

# LETTER HEALTH CONSULTATION

## EVALUATION OF AMBIENT AIR MONITORING DATA IN MONESSEN WASHINGTON COUNTY, PENNSYLVANIA

April 15, 2015

Prepared by:



Pennsylvania Department of Health  
Division of Environmental Health Epidemiology

## **Health Consultation: A Disclaimer**

This report was supported in part by funds provided through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services. The findings and conclusions in these reports are those of the author(s) and do not necessarily represent the views of the Agency for Toxic Substances and Disease Registry or the U.S. Department of Health and Human Services. This document has not been revised or edited to conform to agency standards.

The conclusions and recommendations presented in this health consultation document are based on an analysis of the environmental sampling data and information made available to the PADOH within a limited time frame. The availability of additional sampling data, new information and/or changes in site conditions could affect the conclusions and recommendations presented in this document. PADOH will consider reviewing additional future data related to the site, if made available and deemed appropriate.



To: Nick Lazor  
Environmental Program Manager  
Bureau of Air Quality  
Pennsylvania Department of Environmental Protection

From: Farhad Ahmed, Epidemiologist/Program Manager Health Assessment Program  
Pennsylvania Department of Health (PADOH)

Subject: Review of Ambient Air Monitoring Data from Monessen area  
Washington County, PA

### **Background and Statement of Issues**

DEP requested that DOH and ATSDR review the results of the Monessen, Washington County, PA ambient air monitoring report and determine whether there are any potential acute health risks associated with the exposure to chemicals that were detected near the ArcelorMittal coke plant.

We reviewed the following documents:

1. DEP's Monessen Washington County, PA Ambient Monitoring Report of March 25, 2015
2. OP-FTIR results prior to the start of ArcelorMittal Facility (analysis date 3/31/2014, 04/01/2014, and 04/02/2014 at the Monessen Fire Hall parking lot)
3. OP-FTIR results after the restart of ArcelorMittal Facility (analysis date 04/14/2014, 04/15/2014, 04/16/2014 at the Monessen Fire hall 811 parking lot)
4. EPA TO-15 Target Compounds
5. TO-15 samples collected prior to restart of ArcelorMittal facility (sample dates: 04/01/2014, 04/02/2014, 03/31/2014) at Monessen Boat Dock, Monessen Fire Station, Walnut Ridge)
6. PM 10 samples (analysis for metals) prior to restart and after restart

## **Air Sampling Investigation discussion and results**

ATSDR regional staff members discussed this information together with DOH. Per this request, this information was not evaluated for chronic health effects.

However, the levels of some of the chemicals detected using the OPFTIR method are not suitable for public health risk evaluation since the lower reporting limits were too high and the duration of sampling too short. For example, the hydrogen sulfide reporting limit for some monitoring periods using the OPFTIR was 16,505 ppb. The current ATSDR acute minimal risk level (MRL) for hydrogen sulfide is 70 parts per billion (ppb). This MRL is based on a minimum LOAEL of 2,000 ppb for a > 30% of alteration in two measures of lung function that are suggestive of bronchial obstruction in 2 out of 10 persons with asthma.

The methyl mercaptan reporting limit using the OPFTIR method was at a concentration of 599 ppb (maximum). The highest level detected in the ambient air was at a concentration of 627 ppb. The odor threshold for methyl mercaptan is 1 ppb. NIOSH recommended airborne exposure limit for methyl mercaptan is 500 ppb, not to be exceeded during any 15 minute work period. The detection of this compound in ambient air by OP-FTIR suggests additional sampling using validated methods with sufficiently low detection limits is warranted for public health evaluation purposes.

