Elevated levels of radioactivity in surface sediments near a radioactive waste processing facility in Martins Ferry, Ohio

Concerned Ohio River Residents, EarthJustice

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Abstract

Ambient air quality and freshwater resources face increasing threats from extraction, processing, and waste disposal related to unconventional oil and gas development (UOGD). In an effort to address citizens' requests to determine potential human health effects posed by a radioactive waste processing facility located in the riverside town of Martins Ferry, Ohio, we conducted a science-based investigation to evaluate concentration of Radium-226 (^{226}Ra) and other radioisotopes in proximity to the site. Soil samples collected at various distances from the facility were submitted for radiological analysis, which revealed a gradient of ^{226}Ra that increases with decreasing distance to the facility entrance. Radiological activities for ^{226}Ra ranged from 3.76 pCi/g for the sample taken furthest away from the facility to 14.66 pCi/g for the sample taken closest to the main gate. Results for Lead-214 (^{214}Pb) and Bismuth-214 (^{214}Bi) showed similar trends, with activities that approach or exceed regulatory limits. Samples collected from a cemetery and community park located at least a mile from the facility revealed acceptable background levels for ^{226}Ra and other isotopes of concern.

Soil contamination at this particular site poses two potential threats for human and environmental health. First, soil and dust particles made airborne by car and truck traffic may contain ^{226}Ra that, if inhaled, could increase the risk for lymphoma, bone cancer and leukemia. Second, downward migration of ^{226}Ra and other water-soluble pollutants may compromise the shallow, porous aquifer that underlies the site. Although subsurface contaminant migration falls outside the scope of this project, scientific attention on this topic is warranted when considering evidence revealing contamination of surface sediments with moderately soluble ^{226}Ra at locations that fall within the 1-year time of travel zone to the intake wells for Martins Ferry's municipal water treatment plant.

Background

Martins Ferry is a riverside town in eastern Ohio with a long history of industrial pollution and associated human health issues, including asthma, heart disease and premature death (EPA EJscreen). Wheeling-Pittsburgh Steel Corporation operated a steel galvanizing facility on North 1st Street from the early 1950's until its acquisition by Esmark in 2007. The facility continued operation after being sold by Esmark to Russian based Severstal in 2008, which in turn sold the property to RG Steel in 2011. The property was eventually sold to a local businessman during bankruptcy proceedings of RG Steel in 2012. Between the years of 2000 and 2012 alone, this galvanizing facility released an estimated 13,000,000 lbs. of pollutants, including chromium, zinc, aluminum, lead and hydrochloric acid into the environment (ref).

Austin Masters Services (AMS) is an oil and gas waste processing facility specializing in radiological waste and began operations at this site in 2014. AMS is permitted to receive 60,000 tons of mixed radioactive waste per year (Source: Austin Master Services, 2021), including solid and liquid wastes from unconventional oil and gas development. (Source: ODNR, 2014). Local residents raised concerns about potential negative health impacts from the facility after receiving inspection reports from the Ohio Department of Natural Resources (ODNR) through a public records request. Issues related to containment, overcapacity, and structural integrity are summarized in Table 1. The presence of fluids on the floor of the facility during nearly every inspection raises particular concern for environment dissemination when considering significant boot and truck traffic entering and exiting the facility.

Table 1. *Summary of operational issues identified during scheduled inspections of the AMS facility conducted by ODNR.*

Date	Purpose	Issues	Containment Issues Cited	Bins Full	Water/Waste on Floor	Leaking Roof
12/14/2016	Facility inspection	☐	☐	☐	☐	☐
7/5/2017	Facility inspection	☑	☑	☐	☑	☐
10/26/2017	Facility inspection	☑	☑	☑	☑	☐
11/9/2017	Facility inspection	☑	☑	☐	☑	☐
1/3/2018	Facility inspection	☑	☑	☐	☑	☐
2/22/2018	Facility inspection – View proposed expansion	☑	☑	☐	☑	☑
8/23/2018	Facility Quarterly Inspection	☑	☑	☑	☑	☑
9/7/2018	Follow-up Inpsection	☑	☑	☑	☑	☑
9/12/2018	Follow-up to 9/7/2018 inspection	☑	☑	☐	☑	☐
11/8/2018	4th quarter inspection 2018	☐	☑	☐	☐	☐
4/18/2019	2nd Quarter Site Inspection 2019	☑	☐	☑	☑	☑
8/5/2019	3rd Quarter Site Inspection 2019	☑	☐	☐	☑	☑
11/20/2019	4th Quarter Site Inspection 2019	☑	☐	☑	☑	☑
2/7/2020	1st Quarter Site Inspection 2020	☑	☐	☑	☐	☐
9/2/2020	3rd Quarter Site Inspection 2020	☑	☐	☑	☑	☑
11/18/2020	4th Quarter Site Inspection 2020	☑	☐	☑	☑	☐
2/25/2021	1st Quarter Site Inspection 2021	☑	☑	☑	☑	☐
6/29/2021	2nd Quarter Site Inspection 2021	☑	☐	☑	☑	☐

ODNR Div of Oil and Gas Resource Management Inspection Report Issues

Neither the ODNR nor any other regulatory agency tests for chemical or radioactive pollutants outside the perimeters of the AMS facility. Hence, this report represents the first science-based investigation to address community concerns regarding potential threats to human and environmental health related to processing and transporting radioactive mixed wastes at this site.

Because inhalation of particulates containing ^{226}Ra increases the risk of a variety of health disorders, including leukemia, bone cancer and lymphoma (ref), this project initially targeted potential contamination of roadways serving the area with heavy truck traffic that generates plumes of dust, including respirable $PM_{2.5}$ particles. However, ^{226}Ra and other pollutants in contaminated surface sediments could pose additional threats to groundwater resources, including the shallow aquifer that serves as source water for the local municipal water supply system. Figure 1 illustrates proximity of AMS to the intake wells for the public water supply system (OEPA, 2003; Figure 1).

