Ohio Environmental Protection Agency

John R. Kasich, Governor
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Summary of Ohio EPA Sampling and Analysis at Arco Recycling, East Cleveland May 17, 2017

I. Pollutants Measured

Asbestos

Asbestos is a naturally occurring element known for its durability and fire resistance that was used in a variety of construction materials in the past. No regulated asbestos-containing materials were allowed to be accepted at Arco Recycling (Arco) and there is no indication that regulated asbestos-containing material was accepted. However, this does not mean that asbestos from an exempt source, such as an individual home or source with below regulated threshold quantities of asbestos, was not shipped to Arco. On two occasions during the facility's operation, suspect asbestos-containing material was observed. To be protective of public health, samples of these suspect materials were collected and analyzed. On the first occasion, the results showed no asbestos in the samples. On the second occasion, asbestos was present in the material and Arco had the material removed and shipped to the proper facility. The source of this material could not be linked to a regulated project. In addition, asbestos air samples were collected at the fence line and essentially no airborne asbestos fibers were detected.

Additional asbestos sampling was conducted on May 5, 2017, to coincide with the date that Ohio EPA had a contractor onsite to assess the recyclable value of material within Arco's waste piles. Samples of C&DD waste and C&DD fine materials were collected, as well as samples of air surrounding the facility's perimeter. All material sampled contained less than the regulatory threshold of 1% asbestos. Air samples detected asbestos at a level that is multiple times lower than what would present a human health concern.

Hydrogen Sulfide

Hydrogen sulfide (H2S) gas can be created when sulfur-containing wallboard material is collected and allowed to get wet. This gas is very odiferous, smelling like rotten eggs. A handheld real-time H2S monitor is being used during the sampling to measure for any gas on the site periphery. H2S gas has been detected on one occasion, and at a level that is multiple times lower than what would present a human health concern.

Methane

Methane gas is also being monitored at points surrounding the facility. A handheld real-time multi-gas meter is used to test the air at the same locations and frequency as the H2S sampling. No methane gas has been detected.

Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are emitted from multiple sources in any given urban area, ranging from larger industrial sources to mobile sources (automobile traffic). Construction and

demolition debris (C&DD) facilities do not typically generate VOCs; however, the Agency is monitoring these compounds at Arco to see if any are present in unusual concentrations. This U.S. EPA-approved method can detect over 80 volatile compounds in ambient air. All VOC levels detected near Arco have been below current screening levels for potential health-based effects. Average VOC levels remain within those measured in typical Ohio urban areas.

Particulate Matter

Particulate matter (PM), especially of aerodynamic size less than 10 microns (micrometers) in diameter, has been regulated since 1987. Airborne particles this size can travel deep inside lung tissues, increasing their potential to cause both short and long-term health effects. National Ambient Air Quality Standards are set and periodically reviewed for these pollutants. Once waste removal begins at Arco, Ohio EPA and the Cleveland Division of Air Quality plan to deploy a dedicated PM 10 sampling device at the site to make sure particulate levels do not exceed air quality standards.

II. Air Sampling Results Screening Values Explained

Short-term screening values are developed and used by federal and state agencies to evaluate the potential for human health effects. Compounds detected above these values may require further investigation and action to minimize exposure to human health and the environment. The following list contains a brief explanation of the sources used to establish initial short-term screening values for the air sampling around Arco.

ATSDR Minimum Risk Levels

The 24-hour VOC levels are compared to the Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs) for each compound. An MRL is defined as an estimate of daily human inhalation exposure to a substance that is likely to be without an appreciable risk of adverse non-cancer effects over a specified duration of exposure, in this case 15-364 days.

U.S. EPA Acute Exposure Guideline Level

The U.S. Environmental Protection Agency's (U.S. EPA) Acute Exposure Guideline Level (AEGL-1) for mild effects is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

U.S. DOE Emergency Response Planning Guidelines

The U.S. Department of Energy's (U.S. DOE) Emergency Response Planning Guidelines (ERPG-1) for mild, transient effects is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour, without experiencing other than mild transient adverse health effects and irreversible or serious effects.

Ohio EPA MAGLC

In the absence of U.S. EPA or ATSDR specific health-based information, Ohio EPA's Maximum Acceptable Ground-Level Concentration (MAGLC) derives a screening level from the occupational standards sufficiently adjusted to protect the public, including sensitive populations. In this case, the American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) is divided by compound safety factors to derive a short-term limit on air concentrations permitted in Ohio. No toxic compound levels detected at Arco exceeded these limits.

