



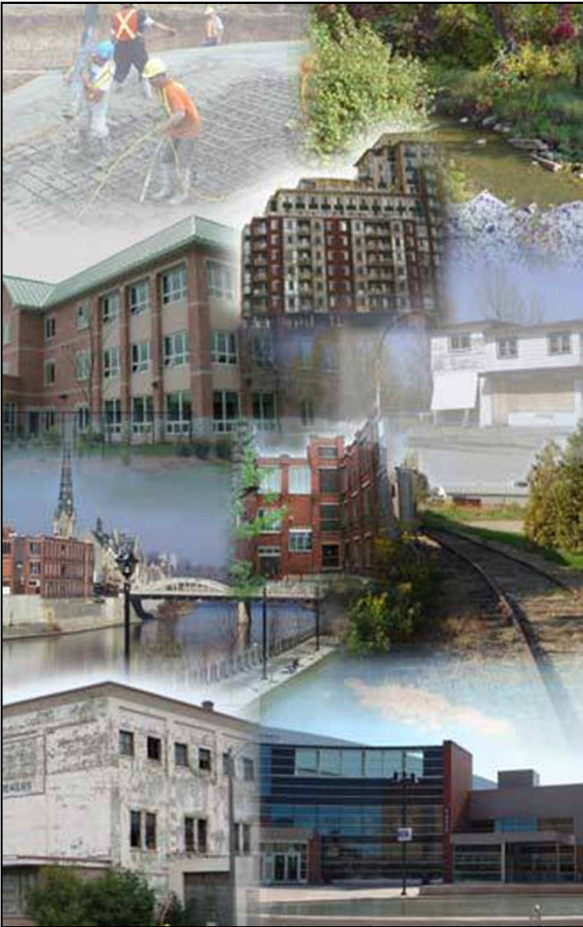
Brownfields (Ontario Regulation 153/04)

Tier 2 Update

2012 Canadian Brownfields Network

June 11th, 2012

Purpose



- The purpose of this presentation is to provide:
 - **Post July 1, 2011 Implementation** - Update on the new Modified Generic Risk Assessment (Tier 2) option

Modified Generic “Tier 2” Risk Assessments



Amendment

- New Tier 2: Modified Generic Risk Assessment (MGRA) provides a streamlined alternative to meeting generic standards and Tier 3 RA

