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NSA CRANE
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LETTER AND COMMENTS FROM U S EPA ON ECOLOGICAL RISK REPORT UNEXPLODED ORDNANCE 7 (UXO 7) NSA CRANE IN
6/24/2011
U S EPA

Barringer, Rick

From: Ramanauskas.Peter@epamail.epa.gov
Sent: Friday, June 24, 2011 4:07 PM
To: Bernhardt, Aaron
Cc: Mazur.Daniel@epamail.epa.gov; 'Barclift, David J CIV NAVFAC LANT, EV'; Hickey, Howard M CIV NAVFAC MW EV; Ramanauskas.Peter@epamail.epa.gov; Basinski, Ralph; Barringer, Rick; Brent, Thomas CIV NAVFAC MW, PWD Crane EV
Subject: RE: Crane UXO7 Report - Eco Risk Comments

Thank you, Aaron.

We accept the lead PRG of 192 mg/kg soil to be an acceptable upper bound soil concentration for lead (protective of the American woodcock) as well as the application of an arithmetic average for the UXO 7 site as described.

Dan pointed out that the response did not address his comment on level of protection (percent adverse effects) to be provided and restriction on toxicity study duration that the Navy will use to represent chronic exposure (typical chronic toxicity study duration is 90 days or longer for wildlife). For a Region 5 US Army site, a 6 week (42 days) duration was used with a default of 4 weeks (28 days) if there was insufficient studies with toxicity data. The prior comment was:

The recent proposal by the Navy for selecting LOAEL TRVs does not place any restrictions on percent adverse effects when selecting a LOAEL TRV from the Eco-SSL database nor is there a limit on the duration of the studies used to restrict use of acute data. The ecological risk assessment needs to be focused on chronic exposure.

Dan also suggested a Clu-in seminar on "Bioavailability-Based Remediation of Metals Using Soil Amendments: Considerations & Evaluation
Techniques: Part 1" that may be of interest. For more information, go to http://www.clu-in.org/conf/tio/soilbioavailability

You may also want to look at: www.cluin.org/ecotools

and Table 1 at:
http://www.clu-in.org/download/remed/epa-542-r-07-013.pdf

Thanks,
Pete

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| From: |
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|"Bernhardt, Aaron" <Aaron.Bernhardt@tetratech.com> |
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| To: |
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|Daniel Mazur/R5/USEPA/US@EPA, Peter Ramanauskas/R5/USEPA/US@EPA |
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| Cc: |

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|"Hickey, Howard M CIV NAVFAC MW EV" <howard.hickey@navy.mil>, "Basinski, Ralph" <Ralph.Basinski@tetratech.com>, "Barringer, Rick" |
|<Richard.Barringer@tetratech.com>, "Brent, Thomas CIV NAVFAC MW, PWD Crane EV" <thomas.brent@navy.mil>, "'Barclift, David J CIV NAVFAC LANT,|
|EV'" <david.barclift@navy.mil> |
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| Date: |
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|06/24/2011 07:08 AM |
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| Subject: |
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|RE: Crane UXO7 Report - Eco Risk Comments |
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Dan and Peter,

Attached is a table with the PRG that was calculated using the lead LOAEL and the other exposure factors you suggested in the e-mail below.
The PRGs based on the NOAEL are presented just for informational purposes to make sure that our calculations were consistent with those used to calculate the Eco SSLs. You can see that the PRG for birds is 192 mg/kg (the PRGs for mammals is much higher). The Navy is willing to use that value as the cleanup goal for this site under the condition that the arithmetic average at the site is less than the 192 mg/kg, not the 95% UCL. The reason is that most of the samples are biased in the areas where the lead contamination was expected to be the greatest, and the areas in between are expected to have much lower lead concentrations. Therefore, the 95% UCL would really overestimate the actual average lead concentration at the site.

Note that the Navy still does not agree with the actual procedure used to develop the LOAEL for lead, and does not necessarily agree to apply the procedure to other sites or for other chemicals, but agrees to use it a UXO 7 in an effort to move the site forward."

Please let us know whether this approach is acceptable and feel free to call me if you have any questions.

Thanks,

Aaron

Aaron Bernhardt | Project Manager/Ecological Risk Assessor
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-----Original Message-----
From: Brent, Thomas CIV NAVFAC MW, PWD Crane EV [mailto:thomas.brent@navy.mil]
Sent: Monday, June 13, 2011 8:22 AM
To: Bernhardt, Aaron
Cc: Hickey, Howard M CIV NAVFAC MW EV; Basinski, Ralph; Barringer, Rick
Subject: FW: Crane UXO7 Report - Eco Risk Comments

Aaron,

Please see Dan's comments below and get back with us to discuss and clarify.

Thanks,
Tom

-----Original Message-----
From: Ramanauskas.Peter@epamail.epa.gov [mailto:Ramanauskas.Peter@epamail.epa.gov]
Sent: Friday, June 10, 2011 15:51
To: Brent, Thomas CIV NAVFAC MW, PWD Crane EV
Subject: Crane UXO7 Report - Eco Risk Comments

Tom,

Here is Dan's response on the UXO7 eco risk. There are a few typos (he was probably typing quickly to get it in by COB today), but nothing that should be major.

Please let us know if you have questions or would like to discuss.