ARCO Recycling, 1705 Noble Road

Ambient Air Sampling Results-Volatile Organic Compounds(VOCs)

January 31, 2017- May 6, 2017

24 Hour Downwind Sampling Results

Compound list	Average (1/2mdl)**	Minimum	Maximum	Count***	Short-term Screening Values	Source
	ppb	ppb	ppb		ppb	
Acetone	4.51	BDL	13.50	16	13,000	MRLs (intermed.)
Acrolein*	0.54	BDL	3.06	5	0.04	MRLs (intermed.)
Benzene	0.37	BDL	1.95	18	6	MRLs (intermed.)
1,3-Butadiene	0.06	BDL	0.16	1	10,000	ERPG-1
n-Butane	1.04	BDL	2.97	17	18,000	MAGLC
2-Butanone	0.43	BDL	1.61	8	200,000	AEGL-1
Carbon disulfide	0.27	BDL	1.03	1	1,000	ERPG-1
Carbon tetrachloride	0.08	BDL	0.14	8	30	MRLs (intermed.)
Chloromethane	0.88	0.43	2.34	20	200	MRLs (intermed.)
Cyclohexane	0.06	BDL	0.12	1	2,400	MAGLC
Dichlorodifluoromethane	0.80	0.47	2.76	20	24,000	MAGLC
Ethanol	3.59	BDL	10.70	15	1,800,000	MAGLC
Ethyl acetate	0.07	BDL	0.21	3	9,500	MAGLC
Ethylbenzene	0.06	BDL	0.10	2	2,000	MRLs
n-Heptane	0.08	BDL	0.16	5	10,000	MAGLC
Hexane	0.16	BDL	0.34	14	1,190	MAGLC
2-Hexanone	0.06	BDL	0.12	1	120	MAGLC
Isopropyl alcohol	1.19	BDL	7.12	11	5,000	MAGLC
Methylene chloride	0.12	BDL	0.21	14	300	MRLs (intermed.)
Methyl methacrylate	0.06	BDL	0.11	1	1,190	MAGLC
Naphthalene	0.12	BDL	0.93	3	240	MAGLC
n-Pentane	0.43	BDL	0.87	18	14,286	MAGLC
Propylene	0.53	BDL	1.21	17	11,905	MAGLC
Styrene	0.07	BDL	0.17	3	5,000	MRLs
Tetrahydrofuran	0.30	BDL	2.82	5	1190	MAGLC
Tetrachloroethylene	0.11	BDL	0.92	2	6	MRLs (intermed.)
Toluene	0.26	BDL	0.94	15	2000	MRLs
Trichloroethene	0.06	BDL	0.12	1	0.4	MRLs (intermed.)
Trichlorofluoromethane	0.40	0.17	1.52	20	24,000	MAGLC
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.09	BDL	0.55	4	24,000	MAGLC
1,2,4-Trimethylbenzene	0.09	BDL	0.21	6	595	MAGLC
Vinyl acetate	0.17	BDL	0.85	5	10	MRLs (intermed.)
o-Xylene	0.10	BDL	0.11	2	600	MRLs (intermed.)
Total m&p-xylenes	0.13	BDL	0.24	5	600	MRLs (intermed.)

BDL= below detection limits

ATSDR Minimum Risk Level (MRLs)

ERPG-Emergency Response Planning Guidelines.The first tier (e.g., ERPG-1) is a temporary, non-disabling effects threshold

AEGL-1 = Acute exposure guideline levels for mild effects

MAGLC= TLV/42

* Acrolein: Sample results for Acrolein are suspect. This compound can be created within the sample canister itself: U.S. EPA is refining the test method to correct for this problem.

** Average (½ method detection limit): The arithmetic mean (average) listed uses one-half of the method detection limit (1/2 MDL) as the numerical value for non-detected compounds when computing the average of multiple sampling events. This method is standard practice to estimate averages with non-detected values.

Method Detection limit: The method detection limit is the lowest measurement the collection / analysis procedure can accurately quantify as a true measurement of the ambient air concentration.

