NR 700
RULE
UPDATE

WELCOME TO THE NR 700 REVISIONS WEBINAR

Audio for this webinar via WisLine

Call 1-888-291-0312 / passcode 5155 216#

WISCONSIN
DEPT. OF NATURAL RESOURCES

October 9
2013

NR 700 REVISIONS WEBINAR

- 1:00 – 3:00 pm
- You must call WisLine for audio. 1-888-291-0312 (passcode: 5155 216#)
- Please MUTE your telephone (*6) (#6 to unmute)
- Download presentation at http://dnr.wi.gov/topic/brownfields/training.html
- Questions via Live Meeting "Q & A" feature or email Michael.Prager@wisconsin.gov

NR 718 – MANAGEMENT OF CONTAMINATED SOIL OR SOLID WASTES DURING RESPONSE ACTIONS

Mark Gordon
Bureau for Remediation and Redevelopment

SUMMARY OF NR 718 CHANGES

- The process set out in NR 718 is being simplified.
- Sections NR 718.11, 718.13 and 718.14 are being consolidated into 1 section.
- NR 718.12(1) covers those situations where DNR approval is generally not needed.
- NR 718.12(2) specifies when DNR approval must be obtained up front.

NR 718.12(1)

- This paragraph covers situations where DNR approval typically is not needed in order to manage contaminated soil.
- It applies to immediate actions being taken under NR 708 or where unexpected contamination is discovered as part of utility or construction work.
- DNR approval is needed if an exemption to the locational criteria or a modification of the sampling provisions is requested.

NR 718.12(2)

- This paragraph specifies the criteria that need to be met when contaminated soil is managed as part of an interim action or remedial action.
- A soil management plan needs to be approved by DNR prior to initiating the work.
- Contaminated soil can be managed at locations other than the property where it was excavated provided the necessary environmental protections are included.

NR 718.12(2) CONTINUED

- If the action will result in the need for a continuing obligation, written notification must be provided at least 30 days prior to submitting the soil management plan.
- Site or facilities with continuing obligations will be included on the Department's database.
- The appropriate fee for adding the site to the database must be submitted.

NR 718 – IMPLEMENTATION ISSUES

- NR 718 provides broad authority to address contaminated soil as part of a response action.
- Response actions include any action taken to respond to a hazardous substance discharge or to environmental pollution.
- DNR is developing guidance to help clarify the options for managing contaminated soil and waste materials at construction and utility projects.

QUESTIONS?

Questions via Live Meeting "Q & A" feature

or email Michael.Prager@wisconsin.gov

Audio via WisLine @ 1-888-291-0312 / passcode: 5155 216#

NR 700
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UPDATE

NR 720 - SOIL CLEANUP STANDARDS

USING RR'S RCL SPREADSHEET

Resty Pelayo
Bureau for Remediation & Redevelopment

October 9
2013

WHAT'S CHANGED IN NR 720

- Removed Tables 1 & 2.
- Removed the GRO and DRO standards.
- No longer the Preventive Action Limit (PAL), but rather the Enforcement Standard (ES) when calculating soil standards protective of groundwater.
- The actual land use will determine the appropriate land use classification.

WHAT'S CHANGED IN NR 720 *(p. 2)*

- Language has been included that averaging soil sampling results may be appropriate.
  1. This was the topic of much discussion with our external advisory committee.
  2. General language recommends seeking DNR approval of the method prior to implementation.
  3. A note was added indicating that averaging not be the sole method for addressing areas with significant soil contamination.
  4. An example using UCL for mean of concentrations is in the guidance document referenced in the code.

WHAT'S CHANGED IN NR 720 *(p. 3)*

- RCL Process is still in place. Now, the soil exposure defaults will be same as EPA's.
- As replacement to the tables in the rule, DNR has developed a spreadsheet with RCLs.
- The spreadsheet will have individual RCLs. Also, it will determine the <u>cumulative</u> hazard index (HI) and the <u>cumulative</u> cancer risk (CR).

WHERE TO LOOK NOW

Old	New	
~~720.09~~	~~*Now Gone*~~	~~***Petroleum Contamination (Table 1, DRO, GRO)***~~
720.11(1)	720.05(5)	**Land Use Classification**
~~720.11(2)~~	~~*Now Gone*~~	~~***Generic RCLs in old Table 2***~~
720.11(5)(b)	720.07(3)	**Background Concentration**
720.19(2)	720.08	**Performance Standards**
720.19(4)	720.10	**RCL for Protection of Groundwater**
720.19(5)	720.12	**RCL for Protection from Direct Contact**

Soil Residual Contaminant Level Determinations Using The U.S. EPA Regional Screening Level Web Calculator

PUB-RR-890 June 20, 2013

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The RSL Web Calculator: *epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search*....4

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RR Program's RCL Spreadsheet....15

