Letter Health Consultation

MIDDLEVILLE TANNERY DUMP SITE

TOWN OF NORWAY, HERKIMER COUNTY, NEW YORK

EPA FACILITY ID: NYD986895290

Prepared by
State of New York Department of Health

OCTOBER 14, 2010

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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STATE OF NEW YORK
DEPARTMENT OF HEALTH
Flanigan Square 547 River Street Troy, New York 12180-2216

Richard F. Daines, M.D.
Commissioner

James W. Clyne, Jr.
Executive Deputy Commissioner

September 30, 2010

Andrew Confortini
U.S. Environmental Protection Agency, Region II
Removal Action Branch
2890 Woodbridge Avenue
Edison, NJ 08837

Re: Middleville Tannery Dump Site
EPA Site #: NYD986895290
Health Consultation

Dear Mr. Confortini:

In March of 2006, the United States Environmental Protection Agency (EPA) requested assistance from the Agency for Toxic Substances and Disease Registry (ATSDR) and the New York State Department of Health (DOH) to evaluate possible exposures to contaminated soil at the Middleville Tannery Dump site in the Town of Norway in Herkimer County. This letter health consultation is a summary of our public health evaluation of the potential current and future exposures to contamination from the site. A draft of this letter was shared with EPA in March 2007 for their use and consideration. No further actions were needed or taken at that time. In July of 2010, EPA requested finalization of this letter.

Site Background:

The site is in a wooded area in the Town of Norway in a remote part of Herkimer County. It is about one acre in size with no buildings and is partially fenced. The road leading to the site is made of gravel and maintained seasonally. Both the tannery and the Town of Middleville disposed of waste on-site, including leather hides and chromium-containing wastes. The site has been inactive since the 1960s.

In August of 1989, the New York State Department of Environmental Conservation (DEC) visited the site and noted piles of scrap leather hides, blue chromium powder, 20 to 30 rusted and deteriorating drums and stressed vegetation. There was no fence at that time.

On a November 2004 site visit, the EPA reported the presence of drums and stained soil on-site. The powder was not observed and a fence with a gate was in place.

Greg Rys of the DOH visited the site with EPA and DEC staff in April 2006. Waste was observed in piles on either side of a lightly used trail running east/west through the property. During the site visit Mr. Rys observed no evidence of people having trespassed or having used the portion of the property on either side of the trail where the wastes were piled.

The DOH believes there are currently no significant exposures to contamination at the site. However, the DOH also believes that people could be exposed to contamination in the future if protective or cleanup measures are not taken and use of the property changes.

Environmental Sampling:

In July 2005, EPA staff collected six soil samples. Five surface samples were collected from the waste area (Appendix A, Table 1) and one subsurface soil sample (and a duplicate) was collected away from the waste piles to establish background. The analyses for chromium were for total chromium; therefore, we have no information about the type of chromium detected (e.g., soluble or insoluble, trivalent or hexavalent chromium).

DOH reviewed the EPA's site-specific background data and compared them to the range of Statewide background data from the *Statewide Rural Surface Soil Survey (SRSS)* (DEC/DOH 2006a), which was done in conjunction with the development of soil cleanup objectives (SCOs) as part of the *New York State Brownfield Cleanup Program* (DEC 2006b). We used source-distant data, which are from samples collected away from roads or other potential contaminant source. Although the site-specific background soil samples were subsurface soil samples, and not strictly comparable to surface soil samples, the site-specific background data were consistent with the statewide data. Table 1 shows the site-specific background data compared to the range and median values from the Statewide Data.

Table 1. Middleville Tannery Dump Site Surface Soil Sampling Site-specific Background and Waste Area Data Compared to New York Statewide Source-distant Data (DEC / DOH 2006a, Table 6a).