## **Conclusions**

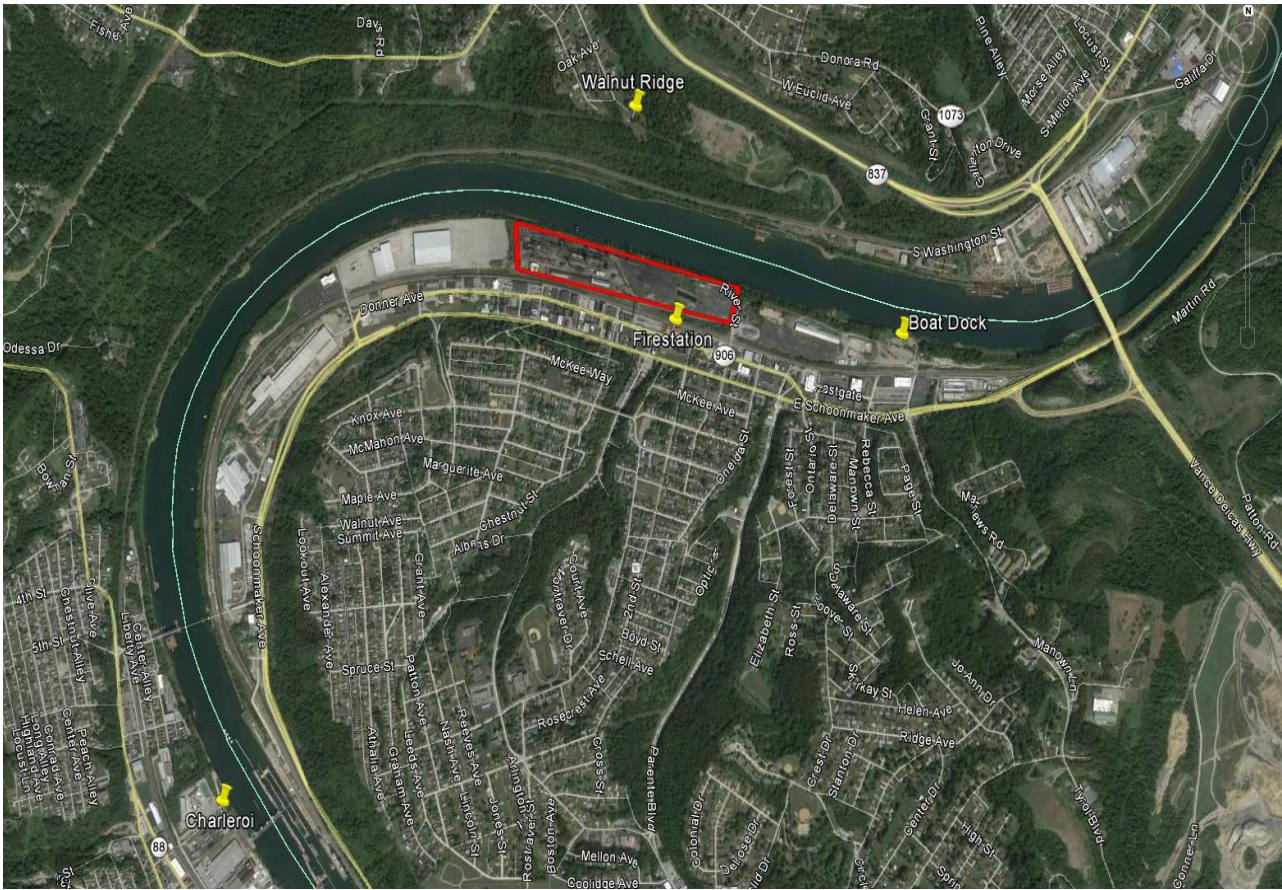
Based on a review of the DEP air sampling results prior to and after restart of the ArcelorMittal coke plant in Monessen, DOH concludes the following:

The levels of various VOCs detected using USEPA method TO-15, as well as the levels of various metals detected in the PM10 samples prior to restart and after restart, are not expected to cause any acute health effects.

Sincerely,



Farhad Ahmed MBBS, MPH  
Epidemiologist/Program Manager Health Assessment Program  
Division of Environmental Health Epidemiology