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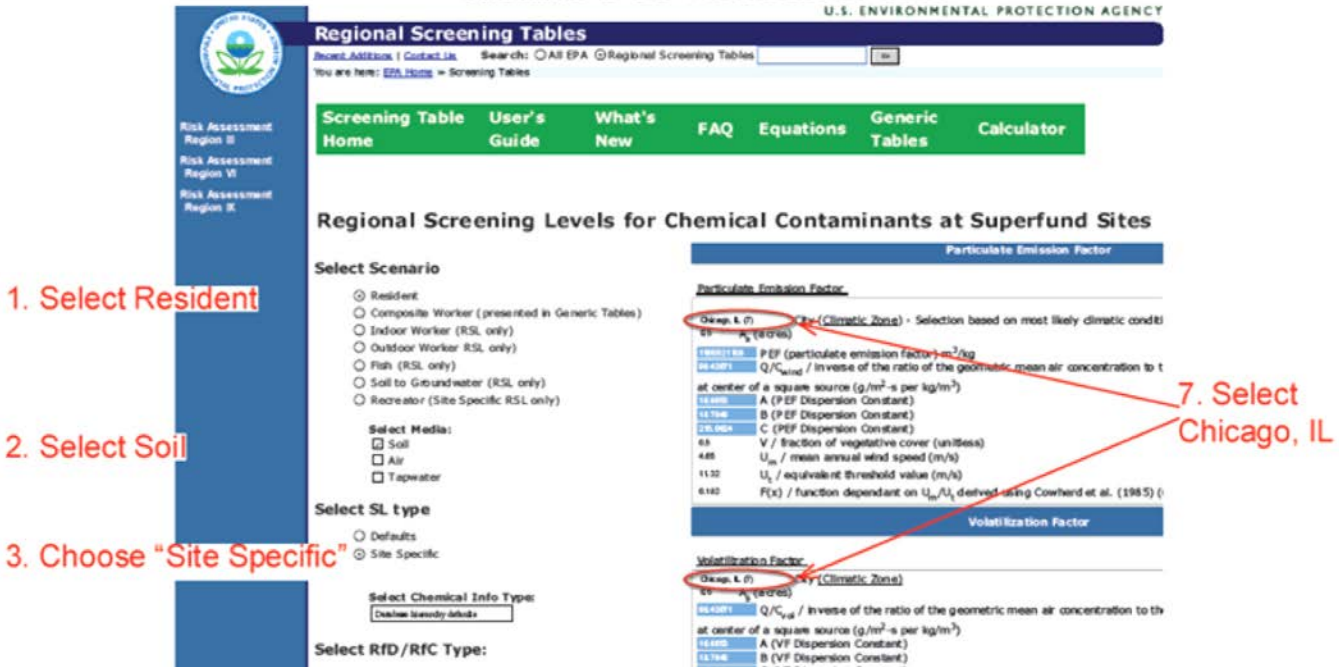
Steps in Using the US EPA's Regional Screening Level Web Calculator to Get Wisconsin Soil RCLs



File | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer | Acrobat

Paste | Cut | Copy | Format Painter | Clipboard | Arial | 10 | Font | Wrap Text | Merge & Center | Alignment | Number | Conditional Formatting | Format as Table | Cell Styles | Styles | Insert | Delete | Cells

A1 | Program by Resty M. Pelayo, WDNR, 608/267-3539. 12/12/2012

Residential setting. Not-To-Exceed D-C RCLs from web-calculator at: *http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search* (Chicago as climatic zone).

Basis: **ca** = cancer; **nc** = non-cancer; **Csat** = soil saturation concentration; **ceiling** = 10%.

------> If web-calculator result or Csat exceeds 10% by weight (the **ceiling** limit concentration defined in RSL Users Guide), Not-to-Exceed D-C RCL defaults to 100,000 ppm.

1. ***Enter data in yellow cells.*** Numeric only values under "INPUT Site Data." For ND, use detection limit. Do not type '-', 'NA' nor 'space bar.' Leave purple cells "as is."

2. ***After completing data entry, click "Get Summary" in Row 872.*** *Click to go there.*

(Contaminants not in the provided list can be ad

C D E

Find ...

Find ...
Then "Options >>"
Look in: "Values" (instead of "Formulas")

Click to Clear INPUT Site Data Entries (Column H)

