



Remediation Standards Facilitate Land Reclamation in Atlantic Canada

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Atlantic Partnership In RBCA Implementation

Presentation to the CLRA/ACRSD Conference
August 27/28 2007



Outline

- Land Reclamation and Contaminants
- Context for Atlantic RBCA
- Atlantic RBCA
- Benefits of Atlantic RBCA
- Case Studies



Land Reclamation



Residues of contaminants are often an issue in land reclamation projects:

- residues from industrial processes
- mine tailings and other residues
- spills and leaks from commercial operations
- on-site disposal and landfilling

Managing these contaminants creates a technical hurdle in the reclamation process.

Different sites require the different levels and types of remediation.

Context for Atlantic RBCA

Prior to 1997 - a Regulatory Pot-Pourri:



- No contaminated site legislation
- Criteria for managing contaminated sites varied between jurisdictions
- Criteria were generic, “gut-feel” - not always science-based
- Regime was “Prevention and Punishment” (P&P) not remediation and redevelopment (R&R)

Context for Atlantic RBCA



ATLANTIC
RBCA
RISK BASED CORRECTIVE ACTION

Infrastructure concerns epitomized by this image.



Context for Atlantic RBCA



The Result:

- Challenges to understand regulations when working in more than one province
- Clean-up criteria could require extensive clean-up regardless of future use
- Regulator's case files were backlogged
- Took a lot of time and money to achieve site remediation and subsequent “closure” of a file by regulators

Atlantic RBCA



Risk Based Corrective Action is a philosophy for managing contaminated sites.

- Assesses the risks of the contamination
- Remediation to manage risks and protect human health and the environment
- “Tier” approach makes it user friendly
- Site-specific remediation goals