**Figure 1 Monessen Project Area**

**Table 1 OP-FTIR results prior to restart of ArcelorMittal facility**

Compound	Sample ID: 31MAR14MLG0548 Analysis Date: 03/31/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:48 - 12:00				Sample ID: 31MAR14MLG1641 Analysis Date: 03/31/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 16:41 - 23:59				Sample ID: 01APR14MLG0500 Analysis Date: 04/01/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:00 -			
	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)
1,2,4-Trimethyl benzene	440	--	--	10:20	292	--	--	--	411	--	--	--
2-Methyl Butane	62	--	--	--	54	--	--	--	178	--	--	--
2-Methyl Pentane	75	--	--	--	59	--	--	--	135	--	--	--
3-Methyl Pentane	73	--	--	--	55	--	--	--	147	--	--	--
Acetaldehyde	365	--	--	--	173	--	191	23:58	294	--	--	--
Ammonia	15	--	--	--	7	--	9	20:08	12	--	20	8:05
Benzene	280	--	--	--	221	--	--	--	270	--	--	--
Carbon Disulfide	431	--	--	--	432	--	--	--	721	--	--	--
Carbon Monoxide	35	203	875	9:09	23	219	919	23:16	33	407	1019	10:15
Carbonyl Sulfide	41	--	--	--	17	--	--	--	20	--	--	--
Chloroform	56	--	--	--	13	--	--	--	42	--	--	--
Chloromethane	484	--	--	--	311	--	--	--	479	--	--	--
Dimethyl sulfide	172	--	199	9:10	139	--	--	--	262	--	--	--
Ethane	189	--	--	--	138	--	279	21:12	320	--	567	8:21
Ethanol	104	--	--	--	38	--	--	--	96	--	--	--
Ethylbenzene	184	--	--	--	182	--	--	--	585	--	--	--
Ethylene	39	--	--	--	17	--	17	21:19	32	--	--	--
Formaldehyde	29	--	--	--	22	--	--	--	35	--	--	--
Hydrogen Chloride	42	--	--	--	31	--	--	--	41	--	--	--
Hydrogen Sulfide	16468	--	--	--	10313	--	--	--	16261	--	--	--
Iso-Butane	49	--	--	--	40	--	--	--	107	--	--	--
Methane	160	326	1435	11:41	93	485	2424	21:05	170	2219	6119	8:18
Methanol	20	--	102	6:18	16	--	633	19:38	20	--	57	5:44
Methyl mercaptan	345	--	423	8:49	310	--	627	22:49	555	--	--	--
Methyl tert-butyl ether (MTBE)	23	--	28	10:32	16	--	--	--	20	--	--	--
Methylamine	255	--	--	--	166	--	192	22:38	238	--	250	5:29
m-Xylene	131	--	--	--	72	--	--	--	106	--	110	6:05
Naphthalene	56	--	--	--	28	--	--	--	46	--	--	--
n-Butane	70	--	113	9:57	52	--	91	18:36	116	--	--	--
n-Heptane	457	--	--	--	421	--	499	22:10	1384	--	--	--
n-Hexane	151	--	--	--	132	--	160	18:09	433	--	--	--
Nitric Acid	31	--	--	--	22	--	44	23:27	31	--	44	5:06
Nitric Oxide	2446	--	--	--	899	--	--	--	1721	--	--	--
Nitrogen Dioxide	202	--	--	--	190	--	--	--	566	--	--	--
Nitrous Acid	10	--	--	--	6	--	--	--	9	--	--	--
Nitrous Oxide	44	--	--	--	22	--	37	23:56	40	--	69	5:39
n-Octane	352	--	358	9:57	321	--	458	18:06	1049	--	--	--
n-Pentane	111	--	--	--	82	--	161	17:38	242	--	--	--
o-Xylene	103	--	--	--	47	--	--	--	103	--	--	--
Ozone	42	--	--	--	32	--	258	19:38	39	--	--	--
Propane	87	--	--	--	74	--	--	--	219	--	--	--
p-Xylene	389	--	--	--	166	--	--	--	281	--	--	--
Styrene	43	--	--	--	34	--	--	--	41	--	--	--
Sulfur Dioxide	351	--	--	--	184	--	202	21:15	330	--	--	--
Toluene	200	--	--	--	124	--	--	--	303	--	--	--
Triethylamine	41	--	--	--	21	--	--	--	33	--	--	--

-- indicates concentration less than reporting limit  
 \*Sampling stopped due to equipment issues

