment did not open for the 2004 season)</i> |
| Mariner Restaurant – Sandy Cove | Open April to October Operated by 2 family members Has 3 restaurant employees <i>(closed 2005)</i> |

9.3.5 Economy

| | |
|---|---|
| Petite Passage – East Ferry | Open April to October Operated by 2 employees Has 4 restaurant employees |
| Ferry Take-Out Seaside Lunch – Tiverton | Open April to October Operated by 2 family members Has 2 restaurant employees |
| Lavinia’s Catch – Freeport | Open April to October Has 7 restaurant employees |

Campgrounds

| | |
|--------------------------------|---|
| Whale Cove – Whale Cove | Open June to September Operated by 2 employees Has 1 restaurant employee |
| Freeport Campground – Freeport | Open June to September Operated by 2.5 family members (<i>1 part-time</i>) (<i>closed 2005</i>) |
| Moby Dick – Central Grove | Open June to September Operated by 2 family members |

Adventure Tour Operators

| | |
|---|---|
| Brier Island Whale and Seabird – Westport | Open June to September |
| Freeport Whale and Seabird – Freeport | Open June to September Operated by 1 family member with 3 employees This is a lobster fisherman who uses his boat for tours in the off-season |
| Mariner Cruises – Westport | Open June to September |
| Basin Charters – Digby | Open June to September Family operated with 4 employees |
| Bay to Bay Adventures – Little River | Open June to September Operated by 1 family member with 4 employees This is a lobster fisherman who uses his boat for tours in the off-season |
| Cetacean Boat Tours – Westport | Open June to September |

9.3.5 Economy

| | |
|---|--|
| Digby Neck Whale Watch – East Ferry | Open June to September Operated by 2 family members with 3 employees This is a lobster fisherman who uses his boat for tours in the off-season |
| Ocean Explorations – Tiverton | Open June to September Operated by 1 family member with 6 employees This is a lobster fisherman who uses his boat for tours in the off-season |
| Petite Passage Whale Watch – East Ferry | Open June to September Operated by family members with 5 employees This is a lobster fisherman who uses his boat for tours in the off-season |
| Pirates Cove – Tiverton | Open June to September Operated by family members with 5 employees This is a lobster fisherman who uses his boat for tours in the off-season |

9.3.14.3 Mitigation – The paragraph does not describe mitigation measures. Public consultations revealed several issues of concern to the community –for example, a heritage centre and recreational facilities – that might suggest possible mitigation measures.)

RESPONSE

As noted in the answer to 9.3.9.3 above, Bilcon maintains that there is no evidence of a negative effect by the Project on the tourism industry and no mitigation measures have therefore been proposed. Notwithstanding this finding, Bilcon is certainly prepared to meet with local community groups to discuss how it can assist these groups. It should be pointed out that Bilcon has offered to provide assistance to the Discovery Centre but the offer was declined. It should also be noted that Bilcon has sponsored the October 21st, 2006 local trade mission to Scotland, part of whose mandate is the tourism sector. Bilcon also recently sponsored the October 14th, 2006 Centre for Women in Business Discovery Expo held in Digby.

9.3.15 Economy – Land Use and Value

9.3.15.3 Clarify the process by which residents may redress concerns about their wells being affected by the Project. Consider a “no fault” mitigation process.

RESPONSE

The response to the panel’s question under 9.1.3.3, Bilcon has set out the criteria Bilcon will apply in adjudicating claims that quarrying operations have affected water supply or quality.

9.3.5 Economy

Bilcon has made it clear that claimants will not be expected to litigate and that a no fault mitigation process will be established.

In some situations, septic systems could be affected by blasting activities. Provide evidence to substantiate the comment that "These systems will not be affected by the project" (pg 108)

RESPONSE

On-site sewage disposal systems are installed in surface materials or occasionally above ground if the water table is high. Both field systems and contour systems are completed in the top three feet of the soil layer and the effluent distribution pipes are laid in clean crushed rock which provides a poor transmissivity to ground vibration. Ground vibration at the foundation of the nearest structure to blasting operations will be monitored to ensure compliance with the Pit and Quarry Guidelines or the conditions established in the permit for the project.

The Nova Scotia Department of Environment and Labour, which is the authority issuing permits for the installation or repair of on-site sewage disposal systems, advise that they have no record of an on-site sewage disposal system being damaged by blasting activities. This would include blasting from mines, quarries and infrastructure (e.g. roads) construction. *(Personal Communication: D. Bruce Arthur)*

9.3.15.6 Property Values – Provide proper data on the property values or properties that may be affected by the Project to determine baseline conditions and to verify the accuracy of the predicted effects, should the Project proceed. Include comparative data from other coastal areas and from the province as a whole. Include a historic component on assessment records to capture relative values prior to the announcement of the Project.

RESPONSE

Properties in Nova Scotia are assessed by the market value valuation method. Residential properties are valued by adding the value of the land, building and things such as decks, garages, etc. together, and then comparing the total value to actual property sales that occurred in that area in recent years. Provincial assessors determine the assessment based on the market value of the property as of a specific date set every year. Market value is the approximate price most people would be willing to pay for a property and the price at which the owner would be willing to sell. This value is determined through market analysis and building costs. The most common reason for change is that the market value of the property has increased or decreased due to changes in property values in the local community. The 2006 market value assessment reflects the physical state of the property as of December 1, 2005 and is based on market value as of January 1, 2004.

9.3.5 Economy

The following table, Table PV-1, reflects the annual percent change and average over time in residential values for all counties that make up the Southern Statistical Region of Nova Scotia and for the Province from 2001 to 2006. Digby County has had by far the lowest average increase in value in comparison to the other counties in the region and the average lags well behind that of the Province. However, it is not believed that this statistic adequately reflects the pattern of change that has occurred on Digby Neck and Islands.

Table PV-1 Annual Percent Increase – Residential Property Values

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Avg. |
|-------------|-------|------|------|-------|-------|-------|------|
| Digby | 0.46 | 1.50 | 2.92 | 3.15 | 1.96 | 3.9 | 2.32 |
| Yarmouth | 0.86 | 3.14 | 3.40 | 7.01 | 5.40 | 5.60 | 4.24 |
| Shelburne | -0.14 | 2.12 | 2.15 | 5.40 | 14.19 | 8.80 | 5.42 |
| Queens | 0.03 | 1.57 | 1.76 | 3.68 | 8.93 | 13.10 | 4.85 |
| Lunenburg | 1.84 | 5.80 | 3.61 | 10.05 | 8.73 | 10.21 | 6.71 |
| Nova Scotia | 1.42 | 2.54 | 5.51 | 6.12 | 6.88 | 9.90 | 5.40 |

Source: Service Nova Scotia/special tabulation

A review of property assessment data maintained by Service Nova Scotia and Municipal Relations www.nsassessment.ca was conducted for the Little River area in order to establish baseline property value data. Property values of 50 residences within an approximate radius of two kilometres of the proposed Whites Point quarry project were investigated. The data gathered includes values prior to the announcement of the proposed quarry (2001) through to proposed values for 2007 – refer to Table PV-2.

Table PV-2 illustrates the percentage change in assessed values over time for individual properties, the aggregate change and average annual change in value. The percentage change in value for individual properties from 2001-2006 varied significantly from a low of 11.81% to 247.66%. The overall average change in value of the 50 properties investigated was approximately 35.52% and the average annual increase in value was roughly 6.30%. The proposed assessment values for 2007 reflect a relatively significant increase (13.47%) over 2006 assessments. Incorporating the proposed increase raises the average annual change in value to approximately 7.5%. It should be noted that the changes in value for the 15 residences within the primary zone of influence (800 metres of the active quarry area) of the proposed Whites Point quarry were very similar. The percentage change between 2001 and 2006 was 34.69% with an annual average percent change of 6.19%. The increase in value of these properties based from the proposed assessment value for 2007 would be 13.91% raising the average annual percent change to 7.48% from 2001-2007.

9.3.5 Economy

Comparative residential property assessment data was also analyzed for residences within the Digby Neck and Islands region as well as other coastal communities in Nova Scotia. A random sample of 15 properties in Whale Cove, Sandy Cove, Freeport, and Westport were compiled in order to establish a baseline within the primary region of focus. Residential property assessment data was also compiled for Parkers Cove, a small fishing village on the Bay of Fundy in Annapolis County; Hantsport, an industrial area including residences in close proximity to the Fundy Gypsum quarry ship loading facility and Chester, a coastal community on the South Shore of Nova Scotia experiencing moderate real-estate growth. Property assessment data for these seven coastal communities is presented in Tables PV – 3 through PV-9.

The communities of Whale Cove, Sandy Cove and Freeport experienced slightly lower increases in assessed property value from 2001-2006 as compared to the Little River area. The percentage increase for each community was 28.77%, 32.81% and 28.85% respectively with average annual increases of 5.22%, 5.88% and 5.25%. The percent change based from the proposed values for 2007 are in line with that of the Little River area with the exception of Freeport. The proposed property values for Freeport indicate only a modest increase in value (0.95%) as compared to that of Little River (13.47%), Sandy Cove (14.61%), Whale Cove (13.95%). Of note, assessed values for 10 of the 15 properties, or two-thirds, investigated in Freeport are expected to decline in value based from the proposed values for 2007.

The community of Westport on Brier Island had the greatest level of increase of the communities investigated within the Digby Neck and Islands region. Property assessments for the 15 properties chosen increased 47.25% from 2001 to 2006 or an increase of a little over 8% on average per year. The proposed increase for 2007 is 14.36%, which would increase the average annual percent change experienced from 2001 to 9.13%, the highest level of increase of the communities studied.

The community of Parkers Cove, Annapolis County was identified as a comparable area to Little River due to the community's size, geographic and industry base similarities (fishing village with fishery related infrastructure, modest retail and tourism base and a small active quarry within 2km's). Similarly, assessment values for Hantsport, Kings County were compiled in order to gauge what effects a similar type project (quarry load-out infrastructure and marine terminal) has had on property values for properties adjacent to a comparable industrial base.

Parker's Cove experienced the lowest level of property value increase of the communities studied. Property assessments increased 18.71% from 2001-2006 with an annual average increase of only 3.53%. However, the annual change in value for the properties selected is expected to increase by 11.10% over 2006 values based from the proposed property value

9.3.5 Economy

increase for 2007. Property assessments in Hantsport increased 28.5% from 2001 to 2006 with an annual average increase of 5.21%. This level of increase is similar to that of Whale Cove and Freeport.

A random sample of properties from the community of Chester, Lunenburg County was also investigated as a comparison of property value change within a coastal region with a relatively high real-estate demand and property speculation. It was not surprising that the community of Chester had the highest relative increase in property assessment values (58.35% from 2001-2006 and an annual average increase of 9.66%) of the communities investigated. However, what is noteworthy, is that the community of Westport on Brier Island appears to be experiencing a similar level of property value increase.

The intent of the analysis on property values was to provide better baseline information or empirical data from which to gain a truer understanding of the change in property values that have occurred within the region of focus and how these compare with other regions within Nova Scotia. It is reasonable to postulate from the information that property values within Digby Neck and Islands could continue to increase annually by five to seven percent on average if the current trend were to continue. However, aside from that general observation, there is nothing that can be definitively concluded and one must caution that there are numerous exogenous factors that may negatively affect property values within the region over time.

9.3.5 Economy

Table PV - 2
Property Assessment Values
LITTLE RIVER & SURROUNDING AREA

| YEAR | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Proposed | % Change 01-'06 | % Change 01-'07 | |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|--------------------|-------|
| | | | | | | | 2007 | | | |
| | \$74,200 | \$77,600 | \$81,200 | \$88,100 | \$88,000 | \$93,000 | \$105,900 | 25.34% | 42.72% | |
| | \$45,300 | \$47,700 | \$50,100 | \$54,400 | \$51,300 | \$54,400 | \$62,400 | 20.09% | 37.75% | |
| | \$42,800 | \$45,200 | \$47,800 | \$52,300 | \$53,000 | \$56,300 | \$64,600 | 31.54% | 50.93% | |
| | \$30,200 | \$31,800 | \$33,500 | \$36,500 | \$37,000 | \$39,300 | \$44,500 | 30.13% | 47.35% | |
| | \$29,400 | \$31,000 | \$32,600 | \$35,500 | \$36,000 | \$38,600 | \$43,800 | 31.29% | 48.98% | |
| | \$57,600 | \$82,400 | \$86,100 | \$89,300 | \$89,900 | \$94,100 | \$107,900 | 63.37% | 87.33% | |
| | \$38,400 | \$40,100 | \$42,100 | \$45,800 | \$46,300 | \$49,100 | \$56,000 | 27.86% | 45.83% | |
| | \$93,100 | \$97,200 | \$101,700 | \$110,200 | \$110,100 | \$115,400 | \$131,300 | 23.95% | 41.03% | |
| | \$27,500 | \$29,100 | \$33,400 | \$36,700 | \$37,200 | \$40,100 | \$45,900 | 45.82% | 66.91% | |
| | \$83,800 | \$92,300 | \$95,700 | \$103,900 | \$104,000 | \$139,000 | \$158,000 | 65.87% | 88.54% | |
| | \$45,200 | \$47,600 | \$50,300 | \$54,900 | \$55,600 | \$59,000 | \$67,500 | 30.53% | 49.34% | |
| | \$61,800 | \$64,200 | \$66,800 | \$72,300 | \$72,400 | \$75,900 | \$86,300 | 22.82% | 39.64% | |
| | \$44,100 | \$45,900 | \$47,900 | \$51,700 | \$51,900 | \$53,600 | \$60,300 | 21.54% | 36.73% | |
| | \$87,300 | \$91,500 | \$96,000 | \$104,200 | \$104,400 | \$110,500 | \$126,100 | 26.58% | 44.44% | |
| | \$66,200 | \$70,100 | \$73,000 | \$79,700 | \$79,300 | \$84,200 | \$95,400 | 27.19% | 44.11% | |
| | \$39,100 | \$46,400 | \$50,500 | \$55,100 | \$65,300 | \$69,000 | \$79,200 | 76.47% | 102.56% | |
| | \$93,900 | \$98,600 | \$103,300 | \$111,300 | \$111,300 | \$116,200 | \$133,100 | 23.75% | 41.75% | |
| | \$71,100 | \$74,200 | \$77,500 | \$76,000 | \$76,000 | \$79,500 | \$91,400 | 11.81% | 28.55% | |
| | \$44,800 | \$47,000 | \$49,300 | \$53,400 | \$54,000 | \$57,000 | \$64,500 | 27.23% | 43.97% | |
| | \$50,100 | \$52,100 | \$54,900 | \$59,100 | \$59,700 | \$62,000 | \$71,000 | 23.75% | 41.72% | |
| | \$42,800 | \$45,200 | \$47,600 | \$52,000 | \$52,600 | \$56,000 | \$64,100 | 30.84% | 49.77% | |
| | \$57,200 | \$60,100 | \$63,300 | \$69,100 | \$70,200 | \$72,300 | \$82,300 | 26.40% | 43.88% | |
| | \$28,800 | \$30,200 | \$31,800 | \$34,700 | \$35,100 | \$37,200 | \$42,300 | 29.17% | 46.88% | |
| | \$57,500 | \$59,400 | \$62,300 | \$66,700 | \$67,100 | \$67,300 | \$76,600 | 17.04% | 33.22% | |
| | \$40,600 | \$42,900 | \$45,300 | \$49,600 | \$64,600 | \$68,400 | \$76,900 | 68.47% | 89.41% | |
| | \$53,600 | \$56,600 | \$59,800 | \$65,400 | \$66,300 | \$70,400 | \$80,800 | 31.34% | 50.75% | |
| | \$32,800 | \$34,700 | \$36,800 | \$40,400 | \$41,000 | \$44,200 | \$50,900 | 34.76% | 55.18% | |
| | \$35,300 | \$37,300 | \$39,500 | \$43,300 | \$43,800 | \$47,100 | \$46,500 | 33.43% | 31.73% | |
| | \$26,500 | \$27,900 | \$29,400 | \$32,100 | \$32,400 | \$35,100 | \$40,000 | 32.45% | 50.94% | |
| | \$21,600 | \$22,600 | \$23,900 | \$25,800 | \$26,200 | \$28,600 | \$32,700 | 32.41% | 51.39% | |
| | \$33,600 | \$35,100 | \$36,800 | \$39,900 | \$39,900 | \$42,700 | \$48,500 | 27.08% | 44.35% | |
| | \$42,800 | \$48,900 | \$106,200 | \$141,500 | \$141,900 | \$148,800 | \$169,700 | 247.66% | 296.50% | |
| | \$77,800 | \$81,400 | \$85,200 | \$92,300 | \$92,400 | \$97,100 | \$110,500 | 24.81% | 42.03% | |
| | \$38,300 | \$40,000 | \$41,900 | \$45,300 | \$45,800 | \$57,600 | \$65,300 | 50.39% | 70.50% | |
| | \$34,500 | \$36,400 | \$38,400 | \$41,800 | \$42,400 | \$45,000 | \$51,400 | 30.43% | 48.99% | |
| | \$38,400 | \$40,500 | \$42,800 | \$49,200 | \$49,800 | \$52,100 | \$59,700 | 35.68% | 55.47% | |
| | \$34,500 | \$36,500 | \$38,100 | \$41,800 | \$41,700 | \$45,000 | \$50,400 | 30.43% | 46.09% | |
| | \$32,000 | \$33,400 | \$35,300 | \$38,200 | \$38,700 | \$41,400 | \$47,500 | 29.38% | 48.44% | |
| | \$34,500 | \$36,000 | \$37,500 | \$40,500 | \$40,600 | \$42,200 | \$47,300 | 22.32% | 37.10% | |
| | \$33,200 | \$35,000 | \$36,600 | \$40,100 | \$40,100 | \$42,900 | \$48,200 | 29.22% | 45.18% | |
| | \$112,100 | \$117,000 | \$122,300 | \$132,100 | \$132,300 | \$151,500 | \$171,800 | 35.15% | 53.26% | |
| | \$29,000 | \$30,500 | \$32,000 | \$34,800 | \$35,200 | \$37,300 | \$42,400 | 28.62% | 46.21% | |
| | \$25,600 | \$27,000 | \$47,300 | \$51,200 | \$50,900 | \$53,100 | \$59,600 | 107.42% | 132.81% | |
| | \$23,600 | \$47,500 | \$49,900 | \$53,700 | \$53,500 | \$56,100 | \$63,800 | 137.71% | 170.34% | |
| | \$41,900 | \$43,800 | \$42,400 | \$46,200 | \$46,700 | \$49,500 | \$56,300 | 18.14% | 34.37% | |
| | \$71,000 | \$74,600 | \$77,700 | \$84,600 | \$84,300 | \$88,800 | \$100,300 | 25.07% | 41.27% | |
| | \$163,700 | \$169,700 | \$175,300 | \$187,200 | \$187,600 | \$197,200 | \$222,300 | 20.46% | 35.80% | |
| | \$40,700 | \$41,900 | \$43,100 | \$45,200 | \$45,500 | \$48,900 | \$52,800 | 20.15% | 29.73% | |
| | \$38,300 | \$40,000 | \$41,800 | \$45,300 | \$45,400 | \$48,400 | \$54,800 | 26.37% | 43.08% | |
| | \$70,100 | \$73,000 | \$76,100 | \$81,900 | \$81,900 | \$81,400 | \$92,300 | 16.12% | 31.67% | |
| TOTAL VALUE | \$2,538,200 | \$2,747,100 | \$2,920,100 | \$3,182,300 | \$3,218,600 | \$3,439,800 | \$3,903,100 | 35.52% | 53.77% | |
| ANNUAL CHANGE | | 8.23% | 6.30% | 8.98% | 1.14% | 6.87% | 13.47% | Avg. % Change | 6.30% | 7.50% |

Source: Service Nova Scotia

9.3.5 Economy

Table PV - 3
Property Assessment Values
WHALE COVE

| YEAR | Proposed | | | | | | | % Change 01-'06 | % Change 01-'07 |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------|--------------------|--------------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | | |
| | \$52,400 | \$54,800 | \$57,300 | \$62,100 | \$62,900 | \$66,800 | \$77,100 | 27.48% | 47.14% |
| | \$29,900 | \$31,600 | \$33,500 | \$36,700 | \$37,200 | \$40,300 | \$46,300 | 34.78% | 54.85% |
| | \$34,200 | \$36,000 | \$38,000 | \$41,500 | \$42,000 | \$44,700 | \$51,100 | 30.70% | 49.42% |
| | \$24,400 | \$25,800 | \$29,500 | \$32,300 | \$32,800 | \$35,500 | \$40,600 | 45.49% | 66.39% |
| | \$24,300 | \$25,500 | \$26,400 | \$28,700 | \$28,700 | \$30,400 | \$33,900 | 25.10% | 39.51% |
| | \$62,500 | \$65,200 | \$76,800 | \$83,200 | \$83,000 | \$86,800 | \$99,400 | 38.88% | 59.04% |
| | \$36,200 | \$37,700 | \$39,300 | \$42,400 | \$42,600 | \$44,400 | \$50,000 | 22.65% | 38.12% |
| | \$31,600 | \$32,700 | \$34,300 | \$36,800 | \$37,100 | \$38,600 | \$43,900 | 22.15% | 38.92% |
| | \$30,100 | \$31,400 | \$32,700 | \$35,300 | \$35,400 | \$37,200 | \$42,400 | 23.59% | 40.86% |
| | \$33,600 | \$35,100 | \$36,600 | \$39,400 | \$39,400 | \$41,400 | \$46,700 | 23.21% | 38.99% |
| | \$39,000 | \$41,000 | \$43,100 | \$46,800 | \$47,400 | \$50,200 | \$57,100 | 28.72% | 46.41% |
| | \$45,300 | \$47,800 | \$50,400 | \$55,100 | \$55,800 | \$58,900 | \$67,500 | 30.02% | 49.01% |
| | \$42,600 | \$44,700 | \$47,000 | \$51,400 | \$52,100 | \$56,100 | \$64,500 | 31.69% | 51.41% |
| | \$72,000 | \$75,300 | \$78,400 | \$85,000 | \$84,500 | \$88,800 | \$100,500 | 23.33% | 39.58% |
| | \$50,500 | \$52,600 | \$54,800 | \$60,000 | \$59,900 | \$63,600 | \$72,000 | 25.94% | 42.57% |
| TOTAL VALUE | \$608,600 | \$637,200 | \$678,100 | \$736,700 | \$740,800 | \$783,700 | \$893,000 | 28.77% | 46.73% |
| ANNUAL CHANGE | | 4.70% | 6.42% | 8.64% | 0.56% | 5.79% | 13.95% Avg. % Change | 5.22% | 6.68% |

Source: Service Nova Scotia

Table PV - 4
Property Assessment Values
SANDY COVE

| YEAR | Proposed | | | | | | | % Change 01-'06 | % Change 01-'07 |
|----------------------|-----------|-----------|-----------|-------------|-------------|-------------|----------------------|--------------------|--------------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | | |
| | \$44,500 | \$47,100 | \$49,900 | \$54,800 | \$55,600 | \$59,800 | \$69,600 | 34.4% | 56.40% |
| | \$45,000 | \$46,900 | \$72,800 | \$78,800 | \$79,800 | \$83,600 | \$96,300 | 85.8% | 114.00% |
| | \$38,300 | \$40,000 | \$41,800 | \$45,300 | \$45,400 | \$48,400 | \$54,800 | 26.4% | 43.08% |
| | \$33,900 | \$35,900 | \$38,000 | \$41,700 | \$42,200 | \$45,700 | \$52,500 | 34.8% | 54.87% |
| | \$96,400 | \$102,000 | \$107,900 | \$118,400 | \$120,000 | \$127,400 | \$146,700 | 32.2% | 52.18% |
| | \$47,500 | \$50,200 | \$53,100 | \$58,300 | \$59,000 | \$62,500 | \$72,000 | 31.6% | 51.58% |
| | \$40,100 | \$42,000 | \$43,900 | \$47,600 | \$47,600 | \$50,700 | \$58,300 | 26.4% | 45.39% |
| | \$37,500 | \$39,600 | \$42,000 | \$45,600 | \$46,200 | \$49,800 | \$57,300 | 32.8% | 52.80% |
| | \$47,600 | \$50,100 | \$52,900 | \$57,700 | \$58,400 | \$61,700 | \$70,700 | 29.6% | 48.53% |
| | \$138,900 | \$144,300 | \$150,500 | \$162,500 | \$162,000 | \$169,400 | \$192,000 | 22.0% | 38.23% |
| | \$47,500 | \$50,100 | \$53,000 | \$58,000 | \$58,800 | \$62,500 | \$71,800 | 31.6% | 51.16% |
| | \$58,000 | \$61,200 | \$64,600 | \$70,500 | \$71,300 | \$75,600 | \$86,900 | 30.3% | 49.83% |
| | \$38,300 | \$40,300 | \$42,400 | \$46,200 | \$46,800 | \$50,700 | \$57,600 | 32.4% | 50.39% |
| | \$43,700 | \$46,200 | \$48,800 | \$53,500 | \$54,200 | \$59,500 | \$68,000 | 36.2% | 55.61% |
| | \$50,800 | \$53,500 | \$56,400 | \$61,600 | \$62,300 | \$65,800 | \$75,400 | 29.5% | 48.43% |
| TOTAL VALUE | \$808,000 | \$849,400 | \$918,000 | \$1,000,500 | \$1,009,600 | \$1,073,100 | \$1,229,900 | 32.81% | 52.22% |
| ANNUAL CHANGE | | 5.12% | 8.08% | 8.99% | 0.91% | 6.29% | 14.61% Avg. % Change | 5.88% | 7.33% |