Comparison / Hazard Index / Cumulative Cancer Risk

Target CR used: 1.00E-06

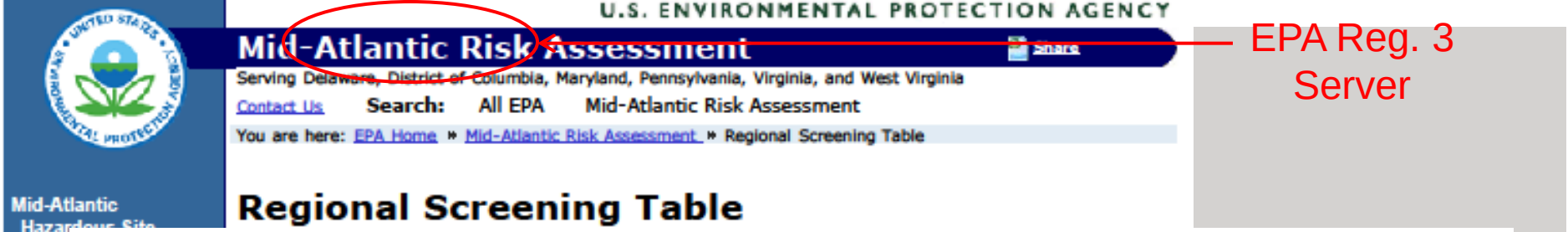
Contaminant	CAS Number	NC RCL (mg/kg)	C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	INPUT Site Data (mg/kg)	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
Benzene	71-43-2	111.	1.49	1.49	ca				
Ethylbenzene	100-41-4	4,220.	7.47	7.47	ca				
Toluene	108-88-3	5,300.	-	818.	Csat				
Xylenes	1330-20-7	890.	-	258.	Csat				
Methyl tert-Butyl Ether (MTBE)	1634-04-4	23,800.	59.4	59.4	ca				
Dichlor									
Dibrom									
Trichlor									
Tetrach									
Vinyl C									
Dichlor									
Dichlor									
Dichlor									
Trichlor									
Carbon Tetrachloride	56-23-5	137.	0.854	0.854	ca				
Trimethylbenzene, 1,2,4-	95-63-6	89.8	-	89.8	nc				
Trimethylbenzene, 1,3,5-	108-67-8		-		Csat				
Naphthalene	91-20-3		5.15		ca				
Benzo[a]pyrene	50-32-8	-	0.015	5	ca				

1 2 3 4

Available at RR's "Resources for Environmental Professionals" WebPage

http://dnr.wi.gov/topic/Brownfields/Professionals.html

Non-Industrial_DC_RCLs | Industrial_DC_RCLs | Summary_Soil_DC_Data | GW_RCLs



EPA Reg. 3 Server

US EPA RSL Website

"... was developed ... as an update of the EPA Region 3 RBC Table, Region 6 HHMSSL Table and the Region 9 PRG Table."

Tips:

1.) RSL may be referred to as RST (T for Table)

2.) Google "EPA RSL Calculator" to get to web-calculator

U.S. ENVIRONMENTAL PROTECTION AGENCY

Regional Screening Tables

Recent Additions | Contact Us Search: All EPA Regional Screening Tables

You are here: EPA Home » Screening Tables

isk Assessment Region III

isk Assessment Region VI

isk Assessment Region IX

http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Screening Table Home | User's Guide | What's New | FAQ | Equations | Generic Tables | Calculator

Regional Screening Levels for Chemical Contaminants at Superfund Sites

Using the RSL Calculator

Select Scenario

- (•) Resident
- ( ) Composite Worker (presented in Generic Tables)
- ( ) Indoor Worker (RSL only)
- ( ) Outdoor Worker RSL only)
- ( ) Fish (RSL only)
- ( ) Soil to Groundwater (RSL only)
- ( ) Recreator (Site Specific RSL only)

1. Select 1 Scenario:
   a.) "Resident" for Non-industrial D-C RCL
   b.) "Composite Worker" for Industrial D-C RCL
   c.) "Soil-to-Groundwater" for GW-protective RCL

Select Media:

- [x] Soil
- [ ] Air
- [ ] Tapwater

2. Select "Soil."

Select SL type

- ( ) Defaults
- (•) Site Specific

3. Choose "Site Specific."
   (Database hierarchy defaults OK)

Select Chemical Info Type:

Database hierarchy defaults

Select RfD/RfC Type:

- (•) Chronic
- ( ) Subchronic

4. Choose "Chronic."

*Chronic selection will retrieve Chronic-only RfDs/RfCs; Subchronic selection will retrieve subchronic values where possible.

Select Individual Chemicals

ALAR
Acenaphthene
Acenaphthylene
Acephate
Acetaldehyde
Acetochlor
Acetone
Acetone Cyanohydrin
Acetonitrile
Acetophenone
Acetylaminofluorene, 2-
Acifluorofen
Acridine
Acrolein
Acrylamide
Acrylic Acid
Acrylonitrile

<< >>

Selected
Arsenic, Inorganic
Benzene
Benzo[a]pyrene
Chromium(VI)
Naphthalene
Tetrachloroethylene
Trichloroethylene

5. Select Chemicals.
   Make sure selections are in the right-hand box.

Or Select All

- [ ] ALL

Retrieve

6. Click "Retrieve."

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Resident Exposure to Soil

Web Calculator Page 2, top part

Exposure Assessment Details

Age Segment (yr)	AF (mg/cm^2)	BW (kg)	ED (yr)	EF (day/yr)	ET (hr/event)	IRS (mg/day)	SA (cm^2/day)
0-2	0.2	15	2	350	24	200	2800
2-6	0.2	15	4	350	24	200	2800
6-16	0.07	70	10	350	24	100	5700
16-30	0.07	70	14	350	24	100	5700
Child (0-6)	0.2	15	6	350	24	200	2800
Adult (6-30)	0.07	70	24	350	24	100	5700

NOTES:

1. Input fields with a "pink" background are a required entry.
2. Input fields with a "blue" background are calculated dynamically.
3. The supporting equations below are used to compute the child and adult exposure parameters.