**Table 1 cont. OP-FTIR results prior to restart of ArcelorMittal facility**

Compound	Sample ID: 01APR14MLG1655 Analysis Date: 04/01/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 16:55 - 00:00				Sample ID: 02APR14MLG0500 Analysis Date: 04/02/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:00 - 12:00				Sample ID: 02APR14MLG2301** Analysis Date: 04/02/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 23:01 - 00:00*			
	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)
1,2,4-Trimethyl benzene	350	--	--	--	309	--	--	--	291	--	--	--
2-Methyl Butane	33	--	--	--	34	--	--	--	131	--	--	--
2-Methyl Pentane	57	--	--	--	63	--	--	--	110	--	--	--
3-Methyl Pentane	47	--	--	--	43	--	--	--	119	--	--	--
Acetaldehyde	250	--	--	--	186	--	--	--	201	--	287	23:41
Ammonia	9	--	--	--	8	--	--	--	8	--	--	--
Benzene	238	--	--	--	247	--	--	--	260	--	--	--
Carbon Disulfide	177	--	--	--	197	--	--	--	306	--	--	--
Carbon Monoxide	28	40	848	22:51	20	84	1290	6:35	18	158	738	23:42
Carbonyl Sulfide	17	--	--	--	8	--	--	--	9	--	--	--
Chloroform	22	--	--	--	13	--	--	--	8	--	--	--
Chloromethane	344	--	--	--	333	--	--	--	373	--	--	--
Dimethyl sulfide	102	--	--	--	114	--	138	10:22	260	--	--	--
Ethane	125	--	--	--	128	--	--	--	267	--	342	23:24
Ethanol	57	--	--	--	40	--	--	--	35	--	--	--
Ethylbenzene	113	--	180	21:00	118	--	--	--	429	--	--	--
Ethylene	22	--	--	--	18	--	--	--	18	--	--	--
Formaldehyde	23	--	--	--	25	--	--	--	31	--	--	--
Hydrogen Chloride	34	--	--	--	36	--	--	--	40	--	--	--
Hydrogen Sulfide	10121	--	--	--	12590	--	--	--	15804	--	--	--
Iso-Butane	32	--	--	--	36	--	--	--	86	--	--	--
Methane	116	--	337	23:02	105	154	1046	9:45	115	1629	3079	23:18
Methanol	17	--	22	18:50	19	--	--	--	21	--	--	--
Methyl mercaptan	218	--	414	21:00	229	--	398	5:30	599	--	--	--
Methyl tert-butyl ether (MTBE)	17	--	--	--	22	--	40	8:54	21	--	29	23:48
Methylamine	190	--	--	--	180	--	--	--	217	--	--	--
m-Xylene	96	--	--	--	78	--	--	--	78	--	--	--
Naphthalene	38	--	--	--	28	--	--	--	26	--	--	--
n-Butane	48	--	60	20:59	49	--	--	--	97	--	--	--
n-Heptane	283	--	--	--	315	--	--	--	1017	--	--	--
n-Hexane	82	--	148	19:05	83	--	--	--	319	--	--	--
Nitric Acid	25	--	36	17:17	28	--	43	5:43	25	--	--	--
Nitric Oxide	1329	--	--	--	926	--	--	--	654	--	--	--
Nitrogen Dioxide	140	--	316	18:40	130	--	--	--	430	--	--	--
Nitrous Acid	7	--	--	--	9	--	--	--	8	--	--	--
Nitrous Oxide	21	--	--	--	15	--	--	--	16	--	--	--
n-Octane	227	--	575	18:53	254	--	--	--	771	--	--	--
n-Pentane	60	--	130	21:00	54	--	70	5:50	175	--	--	--
o-Xylene	56	--	148	18:40	48	--	--	--	51	--	--	--
Ozone	36	--	45	17:26	37	--	--	--	38	--	--	--
Propane	47	--	--	--	47	--	--	--	174	--	--	--
p-Xylene	244	--	--	--	143	--	--	--	133	--	--	--
Styrene	39	--	--	--	39	--	--	--	40	--	--	--
Sulfur Dioxide	242	--	--	--	218	--	--	--	193	--	--	--
Toluene	138	--	--	--	121	--	--	--	154	--	--	--
Triethylamine	28	--	--	--	22	--	--	--	26	--	--	--