Values in milligrams/kilogram of soil (mg/kg)

Analyte	Site Specific Background	Statewide Data Source Distant		Site Data for Waste Area (5 samples)	
		Range	Median	Maximum	Average
Aluminum	9540	561 – 20,000	9855	11,300J	7922
Antimony	0.53	<0.6 - 5.0	<0.8	12UJ	10.4*
Arsenic	4.7	<0.2 - 69	5	R*	R*
Barium	56.5	4 - 743	67	638J	220
Beryllium	0.57	0.1 - 2.5	0.5	0.47J	0.57*
Cadmium	0.05	<0.05 - 4.2	0.4	18.1	6.5
Calcium	5330	245 – 74,500	2125	152,000	38,356
Chromium	13.2	1 - 36	11	8,790	4826
Cobalt	6.5	0.3 - 15.1	6.5	4.6J	3.3
Copper	13.6	2 - 98	12	R*	R*
Cyanide	N/A	nd	nd	0.62J	1.15*
Iron	18,900	783 – 29,500	15,350	R*	R*
Lead	28.4	3 - 110	23	361	203
Magnesium	1590	177 – 46,000	2305	11,100	3812
Manganese	905	13 - 4550	466	1,260J	532
Mercury	0.114	0.01 - 0.34	0.05	3J	1.91
Nickel	13.5	0 - 49	11	33.7J	15.8
Potassium	1290	116 - 2440	787	403J	323
Selenium	0.92	<0.4 - 6.5	1.9	10.7	4.97*
Silver	0.87	<0.1 - 1.6	<0.1	27.4J	16.4
Sodium	46.8	<39 - 422	79	R*	R*
Thallium	0.86	nd (0.0-1.6)	nd	1.5J	1.75*
Vanadium	29.9	2 - 38	17	47.4	36.8
Zinc	94	10 - 454	58	743J	228

* One half the detection limit was used in calculating averages when the analyte was not detected. The detection limit is the smallest amount of the chemical that can be reliably determined.
< Analyte not detected above detection limit shown
nd - not detected above method detection level
N/A - not analyzed
R* - data for this analyte were rejected by laboratory
UJ -analyte detected, but not detected above instrument's calibration range; therefore, the value(s) are estimated.
J -represents estimated value.

Table 1 also compares the soil sample data from the waste disposal area to the site-specific background data.

- Average values of antimony, barium, cadmium, calcium, chromium, lead, magnesium, mercury, nickel, selenium, silver, thallium, vanadium and zinc were higher in the waste disposal area than in the site-specific background sample.
- For barium, calcium, magnesium, nickel, selenium, vanadium and zinc, the average concentration of waste area samples is higher than site-specific background, but is within the range of the statewide source-distant data. Therefore, these metals are not discussed further.
- Because we have no site-specific background value for cyanide, these data are evaluated further, below.
- For thallium, only two samples from the waste disposal area were above site-specific background and the average (using ½ the detection limit) was below the site-specific background, so these were not evaluated further.

DOH then compared the levels of the metals: cadmium, chromium, lead, mercury, silver and cyanide in samples from the waste disposal areas to final unrestricted use Soil Cleanup Objectives (SCOs) (DEC 2006b, Table 375-6.8) and then to chemical-specific human health-based SCOs for unrestricted land use (DEC/DOH 2006b, Table 5.6-1). Both the final and health-based unrestricted SCOs for cadmium, chromium, lead, mercury, silver and cyanide are lower than ATSDR soil comparison values for these metals. The unrestricted use soil cleanup objectives represent the concentration of a contaminant in soil which, when achieved at a site, will require no use restrictions on the site for the protection of public health, groundwater and ecological resources due to the presence of contaminants in soil.

SCOs are contaminant-specific remedial action objectives for soil based on a site's current, intended or reasonably anticipated future use. In developing the SCOs, DEC and DOH considered many factors including multiple human exposure pathways (soil ingestion, dermal contact, inhalation, homegrown vegetable consumption, home-produced animal product consumption). Also considered are short-term and long-term exposures, protection of ecological resources, protection of groundwater and what typical background levels of chemicals are present in rural soils. Soil cleanup objectives have been developed for several land use categories, including "unrestricted" land use. Final SCOs for each land use take into account all of the above considerations. Health-based SCOs are based on the potential health effects of the contaminant and the estimated exposures associated with each land use, but do not consider the protection of ecological resources, protection of groundwater and background levels.

