



Keltic Petrochemicals Inc.
Liquid Natural Gas Facilities and
Marginal Wharf
Goldboro, Nova Scotia



Final
Comprehensive Study Report



October 2007



**Proposed Liquefied Natural Gas Facility
and Marginal Wharf
Comprehensive Study Report
Goldboro, Nova Scotia**

FINAL REPORT

Submitted to:

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LIST OF ACRONYMS

ACCDC	Atlantic Canada Conservation Data Centre
AERMOD	American Meteorological Society Regulatory Model
AMEC	AMEC Earth & Environmental, a division of AMEC Americas Limited
ASU	Air Separation Unit
ATV	All-Terrain Vehicle
BLEVE	Boiling Liquid Expanding Vapour Explosion
BOG	Boil-Off Gas
CCME	Canadian Council of Ministers of Environment
CEA	Cumulative Effects Assessment
CEAA	<i>Canadian Environmental Assessment Act</i>
CEPA	<i>Canadian Environmental Protection Act</i>
CICS	Canadian Institute for Climate Studies
CL	Carapace Length
CLC	Community Liaison Committee
CMHC	Canadian Mortgage and Housing Corporation
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPI	Coalescing Plate Interceptor
CSA	Canadian Standards Association
CSR	Comprehensive Study Report
CTA	Chain Transfer Agent
CWS	Canadian Wildlife Service
DDT	Dichlorodiphenyltrichloroethane
DFO	Fisheries and Oceans Canada
DIANA	Department of Indian and Northern Affairs
DNL	Day-Night Average Sound Level
DNV	Det Norske Veritas
DO	Dissolved Oxygen
EA	Environmental Assessment
EC	Environment Canada
ECC	Environmental Components Of Concern
ECM	Environmental Compliance Monitoring
EEM	Environmental effects monitoring
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPC	Engineering Procurement and Construction
EPP	Environmental Protection Plan
ESC	Erosion and Sediment Control
ESD	Emergency Shut Down

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FEED	Front End Engineering Design
FHCP	Fish Habitat Compensation Plan
GBEP	St. Georges Bay Ecosystem Project
GCIFA	Guysborough County Inshore Fisherman's Association
GCRDA	Guysborough County Regional Development Authority
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GPS	Global Positioning System
HADD	Harmful Alteration, Disruption or Destruction
HAZOP	Hazard and Operability Analysis
HDPE	High Density Polyethylene
IAFU	Induced Air Flotation Unit
IBA	Important Bird Area
IMO	International Maritime Organization
INAC	Indian and Northern Affairs Canada
IPCC	Intergovernmental Panel on Climate Change
ISAR	Interdisciplinary Studies in Aquatic Resources
ISFA	Inverness South Fishermen's Association
ISQC	Interim Sediment Quality Guidelines
KDP	Keltic Development Project
Keltic	Keltic Petrochemicals Inc.
KO	Knock Out
LDPE	Low Density Polyethylene
LLDPE	Linear Low Density Polyethylene
LNG	Liquefied Natural Gas
M&NP	Maritimes and Northeast Pipeline
MARPOL	International Convention for the Prevention of Pollution from Ships
MDO	Maine Diesel Oil
MEK	Mi'kmaq Ecological Knowledge
MFU	Maritime Fishermen's Union
MFWC	Mi'kmaq Fish and Wildlife Commission
MIACC	Major Industrial Accident Council of Canada
MSX	Multinucleate Sphere
Municipality	The Municipality of the District of Guysborough
NAEE	No Adverse Environmental Effect
NBCC	National Building Code of Canada
NFPA	National Fire Protection Association
NO ₂	Nitrogen Dioxide
NO _x	Nitrous Oxides
NPRI	National Pollutant Release Inventory
NRCan	Natural Resources Canada
NSDAF	Nova Scotia Department of Agriculture, Fisheries and Aquaculture

