STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations
Jim Gibbons, Governor
Allen Biaggi, Director
Leo M. Drozdoff, P.E., Administrator

December 3, 2008

Mr. Mark Paris
Basic Remediation Company
875 West Warm Springs Road
Henderson, NV 89011

Ms. Susan Crowley
Tronox LLC
PO Box 55
Henderson, NV 89009

Mr. Curt Richards
Olin Corporation
3855 North Ocoee Street, Suite 200,
Cleveland, TN 37312

Mr. Joe Kelly
Montrose Chemical Corp of CA
600 Ericksen Ave NE, Suite 380
Bainbridge Island, WA 98110

Mr. Brian Spiller
Stauffer Management Co LLC
1800 Concord Pike
Wilmington, DE 19850-6438

Mr. Craig Wilkinson
Titanium Metals Corporation
PO Box 2128
Henderson, NV 89009

Re. **BMI Plant Sites and Common Areas Projects, Henderson, Nevada**
Detection Limits and Data Reporting

Dear Sirs and Madam:

For the purposes of this letter the parties listed above shall be referred to as "the Companies". Guidance on data reporting and detection limits is provided in Attachment A. These issues must be considered and addressed in all future Deliverables. Please contact me with any questions (tel: 702-486-2850 x247; e-mail: brakvica@ndep.nv.gov).

Sincerely,

Brian A Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions

BAR:s

CC: Jim Najima, NDEP, BCA, Carson City
Marysia Skorska, NDEP, BCA, Las Vegas
Shannon Harbour, NDEP, BCA, Las Vegas
Todd Croft, NDEP, BCA, Las Vegas
Greg Lovato, NDEP, BCA, Carson City
Barry Conaty, Holland & Hart LLP, 975 F Street, N.W., Suite 900,Washington, D.C. 20004
Brenda Pohlmann, City of Henderson, PO Box 95050, Henderson, NV 89009
Mitch Kaplan, U.S. Environmental Protection Agency, Region 9, mail code: WST-5,
75 Hawthorne Street, San Francisco, CA 94105-3901
Ebrahim Juma, Clark County DAQEM, PO Box 551741, Las Vegas, NV, 89155-

1741
Ranajit Sahu, BRC, 311 North Story Place, Alhambra, CA 91801
Rick Kellogg, BRC, 875 West Warm Springs, Henderson, NV 89011
Kirk Stowers, Broadbent & Associates, 8 West Pacific Avenue, Henderson, Nevada 89015
George Crouse, Syngenta Crop Protection, Inc., 410 Swing Road, Greensboro, NC 27409
Nicholas Pogoncheff, PES Environmental, Inc., 1682 Novato Blvd., Suite 100, Novato, CA 94947-7021
Lee Erickson, Stauffer Management Company LLC, P.O. Box 18890 Golden, CO 80402
Keith Bailey, Environmental Answers, 3229 Persimmon Creek Drive, Edmond, OK 73013
Susan Crowley, Crowley Environmental LLC, 366 Esquina Dr., Henderson, NV 89014
Susan Crowley, Tronox LLC, PO Box 55, Henderson, Nevada 89009
Mike Skromyda, Tronox LLC, PO Box 55, Henderson, Nevada 89009
Jeff Gibson, AMPAC, 3770 Howard Hughes Parkway, Suite 300, Las Vegas, Nevada 89109
Sally Bilodeau, ENSR, 1220 Avenida Acaso, Camarillo, CA 93012-8727
Cindi Byrns, Olin Chlor Alkali, PO Box 86, Henderson, Nevada 89009
Paul Sundberg, Montrose Chemical Corporation, 3846 Estate Drive, Stockton, California 95209
Joe Kelly, Montrose Chemical Corporation of CA, 600 Ericksen Avenue NE, Suite 380, Bainbridge Island, WA 98110
Deni Chambers, Northgate Environmental Management, Inc., 300 Frank H. Ogawa Plaza, Suite 510, Oakland, CA 94612
Robert Infelise, Cox Castle Nicholson, 555 California Street, 10th Floor, San Francisco, CA 94104-1513
Michael Ford, Bryan Cave, One Renaissance Square, Two North Central Avenue, Suite 2200, Phoenix, AZ 85004
Dave Gratson, Neptune and Company, 1505 15th Street, Suite B, Los Alamos, NM 87544
Paul Black, Neptune and Company, Inc., 8550 West 14th Street, Suite 100, Lakewood, CO 80215
Teri Copeland, 5737 Kanan Rd., #182, Agoura Hills, CA 91301
Paul Hackenberry, Hackenberry Associates, 550 West Plumb Lane, B425, Reno, NV, 89509

Attachment A

Chemical concentration data used for human health and ecological risk assessment are often censored because of the difficulty of determining with sufficient confidence a reportable concentration. There are many types of censoring limits for chemical analytical data, however, they can usually be placed in a category of detection limit, reporting limit or quantification limit. A review of the Companies' databases shows that four terms have been used for censoring limits in the databases across the various projects (see Table 1 below):

- Method Detection Limit (MDL)
- Reporting Detection Limit (RDL)
- Quantitation Limit (QL)
- Reporting Limit (RL)

These are not the same terms that are used in the data validation summary reports (DVSRs), in which the following censoring limits are identified:

- Method Detection Limit (MDL)
- Sample Quantitation Limit (SQL)
- Practical Quantitation Limit (PQL)

The purpose of this guidance is to standardize the approach to reporting information for non-detects.