(Abbreviations explained in User's Guide)

Ingestion, Dermal, and Inhalation Exposure

Soil Carcinogenic Dermal
Soil Carcinogenic Ingestion
Soil Carcinogenic Inhalation
Soil Carcinogenic Total
Soil Non-Carcinogenic Dermal
Soil Non-Carcinogenic Ingestion
Soil Non-Carcinogenic Inhalation
Soil Non-Carcinogenic Total

Clicking will display soil equations.

361	DFS_{adj} (age-adjusted soil dermal factor) mg-year/kg-day
30	ED_r (exposure duration - resident) year
350	EF_r (exposure frequency) day/year
24	ET_r (exposure time - resident) hour
1	THQ (target hazard quotient) unitless
114	IFS_{adj} (age-adjusted soil ingestion factor) mg-year/kg-day
70	LT (lifetime - resident) year
1.0E-6	TR (target cancer risk) unitless

Exposure to Soil Parameters

Accept ALL Defaults Here by Doing Nothing

Mutagenic Parameters

Soil Mutagenic Dermal
Soil Mutagenic Ingestion
Soil Mutagenic Inhalation
Soil Mutagenic Total

1445	$DFSM_{adj}$ (mutagenic age-adjusted soil dermal factor) mg-year/kg-day
489.5	$IFSM_{adj}$ (mutagenic age-adjusted soil ingestion factor) mg-year/kg-day

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Web Calculator Page 2, bottom part

Particulate Emission Factor

Particulate Emission Factor

Chicago, IL (7) City (Climatic Zone) - Selection based on most likely climatic conditions for

0.5 A_s (acres)

98.43071 Q/C_{wind} / inverse of the ratio of the geometric mean air concentration to th at center of a square source (g/m^2-s per kg/m^3)

0.5 V / fraction of vegetative cover (unitless)

4.69 U_m / mean annual wind speed (m/s)

11.32 U_t / equivalent threshold value (m/s)

0.194 F(x) / function dependant on U_m/U_t derived using Cowherd et al. (1985) (u

Volatilization Factor

Volatilization Factor

Chicago, IL (7) City (Climatic Zone)

0.5 A_s (acres)

98.43071 Q/C_{vol} / inverse of the ratio of the geometric mean air concentration to the at center of a square source (g/m^2-s per kg/m^3)

0.006 foc / (fraction organic carbon in soil) g/g

1.5 ?$_b$ / (dry soil bulk density) g/cm^3

0.15 ?$_w$ / (water-filled soil porosity) L_{water}/L_{soil}

2.65 ?$_s$ / (soil particle density) g/cm^3

9.5e8 T / (exposure interval) s

NOTES:

1. ?$_a$(air-filled soil porosity) L_{air}/L_{soil} = n-?$_w$
2. H' (dimensionless Henry's law constant) - chemical-specific
3. n (total soil porosity) L_{pore}/L_{soil} = 1-(?$_b$/ ?$_s$)
4. K_d (soil-water partition coefficient) L/kg = K_{oc} × f_{oc} (organics) - chemical-specific
5. K_{oc} (soil organic carbon/water partition coefficient) L/kg - chemical specific

7. Select "Chicago, IL," in both sections

8. Click "Retrieve."

The output can be saved to a spreadsheet or pdf. Nice!