-- indicates concentration less than reporting limit

\*Sampling stopped due to equipment issues

**Table 2 OP-FTIR results after restart of ArcelorMittal facility**

Compound	Sample ID: 14APR14MLG0500 Analysis Date: 04/14/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:00 - 12:00				Sample ID: 14APR14MLG1706 Analysis Date: 04/14/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 17:06 - 00:00				Sample ID: 15APR14MLG0500 Analysis Date: 04/15/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:00 - 12:00			
	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)
1,2,4-Trimethyl benzene	426	--	--	--	432	--	--	--	307	--	--	--
2-Methyl Butane	33	--	--	--	53	--	--	--	30	--	43	6:22
2-Methyl Pentane	69	--	--	--	81	--	--	--	57	--	--	--
3-Methyl Pentane	45	--	--	--	63	--	--	--	38	--	54	6:07
Acetaldehyde	252	--	--	--	357	--	--	--	207	--	--	--
Ammonia	13	--	--	--	16	--	--	--	9	--	21	5:51
Benzene	267	--	--	--	262	--	284	18:41	231	--	336	7:44
Carbon Disulfide	177	--	--	--	299	--	--	--	157	--	--	--
Carbon Monoxide	33	--	152	9:56	28	114	1848	23:04	22	45	386	9:35
Carbonyl Sulfide	14	--	--	--	14	--	--	--	9	--	--	--
Chloroform	32	--	--	--	46	--	--	--	18	--	--	--
Chloromethane	458	--	--	--	455	--	--	--	323	--	--	--
Dimethyl sulfide	111	--	141	5:40	159	--	--	--	104	--	305	8:01
Ethane	133	--	163	5:38	175	--	--	--	115	--	--	--
Ethanol	86	--	113	6:24	99	--	--	--	48	--	--	--
Ethylbenzene	119	--	124	8:29	171	--	302	18:33	112	--	171	10:36
Ethylene	32	--	--	--	42	--	--	--	21	--	79	6:12
Formaldehyde	28	--	--	--	29	--	--	--	24	--	--	--
Hydrogen Chloride	40	--	--	--	40	--	--	--	35	--	--	--
Hydrogen Sulfide	15735	--	--	--	16505	--	--	--	10589	--	--	--
Iso-Butane	36	--	--	--	49	--	--	--	31	--	--	--
Methane	118	--	193	9:05	102	438	4372	21:34	83	135	2268	8:02
Methanol	20	--	--	--	20	--	48	17:29	17	--	22	11:46
Methyl mercaptan	236	--	--	--	315	--	--	--	218	--	272	10:39
Methyl tert-butyl ether (MTBE)	23	--	26	10:41	22	--	33	22:34	18	--	25	6:23
Methylamine	236	--	--	--	236	--	--	--	185	--	--	--
m-Xylene	115	--	--	--	111	--	--	--	78	--	--	--
Naphthalene	39	--	--	--	39	--	--	--	28	--	--	--
n-Butane	53	--	63	5:54	66	--	87	21:37	41	--	--	--
n-Heptane	318	--	--	--	453	--	--	--	285	--	--	--
n-Hexane	82	--	--	--	129	--	--	--	74	--	--	--
Nitric Acid	32	--	--	--	31	--	--	--	24	--	--	--
Nitric Oxide	1797	--	--	--	1510	--	--	--	807	--	--	--
Nitrogen Dioxide	146	--	--	--	190	--	--	--	128	--	404	7:09
Nitrous Acid	7	11	19	11:03	7	12	19	17:30	7	--	16	5:46
Nitrous Oxide	31	--	--	--	42	--	--	--	18	--	26	7:29
n-Octane	261	--	319	8:54	356	--	--	--	236	--	--	--
n-Pentane	57	--	95	5:32	80	--	--	--	48	--	--	--
o-Xylene	101	--	146	5:53	104	--	--	--	52	--	57	7:16
Ozone	41	--	45	11:04	39	--	--	--	35	--	--	--
Propane	46	--	--	--	74	--	--	--	42	--	57	6:43
p-Xylene	224	--	--	--	227	--	--	--	145	--	--	--
Styrene	43	--	--	--	42	--	--	--	36	--	--	--
Sulfur Dioxide	299	--	--	--	321	--	--	--	201	--	--	--
Toluene	175	--	222	6:19	215	--	--	--	122	--	--	--
Triethylamine	30	--	--	--	41	--	50	23:28	24	--	43	5:47