Source: Service Nova Scotia

9.3.5 Economy

Table PV - 5
Property Assessment Values
FREEPORT

| YEAR | Proposed | | | | | | | % Change 01-'06 | % Change 01-'07 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|---------------------|--------------------|--------------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | | |
| | \$58,400 | \$60,900 | \$63,600 | \$68,800 | \$68,700 | \$71,300 | \$80,800 | 22.09% | 38.36% |
| | \$49,800 | \$50,100 | \$50,500 | \$50,500 | \$51,000 | \$53,100 | \$54,400 | 6.63% | 9.24% |
| | \$33,900 | \$35,700 | \$37,700 | \$41,300 | \$41,900 | \$44,000 | \$40,500 | 29.79% | 19.47% |
| | \$31,500 | \$33,300 | \$35,200 | \$38,500 | \$39,000 | \$42,200 | \$39,100 | 33.97% | 24.13% |
| | \$55,400 | \$57,800 | \$60,400 | \$83,700 | \$83,600 | \$87,300 | \$79,400 | 57.58% | 43.32% |
| | \$28,200 | \$29,400 | \$34,900 | \$37,900 | \$37,600 | \$39,600 | \$35,900 | 40.43% | 27.30% |
| | \$33,200 | \$34,800 | \$36,400 | \$39,700 | \$40,000 | \$42,200 | \$38,800 | 27.11% | 16.87% |
| | \$16,800 | \$18,700 | \$19,600 | \$21,300 | \$21,500 | \$22,700 | \$21,100 | 35.12% | 25.60% |
| | \$26,100 | \$27,500 | \$29,000 | \$31,700 | \$32,100 | \$33,900 | \$31,400 | 29.89% | 20.31% |
| | \$40,700 | \$42,300 | \$44,000 | \$47,400 | \$47,300 | \$50,300 | \$45,900 | 23.59% | 12.78% |
| | \$27,700 | \$29,200 | \$30,800 | \$33,700 | \$34,100 | \$37,000 | \$34,300 | 33.57% | 23.83% |
| | \$31,000 | \$32,700 | \$34,600 | \$37,900 | \$38,400 | \$44,100 | \$40,800 | 42.26% | 31.61% |
| | \$59,200 | \$61,500 | \$63,900 | \$69,100 | \$69,200 | \$72,500 | \$88,700 | 22.47% | 49.83% |
| | \$57,300 | \$59,700 | \$62,300 | \$67,300 | \$67,200 | \$70,200 | \$80,500 | 22.51% | 40.49% |
| | \$39,000 | \$40,700 | \$42,400 | \$45,700 | \$45,700 | \$47,500 | \$53,500 | 21.79% | 37.18% |
| TOTAL VALUE | \$588,200 | \$614,300 | \$645,300 | \$714,500 | \$717,300 | \$757,900 | \$765,100 | 28.85% | 30.07% |
| ANNUAL CHANGE | | 4.44% | 5.05% | 10.72% | 0.39% | 5.66% | 0.95% Avg. % Change | 5.25% | 4.53% |

Source: Service Nova Scotia

Table PV - 6
Property Assessment Values
WESTPORT

| YEAR | Proposed | | | | | | | % Change 01-'06 | % Change 01-'07 |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------|--------------------|--------------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | | |
| | \$81,500 | \$95,800 | \$100,800 | \$110,100 | \$110,900 | \$116,900 | \$134,400 | 43.44% | 64.91% |
| | \$43,700 | \$46,200 | \$48,900 | \$53,700 | \$54,400 | \$57,700 | \$66,500 | 32.04% | 52.17% |
| | \$38,800 | \$42,100 | \$43,900 | \$48,200 | \$48,200 | \$51,000 | \$57,900 | 31.44% | 49.23% |
| | \$38,200 | \$39,600 | \$41,700 | \$44,700 | \$45,100 | \$46,900 | \$53,900 | 22.77% | 41.10% |
| | \$66,700 | \$69,600 | \$86,100 | \$93,400 | \$94,000 | \$98,300 | \$112,900 | 47.38% | 69.27% |
| | \$56,200 | \$59,200 | \$62,300 | \$79,500 | \$97,900 | \$102,500 | \$118,700 | 82.38% | 111.21% |
| | \$34,300 | \$36,300 | \$38,400 | \$42,100 | \$42,700 | \$45,300 | \$52,100 | 32.07% | 51.90% |
| | \$30,600 | \$32,300 | \$34,200 | \$30,900 | \$31,300 | \$33,200 | \$38,100 | 8.50% | 24.51% |
| | \$33,500 | \$34,800 | \$36,600 | \$39,300 | \$39,600 | \$41,300 | \$47,500 | 23.28% | 41.79% |
| | \$63,200 | \$66,900 | \$70,900 | \$77,900 | \$79,000 | \$83,400 | \$96,200 | 31.96% | 52.22% |
| | \$24,100 | \$41,000 | \$43,400 | \$47,400 | \$47,700 | \$50,200 | \$57,600 | 108.30% | 139.00% |
| | \$31,300 | \$32,900 | \$34,800 | \$38,200 | \$38,700 | \$40,900 | \$47,100 | 30.67% | 50.48% |
| | \$36,700 | \$38,600 | \$40,600 | \$44,200 | \$44,700 | \$82,300 | \$89,000 | 124.25% | 142.51% |
| | \$35,300 | \$37,000 | \$38,700 | \$43,700 | \$43,900 | \$46,200 | \$52,900 | 30.88% | 49.86% |
| | \$36,500 | \$38,200 | \$40,200 | \$58,100 | \$58,900 | \$61,900 | \$70,800 | 69.59% | 93.97% |
| TOTAL VALUE | \$650,600 | \$710,500 | \$761,500 | \$851,400 | \$877,000 | \$958,000 | \$1,095,600 | 47.25% | 68.40% |
| ANNUAL CHANGE | | 9.21% | 7.18% | 11.81% | 3.01% | 9.24% | 14.36% Avg. % Change | 8.09% | 9.13% |

Source: Service Nova Scotia

9.3.5 Economy

Table PV - 7
Property Assessment Values
PARKER'S COVE

| YEAR | 2001 | 2002 | 2003 | 2004 | 2005 | Proposed | | % Change 01-'06 | % Change 01-'07 | |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|--------------------|-------|
| | | | | | | 2006 | 2007 | | | |
| | 106,100 | 106,700 | 121,300 | 121,400 | 123,400 | 128,000 | 141,400 | 20.64% | 33.27% | |
| | 102,000 | 102,300 | 103,700 | 104,800 | 106,200 | 111,300 | 124,300 | 9.12% | 21.86% | |
| | 46,600 | 47,400 | 48,800 | 50,000 | 51,500 | 54,500 | 60,800 | 16.95% | 30.47% | |
| | 46,600 | 47,200 | 53,200 | 54,300 | 55,700 | 57,800 | 64,100 | 24.03% | 37.55% | |
| | 47,900 | 47,900 | 53,100 | 54,400 | 56,000 | 58,400 | 64,700 | 21.92% | 35.07% | |
| | 47,000 | 47,300 | 48,000 | 48,700 | 50,100 | 52,200 | 58,000 | 11.06% | 23.40% | |
| | 61,200 | 62,300 | 88,400 | 89,700 | 92,600 | 97,200 | 109,200 | 58.82% | 78.43% | |
| | 70,800 | 71,200 | 73,900 | 65,900 | 71,000 | 74,100 | 81,800 | 4.66% | 15.54% | |
| | 60,400 | 61,300 | 57,600 | 59,100 | 60,300 | 64,100 | 70,600 | 6.13% | 16.89% | |
| | 75,800 | 76,200 | 84,900 | 86,000 | 87,400 | 92,200 | 102,800 | 21.64% | 35.62% | |
| | 50,100 | 50,200 | 60,200 | 60,800 | 62,600 | 67,100 | 74,800 | 33.93% | 49.30% | |
| | 63,000 | 63,400 | 70,400 | 71,500 | 73,000 | 76,200 | 85,200 | 20.95% | 35.24% | |
| | 106,500 | 107,100 | 109,000 | 110,700 | 113,000 | 118,500 | 131,200 | 11.27% | 23.19% | |
| | 64,400 | 65,300 | 74,100 | 75,200 | 76,700 | 80,500 | 89,000 | 25.00% | 38.20% | |
| | 99,000 | 99,700 | 101,600 | 103,300 | 105,600 | 111,300 | 123,500 | 12.42% | 24.75% | |
| TOTAL VALUE | \$1,047,400 | \$1,055,500 | \$1,148,200 | \$1,155,800 | \$1,185,100 | \$1,243,400 | \$1,381,400 | 18.71% | 31.89% | |
| ANNUAL CHANGE | | 0.77% | 8.78% | 0.66% | 2.54% | 4.92% | 11.10% | Avg. % Change | 3.53% | 4.80% |

Source: Service Nova Scotia

Table PV - 8
Property Assessment Values
HANTSPORT

| YEAR | 2001 | 2002 | 2003 | 2004 | 2005 | Proposed | | % Change 01-'06 | % Change 01-'07 | |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|--------------------|-------|
| | | | | | | 2006 | 2007 | | | |
| | \$90,700 | \$92,700 | \$105,300 | \$106,100 | \$109,100 | \$113,900 | \$118,200 | 25.58% | 30.32% | |
| | \$66,100 | \$68,000 | \$73,100 | \$73,800 | \$74,800 | \$79,000 | \$82,900 | 19.52% | 25.42% | |
| | \$34,200 | \$35,000 | \$38,600 | \$38,900 | \$39,600 | \$41,500 | \$42,700 | 21.35% | 24.85% | |
| | \$77,700 | \$78,900 | \$85,600 | \$85,500 | \$87,500 | \$91,100 | \$94,200 | 17.25% | 21.24% | |
| | \$123,400 | \$126,300 | \$140,400 | \$141,300 | \$145,600 | \$152,400 | \$158,500 | 23.50% | 28.44% | |
| | \$71,600 | \$73,500 | \$79,500 | \$79,900 | \$81,300 | \$85,300 | \$87,500 | 19.13% | 22.21% | |
| | \$59,000 | \$60,500 | \$65,700 | \$66,200 | \$67,500 | \$70,900 | \$73,000 | 20.17% | 23.73% | |
| | \$78,500 | \$80,800 | \$96,600 | \$97,900 | \$101,600 | \$107,300 | \$112,500 | 36.69% | 43.31% | |
| | \$70,100 | \$71,700 | \$90,100 | \$90,800 | \$92,500 | \$96,800 | \$99,600 | 38.09% | 42.08% | |
| | \$77,100 | \$79,000 | \$88,500 | \$89,200 | \$92,000 | \$96,400 | \$100,300 | 25.03% | 30.09% | |
| | \$75,300 | \$77,300 | \$84,800 | \$85,600 | \$95,400 | \$99,200 | \$103,900 | 31.74% | 37.98% | |
| | \$97,700 | \$99,700 | \$109,400 | \$110,300 | \$114,200 | \$120,300 | \$125,900 | 23.13% | 28.86% | |
| | \$85,500 | \$99,600 | \$134,400 | \$133,800 | \$135,500 | \$150,100 | \$152,300 | 75.56% | 78.13% | |
| | \$108,400 | \$117,200 | \$117,400 | \$118,300 | \$120,200 | \$128,400 | \$130,600 | 18.45% | 20.48% | |
| | \$57,500 | \$57,800 | \$58,300 | \$69,000 | \$69,600 | \$74,400 | \$76,300 | 29.39% | 32.70% | |
| TOTAL VALUE | \$1,172,800 | \$1,218,000 | \$1,367,700 | \$1,386,600 | \$1,426,400 | \$1,507,000 | \$1,558,400 | 28.50% | 32.88% | |
| ANNUAL CHANGE | | 3.85% | 12.29% | 1.38% | 2.87% | 5.65% | 3.41% | Avg. % Change | 5.21% | 4.91% |

Source: Service Nova Scotia

9.3.5 Economy

Table PV - 9
Property Assessment Values
CHESTER

| YEAR | Proposed | | | | | | | % Change 01-'06 | % Change 01-'07 | |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|--------------------|-------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | | | |
| | \$99,300 | \$111,500 | \$122,100 | \$149,900 | \$161,900 | \$177,700 | \$188,700 | 78.95% | 90.03% | |
| | \$64,600 | \$70,100 | \$75,300 | \$96,800 | \$97,900 | \$101,500 | \$114,400 | 57.12% | 77.09% | |
| | \$110,500 | \$121,700 | \$131,800 | \$188,500 | \$190,700 | \$196,100 | \$220,400 | 77.47% | 99.46% | |
| | \$72,800 | \$80,200 | \$86,500 | \$116,900 | \$128,500 | \$140,800 | \$149,700 | 93.41% | 105.63% | |
| | \$86,700 | \$96,700 | \$105,200 | \$127,800 | \$140,000 | \$153,000 | \$163,100 | 76.47% | 88.12% | |
| | \$102,000 | \$112,300 | \$130,600 | \$150,700 | \$163,900 | \$178,300 | \$190,700 | 74.80% | 86.96% | |
| | \$110,800 | \$122,100 | \$132,200 | \$143,300 | \$152,500 | \$187,200 | \$192,100 | 68.95% | 73.38% | |
| | \$85,600 | \$94,300 | \$103,800 | \$114,800 | \$123,500 | \$128,000 | \$131,400 | 49.53% | 53.50% | |
| | \$120,100 | \$134,200 | \$147,600 | \$141,400 | \$150,600 | \$155,500 | \$160,600 | 29.48% | 33.72% | |
| | \$73,300 | \$82,200 | \$89,900 | \$107,200 | \$127,700 | \$132,600 | \$134,900 | 80.90% | 84.04% | |
| | \$77,500 | \$87,400 | \$97,400 | \$117,800 | \$125,900 | \$122,500 | \$125,900 | 58.06% | 62.45% | |
| | \$99,300 | \$108,900 | \$117,000 | \$113,600 | \$122,200 | \$126,600 | \$129,900 | 27.49% | 30.82% | |
| | \$138,000 | \$152,900 | \$167,000 | \$165,400 | \$178,200 | \$183,100 | \$189,500 | 32.68% | 37.32% | |
| | \$126,700 | \$140,000 | \$152,900 | \$164,200 | \$177,900 | \$193,300 | \$207,000 | 52.57% | 63.38% | |
| | \$96,300 | \$106,300 | \$115,200 | \$127,900 | \$136,900 | \$141,300 | \$146,200 | 46.73% | 51.82% | |
| TOTAL VALUE | \$1,463,500 | \$1,620,800 | \$1,774,500 | \$2,026,200 | \$2,178,300 | \$2,317,500 | \$2,444,500 | 58.35% | 67.03% | |
| ANNUAL CHANGE | | 10.75% | 9.48% | 14.18% | 7.51% | 6.39% | 5.48% | Avg. % Change | 9.66% | 8.97% |

Source: Service Nova Scotia

9.3.5 Economy

9.3.15.9 The consultant's report recommended forming a property value monitoring committee. Will the CLC be involved in this monitoring? Describe the role of affected property owners in the monitoring program. How will property evaluators determine whether losses in value are attributed to the project?

RESPONSE

While the consultant's report recommended forming a Property Value Monitoring Committee, Bilcon did not adopt this recommendation. However, it is Bilcon's intent to have a person with knowledge of the local real estate market (probably a local realtor) as a member of the CLC. Property owners who feel that the value of their property has been affected by Bilcon's activities would bring their concerns to the specific CLC member, or to the CLC itself. The CLC will bring the matter to the attention of Bilcon who will engage a qualified property appraiser to carry out an evaluation.

Property appraisers faced with an apparent decline in property values would have to evaluate all local economic factors; for example, drop in tourism numbers, continued decline in fishery, continued population loss, as well as more national issues such as the state of the Canadian economy and interest rates.

By comparing the results of these extraneous factors, for example, on values at a significant distance from the project, a qualified property evaluator will be able to determine the residual effect of the quarry itself.

**WP-1498 – Nova Scotia Department of Environment and Labour
Comments from the Environmental Monitoring and Compliance Division
Yarmouth District Office
Bruce Arthur - Acting District Manager
Scott Lister – Hydrogeologist**

4. Chapter 7.7.1 discusses utilities and states that "electrical energy would be provided from upgraded services on Highway 217 to the quarry compound area." What is meant by "upgraded services on Highway 217? How much electrical energy is the project expecting to use on an annual basis? Is the present grid capable of providing this energy or will this main line on Highway 217 need to be increased in capacity? If upgrade is required what will be negative or positive effects on area residents? Who would be responsible for constructing and financing the upgrades?

RESPONSE

Bilcon has identified a power requirement to feed approximately 7,000 horse power of electric motors. NSPI has identified a requirement for line work and sub-station upgrades to supply this demand. Bilcon also recognizes the requirement to provide flicker control to

9.3.5 Economy

minimize flicker on the NSPI electrical system. Bilcon is responsible for financing the upgrades which would be carried out by NSPI. Bilcon is of the opinion that the upgrading of the line from Digby to Whites Point will have a positive affect on the power supply for area residents.

WP-1541 Fisheries and Oceans Canada

EIS Volume I – Plain Language Summary

Page 28, Section 7.5 Fishing – The list of potential effects in this section deals primarily with environmental effects on fish and habitat, rather than conflicts with or potential effects on fishing activities. For example, Section 9 goes into some detail on these issues (e.g. good communication with fishers and compensation for gear damage) yet no mention of this is made in the summary.

RESPONSE

Comment noted. In hindsight it would have been useful to provide some background with respect to communication with lobster fishers and compensation for gear damage in the Plain Language Summary.

Section 7.9 Employment and the Economy – There is only one statement on the fishery, “There is no evidence that the operation of the quarry will affect either the fishery or the tourism industry.” Yet it seems fairly clear that the marine terminal and shipping will interact with and impact fishing activities. This statement should be supported by further information/documentation particularly when the first paragraph on this page states that the lobster industry has increased significantly in this area. If it can not be supported then statement “there is no evidence that the operation of the quarry will affect the fisher” should be retracted.

RESPONSE

Traditional fishing activity may be affected in Bay of Fundy waters by shipping. This has been determined to be a long term, insignificant effect of local scale due primarily to the proposed shipping route. Discussion with traditional fishermen who use these waters is ongoing. Bilcon is proposing a lobster trap fund to compensate lobstermen and others for any loss of gear due to quarry shipping activities. The statement “there is no evidence that the operation of the quarry will affect the fishery” is retracted.

EIS Volume III – Maps

Map 6B – Business and Services – This map depicts aquaculture sites, wharves and processing plants but no maps showing fishing areas were produced. Source material from interviews, meetings, socio-economic profiles, field observations and traditional community ecological knowledge could have been mapped to illustrate the text descriptions. (e.g.,

9.3.5 Economy

herring nets, customary lobster grounds, other trap and logline areas). Mapping these uses would help lend visual support to the conclusions of “insignificant negative impact”.

RESPONSE

Map 39 – Marine Resources – Bay of Fundy has been prepared indicating the relation of quarry activities to traditional fishing areas and stocks. Map 39 has been included as part of this comment and response submittal.

Volume IV – Chapter 1

Table C1 – Commitments Table – Page 7 – This table only includes the lobster fishery. Is there the potential for damage to other gear types? Can the “lobster trap fund” be used to compensate for other gear losses? Commitment 11.3 makes the very specific commitment that carriers will enter and leave on “the same predetermined bearing” Will this final route be determined with input from local fishers?

RESPONSE

Bilcon has been advised in discussions with local fishers that no other fishing gear is currently being used in the Whites Cove area other than sea cucumber rakes. Bilcon was specifically advised that gill nets have not been set for four years.

The predetermined bearing for the ship to approach and depart the Whites Point Terminal will be set following discussions and input from local fishers.

EIS Volume VII – Chapter 9.3 Human Environment and Impact Analysis

Comment

Page 81 – 9.3.9.1.3 The proponent states that the gear impact compensation plan has been agreed to by lobster fishers. What agreement was reached? Was this agreement signed by all potentially affected fishers? Did this include potentially affected fishers from other sectors? The proponent should provide more details. Was displacement of fishers from fishing areas from physical components, shipping routes and any exclusion zones also included in the agreement?

In Section 9.3, page 95 the proponent states that, “Discussions are presently in progress concerning a lobster trap fund to be established by Bilcon of Nova Scotia Corporation, and administered by the local lobster fishermen, to provide compensation for lost traps and related gear due to shipping activities.” While Section 11, page 46 states, “The fish habitat compensation plan will be implemented upon the Proponent receiving approval for the project, while other compensation agreements will be honoured on an annual basis in the case of the Whites Cove fishers and on an as-required basis in the case of well problems. The Proponent is the subsidiary of a well established New Jersey family-held company which will provide funding for the construction of the Whites Point project (\$40.6 CAD million)

9.3.5 Economy

from its own resources. No specific mechanism is proposed to finance the proposed compensation agreements, other than from on-hand resources". The proponent should clarify how the fisheries compensation agreement will be established and administered.

RESPONSE

Three meetings were held with licensed lobster fishers who traditionally fish in the nearshore Whites Cove area. Agreement was reached on the establishment in consultation with lobster fishers of a designated inbound and outbound route, the increase in turning radius of the ship immediately adjacent to the Whites Point terminal and the establishment of a compensation fund to be administered by a committee of lobster fishers. No specific details of the compensation plan have been established pending a meeting with the Lobster Fishing Area #34 Management Board.

A letter requesting a meeting to clarify details was sent on September 20th, 2006 but to date no response has been received.

Section 9.3.13 Economy – Fishery/Near shore – This section emphasizes the lobster fishery but the treatment of other fisheries and the spatial extent of the adjacent fishing grounds appear to be somewhat limited.

RESPONSE

The marine resources in the Bay of Fundy adjacent to the proposed Whites Point Quarry and Marine Terminal are shown on Map 39 in relation to shipping activities. This information on this area of the Bay of Fundy and Saint Mary's Bay was compiled by Fisheries and Oceans Canada and the Western Valley Development Authority in 1997. Traditional Knowledge, supplied by the fishing industry was used during compilation of this information. Various species of ground fish, pelagic fish and shellfish and their spatial extent are shown. Also, areas of specific fishing activity are outlined.

Page 85 – With regard to the commercial periwinkle harvesting the Whites Cove area, DFO does not have any data on this fishery as it is currently not a licensed fishery. Therefore, DFO does not know how many harvesters may be affected. However, this should not be a significant issue if the proponent maintains their commitment to allowing for continued access for harvesters.

RESPONSE

Comment noted.

Section 9.3.13.1 Economy – Fishery/ Near shore Research – This section presents license statistic by species (18) and type (14) which indicates that fishers are legally entitled to fish for more than what are described as active fisheries (i.e. lobster, herring, mackerel and sea

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cucumber). The statement on page 92, "These waters have also attracted fishers partaking in a recently established experimental sea cucumber fishery." signifies the likelihood of interest in new and expanding fisheries. Therefore, the proponent should indicate the potential for future fisheries to develop in the area of the project.

RESPONSE

At the present time there is one exploratory licence for a sea cucumber fishery in Southwest Nova Scotia and Bilcon has been advised (per. com. Bobbie Childs – DFO Yarmouth) that discussions have taken place for a potential exploratory green crab fishery. In discussions with local fishermen, Bilcon has been advised that harvesting for sea cucumbers in the Whites Cove area would take place for approximately one week in a year.

Detail on specific fishing patterns in the waters adjacent to the proposed quarry and terminal appears to have been informed largely by on-site observations in 2002 and 2003. How thorough, frequent and seasonal were those observations? Were traditional users consulted to supplement observations? Were any other new or traditional fisheries conducted in 2004, 2005 or 2006?

RESPONSE

Observations of fishing and other boating activities were conducted by David W. Kern in 2002 and 2003. Observations in 2002 were conducted weekly from May to October. Observations in 2003 were conducted weekly from April to December. The duration of these observations averaged four hours per week. Observations were aided with 7 x 35 binoculars. Photographic documentation was also conducted when warranted. Traditional users were consulted including Wanda Van Tassel (periwinkles and dulse), and Dwayne Theriault (sea urchins and lobster).

Sea urchin harvest should be given more consideration. The section states that no diving for urchins was observed in this area of the Bay, but it is not stated whether there has been effort there in the past or if there is interest amongst harvesters.

RESPONSE

An active sea urchin fishery exists in waters surrounding Digby Neck and Islands. It is a "limited entry" fishery with no new licenses presently being considered. This fishery has no designated fishing areas (pers. com. Anne Sweeney, DFO 2006). The urchin fishery began in 1997-1998 and in 2005-2006 had three or four active, licensed participants who fish in the Bay of Fundy and Saint Mary's Bay area (There are a total of 6 licenses in the Digby/Annapolis/Kings area – pers. Com. Bobbie Childs – DFO). Each licensed boat may employ up to four divers. The fishing season is generally during October to March. Although urchin diving may occur in both Saint Mary's Bay and the Bay of Fundy, the most

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lucrative harvest areas occur in and around Grand and Petite Passages (pers com. Bob Miller, DFO, 2006) – see Map 39.