ca: cancer

nc: non-cancer

DC RCLs

Csat

1.49E+00 ca*

7.02E+01 nc

Site-specific

Resident Risk-Based Screening Levels (RSL) for Soil
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Ingestion SF (mg/kg-day) -1	SFO Ref	Inhalation Unit Risk (ug/m ^{3}) $^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m ^{3})	RfC Ref	GIABS	ABS	Volatilization Factor (m ^{3}/kg)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m ^{3}/kg)	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL HQ=1 (mg/kg)	Dermal SL HQ=1 (mg/kg)	Inhalation SL HQ=1 (mg/kg)	Noncarcinogenic SL HI=1 (mg/kg)	Screening Level (mg/kg)
Arsenic, Inorganic	7440-38-2	1.50E+00	I	4.30E-03	I	3.00E-04	I	1.50E-05	C	1	0.03	-	-	1.43E+09	4.27E-01	4.49E+00	8.07E+02	3.90E-01	2.35E+01	2.79E+02	2.23E+04	2.16E+01	3.90E-01 ca*
Benzene	71-43-2	5.50E-02	I	7.80E-06	I	4.00E-03	I	3.00E-02	I	1	-	5.49E+03	1.82E+03	1.43E+09	1.16E+01	-	1.71E+00	1.49E+00	3.13E+02	-	1.72E+02	1.11E+02	1.49E+00 ca*
Cadmium (Diet)	7440-43-9	-		1.80E-03	I	1.00E-03	I	2.00E-05	C	0.025	0.001	-	-	1.43E+09	-	-	1.93E+03	1.93E+03	7.82E+01	6.98E+02	2.98E+04	7.02E+01	7.02E+01 nc
Chromium(VI)	18540-29-9	5.00E-01	J	8.40E-02	S	3.00E-03	I	1.00E-04	I	0.025	-	-	-	1.43E+09	2.98E-01	-	1.63E+01	2.93E-01	2.35E+02	-	1.49E+05	2.34E+02	2.93E-01 ca
Chromium, Total	7440-47-3	-		-		-		-		0.013	-	-	-	1.43E+09	-	-	-	-	-	-	-	-	
Dichloroethane, 1,2-	107-06-2	9.10E-02	I	2.60E-05	I	6.00E-03	X	7.00E-03	P	1	-	7.11E+03	2.98E+03	1.43E+09	7.04E+00	-	6.65E-01	6.08E-01	4.69E+02	-	5.19E+01	4.67E+01	6.08E-01 ca*
Ethylbenzene	100-41-4	1.10E-02	C	2.50E-06	C	1.00E-01	I	1.00E+00	I	1	-	8.81E+03	4.80E+02	1.43E+09	5.82E+01	-	8.57E+00	7.47E+00	7.82E+03	-	9.18E+03	4.22E+03	7.47E+00 ca
Lead and Compounds	7439-92-1	-		-		-		-		1	-	-	-	1.43E+09	-	-	-	-	-	-	-	4.00E+02	4.00E+02 nc
Benzo[a]pyrene	50-32-8	7.30E+00	I	1.10E-03	C	-		-		1	0.13	-	-	1.43E+09	2.04E-02	5.32E-02	1.25E+03	1.48E-02	-	-	-	-	1.48E-02 ca**
Naphthalene	91-20-3	-		3.40E-05	C	2.00E-02	I	3.00E-03	I	1	0.13	7.20E+04	-	1.43E+09	-	-	5.15E+00	5.15E+00	1.56E+03	4.30E+03	2.25E+02	1.88E+02	5.15E+00 ca*
Tetrachloroethylene	127-18-4	2.10E-03	I	2.60E-07	I	6.00E-03	I	4.00E-02	I	1	-	3.65E+03	1.66E+02	1.43E+09	3.05E+02	-	3.41E+01	3.07E+01	4.69E+02	-	1.52E+02	1.15E+02	3.07E+01 ca**
Toluene	108-88-3	-		-		8.00E-02	I	5.00E+00	I	1	-	6.66E+03	8.18E+02	1.43E+09	-	-	-	-	6.26E+03	-	3.47E+04	5.30E+03	5.30E+03 sat
Trichloroethylene	79-01-6	4.60E-02	I	4.10E-06	I	5.00E-04	I	2.00E-03	I	1	-	3.43E+03	6.92E+02	1.43E+09	3.24E+00	-	8.04E-01	6.44E-01	3.91E+01	-	7.16E+00	6.05E+00	6.44E-01 ca**
Xylenes	1330-20-7	-		-		2.00E-01	I	1.00E-01	I	1	-	9.05E+0[illegible]	2.58E+02	[illegible]43E+09	-	-	-	-	1.56E+04	-	9.44E+02	8.90E+02	8.90E+02 sat

