

From: [Nepomuceno, Gabriella@DTSC](mailto:Nepomuceno_Gabriella@DTSC)
To: [Rohlfes, Larry@DTSC](mailto:Rohlfes_Larry@DTSC)
Subject: RE: IRP-Requested Info from February 8 Meeting
Date: Monday, March 20, 2017 10:08:41 AM
Attachments: [Hot Spot Definitions from EPA.DOCX](#)

Hi Larry,

With regards to five year reviews – they are required for Superfund Sites, but the guidance is used for other sites types that require five year reviews as well. The US EPA Comprehensive Five-Year Review Guidance (EPA 540-R-01-007) is the main guidance document: <https://semspub.epa.gov/work/HQ/128607.pdf>. This link takes you to the guidance on writing Five Year Reviews: https://www.epa.gov/superfund/writing-five-year-reviews-superfund-sites#sub_anchor. The requirement for five year reviews is stated in the National Contingency Plan (NCP) Section 300.430(f)(94)(ii): “If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.”

This is the software HERO uses to estimate the Exposure Point Concentrations (EPCs), but also describes techniques to evaluate ‘hot spots’: https://www.epa.gov/sites/production/files/2015-03/documents/proucl_v5.0_tech.pdf. Specifically Section 1.13.4 Using BTVs (Upper Limits) to Identify Hot Spots (page 29) and Section 5.2 Treatment of Outliers in Background Data Sets with NDs (page 136). Attached is a list of references used by HERO, including excerpts those two citations.

-Gabby

From: Rohlfes, Larry@DTSC
Sent: Tuesday, February 21, 2017 12:02 PM
To: Nepomuceno, Gabriella@DTSC <Gabriella.Nepomuceno@dtsc.ca.gov>
Subject: IRP-Requested Info from February 8 Meeting

Hi Gabby,

Hope you had a great Presidents’ Day weekend!

I’m sending you this message to request two items that Gideon asked of DTSC at the February 8 IRP meeting:

- One is the U.S. EPA guidance on what a five-year review of cleanup sites that have hazardous substances left in place and ongoing remedies should include. According to my notes, this request was made during an exchange between Gideon and Ray Leclerc. Gideon asked if the five-year review process was in statute. Ray responded that federal law required a review and that U.S. EPA provided guidance on what a review should include. Gideon then asked Ray for that guidance.

- The other is the guidance for dealing with sampling “hot spots.” According to my notes, Ray said DTSC did “hot spot” analysis to avoid mixing sample results that could indicate a risk with sample results that did not indicate a risk during the discussion on Ag Park. He then said that when “hot spots” of toxic substances were identified, the cleanups could be surgical in nature. Gideon then asked if there were guidelines for dealing with “hot spots,” Ray responded that there was some guidance, and Gideon then asked me to obtain it from DTSC.

Will add these requests to the IRP’s info request tracking doc.

LARRY

Larry Rohlfes
DTSC Independent Review Panel
CalEPA Headquarters
1001 I Street
Sacramento, CA 95814-2828
(916) 327-4493
Legislation/MS 22C