Consultation with a former sea urchin captain indicates there are no urchins of commercial numbers in the area of Whites Cove. Further this captain commented that, to his knowledge, no urchin boat ever had a day's fishing from Sandy Cove to Whale Cove and the only good urchin producing areas below Sandy Cove are Petite Passage, Grand Passage, and the North West Ledge. Also, in his opinion, the marine terminal may even help the sea urchin fishery by serving as a spat collector (pers. com. Dwayne Theriault 2006).

Section 9.3.13.2 – Economy – Fishery Near Shore Analysis – While it seems reasonable to use regional landings to characterize the overall economic impact as localized and insignificant, there may be adverse impact for individuals and small groups of fishers. On page 95 it is stated that “Construction of the marine terminal and shipping activities may inconvenience the traditional lobster fishery adjacent to Whites Point.” For greater certainty and clarity, the exact nature of that “inconvenience” for area fishers could be elaborated.

RESPONSE

As noted in other responses, the attendees at the three meetings held with licensed lobster fishers who traditionally fish in the nearshore Whites Cove area were of the view that the inconvenience from shipping activities was not an issue. Since a decision has now been made to construct the terminal from drilling barges which can only operate during the summer months, the lobster fishery will not be inconvenienced since no construction activities at the terminal will take place during the lobster season.

For example, the section states that the terminal location in depths of 16 metres”...is not expected to disrupt lobster trap setting areas.” Next is suggested that vessel traffic will occur through depths where lobster is fished. What are those depths, how was this information derived and from what source? How important are grounds in the proposed shipping route or within the half mile radius of near shore surface waters that will be influenced by vessel and loading operations: How much fishable bottom or how many lobster traps are likely to be affected? As mentioned earlier, a map would be helpful to illustrate grounds.

RESPONSE

Discussions with local lobster fishers has provided Bilcon with background on the fishery in the Whites Cove area. The season commences in LFA 34 on the last Monday in November and continues to the end of May. Lobster fishers traditionally set their traps for the first two weeks of the season in Saint Mary's Bay and then move across to the Bay of Fundy. In the Bay of Fundy as the water cools lobsters move further offshore and hence traps are set further away from the Whites Cove area as winter progresses. Bilcon is advised that two or

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three lobster fishers have traditionally fished inshore at Whites Cove and do not move their traps west into deeper water during the winter. Bilcon is advised that towards the end of January traps are set in the fishing lanes but interference by ships is not seen as a major concern.

As the water warms in March, the lobsters begin to move inshore again and Bilcon is advised that all but two or three lobster fishers move back into Saint Mary's Bay for the months of April and May.

Fishers can request shipment schedules but it is not made clear whether traps and other gear can be set inside the designated shipping lanes or alternatively, moved in and out to avoid vessel-gear interactions. Will the proposed lobster habitat compensation area be open and accessible for fishing (out of the shipping route etc)?

RESPONSE

In the immediate area of the Whites Point terminal, the ship will move in a circular route shown on Map SR-1 in Section 7.0 – Revised Project Description. This turning circle has been increased in size to a radius of 1.6 kilometres at the request of lobster fishers. The intent is that lobster fishers can set traps at any time within the turning circle without inconvenience.

With respect to the designated route between the shipping lane and the Whites Point terminal, it should be noted that the same bearing will be used for both inbound and outbound vessels. This designated route will be established in consultation with lobster fishers. It is anticipated that the shipping frequency will be approximately one vessel per week and the timing of the vessel's transit will be made known to interested parties by means of a designated telephone line. It is anticipated that lobster fishers setting traps outside of the turning circle will do so respecting the designated route or remove traps from the designated route before a vessel's transit.

Page 95 – With regard to the impact of vessel traffic and loss of fishing gear, compensation may also be required for loss of income (in addition to loss of gear).

RESPONSE

Since the inbound and outbound lane will be specifically designated and will be the same for each vessel transit and the timing of each transit will be made known to fishers, there would appear to be no basis for compensation for loss of income.

In addition, the proposed shipping routes appear to be fully contained within Lobster Fishing Area 34; however, if shipping will occur within LFA38, there may be some loss of gear experienced in that fishing area as well.

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RESPONSE

There will be no shipping connected to the quarry operation within LFA 38.

Section 9.3.13.3– Economy – Fishery/Near shore Mitigation – Lobster fishermen requested a wider ship approach/departure area in the vicinity of the marine terminal to “allow traps to be set in an area presently being fished”. It is not clear how a wider area will secure customary fishing access. Would it not expand or increase the likelihood of vessel-gear interactions? A map would help to explain this proposal. Also the proponent should explain how fishers will be compensated if they are displaced or prevented from fishing due to exclusion zones.

RESPONSE

Please refer to Map SR-1 in Section 7.0 – Revised Project Description. The wider turning circle is to enable the lobster fishers to fish without disturbance inside the circle. There are no exclusion zones but clearly it would be imprudent to set traps in a designated shipping lane at the time of a known vessel transit.

WP-1542 Health Canada Public Information and Consultation Process

Health Canada notes that primary public concerns identified were related to the preservation of the environment, and indirect effects of the project on income sources (fishing, lobster, tourism etc.) and quality of life of local residents.

RESPONSE

Comment noted.

Socio-Economic Impact of Potential Environmental Effects on Local Industries

The main industries that may be affected by the environmental effects of the proposed quarry are the fishing (aquaculture, intertidal, and nearshore) and tourism industries.

According to Section 9.3.10 of the report, the Bay of Fundy in the area of the proposed quarry supports a fixed and mobile gear commercial fishery for groundfish (the most common species include cod, haddock, and Pollock); pelagic species such as herring and mackerel; crustaceans (primarily lobster); molluscs (primarily scallops); and local harvesting of sea plants. In addition, localized harvesting of periwinkles, sea urchins, and more recently an experimental sea cucumber fishery has also been carried out in this area of the Bay. On Digby Neck/Islands, based on the last census of 2001, approximately 36% of the labour force was involved in the fishery (Section 9.3.9.1, Table E-1). Therefore, fishing is very important for the local economy. According to the EIS, the most lucrative sector is the lobster fishery,

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and lobster fishing and herring gill netting are the two main fishing activities occurring in the project area, including the near shore area adjacent to the Whites Point Quarry property (Section 9.3.13.1).

Concerns were that fishing could be impacted by the project activities (including, blasting and the construction and operation of the marine terminal) on economically valued marine species. Providing that the Department of Fisheries and Oceans (DFO) agrees with the marine species assessment conducted and the local fishermen agree on the mitigation measures to be implemented, Health Canada agrees that the socio-economic impact of the project on fishing is not expected to result in adverse effects. More specifically:

- *For the existing nearby aquaculture facilities, setback distances from the proposed quarry are greater than those outlined in applicable guidelines, and additional mitigative measures have been recommended, including minimizing potential blasting effects through the use of time-delays and smaller individual charges.*
- *For fishing in the intertidal zone, Bilcon indicates that access to the shoreline will remain. However, for the safety of these individuals, a check-in procedure will be required.*
- *For nearshore fishing, Bilcon indicates that herring nets are set closer to the shoreline than the course of the vessel, and would not likely be affected, however, lobster trap gear may become entangled during vessel arrival and departure. Specific mitigation measures were proposed for herring and lobster fishermen, including the development of designated shipping lanes, sharing of shipping schedule information with fishermen, and the potential development of a fund to compensate in the event of tangled gear.*

In addition to fishing, tourism is also a major industry on Digby Neck. Based on the Attitude Survey (AMEC, October 2005) and the public registry, concern was expressed that tourism, particularly people visiting the area for its scenic beauty and/or its natural attractions including bird watching and marine mammal watching, could decrease as a result of the project. Section 9.3.14.2 (Analysis) of the EIS states that the proposed Whites Point quarry is not visible from the Digby Neck and Islands Scenic Drive (Hwy #217), from any tourist accommodations (fixed roof or campgrounds), adventure tour ports, designated heritage buildings or any of the proposed sites for the Discovery Centre. As a result of its proposed layout, including the proposed environmental preservation zone, the site (including marine terminal) would only be visible by water. With respect to the whale watching, the EIS states that “the greatest concentration of whales and whale watching effort does not occur along the Digby Neck coast of the Bay of Fundy”, and” whale watching tours, recreational boating or adventure boating in the Bay of Fundy presently do not frequent the nearshore

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waters of the Whites Point Area”, thus “views of the quarry and marine terminal from tour boats will not be common”. (Section 9.3.14.2 and 9.3.14.5).

No specific mention is made of how noise from quarrying operations will impact tourism, tourist accommodations, designated heritage buildings or other buildings of potential interest to tourists. In general the report indicates that noise will not result in adverse effects to humans due to adherence to the Nova Scotia Pit and Quarry Regulations for noise levels, however, the specific issue of noise and tourism is not addressed in the report.

As a mitigative measure, Bilcon mentioned that a representative of the tourism industry will be invited to sit on the CLC. Although no significant adverse effects have been predicted by Bilcon, Health Canada recommends that a formal follow-up process be implemented to assess the potential change in volume of tourism and its potential causes. This follow-up should include an annual review of tourism statistics (and possibly a tourist survey) during the construction phase and the first few years of operation.

RESPONSE

Bilcon will develop a follow-up process to assess the potential change in volume of tourism and its potential causes. Consultation with the tourism industry representative on the CLC and an annual review of tourism statistics during the construction phase and the first few years of operation will be conducted.

Mitigation Measures and Monitoring and Follow-up Program

Provided there is participation by the relevant stakeholders, the proposed mitigation appears to be appropriate in order to reduce the potential social and economic impacts that could be derived from the potential environmental effects of the project. Openness, transparency and ready access to information is essential in ensuring an informed public and will assist in decreasing the distance between reality and perception.

RESPONSE

Comment noted. Please refer to Section 8.2 – Public Consultation in this submission.

WP 1625 – Partnership for Sustainable Development

Deficiency Statement 60

EIS Guidelines

9.3.3- Economy - ‘Describe the local and regional economies and their performance.’

8.1 - Methods - ‘Document all models and studies so that, to the extent possible, the analyses are transparent and reproducible; support analyses and conclusions with reference to appropriate literature and provide all relevant references.’

9.3.5 Economy

EIS

The EIA states that 'Under a new policy directive from the provincial government, the Towns and Counties of Annapolis and Digby (including Clare) combined to create the Western Valley Development Authority (WVDA) and in 1995, the WVDA produced a Development Plan for the Western Valley (title)...However, new business failed to materialize and the various municipal units removed their support for the WVDA in 2005, and collapsed the organization.' Missing is evidence to support the argument that "new business failed to materialize". The WVDA's 2005 Business Plan, approved by its Board of Directors, states that more than 300 new businesses opened in Annapolis and Digby counties between 2001 and 2004. The Investor's Business Case, states 'The number of net job creation since 2001 in the Western Valley is almost 2,500... During this time period, the unemployment rate in the Western Valley has dropped by an estimated 2.5%, while the participation rate increased by 6.6%. This estimated growth in employment is 14.9% over the past three years.'

If "new businesses failed to materialize", as the EIS claims, then existing businesses must have expanded. Either way, the data suggests a positive, not negative, change in the business environment between 2001 and 2005. The Proponent should revise the EIS, making use of all relevant information and substantiating all conclusions.

RESPONSE

Bilcon notes the statistics provided by the Western Valley Development Authority but does not accept that there has been a positive change in the business environment in the Western Valley area between 2001 and 2005. Bilcon would point out the following recent negative changes to the business environment in recent years.

- The closure of Britex (130 jobs lost)
- The closure of Weymouth Sawmill (75 jobs lost)
- The closure of Shaw Wood (230 jobs lost)
- The downturn, generally, in the soft wood lumber industry caused by the dramatic downturn in new housing construction in the US (unknown number of jobs lost)
- The significant downturn in the ground fish industry (unknown number of jobs lost)
- The significant downturn in the scallop fishing industry (unknown number of jobs lost)
- The significant downturn in the tourism industry (unknown number of jobs lost)
- The threat of closure of the Digby / Saint John Ferry (threat to 130 jobs)

It is clear that the municipalities understand the magnitude of recent population declines in the Western Valley, as it sought to replace the Western Valley Development Authority with a more proactive job creating development agency.

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The recent revival of the local Boards of Trade is also another prime indicator of the concern local businesses have with the state of the local economy. The Digby Board of Trade has recently completed a trade mission to Scotland in an attempt to attract new business to the area. It should be noted that Bilcon was a significant sponsor of this trade mission.

Deficiency Statement 61

EIS Guidelines

9.3.3- Economy - 'Discuss local and regional economic development goals and objectives as identified in public consultations, and community, regional and territorial economic development plans and strategies.'

EIS

In its consideration of local and regional economic development plans, the EIS fails to consider Vision 2000-Building Tomorrow: A multi-year action plan for Annapolis and Digby counties. The document was developed through an extensive community consultation process involving hundreds of individuals and detailed surveys of more than 500 businesses. The strategy was named the best community-based economic development plan in Canada in 2000 by the Economic Developers Association of Canada and the Royal Bank. The document contains numerous sections that are relevant to the Project, including: Business Development, Environment, Natural Resources, and Tourism, Heritage and Culture.

Section 9.3.9 of the EIS quotes heavily from the provincial government's Opportunities for Prosperity issued in 2001. It is curious to note that the Province's updated strategy document, entitled Opportunities for Sustainable Prosperity¹³¹, was not addressed. Likewise, the EIS fails to incorporate input from the province's Green Plan Towards a Sustainable Environment.

The EIS is deficient in its consideration of local, regional and provincial economic development strategies. The Proponent should revise the document to include these documents.

RESPONSE

Bilcon is of the opinion that economic development plans and strategies developed in 2001 do not address the reality of the present economic situation in the local area. As noted above, there has been a dramatic downturn in the local economy in the past two years with resulting major job losses and a significant out-migration of the local population. The plans referenced which were developed in 2000 simply do not address the reality.

Deficiency Statement 75

EIS Guidelines

10.3.3- Economy - 'Describe the consistency of the Project with goals and objectives identified in provincial, regional and community economic development plans and strategies.'

9.3.5 Economy

EIS

9.3.9.1.2 - *Consistency of the Project with Goals and Objectives Identified in Economic Plans and Strategies* - It is interesting that the Proponent does not refer to even one of the 13 economic plans and strategies that were published by the Regional Development Authority between 1994 and 2005. This is odd, given that the Authority had a mandate sanctioned by the Minister of Economic Development to lead economic development in Annapolis and Digby counties. The Board of the RDA was comprised of representatives from the seven participating municipalities (including elected officials and CAOs), the provincial Office of Economic Development and other provincial agencies, ACOA and other federal agencies, and individual citizens appointed by the municipalities.

The EIS does reference a 2000 evaluation report of the WVDA, prepared by PRAXIS Research. Only one section from that document is referenced in the EIS: "Appendix A: WVDA Sector Goals and Examples of Activities." It is noted that under the category of Natural Resources, the activities and accomplishments that PRAXIS chose to highlight are in the forestry, fisheries, and agriculture sectors. 'Forestry, fisheries, and agriculture are noted but there is no mention of any mineral resource extraction'¹⁶², states the EIS. From this one piece of "evidence", the Proponent concludes that 'In fact, it is clear that the staff of the WVDA did not support the project and refused to consult with the Proponent on any of the issues raised by the community.'

The EIS concludes that the reason there were no projects listed in the mining sector was not because the sector does not comprise as large a portion of the regional economy as the forestry, fisheries and agriculture sectors, but rather as evidence that the "staff of the WVDA did not support the project". No mention is made of the fact that the Bilcon of Nova Scotia Corporation never contacted the RDA for assistance in any way. The agency was, however, approached by numerous individuals, organizations, and businesses from the Digby Neck and Islands region with respect to the quarry proposal.

The EIS goes on to claim that "... the approach to community economic development adopted by the staff of the WVDA did not reflect the community's approach as expressed by the various councils in the area and the organization has been disbanded."¹⁶⁴

It is noteworthy that the EIS does not mention that the WVDA Board, which was responsible to setting its strategic agenda, was comprised of "the various councils". The EIS also chooses not mention the fact that the council responsible for the geographic area in which the proposed activity is to take place, the Municipality of the District of Digby, passed a motion against the Whites Point quarry proposal. It is also curious that the only excerpt from the PRAXIS document that is quoted in the EIS is the statement above. Omitted are the statements throughout the document that suggest that the "...approach to community economic development adopted by the staff" did indeed "reflect the community's approach". The EIS is deficient in its analysis of local and regional economic development strategies. The document makes a number of statements which are misleading, unsubstantiated or not referenced. The Proponent should revise the EIS to fully address the Guidelines.

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RESPONSE

In the text of the question the following statement was made “No mention is made of the fact that Bilcon of Nova Scotia Corporation never contacted the RDA for assistance in any way.” The reality is that the RDA was asked to sit on the Community Liaison Committee but refused the opportunity. It is clear that the Executive Director of the RDA was opposed to the Whites Point project and, indeed, has provided a research report annexed to the submission from the Partnership for the Sustainable Development of Digby Neck and Island Society. The reality of the economic situation in the local area has been dealt with in answers to previous questions.

Deficiency Statement 76

EIS Guidelines

10.3.5 – Land Use and Value - ‘Assess effects of the Project on site, local and regional land values during operation and after decommissioning.’ 8.1 – Methods – ‘Identify and justify any assumptions made. Indicate the degree of certainty in the impact predictions and determination of significance (identify measures used).’

EIS

The EIS presents a summary of property sale statistics for the periods of 1999 to 2002 and 2002 to mid 2005. In summarizing these statistics, the EIS concluded: ‘Due to the variable nature of the individual properties sold, it is not possible to compare values in the two time periods...’ The EIS later states that ‘It would appear from the real estate statistics for Digby Neck and the Islands referenced above, there is no general perception among buyers that the proposed quarry and marine terminal at Whites Point is likely to negatively affect property values on Digby Neck and the Islands.’ The EIS makes reference to three case studies contained in the Gardner Pinfold Report, concerning impacts of quarry activity on property values. Of the three case studies, the Auld’s Cove (Canso) example does not mention property values; the Hantsport example identified no adverse effect on property values, while the Sechelt case cited clear impacts on real estate values. In consulting with Sechelt real estate agents, the Gardner Pinfold study found ‘proximity to the mine site does have a negative impact on property value. Given a choice, people will prefer to neither see nor hear the Sechelt operation.’ It is interesting to note that the adverse effects noted in the Reference volume are not reflected in the text of the main EIS.

The EIS also cites the example of Parker Mountain Aggregates near Annapolis Royal, NS as a comparative quarry. In its analysis of property development the EIS fails to identify that the Parker Mountain quarry is in fact quite different from the proposed quarry at Whites Point. The Parker Mountain quarry is much smaller and is not permitted to use blasting for aggregate removal. Based in part on complaints from neighbours, Parker Mountain Aggregates was subject to prosecution by the Department of Environment and Labour in 2005 over alleged illegal blasting.

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By its own conclusion, the EIS identifies that the property sale are of limited use given the small and variable dataset. Of the three case studies cited in the Gardner Pinfold report, only two address impacts on property values, one positively, one negatively. The comparability of the Parker Mountain quarry is limited, given its differences in scale and lack of regular blasting. Based on the above evidence, the EIS concludes, 'While property values in general on Digby Neck and Islands are unlikely to be affected, those properties within 800 m of the active quarry could be marginally affected resulting in an insignificant negative effect in the local area.'

The methodology employed to assess the impacts on property values is clearly insufficient to support the conclusions made. Assumptions made within the methodology are not documented and no estimation of certainty is provided for the final conclusion. The Proponent should revise the EIS, incorporating a more comprehensive and transparent methodology to assess the impacts on local and regional property values.

RESPONSE

Please refer to responses to the Panel and Agencies in this document.

Deficiency Statement 92

EIS Guidelines

12.8 - Compensation, 'Describe plans to compensate resource users, property owners, and communities for losses or damage that may occur as a result of the effects of the Project.' 'Describe mechanisms to be put in place to finance proposed compensation plans.'

EIS

9.3.13.3 - Mitigation - No further information is provided on how compensation for damage to lobster traps and fishing gear will be administered, financed and guaranteed for the life span of the Project.

From my professional and therefore limited perspective, the incremental environmental effect of building and operating the terminal will be minimal. The compensation program for destroyed lobster traps and other fishing gear will require some mechanism for keeping the companies feet to the fire... an independent fisheries effects monitoring committee for example. These details need to be more precisely stated, or specified in the permits.

RESPONSE

Please refer to Bilcon's responses to the Panel and Agencies in this section and also, please refer to Section 9.2.3 – Aquatic Ecology- Marine and Section 9.2.4 – Transportation in this document.

9.3.5 Economy

Deficiency Statement 93

EIS Guidelines

12.8 – Compensation – “Describe any plans for compensation that would be part of proposed mitigation to address negative or adverse impacts from the Project.”

EIS

11.8 – Compensation – The EIS does not appear to consider the need for compensation where an unanticipated negative adverse impact may occur. For example, the EIS indicates that there is little risk of a ship strike with a Right whale. Where there is any risk of irreversible damage the EIS should include a compensation plan to address that damage.

RESPONSE

Bilcon has not contemplated a compensation plan to address a ship strike with a Right Whale or, indeed, any other marine mammal. Bilcon is not aware of any mechanism for addressing this issue.

9.3.6 Human Health and Wellness and Socio-Cultural Environment

EIS Reference: EIS Volume VII, Chapter 9, Section 9.3.17

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9.3.6 Human Health and Wellness and Socio-Cultural Environment

WP 1452 – Joint Review Panel

9.3.7 Community Profile

9.3.7.1 Demographic Profile – Include the community of Brier Island in the analysis of population, economy, tourism, etc. Discuss how changes of the population in the Digby Neck and Islands region compare with other rural coastal areas of Nova Scotia over the same period.

RESPONSE

The analysis of population has been updated to include the geographic area of Brier Island. A prior investigation of the population trend for Brier Island had been conducted. It was omitted as part of the original review in order to maintain continuity of geographic representation from the quarry as described in the EIS. However, information specific to Brier Island was incorporated or not excluded from other components of the analysis under the Community Profile section, such as the analysis of education, income, and the economy including the fishery and tourism.

Population statistics for Dissemination Area 37 or Brier Island, reflect a similar pattern of decline in population from 1981 through 2001 to that of other areas within the Digby Neck and Island region. According to Statistics Canada data, the population on Brier Island declined 25.4% or an absolute decline of approximately 90 persons from 1981 to 2001. The following table outlines population change for Digby Neck and Islands inclusive of Brier Island.

Table DP- 1, Population Change 1981-2001, Digby Neck and Islands

| | 1981 Census | | 1991 Census | | 2001 Census | | Percent Change '81-'01 |
|---|----------------|------|----------------|------|----------------|------|------------------------------|
| | # | % | # | % | # | % | |
| Total Reporting 5 to 10-year age groups | 2,205 | | 1,915 | | 1,595 | | -27.7 |
| 0 - 4 yrs | 135 | 6.1 | 140 | 7.3 | 80 | 5.0 | -40.7 |
| 5 - 9 yrs | 180 | 8.2 | 115 | 6.0 | 95 | 6.0 | -47.2 |
| 10 - 14 yrs | 225 | 10.2 | 120 | 6.3 | 105 | 6.6 | -53.3 |
| 15 - 19 yrs | 215 | 9.8 | 165 | 8.6 | 85 | 5.3 | -60.5 |
| 20 - 24 yrs | 160 | 7.3 | 160 | 8.4 | 55 | 3.4 | -65.7 |
| 25 - 34 yrs | 315 | 14.3 | 290 | 15.1 | 180 | 11.3 | -42.9 |
| 35 - 44 yrs | 205 | 9.3 | 275 | 14.4 | 230 | 14.4 | +12.2 |
| 45 - 54 yrs | 205 | 9.3 | 165 | 8.6 | 270 | 16.9 | +31.7 |
| 55 - 64 yrs | 270 | 12.2 | 180 | 9.4 | 170 | 10.7 | -37.0 |
| 65 - 74 yrs | 190 | 8.6 | 210 | 11.0 | 160 | 10.0 | -15.8 |
| 75+ | 110 | 5.0 | 125 | 6.5 | 215 | 13.5 | +95.5 |

Source: Statistics Canada Profile Information, EA & DA's 1981-2001

9.3.6 Human Health and Wellness and Socio-Cultural Environment

The inclusion of population data for Brier Island did not reveal any appreciable change in what was originally concluded as the general trend of population decline within the region. The original figure of decline presented in the EIS was 28.4%, the inclusion of population data for Brier Island reduced the percent decline to 27.7%.

There were some minor changes in population distribution across age categories, with possibly the most notable being a reduction in the percentage increase of population in the 75+age category. The inclusion of population data for Brier Island reduced the overall percentage increase from 116.7% to 95.5% for this age category. However, once again, as stated in the EIS, the general trend across age categories reflects a reduction in younger age populations and a growing elderly population.

The following table illustrates the change in population over various classifications.