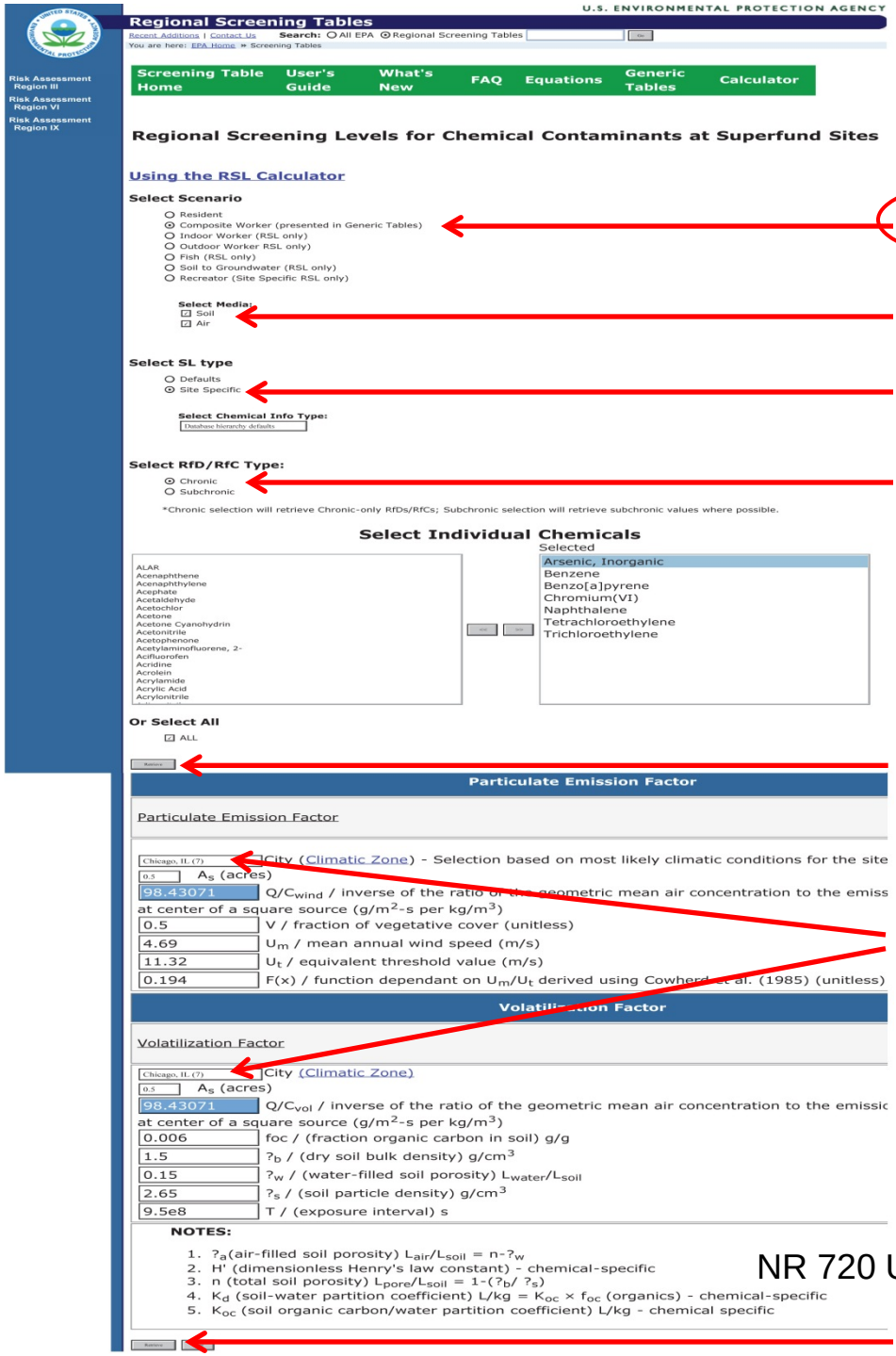
Output generated 31AUG2012:09:55:10

2.58E+02

8.90E+02 sat

sat: exceeds Csat

Industrial D-C RCLs



1. Composite Worker
2. Soil
3. Site Specific
4. Chronic
5. Chemicals
6. Retrieve
7. Select "Chicago, IL" in both PEF and VF sections

NR 720 Update

8. "Retrieve"

DC RCLS AND RSL WEB-CALCULATOR

- Web-calculator allows us to determine individual soil direct-contact (DC) RCL
- With multiple contaminants, our concerns:
  - Individual exceedance, <u>and</u>
  - Cumulative exceedance
- *So we still need: A separate cumulative evaluation*

RR PROGRAM'S SPREADSHEET OF RCLS

- The RCLs are the results from the RSL web-calculator
- Given soil data, the spreadsheet tallies individual *and* cumulative exceedances

File | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer | Acrobat

Paste | Cut | Copy | Format Painter | Clipboard | Arial | 10 | Font | Wrap Text | Merge & Center | Alignment | Number | Conditional Formatting | Format as Table | Cell Styles | Styles | Insert | Delete | Format | Cells

A1 | Program by Resty M. Pelayo, WDNR, 608/267-3539. 12/12/2012

Residential setting. Not-To-Exceed D-C RCLs from web-calculator at: *http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search* (Chicago as climatic zone).

Basis: **ca** = cancer; **nc** = non-cancer; **Csat** = soil saturation concentration; **ceiling** = 10%.

------> If web-calculator result or Csat exceeds 10% by weight (the **ceiling** limit concentration defined in RSL Users Guide), Not-to-Exceed D-C RCL defaults to 100,000 ppm.

1. ***Enter data in yellow cells.*** Numeric only values under "INPUT Site Data." For ND, use detection limit. Do not type '-', 'NA' nor 'space bar.' Leave purple cells "as is."

2. ***After completing data entry, click "Get Summary" in Row 872.*** Click to go there.

(Contaminants not in the provided list can be a

C D E

Find ...

Find ...
Then "Options >>"
Look in: "Values" (instead of "Formulas")

Click to Clear INPUT Site Data Entries (Column H)

Contaminant	CAS Number	NC RCL (mg/kg)	C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	INPUT Site Data (mg/kg)	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
							Comparison / Hazard Index / Cumulative Cancer Risk		Target CR used: 1.00E-06
Benzene	71-43-2	111.	1.49	1.49	ca				
Ethylbenzene	100-41-4	4,220.	7.47	7.47	ca				
Toluene	108-88-3	5,300.	-	818.	Csat				
Xylenes	1330-20-7	890.	-	258.	Csat				
Methyl tert-Butyl Ether (MTBE)	1634-04-4	23,800.	59.4	59.4	ca				
Dichloroethane, 1,2-	107-06-2	46.7	0.608	0.608	ca				
Dibromoethane, 1,2-	106-93-4	107.	0.047	0.047	ca				
Trichloroethylene	79-01-6	6.05	0.644	0.644	ca				
Tetrachloroethylene	127-18-4	115.	30.7	30.7	ca				
Vinyl Chloride	75-01-4	93.3	0.067	0.067	ca				
Dichloroethylene, 1,1-	75-35-4	342.	-	342.	nc				
Dichloroethylene, 1,2-trans-	156-60-5	211.	-	211.	nc				
Dichloroethylene, 1,2-cis-	156-59-2	156.	-	156.	nc				
Trichloroethane, 1,1,1-	71-55-6	12,300.	-	640.	Csat				
Carbon Tetrachloride	56-23-5	137.	0.854	0.854	ca				
Trimethylbenzene, 1,2,4	95-63-6	89.8	-	89.8	nc				
Trimethylbenzene, 1,3,5	108-67-8		-	182.	Csat				
Naphthalene	91-20-3		5.15	5.15	ca				
Benzo[a]pyrene	50-32-8	-	0.015	0.015	ca				