DOH used the SCOs as comparison values to evaluate the environmental sampling results at the site. We first used the final SCOs for the "unrestricted" land use category for this comparison because we believe the most likely uses of the property in the future are for farming or rural residential use, (including vegetable gardening) since the site is located in a rural area. In instances where the final SCOs were exceeded we compared

the site data to the health-based SCOs for unrestricted land use. The health-based SCOs for unrestricted land use are lower than health-based SCOs for other land use categories because the human health values consider exposure by all of the exposure pathways identified above.

Health-based SCOs as comparison values are not meant to represent a bright line between exposures that cause health effects and those that do not. Environmental sampling results less than the health-based SCOs are not considered a health concern. Sampling results that exceed the health-based SCO indicate a need for further evaluation. The degree of concern when the health-based SCO is exceeded depends on an evaluation of several factors, including (among others) the actual potential for exposure, background levels or levels of the chemical we would typically expect to find in the environment, other sources of exposure to the chemical, and the strength and quality of the available toxicological information on the chemical.

There is currently no SCO for antimony, therefore antimony levels were evaluated by comparison with the ATSDR's reference dose-based media evaluation guide (RMEG) (ATSDR, 2010) and the EPA's generic soil screening level for residential exposure (EPA, 2010) (see Public Health Implications). ATSDR's RMEGs for soil represent soil concentrations to which humans may be exposed without experiencing adverse health effects. RMEGs serve as screening tools. Substances found at concentrations below RMEGs are not expected to pose public health hazards, while substances found at concentrations above RMEGs require further evaluation before drawing a public health conclusion (ATSDR, 2005). The ATSDR RMEG (in addition to the SCOs) was also used to further evaluate chromium levels at the site. The EPA generic soil screening levels are used as tools to evaluate contamination at hazardous waste sites, and represent a soil concentration for the contaminant below which no further action or study is generally warranted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)(EPA, 2010).

Table 2. Summary of On-site Soil Sample Data from the Middleville Tannery Waste Site Compared to Health-Based (DEC/DOH 2006b) and Final Soil Cleanup Objectives (SCOs) (DEC 2006b).
Values in milligrams/kilogram of soil (mg/kg)

Analyte	Site Background (mg/kg)	Health Based SCO[1]	Final SCOs					Maximum Result	Average Result [2]	Number of Detections (n=5)
		Unrestricted	Unrestricted	Residential	Restricted Residential	Commercial	Industrial			
Cadmium	0.05	0.43	2.5	2.5	4.3	9.3	60	18.1	6.5	4 [3]
Chromium [4]	13.2	11	1	22	110	400	800	8790	4830	5
Lead	28.4	200	63	400	400	1000	3,900	361	203	5
Mercury [5]	0.114	0.12	0.18	0.81	0.81	2.8	5.7	3	1.9	5
Silver	0.87	18	2	36	180	1500	6,800	27.4	16.4	5
Cyanide [6]	NA	27	27	27	27	27	10,000	0.62	1.15	3

1 Health-based SCOs do not consider protection of ecological resources, protection of groundwater and background levels, but are based on the potential human health effects associated with the contaminant and the estimated exposures associated with each type of land use.
2 Average result calculated using half the detection limit for non-detects
3 Data rejected for the 5th sample, not included in average
4 Chromium results were screened using SCOs for hexavalent chromium
5 Inorganic salts
6 Cyanide expressed as total cyanide

Public Health Implications:

Several metals were found at levels above SCOs:

- The average detected concentrations for cadmium, chromium, lead, mercury and silver were all above final unrestricted SCOs (Table 2). Average detected concentrations of all of these metals except silver exceeded the unrestricted health based SCO. The average level of chromium (4830 mg/kg) is over 400 times higher than the unrestricted health-based SCO (11 mg/kg). The maximum and average soil levels for cyanide are less than the final unrestricted SCO.
- In addition to exceeding the health-based SCO, the average and maximum levels of chromium are also above the ATSDR's RMEG for hexavalent chromium

(200 mg/kg), which is based on child exposure. Since the average on-site levels of chromium in surface soil substantially exceeded both the unrestricted health-based SCO and the RMEG, we further evaluated the risks for potential exposures to chromium at the site (see below).