Experience to date

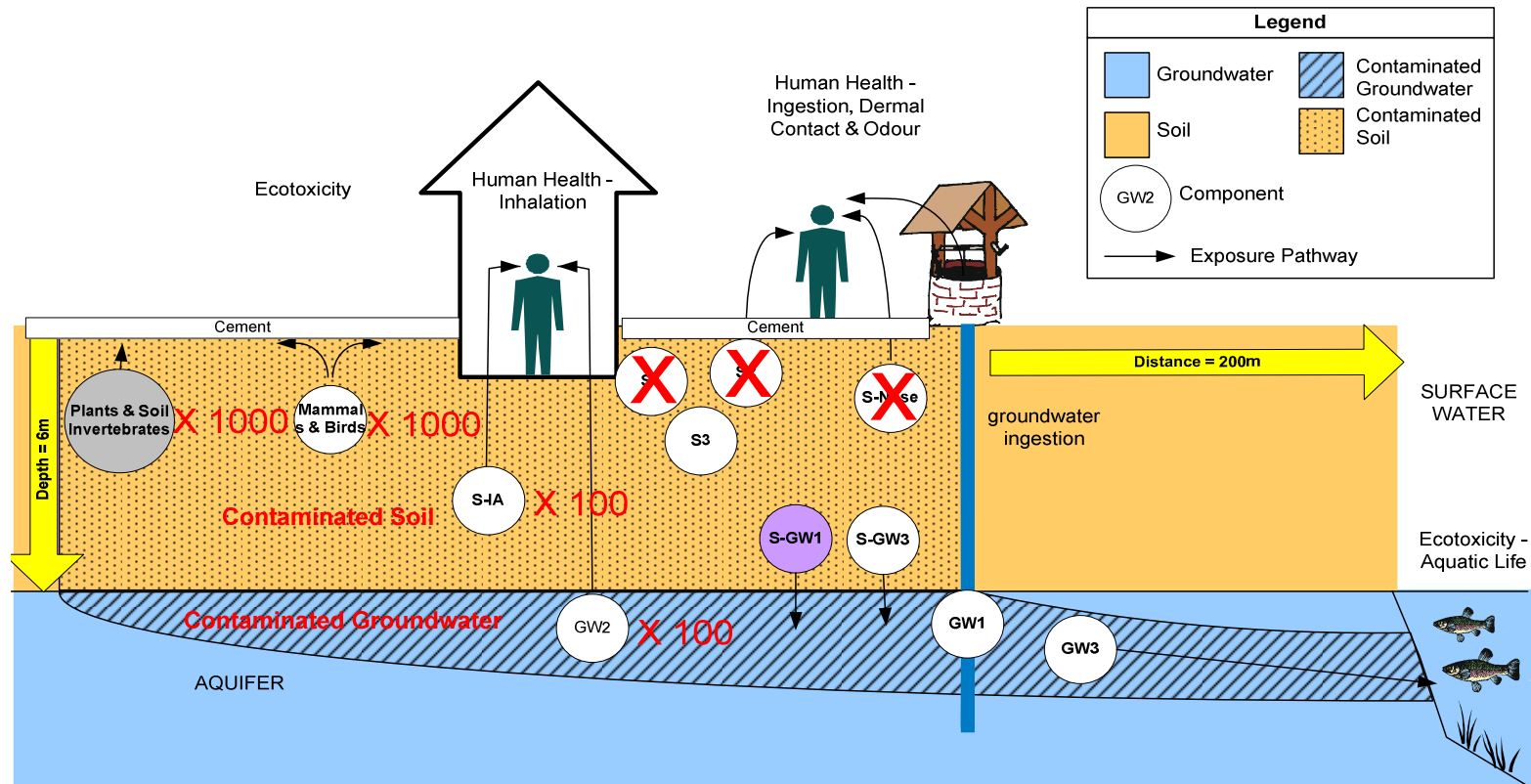
- Tier 2 model used in ~1/2 RA submissions since July 1, 2011
- 15 RAs & PSFs submitted using only Tier 2 for modelling:
 - 10 RAs: 5 accepted within eight (8) weeks; 5 currently under review
 - 5 PSFs submitted using Tier 2, with more submissions in the pipeline
 - 1-4 (avg 3) types of COCs: Metals & PAH > EC/SAR, PHC, VOC > PCBs
- Tier 2 tools (e.g. soil vapour options & RMMs) used in Tier 3 RAs
- Tier 2 frequently used as a screening tool: study and/or transaction of sites
- The Ontario MOE received a “Brownie” Award from the Canadian Urban Institute for the MGRA model

Modified Generic Risk Assessment “Approved Model”

Features of the “Approved Model”

- **11 site parameters** that can be altered by the QP_{RA}
- Measures that modify components or pathways:
 - **6 RMMs** (CPU required)
 - **3 Caps**: hard cap, fill cap, shallow soil cap
 - **3 Building restrictions**: 1) no buildings; 2) presence of parking garage; 3) ground floor non-residential
 - **2 Other Pathway Modifiers**
 - **Modified Ecological Protection**
 - **Soil vapour screening levels** to modify soil and/or groundwater to indoor air pathway

Conceptual Site Model: Site Specific Conditions + SV Screening + Risk Management



Example of Tier 2 Results for 12 common contaminants

Full Depth Potable, Residential - FOC = 0.01 in soil and 0.002 in aquifer +200m to surface water - Risk Management = underground parking garage and asphalt cap

Contaminant	Generic Soil Standard (Table 2)	Tier 2 Standards: Site Specific Parameters Only	Tier 2 Standards: with Risk Management
Benzene	(0.17) 0.21	(0.17) 0.41	(1.3) 1.6
Benzo(a)pyrene	0.3	0.3	3.6
Lead	120	120	1000
PHC F1	(65) 55	(210) 140	(590) 950
PHC F2	(150) 98	(150) 89	(2100) 3100
PHC F3	(1300) 300	(1300) 300	(7200) 8400
PHC F4	(5600) 2800	(5600) 2800	(8000) 12000
PCBs	0.35	0.35	4.1
Tetrachloroethylene	(2.3) 0.28	(2.3) 0.53	(2.5) 2.1
Vinyl Chloride	(0.022) 0.02	(0.022) 0.02	(0.25) 0.21
Xylene	(25) 3.1	(25) 6.2	(130) 230
Zinc	340	340	(24000) 15000

MGRA (Tier 2): Comparison with Tier 3 RA (Schedule C)