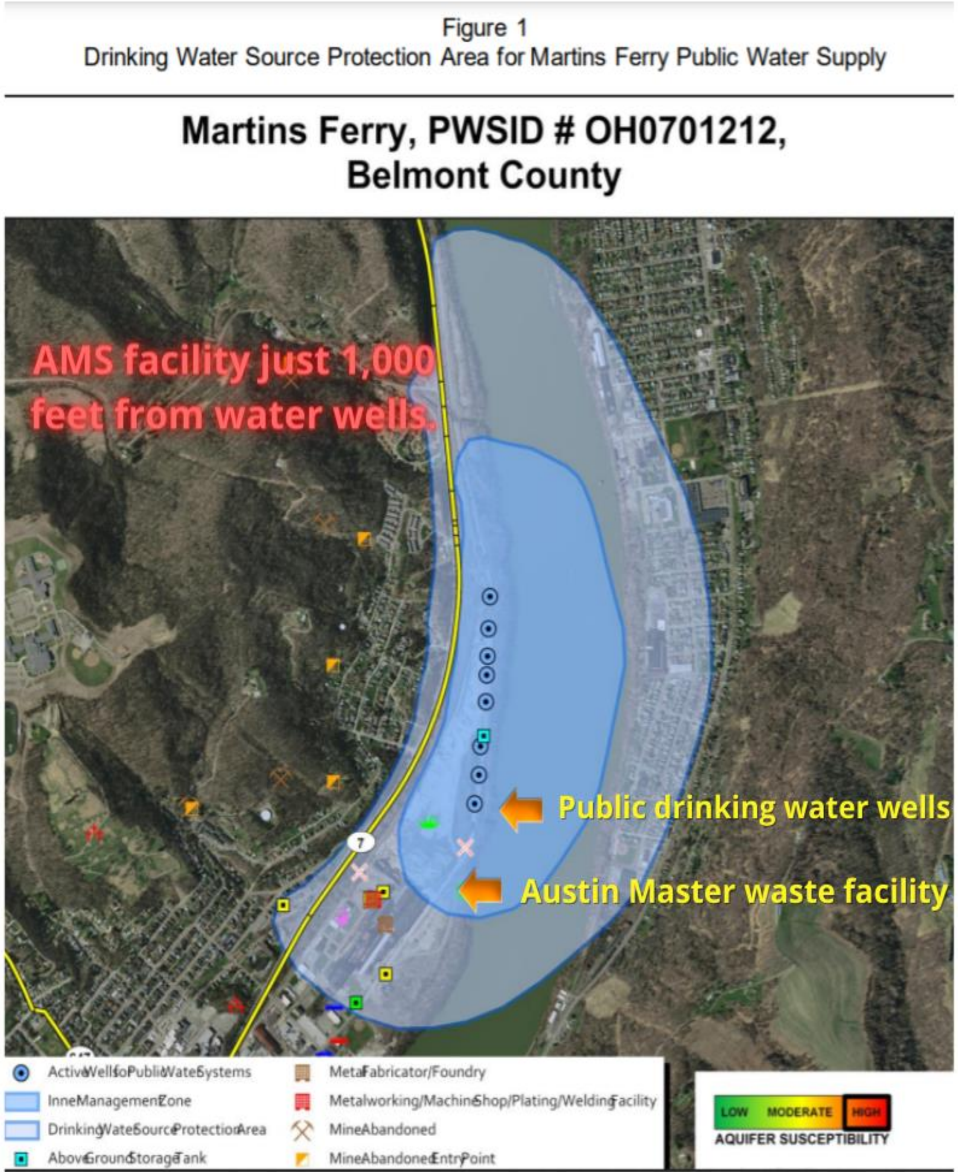

Figure 1. *Map of the drinking water source protection area for Martins Ferry, Ohio public drinking water supply (figure modified from OEPA, 2021). The drinking water pumping well locations are indicated by blue circles (labeled as "Active Wells for Public Water Systems" in the legend). The "Inner Management Zone" line (darker blue circle) corresponds to the boundary for a 1-year composite time of travel, and the "Drinking Water Source Protection Area" line (lighter blue circle) corresponds to the boundary for a 5-year composite time of travel. The AMS facility clearly falls within the Drinking Water Source Protection Area and is within 1,000 feet of the closest pumping well for the public water supply.*

This project does not directly address issues related to subsurface contaminant migration, although such efforts are certainly warranted based upon results and information presented here.

Methods

Soil surveys for radioactivity were conducted using a Model 3000 Ludlum Digital Survey Meter. Surveys were taken along a linear transect paralleling North 1st Street leading to the entrance of the AMS radioactive waste processing facility in Martins Ferry, Ohio. Results obtained along this transect were compared with background radioactivity measurements taken at a community park and a cemetery located up to 1 mile away from the facility. Transect samples with survey values more than twice that expressed from background measurements were collected for subsequent Gamma spectroscopy.

Figure 2 illustrates the location of samples collected during two visits to the site. Samples were first collected on November 9th, 2021 and labeled MWA in honor of guidance and assistance provided from members of the nonprofit environmental advocacy group Mountain Watershed Association. Approximately 10 grams of soil was collected directly into sealable plastic storage bags and shipped to Boston Chemical Data Corporation in Natick, MA for initial Gamma spectroscopic screening. Three of the samples (MWA 11, MWA 12, MWA 13) showed high total activity and were sent to Eberline Analytical/Oak Ridge Laboratory (Eberline Lab) in Oak Ridge, TN for additional radiological analysis. Due to low sample mass, the three samples were combined, blended and then divided in half to allow for a duplicate measurement.