*** Count: Total detections out of 20 sampling events (other samples were below detection limits)

ARCO Recycling, 1705 Noble Road

Ambient Air Sampling Results-Volatile Organic Compounds(VOCs)

January 31, 2017- May 6, 2017

24 Hour Residential Sampling Results

Compound list	Average (1/2mdl)**	Minimum	Maximum	Count***	Short-term Screening Values	Source
	ppb	ppb	ppb		ppb	
Acetone	2.89	BDL	6.06	12	13,000	MRLs (intermed.)
Acrolein*	0.28	BDL	0.87	1	0.04	MRLs (intermed.)
Benzene	0.31	0.15	1.06	19	6	MRLs (intermed.)
n-Butane	1.48	0.47	3.54	19	18,000	MAGLC
2-Butanone	0.32	BDL	0.70	4	200,000	AEGL-1
Carbon tetrachloride	0.06	BDL	0.12	5	30	MRLs (intermed.)
Chloromethane	0.70	0.55	0.98	19	200	MRLs (intermed.)
Dichlorodifluoromethane	0.58	0.47	0.78	19	24,000	MAGLC
Ethanol	4.05	BDL	10.50	18	1,800,000	MAGLC
n-Heptane	0.05	BDL	0.11	1	10,000	MAGLC
Hexane	0.17	BDL	0.35	14	1,190	MAGLC
2-Hexanone	0.05	BDL	0.12	1	120	MAGLC
Isopropyl alcohol	0.95	BDL	6.07	13	5,000	MAGLC
Methylene chloride	0.12	BDL	0.30	16	300	MRLs (intermed.)
Naphthalene	0.11	BDL	0.25	1	240	MAGLC
n-Pentane	0.49	0.18	0.96	19	14,286	MAGLC
Propylene	0.60	0.28	1.30	19	11,905	MAGLC
Styrene	0.06	BDL	0.15	1	5,000	MRLs
Tetrachloroethylene	0.12	BDL	0.29	2	6	MRLs (intermed.)
Toluene	0.27	0.10	0.49	19	2000	MRLs
Trichlorofluoromethane	0.23	0.20	0.30	19	24,000	MAGLC
1,1,2-Trichloro-1,2,2-	0.10	BDL	0.10	2	24,000	MAGLC
1,2,4-Trimethylbenzene	0.06	BDL	0.12	4	595	MAGLC
Vinyl acetate	0.11	BDL	0.30	1	10	MRLs (intermed.)
Total m&p-xylenes	0.12	BDL	0.22	4	600	MRLs (intermed.)

BDL= below detection limits

ATSDR Minimum Risk Level (MRLs)

AEGL-1 = Acute exposure guideline levels for mild effects

MAGLC= TLV/42

* Acrolein: Sample results for Acrolein are suspect. This compound can be created within the sample canister itself: U.S. EPA is refining the test method to correct for this problem.

** Average (½ method detection limit): The arithmetic mean (average) listed uses one-half of the method detection limit (1/2 MDL) as the numerical value for non-detected compounds when computing the average of multiple sampling events. This method is standard practice to estimate averages with non-detected values.

Method Detection limit: The method detection limit is the lowest measurement the collection / analysis procedure can accurately quantify as a true measurement of the ambient air concentration.