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NSDE	Nova Scotia Department of Energy
NSDNR	Nova Scotia Department of Natural Resources
NSEL	Nova Scotia Department of Environment and Labour
NSMNH	Nova Scotia Museum of Natural History
NSPI	Nova Scotia Power Inc.
NSRBA	Nova Scotia Road Builders Association
NSUARB	Nova Scotia Utility and Review Board
NWPA	<i>Navigable Waters Protection Act</i>
OCIMF	Oil Companies International Marine Forum
OCSG	Offshore Chemical Selection Guidelines
ORV	Open Rack Vaporization
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PEL	Probable Effect Level
PIRI	Partnership in RBCA Implementation
PLC	Programmable Logic Control
PM	Particulate Matter
PM ₁₀	Particulate Matter with aerodynamic diameter less than a nominal 10 micrometres
PM _{2.5}	Particulate Matter with aerodynamic diameter less than a nominal 2.5 micrometres
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QRA	Quantitative Risk Assessment
RA	Responsible Authorities
RBCA	Risk-Based Corrective Action
RCMP	Royal Canadian Mounted Police
RMS	Root Mean Square
ROV	Remote Operated Vehicle
S&W	Stone & Webster
SARA	<i>Species At Risk Act</i>
SCV	Submerged Combustion Vaporization
SD	Statistical District
SIGTTO	Society of International Gas Tanker and Terminal Operators
SIRE	Ship Inspection Report Programme
SO ₂	Sulphur Dioxide
SOEI	Sable Offshore Energy Inc.
SOEP	Sable Offshore Energy Project
SPM	Suspended Particulate Matter
SSP	Steel Sheet Piling
SWMP	Storm-water Management Plan
TC	Transport Canada
TCH	Trans-Canada Highway
TDG	Transportation of Dangerous Goods

TERMPOL	Technical Review Process of Marine Terminal Systems in Transshipment Sites
the Agency	Canadian Environmental Assessment Agency
the Board	Nova Scotia Environmental Assessment Board
the Project	Petrochemical and Liquefied Natural Gas Facility in Goldboro, Nova Scotia
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
UK	United Kingdom
USA	United States of America
UTM	Universal Transverse Mercator
VEC	Valued Environmental Component
VHP	Very High Pressure
VLCC	Very Large Crude Carriers
VOC	Volatile Organic compound
WHMIS	Workplace Hazardous Materials Information System

LIST OF UNITS

%	percent
$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
μm	micrometer
μS	microseimens
$\mu\text{S}/\text{cm}$	microseimens per centimetre
BCM	billion cubic metres
bcm/a	billion cubic metres per annum
BF/P	base flow to precipitation
BTU	British Thermal Unit
BTU/hr	British Thermal Units per hour
cm	centimetre
cm/sec	centimeters per second
dB	decibels
dBA	Decibel measurement using an A weighting filter
dB re $1\mu\text{Pa}$	decibals referenced to 1 microPascal
DWT	dead weight tonnes
g/t	grams per tonne
gal/hr	gallons per hour
gal/yr	gallons per year
ha	hectare
hPa	hectopascal
Hz	hertz
ka	kiloannum
kg	kilogram
kg/hr	kilograms per hour
kg/m^3	kilograms per metres cubed
kHz	kilohertz
km	kilometre
km/h	kilometres per hour
km^2	square kilometre
kTA	kilotonnes per ampere
kV	kilovolts
KVA	kilovolts per annum
kW	kilowatt
L	litre
L/min	litres per minute
lb/hr	pounds per hour
lb/mmBTU	pounds per million British Thermal Units
Leq	equivalent sound level
m	metre
m/s	metres per second
m^2	square metres

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m ³	cubic metres
m ³ /day	cubic metres per day
m ³ /hr	cubic metres per hour
m ³ /year	metres cubed per year
mg	milligrams
mg/kg	milligrams per kilogram
mg/L	milligram per litre
mg/m ³	milligrams per cubic metre
ml	millilitre
mm	millimetre
mm/d	millimetres per day
mmcf/hr	million cubic feet per hour
mmcf/yr	million cubic feet per year
mmcf/d	million cubic feet per day
mmt	million metric tonnes
MW	megawatt
MWe	megawatts of electricity
Nm ³	normal cubic metres
Nm ³ /hr	normal cubic metres per hour
°C	degrees celsius
°F	degrees fahrenheit
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
psig	pound per square inch gauge
QF/P	quick flow to precipitation
t	metric tonne
t/year	metric tonnes per year
tcf	trillion cubic feet
TF-P	total flow to precipitation
W/m ²	watts per square metre