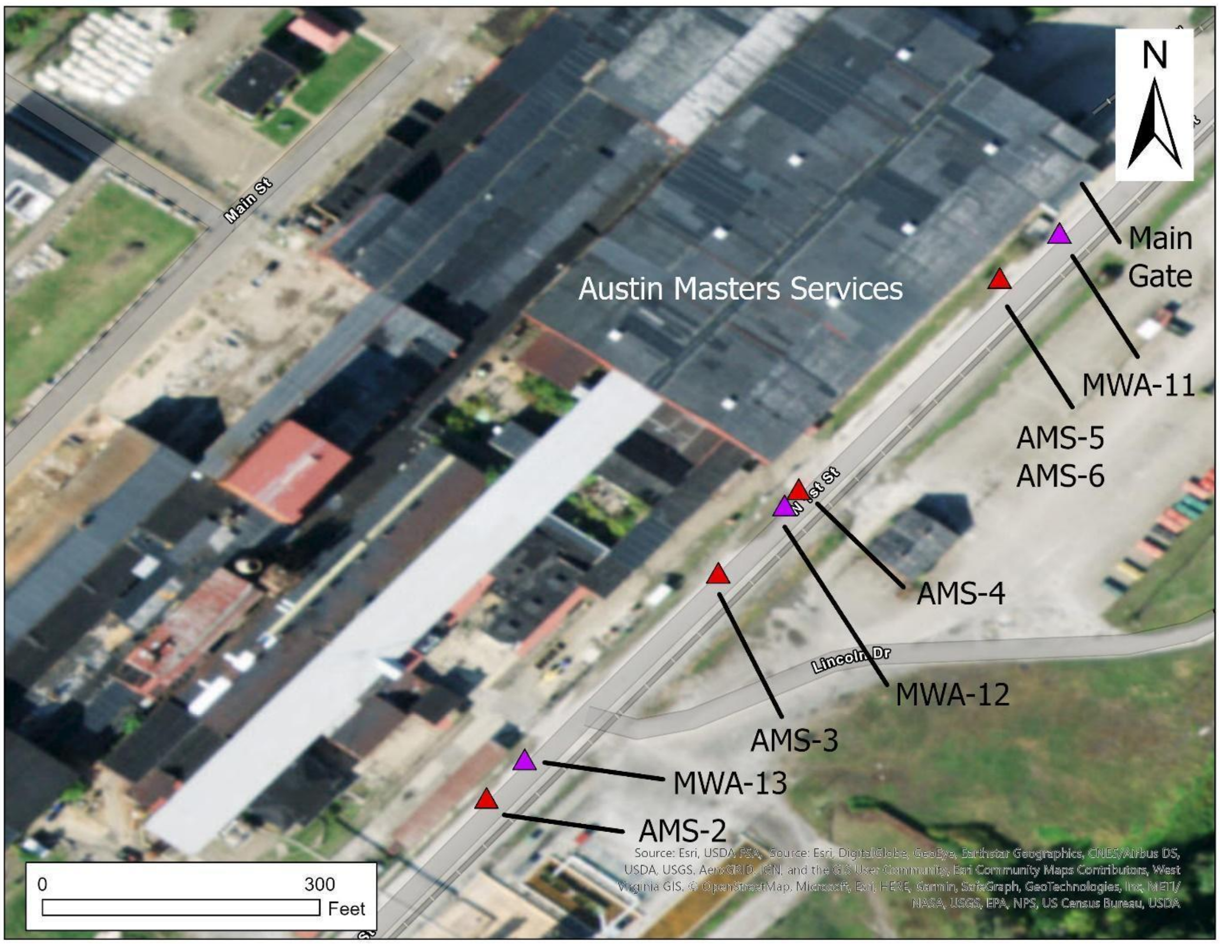

Figure 2. *Location of samples collected during two sampling expeditions. Note that samples MWA-11, AMS-5, and AMS-6, were taken closest to the building's Main Gate.*

A second set of samples was collected on February 16th, 2022 along the same transect used previously (Figure 2). Samples labeled AMS-2 through AMS-6 were collected in response to elevated radioactivity detected during soil surveys using the Ludlum Digital Survey Meter. Samples AMS-1 and AMS-7 represent background samples taken from a community park and cemetery, respectively. Approximately

100 grams of surface sediments were collected from each sample location using sterile plastic scoops and then transferred to sterile, plastic sample containers. Samples were secured with plastic lids and tamper-proof parafilm tape and sent directly to Eberline Lab in Oak Ridge for Gamma spectroscopy using EPA Method 901.1 Modified.

Table 2 provides dates and GPS coordinates for surface sediment samples collected near the AMS facility

Table 2. *Coordinates and sampling dates of surface sediment samples collected around the Austin Masters Services facility, as well as two reference samples collected at a community park and cemetery located in Martins Ferry.*

Sample name	Date collected	Latitude	Longitude
MWA-11	11-09-2021	40.102611	-80.711000
MWA-12	11-09-2021	40.101806	-80.711814
MWA-13	11-09-2021	40.101056	-80.712583
AMS-1 Park	02-16-2022	40.094484	-80.727518
AMS-2	02-16-2022	40.100942	-80.712696
AMS-3	02-16-2022	40.101607	-80.71201
AMS-4	02-16-2022	40.101854	-80.711772
AMS-5	02-16-2022	40.102478	-80.711177
AMS-6	02-16-2022	40.102478	-80.711177
AMS-7 Cemetery	02-16-2022	40.103834	-80.720717