	MGRA (Tier 2)	Full RA (Tier 3)
Submission Process	PSF & RA submitted together Use MGRA reporting template	PSF submitted → MOE returns comments → QP submits RA
RMM	Only 6 RMMs in “Approved Model”	Any RMM may be proposed
CPU	Standardized; No EBR posting	EBR posting (30 days)
Mandatory Appendices	Summary of Phase one and two ESA Reports + Phase two CSM portion of Phase two ESA Report & MGRA Appendix from Phase two ESA Report	Summary of Phase one and two ESA Reports + Phase two CSM portion of Phase two ESA Report & For RMM: detailed plans & specs for control measures + engineering report
Review Timelines	Tier 2 RA = 8 weeks <i>(If in WAA, 22 weeks)</i>	16 weeks (or 22 weeks if part of Wider Area of Abatement (WAA))
Sensitive Site	May <u>NOT</u> be used if Section 41 of the regulation applies	May be used if Section 41 of regulation applies

Modified Generic Risk Assessment, *continued*

(Schedule C, s. 4&7)

Requirements for MGRA (Tier 2):

- An MGRA:
 - Uses the “**Approved Model**”^{*} in a manner that is **appropriate to the characteristics** of the RA property;
 - Is submitted in a **template** provided by the Ministry
 - Only changes model default values in accordance with the **prescribed Phase 2 ESA work** (Schedule E, Table 4)
- Appendix – MGRA appendix from Phase 2 ESA report (Schedule E, Table 1)

** Note that the “MGRA model” or “Approved Model” can be used in either a MGRA (Tier 2 RA) or a full (Tier 3) RA. For an RA to be considered an MGRA, the above requirements must be met.*

Modified Generic Risk Assessment, *continued*

(Schedule C, s. 7)

An MGRA shall NOT be submitted if:

- **“Sensitive” Site** (Section 41 of the Reg):
 - pH < 5 or > 9 (surface soil); pH < 5 or > 11 (subsurface);
 - The property is within, or includes, or is adjacent to an Area of Natural Significance;
- Any **Risk Management Measure (RMM)** other than an RMM designed and published in the “Approved Model” is used
- As with all RAs, only QP_{RAS} may submit an MGRA

“Streamlined” Tier 3s: Why not Tier 2?

- The majority of RAs that use the Tier 2 model **do not meet** all MGRA requirements
- Common reasons RAs submitted as Streamlined Tier 3s rather than MGRA:
 - 7 instances: RMMs other than Tier 2 RMMs
 - E.g.: GW/IA Monitoring, PPE/Fan for trench worker, prohibition of potable wells (potable GW sites), Storage garage equivalence, Ground Floor Non-Residential RMM for institutional ground floor
 - 1 instance: PHC F2 (groundwater)

Continuous Improvement

- MOE continues to look for new ways to make Tier 2 applicable at as many sites as possible
 - MOE and Tier 2 Working Group
 - Petroleum Hydrocarbon Demo Project (for gas station sites, etc)
 - Currently revisiting RMM list and considering additional RMMs
 - IT system and online submission
 - The “Streamlined Tier 3 based on Tier 2” option
 - Customer Service: keeping review in house; 16 week Reg review timeline, but aiming for 8 week review timeline

“Streamlined” Tier 3s: Reasons for >1 Review Iteration

- Acceptance typically in **1-2** review iterations
- Common Issues:
 - RMM other than Tier 2 RMM = Streamlined Tier 3
 - Missing report section 7 “Risk Management Plan”
 - Site characterization
 - Data that don’t match Tier 2 inputs
 - A pH exceedence (triggers “sensitive site”) without explanation
 - Wrong screening table (Medium/Fine table for a Coarse soil site)
 - Insufficient off-site discussion (GW sites)
 - If any other modelling carried out, include sufficient data to reproduce results
 - (Phase 2 CSM incomplete)

“Streamlined” Tier 3s: Helpful Hints

- **PSF Stage:**
 - Submit draft RA & Tier 2 inputs/outputs
 - Double check all requirements before sending (eg: legal description, HH & Eco CSMs with & without RMM, Phase 2 CSMs don't meet Reg requirements)
- **RA Stage:**
 - *Use MGRA Report Template as much as possible; interleaf additional info/sections
 - Site CSM must be consistent with Tier 2 CSM
- **When in doubt, please call!**

Modified Generic Risk Assessment, *continued*

(Schedule C, s. 1)

- The “Approved Model” (aka Tier 2 or MGRA model)
 - Data file titled “Modified Generic Risk Assessment Model” and dated October 19, 2009, as amended from time to time
 - Available on the Internet at:
www.ene.gov.on.ca/environment/en/subject/brownfields/STDPROD_087096.html

Microsoft Excel - Modified Generic Risk Assessment Model - October 19, 2009.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF Type a question for help