Table 1: Censoring limits in Companies' databases

Dataset	MDL	RDL	QL	RL
Suppl. Background Report	x	x	x	
Deep Background Report	x	x	x	
2005 Background Report	x	x	x	
TRECO	x	x	x	x
Borrow Pit	x	x		x
Parcel 4A	x			x
Parcels A & B (TRONOX)	x			x
Parcel 4B	x			x
Galleria				x
Mohawk (from June 2008 DB)	x			x
Southern RIBS				x
Sunset North	x			x
Western Hook				x

The DVSRs provide the following definitions:

- Method Detection Limit (MDL) – This limit was established by the laboratories according to the requirement in 40 CFR 136, Appendix B, and represents the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are established using matrices with little or no interfering species using reagent matrices and are considered the lowest possible reporting limit. Often, the MDL is represented as the instrument detection limit. MDLs are included in data reports as well as the electronic data deliverables (EDDs).

- Sample Quantitation Limit (SQL) – The SQL is defined as the MDL adjusted to reflect sample-specific actions, such as dilution or use of smaller aliquot sizes, and takes into account sample characteristics, sample preparation, and analytical adjustments. It represents the sample-specific detection limit and all non-detected results are reported to this level.

- Practical Quantitation Limit (PQL) – This limit is defined as the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration point for the analyte, and includes the predicted effect of sample matrices with typical interfering species. The PQL is the lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. PQLs are used to estimate or evaluate the minimum concentration at which the laboratory can be expected to reliably

measure a specific chemical contaminant during day-to-day analyses of different sample matrices. Detected results greater than the SQL, but less than the PQL, were qualified by the laboratory as estimated.

SQLs are sample-specific detection limits. They are usually an adjustment from the MDL for sample specific reasons (e.g., dilution, interference). PQLs are greater than the SQLs and are similar to a reporting limit in that, in most cases, they are the lowest calibration level run or some multiple of the SQL.

The censoring limits in the EDDs (as loaded into the database), in most cases, include the MDL, the SQLs for metals and PQLs for all other stable chemistries. All results greater than the SQL and less than the PQL are qualified as estimated (J flag).

In effect, the DVSRs and databases, agree concerning the use of the term MDL; RDL appears to be the same as SQL; and RL appears to be the same as PQL. QL is also the same as PQL.

It is requested that the discrepancy in the nomenclature be resolved. Most sampling and analysis plans, risk assessment reports and other relevant documents describe the censoring limit to be used for statistical data analysis as the SQL. Consequently, NDEP suggests that the MDL, SQL, PQL nomenclature be adopted in the databases as well as in the DVSRs and all other Deliverables.

Of further concern is how the censoring limits have been used in statistical data analysis and risk assessment. Again, there have been inconsistencies. For some projects the SQL (RDL) has been used, and for others the PQL (RL or QL) has been used. There are also inconsistencies between use of censoring limits for inorganic chemicals (metals) and organic chemicals within the same database. NDEP prefers that the SQL is used for all statistical analysis and risk assessment. As noted above this a sample-specific detection limit. This approach allows for inclusion of more information in the statistical analysis, allows background comparisons to be performed more clearly, and removes unnecessary conservatism from the risk assessments.

To clarify, NDEP suggests the following courses of action to make use of censoring limits consistent and as useful as possible:

1. Make the nomenclature consistent between databases, DVSRs and all Deliverables.

2. Report the MDL, SQL and PQL in the databases. NDEP notes that the MDL and SQL are often the same. In those cases, reporting the SQL is sufficient.

3. Use the SQL in statistical analysis and risk assessment.

The situation is somewhat different for radionuclides. In this case, data can be reported regardless of the minimum detectable activity (MDA), which serves as a metric for evaluating sensitivity of the laboratory analysis. The MDA for radionuclides is the lowest level of activity in a given sample that is statistically distinguishable from a sample with no activity, at the 2-sigma confidence interval. The MDAs for radionuclide analysis are determined by a mathematical formula that takes into account sample volume, chemical recovery, instrument detection efficiency and background, and sample counting duration. The

MDA, therefore, is equivalent to the SQL for radiochemical analytes. For radiochemical analysis, no PQL is established as all results are reported to the MDA. In addition, the 2-sigma radiological error is reported for each analyte in each sample. Because a result that is not censored is available for all radionuclide analyses, NDEP prefers that the MDAs are reported in the databases, but are otherwise not used for statistical analysis or risk assessment, and that the raw data are used directly.

Asbestos also provides a unique case. Asbestos data should be reported in terms of the raw counts of asbestos fibers detected in a given sample. Analytical sensitivity and concentration of asbestos in soil can be calculated from the raw data if the other elutriator instrument parameters are also provided (e.g., area of the filter, area of the scanned part of the filter, volume of air passed through the filter). In effect there are no detection limits that can be used to censor the asbestos data.