- The average level of lead (203 mg/kg) marginally exceeded the unrestricted health-based SCO (200 mg/kg). If use of the site changes, exposure to the levels of lead in site soils are unlikely to significantly increase blood lead levels or result in health effects.
- The average levels of cadmium (6.5 mg/kg) and mercury (1.9 mg/kg) exceed both their final unrestricted SCOs (2.5 mg/kg and 0.18 mg/kg respectively, based on background levels for each contaminant) and their health-based SCOs (0.43 mg/kg and 0.12 mg/kg, respectively). There are currently no exposures to cadmium and mercury on site. Should use of the site change, increased exposure to these contaminants above typical background levels could occur, and the potential health risks would need to be evaluated and addressed. The average and maximum levels of antimony (10.4 mg/kg and 12 mg/kg, respectively) were below the ATSDR child RMEG of 20 mg/kg (ATSDR, 2010), as well as the EPA generic soil screening level of 31 mg/kg for residential exposure (EPA, 2010). Since neither of these two soil guideline concentrations was exceeded, antimony was not evaluated further.

Chromium is the contaminant found at the highest level in site soils. Under the unrestricted children exposure scenario used to develop the Soil Clean-Up Objectives for the Brownfields Cleanup Program (DEC/DOH, 2006b), the estimated contaminant intake resulting from incidental ingestion of chromium at the highest level reported in site soils combined with assumed chromium intakes from other sources (e.g., food, drinks, mineral supplements) is almost twice that of the EPA reference dose for insoluble trivalent chromium salts[1]. Exceedance of the EPA reference dose indicates a need for further evaluation of potential exposures. The unrestricted exposure scenario includes the residential exposure scenario, with the additional potential exposures should someone live on a farm and consume farm products grown on this contaminated soil.

The possibility also exists that some of the on-site chromium is present as soluble trivalent chromium salts or as the more toxic hexavalent form. If a significant amount of the chromium is in these forms, our concern for exposures and the risk for noncancer health effects would increase. Finally, the highest and average levels of chromium detected on-site are over two orders of magnitude higher than the range of total chromium soil background concentrations (1 - 36 mg/kg) identified in the Statewide Rural Surface Soil Survey (DEC/DOH 2006a), and are indicative of overt contamination. Based on these considerations, contaminant levels and potential health risks for chromium on-site will need to be addressed in the event that site use changes in the

[1] The exposure scenario (DEC/DOH, 2006b) for unrestricted land use assumes a 13.3 kg child ingests 74 mg of soil per day, a relative source contribution of 20% and factors of 5 and 2 to account for additional exposure via ingestion of homegrown vegetables and farm products, respectively. The time-weighted soil ingestion rate assumes a child ingests 40 mg/day of indoor dust with an outdoor soil source every day, and 80 mg/day of outdoor soil 5 days per week, 31 weeks per year.

future. At that time, soil samples should be analyzed using methodology that differentiates between soluble and insoluble, trivalent/hexavalent forms of chromium.

Conclusion:

ATSDR and DOH conclude that soil contaminated with chromium and other metals at the Middleville Tannery Dump site is not expected to harm people's health with exposures limited by access controls (see Appendix A). However, measures are needed to prevent people from being exposed to contaminated soil in the future should use of the land change. Several metals, including chromium, mercury, lead, and cadmium were found in the soil of the Middleville Tannery Dump site above final and health-based unrestricted use soil cleanup objectives. The levels of chromium also are above the ATSDR's reference dose-based media evaluation guide for hexavalent chromium. There is no evidence that people are currently being exposed to the on-site contamination. However, exposure to chromium, mercury and cadmium could increase the risk for adverse health effects if the use of the site changes in the future.