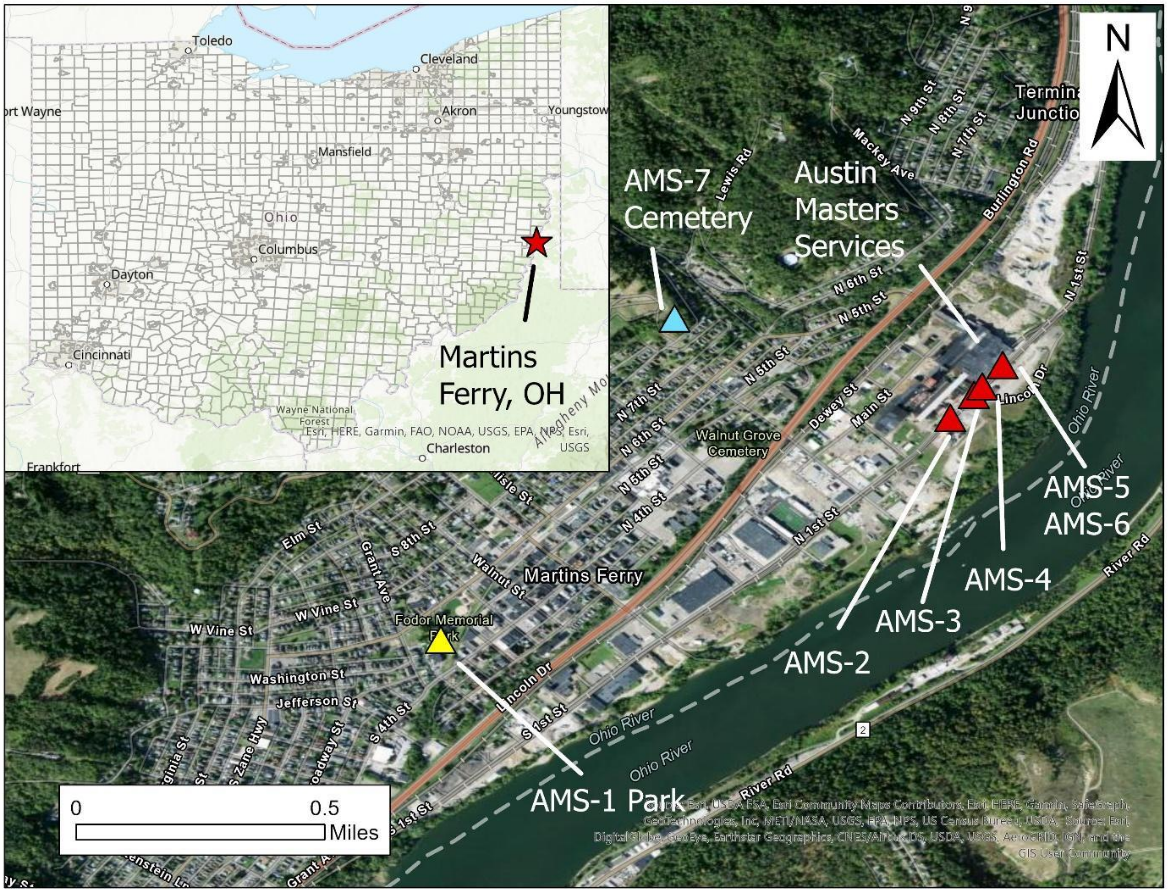

Figure 3. *Location map of the Austin Masters Services facility in Martins Ferry, Ohio and of collected surface sediment samples during the second sampling trip (red triangles) on 02/16/2022. Samples include surface sediment at a local park (yellow triangle) and a local cemetery (light blue triangle).*

Results

Table 3 summarizes activity concentrations for ^{226}Ra concentrations in soil samples collected during two sampling expeditions. An average background level of 1.34 ± 0.33 picocuries per gram (pCi/g) for ^{226}Ra was established using data for samples ASM-1 Park and ASM-7 Cemetery. In comparison, activity concentrations for ^{226}Ra from samples collected along the transect near the AMS facility are significantly higher than background concentrations and range from 3.76 ± 0.34 pCi/g (for the sample furthest away from the AMS Main Gate) to 14.66 ± 0.95 pCi/g (for the sample closest to the AMS Main Gate) (Table 3).

Table 3. *Gamma spectroscopy results for ^{226}Ra for surface sediment samples collected around the Austin Masters Services facility, a local park, and a local cemetery.*

Sample name	Activity concentration (pCi/g) ^{226}Ra	Counting uncertainty (pCi/g)
Combined MWA 11/12/13[a]	14.07	1.59
AMS-1 Park[b]	1.07	0.19
AMS-2	3.76	0.34
AMS-3	7.64	0.69
AMS-4	13.12	1.05
AMS-5	14.66	0.95
AMS-6	14.14	1.09
AMS-7 Cemetery	1.60	0.46

[a] The "Combined MWA 11/12/13" sample was analyzed twice, the table shows the average of those two measurements.
[b] The "AMS-1 Park" sample was analyzed twice, the table shows the average of those two measurements.

Activity concentrations for ^{214}Pb and ^{214}Bi are presented in Tables 4 and 5, respectively and share similar profiles with ^{226}Ra in samples collected at the site.

Table 4. *Gamma spectroscopy results for ^{214}Pb for surface sediment samples collected around the Austin Masters Services facility, a local park, and a local cemetery.*

Sample name	Activity concentration (pCi/g) ^{214}Pb	Counting uncertainty (pCi/g)
Combined MWA 11/12/13[a]	14.89	1.62
AMS-1 Park[b]	1.20	0.18
AMS-2	3.79	0.34
AMS-3	9.03	0.87
AMS-4	13.02	1.04
AMS-5	14.98	1.02
AMS-6	14.89	1.32
AMS-7 Cemetery	1.42	0.38

[a] The "Combined MWA 11/12/13" sample was analyzed twice, the table shows the average of those two measurements.
[b] The "AMS-1 Park" sample was analyzed twice, the table shows the average of those two measurements.