Table DP-2, Change in Age Categories, Digby Neck & Islands

| <i>Classification</i> | <i>Age Category</i> | <i>1981 #</i> | <i>2001 #</i> | <i>Percent Change '81 - '01</i> |
|-----------------------|---------------------|---------------|---------------|---------------------------------|
| Youth -dependent | 0 - 14 | 540 | 280 | -48.1 |
| Young Workforce | 15 - 34 | 690 | 320 | -53.6 |
| Young Family | 20 - 44 | 680 | 465 | -31.6 |
| Primary Workforce | 20 - 64 | 1,155 | 905 | -21.6 |
| Retirement | 65+ | 300 | 375 | +25.0 |

Source: Statistics Canada Profile Information, EA & DA's 1981-2001

The population decline that has occurred on Digby Neck and Islands appears to be more of a recent phenomenon, within the past 20 to 25 years, than the typical continuous long-term decline experienced in many rural agricultural communities. According to research on the area conducted by Social Anthropologist Anthony Davis (*Dire Straits: The Dilemmas of a Fishery - 1991*), the area's population was fairly stable, with moderate growth in some communities between 1961 to 1981. Mr. Davis commented that the 1981 Census figures on age and sex distribution of the area attested to the probability of future problems for the Neck and Islands. He compared the contemporary population distribution, which reflected a relatively flat distribution along age categories, to that of the bell shaped distribution of Digby County in 1951. He further commented that there were more people in the older age groups and fewer in the economically active age group, those between the ages of 20 and 64. Moreover, if the pattern of substantial out-migration by young people continued to prevail, it would be safe to predict that the distortions in age structure present at the time would be exaggerated in the future and that the viability question raised in the 1950's Sterling County study may become a serious problem (Davis 1991).

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The Panel requested a comparison of population decline with other rural coastal areas of Nova Scotia over the same period. This would be rather difficult to do given the changes in boundaries of Census agglomeration areas that occurred from 1981-2001 and the constraints of access to concordance information and cost of acquiring this data. In light of this, a comparison of population change among coastal communities from 1991-2001 only, has been conducted in order to provide a comparison of change along community lines. The following section draws heavily upon research and analysis contained in a document entitled "Between the Land and the Sea", a study completed in 2004 by PRAXIS Research and Consulting Inc., commissioned by the Coastal Communities Network of Nova Scotia.

The study's primary objectives was to assess the role marine harbors and infrastructure played in the economic health of coastal communities, demonstrate the extent to which the stability of coastal communities were dependent on this infrastructure and whether rationalization initiatives by government were justified when comparing net savings to potential social costs to the communities. As a part of their assessment, PRAXIS developed various database tools to estimate and monitor demographic and other economic changes occurring in coastal communities.

Section 3.1 of the PRAXIS study outlined demographic trends and settlement patterns for coastal rural, non-coastal rural and urban zones within Nova Scotia. Coastal rural was defined as all the areas of the province that bordered the coast, with the exception of urban areas. The coastal rural zone was divided into 77 harbour clusters based on one or more identifiable communities. For example, instead of identifying a single area cluster such as Tatmagouche an area range was used to identify the cluster such as Prospect to Peggy's Cove, NS.

The study's general findings established a figure for rural coastal population of 268,095 and that the coastal rural zones had a 6.10% loss in population from 1991-2001 and the loss that occurred between census years 1996 and 2001 was 3.90%. Non coastal rural zones had a population loss of 13.1% from 1991-2001, however only a slight loss of 0.65% occurred between 1996 and 2001. Population change was presented for each identified community cluster as well. According to the findings, 10.4% of the coastal harbour clusters experienced significant growth (greater than a 5% increase), 11.7% had slight to moderate growth (0.1 to 5% growth), 20.8% had a slight to moderate decline (-0.1 to -5%), 32.5% had a significant decline (-5.1% to -10%), 15.6% a very significant decline (-10.1% to -15%) and approximately 9% of the clusters were categorized as having a severe population loss (-15% or greater). Digby Neck and Islands fell into this latter category of severe population loss.

As a complement to the PRAXIS study, an analysis of population change was also conducted using Nova Scotia Community Counts data for population change between 1991 to 2001. The geographic boundaries outlined by NS Community Counts are somewhat different from those defined in the PRAXIS study in that the geographic boundaries do not necessarily

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follow Census dissemination area boundaries. However, the geographic boundaries used to define Digby Neck are the same in both instances.

One hundred and seventy-one communities identified as having a coastal influence (i.e. abutting or adjacent to a coastline) were analyzed. **Maps 32 and 33** reflect the change in population that occurred within these communities from 1991 to 2001. A further refinement was conducted to exclude those communities with urban influence and population densities greater than 150 persons/km², consistent with the definition of rural population measure by the Organization for Economic Cooperation & Development, in order to establish a proximate for rural coastal.

The population estimate was generally similar to that expressed in the PRAXIS study. Rural coastal population, using Coastal Community data, was estimated at 270,143. However, the difference in the change or decline in population was appreciably lower, with a decline of only 3.58% from 1991 to 2001 and a loss of 2.57% between Census years 1996 and 2001 compared with 6.10% and 3.90% respectively. However, regardless of which figures are truly more reflective of the actual change, it is probably safe to say that Digby Neck and Islands is experiencing a greater level of population loss in comparison to the average for coastal communities. Moreover, while most rural coastal communities (76%) are experiencing some level of population decline, there are only a few (15 communities) experiencing a population decline similar to or greater than Digby Neck and Islands.

9.3.7.1.1 Describe the population and distribution of seasonal residents.

RESPONSE

Non-resident land ownership in Nova Scotia, especially in coastal communities, was investigated in 2001 by the Voluntary Planning Task Force (2001). This study indicated that non-residents own more than 16% of coastal property in Nova Scotia. Non-resident ownership of coastal properties is particularly high in Annapolis and Digby counties (more than 25%). Also, the counties of Queens (24.1%), Shelburne (21.5%), and Richmond (17.3%) have high non-resident coastal property ownership.

Digby county in particular has the highest non-resident land ownership in Nova Scotia (<http://www.gov.ns.ca/vp/nonres/snsmr/ProvincialMap.htm>). Non-resident ownership in Digby county amounts to 75,318.8 hectares or 28.3% of the total county area (<http://www.gov.ns.ca/vp/nonres/snsmr/DigbyMap.htm>). As shown on the above referenced map, Digby Neck and Islands accounts for a significant portion of coastal properties in non-resident ownership. It should be noted that the non-resident ownership was derived from analysis of the Mailing Address component of the Nova Scotia Property Records Data Base as of May 2000. Since not all non-resident landowners use their permanent residence

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address for assessment notice purposes, the non-resident ownership displayed on these maps is probably a conservative number.

To more accurately determine the non-resident (seasonal) population distribution of seasonal residents in proximity to the proposed Whites Point Quarry and Marine Terminal, a similar, updated data analysis as above was used for continuity. Current (2006) mailing addresses were reviewed using the address component of the Nova Scotia Property Records Data Base. These addresses with their corresponding property identification number were then crossed referenced with Service Nova Scotia and Municipal Relations property identification mapping. Non-resident properties with buildings shown on the property maps, were then identified as non-resident (seasonal) residences. Non-resident properties without building shown on the property maps, were identified as simply non-resident properties. These latter properties have the potential for future residential development or subdivision. The extent of this investigation extended somewhat beyond the 4 km primary area of influence of the proposed quarry. This area of influence is similar in extent to the 4 km study zone as inventoried for the "Buildings by Type" – Maps 3A – 3E contained in the EIS.

Following are the results of this investigation with distribution of non-resident (seasonal) residences shown on **Maps 34 and 35**. Approximately 76 seasonal residences were identified. Assuming 2.3 persons per household, a total seasonal population within this particular study area would be approximately 175 seasonal residents. This probably represents a conservative estimate as some seasonal residents may choose to maintain a local mailing address for assessment purposes and not their permanent non-resident address. Also, seasonal residents may rent or vacation seasonally at residences owned by family members which have local mailing addresses. Also shown on **Maps 34 and 35** is the non-resident land area with potential for future residential or subdivision development.

Sandy Cove, the major population centre on Digby Neck, historically has been an area preferred by seasonal residents. Traditional knowledge contends the population of Sandy Cove increases 50% during the summer months. In addition to the influx of seasonal residents, real estate speculation by non-residents is evident. Of the total 2,442 acres investigated within the Sandy Cove area, a significant amount (91%) or 2,217 acres were identified as being in non-resident ownership. For the purpose of this study, non-resident ownership was determined from the property records database as properties other than those with a Sandy Cove mailing address. One can assume that non-resident speculation has effectively inflated real estate prices to the point where local residents cannot afford to purchase land in this area. The amount of land, including coastal properties, in non-resident ownership will likely influence a transition from traditional socio/cultural/development patterns.

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References

Voluntary Planning Task Force (2001). "Non-Resident Land Ownership in Nova Scotia".
<http://www.gov.ns.ca/vp/nonres/fr.pdf>

Voluntary Planning Task Force (2002). "Maps and Statistics".
<http://www.gov.ns.ca/vp/nonres/back.htm>

Coastal Communities Network, Atlantic Health Promotion Research Centre, and Dalhousie University. "Painting the Landscape of Rural Nova Scotia" October 2003.

Service Nova Scotia and Municipal Relations, Land Information Centre – Western Region, Registry and Information Management Services Division, "Property Identification Map and Parcel Historic Listing Report" 2006.

The Proponent has committed to focusing its hiring efforts on women in the local area, yet it provides no evidence or argument in 9.3 that would lead to this strategy. Provide evidence or otherwise explain the Proponent's proposed hiring strategy to target women.

RESPONSE

Bilcon will:

- provide full and fair employment opportunities for women during all project phases;
- ensure that potential women candidates are reached through special communications' initiatives;
- ensure that any recruitment effort focuses equally on women and men;
- actively seek the advice and participation of women's groups in any community-based initiative;
- promote female candidates in a range of skilled, unskilled, technical and professional job classifications and provide opportunities for advancement on the basis of qualifications and performance;
- provide ongoing support for women by providing a workplace where all individuals are treated in a fair, equitable and respectful manner while working on the project and ensure that zero tolerance for sexual harassment occurs in the workplace; and
- have the workplace reviewed by a gender specialist to ensure that no barriers to women's participation at the workplace are readily apparent.

9.3.7.1.7 *The EIS states that "The area appears to be a community in decline." Describe the evidence, apart from population loss, used to draw this conclusion.*

RESPONSE

The statement, "the area appears to be a community in decline", was a reference to population loss only and was not used or intended to be construed as a summation of the

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stability of the community in general. However, as was discussed in the EIS, there are inherent difficulties in maintaining community infrastructure when a community continues to lose population over time and eventually, if this situation is not reversed or some form of economic development does not occur, the community will experience a decline.

Consider evidence from traditional community knowledge or public consultation in drawing conclusions about community character, function and viability.

RESPONSE

Throughout the Traditional Knowledge report, numerous anecdotal examples of an area in decline were expressed by residents. However, Digby Neck, in many ways, is no different than many rural areas of Canada. These rural areas are experiencing declining fertility rates, out-migration of both young and old and limited economic opportunities, all of which contribute to a decline in such social institutions and infrastructure such as schools, churches, health facilities, businesses and recreational facilities. In the individual consultation report, of the more than 50 individuals who expressed an opinion about the project, almost half of them indicated the need for employment in the area. Examples of their comments were “There is a desperate need for long term sustainable development in this area and this project would help” and “Employment opportunities in the area are limited and the project would provide much needed opportunities.”

The situation can perhaps be summed up in 4.4 and 4.5 of the Community Knowledge Report located in EIS Reference Volume VI, Tab 23.

Section 4.4

Many of the participants expressed a feeling of loneliness associated with not having their children or grandchildren close at hand. #48 “They have had to go away to find work.” and #16 stated “There is nothing here for them.” #15 stated that “My children phone me every night since their dad died”. She went on to say that “in the past you never moved very far away and families were close”. The increased mobility and educational opportunities as well as a lack of viable employment opportunities are all factors in this situation. Many spoke of schools in Freeport, Central Grove, Tiverton, Little River, Mink Cove, Sandy Cove, Lake Midway, Centreville & Rossway. In the 1940's it appears that there were over 600 children in the small schools. In 2005, there are less than 180 students in the two remaining consolidated schools.

Section 4.5

When speaking of the current community #55 stated that “Anyone who could go has gone and those who stayed are living on the edge.” He continued “We have a lot of folks on welfare or UI (Employment Insurance) for most of the year. None of my kids are here; they

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are all working away. Christ, I left when I was in my 20's and just came back to retire. If nothing changes in terms of employment, who is going to drive the fire trucks?"

Correct the references to the table numbers on Pg 60.

RESPONSE

On page 60, the Table reference should be Table CP – 23, not Table CP – 20.

Describe social networks and institutions, community values and concerns, and the cultural characteristics of the area.

RESPONSE

Please refer to:

EIS Volume VII – 9.3 Human Environment and Impact Analysis

- 9.3.7 Community Profile, page 28
- 9.3.10 Economy Fishery, page 85
- 9.3.11 Economy – Fishery/Aquaculture, page 88
- 9.3.12 Economy – Fishery/Intertidal, page 90
- 9.3.13 Economy – Fishery/Nearshore, page 91
- 9.3.14 Economy – Tourism, page 97
- 9.3.15 Economy – Land Value, page 106
- 9.3.17 Human Health and Community Wellness, page 119
- 9.3.22 Socio-cultural Patterns, page 136
- 9.3.23 Education, Training and Skills, page 150

Bilcon's Response to Comments

Section 8.1 – Impact Analysis in this document.

9.3.16 Recreation

Since the mid-twentieth century, community residents used the Whites Cove site as a recreation area, despite its status as private property. The Proponent identifies the nearest publicly-owned recreational area as 10 km away. The survey of residents identifies a desire for recreational facilities.

9.3.16.3 Does the Proponent plan to mitigate or compensate for the loss of community recreational use of the site?

RESPONSE

The Traditional Knowledge interviews describe recreational uses of the shoreline and of the quarry property itself but the consensus generally was that the usage for recreational purposes has declined significantly since the 1950's.

As noted in the EIS, access to crown land via the public Whites Cove Road cannot be restricted, and unrestricted access along the shore on crown lands below the ordinary high-

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water line would be maintained. Access to the quarry site would be restricted for safety reasons and for the preservation of the environmental preservation zones. Bilcon recognizes that there is still some local recreational use of the Whites Cove Road. If Bilcon acquires the Whites Cove Road, traditional access to the coastline will be terminated. To mitigate the loss of this access to the coast, Bilcon proposes to build and maintain a new walking/hiking/nature trail from the quarry Compound Area, along their east property line to the coast.

While Bilcon has no plans to mitigate or compensate for the loss of community recreational use on the site, Bilcon would be prepared to discuss proposals from the community.

If the Proponent acquires the right to Whites Point Road, then how will harvesters gain access to the shore? Will the Proponent limit access to the beach to quarry operating hours?

RESPONSE

Should Bilcon acquire the right to the Whites Point Road, beach harvesters would gain access to the shore through the main quarry gates and access would only be restricted for a short period of time around blasting operations. The quarry will be in operation between 0600 and 2200 which means the site gate would be manned between 0500 and 2300. Bilcon is of the opinion that the access being restricted to the 0500 and 2300 period would not hinder beach harvesting activities.

Has the Proponent considered making the buffer properties it has acquired available for community recreation or other use?

RESPONSE

Bilcon has not considered making the buffer properties it has acquired available for community recreation or other uses. However, Bilcon would certainly be open to suggestions or requests by the community in the future.

9.3.17 Human Health and Community Wellness

The EIS does not adequately address the possible respiratory effects from dust generated from all aspects of the Project. It gives insufficient attention to the stress that may be caused by the Project to local residents. Describe the baseline conditions for respiratory illness in the area.

RESPONSE

Please refer to:

EIS Reference Volume VI, Tab 34, Human Health and Community Wellness Assessment – Sections 3.2.1.4 and 3.2.2 and 6.3.2, EIS Volume VI, Chapter 9.1.8 – Air Quality and Bilcon's responses in Section 9.1.6 – Air Quality.

9.3.6 Human Health and Wellness and Socio-Cultural Environment

Consider the possible effects of the Project on mental health and well-being both among those in favour of and opposed to the Project.

RESPONSE

Bilcon does not believe that this question can be answered in a scientific manner.

9.3.19 Human Health – Marine Contaminants

9.3.19.2 The on-site sampling is not adequate to generate scientifically defensible information concerning copper concentrations. The Proponent argues that “implications to human health are uncertain”. The Panel expects the Proponent to present current scientific information on the implications of copper on human health.

Given that periwinkles harvested for human consumption in the near shore environment on the site may be exposed to high concentrations of copper draining from the sediment ponds, this matter requires clarification.

RESPONSE

EIS Coverage

In EIS Section 9.3.19.2 Analysis, it is stated that copper levels in the soil at Whites Point was low (39 mg/kg at EQL 2). Also, copper levels in surface water entering the Bay from the Whites Point site is extremely low (2 – 3 ug/L at EQL 2). Likewise copper in the intertidal marine waters was extremely low (0.8 mg/L at EQL 0.1). Copper content in the basalt rock to be processed at the quarry site was also low (27 – 230 mg/kg, depending on depth at EQL 2).

On-site analyses as stated above are described in multiple sections of the EIS (e.g., Basalt bedrock and groundwater in 9.1.2.1 Research; Geochemistry of the Beaver River Till–Basalt Till Facies, soil, and pond sediments in 9.1.4.1 Research; surface water in 9.1.6.1 Research).

As stated in section 9.3.19.5 Impact Statement, Marine Contaminants – Human Health, background levels of metals are relatively low on-site. Surface water runoff and sediments from quarry operations will be contained in on-land environmental control structures, and sediments for future use during reclamation will be placed in dyked disposal areas on-site. These precautionary measures will reduce the possibility of contaminants entering the marine environment and affecting marine organisms harvested for human consumption.

A review of scientific information on the implications of copper on human health is briefly presented below in the Response to the Panel. Fate of copper in the environment is reviewed in Response to the Panel in the section on Contaminants.

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Response to the Panel

Like iron and zinc, humans have developed a homeostatic mechanism with regard to copper exposure. Copper is an essential element for humans involved in aerobic enzyme function, hemoglobin synthesis, and gene transcription (Ralph and McArdle 2001). Many organisms have developed similar mechanisms for regulating copper levels at the biochemical and molecular levels (IPCS 1998), seeking to maintain their copper levels in a range that avoids deficiency and excess. Doses below the recommended daily allowance (RDA) can produce adverse developmental consequences and heart disease, while higher doses can produce toxic responses, including liver (primary organ for copper distribution in humans), kidney, cardiovascular, hematopoietic, and central nervous system effects (Georgopoulos et al. 2006; Ralph and McArdle 2001). In essence, the toxicity and essentiality of copper produces a U-shaped dose response curve, a hormetic response (Calibrese and Baldwin 2001; Calebrese 2004). The United States RDA for adult men and women is 900 ug/day; the median intake of copper in the US ranges from 1.0-1.6 mg/day, again, for adult men and women (global average is 1.5 mg/d for adults (Ralph and McArdle 2001)). IPCS (1998) lists the lower acceptable level of intake at 20 ug Cu/kg/day generally with a higher level of 50 ug Cu/kg/day for infants. The maximum daily allowances for various global regions ranges from 130 to 500 ug/kg/day (Ralph and McArdle 2001).

Chronic effects in humans are rare but may occur in individuals with Wilson's disease (1:30,000 live births) in which copper transport enzymes are inactive and copper accumulates in the liver and brain (Ralph and McArdle 2001). Also, the usually fatal Menkes disease (1:200,000 live births) resembles a copper deficiency in which Cu is not distributed past the gastrointestinal tract (IPCS 1998; Ralph and McArdle 2001). Based on the copper level required to produce liver damage, the tolerable upper intake level for adults is 10,000 ug/day. Additionally, acute, gastrointestinal upset often occurs at levels of 3 mg/L in water and above (Georgopoulos et al. 2006). This GI irritation usually is associated with copper in water and not in food where it is typically less bioavailable (i.e., complexed to proteins, lipids, etc. (Ralph and McArdle 2001)). In the US, the secondary maximal contaminant level (MCL) for drinking water based on taste and odour (aesthetics) is 1.3 mg/L. Under the Canadian Drinking Water Guidelines, the Canadian Guideline limit is 1 mg/L. IPCS (1998) lists the maximum level of intake around 2-3 mg/day.

Periwinkles are anticipated to be harvested for human consumption from the near shore tide pools, adjacent to and on the site. These sea snails, *Littorina* sp., have exhibited a maximum copper level of 22.1 mg/kg in pre-operation sampling. Periwinkles do not appear to be sensitive to the levels of copper already present in this environment. Given the potentially elevated background levels of copper and the fact that on-site operations are not expected to significantly elevate those levels, additional impacts to this harvested food source are not expected. ATSDR (2004) notes that individuals who regularly consume shellfish typically have higher copper intakes (an additional 2-150 mg/day) than those who do not consume

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shellfish. Research for this response did not identify current guidelines for copper content in marine organisms. Stewart and White (2001), in a review paper of contaminants on the Scotian Shelf, referred to a Health and Welfare Canada Guideline (circa 1996) of 100 µg/g in marine and freshwater animal products. According to the EIS (Section 9.3.19), levels above 800 µg/g (mg/kg or ppm) are considered excessive in aquatic food organisms. The current maximum levels found in periwinkles are over 30 times lower than that tissue concentration.

Country foods such as dewberry, raspberry and blueberry exhibit pre-operation levels of copper below 1 mg/kg. Health Canada recommends an upper limit dose of copper in adults (19 years and older) of 10 mg/day from drugs and health products (Health Canada 2004). Given the elevated background level of copper for this general vicinity, the fact that the berries do not show elevated levels of copper and the existence of homeostatic copper mechanisms in humans, the site is not expected to significantly elevate existing copper levels.

Please refer to Section 12 – AMEC Earth and Environmental – Copper, in this document.

9.3.19.2 Analysis – Provide the “Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health”, cited as Reference 41 (but not there).

RESPONSE

A reference was made in the EIS for the Canadian Soil Quality Guidelines as reference 41 in the bibliography. References contained in a bibliography are generally not included with the report. This reference can be accessed at Environment Canada’s web-site at – <http://www.ec.gc.ca/CEQG-RCQE/English/Ceqg/Soil/default.cfm>

9.3.20 Human Health – Land Contaminants

9.3.20.3 Mitigation – Identify all “chemical agents” that may be used at the Project site and their amounts/concentrations, properties, usage, storage and other relevant information. Include fertilizers, herbicides, pesticides and other agents.

RESPONSE

Please refer to Table 4 – Hazardous Materials Stored On-site, contained in Section 11.2 – Accidents and Malfunctions in this submission. Note that herbicides and pesticides will not be used on-site.

Although the Proponent commits to minimizing dust escaping from the site, dust is a by-product of blasting, crushing and loading. Consider the implications of dust on the health and well-being of neighbouring populations. Describe the areas likely to be affected and proposed methods of monitoring human health as well as air quality parameters – TSP, PM₁₀ or PM_{2.5}.

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RESPONSE

Please refer to the responses to the series of questions raised by Health Canada with respect to dust and air quality parameters in Section 9.1.6, Air Quality in this submission.

Pg 145 – Explain the meaning of the statement “the project activities ... are not expected to have an adverse effect on social cohesion ... as it relates to social capital”. What evidence supports this conclusion?

RESPONSE

The question needs to be put in the context of the entire paragraph. Bilcon acknowledges that before any actual construction takes place, the idea of the project has caused an adverse effect on social cohesion and has so stated, i.e. “the pre-project planning phase and the environmental assessment will temporarily create an adverse effect on social cohesion (P. 145).”

However, as explained in the next paragraph on the same page, the idea of the actual construction and operation of the project did not elicit any out of the ordinary negative comments in the quality of life survey with regard to social capital *. This is perhaps because the survey respondents’ indicated that trust in each other and the provincial government was fairly low and this project was not likely to lower their level of trust any further.

*Social capital is defined as the characteristics of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefits.

Pg 147 – A statement suggests that “New people employed at the quarry” may become active in volunteerism. Elsewhere the EIS suggests that employees will be hired locally. Resolve this discrepancy.

RESPONSE

One of the selection factors for the Whites Point quarry was the availability in the local area of trained or trainable people for the quarry and marine terminal operation. While no advertisements for prospective employees or job fairs have been held, Bilcon has received over 250 applications for employment, suggesting that Bilcon was correct in its estimation of employee availability. Bilcon is, however, aware that over the past four years, a significant number of people in the local area have taken up employment in western Canada and this process appears to be accelerating. However, at the request of local residents, a meeting was held on October 2nd, 2006, with 21 young people from communities immediately surrounding the project who were invited to the meeting by a community member. These young people expressed a strong desire to be considered for employment at the Quarry and Bilcon detailed its training plans.

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On Nov 15, 2006, Bilcon held another employment information meeting. Notices were placed in the communities of Digby Neck and Islands. Bilcon also invited people who had expressed interest in employment opportunities with Bilcon. Approximately 45 people attended. Handouts included job descriptions, rates of pay, benefits, skills and education required. Bilcon also addressed the issue of training for local people. Attendees were also interested in discussing the effects of quarry operations on their community. Consequently the topics of discussion turned to subjects such as air quality, noise, surface water, groundwater and wells, aesthetics and light. Both meetings were very positive and Bilcon plans more public information meetings at its office in Little River in the New Year.