A1 fx Site Descriptors

	A	B	C	D	E	F	G	H	I	J
1	Site Descriptors	IMPORTANT - Ensure that "Analysis Tool Pak" and "Solver Add-in" are activated (Tools/Add-Ins...)								
2										
3	Proposed Land Use	Residential/Parkland/Institutional								
4	Site Soil Texture	Coarse								
5	Is the ground water potable or non-potable?	Potable								
6	Is this a stratified clean-up?	Full Depth								
7	Is site within 30 m of surface water?	More than 30 m to surface water								
8	Is the soil less than 2 m deep?	More than 2 m								
9										
10	TIER 2 INPUT PARAMETERS		Tier 2 Adjustable Values		Acceptable Tier 2 Lower limit	Acceptable Tier 2 Upper limit	Default Values			
11										
12	Distance from source centre to downgradient water body	36.5	m			36.5	5,000		36.5	m

MOE contacts

Tier 2 inquiries – SDB-Tier2RAReview@ontario.ca

Standards inquiries – Marius.Marsh@ontario.ca

Risk Assessment inquiries – Geoffrey.Floyd@ontario.ca

General Record of Site Condition inquiries – (416) 326 2945 – RSC Officer

For Q&A – MGRA in O.Reg 153/04

Appendix 5: Chart to identify which Tier 2 input parameters affect which pathways (subsurface transport components)

Pathway/Tier2 Input Parameters	S-IA*	S- Odour	S-GW1	S-GW3	S-OA	GW1	GW2	GW3	Free Phase Threshold
Distance to surface water	NA	NA	NA	✓	NA	NA	NA	✓	NA
Soil FOC – water table to soil surface	✓	NA	✓	✓	✓	NA	NA	NA	✓
Soil FOC – upper 0.5m	NA	✓	NA	NA	NA	NA	NA	NA	NA
Depth to water table	NA	NA	NA	NA	NA	NA	✓	NA	NA
Property Soil Type – vadose zone	✓	✓	✓	✓	✓	NA	✓	NA	✓
Property Soil Type – capillary fringe	NA	NA	NA	NA	NA	NA	✓	NA	NA
# Frozen Days	NA	✓	NA	NA	NA	NA	NA	NA	NA
Aquifer horizontal hydraulic conductivity	NA	NA	NA	✓	NA	NA	NA	✓	NA
Aquifer horizontal hydraulic gradient	NA	NA	NA	✓	NA	NA	NA	✓	NA
Aquifer dry bulk density	NA	NA	NA	✓	NA	NA	NA	✓	NA
Aquifer FOC	NA	NA	NA	✓	NA	NA	NA	✓	NA

Relationship between assumptions and generic SCS pathways

Source: MGRA User Guide

* Best method to do Tier 2 on S-IA pathway is using soil vapour screening methods as described in the body of this document.

NA = not applicable for pathway; ✓ = applicable for pathway

Modified Generic RA Reporting Requirements

1. We expect that a standard MGRA template will be auto-populated by the IT system with some areas for the QPRA to complete and sign-off.
2. Additional information: (Schedule C, Section 4, sub-section 6, Para 4)
 - a) A summary of the ESA investigation, including:
 - i. justification for the sampling program
 - ii. a summary of QA/QC,
 - iii. assessment of whether the sampling program is sufficient for RA, and
 - iv. a rationale for and description of any deviations from the assumptions used in the development of the generic SCS.
 - b) The MGRA appendix of the phase two ESA report (see Table 1, report section 10, subheading (d), of Schedule E),
 - c) The phase two conceptual site model (see Table 1, report section 6, subheading (x), of Schedule E)

For Q&A - Amendments

Phase One and Two ESA

Amendment

- Clear and transparent RSC submission process
- Clear environmental site assessment (ESA) requirements which reflect best practices



Experience to date

- 630 RSC's submitted in the quarter prior to July 1, 2011 compared to 137 the previous year
- 51 RSC's filed to the Environmental Site Registry between July 1, 2011 and March 31, 2012.
- Approximately 260 section 21.1 notices are outstanding
- We are finding that RSC submissions contain simple and avoidable errors (e.g. missing components)
- We recognize there is a learning curve and encourage the use of available MOE guidance for your ESA work and schedules D and E in O.Reg 153/04 for reporting requirements