Table 5. *Gamma spectroscopy results for ^{214}Bi for surface sediment samples collected around the Austin Masters Services facility, a local park, and a local cemetery.*

Sample name	Activity concentration (pCi/g) ^{214}Bi	Counting uncertainty (pCi/g)
Combined MWA 11/12/13[a]	14.07	1.59
AMS-1 Park[b]	1.07	0.19
AMS-2	3.76	0.34
AMS-3	7.64	0.69
AMS-4	13.12	1.05
AMS-5	14.66	0.95
AMS-6	14.14	1.09
AMS-7 Cemetery	1.60	0.46

[a] The "Combined MWA 11/12/13" sample was analyzed twice, the table shows the average of those two measurements.
[b] The "AMS-1 Park" sample was analyzed twice, the table shows the average of those two measurements.

Discussion

The US EPA requires activity concentrations of ^{226}Ra to not exceed local background concentration by more than 5 pCi/g (Luftig and Weinstock, 1997). The local cemetery and local park surface sediment samples yielded an average background activity concentration of 1.34 ± 0.33 pCi/g. Hence, values of 6.34 pCi/g would suggest that local soils should be no more than 6.34 pCi/g. Figure 5 clearly shows that surface sediments outside of the AMS facility are well above the limit recommended by the US EPA. Results also demonstrate that activity concentrations for Radium-226, Lead-214 and Bismuth-214 increase with proximity to the facility entrance, implicating AMS as the source for local contamination.

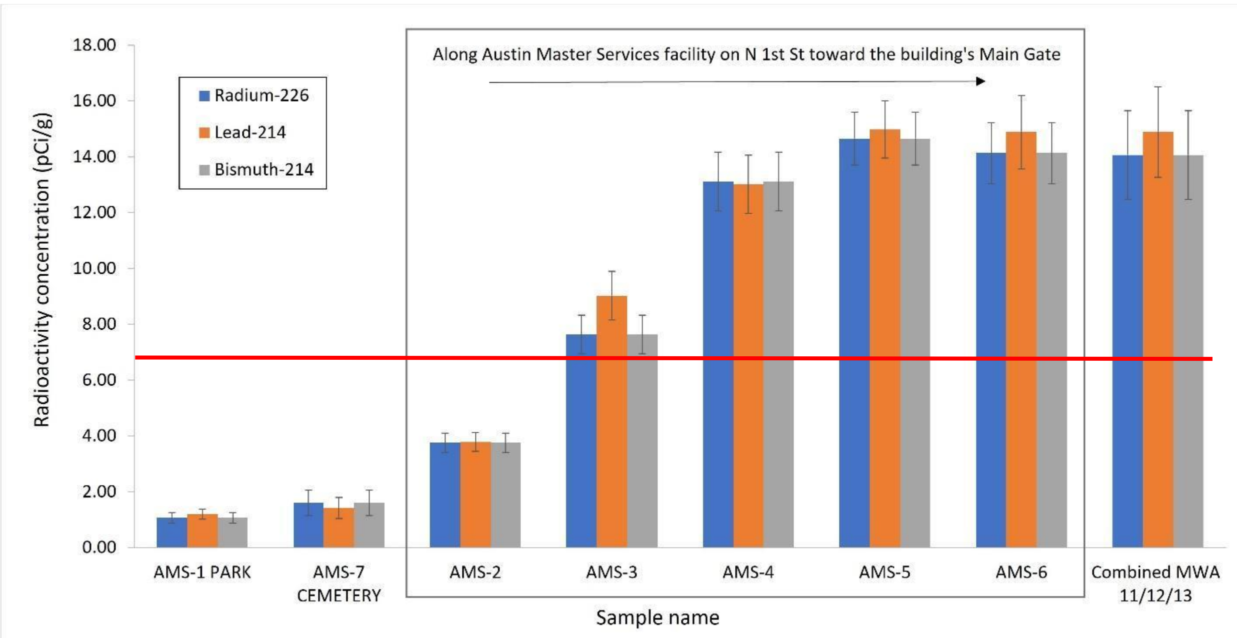

Figure 4. *Activity concentrations for Radium-226 (blue), Lead-214 (orange), and Bismuth-214 (gray) for surface sediment samples collected around the Austin Masters Services facility (MWA and AMS-2 through AMS-7), a local park (AMS-1), and a local cemetery (AMS-7). The red line represents the US EPA's requirement that soils be no more than 5 pCi/g above background levels (Luftig and Weinstock, 1997), in this case the background levels are indicated by the cemetery and park samples. Counting uncertainty for gamma spectroscopy is shown as a black error bar for each of the samples.*

Radium-226, Lead-214, and Bismuth-214, that are identified at high concentration in the surface sediment samples collected near the AMS facility are part of the Uranium-238 decay chain (Figure 6). This decay series and its radioisotopes are commonly associated with oil and gas waste (AL Nabhani et al., 2016).