Compare with **E**

Ratio with **C**

Ratio with **D** x 1e-06

1 2

Non-Industrial_DC_RCLs | Industrial_DC_RCLs | Summary_Soil_DC_Data | GW_RCLs

Example Summary Sheet

Direct-Contact ***Exceedance*** - ***Hazard*** - ***Risk*** Calculation Summary from Soil Data

BRRTS # :

# of Soil-Concentration Entries: 13

Number of Individual Exceedance	(Cumulative) Hazard Index	(Cumulative) Cancer Risk
5	0.2786	7.8E-05

Any red font signifies exceedance.

Bottom-Line: **NO! This non-industrial site sampling location will need either further cleanup to lower contaminant levels or the construction of a cap/cover to address the direct-contact pathway.**

Contaminant	CAS Number	NC RCL (mg/kg)	C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	INPUTTED Site Data (mg/kg)	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
Benzene	71-43-2	111.	1.49	1.49	ca	1.		0.009	6.7E-07
Ethylbenzene	100-41-4	4,220.	7.47	7.47	ca	1.		0.0002	1.3E-07
Toluene	108-88-3	5,300.	-	818.	Csat	1.		0.0002	
Xylenes	1330-20-7	890.	-	258.	Csat	1.		0.0011	
Dichloroethane, 1,2-	107-06-2	46.7	0.608	0.608	ca	1.	E	0.0214	1.6E-06
Trichloroethylene	79-01-6	6.05	0.644	0.644	ca	1.	E	0.1653	1.6E-06
Tetrachloroethylene	127-18-4	115.	30.7	30.7	ca	1.		0.0087	3.3E-08
Naphthalene	91-20-3	188.	5.15	5.15	ca	1.		0.0053	1.9E-07
Benzo[a]pyrene	50-32-8	-	0.015	0.015	ca	1.	E		6.8E-05
Arsenic, Inorganic	7440-38-2	21.6	0.39	0.39	ca	1.	E	0.0463	2.6E-06
Chromium(VI)	18540-29-9	234.	0.293	0.293	ca	1.	E	0.0043	3.4E-06
Lead and Compounds	7439-92-1	400.	-	400.	nc	1.		0.0025	
Cadmium (Diet)	7440-43-9	70.2	1,930.	70.2	nc	1.		0.0142	5.2E-10

Non-Industrial DC RCLs | Industrial DC RCLs | Summary Soil DC Data | GW RCLs

3

Example Soil Data

Hazard quotient from spreadsheet

S-1

	Conc., mg/kg	(HQ)
Benzene:	1.3	(0.012)
Toluene:	800.	(0.1521)
Ethylbenz:	7.	(0.0017)
Xylene:	240.	(0.2824)
Lead (Pb):	215.	(0.5375)
	HI =	**0.9857**

S-2

B:	1.4	(0.013)
T:	507.	(0.0964)
E:	3.	(0.0007)
X:	250.	(0.2941)
Pb:	143.	(0.3575)
	HI =	**0.7617**

S-3

B:	0.5	(0.0046)
T:	100.	(0.019)
E:	5.	(0.0012)
X:	85.	(0.1)
Pb:	350.	(0.875)
	HI =	**0.9999**

S-4

B:	0.8	(0.0074)
T:	50.	(0.0095)
E:	3.	(0.0007)
X:	50.	(0.0588)
Pb:	360.	(0.9)
	HI =	**0.9765**

U.S. ENVIRONMENTAL PROTECTION AGENCY

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Risk Assessment Region III

Risk Assessment Region VI

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Groundwater-protective RCLs

Select Scenario

- Resident
- Composite Worker (presented in Generic Tables)
- Indoor Worker (RSL only)
- Outdoor Worker RSL only)
- Fish (RSL only)
- Soil to Groundwater (RSL only) ← 1. Soil to Groundwater
- Recreator (Site Specific RSL only)

Select SL type

- Defaults ← 2. Defaults
- Site Specific

Select RfD/RfC Type:

- Chronic ← 3. Chronic
- Subchronic

*Chronic selection will retrieve Chronic-only RfDs/RfCs; Subchronic selection will retrieve subchronic values where possible.

Select Individual Chemicals 4. Select Chemicals.