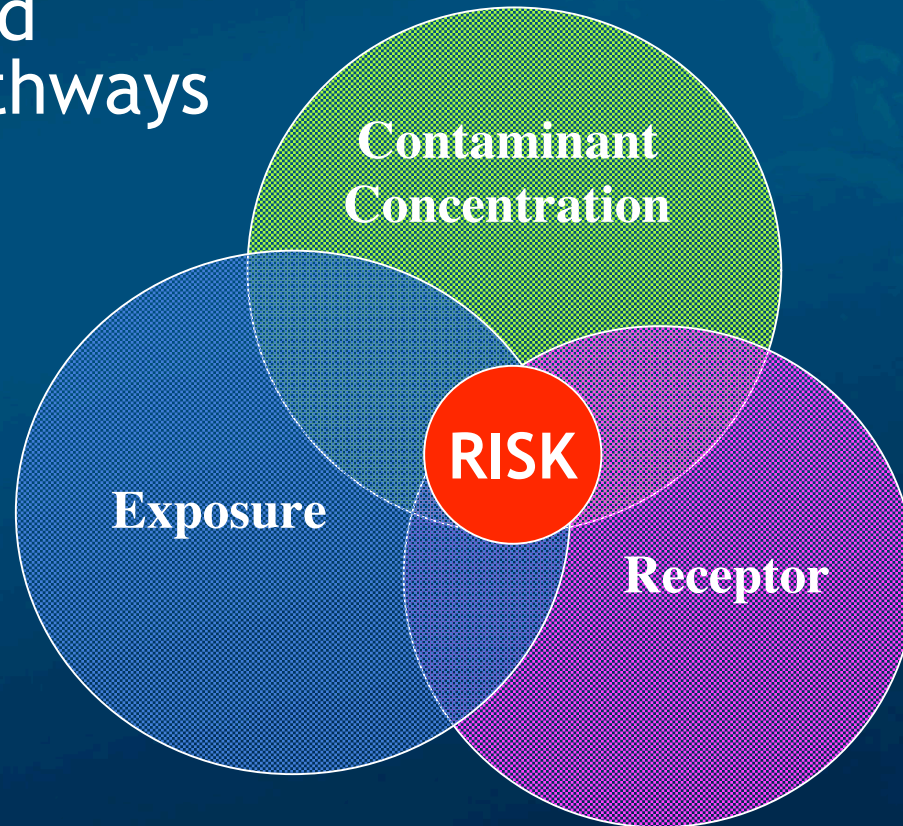
Developed in the mid-1990’s in the USA

Adapted for conditions in Atlantic Canada
in 1998

Risk and RBCA

Risk occurs when there is a combination of

- contaminant concentration
- receptors and
- exposure pathways

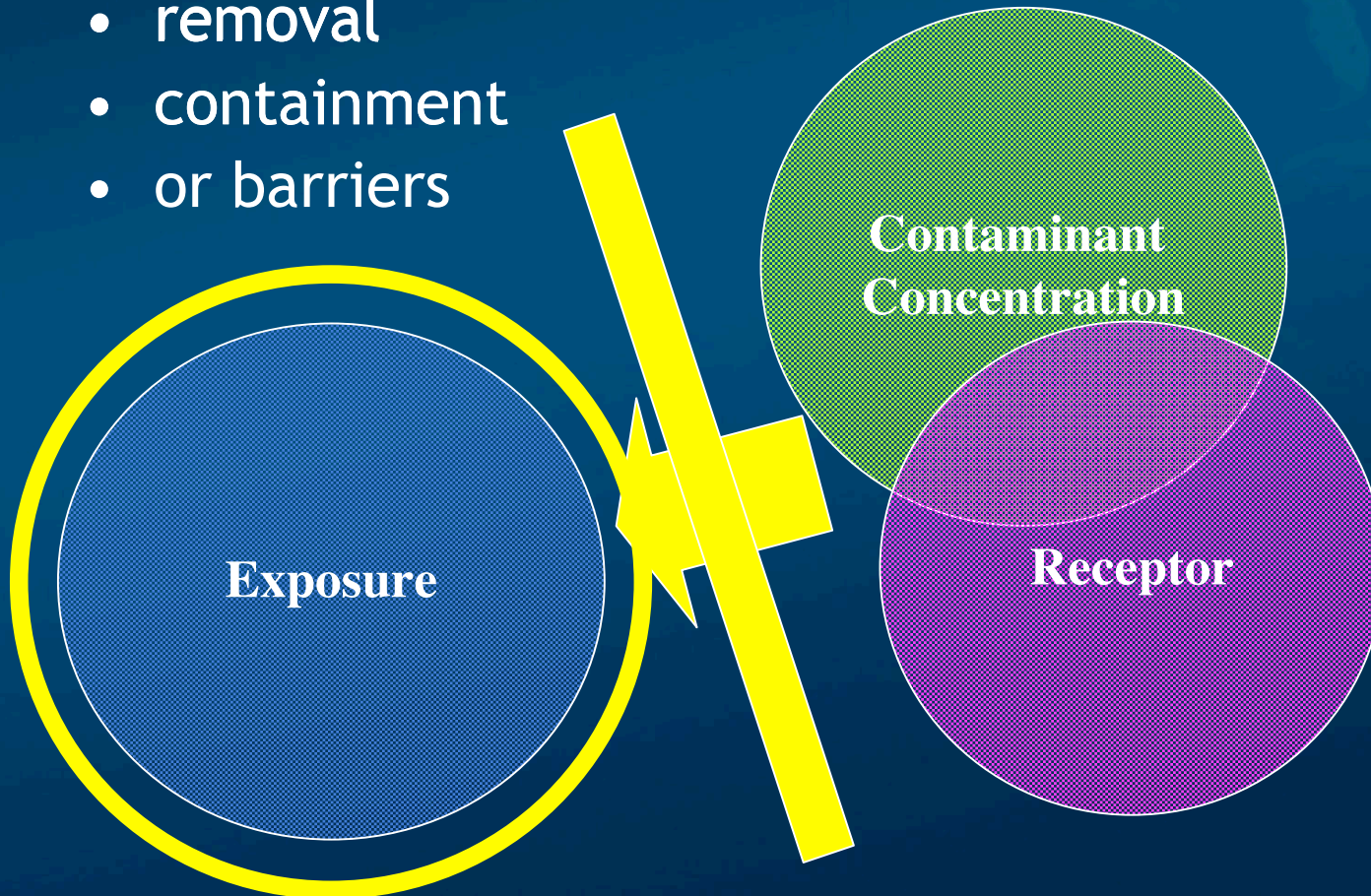


Risk and RBCA

No Pathway = No Exposure = No Risk

Control exposure by eliminating pathways through:

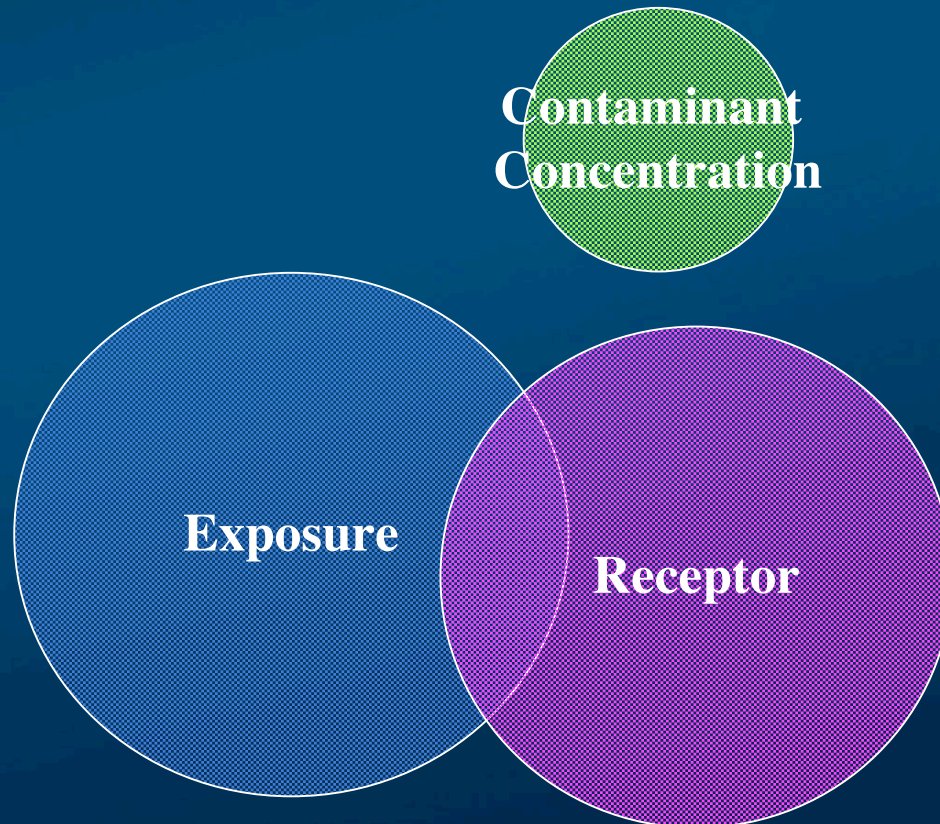
- removal
- containment
- or barriers



Risk and RBCA

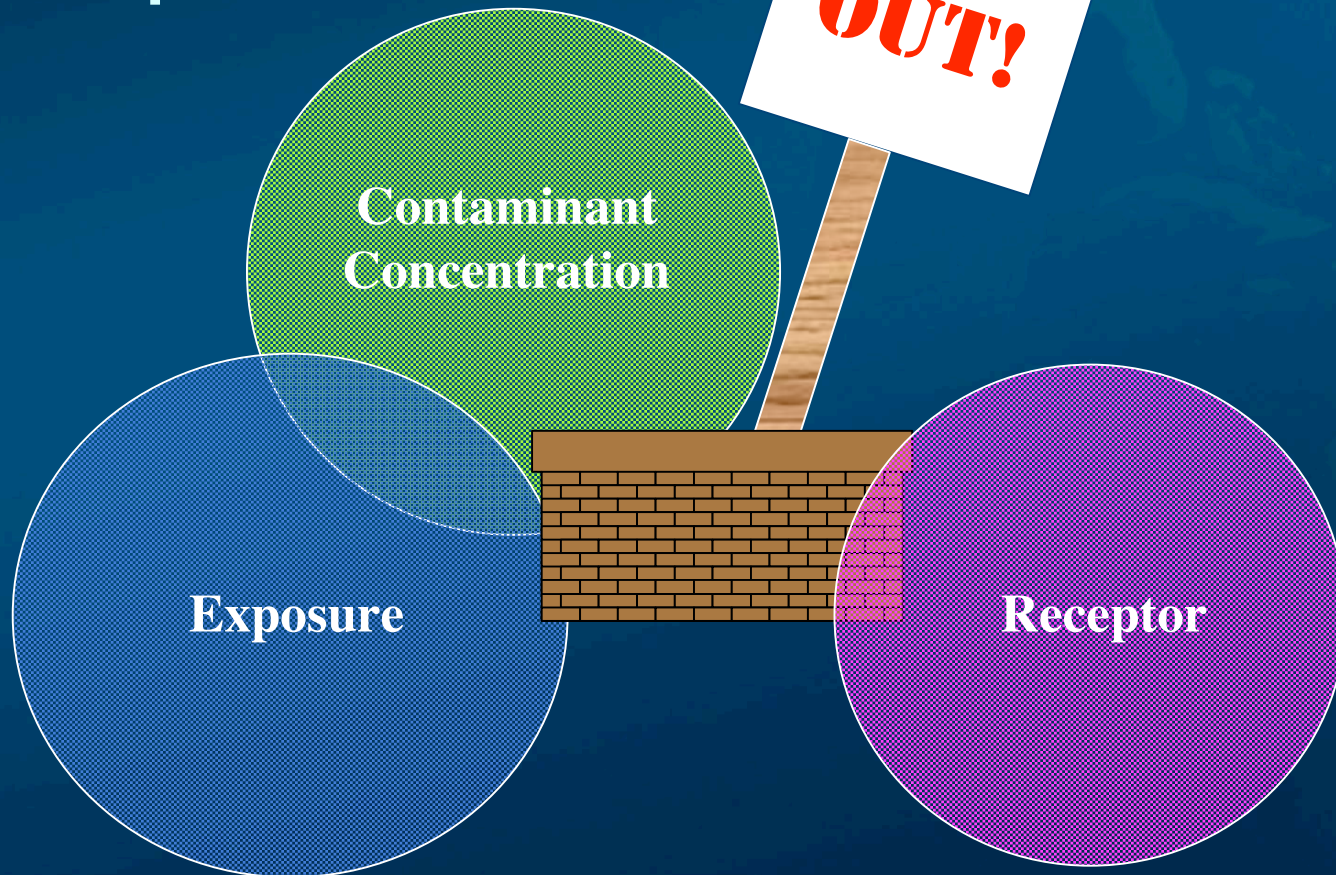
No Concentration = No Risk

Reducing contaminant concentration also reduces or eliminates risk.



Risk and RBCA

Barriers to Receptors =
No Receptors = No Risk



Atlantic RBCA

Atlantic RBCA creates a level playing field for contaminated site remediation across the four provinces

Pre-Approved software ensures everyone is using the same methods



Atlantic RBCA

Atlantic RBCA consists of tools and processes

TOOLS:

- Software that provides a scientific assessment of the risks, depending on pathways and receptors
- Clean-up goals based on reducing/managing risks at acceptable level
- Look-up Tables at Tier 1 for standard conditions
- Pre-approved risk assessment methodology



Atlantic RBCA



Atlantic RBCA:

- software is designed for petroleum hydrocarbons, which are the most common contaminants
- software can analyze other contaminants
- is harmonized with the CCME Canada-Wide Standard for petroleum in soil to provide equal or better protection of human health and environment as CWS
- includes impacts on soil, ground water, surface water, indoor air and soil vapour

Atlantic RBCA

Atlantic RBCA consists of tools and a processes

PROCESSES:

- Atlantic Partnership in RBCA Implementation (PIRI)
- Forum for discussion and debate
- Consensus decision-making
- Harmonized Atlantic management approaches



Benefits of Atlantic RBCA

Atlantic RBCA has been in used for 9 years:

- Over 3,000 sites remediated
- Closure rate is 10X pre-Atlantic RBCA
- To date, no re-openers
- File processing time is much reduced
- Continuous refinement of the tools and processes

**Sites put into use faster = faster
return on investment**



Benefits of Atlantic RBCA



Atlantic RBCA provides:

- the **ASSURANCE** of a science-based process, that gives clients and neighbours confidence;
- the **CONVENIENCE** of a consistent, comprehensive approach in all four provinces; easy to use software;
- the **ECONOMY** of cost-effective, site-specific clean-up and rapid regulator processing of files;
- And the **CREDIBILITY** - a track record of reliability, coupled with a commitment to continuous improvement.

Benefits of Atlantic RBCA

Atlantic RBCA is widely accepted by Federal custodial departments in Atlantic Canada

The Atlantic PIRI process is recognized for Best Practices by the Federal Community of Regulators

Atlantic PIRI was the 2006 “Brownie” Award winner for policy development



Case Studies

- Former US Air & Naval Base, Argentia Newfoundland
- Abe Zakem House, Charlottetown PEI
- Gladstone Stores, Halifax N.S.
- Former Forestry Airfield, Charlo N.B.

Former US Air and Naval Base Argentia Newfoundland



- 9,100 acres
- Multiple contaminants
- Large petroleum storage area



Former US Air and Naval Base Argentia, NL



\$106 Million remediation
over 10-years

Lead by PWGSC with
community input through
the Argentia Management
Authority

Atlantic RBCA used for
hydrocarbons

Site is ready for new
industrial and commercial
uses



Abe Zakem House Charlottetown PEI



Former City Public Works Garage with hydrocarbon contamination in soil and groundwater

Urban vacant lot (brownfield)

Project of Kiwanis with city, province, CMHC

Goal: affordable seniors housing

High generic cleanup cost



Abe Zakem House, Charlottetown PEI



Atlantic RBCA allowed contaminated soils to be left in place

Engineering controls reduce exposure:

- thicker concrete slab
- impermeable vapour barrier
- mechanical ventilation system

Remedial cost reduced

Fully rented on opening

Assurance, Convenience
Economy and Credibility



Gladstone Stores, Halifax N.S.



Former DND storage decommissioned in 1999

Petroleum hydrocarbons, widespread PAHs & metals, and VOCs

Atlantic RBCA

- Tier II health risk assessment
- Site Specific Targets for hydrocarbons
- Single family lots had all fill removed
- Impacted soils on multi-family lots placed under hard surfaces or landscape and monitored

Extensive consultation



Former DND Gladstone Stores Halifax N.S.



Gladstone Ridge

- 17 single family houses at street front
- Two high rise condos, 139 units each
- Seniors residence



Former Forestry Airfield Charlo, N.B.



Used as a base for DDT
aerial spraying in 1950s
near rural subdivision

High local concern - project
involved NB Env, Health,
village and residents

Soil and water impacts (DDT
> CCME) + hydrocarbons



Former Forestry Airfield Charlo, N.B.



**ATLANTIC
RBCA**
RISK BASED CORRECTIVE ACTION

Atlantic RBCA risk assessment for site specific targets for hydrocarbons

- Protective soil cover and land controls

Purchased impacted land impacted and adjacent properties

Created a community park - client pays for perpetual care (non-DDT)

**Assurance, Convenience,
Economy and Credibility**



For further information:

Check out the Atlantic RBCA
website:

www.atlanticrbca.com



For further information:



Argentina: www.pwgsc.gc.ca/argentina/text/index-e.html

Charlottetown: www.mah.gov.on.ca/Asset1458.aspx

Halifax:

Charlo : www.atlanticrbca.com/data_eng/conf_2003/win-win_niel_brodie_mgi_2003_piri_halifax.pdf