In conclusion, Bilcon still believes that, with the exception of the Operations Manager who has already moved to the area, all employees will be hired locally. Bilcon also believes that with these young people in stable employment, the level of volunteerism could very well increase in the communities adjacent to the project.

Pg 148 – Explain how the benefits available to employees are interpreted to provide positive effects at a “community scale”.

RESPONSE

Bilcon intends to hire the majority of its workforce from the local community and this could include bringing back to the community those who may have had to seek employment elsewhere due to a lack of local employment opportunities. An initial informal meeting held in October 2006, arranged by a community member and hosted by Bilcon at the quarry site, explained employment opportunities at the Whites Point Quarry and Marine Terminal. 21 people from the local community attended and showed interest in work at the quarry. A subsequent meeting held in November 2006 attracted approximately 45 people interested in employment at the quarry. This was an indication to Bilcon that their intention to hire from the community can be realistically realized.

In addition to providing the community with full-time employment opportunities, Bilcon will offer its employees a benefits package. Benefits to be offered will include medical and dental plans, and a pension plan. In addition, incentives will be offered in the form of cash bonuses for exceeding production targets.

Since the employees will be from the local community, the benefits indicated above will contribute to these persons well being and sense of security. The increased social well-being of these persons will be retained within their community and not be exported as would be the case if the workforce was hired from away. In a broader sense, employment opportunities, benefits, and incentives for the local workforce age group will help to retain this vital,

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productive age group within the community. Hence, it is Bilcon's contention that a positive effect, however insignificant, will be realized in the community.

During the community consultations and scoping sessions, some community members indicated a concern that the quarry Project would draw away skilled employees (like heavy equipment mechanics) from other local businesses. Address this concern.

RESPONSE

Bilcon does not perceive that there will be any measurable impact to the availability of skilled labour in the area due to its labour requirements. The level of unemployment in the region is relatively high and it is quite apparent from the applications Bilcon has received for employment at the quarry that there is a significant portion of skilled trades-people that are currently unemployed and seeking work.

Further, the wage rates to be offered at the quarry are on par with industry averages for skilled labour within the region for those job skills meeting Bilcon's requirements (please refer to average wage rates Table WR-1). Therefore, it is not anticipated that Bilcon will have a comparative advantage in this regard.

Bilcon does recognize that its commitment to training those that would currently be considered unskilled, may impact the immediate local labour market. However, there are and have been various government sponsored training programs through unemployment insurance initiatives and fishery adjustment programs such as TAGS, which were implemented in order to increase the employability of this "unskilled" set. One can assume that these skills development and training measures were, at least in-part, initiated to offer opportunities to those displaced due to the rationalization occurring in the fishery and to lessen the dependence on employment insurance or other forms of income supplement. Bilcon fails to see how their strategy of offering training to this unskilled set differs appreciably with other strategies that have been implemented in the region and why it would, in Bilcon's case, have negative connotations. If there is a difference, it is that Bilcon's training will result in employment within the local community, whereas the other may result in no increased opportunity for employment based from the training received or individuals having to seek employment elsewhere in order to benefit from the training received.

Nevertheless, Bilcon will exercise care in its recruiting strategies to try and limit labour impacts on local businesses. Bilcon's strategy to entice those that have left the community to return is one of the measures they plan to employ to insure there is limited disruption in the local labour pool.

Of those with highly specialized skills required by the Project who have submitted applications to the Proponent, what proportion is already employed locally?

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RESPONSE

Bilcon has been receiving job applications for a period of 4 ½ years. Of those with highly specialized skills who have submitted applications to Bilcon 92% were either unemployed at the time or expected to be unemployed in the near future. 8% were in current employment in the local area which included the Town of Digby.

On Pg 155, the Proponent refers to a possible “influx” of students due to quarry employment. (Are any effects expected on staffing in the schools?) On Pg 156, the EIS concludes there will “no significant influx of workers”. Resolve this discrepancy on whether any “influx” is anticipated.

RESPONSE

On Page 155 of the EIS, Bilcon did not in fact refer to a possible “influx” of students due to quarry employment. What the EIS says is that *“There is adequate capacity to handle any influx due to quarry employment.”*

In this context, Bilcon was referring to the family formation in the area, fostered by long-term, well-paid employment. It is doubtful whether such increases in enrollment would have any affect on staffing in the schools.

On Pg 158 the Proponent says, “No similar undertakings are known to be planned in the near future.”. During the scoping sessions, community residents identified a concern that the nature of the local geology and geography could facilitate further developments of basalt quarries along North Mountain. To address that issue, describe the anticipated demand and supply for aggregates along the Eastern Seaboard over the next 25 years.

RESPONSE

Please refer to Section 7.0 Revised Project Description – Alternatives to the Project.

WP 1498 - Nova Scotia Department of Environment and Labour Environmental Monitoring and Compliance Division

6. Chapter 9.3.18 discusses groundwater from one borehole only. It states that the existing baseline groundwater quality data from the quarry site meets existing drinking water guidelines for MACs and IMACs and on-site wells, for domestic use are expected to provide good quality drinking water” This seems to be more a statement rather than fact since no baseline samples were taken from any of the existing domestic wells and compared to the single borehole water quality. Additional on-site and off-site baseline monitoring should be required prior to commencement of operation in the event that an approval to operate is issued..

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RESPONSE

Bilcon advises that baseline groundwater quality data from all six new monitoring wells has been obtained and is attached in Appendix 1 in Section 9.1.2 – Geology and Hydrogeology, further Bilcon advises that partial baseline water quality data from offsite existing domestic wells has been obtained and is set out in the Domestic Well Survey by Conestoga Rovers – February, 2007, in Section 12 of this submission.

WP 1542 - Health Canada

Noise and Vibration (Table ECM-2, Section 9.1.9, Section 9.1.11, Reference Document #31, Noise and Air Quality Study at Whites Point Quarry)

- 1 *In Table ECM-2, Noise and Vibration – the frequency of monitoring is identified as “weekly”. This statement should be clarified to indicate that noise monitoring will be conducted during blasting events, as presented in Section 9.1.9.4 – Monitoring.*

RESPONSE

Bilcon agrees. Monitoring of all blast events will be conducted as presented in paragraph 9.1.9.4 of the EIS.

Please refer to EIS Vol. VI, Chapters 9.1.9 and 9.1.10 and EIS Reference Vol. V, Tab 31

- 2 *The report does not look at potential cumulative effects of multiple site activities on total noise levels (including blasting, Drilling, plant operations, vehicle traffic and ship loading). Could cumulative effects result in elevated noise levels above provincial standards (55 dBA at night, 60 dBA in evening, and 65 dBA during the day – Nova Scotia Department of Environment Pit and Quarry Guidelines)?*

RESPONSE

In addition to Project operations, cumulative effects at Whites Point Quarry would include noise emissions from ship loading activities, drilling, and blasting. Material handling and movement is performed on-site. There is little to no vehicular traffic off-site since aggregate is loaded directly on to a ship and is transported from there. Blasting is an event that is short in duration and, as indicated in the EA, will likely be conducted every two weeks, so it is not appropriate to include blasting in modeling cumulative effects.

The cumulative effects of noise emissions from normal Project operations, drilling, and ship loading was modeled using CadnaA. Sound power levels for ship loading and drilling were found to be approximately 105 dBA (European Commission, 2005) and 90 dBA (E.A.R,

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2006), respectively. Predicted noise levels at nearby residential receptors with the treed buffer zone were modeled and are shown in Table 1.1 on the following page.

| Table 1.1 Predicted Sound Levels for Cumulative Effects at Whites Point Quarry | | | | |
|---|---|---|--------------------------------|------------------------------|
| Residential Receptor | Predicted Cumulative Effects Noise Level (dBA) | Nova Scotia Sound Level Limits (dBA) | | |
| | | Day (07:00 – 19:00) | Evening (19:00 – 23:00) | Night (23:00 – 07:00) |
| R1 | 48.8 | 65 | 60 | 55 |
| R2 | 44.2 | 65 | 60 | 55 |
| R3 | 51.5 | 65 | 60 | 55 |
| R4 | 37.1 | 65 | 60 | 55 |
| R5 | 47.3 | 65 | 60 | 55 |
| R6 | 49.1 | 65 | 60 | 55 |
| R7 | 48.9 | 65 | 60 | 55 |
| R8 | 48.6 | 65 | 60 | 55 |

Table 1.1 shows that the predicted cumulative effects noise levels (resulting from the inclusion of ship loading and drilling) at the nearby residential receptors met provincial noise guidelines.

References

E.A.R., Aearo Company. 2006. Noise Navigator™ Sound Level Database. Indianapolis, Indiana

European Commission, Directorate General Environment. 2005. Service Contract on Ship Emissions: Assignment, Abatement and Market-based Instruments, Cheshire, England.

- 3 *In addition to cumulative effects associated with multiple site, no mention is made about the cumulative effects associated with noise with respect to this quarry and the other existing quarries on Digby Neck, and how an additional quarry will contribute to increased noise levels in the area.*

RESPONSE

In the whole of Digby County there are numerous pits and quarries, possibly numbering in the range of 80-85. There are two pits (Mink Cove and Sandy Cove) and one quarry (Rossway Quarry) that are located relatively close to Whites Point, neither of which was

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audible during visits to the area. Many others of various sizes are located at a greater distance.

Due to lack of specific noise data for other pits and quarries it is difficult to accurately model the specific contributions of pits and quarries; however their contributions would be incorporated into the existing baseline data collected prior to construction and operations at Whites Point Quarry.

- 4 *Plain Language Summary – section 1, second paragraph – This clause indicates there will be two shifts, please clarify if this means operation will occur during the night.*

RESPONSE

There will be 2 shifts – 0600 – 1400 hours and 1400 – 2200 hours. No operations will be conducted at night.

- 5 *Section 9.1 Existing Physical Environment, Section 9.1.9.2 – Recognizing that the Nova Scotia Department of Environment Pit and Quarry Guidelines (199) require a concussion (air blast) to not exceed 128 dBA within 7 metres of the nearest structure, Health Canada would like to provide information on the use of 128dBA in comparison to the use of 128 dB unweighted (i.e., lin). From discussion with an official of the Ministry of the Environment for Ontario, our understanding is that the concussion criterion should be 128db unweighted i.e., lin (not A-weighted) to protect property from damage.*

The EPA (1974 recommended that the peak level of a single daily sonic boom be less than 125 dB in order for there to be little or no public annoyance. As blasts and sonic booms create similar levels of annoyance (Schomer et al, 1997) for equal peaks and the blasts will not occur more than once every 2 weeks, it does not seem likely that the blasts will cause significant t annoyance if they meet a 128dB unweighted criterion when monitored.

At the 128dB unweighted criterion level, and with the expected duration of less than 1 second and frequency spectrum of a blast, there should also be no concerns regarding irreversible hearing damage or other significant adverse physiological effects. However if the same numerical criterion level is used with A-weighting, Health Canada would like to know the C-weighted peak level, the C-weighted SEL, the A-weighted SEL and the overall blast B-duration of the pulse(s) in order to determine the potential for health effects.

Although we cannot comment on the potential for property damage using a 128 dBA criterion as this is not our area of expertise, the proponent may wish to further

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consider this potential concern as a further argument for a commitment to a 128dB unweighted (i.e., lin) criterion level.

RESPONSE

Bilcon are not aware of the reasoning by which the A weighting scale was used in the Pit and Quarry Guideline, but do recognize that a linear scale is more common. For example, the Halifax Regional Municipality uses 128 dB unweighted. As the reviewer is aware, the objective of blasting in a quarry is to expend the maximum energy in the fracturing of rock, and the minimum of energy in the air as noise. A blast with undue noise can result from either lack of confinement of the explosives (i.e. poor practice), or from unforeseen geologic conditions. Because of the two routes of energy dissipation, there are two safeguards ensuring proper practice. The energy dissipated in the rock is limited through the imposition of maximum vibration criteria, expressed as peak particle velocities. The Nova Scotia criterion is identical to the HRM criterion, and the Ontario one. The protection of structures from damage is accomplished mainly by the vibration limit.

The criterion limiting the noise level is set to limit disturbance and annoyance, and offers a margin of safety for hearing damage or property damage. As a benchmark, the sound pressure levels of the “noon gun” were measured in Halifax on January 5, 2007. The gun is fired at 1200 from the Citadel, and has attained the status of a heritage feature in the city. Two Larson Davis 824 Type 1 meters were set up at the corner of Duke and Brunswick Streets, and measurements were made for the noon event. The meters were set on fast response, and the impulse, A, C and linear weighted readings were all within 1 dB of 123 dB. The measurement was approximately 205 m from the cannon, and lower in elevation. These observations are introduced here to assist in “benchmarking” the sound pressure levels under discussion. An “on-axis” measurement would likely have been significantly higher.

In the case of a blast in a quarry, a greater amount of the energy would be in the lower frequencies, but the A weighted reading would still be relevant for “annoyance” effects. It must be noted that the 128 dBA is a prescribed limit, and that routine, properly controlled blasts would be less than this, and will be protective of annoyance to persons. Although it is intuitively appealing to relate the different weighting schemes, there is a logical problem with this. For a given explosives charge, the sound pressure level may vary greatly, depending on the proper stemming of the charge holes, and the character of the rock. In the extreme, if the charge is in air, the A and linear responses might be essentially the same (as with the noon gun), but if that charge were to be installed perfectly, the bulk of the energy would dissipate in the rock, and the sound pressure level in the atmosphere would be much lower, by either scale. In reality, each case will be between these two extremes. As the A weighted sound goes up, the linear sound becomes closer to the A weighted level because the lower frequency component is reduced. As the A weighted sound goes down, more energy is dissipated in the rock and low frequencies. The relationship between the two scales will not

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be constant. It varies with the depth of the charge, and this relationship is illustrated in the ISEE Blasters' Handbook (Fig. 38.8, p 631) where a charge in air, average burial, and deep burial would approximately result in 171, 130, and 91 dB, respectively. It is therefore not possible to take a fixed difference, apply it to a 128 dBA blast and derive a linear reading, and it would be misleading to do so.

- 6 *Section 9.1.9.3 Mitigation – Given the apparent t distances between source, 30 metre buffer of trees and receiver, please clarify how much attenuation could be expected from this buffer. A significant attenuation does not seem consistent with the use of ISO 9613-2(1996). Attenuation of sound during propagation outdoors – Part 2: General method of calculation.*

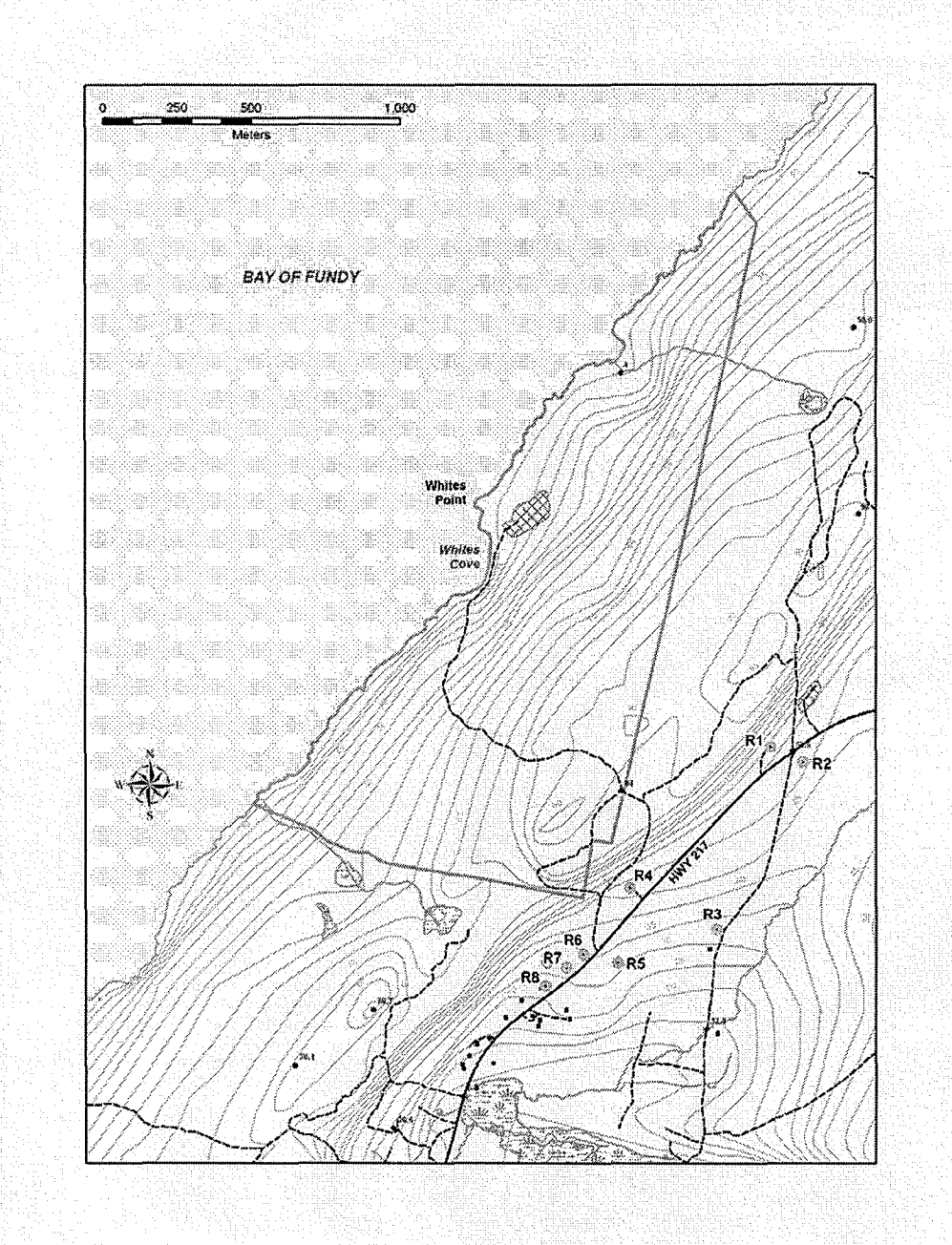
RESPONSE

Predicted sound levels at residential receptors closest to the Project study area were measured using CadnaA (Computer Aided Noise Abatement) version 3.5.115, a computer program capable of predicting noise levels at specified receiver positions originating from a variety of noise sources. CadnaA includes the international standards prescribed by the International Organization for Standardization (ISO) *Standard 9613 – Attenuation of Sound during Propagation Outdoors (ISO 9613)*.

The sound attenuation resulting from the 30 m buffer of trees surrounding the quarry site was investigated by predicting the sound levels at receptors without the 30 m treed buffer and then running the model again under the same conditions with the inclusion of the buffer. The map below shows the residential receptors taken into consideration for the model.

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Figure 1.1 Location of Closest Residential Receptors to the Whites Point Quarry Study Area



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The predicted sound levels due to Project operations with and without the buffer zone are summarized in Table 1.2.

Table 1.2 Predicted Sound Levels for Operations at Whites Point Quarry with and without the presence of a Buffer Zone

| Residential Receptor | Predicted Operations Noise Level (dBA) | Predicted Operations Noise Level with Buffer Zone (dBA) | Nova Scotia Sound Level Limits (dBA) | | |
|----------------------|--|---|--------------------------------------|-------------------------|-----------------------|
| | | | Day (07:00 – 19:00) | Evening (19:00 – 23:00) | Night (23:00 – 07:00) |
| R1 | 50.8 | 48.8 | 65 | 60 | 55 |
| R2 | 48.9 | 44.2 | 65 | 60 | 55 |
| R3 | 51.5 | 51.5 | 65 | 60 | 55 |
| R4 | 47.1 | 37.1 | 65 | 60 | 55 |
| R5 | 49.6 | 47.3 | 65 | 60 | 55 |
| R6 | 49.1 | 49.1 | 65 | 60 | 55 |
| R7 | 48.9 | 48.9 | 65 | 60 | 55 |
| R8 | 48.6 | 48.6 | 65 | 60 | 55 |

As is evident from the modeling results, attenuation due to the buffer zone impacted receptors R1, R2, R4, and R5. R4 and R2 are the most impacted due to the inclusion of the buffer, likely due to their relatively low elevation with reference to the buffer. In addition, R4 is located on property that is owned by Bilcon and is closer to the buffer zone than other receptors, which promotes noise attenuation.

References

International Organization for Standardization (ISO). 1993. International Standard 9613-1, Acoustics – Attenuation of Sound During Propagation Outdoors – Part 1: Calculation of Absorption of Sound by the Atmosphere. Geneva, Switzerland.

7. *Section 9.1.10.1 Noise and vibration research (page 71, first paragraph) – Health Canada recommends that this paragraph be deletedbased on very old data (1972). Health Canada recommends the use of CAN CSA/ISO9613-21996 or software based on this standard for calculation of sound propagation.*

RESPONSE

Comment noted. The reference noted has not been deleted as suggested as it contains original research on noise, especially in relation to plants and the study work is still applicable to today. However, predicted sound levels at residential receptors closest to the Project study area were measured using CadnaA (Computer Aided Noise Abatement) version 3.5.115. CadnaA includes the international standards prescribed by the International Organization for

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Standardization (ISO) Standard 9613 – Attenuation of Sound during Propagation Outdoors (ISO 9613).

8. *Section 9.1.10.2 Noise and Vibration, Analysis (page 72, first paragraph) – Please clarify if operation will occur during the night time*

RESPONSE

No operation will be conducted at night time i.e. between 2200 and 0600 hours.

9. *Can the proponent verify that the noise levels at the nearest receptor will be below the appropriate Health Canada criterion? Guidance on the appropriate criterion to use is given below.*

In quiet rural areas, Health Canada recommends an Ldn at residences below 45 dBA for impulsive noise sources that are neither high energy impulsive noise or highly impulsive noise (these two latter sources are enumerated in CAN/CSA-ISO01996-1:05(2005)(ISO 1996-1:2003). Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures).

For representative residences, Health Canada normally requests the Leq from 7 a.m. to 10 p.m., Ld, and the Leq from 10 p.m. to 7 a.m. Ln. Given that these time periods differ from those presented in the Nova Scotia Guidelines for Environmental Noise Measurement and Assessment, if it is not technically or economically feasible for the proponent to provide the numbers as per Health Canada's Leq intervals, Health Canada would be willing to approximate values based on the Nova Scotia guidelines measurement intervals. Health Canada normally requests the Leq values for baseline, construction and for operation. Relevant information was provided in the EA, but not clearly enough for Health Canada to make a comparison to the draft Health Canada criteria.

Higher values are permissible under other conditions as can be determined from the enclosed draft Health Canada Fact Sheet for Noise Issues. Based on the data given in the Environmental Assessment, this level appears to be attainable.

RESPONSE

The Ldn of 45 dBA recommended by Health Canada for impulsive sources, which are neither high energy impulsive noise or highly impulsive noise, is not applicable in this case because impulsive noise will not occur during night time hours. Hours of operation are 0600 – 2200 hours – please refer to 7.8 Operations and Maintenance Phase in Revised Project Description. Pile driving may be conducted; however it will be limited to daytime hours of

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operation during the construction period. Blasting, estimated to be conducted on a weekly to bi-weekly time scale, is predicted to add about 2 dB of peak noise to the routine operational noise, although there is likely to be some compensation for this by a shutdown of other activities during the period that blasting occurs.

The residential receptor located closest to the quarry property boundary is R4, for which there is 24 hour baseline noise monitoring data and predicted sound levels due to construction and operational activities, determined using noise modeling software (CadnaA). R4 is located on property owned by Bilcon. The baseline Leq values for R4 calculated from monitoring data were 42.7 dBA and 47.0 dBA, for night and day, respectively. The predicted Leq values at R4 for Project construction and operation are 39.5 dBA and 47.1 dBA, respectively. It should also be noted that construction and operations will be carried out only during day time and evening hours.

Note: When computing the Ldn an additional 10 dB was added to the baseline night time data; however in computing the night time Leq, above, 10 dB was not added.

10. *Section 9.1.10.4, Noise and Vibration, Monitoring – Health Canada requests that the proponent verify that the monitoring criteria will also respect the appropriate Health Canada criteria at residences.*

RESPONSE

The analysis shows that the facility as planned, will meet the guideline criteria from Health Canada, and be well within the criteria from the Pit & Quarry Guidelines that form the basis for operating permits in the Province of Nova Scotia. Bilcon will undertake to assess the performance of the quarry in conjunction with the monitoring program, and to enact such further mitigation that is consistent with normal business practice.

References

Nova Scotia Department of Environment (NSDEL). 1999. Pit and Quarry Guidelines, Halifax, Nova Scotia.

11. *Section 9.1.11.2, Noise and Vibration, Ship Loading – Please clarify if ship loading operations will occur at night.*

RESPONSE

Bilcon will attempt to schedule shiploading operations during the 0600 – 2200 hours time period. However, it is possible due to the ship schedule that occasional shiploading will take place at night.

12. *Please indicate why at Sechelt, the decibel levels and distances on page 74 do not seem to be consistent with the value of 45 dBA at 1480 m reported on page 75.*

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RESPONSE

Decibel levels recorded at Sechelt during ship loading are presented on pages 74 and 75 of the EIS. These data are taken from reference 69 identified in the EIS bibliography. The dBA data presented appears consistent with diminishing dBA further from the source. At 1480m, shiploading noise diminished to background levels of 45dBA.