ALAR
Acenaphthene
Acenaphthylene
Acephate
Acetaldehyde
Acetochlor
Acetone
Acetone Cyanohydrin
Acetonitrile
Acetophenone
Acetylaminofluorene, 2-
Acifluorofen
Acridine
Acrolein
Acrylamide
Acrylic Acid
Acrylonitrile

<< >>

Selected

Arsenic, Inorganic
Benzene
Benzo[a]pyrene
Cadmium (Water)
Chromium(VI)
Chromium, Total
Dichloroethane, 1,2-
Ethylbenzene
Lead and Compounds

Retrieve ← 5. Retrieve

WEB-CALCULATOR SOIL-TO-GW SCENARIO

- Web-calculator does <u>not</u> know NR 140 ES!
- Web-calculator uses risk-based water concentrations and MCLs in its calculations.
- Easy to make adjustments, so the GW-RCLs in the spreadsheet are ES-based soil levels.
- We also use a default dilution factor of 2 for the GW-RCLs in the spreadsheet.

Typically, GW-RCL << DC-RCL

File | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer | Acrobat

Normal | Page Layout | Page Break Preview | Custom Views | Full Screen | Workbook Views
Ruler | Formula Bar | Gridlines | Headings | Show
Zoom | 100% | Zoom to Selection | Zoom
New Window | Arrange All | Freeze Panes | Split | Hide | Unhide | View Side by Side | Synchronous Scrolling | Reset Window Position | Window
Save Workspace | Switch Windows

A10 — Atrazine, total chlorinated residues

GW-RCLs

	A	B	D	E	F	I	J	K	L	M
1	NR140 Substance	NR 140 CAS	Fed MCL (ug/l) (If Red, MCL>ES)	NR 140 ES (ug/l)	RCL-gw (mg/kg) DF=1	Use 2, or input the calculated site-specific DF -->	2.00	INPUT NUMERIC SOIL Site Data Max (mg/kg)	Flag E = Individual Exceedance!	Type BRRTS No. Here (If Known). Assess groundwater data separately.
2	Acetochlor	34256-82-1	-	7.	0.0056		0.0112			Click here to Clear (Column K) Site Entries
3	Acetone	67-64-1	-	9,000.	1.847		3.6939			
4	Alachlor	15972-60-8	2.	2.	0.0017		0.0033			
5	Aldicarb	116-06-3	3.	10.	0.0025		0.005			
6	Aluminum	7429-90-5	-	200.	300.6452		601.2903			
7	Antimony	7440-36-0	6.	6.	0.271		0.542			
8	Anthracene	120-12-7	-	3,000.	98.3721		196.7442			
9	Arsenic	7440-38-2	10.	10.	0.292		0.584			
10	Atrazine, total chlorinated residues	1912-24-9	3.	3.	0.002		0.0039			
11	Barium	7440-39-3	2,000.	2,000.	82.4		164.8			
12	Bentazon	25057-89-0	-	300.	0.0659		0.1319			
13	Benzene	71-43-2	5.	5.	0.0026		0.0051			
114	Toluene	108-88-3	1,000.	800.	0.5536		1.1072			
115	Toxaphene	8001-35-2	3.	3.	0.464		0.928			
116	1,2,4-Trichlorobenzene	120-82-1	70.	70.	0.204		0.408			
117	1,1,1-Trichloroethane	71-55-6	200.	200.	0.0701		0.1402			
118	1,1,2-Trichloroethane	79-00-5	5.	5.	0.0016		0.0032			
119	Trichloroethylene (TCE)	79-01-6	5.	5.	0.0018		0.0036			
120	2,4,6-Trichlorophenol (2,4,6-TCP)	93-72-1	50.	50.	0.0275		0.055			
121	1,2,3-Trichloropropane	96-18-4	-	60.	0.026		0.052			
122	Trifluralin	1582-09-8	-	7.5	0.2477		954			
123	Trichlorobenzene (1,2,4- and 1,3,5-isomers)	95-63-6 / 108-67-8	-	480.	0.6897		793			
124	Vanadium	7440-62-2								

Exceedance
E
Flag
Here

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Non-Industrial_DC_RCLs | Industrial_DC_RCLs | Summary_Soil_DC_Data | GW_RCLs

SUMMARY

- US EPA RSL web-calculator is used to generate DC and GW-protective RCLs for individual contaminants
- Given soil boring data, the RR Program's RCL spreadsheet can be used to evaluate individual and cumulative exceedance
- Groundwater data need to be separately assessed

Web-Calculator / RCL Spreadsheet
Resource Staff Available for More Questions

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QUESTIONS?

Questions via Live Meeting "Q & A" feature

or email Michael.Prager@wisconsin.gov

Audio via WisLine @ 1-888-291-0312 / passcode: 5155 216#

NR 700 REVISIONS

- **Next Webinar: Wednesday, October 16, 2013**
- **1:00 – 3:00 pm**
- **Chapters: 708, 722, 724**
- **Presenters: Mark Gordon, Jane Lemcke, Dan Kolberg, Tom Coogan**
- **Presentations available at http://dnr.wi.gov/topic/brownfields/training.html**
- **Questions after today can be emailed to DNRRRComments@wisconsin.gov**