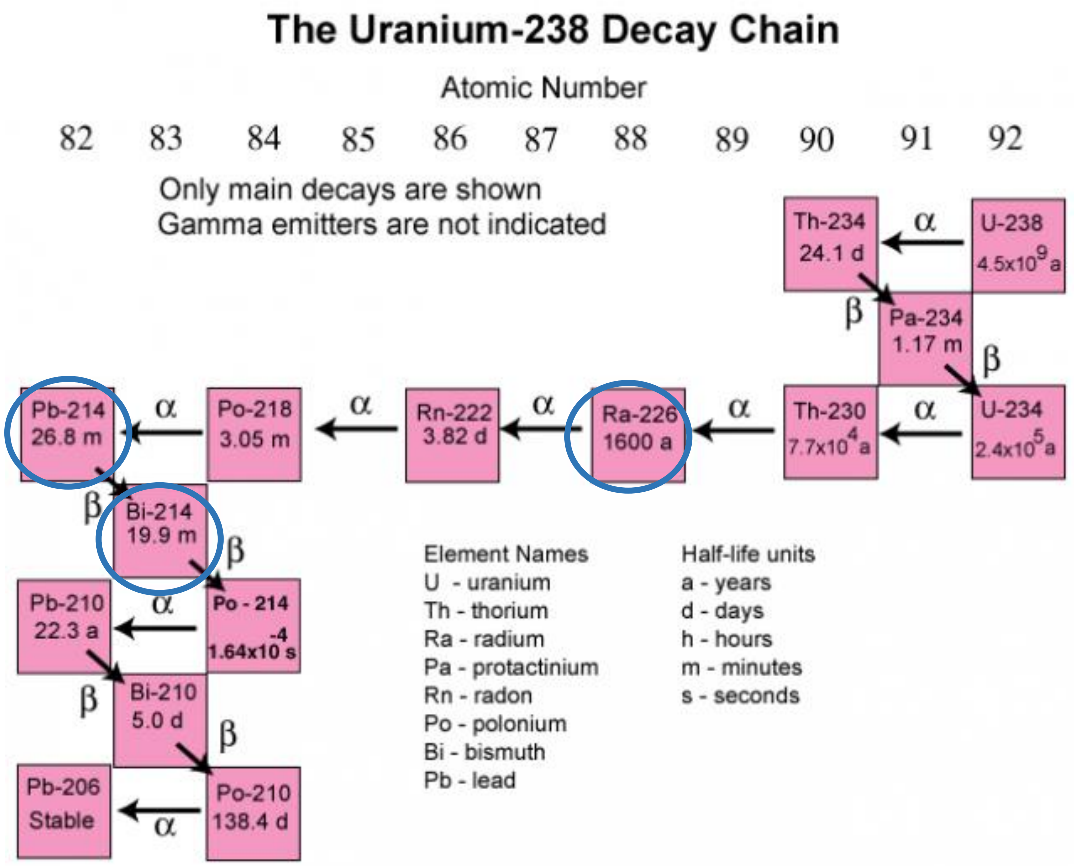

Figure 5. *Uranium-238 decay chain. The three radioisotopes identified in the surface sediment samples near the Auston Masters facility, Radium-226 (Ra-226), Lead-214 (Pb-214), and Bismuth-214 (Bi-214), are circled in blue. Figure modified from https://www.epa.gov/radiation/radioactive-decay.*

The U.S. Environmental Protection Agency (US EPA) developed guidance for soil screening levels to "facilitate prompt identification of radionuclides and exposure areas of concern" (US EPA, 2000). According to this guidance, the screening level is used to determine response actions for cleanup (Figure 6). The generic soil screening level for external radiation exposure for Radium-226 and its decay products is 0.0915 pCi/g (Table 2). The gamma spectroscopy results for the AMS surface sediment samples are clearly orders of magnitude above the soil screening levels for Radium-226 and its decay products.

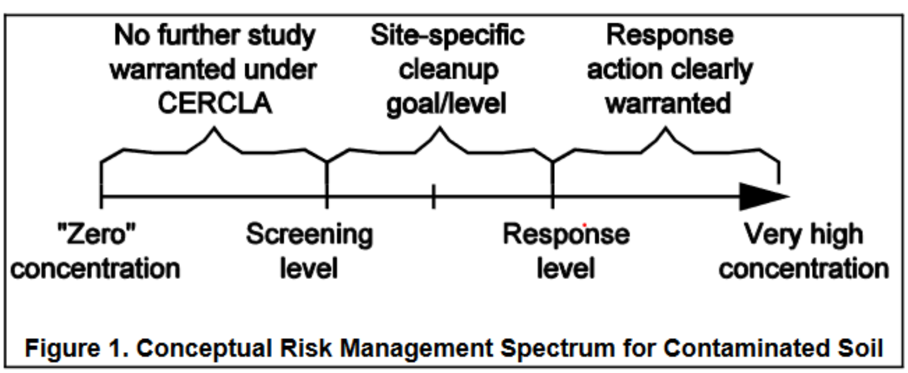

Figure 6. *US EPA soil screening level guidance for contaminated soil (Source: US EPA, 2000).*

Table 6. *US EPA generic soil screening level (SSL) in pCi/g for Radium-226. The first row represents the SSL for Radium-226 on its own, and "decay-corrected' accounts for the decay products (including Lead-214 and Bismuth-214) of Radium-226 (Source: US EPA, 2000).*

Type	Ingestion of homegrown produce	Direct ingestion of soil	Inhalation of fugitive dust	External radiation exposure
Not accounting for decay	0.0683	1.09	1,570	0.0131
Decay-corrected	0.0915	1.29	12,900	0.0915

Groundwater Monitoring Wells

Although potential contamination of groundwater remains as a concern, assessing migration of ^{226}Ra and other radioactive or chemical contaminants in groundwater fell outside the scope of this project. However, information obtained from a Semi-Annual Groundwater Monitoring Program conducted by Austin Master Services warrants some attention and comment. Figure 7 shows the location of four groundwater monitoring wells installed by AMS in 2015. The well labeled NE at the bottom of the figure lies between the facility and the intake wells for the Martins Ferry water treatment plant and within the Inner Management Zone that corresponds with a 1-year time of transport to the municipal water wells.