Health Canada Comments Related to Reference Document #31 – Jacques Whitford Environment Limited 2005 Noise and Air Quality Study at Whites Point Quarry, Project No. NSD19591

1. *Section 2.1 Introduction to Noise – To call a 3 dB change in sound level barely perceptible may be misleading. If used inappropriately, this generalization can be detrimental to an environmental assessment. Please provide references for this statement. Although the statement may be true in some cases, it can be misleading if the change is due to the addition of two dissimilar sounds. For example, consider masking thresholds for sounds at different frequencies or with different temporal patterns. As another example, a doubling of the number of events may not be noticed by some, but in most cases it is expected that it would be easily perceptible.*

The use of 90 dBA for noise level from television is not realistic and may cause readers to underestimate the impact of 90 dBA. A better typical comparison may be to the sound level of the background if you have to shout to carry on a conversation with someone only 0.5 metres away. The sound level on the shoulder of a major highway is typically in the range of 80 to 90 dBA.

It may be illustrative to give an example for a doubling of sound energy level such as two trucks will produce 3 dB more noise than one truck.

RESPONSE

Detecting differences in sound intensity varies according to frequency and sound level. It is noted that when combining two dissimilar sounds, whether differing in frequency and/or temporal pattern, they may not necessarily produce a 3 dB change in sound level, but, in this environment, with the normal variations and composite nature of background as well as project-specific sounds, it is likely that changes of 3 dB would be very difficult to detect.

For the important mid-frequency range and for commonly used levels within the range of human audibility, the minimum detectable change in level that the ear can detect is about 2 or 3 dB (Everest, 2001). While it is agreed that frequency and sound levels are factors that can alter the threshold of detection of differences, it is also noted in the cited reference, and borne

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out by observations that the detection of such small differences requires a relative absence of interfering sounds, and a relative steady-state of the subject sound.

Televisions are more often found to operate in the 60-70 dBA range, but other audio entertainment systems are operated at levels approaching 90 dBA. Some qualifying text was inadvertently dropped, and it is acknowledged that the 90 dBA should be considered typical of the high end of the range for entertainment devices.

2. *Section 2.8 Potential Issues, Interactions and Concerns – Please indicate the following:*

- *all hospitals, schools, day-cares and seniors' residences for which a significant effect is plausible from either project construction or operation noise – if there are none, state this explicitly and provide a rationale;*
- *any sites within the study area where socially significant First Nations cultural or religious ceremonies take place;*
- *an indication of whether the community is a quiet rural one*

RESPONSE

With regard to hospitals, schools, day-cares and seniors' residences, there is only one school located on Digby neck, located approximately 3 km from the quarry property boundary. However, due to this separation distance it is not expected that the school would undergo significant effects from project construction or operation noise. Attenuation with distance, alone, would likely reduce project-related sound levels by a further 10 dB, or more, at the school.

There are no sites within the study area where socially significant First Nations cultural or religious ceremonies take place.

As indicated in Reference Document #31, Table 2.4, baseline noise monitoring measurements indicate a variety of sound levels within the community. The baseline sound levels in Table 2.4 indicate that the community would lie between the category of quiet suburban and normal suburban community.

3. *Section 2.11, Construction – How many months will the construction last?*

RESPONSE

The construction period will be to some extent contingent upon the date at which permits are issued. This is because the marine terminal will be constructed during the summer months. However, it is reasonable to assume a construction period of 12 to 18 months from the end of the permitting process.

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4. *Please verify that there will be no night time (i.e. 10 p.m. to 7 a.m.) construction*
-

RESPONSE

There will be no construction between 2200 – 0600 hours.

5. *It is not clear if the construction noise levels provided of 64 dBA at the nearest receptor will not be likely to cause widespread complaints. This should be verified by the proponent for the following assumption. Health Canada predicts that it is not likely for there to be widespread complaints if construction noise levels are less than 60 or 65 dBA Leq for 12 hours of daytime activity depending on whether the area can be characterized as quiet suburban/rural or normal suburban, respectively. The following assumptions apply:*

- 1a) Quiet suburban or rural community (Ldn <52 dBA);*
 - 1b) Normal suburban community (Ldn in range of 53 to 57 dBA);*
 - 2) Construction affecting any one site has a duration of less than 2 months; and*
 - 3) No pure tone or impulsive character.*
-

RESPONSE

The listed assumptions were considered for the Project and Ldn values were calculated based on 24 hours of data taken on June 19, 2005 at the Project boundary and May 3, 2005 at the nearest receptor. The Ldn at the Project boundary was determined to be 44.4 dBA, categorizing that area as quiet suburban or rural community. This categorization was supported by the Ldn value of 49.6 dBA calculated at the nearest receptor. Construction will likely not exceed 2 months in duration at any one site except for the marine terminal and processing area and impulsive noise (*i.e.*, jack hammer) will be kept to a minimum.

Construction noise levels at nearby residential receptors were modeled using CadnaA. The effects of noise due to construction were analyzed by determining the activities that would create noise, and the typical levels of noise produced. Table 1 lists typical construction equipment noise emission levels. Actual equipment used on site may differ from those modeled.

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Table 1 Typical Noise Emission Levels of Construction Equipment

| Construction Equipment | Typical Sound Level at 15 m (dBA) |
|---|-----------------------------------|
| Earth Moving | |
| Loader | 85 |
| Bulldozer | 85 |
| Backhoe | 80 |
| Scraper | 89 |
| Grader | 85 |
| Excavator | 93 |
| Heavy Truck | 88 |
| Materials Handling | |
| Crane (Mobile) | 83 |
| Crane (Derrick) | 88 |
| Concrete Mixer | 85 |
| Screen | 100 |
| Vibratory Roller | 102 |
| Conveyor Belt | 93 |
| Crusher | 96 |
| Stationary Equipment | |
| Air Compressor | 81 |
| Generator | 81 |
| Impact Equipment | |
| Jack Hammer | 88 |
| Pile Driver (Impact) | 101 |
| Source: US Department of Transportation, 2006 European Commission Noise Database 1.0 | |

For the purposes of modeling, it was assumed that 13 major items (i.e., 2 loaders, 2 bulldozers, air compressor, generator, pile driver, scraper, grader, crane (mobile), excavator, heavy truck) of construction equipment would be operating at any given time within the project development area (i.e., processing plant). When conducting noise modeling, the construction equipment was positioned at the centre of the work area.

Because construction activities will occur between daytime hours of 06:00 and 22:00, construction activity is expected to have little to no effect on night time sound levels. The predicted construction noise levels at each residential receptor location are provided in Table 2, along with provincial noise limits as prescribed by the Nova Scotia Pit and Quarry Guidelines. The level of noise will vary according to the type of construction activity being conducted and the number of pieces of equipment in operation at any given time; however the predicted values offer an indication of impacts on nearby residential receptors.

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| Residential Receptor | Predicted Construction Noise Level (dBA) | Nova Scotia Sound Level Limits (dBA) | | |
|----------------------|--|--------------------------------------|-------------------------|-----------------------|
| | | Day (07:00 – 19:00) | Evening (19:00 – 23:00) | Night (23:00 – 07:00) |
| R1 | 43.4 | 65 | 60 | 55 |
| R2 | 41.6 | 65 | 60 | 55 |
| R3 | 43.9 | 65 | 60 | 55 |
| R4 | 39.5 | 65 | 60 | 55 |
| R5 | 42.2 | 65 | 60 | 55 |
| R6 | 41.7 | 65 | 60 | 55 |
| R7 | 41.8 | 65 | 60 | 55 |
| R8 | 41.1 | 65 | 60 | 55 |

Predicted noise levels at the nearest receptors are well below provincial noise limits for all designated time periods. According to Health Canada, the predicted noise levels due to construction will not likely cause widespread complaints.

6. *Section 2.12, Operation - Please indicate if there will be operation at night*

RESPONSE

No operations will be conducted at night, i.e. 2200 – 0600 hours.

7. *Please clarify the statement that operation levels will be 40 dBA at the nearest receptor due to distance. Health Canada assumed that the nearest receptor was 1 km away and calculated 36 dBA of attenuation due to geometric spreading, yielding a sound level of 49 dBA at the nearest receptor due to distance (i.e., geometric spreading).*

RESPONSE

The answers to the preceding questions have provided much more detailed sound modeling information, including the effects of topography, vegetation buffering, and other factors, such as the site layout, that were not available in the initial analysis but were approximated.

Air Quality (Table ECM-2, Section 9.1.8, Reference Document #31, Noise and Air Quality Study at Whites Point Quarry)

The project EIS report includes many pictures and maps; unfortunately, many processes that will be used have not been described schematically. It would be useful to obtain more visual information regarding project processes and equipment, such as the crusher/screening operations.

RESPONSE

Please refer to Section 9.1.6 – Air Quality for photos of typical processing plant in this document.

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General Air Quality Comments

1) *Is there a wind rose for the site? (A wind rose is a graphical representation used to show the information about the distributions of wind speeds, and the frequency of the varying wind directions, based on meteorological observations of wind speeds and wind directions).*

RESPONSE

No specific wind rose was prepared for the site. However, general wind rose diagrams applicable to the site are provided in the EIS, Appendix 48 – Wind statistics.

2) *Health Canada is looking for clarification as to the location of the closest residences, including how many are within two kilometres of the site. Several references provide different distances; 1000 metres (ref: EIS Plain language summary, Section 7.3); and 500 metres (ref: Noise and Air Quality Study, Jacques Whitford (2005), Section 2.11, page 12).*

RESPONSE

Please refer to EIS Volume III – Maps, specifically Maps 3A to 3E. These maps were generated in response to the EIS Guidelines requesting buildings by type within 4 kilometres of the quarry site. Please refer to the legend on each map for detailed information.

Specific Air Quality Comments

Blasting operations

Study report descriptions of blasting activities impacts on air quality are very general. The Noise and Air Quality Study at Whites Point Quarry by Jacques Whitford (2005), Section 3.5, page 27, states “Blasting can result in a concentrated plume of particulate matter, but the volume and time duration of such plumes are constrained. Even when blasts result in a visible plume, the contribution to 24-hour averages, as in the Air Quality Regulations, will be negligible.” Such activity requires more in depth analysis and should answer the following questions:

- *What are the characteristics of the emissions associated with blasting?*
- *What is the dispersion pattern of the plume, e.g. where does it go?*
- *How long would it stay in the air and what is the exposure that is anticipated for the population located close to the site?*
- *Who are the most exposed people?*
- *Has there been modeling of those plumes? If not, how can the proponent conclude that contribution to ambient air deterioration will be negligible (see citation above)?*
- *Blasting has been associated with carbon monoxide poisoning in houses located close to a blasting area. Is there any risk of such an effect?*

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RESPONSE

Quarries must drill and blast to reduce aggregate material to sizes that can be transferred in an efficient way to the crusher, if necessary. Similar to crushing, blasting operations consist of particulate matter generated during physical attrition of the aggregate and are conducted by professional blasters, who design custom blast plans to increase efficiency while reducing dust emissions and vibration.

Blasting technology has undergone significant improvements in order to minimize vibration and dust problems. With precision detonation techniques that have been adopted, explosive charges located in drilling holes are detonated with precisely timed millisecond delays. The result is a number of small detonations as opposed to one large blast, which reduces dust. In addition, the blast control plugs and/or stemming materials used when blasting serve to further reduce dust generation and flyrock. Therefore, blasting produces aggregate and particulate of relatively larger sizes that do not remain suspended in the atmosphere for an extended period of time. The plume created when blasting would likely only remain visible for a matter of minutes whereby a large fraction of the particulate would settle close to the blast site. A small fraction of dust could become entrained according to wind direction; however its effects on air quality at the residential receptors located closest to the quarry will most likely be negligible. The people most exposed to blasting emissions would be employees present on the blast site; however strict precautions are taken to ensure the health and safety of workers, minimizing exposure as much as possible.

Carbon monoxide (CO) has been associated with the detonation of explosives for the purposes of blasting; however by employing a few preventive measures, CO migration can be curtailed. The measures found to be safe and reduce CO production were to excavate the overburden before drilling, place blast mats, excavate the broken rock after each blast, and change the sequence of blasting (Martel, R. *et al.*, 2004).

A blast emission is more accurately characterized as a puff, than as a plume. The event is relatively short lived, generally passing a downwind observer in a time frame of seconds to a minute or two. Bilcon will use the services of a professional blasting firm to conduct these activities, ensuring that the appropriate amount of design is used to use the blast energy in the fracturing of rock, rather than in suspending particulate matter in the air. Given an estimate of a worst-case visible puff, of dimensions of, say, 100m, and with concentrations of particulate at the visible range of $1000 \mu\text{g}/\text{m}^3$, and an ambient level of about $40 \mu\text{g}/\text{m}^3$, the resulting 24 hour suspended particulate matter would be elevated from 40 to 41 by the passage of the puff at a slow wind speed of 1 m/s. Therefore, the contribution to the 24 hour average is negligible. It is Bilcon's intended policy that there will be no visible puffs affecting any offsite receptors.

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Crushing operations

Based on the project description as presented in the EIS, crushing and screening would be more regular activities than blasting, and may also result in particulate matter emissions. The Noise and Air Quality Study at Whites Point Quarry by Jacques Whitford (2005), Section 3.5, page 27 states "In this project, the crushing is to be conducted in an enclosed space, which is to be ventilated through filters to the outdoors. The material is collected after crushing, and the finer particles are transported in a moist state to be used as fill on the property." In Section 9.1.10.3 of the EIS (Mitigation), the document states that "processing equipment will be enclosed whenever practical to reduce noise levels at the source".

- Will the equipment be in an enclosed space (as opposed to being enclosed whenever practical)?
- What are the chemical characteristics of the particles associated with crushing?
- Is there any toxicity associated with such particles (for example leachable toxic metal)?
- What size are the particles that will go in the air after filtration (what is the filter mesh size)?
- What is the pattern of the plume, e.g. where does it go?
- How long will particles emitted from crusher and passed through filters stay in the air?
- Has there be any modeling of those emissions?
- Will the deposit site for particles (see Noise and Air Quality study, paragraph above) be maintained in a moist state on a permanent basis?

RESPONSE

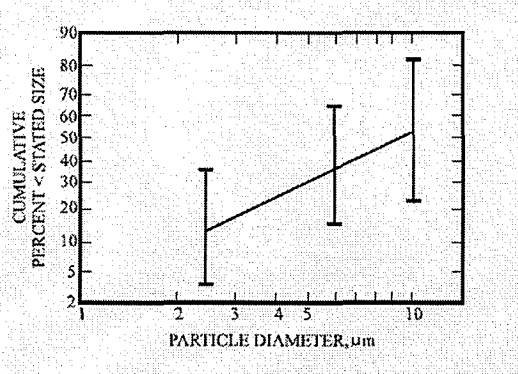
The only pollutant emission of concern from stone crushing operations is particulate matter; which is generated due to the physical attrition the aggregate undergoes. Particles formed by crushing operations have chemical compositions identical to the parent material undergoing size reduction. The main constituents of mineral particulate are typically natural crustal elements. These emissions are similar to particulate emitted by agricultural and construction operations.

Physical attrition processes such as crushing typically yield particles, which have aerodynamic diameters that are predominantly larger than 10 µm. Only a minute fraction of the mineral particulate would be in the PM₁₀ range. Due to the significant amount of energy required to further subdivide the particles, even less of the mineral particulate are in the PM_{2.5} size range.

The particle size distribution characteristic of mechanically generated particulate from processing aggregate and unprocessed ore is provided in the US EPA AP-42 (Fifth Edition, Volume 1, Appendix B.2) reference document (Figure 1).

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Figure 1



PM_{2.5} emissions, of greater concern with respect to health-related impacts, are produced primarily from combustion processes (e.g., internal combustion engines) as opposed to mechanical processes. In fact, the cumulative percent of mechanically generated PM_{2.5} from the production of aggregate and/or unprocessed ores is less than or equal to 15% (US EPA, AP-42).

Due to the nature of the size distribution of the particles generated by crushing, the particles would settle within a relatively close distance from the source.

In this particular case, the crusher will be completely enclosed in a building. It is intended that the building be completely contained to maintain a safe working temperature through the year, and to enable the use of water as a medium to completely control the dust production from the crusher; therefore no emissions and/or plume will be emitted from crushing operations. Ventilation of the building will be strictly for the purpose of providing an appropriate working environment for staff, and there will not be visible emissions from the source.

Storage of material

This is also an on-going activity, since the project implies both removal of organic soil on the area where extraction will be carried out and the subsequent storage of blasted rock material. The Noise and Air Quality Study at Whites Point Quarry by Jacques Whitford (2005), Section 3.5, page 27 states "Storage piles and exposed areas are often left uncovered due to the need for frequent material transfer, which can lead to considerable dust generation. Dust emissions can take place during several points in the storage cycle, including material loading onto the pile, disturbances by strong wind currents, and removing loads from the pile. The potential drift distance of particles caused by wind is determined by the initial injection height of the particle, the terminal settling velocity of the particle, and the degree of atmospheric turbulence."

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- What would be the characteristics of the stored particles?
- What would be their size?
- Is there any mitigation procedure to prevent particle dispersion?

RESPONSE

The characteristics and size distribution of the particulate matter in storage piles would be similar to that of the material produced by crushing; therefore primarily consisting of particles great than 10 microns in diameter with the additional washing step to completely rid the stockpiles of fine material. There is only the potential for fugitive dust emissions to occur from topsoil storage piles, or from the storage are of the washed fines by wind action and/or by human activities.

There are several different mitigation options to minimize particle dispersion from storage piles, if needed. These types of mitigation measures are outlined in the table shown below.

| Fugitive Emission Source | Control Techniques | | | | | | | | | | | | | | | | | | | |
|--------------------------|----------------------|------------------|----------|------------|--------------------|-----------|------------------------------|-------------------|-----------------------|---------------|-----------------------------------|------------------|-----------------------|--------------------------|------------------------|-------------------------------|---------------------|--------|--------------|-------|
| | Chemical Stabilizers | Vegetative Cover | Watering | Windbreaks | Wind Barriers/Berm | Plantings | Pile Shaping and Orientation | Paving and Gravel | Sweeping and Cleaning | Reduced Speed | Curbing and Stabilizing Shoulders | Operators Change | Reduced Drop Distance | Water Sprays and Foggers | Electrostatic Curtains | Partial or Complete Enclosure | Hooding and Ducting | Covers | Wheel Washes | Foams |
| Paved roads | | | X | X | X | X | | | X | X | X | | | | | | | | | |
| Unpaved roads | X | | X | X | X | X | | X | X | X | | | | | | | | | | |
| Unpaved parking lots | X | | X | X | X | X | | X | X | X | | | | | | | | | | |
| Active storage piles | | | X | X | X | X | X | | | | | X | | | | X | | X | | |
| Inactive storage piles | X | X | X | X | X | X | X | | | | | X | | | | X | | X | | |
| Exposed areas | X | X | X | X | X | X | | X | | | | | | | | | | | | |
| Construction sites | | | X | X | X | | | X | | | | X | | | | X | | | | |
| Conveyor transfer | | | | X | | X | | | | | | X | X | X | X | X | X | | | X |
| Drop points | | | | X | | | | | | | | X | X | X | X | X | X | | | X |
| Loading and unloading | | | | X | X | | | | | | | X | X | X | X | X | X | | | X |
| Vehicle carryout | | | | | | | | X | X | | | | | | | | | | X | |
| Truck and rail spills | | | | | | | | X | X | X | | | | | | | | | X | |
| Crushing and screening | | | X | X | X | | | | | | | X | X | X | X | X | X | X | | X |
| Waste sites | X | X | | X | | X | | X | | | | X | | | | | | | | |
| Tilling operations | | | X | | | | | | | | | X | | | | | | | | |
| Feed lots | X | X | X | | | | | | | | | X | | | | | | | | |

(Reference: Environmental Engineers' Handbook, Second Edition)

In the case of Whites Point quarry, topsoil storage piles will remain relatively inactive with no frequent transfer of particulate matter. In addition, with the treed buffer zone surrounding the quarry site and the strict watering regime, suppression of fugitive dust emissions will be sufficient. The storage piles will also ultimately contribute to quarry reclamation as well, where they will be covered with vegetation. The washed fines will be maintained in a moist

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state, by water sprays in the sediment storage area or in the settling ponds potentially fully covered by a water surface, and will not be susceptible to wind erosion.

Power supply and heating source

From available information, it appears that the project will mainly be electrical powered, using the provincial electricity network. Is there any possibility that the quarry project execution could reduce any Nova Scotia community air quality because of the additional electric energy requirement?

RESPONSE

Discussions with Nova Scotia Power Inc. (NSPI) indicate the following:

1. The electrical distribution system from Digby to Whites Point will need to be upgraded. This will be carried out by NSPI at Bilcon's expense.
2. NSPI has sufficient capacity in its current system to supply the demands of the quarry operation.

Since no additional production capacity is required, it is not anticipated that there will be a reduction of the air quality in any Nova Scotia community.

The report also mentions another on-site source of air pollutant emission:

Heating systems for the office

"Heating systems for the office and shop will be fueled by recycling waste oil from the mobile equipment. A double walled fuel storage tank with an alarm system and surrounding spill containment will be located in the compound area." (Source: EIS Report Volume V, section 7.8, p. 43). More details on the nature of this heating and storage system are required in order to determine the potential for adverse human health effects. Details would include:

- *What are the chemical characteristics of the fuel to be used?*
- *Could those fuels be considered as dangerous waste?*
- *Does this use of recycling waste oil require a permit and, if affirmative, does the proponent own such permit?*
- *What type of equipment will be used to heat the office and shop?*
- *What is the dispersion model for the plume?*
- *Who are the most exposed people?*

RESPONSE

Bilcon has revisited this element of the conceptual design and at the present time does not anticipate fuelling the heating systems for the office and shop with recycled waste oil from the mobile equipment. Heating will be by conventional oil-fired equipment.

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Cumulative Effects

No mention is made about the cumulative effects associated with dust related to multiple quarry operations (i.e. blasting, crushing, screening, stockpiling, etc.) and also with respect to this quarry and the other existing quarries on Digby neck, and how an additional quarry will contribute to increased dust generation in the area.

RESPONSE

In the whole of Digby County there are numerous pits and quarries, possibly numbering in the range of 80-85. There are two pits (Mink Cove and Sandy Cove) and one quarry (Rossway Quarry) that are located relatively close to Whites Point. Many others of various sizes are located at a greater distance. Due to lack of specific dust data for other pits and quarries it is difficult to accurately model the specific contributions of pits and quarries; however their contributions would be incorporated into the existing baseline data collected prior to construction and operations at Whites Point Quarry.

Please also refer to Section 10.0 – Cumulative Effects in this document.

Health Canada Conclusions Re: Air Quality Assessment

The report on Whites Point quarry reveals some significant uncertainties regarding air quality issues. As a result, at this point, it is not possible to give an evaluation of the potential health risk for the project related to air quality.

RESPONSE

As stated in the EA, the primary air quality issue involved with Whites Point Quarry, and other similar quarry and aggregate processing operations, is PM emissions. This is illustrated in Table 1, shown on the following page:

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| Table 1 Whites Point Quarry Construction and Operation Activities and Associated Emissions | | | | | | |
|--|-----------------------------------|----------------------|-----------------------------------|------------------------------------|----------------------------------|--|
| Process | Non-Engine Emissions | | | | | Engine Emissions |
| | Total Suspended Particulate (TSP) | Carbon Monoxide (CO) | Sulfur Dioxide (SO ₂) | Nitrogen Oxides (NO _x) | Volatile Organic Compounds (VOC) | NO _x , CO, CO ₂ , VOC, TSP, HC |
| Construction Activity | | | | | | |
| Site Infrastructure (e.g., roads) | X | | | | | X |
| Site Clearance (e.g., grading, scraping) | X | | | | | X |
| Earthmoving | X | | | | | X |
| Operations Activity | | | | | | |
| Drilling | X | | | | | |
| Blasting | X | | | | | |
| Crushing | X | | | | | |
| Screening | X | | | | | |
| Conveying | X | | | | | |
| Material Handling | X | | | | | X |
| Material Transport | X | | | | | X |
| Ship Loading/Unloading | X | | | | | X |
| Fugitive Sources (e.g., storage piles, power generation) | X | | | | | X |

As stated in the EA, applicable regulatory requirements considered included those prescribed by the Nova Scotia Air Quality Regulations and the Nova Scotia Pit and Quarry Guidelines. Table 2 on the following page shows the Nova Scotia Air Quality Regulations.

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| Table 2 Nova Scotia Air Quality Regulations | | |
|--|-------------------------|---|
| Contaminant | Averaging Period | Maximum Permissible Ground Level Concentration ($\mu\text{g}/\text{m}^3$) |
| Nitrogen Oxides (as NO_2) | 1 hour | 400 |
| | 24 hour | - |
| | Annual | 100 |
| Sulfur Dioxide (SO_2) | 1 hour | 900 |
| | 24 hour | 300 |
| | Annual | 60 |
| Particulate Matter (PM) | 24 hour | 120 |
| | Annual | 70 |
| Carbon Monoxide (CO) | 1 hour | 34,600 |
| | 8 hour | 12,700 |

The Nova Scotia Pit and Quarry Guidelines echo the Nova Scotia Air Quality Regulations for PM at the site property boundaries:

- Annual Geometric Mean $70 \mu\text{g}/\text{m}^3$
- Daily Average (24 hours) $120 \mu\text{g}/\text{m}^3$

From Table 2, it is evident that PM is the air contaminant of concern in terms of quarry construction and operations; however, as stated in the EA, mitigative measures will greatly reduce the quantity of PM emissions. Mitigative measures such as enclosing equipment (*i.e.*, crushers) and the use of water as a dust suppressant are highly effective ways in which to reduce PM dispersion.