Recommendation:

Measures should be taken to prevent exposures to contaminated soil, especially chromium-contaminated soil, should the use of the land change in the future. Contaminant levels in the soil will need to be addressed prior to redevelopment.

Although existing data were adequate to evaluate potential exposures to site contaminants, additional sampling and analytical data for the metals whose analysis was rejected (e.g. arsenic) may be needed in the future to characterize the nature and extent of contamination at the site.

If you have any questions, please call me at (518) 402-7860.

Sincerely,

Scarlett Messier
Public Health Specialist
Bureau of Environmental Exposure Investigation

ec: S. Bates / K. Anders
D. Miles / R. Fedigan
D. Luttinger / T. Johnson
G. Ulirsch
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References:

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Appendix A, Table 1

Soil Sampling Results

All results in milligrams per kilogram (mg/kg)

Sample ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide	Iron
MTD-SS1	7,650J	12UJ	R	106J	1UJ	5.3J	7,650J	3,910J	4.6J	R	0.62J	R
MTD-SS2	6,210J	10.9UJ	R	638J	0.91U	R	152,000	8,790	1.3J	R	4.9U	R
MTD-SS3	8,450J	9.2UJ	R	65.3J	0.47J	18.1	6,330	1,380	4.1J	R	0.34J	R
MTD-SS4	6,000J	10.6UJ	R	220J	0.88U	1.5J	18,900	7,840	2J	R	0.18J	R
MTD-SS5	11,300J	9.4UJ	R	70.1	0.46J	1J	6,900	2,210	4.5J	R	4.3U	R

Sample ID	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
MTD-SS1	82.7J	1,070J	465J	1.3J	33.7J	287J	7UJ	10J	R	1.2J	37.1J	743J
MTD-SS2	330	11,100	281J	3J	10.4J	375J	10.7	27.4J	R	1.5J	43.5	111
MTD-SS3	361	1,150	378J	2.8J	11.8J	249J	5.4U	16J	R	3.8U	24.7	79.1
MTD-SS4	184	4,270	276J	1.6J	11.9J	301J	1.7J	24.5J	880U	4.4U	47.4	127
MTD-SS5	58.3	1,470	1,260J	0.85J	11J	403J	5.5U	4.3J	783U	3.9U	31.1	79.4

R - data for this analyte rejected by laboratory
U - analyte not detected above detection limit shown
UJ - analyte not detected above instrument's calibration range, value(s) estimated
J - represents estimated value

APPENDIX B
Conclusion Categories and Hazard Statements

ATSDR has five distinct descriptive conclusion categories that convey the overall public health conclusion about a site or release, or some specific pathway by which the public may encounter site-related contamination. These defined categories help ensure a consistent approach in drawing conclusions across sites and assist the public health agencies in determining the type of follow-up actions that might be warranted. The conclusions are based on the information available to the author(s) at the time they are written.

1. Short-term Exposure, Acute Hazard "ATSDR concludes that...could harm people's health."

This category is used for sites where short-term exposures (e.g. < 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid public health intervention.

2. Long-term Exposure, Chronic Hazard "ATSDR concludes that...could harm people's health."

This category is used for sites that pose a public health hazard due to the existence of long-term exposures (e.g. > 1 yr) to hazardous substance or conditions that could result in adverse health effects.

3. Lack of Data or Information "ATSDR cannot currently conclude whether...could harm people's health."

This category is used for sites in which data are insufficient with regard to extent of exposure and/or toxicologic properties at estimated exposure levels to support a public health decision.

4. Exposure, No Harm Expected "ATSDR concludes that ... is not expected to harm people's health."

This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.

5. No Exposure, No Harm Expected "ATSDR concludes that ...will not harm people's health."

This category is used for sites that, because of the absence of exposure, are not expected to cause any adverse health effects.

CERTIFICATION

The letter health consultation for the Middleville Tannery Dump site was prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.

Technical Project Officer, CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation, and concurs with its findings.

Team Leader, CAT, CAPEB, DHAC, ATSDR