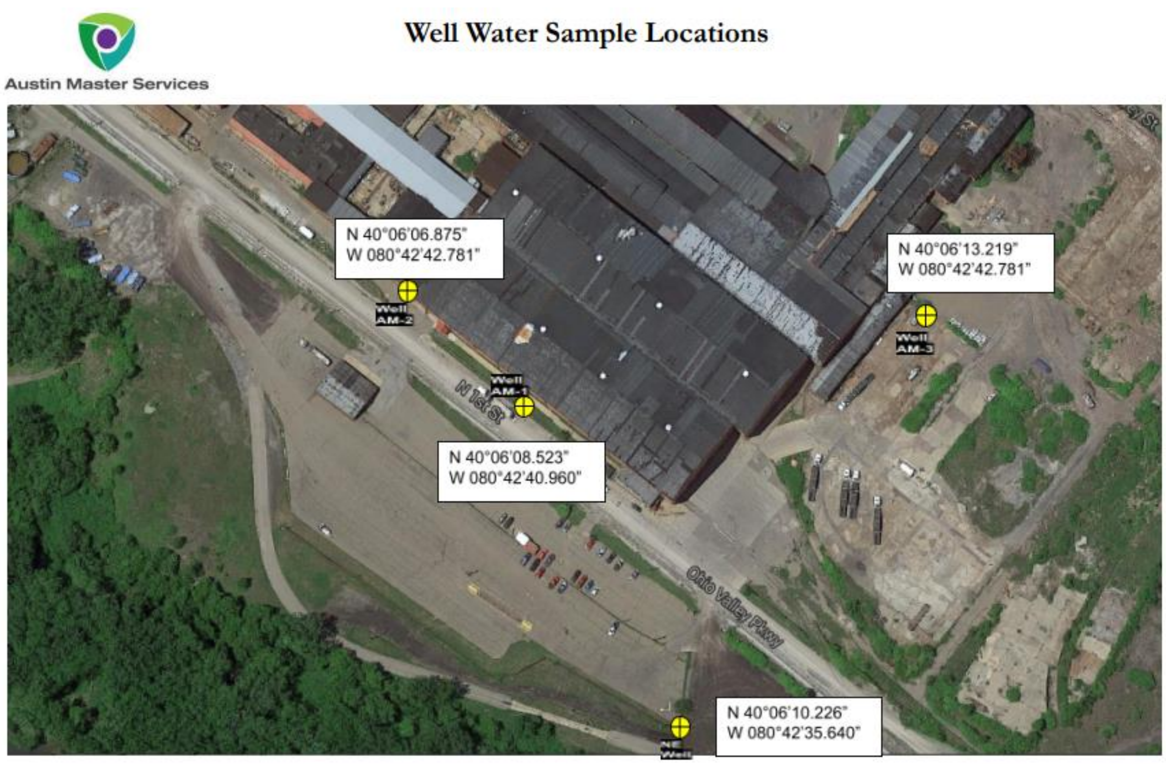

Figure 7. *Location of groundwater monitoring wells installed by AMS in 2015. Image courtesy of AMS.*

Tabulated results from radiological and chemical analyses were provided by AMS for each of the four wells from 2015 to 2021. Table 7 presents information from the Northeast monitoring well (NE) located between the waste processing facility and the intake wells for Martins Ferry's municipal water treatment plant. Activity levels for gross alpha emissions typically exceeded health-based screening levels and raised concern for the quality of this source water. However, based upon large confidence intervals reported for gross alpha activity for the most recent sample and the lack of confidence intervals for results from previous years, it is difficult to trust results as they are presented.

Table 7. Summary of analytical results from the Northeast monitoring well (NE). Values highlighted in yellow exceed health-based screening levels. Green highlights indicate exceedance of aesthetics-based standard maximum contaminant level (SMCL) and red indicates exceedance of both health-based and aesthetic-based screening levels.

GROUNDWATER ANALYTICAL RESULTS - NE WELL
SEMI-ANNUAL GROUNDWATER MONITORING PROGRAM - AMS MARTINS FERRY FACILITY
AUSTIN MASTERS WASTE PROCESSING FACILITY
MARTINS FERRY, OHIO