In addition, a dust monitoring plan will be developed in consultation with Nova Scotia Department of Environment and Labour (NSDEL). Through periodic ambient air quality monitoring at specified monitoring locations the effectiveness of implemented mitigative measures can be verified and further action can be taken, if required.

The impact of the White's Point Quarry is estimated to be significantly less than the many comparable operations in the province, because of the lack of truck traffic out of the site, the strict washing and consequent dust control, the enclosure of the crusher, and the topography and site isolation. Bilcon is of the opinion that Health Canada can conclude with some degree of confidence that the health impacts are likewise lower.

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Light (Table ECM-2, Section 9.1.12, Reference Document #31, Noise and Air Quality Study at Whites Point Quarry)

The EIS indicates that operational lighting will be kept to a minimum and synchronized with needs to reduce energy consumption at the quarry. Potential effect of light on people is not assessed. JEWEL Report (2005) discusses lightscape management but does not address the potential adverse effects of light/sky glow on people. Sky glow is defined as “the brightening of the night sky due to man made lighting” (IDA, 2002). At this time there is not enough information to determine whether the presence of light/sky glow will have an adverse effect on nearby residents.

RESPONSE

Please refer to page 100 of the Revised Project Description.

With limited research available on the topic of the effects of artificial light on human health, an assessment cannot be provided at this time. According to the U.K. Environment Agency, the following measures can be employed to reduce the effects of night time light/sky glow.

- Positioning lights properly and directing light downward
- Using only the necessary amount of light
- Switching off unnecessary lighting particularly late at night and in the early morning hours; and
- Designing light fittings that reduce light emitted upwards

These measures will be included in the design of Whites point quarry in order to reduce the potential of exposure of light to nearby residents. The presence of numerous other light sources on the coastline has not resulted in the development of guidelines by government agencies that the proponent has been able to identify, but, should such guidelines be issued, it shall be the policy of Whites Point quarry to make every reasonable effort to comply.

Drinking Water Quality – Comments on EIS

- 1 *Section 9.1.3.2, Analysis – Only five of the 17 drilled residential wells in the vicinity of the proposed quarry had provincial well logs, and as such, the depths of the other twelve wells are not known. The report then states that these other twelve are either “pre-1965 drilled wells, non-registered wells, dug wells, or springs”, which contradicts the previous statement that indicates the 17 wells are drilled. Health Canada recommends that a detailed well survey of all 24 wells in the vicinity of the project be conducted to determine their depth and to verify the aquifer that they are utilizing.*

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RESPONSE

A detailed well survey of all wells within 800 metres of the active quarry will be conducted to determine their depth, yield and water quality. Please note that this has been partially completed and the results are contained in Conestoga Rovers – Domestic Well Survey, November 2006, in Section 12 of this document.

- 2 *Section 9.1.3.2 Analysis – The report assumes that all of the drilled wells are in a different hydrostratigraphic unit than the quarry, indicating that quarrying will occur in the upper flow unit of the North Mountain basalt (fractured bedrock) whereas “drilled wells are constructed in the middle or lower flow units of the North Mountain Basalt or in the deeper Blomidon Formation”. The report thus concluded that “local wells will be located hydraulically down-gradient of the quarry and/or in different geologic horizons and groundwater watersheds”. Given that there are no well logs for 12 of the 17 drilled wells in the vicinity of the proposed project site, Health Canada believes it is not possible to make this conclusion with certainty.*
-

RESPONSE

One of the primary objectives of the geologic investigation conducted by Bilcon was to delineate the structure and the stratigraphy of the UFU and MFU and the contact between the units.

Ten boreholes were drilled. Eight holes were drilled on the Bilcon property. Two holes were drilled in the valley south of North Mountain. Five of these holes penetrated the contact between the UFU and MFU unit. The contact was not penetrated in the remaining holes because it dips and plunges below sea level to the northwest. Core data were analyzed and sampled by MVC and Dr. Kontak, Ph.D., Regional Geologist with the NSDNR, Minerals and Energy Branch, the recognized expert on the North Mountain Basalt. The drill data were supplemented with detailed local and regional field work conducted in December 2004 and May 2005 by MVC and Dr. Kontak.

The aforementioned data enabled the investigators to clearly delineate the subsurface structure and the outcrop of the contact between the UFU-MFU, and the surficial bedrock geology. Consequently, it is possible to conclude with confidence that the surveyed drilled wells are constructed in the middle or lower flow units of the North Mountain Basalt or in the deeper Blomidon Formation, and thus, in a different geologic horizon than the quarry.

Please refer to Map 2-R1 in Section 7.0 – Revised Project Description.

Health Canada, the Panel, etc. are strongly encouraged to visit the project field. Inspection of the site geology will validate this conclusion and allay the concerns of the reviewer.

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- 3 *Section 9.1.3.2, Analysis and Mineral Valuation and Capital Inc. (2005) – The report and supporting documentation indicates that several of the neighbouring domestic and industrial wells are locate hydraulically downgradient of the quarry, however, if they are downgradient of the site, wouldn't any contaminants entering the groundwater as a result of site activities flow downgradient and potentially enter these wells? In addition, if groundwater drawdown occurred at the site, would this not decrease the quantity of groundwater available downgradient?*

According to the Oregon Department of Environmental Quality, "groundwater outside and upgradient of the facility is generally presumed to be unaffected by the source. Groundwater beneath and downgradient from the area of facility operations is most likely to be affected by pollutant discharges. Once pollutants affect groundwater, the contaminants usually move in the direction of groundwater flow downgradient and away from area of immediate impact" (<http://www.deq.state.or.us/wq/groundwa/IMDMonitoringBGGQuality.pdf>).

RESPONSE

It is possible that contaminants entering the groundwater as a result of site activities could potentially enter these wells. However, all quarry activities with the exception of the access road from Highway #217 will be conducted on the west side of the groundwater divide. In addition, the contaminant, barring an accident or malfunction, would be basalt fines, which testing has shown to contain no toxic materials.

There is no intention to use groundwater in any site activity other than in the office facility and quarrying of the rock will not take place below the water table, however, it is true that changing the topography could change the water table to the east of the groundwater divide. However, as noted elsewhere all wells in the vicinity of Highway #217 are either in the upper till unit (dug wells) or drilled wells in the middle flow unit or lower flow unit. A significant loss of yield in domestic wells in considered to be highly unlikely. In the event that this occurs, Bilcon has established a no litigation compensation policy which would involve drilling new wells at Bilcon's expense.

- 4 *Section 9.1.3 – Hydrogeology – No mention is made about the on-site groundwater use. Will groundwater be used on-site for such purposes as for drinking and in office facilities? If so, please identify the frequency and parameters to be tested as part of the monitoring program.*

RESPONSE

Groundwater will be used in the office facilities for drinking and washing. This water will be tested every six months for bacteriology and once per year for general chemistry and trace metals.

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Groundwater Monitoring

1 Section 9.1.3.3, Mitigation, Section 9.1.3.4, Monitoring 9.3.18.4, Monitoring and Table ECM-2 outline different proposed groundwater monitoring programs:

- Section 9.1.3.3 – “Groundwater from all neighbouring properties will be analysed for bacteriology, general chemistry and trace metals once prior to quarry operations to establish baseline conditions”. Will this be conducted for all 24 wells?

RESPONSE

An analysis for bacteriology, general chemistry and trace metals will be conducted prior to quarry operations for all wells in the vicinity of the quarry.

- Section 9.1.3.3 Section Water table levels will be monitored in the six new monitor wells and the four existing boreholes as quarrying proceeds. The number times water levels will be monitored is not stated here, but found later in Table ECM-2 that it will be weekly. The water table levels are intended to be monitored in the four existing boreholes, three of which were unable to be sampled in 2002(JWEL) because of damage, have these boreholes been repaired: In addition there is no mention of collecting water table levels prior to quarry operations. Will this be done in order to establish baseline conditions?

RESPONSE

The monitoring wells have now been repaired twice as a result of vandalism, but the bore holes have not yet been repaired. The bore holes will be repaired once a drill rig capable of recoring the holes is brought to the site. It should be noted that water table levels have been collected on a weekly basis since September 2005 to the present time and will be collected on a weekly basis in the future.

- Section 9.1.3.4 – states that an “on-site groundwater monitoring program was selected”, however it indicates that both on-site and adjacent property groundwater data is essential for establishment of baseline conditions and to further demonstrate no diminution in groundwater quantity or quality”

RESPONSE

A partial domestic well survey has been completed for the domestic wells along Highway #217 within 800 metres of the active quarry and this will be completed prior to any work on the quarry site in order to establish baseline conditions.

- Section 9.1.3.4 – “A comprehensive groundwater monitoring program was initiated in the fall of 2005 for the six monitoring wells”, although details of this program are not presented (i.e. parameters tested, frequency of sample collection etc.)

RESPONSE

Please refer to Appendix 1 in Section 9.1.2 – Geology and Hydrogeology in this document.

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- *Section 9.1.3.4 – Monitoring – the report states that “water quality monitoring will be performed by Bilcon of Nova Scotia Corporation on an annual basis for bacteriology, general chemistry and trace metals”, however, the locations of this monitoring is not clear – will it be samples from the boreholes, the monitor wells and/or the off-site residential/commercial wells?*

RESPONSE

Monitoring will be conducted on an annual basis for bacteriology, general chemistry and trace metals for the six monitoring wells. Monitoring will be conducted on the domestic wells adjacent to the Highway #217 every five years unless a complaint is received from a homeowner in which case testing will be conducted immediately. NSDEL advises that there are no registered commercial wells on Digby Neck.

- *Section 9.1.3.4 Monitoring – the report states that “summary reports of groundwater levels and water quality will be provided to the NSDEL monthly during operation of the quarry”. It is previously stated that groundwater levels will be measured in the six new monitoring wells and four existing boreholes monthly, but it is unclear as to what water quality parameters will also be analysed and submitted to NSDEL on a monthly basis.*

RESPONSE

Water levels in the six new monitoring wells and four existing boreholes will be collected on a weekly basis and reported to NSDEL on a monthly basis during quarry operations. In addition, water quality parameters, bacteriology, general chemistry and trace minerals for the six monitoring wells and the four bore holes will be monitored annually. The results will be submitted to the NSDEL in the month in which the monitoring was conducted.

- *Section 9.3.18.4 Monitoring – “chemical, physical and biological well water parameters will be monitored both on-site and off-site at the specially constructed monitoring wells” and “water samples will be taken from a monitoring well located on the quarry property line” and “off-site monitoring will be conducted in the same groundwater source as existing deep, domestic wells located in the immediate area”. Health Canada would like to see the proposed groundwater monitoring program, including sampling locations, parameters, and frequency of sampling specified in the report.*

RESPONSE

Monitoring of groundwater both on-site and off site is discussed in the EIS Volume VI, Chapter 9.1.3.4 and 9.3.18.4, and as responses to the previous six questions. Bilcon will prepare a detailed monitoring program for the approval of NSDEL during the industrial permit stage of the project.

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- *Table ECM-2 indicates that only water levels will be measured monthly at the 6 monitoring well locations on the property and bacteriology, general chemistry and trace metals will be analysed annually. The locations where these samples will be collected are not clear.*

RESPONSE

Please refer to response to previous Health Canada questions.

- 2 *Section 9.3.18.4 – Monitoring – “since the groundwater from on-site sources meets the Summary Guidelines for Canadian Drinking Water Quality for MACs and IMACs parameters, this would result in a long term, neutral (no) effect of local scale.” The report assumes that the project will have no impact on future groundwater quality, which is not necessarily correct. It is important to monitor during construction and operation to ensure that this quality is not deteriorated due to project activities.*

RESPONSE

Please refer to previous responses in this section.

- 3 *More frequent monitoring than what was recommended in the EIS may be appropriate to ensure quarry activities do not adversely affect water quality and levels, such as during periods of intensive blasting and rock cutting. Monitoring of the proposed perimeter and on-site wells should occur at a schedule that ensures that water quality is tested during periods of high quarry activity, especially in the initial phases of construction and operation. If water quality declines for any reason during these activities, immediate measures should be taken to provide adequate water supplies to local residents (I.E. bottled water and/or adequate treatment). In addition, monitoring for water level changes should take place over several years to confirm seasonal water level variations in addition to possible effects of quarry operations.*

Long term annual monitoring should continue to provide further information on the impact of quarry activity in addition to seasonal variations in water quality and water table levels.

RESPONSE

During early years of quarry construction, Bilcon will consider more frequent monitoring to ensure blasting does not adversely affect water quality of adjacent residential wells.

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Comments Related to References #28 and #29 – JWEL (2002) and Mineral Valuation and Capital Inc (MVCI) (2005) Reports

1 The two studies (JWEL, 2002 and MVCI, 2005) appear to have conflicting conclusions, for the JWEL (2002) report, based on a small project footprint (9.6 acres/-4hectares), indicated potential adverse effects to water quality and quantity, including on-site groundwater intrusion at the quarry site. In contrast, the MVCI (2005) study, based on the larger project footprint (indicated in the EIS to be approximately 300 acres of the 380 acre site over 50 years) concluded that there would be no adverse effects on water quality or quantity associated with larger project and there will be no groundwater intrusion at the quarry site. The following Table presents the conclusion from the JWEL(2002) study in comparison to the conclusions and rationale provided in MVCI (2005)

| JWEL Study Conclusions | MVCI Study Conclusions |
|--|--|
| Deterioration in water quality is not expected Since the residential wells are located up-Gradient of the proposed quarry | The local domestic and commercial wells will be located hydraulically down-gradient of the quarry |
| Blasting may result in temporary siltation Of nearby wells | Based on several U.S. studies, blasting will not impact the groundwater quality or quantity (including groundwater chemistry, water well stability and turbidity, yield etc) |
| Site activities may result in reduced water levels in wells hydraulically up-gradient to the quarry. | Quarrying will be initiated above the natural water table, and, as a result, mine dewatering and pumping will not be needed and there will be no groundwater withdrawal or drawdown. |
| Short-term impacts from blasting vibrations may include temporary discoloration of water and that mitigation could include reducing the size of individual blast units, or provision of a dirt filter or bottled water during periods of intensive blasting. | Based on several U.S. studies, blasting will not impact the groundwater quality or quantity (including groundwater chemistry, water well stability and turbidity, yield etc). |
| Bedrock in the vicinity of the quarry has a low to moderate degree of permeability, suggesting that a moderate inflow of groundwater could occur to the quarry. | Quarrying will be initiated above the natural water table, and, as a result, mine dewatering and pumping will not be needed and there will be no groundwater withdrawal or drawdown. |
| As the proposed quarry advances northeast and east into the side of North Mountain, the water table in the immediate vicinity of the quarry wall will begin to decline as water drains into the quarry through numerous fractures in the bedrock. | Quarrying will be initiated above the natural water table, and, as a result, mine dewatering and pumping will not be needed and there will be no groundwater withdrawal or drawdown. |
| Significant decline in water level and/or loss of yield are not anticipated during the proposed 9.6 acre quarry operation, however, if the quarry extends further into the property and beyond the proposed 9.6 acres, the degree of impact would be related to individual well yields, distance from the drainage face, well depth and time of year. The conclusion of the report was that water level declines are possible under the large long term mining scenario. | Quarrying will be initiated above the natural water table, and, as a result, mine dewatering and pumping will not be needed and there will be no groundwater withdrawal or drawdown. In addition, the wells will be in a different groundwater watershed and/or hydraulically down-gradient of the quarry |

RESPONSE

Please refer to Bilcon’s response to WP 1431 – Panel (IR10) on page 1 in this section.

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The MVCI (2005) study does not provide empirical evidence that the removal of 100 million tonnes of basalt rock (2 million tonnes per year for 50 years as presented in Section 7.0, Project Description) will not have an impact on the water table or will not result in groundwater drawdown or groundwater infiltration at the project site. In addition, the MVCI (2005) study does not provide mitigation measures in the event that off-site drinking water wells are affected by site operations. The JWEL (2002) report provides adequate mitigation measures for possible adverse effect to off-site drinking water wells resulting from quarry construction and activity, and Health Canada recommends that these proposed mitigation measures be implemented if adverse effects are identified during monitoring or as a result of public complaints.

RESPONSE

The MVCI 2005 study does not provide empirical evidence defined as “based on actual observations” since it is not possible to test mine 100 million tons. The opinion is based on work completed and is put forward in recognition that a number of mitigative, monitoring and compensation programs will be put in place to ensure that damage either does not occur or is fully compensated for under the compensation plan described elsewhere in this document.

It was noted in Section 4.5 of the JWEL (2002) that quarry groundwater sampling showed that all water chemistry parameters met Health Canada guideline values for drinking water quality with the exception of manganese. Table 4 indicated that the baseline level of manganese was 0.1 mg/L, which is 2-fold higher than the current Health Canada aesthetic objective of 0.05 mg/L. Is there any data available on manganese levels in residential wells and/or perimeter monitoring wells?

RESPONSE

The results with respect to manganese levels for residential wells currently tested are as follows:

8 wells showed non detected

1 well showed 2 micrograms per litre ($\mu\text{g/L}$)

1 well showed 11 micrograms per litre ($\mu\text{g/L}$)

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Country Foods (Table ECM-2, Section 9.3.21)

Health Canada recommends that raspberries and periwinkles be analyzed for metal following the first year of operation and then every subsequent five years. This would enable early detection of any elevated metals concentrations that may have been the result of quarry construction and early operations.

RESPONSE

EIS Coverage

EIS Section 9.3.21.4 Monitoring, states, in addition to monitoring air, water, and soil pathways as presented in previous sections of this EIS, Bilcon of Nova Scotia Corporation proposes to monitor country foods. Every five years, laboratory analysis of the metal content in wild raspberries and periwinkles will be conducted. A report comparing background levels to present levels will be compiled and made available to Health Canada if requested.

Response to the Panel

Considering the low background levels of metals (excepting copper in basalt and glacial till) in on-site soil, rock, and water, the proposed design considerations for spill containment, hazardous material handling, and proposed precautionary measures, the possibility of contaminants entering human food resources is extremely unlikely. However, Bilcon of Nova Scotia Corporation has proposed in EIS Section 9.3.21.4 Monitoring that wild raspberries and periwinkles be analyzed for copper following the first year of operation and then every subsequent five years; if the results are not substantially different between sampling events, the frequency may be decreased or even discontinued. In the unlikely event that the results are significantly higher, the potential hazard will be assessed, the mitigation processes re-evaluated if need be, and the monitoring frequency adjusted as appropriate.

Socio-Economic Assessment (Section 9.3, Reference Document #22 Digby Neck and Islands Individual Consultation Report, Reference Document #34 Human Health and Community Wellness Assessment, Reference Document #32 Digby Neck/Islands Economic Profile, Appendix III Tab 16 Mi'kmaq Use of Oositookum (Digby Neck), its surrounding waters, and the Mainland Shore of St. Mary's Bay)

Health Canada has reviewed the socio-economic aspects of this project specifically as they relate to the potential Environmental effects of the project.

According to the Canadian Environmental Assessment Act (CEAA)(1992), socio-economic effects can only be assessed indirectly, as a result of an environmental effect of a project. CEAA defines an environmental effect in respect of a project as:

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- a) *any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,*
- b) *any effect of any change referred to in paragraph (a) on*
 - (i) health and socio-economic conditions,*
 - (ii) physical and cultural heritage,*
 - (iii) the current use of lands and resources for traditional purposes by aboriginal persons, or*
 - (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or*
- c) *any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada.*

Health Canada has reviewed the socio-economic aspects of this project specifically as they relate to the potential Environmental effects of the project.

RESPONSE

Comment noted.

Public Information and Consultation Process

Health Canada acknowledges the effort invested by the proponent regarding the public information and consultation process as detailed in the EIS Guidelines. Communication activities and information are well presented and easy to retrieve. The newsletters and the creation of a Community Liaison Committee (CLC) are good practices that help the proponent inform the community and at the same time receive feedback from the community on the project.

RESPONSE

Comment noted. Please see response to the Panel in Section 8.2 – Public Consultation in this submission

Health Canada notes that primary public concerns identified were related to the preservation of the environment and indirect effects of the project on income sources (fishing, lobster, tourism, etc.) and quality of life of local residents.

RESPONSE

Bilcon will be happy to work with the local tourism association to help objectively assess any changes in tourism visitation to Digby neck that can be directly attributed to the quarry.

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Health Canada also identified a gap in the public information and consultation process among First Nations in the regional and local area. As the proponent recognizes, good communication has not been established with First Nations living in the area and despite the numerous documented attempts. Health Canada would support any future attempt to consult with the local First Nations group.

RESPONSE

Please refer to Bilcon's response to the Panel under Section 3.1 Traditional and Community Knowledge.

Bilcon will continue to make efforts to establish contact with the Confederacy of Mainland Mi'kmaq and would welcome an opportunity to discuss the project and any issues the Confederacy has regarding the project.

Traditional Knowledge and Social Impacts on First Nations' Quality of life and well-being

The TKS elaborated by the Confederacy of Mainland Mi'kmaq states that: "the Mi'kmaq have used Digby Neck and its surrounding waters since before the arrival of Europeans and continue to use the area for traditional purposes to this day" (Appendix III, Tab #16- Confederacy of Mainland Mi'kmaq, 2005, page 3), and "there is significant traditional current Mi'kmaq use in Oositookum (Digby Neck) and its surrounding water" (page 21). No further information is provided regarding the potential impact the project site itself may have on the traditional use of land for camping, harvesting of wood, stones, clay, food plants, berries, wild fruit, quills, seashells, or the hunting of ducks and deer, or the use of the surrounding waters to fish for haddock, lobster, halibut, urchin, trout, Pollock, mackerel, herring, scallop and crab (Appendix III, Tab #16 – Confederacy of Mainland Mi'kmaq, 2005, page 21).

Realizing previous consultation difficulties encountered by the proponent, Health Canada would like to see more information about whether the project may limit access to traditional hunting/gathering or fishing grounds used by local First Nations people.

RESPONSE

Access to the quarry site proper will be subject to some restriction due to safety considerations. Access to the shoreline will remain unimpeded either via the existing Whites Cove Road or by an alternate access, which would be constructed by Bilcon should the Whites Cove Road be acquired by Bilcon.

Please refer to Bilcon's responses in Section 3.1 Traditional and Community Knowledge and Section 8.2 Public Involvement in this submission.

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Socio-Economic Impact of Potential Environmental Effects on Local Industries

The main industries that may be affected by the environmental effects of the proposed quarry are the fishing (aquaculture, intertidal, and nearshore) and tourism industries.

According to Section 9.3.10 of the report, the Bay of Fundy in the area of the proposed quarry supports a fixed and mobile gear commercial fishery for groundfish (the most common species include cod, haddock, and pollock); pelagic species such as herring and mackerel; crustaceans (primarily lobster); mollusks (primarily scallops; and local harvesting of sea plants. In addition, localized harvesting of periwinkles, sea urchins, and more recently an experimental sea cucumber fishery has also been carried out in this area of the Bay. On Digby Neck/Islands, based on the last census of 2001, approximately 36% of the labour force was involved in the fisher (Section 9.3.9.1, Table E-1). Therefore, fishing is very important for the local economy. According to the EIS, the most lucrative sector is the lobster fishery, and lobster fishing and herring gill netting are the two main fishing activities occurring in the project area, including the nearshore area adjacent to the Whites Point Quarry property (Section 9.3.13.1)

Concerns were that fishing could be impacted by the project activities (including blasting and the construction and operation of the marine terminal) on economically valued marine species. Providing that the Department of Fisheries and Oceans (DFO) agrees with the marine species assessment conducted and the local fisherman agree on the mitigation measures to be implemented, Health Canada agrees that the socio-economic impact of the project on fishing is not expected to result in adverse effects. More specifically:

For the existing nearby aquaculture facilities, setback distances from the proposed quarry are greater than those outlined in applicable guidelines, and additional mitigative measures have been recommended, including minimizing potential blasting effects through the use of time delays and smaller individual charges

For fishing in the intertidal zone, the proponent indicates that access to the shoreline will remain. However, for the safety of these individuals, a check-in procedure will be required.

For nearshore fishing, the proponent indicates that herring nets are set closer to the shoreline than the course of the vessel, and would not likely be affected, however, lobster trap gear may become entangled during vessel arrival and departure. Specific mitigation measures were proposed for herring and lobster fishermen, including the development of designated shipping lanes, sharing of shipping schedule information with fishermen, and the potential development of a fund to compensate in the event of tangled gear.