*** Count: Total detections out of 19 sampling events (other samples were below detection limits)

ARCO Recycling, 1705 Noble Road						
Ambient Air Sampling Results-Volatile Organic Compounds(VOCs)						
	January 31, 2017- May 6, 2017					
	24 Hour Upwind Sampling Results					
Compound list	**Average (1/2mdl)****	**Minimum**	**Maximum**	**Count*****	**Short-term Screening Values**	**Source**
	ppb	**ppb**	**ppb**		**ppb**	
Acetone	3.42	BDL	6.87	14	13,000	MRLs (intermed.)
Acrolein*	0.28	BDL	0.52	2	0.04	MRLs (intermed.)
Benzene	0.27	0.10	0.85	19	6	MRLs (intermed.)
n-Butane	1.50	0.31	3.98	19	18,000	MAGLC
2-Butanone	0.38	BDL	0.75	7	200,000	AEGL-1
Carbon tetrachloride	0.07	BDL	0.11	6	30	MRLs (intermed.)
Chloromethane	0.72	0.55	1.02	19	200	MRLs (intermed.)
Dichlorodifluoromethane	0.57	0.43	0.76	19	24,000	MAGLC
Ethanol	4.21	BDL	14.00	18	1,800,000	MAGLC
n-Heptane	0.06	BDL	0.14	3	10,000	MAGLC
Hexane	0.19	BDL	0.41	15	1,190	MAGLC
2-Hexanone	0.07	BDL	0.48	1	120	MAGLC
Isopropyl alcohol	1.00	BDL	5.85	13	5,000	MAGLC
Methylene chloride	0.11	BDL	0.24	15	300	MRLs (intermed.)
n-Pentane	0.51	0.16	1.20	19	14,286	MAGLC
Propylene	0.69	0.28	1.33	19	11,905	MAGLC
Styrene	0.06	BDL	0.15	1	5,000	MRLs
Toluene	0.27	BDL	0.51	18	2000	MRLs
Tetrachloroethylene	0.07	BDL	0.28	2	6	MRLs (intermed.)
Trichlorofluoromethane	0.23	0.20	0.29	19	24,000	MAGLC
1,2,4-Trimethylbenzene	0.07	BDL	0.14	4	595	MAGLC
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.06	BDL	0.11	2	24000	MAGLC
Vinyl acetate	0.13	BDL	0.32	3	10	MRLs (intermed.)
o-Xylene	0.06	BDL	0.10	2	600	MRLs (intermed.)
Total m&p-xylenes	0.13	BDL	0.25	4	600	MRLs (intermed.)
BDL= below detection limits						
ATSDR Minimum Risk Level (MRLs)						
AEGL-1 = Acute exposure guideline levels for mild effects						
ERPG-Emergency Response Planning Guidelines.The first tier (e.g., ERPG-1) is a temporary, non-disabling effects threshold						
MAGLC= TLV/42						

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** Average (½ method detection limit): The arithmetic mean (average) listed uses one-half of the method detection limit (1/2 MDL) as the numerical value for non-detected compounds when computing the average of multiple sampling events. This method is standard practice to estimate averages with non-detected values.

Method Detection limit: The method detection limit is the lowest measurement the collection / analysis procedure can accurately quantify as a true measurement of the ambient air concentration.

*** Count: Total detections out of 19 sampling events (other samples were below detection limits)

ARCO Recycling, 1705 Noble Road

Ambient Air Sampling Results-Reduced Sulfur Compounds

January 25, 2017- May 9, 2017

24 Hour Downwind Sampling Results

Client Sample ID:		EPA 028473/SN 20101	EPA 027118/SN 11491	EPA 027747/SN 11496	EPA 028472/SN 20100 Canister	EPA 028472/SN 20100 Canister	EPA 027735/SN 11515	EPA 027126/SN 11493	EPA02774 3/SN11518	EPA 028203/SN 11500	EPA 028202/SN 11490	EPA02837 2/SN20893	EPA02711 5/SN11523	EPA 027733/SN 11514		
DAT Sample ID:		0117038-1	217004	217012	217022	217022	217030	217032	0317007-1	317014	0317050-1	0417013-1	0417048-1	0517015-1		
Date Analyzed:		01/25/17-01//26/2017	01/31/2017-02/01/2017	02/07/2017-02/08/2017	02/14/2017-02/15/2017	02/14/2017-02/15/2017	02/22/2017-02/23/2017	2/23/2017	03/02/2017-03/03/2017	03/08/2017-03/09/2017	03/29/2017-03/30/2017	04/10/2017-04/11/2017	5/5/2017-5/6/17	5/8/2017-5/9/17		
		24hr.	24hr.	24hr.	24hr.	Duplicate Lab analysis, 24hr.	24hr.	grab	24hr.	24hr.	24hr.	24hr.	24hr.	24hr.	**Short-term Screening Values**	**Source**
Analyte		**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	**ppb**	
Hydrogen sulfide	773-06-4 03-38-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	70	**MRLs**
Carbonyl sulfide		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23,000	AEGL 2
Methyl mercaptan	74-93-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ERPG-1
Ethyl mercaptan	75-08-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	AEGL 2
Dimethyl sulfide	75-17-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	500	ERPG-1
Carbon disulfide	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	ERPG-1
tert-Butyl mercaptan	75-66-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	No Value	
n-Propyl mercaptan	107-03-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	No Value	
n-Butyl mercaptan	109-79-5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	No Value	
Dimethyl disulfide	75-18-3	ND	ND	ND	0.2	0.187	ND	ND	ND	ND	ND	ND	ND	ND	10	ERPG-1

ATSDR Minimum Risk Level(MRLs)

ERPG-1-Emergency Response Planning Guidelines.The first tier (e.g., ERPG-1) is a temporary, non-disabling effects threshold

AEGL-2 = Acute exposure guideline levels for irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.