Sample ID:	NE Well										Groundwater Standards	
Date:	8/27/2015	3/30/2016	9/16/2016	5/17/2017	9/21/2017	4/14/2018	10/24/2018	5/8/2019	12/20/2019	9/17/2021		
Sampler:										CEC		
Laboratory:												
Parameters											MCL[1]	SMCL[2]
TCL VOCs (mg/l)												
cis-1,2-Dichloroethene	< 0.001	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	0.07	nsc
1,1, Dichloroethane	< 0.001	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	nsc	
Toluene	< 0.001	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	1	
Trichloroethene	< 0.001	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	0.005	nsc
Vinyl chloride	< 0.001	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	0.002	
Metals (mg/L)												
Arsenic (Total)	0.019	ND	0.019	0.028	0.023	ND	0.022	ND	--	<0.020	0.01	nsc
Arsenic (Dissolved)	--	--	--	--	--	--	--	--	--	<0.020	0.01	nsc
Barium (Total)	0.21	0.026	0.23	0.36	0.49	0.017	0.36	0.0996	--	0.0126	2	nsc
Barium (Dissolved)	--	--	--	--	--	--	--	--	--	0.0078	2	nsc
Boron (Total)	--	--	--	--	--	--	--	--	--	0.42	6 [3]	nsc
Boron (Dissolved)	--	--	--	--	--	--	--	--	--	0.434	6 [3]	nsc
Cadmium (Total)	0.065	0.08	0.047	0.063	0.041	0.073	0.053	0.0432	--	0.0287	0.005	nsc
Cadmium (Dissolved)	--	--	--	--	--	--	--	--	--	0.0305	0.005	nsc
Calcium (Total)	--	--	--	--	--	--	--	--	--	241	nsc	nsc
Calcium (Dissolved)	--	--	--	--	--	--	--	--	--	250	nsc	nsc
Chromium (Total)	0.048	0.028	0.067	0.081	0.09	0.022	0.054	0.0282	--	0.018	0.1	nsc
Chromium (Dissolved)	--	--	--	--	--	--	--	--	--	0.0165	0.1	nsc
Iron (Total)	--	--	--	--	--	--	--	--	--	6.72	nsc	0.3
Iron (Dissolved)	--	--	--	--	--	--	--	--	--	2.45	nsc	0.3
Lead (Total)	0.099	0.0044	0.097	0.094	0.13	ND	0.082	0.0115	--	<0.010	0.005	nsc
Lead (Dissolved)	--	--	--	--	--	--	--	--	--	<0.010	0.005	nsc
Lithium (Total)	--	--	--	--	--	--	--	--	--	PENDING	0.083 [3]	nsc
Lithium (Dissolved)	--	--	--	--	--	--	--	--	--	0.247	0.083 [3]	nsc
Magnesium (Total)	--	--	--	--	--	--	--	--	--	23.0	nsc	nsc
Magnesium (Dissolved)	--	--	--	--	--	--	--	--	--	23.6	nsc	nsc
Manganese (Total)	2.5	2.7	2.5	2.8	2	2.5	1.6	1.53	--	1.47	nsc	0.05
Manganese (Dissolved)	--	--	--	--	--	--	--	--	--	1.49	nsc	0.05
Mercury (Total)	0.00026	ND	ND	ND	ND	ND	ND	ND	--	<0.00020	0.002	nsc
Mercury (Dissolved)	--	--	--	--	--	--	--	--	--	<0.00020	0.002	nsc
Potassium (Total)	--	--	--	--	--	--	--	--	--	4.82	nsc	nsc
Potassium (Dissolved)	--	--	--	--	--	--	--	--	--	4.83	nsc	nsc
Selenium (Total)	0.01	ND	ND	ND	ND	ND	ND	ND	--	<0.020	0.05	nsc
Selenium (Dissolved)	--	--	--	--	--	--	--	--	--	<0.020	0.05	nsc
Sodium (Total)	--	--	--	--	--	--	--	--	--	54.2	nsc	nsc
Sodium (Dissolved)	--	--	--	--	--	--	--	--	--	54.3	nsc	nsc
Silver (Total)	0.01	ND	ND	ND	ND	ND	ND	ND	--	<0.005	nsc	0.1
Silver (Dissolved)	--	--	--	--	--	--	--	--	--	0.0052	nsc	0.1
Strontium (Total)	--	--	--	--	--	--	--	--	--	0.794	4 [3]	nsc
Strontium (Dissolved)	--	--	--	--	--	--	--	--	--	0.790	4 [3]	nsc
Zinc (Total)	3	2	3	2.5	2.6	2.1	1.5	1.52	--	2.26	nsc	5
Zinc (Dissolved)	--	--	--	--	--	--	--	--	--	2.38	nsc	5
General Chemistry (mg/l unless otherwise noted)												
pH (Standard Units)	--	--	--	--	--	--	--	--	--	2.8 H3,H6	nsc	6.5-8.5
Alkalinity	--	--	--	--	--	--	--	--	--	--	nsc	nsc
Chloride	Not done	54.9	67.1	70.2	57.9	44	53.6	50.2	--	52.2	nsc	250.0
Sulfate	Not Done	1620	1040	1530	1380	1300	1220	1220	--	1100	nsc	250.0
Hardness	--	--	--	--	--	--	--	--	--	696	nsc	nsc
Total Dissolved Solids	--	--	--	--	--	--	--	--	--	--	nsc	500.0
Total Suspended Solids	--	--	--	--	--	--	--	--	--	--	nsc	nsc
Specific Conductance (µS/cm)	--	--	--	--	--	--	--	--	--	2450 1c	nsc	nsc
Field Readings												
Temperature ° C	15.5	--	--	--	--	--	--	--	--	14.85	nsc	nsc
pH (Standard Units)	2.68	--	--	--	--	--	--	--	--	2.79	nsc	6.5-8.5
Specific Conductance (µS/cm)	3000	--	--	--	--	--	--	--	--	2187	nsc	nsc
Total Dissolved Solids (mg/l)	--	--	--	--	--	--	--	--	--	1	nsc	500.0
Oxidaiton Reduction Potential (mV)	--	--	--	--	--	--	--	--	--	494	nsc	nsc
Dissolved Oxygen (mg/l)	--	--	--	--	--	--	--	--	--	1.85	nsc	nsc
Turbidity (NTU)	394	--	--	--	--	--	--	--	--	56.5-1000/56.5	nsc	nsc
Radiological (pCi/l unless otherwise noted)												
Gross Alpha	28	23.9	13.7	169	104	11.6	55.6	10.8	--	11.5±5.53	15	nsc
Gross Beta	37.4	9.88	48.6	143	98	23	47	4.46	--	3.01±2.54	4 mrem/yr dose	nsc
Radium-226	0.13	0.386	0.712	0.226	0.39	0.33	0.358	0.519	--	-0.281±0.419	5 [4]	nsc
Radium-228	0.65	1.7	1.26	0.578	1.18	0.75	1.24	1.44	--	0.286±0.380	5 [4,]	nsc

Additional information regarding sample collection and handling protocols, instrument operational parameters, complete laboratory datasets, and well log reports are needed to properly assess subsurface contaminant migration from this site.

Conclusion and Next Steps

This community driven sampling project represents major cause for concern. These preliminary sampling results around the AMS facility suggest there is significant contamination of radionuclides associated with oil and gas waste in the surface sediments surrounding the facility.

Local regulatory agencies (e.g., OEPA, ODNR, and ODH) need to conduct a thorough sampling of the Austin Masters Services facility's surrounding areas as well as sample the ground, air filters, and other surfaces within the facility to ensure the public health safety of the facility's workers as well as for local residents.

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