-- indicates concentration less than reporting limit  
\*Sampling stopped due to equipment issues



**Table 2 cont. OP-FTIR results after restart of ArcelorMittal facility**

Compound	Sample ID: 15APR14MLG1637 Analysis Date: 04/15/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 16:37 - 00:00				Sample ID: 16APR14MLG0500 Analysis Date: 04/16/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 05:00 - 12:00				Sample ID: 16APR14MLG1625 Analysis Date: 04/16/2014 Analysis Location: Monessen Fire Hall 811 Parking Lot Analysis Time: 16:25 - 00:00			
	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)	Reporting Limit (ppb)	Time Weighted Average Concentration (ppb)	Maximum Concentration (ppb)	Time of Maximum Concentration (24 hour)
1,2,4-Trimethyl benzene	260	--	--	--	212	--	--	--	312	--	--	--
2-Methyl Butane	28	--	--	--	19	--	24	8:53	36	--	--	--
2-Methyl Pentane	52	--	--	--	37	--	--	--	55	--	--	--
3-Methyl Pentane	36	--	--	--	24	--	--	--	45	--	--	--
Acetaldehyde	160	--	--	--	114	--	--	--	232	--	--	--
Ammonia	7	--	13	23:29	6	--	--	--	10	--	--	--
Benzene	206	--	--	--	181	--	247	6:07	217	--	254	23:40
Carbon Disulfide	160	--	--	--	93	--	--	--	184	--	--	--
Carbon Monoxide	22	48	1837	22:15	20	--	153	11:18	25	57	582	22:16
Carbonyl Sulfide	11	--	--	--	7	--	--	--	21	--	--	--
Chloroform	12	--	--	--	8	--	--	--	28	--	--	--
Chloromethane	262	--	--	--	211	--	--	--	312	--	--	--
Dimethyl sulfide	94	--	--	--	69	--	--	--	115	--	237	21:28
Ethane	103	--	225	17:48	67	--	--	--	120	--	--	--
Ethanol	36	--	84	19:54	27	--	96	8:53	54	--	55	19:03
Ethylbenzene	99	--	143	20:09	76	--	144	5:18	118	--	--	--
Ethylene	17	--	99	23:29	14	--	--	--	25	--	--	--
Formaldehyde	21	--	--	--	18	--	--	--	22	--	--	--
Hydrogen Chloride	31	--	--	--	27	--	--	--	33	--	--	--
Hydrogen Sulfide	8327	--	--	--	6329	--	--	--	10405	--	--	--
Iso-Butane	28	--	--	--	19	--	--	--	33	--	--	--
Methane	79	106	4922	23:02	65	--	1778	5:06	97	138	3166	23:41
Methanol	15	--	--	--	13	--	23	7:58	16	--	--	--
Methyl mercaptan	190	--	280	18:06	147	--	--	--	221	--	--	--
Methyl tert-butyl ether (MTBE)	15	--	--	--	13	--	--	--	17	--	--	--
Methylamine	159	--	--	--	134	--	--	--	176	--	--	--
m-Xylene	66	--	--	--	56	--	73	6:06	88	--	--	--
Naphthalene	24	--	--	--	20	--	--	--	35	--	--	--
n-Butane	39	--	--	--	25	--	--	--	45	--	--	--
n-Heptane	260	--	--	--	185	--	--	--	304	--	--	--
n-Hexane	69	--	--	--	48	--	--	--	89	--	--	--
Nitric Acid	20	--	32	21:35	17	--	--	--	23	--	--	--
Nitric Oxide	736	--	--	--	423	--	--	--	1293	--	--	--
Nitrogen Dioxide	119	--	--	--	91	--	109	9:35	137	--	--	--
Nitrous Acid	6	--	10	16:43	5	--	--	--	7	--	11	20:29
Nitrous Oxide	16	--	19	19:52	11	--	25	7:52	24	--	--	--
n-Octane	216	--	308	19:57	157	--	--	--	246	--	--	--
n-Pentane	45	--	92	20:59	30	--	--	--	61	--	--	--
o-Xylene	41	--	--	--	32	--	--	--	61	--	--	--
Ozone	31	--	56	19:57	27	--	29	6:23	33	--	34	23:21
Propane	39	--	--	--	27	--	--	--	50	--	--	--
p-Xylene	127	--	--	--	101	--	--	--	225	--	--	--
Styrene	34	--	--	--	30	--	--	--	36	--	--	--
Sulfur Dioxide	166	--	190	21:01	130	--	--	--	223	--	--	--
Toluene	98	--	--	--	80	--	--	--	128	--	--	--
Triethylamine	20	--	--	--	17	--	--	--	27	--	--	--