1. USEPA (1996) Soil Screening Guidance: Technical Background Document Superfund. EPA/540/R95/128 May 1996.
<https://nepis.epa.gov/Exe/ZyNET.exe/9100K73D.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1995+Thru+1999&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C95thru99%5CTxt%5C00000027%5C9100K73D.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>
'Hot Spot' definition as "a small portion of the [exposure area that] has very high levels"
2. USEPA (2002) RCRA Waste Sampling Technical Guidance Office of Solid Waste. EPA530-D-02-002. August 2002.
https://www.epa.gov/sites/production/files/2015-10/documents/rwsdtg_0.pdf
'Hot Spot' definition as a "strata that contain high concentrations of the characteristic of interest and are relatively small in size when compared with the total size of the materials being sampled (ASTM D 6009-96)."
3. Hot Spots and Incremental Sampling Methodology Prepared by Deana Crumbling, USEPA, March 27, 2014.
<https://www.epa.gov/sites/production/files/2016-06/documents/overview-pm-hotspot-analysis-requirements-guidance-oct-2014.pdf>
4. ITRC. 2014. Hot Spots: Incremental Sampling Methodology (ISM) FAQs. Prepared by Deana Crumbling. March 2014. <http://www.itrcweb.org/Documents/Team-ISM/ISM-hotspot-FAQ-Final.pdf>.
5. ProUCL Version 5.0.00 Technical Guide. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. September 2013 EPA/600/R-07/041
https://www.epa.gov/sites/production/files/2015-03/documents/proucl_v5.0_tech.pdf
www.epa.gov.
 Prepared for: Felicia Barnett, Director, ORD Site Characterization and Monitoring Technical Support Center (SCMTSC), Superfund and Technology Liaison, Region 4, 61 Forsyth Street SW, Atlanta, GA 30303. Prepared by: Anita Singh, Ph.D.1 and Ashok K. Singh, Ph.D.2
 1Lockheed Martin IS&GS-CIVIL
 2890 Woodbridge Ave
 Edison NJ 08837
 2Professor of Statistics, Department of Hotel Management
 University of Nevada Las Vegas
 Las Vegas, NV 89154
 U.S. Environmental Protection Agency
 Office of Research and Development
 Washington, DC 20460

Section 1.13.4 Using BTVs (Upper Limits) to Identify Hot Spots (page 29)

The use of upper limits (e.g., UTLs) to identify hot spot(s) has also been mentioned in the *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (EPA, 2002b). Point-by-point site observations are compared with a pre-established or estimated BTV. Exceedances of the BTV by site observations may be considered as representing impacted locations with elevated concentrations (hot spots).

Section 5.2 Treatment of Outliers in Background Data Sets with NDs (page 136)

A couple of classical outlier tests (e.g., Dixon and Rosner tests) are available in the ProUCL software. These tests can be used on data sets with or without ND observations. Additionally, one can use graphical displays such as Q-Q plots and box plots to visually identify high outliers in a left-censored data set. It should be pointed out, that for environmental applications, it is the identification of high outliers (perhaps representing contaminated locations and hot spots) that is important. The occurrence of ND (less than values) observations and other low values is quite common in environmental data sets, especially when the data are collected from a background or a reference area. For the purpose of the identification of high outliers, one may replace ND values by their respective detection limits or half of the detection limits or may just ignore them (e.g., especially when high reporting limits are associated with NDs) from the outlier tests. A similar approach can be used to generate graphical displays: quantile-quantile (Q-Q) plots and histograms. Except for the identification of high outlying observations, the outlier test statistics (computed with NDs or without NDs) are not used in any of the estimation and decision making processes. Therefore, for the purpose of testing for high outliers, it does not matter how the ND observations are treated.

Some Additional Hot Spot references:

1. EPA Air Guidance on PM10 and PM2.5 Hot Spots: <https://www.epa.gov/state-and-local-transportation/project-level-conformity-and-hot-spot-analyses>
2. EPA Overview of PM10 Hot Spot Guidance: <https://www.epa.gov/sites/production/files/2016-06/documents/overview-pm-hotspot-analysis-requirements-guidance-oct-2014.pdf>
3. EPA Region 3 Soil Screening Guidance
<https://nepis.epa.gov/Exe/ZyNET.exe/9100K73D.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1995+Thru+1999&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C95thru99%5CTxt%5C00000027%5C9100K73D.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>
4. EPA Soil Sampling Guidance (1995) https://clu-in.org/download/char/SF_Rep_Samp_Guid_soil.pdf

Section 2.9.6 Search Sampling

Search sampling utilizes either a systematic grid or systematic random sampling approach to search for areas where contaminants exceed applicable clean-up standards (hot spots). The number of samples and the grid spacing are determined on the basis of the acceptable level of error (i.e., the chance of missing a hot spot). Search sampling requires that assumptions be made about the size, shape, and depth of the hot spots.