Updated Standards

Amendment

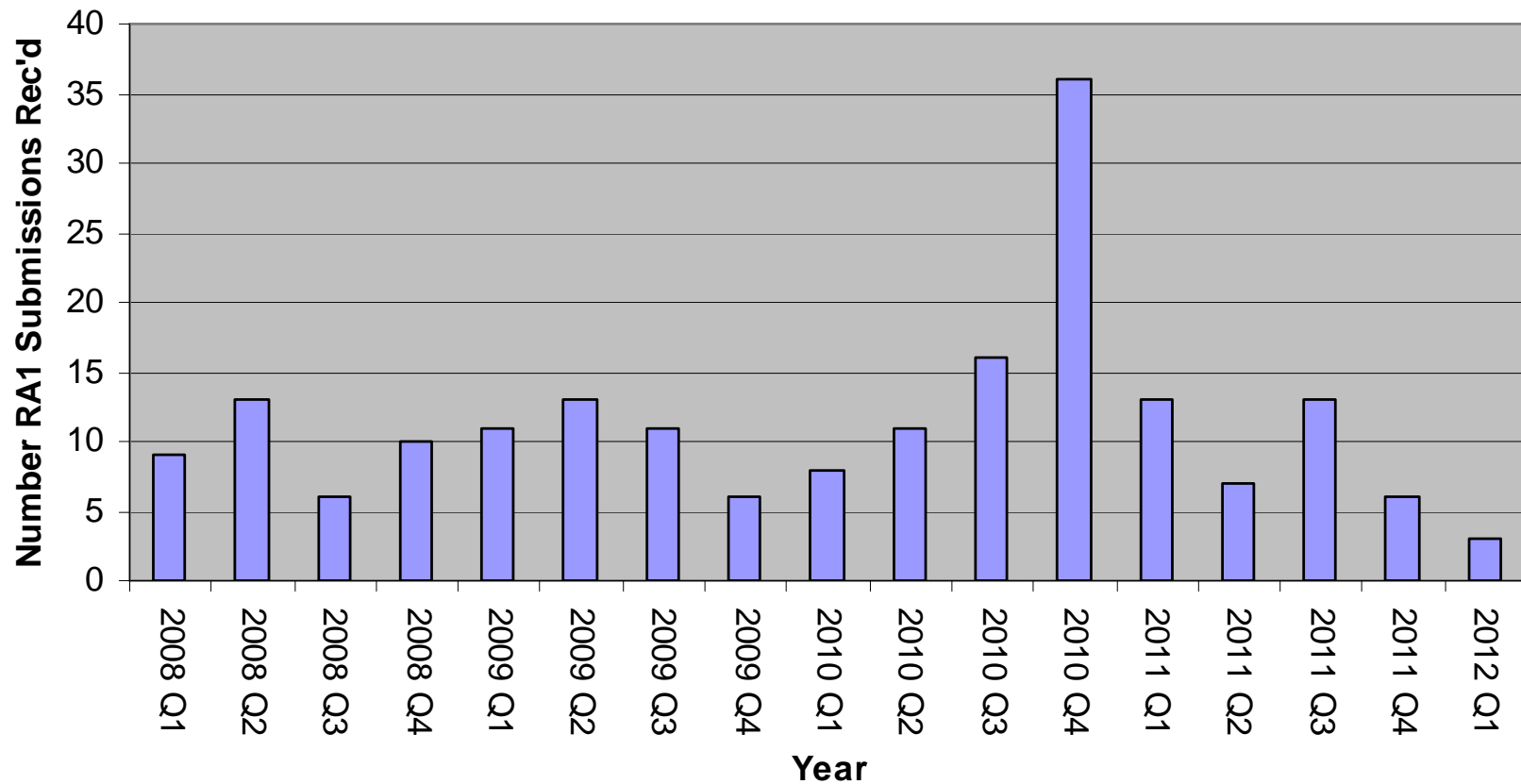
- Revised standards for 120 chemicals.
- Additional generic tables
- New standard model as a basis for modified generic (Tier 2) risk assessment submissions (next slide)



Experience to date

- Standards are more up to date with current science and consistent with risk assessment requirements
- There were a large number of RA submissions prior to the transition deadline (Dec 31, 2010)
- Following the 2010 spike in RA volume the number of submissions has returned to normal

Number of Risk Assessment Submissions per Quarter (2008 - present)



Note: Spike of submissions prior to the Dec 31, 2010 deadline (TN).

Work continues...

- A project is underway which will work towards making Tier 2 more useable at petroleum contaminated sites.
- A broader IT web design is underway and will include a new RSC registry and a Tier 2 user interface.
- The MOE is looking at new models for generating better communication at the risk assessment review stage
- MOE believes that a community of practice would benefit risk assessment practitioners and encourages its establishment
- Additional guidance being developed:
 - Soil Vapour Intrusion Guidance
 - Excess Soil Best Management Practices