In addition to fishing, tourism is also a major industry on Digby Neck. Based on the Attitude Survey (AMEC, October 2005) and the public registry, concern was expressed that tourism, particularly people visiting the area for its scenic beauty and/or its natural attraction

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including bird watching and marine mammal watching, could decrease as a result of the project. Section 9.3.14.2 (Analysis) of the EIS states that the proposed Whites Point quarry is not visible from the Digby Neck and Islands Scenic Drive (Hwy #27), from any tourist accommodations (fixed roof or campgrounds), adventure tour ports, designated heritage buildings or any of the proposed sites for the Discovery Centre. As a result of its proposed layout, including the proposed environmental preservation zone, the site (including marine terminal) would only be visible by water. With respect to whale watching, the EIS states that "the greatest concentration of whales and whale watching effort does not occur along the Digby Neck coast of the Bay of Fundy", and "whale watching tours, recreational boating or adventure boating in the Bay of Fundy presently do not frequent the nearshore waters of the Whites Point Area", thus "views of the quarry and marine terminal from tour boats will not be common" (Sections 9.3.14.2 and 9.3.14.5).

No specific mention is made of how noise from quarrying operations will impact tourism, tourist accommodations, designated heritage buildings or other buildings of potential interest to tourists. In general, the report indicates that noise will not result in adverse effects to humans due to adherence to the Nova Scotia Pit and Quarry Regulations for noise levels, however, the specific issue of noise and tourism is not addressed in the report.

As a mitigative measure, the proponent mentioned that a representative of the tourism industry will be invited to sit on the CLC. Although no significant adverse effects have been predicted by the proponent, Health Canada recommends that a formal follow-up process be implemented to assess the potential change in volume of tourism and its potential causes. This follow-up should include an annual review of tourism statistics (and possibly a tourist survey) during the construction phase and the first few years of operation.

RESPONSE

Bilcon will develop a follow-up process to assess the potential change in volume of tourism and its potential causes. Consultation with the tourism industry representative on the CLC and annual review of tourism statistics during the construction phase and the first few years of operation will be conducted.

Social Impacts of Environmental Effects on Local Residents' Quality of Life and Well-Being

Quality of life is a composite measure of an individual's satisfaction with life. Many factors can therefore affect an individual's quality of life, from their socio-economic status to the state of the nearby environment. As per the scope of the Canadian Environmental Assessment Act, Health Canada focus of review is where there is a potential for adverse effects only based on the potential environmental effects of the project.

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In general, for Digby Neck residents, quality of life is closely associated with a healthy and safe environment (Human Health and Community Wellness Assessment, page 37). The study also states that Digby Neck is a relatively clean environment in an enjoyable natural setting, which is one of the likely reasons why people, including summer residents, live there. Over 80% percent of Digby Neck residents ranked their healthy environment as being somewhat satisfying to very satisfying. In addition, "people value a healthy environment and its importance to their health, as well as believe that environmental components, such as clean water and air, are necessary to achieve a healthy environment" (Human Health and Community Wellness Assessment, page 39). Many public concerns related to the proposed project are related to disturbance associated with the quarry activities (for example, noise and dust),

As per comments presented elsewhere in this letter, Health Canada is requesting some clarification regarding the assessment of specific project environmental effects (i.e. effects on noise, air quality, drinking water etc.) Therefore, it is not possible at this time to determine whether or not significant adverse effects to quality of life are anticipated. However, Health Canada would like to point out that the proposed mitigation measures (such as open communication and the complaint process) could help resolve concerns over the effects of the project on nearby residents' quality of life.

RESPONSE

Please refer to Section 9.1.7 – Noise and Vibration, Section 9.1.6 – Air Quality, Section 9.1.2 Geology and Hydrogeology. Bilcon will ensure that an open communication process will carry on throughout the life of the project and that an efficient complaint process will be implemented.

Mitigation Measures and Monitoring and Follow-Up Program

Provided there is participation by the relevant stakeholders, the proposed mitigation appears to be appropriate in order to reduce the potential social and economic impacts that could be derived from the potential environmental effects of the project. Again, openness, transparency and ready access to information is essential in ensuring an informed public and will assist in decreasing the distance between reality and perception.

RESPONSE

Comment noted.

Regulatory Environment

Section 6.5 Regulatory Environment – Canada Health Act – The use of the Canada Health in this context is incorrect. The Canada Health Act is an "Act relating to cash contribution by Canada and relating to criteria and conditions in respect of insured health services and extended health care services" (Canada Health Act, 1984). The correct Act that gives the

9.3.6 Human Health and Wellness and Socio-Cultural Environment

Minister of Health the power to ensure the protection of human health in Canada and to conduct research in areas related to human health protection and promotion is the Department of Health Act (1996) (Section 4)

In addition, Health Canada and Environment Canada are jointly responsible for administering the Canadian Environmental Protection Act (1999), including the assessment and management of risks associated with existing and new substances. (Under CEPA (1999), the Minister of Health is also responsible for conducting research on the role of substances in illness and other health problems.

Under CEAA, Health Canada's legislated role is typically as a Federal Authority to provide expert information and knowledge on health issues when requested by other federal departments carrying out environmental assessments under CEAA. Health Canada is also a Responsible Authority for projects it proposes or funds, such as nursing stations and treatment centres for First Nations people. In the case of this project, Health Canada is a Federal Authority and can provide expert advice on any of the following areas (if asked):

- *Drinking water and sewage management;*
- *Air, water, food and soil quality guidelines/standards;*
- *Impacts of noise on human health;*
- *Community health (First Nations);*
- *Radiation protection (ionizing and non-ionizing);*
- *Environmental and occupational toxicology;*
- *Health promotion in the workplace;*
- *Epidemiology; and*
- *Health risk assessment and risk management.*

RESPONSE

Please refer to correspondence, File: OF6-3-65-1, from Allison Denning, Regional Environmental Assessment Coordinator, Health Canada – Atlantic Region to Debra Myles, Panel Manager, Whites Point Quarry and Marine Terminal Project - Joint Review Panel dated August 4, 2006. On page 13 of that letter, Ms. Denning points out and clarifies an inaccurate statement relative to the role and responsibilities of Department of Health Act as follows:

“ Section 6.5 Regulatory Environment – Canada Health Act – The use of the Canada Health Act in this context is incorrect. The Canada Health Act is an “*Act relating to cash contributions by Canada and relating to criteria and conditions in respect of insured health services and extended health care services*” (Canada Health Act, 1984). The correct Act that gives the Minister of Health the power to ensure the protection of human health in Canada and to conduct research in areas related to human health protection and promotion is the *Department of Health Act (1996) (Section 4)*.

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WP1541 – Fisheries and Oceans Canada

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Page 127 – Section 9.3.18 to 9.3.20 – Contaminants – There is no proposal within this EIS for environmental effects monitoring of the commercially valuable species such as lobster, crab, and scallop that are sensitive to the toxic metal exposures, especially in the Bay of Fundy areas. The monitoring of water quality of outflow from the sediment retention ponds is insufficient to detect the possible problem of contamination associated with quarrying operation. In the study of the selection of bioindicators for monitoring marine environmental quality of the Bay of Fundy, Chou et al. (200) reported that lobsters from Digby had elevated digestive gland copper (70ug/g) in comparison to lobsters from Pubnico (10ug/g. Chou et al. also reported the ineffectiveness of mussels and sediments as reliable indicators of contaminants. Mussels and sediments failed to reveal the problem of high toxic metals in the Bay of Fundy area. The EIS quotes the Gulfwatch results and states that heavy metal concentrations in blue mussels are near natural levels (Table MC-1, page 128). The report should include recent bioindicator studies by Chou et al. with regard to the contaminant levels in lobsters and crabs from the Bay of Fundy areas. The selection of bioindicators is key to revealing the toxic metal exposure in marine organisms.

Comments on Mitigation and Monitoring

Contaminants

It is suggested that lobster, scallop and crab be assessed for contaminants in addition to other environmental samples within the environmental effects monitoring program.

RESPONSE

EIS Coverage

Section 9.3.18 Human Health - Drinking Water Quality; 9.3.19 Human Health - Marine Contaminants; 9.3.20 Human Health - Land Contaminants; 9.1.6 On-site Surface Water Drainage

In Section 9.1.6.4 Monitoring, it is stated that water quality monitoring of all outflows from sediment retention ponds will be conducted weekly for Total Suspended Solids (TSS) and pH and monthly for general chemistry. TSS will be maintained at less than 50 mg/L per grab sample or 25 mg/L monthly arithmetic mean while pH will be maintained within a range of 5 – 9 per grab sample or 6 – 9 monthly arithmetic mean at the sediment pond outlet. These TSS and pH limits correspond with those contained in the permit for the four hectare quarry on this site. The frequency of monitoring will be weekly for TSS and pH and a monthly summary of results will be prepared by Bilcon of Nova Scotia Corporation and be available to regulatory agencies.

In Section 9.3.19 Human Health – Marine Contaminants, 9.3.19.1 Research, it is stated that contaminants such as metals have been measured in scallop and lobster in the Bay of Fundy.

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Scallop from most of the Bay generally had metal levels comparable to those from uncontaminated areas (Bay of Fundy Ecosystem Partnership 2004, Ref. 99). Copper measurements in the tissues of lobster in the upper Bay of Fundy, **predominately in a non-industrialized area**, had levels as much as 30 – 100 times higher than industrialized areas.

Response to Fisheries and Oceans Canada

Given the concern over the potential for high copper levels, it is proposed that all outflows from sediment retention ponds be sampled semi-annually and the samples analyzed for copper. This program would then be sunsetted if the levels of copper can be shown to be of no concern .

The use of bioindicators is said to be “key to revealing the toxic metal exposure in marine organisms”. This is incorrect because it assumes there will be significant exposure to organisms in the marine environment, which is a false premise. As indicated in the response to the panel in the previous section on contaminants, copper exposure is expected to be extremely low due to the planned mitigation strategy and the physical/chemical processes acting upon the copper in the environment. Analysis of periwinkle has shown copper levels of 22.1 mg/kg, a consequence of the naturally occurring background levels of copper. Research for this response did not identify current guidelines for copper content in marine organisms. Stewart and White (2001), in a review paper of contaminants on the Scotian Shelf, referred to a Health and Welfare Canada Guideline (circa 1996) of 100 µg/g in marine and freshwater animal products. Bilcon of Nova Scotia Corporation, in good faith, has proposed to continue the sampling and analysis of periwinkles for copper. It is anticipated that any biomonitoring will not discern exposure due to the site activities nor show copper levels over and above that which is due to background exposure.

The full range of elevated digestive gland copper in lobster as presented in Chou et al. (2003) include the following digestive gland (ug/g wet weight) copper concentrations from the Bay of Fundy:

| | | |
|---------------------|------------------|-----------------|
| Inner Bay of Fundy | Cobequid Bay | 856 ug/g ± 40 |
| | Minas Basin | 405 ug/g ± 20 |
| | Minas Channel | 110 ug/g ± 25 |
| New Brunswick Coast | Shepody Bay | 637 ug/g ± 36 |
| Nova Scotia Coast | Cumberland Basin | 836 ug/g ± 17 |
| Saint John Harbour | Dumpsite | 317 ug/g ± 16 |
| Annapolis Basis | Annapolis Basin | 70.5 ug/g ± 2.8 |
| Outer Bay of Fundy | Pubnico | 10.4 ug/g ± 3.6 |

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There are several issues against the use of lobster in a biomonitoring strategy. In Chou et al. (2003), there were high levels of copper in the digestive gland (hepatopancreas) of lobster, but edible tissues were not analyzed. It is expected that muscle tissue would likely have been much lower in copper concentration than the level determined in the hepatopancreas. This phenomenon has been observed in other decapod crustaceans that regulate metals (Bryan 1968; Bagatto and Alikhan 1987). Metals are sequestered in the hepatopancreas via metallothioneins, membrane metal transport proteins, and vacuolar sequestration mechanisms (Ahearn et al. 2004) and thus removed from circulation. The correlation of hepatopancreas copper and the copper concentration in the sediments in the Bay of Fundy was poor. The source of copper was unknown and could be from background sources. Lobsters appear to have a greater capacity for metal uptake and accumulation. Lobsters are also rather mobile, making it even more difficult to pinpoint a contributing source of contamination.

Metals have been measured in scallop and lobster in the Bay of Fundy. Scallop from most of the Bay generally had metal levels comparable to those from uncontaminated areas (Bay of Fundy Ecosystem Partnership 2004). Copper measurements in the tissues of lobster in the upper Bay of Fundy, predominately in a non-industrialized area, had levels as much as 30 – 100 times higher than industrialized areas.

These facts raise serious questions as to the suitability of lobster in a monitoring program. A periwinkle biomonitoring program has been proposed. Use of lobster in a biomonitoring program is not recommended.

References

Please refer to Section 12 – AMEC Earth and Environmental Inc. – Reference Document on Copper.

WP 1630 - Environment Canada

Item #11 Characterizing Existing Ambient Air Quality Information Request

Identify and use data from recording stations that are more indicative of air quality in the area likely to be affected by the Project.

Delineate and explain the airshed boundaries to be used in describing air quality and in assessing impacts while recognizing that particulates emitted by the Project have been identified in the EIS as the contaminant of most concern.

RESPONSE

In addition to ambient air quality monitoring stations operated by The Nova Scotia Department of Environment and Labour, stations are also operated by the National Air

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Pollution Surveillance (NAPS) network. Stations operated by NAPS that would be closest to the quarry site, and therefore representative of air quality in the area, would include those located at Kejimikujik National Park, Aylesford Mountain, Dayton (Yarmouth), and St. Andrews, New Brunswick. Air quality data collected by NAPS have been used to demonstrate the links between air pollution and human health, and also to evaluate air pollution control strategies, identify urban air quality trends, and forewarn of emerging air pollution issues. With reference to Whites Point quarry, the primary air quality issue is related to particulate matter generated from aggregate processing operations on-site.

The St. Andrews monitoring station is located on the grounds of the Huntsman Marine Science Centre and conducts monitoring for ozone (O₃), particulate matter < 2.5 µm (PM_{2.5}), and mercury (Hg). With respect to measured PM_{2.5} concentrations, in 2003 and 2004 hourly values were consistently low. Hourly values seldom exceeded 30 µg/m³, with the majority below 15-20 µg/m³. The 98th percentile value for 2003 and 2004 (based on 24-hour averages) were 13.1 µg/m³ and 9.5 µg/m³, respectively.

The station located at Kejimikujik National Park showed low concentrations of PM₁₀ between 1993-1996 and 1999-2001 of between 6 and 11 µg/m³. Similarly, low concentrations below 6 µg/m³ were found at the Kejimikujik between 1999 and 2001.

Ground-level ozone is also measured at the Kejimikujik monitoring station, in addition to the Aylesford Mountain and Dayton (Yarmouth) sites. From 1986 – 2001, the Kejimikujik and Aylesford Mountain stations have shown an increase in ground-level ozone. Ground-level ozone concentrations measured at Aylesford Mountain are typically higher due to the elevation of the site. Given the relatively remote locations of both monitoring sites, their data are a good indicator of the impact of transboundary air contaminants from the US and central Canada.

While ground-level ozone and other air contaminants are integral in the region's overall air quality, it is particulate matter that is of concern when dealing with quarry operations. When assessing the impacts of operations at Whites Point Quarry, while the Nova Scotia Air Quality Regulations are essential, the current state of air quality in the region with respect to particulate matter will be considered.

Item #12 Predicting the Quantity and Fate of Emissions Information Request

Provide more detailed emission estimates in terms of pertinent parameters (e.g. total particulate matter and its fractions including PM₁₀ and PM_{2.5}) and sources (e.g. construction equipment, bulk carriers). Discuss these estimates in the context of applicable regulatory requirements, standards, goals, objectives and targets as applicable.

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Provide more detailed discussion on dispersion of Project-related emissions, and their potential influence on ambient air quality in an appropriately defined airshed(s) taking into account the influence of wind conditions.

RESPONSE

A summary of emissions resulting from construction and operational activities at Whites Point Quarry are presented in Table 1.

| Table 1 Whites Point Quarry Construction and Operation Activities and Associated Emissions | | | | | | |
|--|-----------------------------------|----------------------|-----------------------------------|------------------------------------|----------------------------------|--|
| Process | Non-Engine Emissions | | | | | Engine Emissions |
| | Total Suspended Particulate (TSP) | Carbon Monoxide (CO) | Sulfur Dioxide (SO ₂) | Nitrogen Oxides (NO _x) | Volatile Organic Compounds (VOC) | NO _x , CO, CO ₂ , VOC, TSP, HC |
| Construction Activity | | | | | | |
| Site Infrastructure (e.g., roads) | X | | | | | X |
| Site Clearance (e.g., grading, scraping) | X | | | | | X |
| Earthmoving | X | | | | | X |
| Operations Activity | | | | | | |
| Drilling | X | | | | | |
| Blasting | X | | | | | |
| Crushing | X | | | | | |
| Screening | X | | | | | |
| Conveying | X | | | | | |
| Material Handling | X | | | | | X |
| Material Transport | X | | | | | X |
| Ship Loading/Unloading | X | | | | | X |
| Fugitive Sources (e.g., storage piles, power generation) | X | | | | | X |

As stated in the EIS, applicable regulatory requirements considered included those prescribed by the Nova Scotia Air Quality Regulations and the Nova Scotia Pit and Quarry Guidelines. Table 2 shows the Nova Scotia Air Quality Regulations.

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| Table 2 Nova Scotia Air Quality Regulations | | |
|---|------------------|---|
| Contaminant | Averaging Period | Maximum Permissible Ground Level Concentration ($\mu\text{g}/\text{m}^3$) |
| Nitrogen Oxides (as NO_2) | 1 hour | 400 |
| | 24 hour | - |
| | Annual | 100 |
| Sulfur Dioxide (SO_2) | 1 hour | 900 |
| | 24 hour | 300 |
| | Annual | 60 |
| Particulate Matter (PM) | 24 hour | 120 |
| | Annual | 70 |
| Carbon Monoxide (CO) | 1 hour | 34,600 |
| | 8 hour | 12,700 |

The Nova Scotia Pit and Quarry Guidelines echo the Nova Scotia Air Quality Regulations for PM at the site property boundaries:

- Annual Geometric Mean $70 \mu\text{g}/\text{m}^3$
- Daily Average (24 hours) $120 \mu\text{g}/\text{m}^3$

From Table 1, it is evident that PM is the air contaminant of concern in terms of quarry construction and operations; however, as stated in the EA, mitigative measures will greatly reduce the quantity of PM emissions. Mitigative measures such as enclosing equipment (*i.e.*, crushers) and the use of water as a dust suppressant are highly effective ways in which to reduce PM dispersion.

In addition, a dust monitoring plan will be developed in consultation with Nova Scotia Department of Environment and Labour (NSDEL). Through periodic ambient air quality monitoring at specified monitoring locations the effectiveness of implemented mitigative measures can be verified and further action can be taken, if required.

The presence of a ship at the dock will add the emissions of the “hotelling” systems to the project emissions; however, the spatial separation of 1 km, or more, from public receptors is adequate to provide safe dispersion of these emissions, and is much greater – perhaps an order of magnitude – than the separation of similar vessels from the public in harbours such as Halifax, Dartmouth, Digby, and elsewhere. The use of electrical power from the provincial grid eliminates the need for on-site generation, and the utility providing this power is approved to do so by the Department of Environment and Labour. Vehicles operated within the site will be well maintained, and are well separated from the public. The design of the facility to use ship transport of the product eliminates the need for trucking the material on the public roads.

9.3.6 Human Health and Wellness and Socio-Cultural Environment

Item #13 Mitigating and Monitoring Effects on Air Quality Information Request

Provide a more detailed description of how ambient air quality requirements will be met and the role of a monitoring program in this regard.

Present a proposed monitoring program for air quality consistent with the direction provided in Section 12.4 of the guidelines. Such a program should include regulatory requirements, standards, goals, objectives and targets; provisions for submitting monitoring results for review by the public and regulatory agencies; and, a discussion of how monitoring results will be used for making necessary adjustments to Project design and operation.

RESPONSE

A preliminary dust monitoring plan for Whites Point Quarry would resemble something similar to what is presented below.

Whites Point Quarry – Air Quality Monitoring Plan

Particulate matter emitted into the atmosphere consists of material in a broad range of aerodynamic diameters. Matter greater than about 44 µm in diameter will fall to the ground within a few metres, or tens of metres, of the source. Material of smaller diameter will remain suspended in the atmosphere, and is referred to as Total Suspended Particulate Matter (TSP), but is often referred to by the public as “dust”. The “dust” monitoring plan technically refers to Suspended Particulate Matter. The standard method for determining Suspended Particulate Matter is the use of high-volume air samplers that draw about 2 m³/minute of air through a filter paper that has been weighed prior to exposure. Following exposure, the filter is desiccated for 24 hours and then the weight difference is determined gravimetrically.

Dust emissions are inevitable when conducting quarry operations; however by applying the appropriate dust mitigation measures (as outlined in the EA) their effects will be kept to acceptable levels. To confirm the success of the mitigative measures or to signal the need to apply more aggressive mitigation, dust monitoring will be conducted.

According to the conditions of Nova Scotia Pit and Quarry Guidelines, the dust emissions will not exceed the following limits at the site property boundaries:

- Annual Geometric Mean 70 µg/m³
- Daily Average (24 hours) 120 µg/m³

Therefore, when conducting dust monitoring, these will be the guidelines by which the success of the dust mitigation measures will be gauged.

9.3.6 Human Health and Wellness and Socio-Cultural Environment

Monitoring parameters and locations will be selected in consultation with NSDEL. The potential monitoring site locations would represent the areas of potentially sensitive receptors. Selection will be based on agreement from parties (*i.e.*, landowners) involved, power, access, and other relevant issues. In response to public consideration and concern the monitoring plan will comprise routine monitoring and attention to allegations of chronic problems or isolated events.

Visual inspections in conjunction with real-time monitoring will be performed to measure dust levels and to ensure that quarrying, materials handling, and consolidation operations do not result in excessive on-site dust emissions. Visual inspection will be the primary method for evaluating the effectiveness of dust control during this project. Real-time monitoring using a combination of hi-volt samplers and gravimetric weighing will be used to quantify total dust levels and/or to determine if corrective action is needed.

Regarding the frequency of dust monitoring, inspections for visible airborne dust will be conducted routinely several times during each working day. A schedule will be developed for real-time air sampling that includes meteorological fluctuations that occur on a daily basis and throughout the year. One option is that real-time monitoring is performed once a month and readings are collected at 0600, 1200, 1100 hours, which characterizes the morning, afternoon, and nighttime conditions. By doing this on a monthly basis, seasonal results will also be characterized. Monitoring is not appropriate during rain snow, or heavy fog conditions due to limitations of the method applicability. These weather conditions, however, substantially reduce the potential for heavy dust emissions.

If the dust emission limits of the Nova Scotia Pit and Quarry Guidelines are exceeded, then further mitigative action will be initiated. Furthermore, visible airborne dust will be used as the site action item. If dust is visible, dust suppression methods will be implemented. If visible dust is present at the site boundary, work will be stopped until engineering controls or alternate methods are initiated to reduce the levels of visible airborne dust. Appropriate engineering controls and personal protective equipment will be used where appropriate. In the event of a public complaint, additional monitoring will be used to aid in addressing the complaint so appropriate action can be taken, if needed. Whites Point quarry will establish a complaint resolution program to deal with residents' or other (*e.g.*, NSDEL) potential queries and/or complaints as they arise.

WP 1625 – Partnership for Sustainable Development

Deficiency Statement 72

EIS Guidelines

10.3.1 – Community Profile – “Describe and evaluate the beneficial and adverse effects of the Project on those VECs selected for the human environment, explaining the rationale used.” “Describe and evaluate changes to health and social and economic conditions that

9.3.6 Human Health and Wellness and Socio-Cultural Environment

may occur as a result of Project-related impacts to the biological and physical environments.”

EIS

9.3 – Human Environment and Impact Analysis – The EIS argues that Digby Neck is a community in decline using indicators such as out-migration, income and education as evidence for this claim. What it does not address is the extent to which Digby Neck is a resilient or healthy community despite these challenges. It does not address the impact which the building of the quarry or the process that will lead to the final decision will have on the overall well being of the community. It does not address the extent to which the people of Digby Neck have the capacity to figure this one out for themselves. The analysis used to support the EIS findings of insignificant or neutral for the human environment VECs fails to recognize the integrated and complex nature of a vital community. The questions that need to be asked when a new opportunity arises are: will the opportunity be one that offers improved community vitality? Or, will the development harm existing healthy patterns in the community?

RESPONSE

Please refer to EIS Volume VII, Chapter 9.3 Human Environment and Impact Analysis and in Bilcon’s responses to the Panel and Agencies in this section.

Deficiency Statement 77

EIS Guidelines

10.3.7 – Human Health and Community Wellness – “Describe and evaluate potential health impacts that may arise from changes in water quality and quantity.”

EIS

9.3.18.5 - Impact Statement - The EIS uses water results from one borehole in 2002 to conclude that there is no long-term effect on drinking water quality for on-site sources. Using current conditions to make future predictions, when the soil cover, landscape, topography, land use, and geology of the area will change in the future is totally inappropriate. No predictive modeled or future scenarios are discussed. Similarly for the impact statement for off-site drinking water quality and quantity – the EIS assumes that the till and three flow units are completely distinct and always will be – without offering adequate evidence. The information provided fails to meet the requirements of section 10.3.7 of the EIS Guidelines by failing to adequately consider potential impacts.

RESPONSE

Please refer to Section 9.1.2 – Geology and Hydrogeology and Bilcon’s responses to the Panel and Agencies in this section.