Thanks!
Pete

----- Forwarded by Peter Ramanauskas/R5/USEPA/US on 06/10/2011 02:49 PM

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| From: |
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|Daniel Mazur/R5/USEPA/US
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| To: |
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|Peter Ramanauskas/R5/USEPA/US@EPA
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| Date: |
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|06/10/2011 01:36 PM
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| Subject: |
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|Re: Fw: Crane UXO7 Report
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Pete,

The Crane RFI report for the UXO - Ranges (July 2009) identifies a decision (clean-up) criteria of 400 mg/kg for lead in soil. This is based on a human health screening criteria presented in Section 4.0 (see 2nd & 3rd paragraphs on page 4-1 and Table 4-1) and inappropriate benchmarks developed for Step 3a of the screening ecological risk assessment (SERA). Navy policy under Step 3a allows for refinement of exposure estimates (e.g., percentage of site supporting receptor feeding, ingestion rates of female organisms) used in the SERA, but does not support refinement of effect benchmarks to include a chronic lowest observed adverse effect levels (LOAEL). Navy policy allows decisions can be made based on LOAELs in the baseline ecological risk assessment (BERA). Also, Step 3a advises use of 95% UCL of mean concentrations for chemicals of potential concern (COPC) along with an evaluation of hot spots.

The report claims (see Executive Summary, pages ES-3 and ES-4) this soil concentration would achieve acceptable ecological protection (based on LOAEL effect benchmarks). When the ecological risk assessment progresses past Step 3a, EPA will

disagree with this conclusion based on the method developed to select specific wildlife lowest observed adverse effect level (LOAEL) endpoints as presented in Table F.2.

In the USEPA 2005 Guidance for Developing Ecological Soil Screening Levels (Eco-SSL), the LOAEL is identified as the "lowest bounded LOAEL" (see Section 1.2 and Table 1.1) and specific lowest bounded LOAEL TRVs are provided in the individual chemical reports (see last paragraph of Sections 5.1 and 6.1 and corresponding Tables). It is misleading to suggest a geometric mean of all the LOAEL data from the Eco-SSL reports will generate an acceptable LOAEL TRV especially since many of the LOAEL values are not bounded and may represent adverse effects greater than 20% (e.g., LC50's).

For small mammals with high reproductive potential, EPA Region 5 has estimated a LOAEL TRV of 30.2 mg/kg-day for lead from the Eco-SSL database. This value was developed for another site (US Army Badger, WI), to estimated a soil lead concentration (upper limit) to be protective for a shrew. Using only bounded LOAEL TRVs for reproduction and growth (where adverse affects range from 5 - 30%) a geometric mean of 30.2 mg/kg-day for lead was calculated to represent a 20% adverse effect for a shrew. This approach was provided to the Navy's contractor by email on 9-11-2099.

Since an American woodcock has a lower rate of reproduction, the LOAEL TRV should represent no more than a 15% adverse effect. Using the data assembled for the above noted US Army Badger site, only bounded LOAEL TRVs for reproduction and growth (where adverse affects range from 5 -
15%) a geometric mean of 9.7 mg/kg-day for lead was calculated to represent a maximum15% adverse effect for a woodcock.

The Eco-SSL equation (see Tables 5.2 & 6.2, footnote #4 from Eco-SSL report for lead) was modified using the above LOAEL TRV and 50th percentile food & soil ingestion rates (see Eco-SSL report Attachment 4-1, Tables 1 & 3) to project an estimated upper soil criteria for lead.

HQ = FIR * (Soil * Ps + B)/ TRV set HQ = 1 and
solve for Soil

Solve for lead in earthworm (B) ln B = (0.807 *
ln soil) -
0.218

For shrew:	LOAEL TRV	= 30.2 mg/kg-day
	FIR	= 0.167 g/g-day
	Ps	= 0.9%
For woodcock:	LOAEL TRV	= 9.7 mg/kg-day
	FIR	= 0.142 g/g-day
	Ps	= 6.4%

The cleanup soil value needs to be based on the above LOAEL TRVs, FIR and Ps (soil ingestion rate) as calculated for the shrew and woodcock.
Compared to Eco-SSL soil values which uses a NOAEL TRV with higher food and soil ingestion rates, the soil cleanup value will use a higher TRV and lower ingestion rates and is expected to have a higher soil lead concentration.

The recent proposal by the Navy for selecting LOAEL TRVs does not place any restrictions on percent adverse effects when selecting a LOAEL TRV from the Eco-SSL database nor is there a limit on the duration of the studies used to restrict use of acute data. The ecological risk assessment needs to focused on chronic exposure.

Dan

[attachment "PRG Calc for Lead_Crane.xlsx" deleted by Peter Ramanauskas/R5/USEPA/US]

Development of Soil PRGs for the American Woodcock and Short-Tailed Shrew

Parameters	Woodcock		Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL
HQ	1	1	1	1
Food Injestion Rate (FIR) g/gBW/day	0.214	0.142	0.209	0.176
Ps (proportion of soil consummed)	0.164	0.064	0.03	0.009
Invertebrate Concentration (Ci) (mg/kg)	5.73	56.0	20.7	165
TRV	1.63	9.7	4.7	30.2
HQ	0.998	0.999	0.99550	0.99999
Soil Concentration (PRG) (mg/kg)	**11.4**	**192**	**56**	**733**

HQ=FIR*(Soil conc*Ps+Ci)/TRV

Ci - Exp(0.807 * ln(Cs) - 0.218)