-- indicates concentration less than reporting limit

\*Sampling stopped due to equipment issues

**Table 3 EPA TO-15 Target Compounds**

1,1,1-Trichloroethane*	2-Butanone	Cyclohexane
1,1,2,2-Tetrachloroethane*	2-Hexanone	Dibromochloromethane*
1,1,2-Trichloroethane*	2-Methoxy-2-methylpropane (MTBE)*	Dichlorodifluoromethane
1,1,2-Trichlorotrifluoroethane	2-Propenal (acrolein)	Dichloromethane
1,1-Dichloroethane*	4-Methyl-2-pentanone	Ethylbenzene
1,1-Dichloroethene*	Acetone	Hexachloro-1,3-butadiene*
1,2,4-Trichlorobenzene*	Benzene	m/p-Xylene
1,2,4-Trimethylbenzene	Bromodichloromethane*	n-Heptane
1,2-Dibromoethane*	Bromoform*	n-Hexane
1,2-Dichlorobenzene*	Bromomethane*	o-Xylene
1,2-Dichloroethane*	Carbon disulfide*	Propene
1,2-Dichloropropane*	Carbon tetrachloride	Styrene
1,2-Dichlorotetrafluoroethane*	Chlorobenzene*	Tetrachloroethene
1,3,5-Trimethylbenzene	Chloroethane*	Tetrahydrofuran*
1,3-Butadiene*	Chloroethene (vinyl chloride)*	Toluene
1,3-Dichlorobenzene*	Chloroform*	trans-1,2-Dichloroethene*
1,4-Dichlorobenzene*	Chloromethane	trans-1,3-Dichloropropene*
1-Bromopropane*	cis-1,2-Dichloroethene*	Trichloroethene*
1-Ethyl-4-methylbenzene	cis-1,3-Dichloropropene*	Trichlorofluoromethane

\*Compounds not detected during sampling

**Table 4 TO-15 Samples collected prior to restart of ArcelorMittal facility**

Sample ID	O2014002716	O2014002717	O2014002712	O2014002713	O2014002714	O2014002718	O2014002719
Sample Date	4/1/2014	4/2/2014	3/31/2014	4/1/2014	4/2/2014	3/31/2014	4/1/2014
Sample Type	24 hr	24 hr	24 hr	24 hr	24 hr	24 hr	24 hr
Sample Location	Monessen Boat Dock	Monessen Boat Dock	Monessen Fire Station	Monessen Fire Station	Monessen Fire Station	Walnut Ridge	Walnut Ridge
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Compound							
1,1,2-Trichlorotrifluoroethane	0.090*	0.089*	0.075*	0.111*	0.092*	0.086*	0.097*
1,2,4-Trimethylbenzene	0.032*	0.089*	0.215	0.045*	0.090*	0.052*	ND
1,3,5-Trimethylbenzene	ND	ND	0.073*	ND	ND	ND	ND
1-Ethyl-4-methylbenzene	ND	0.026*	0.089*	ND	0.031*	ND	ND
2-Hexanone	ND	ND	ND	0.046*	ND	ND	ND
Acetone	--	--	3.332	7.617	3.947	3.955	6.079
Acrolein	--	--	0.415	0.767	0.424	0.539	0.613
Benzene	0.183	0.302	0.893	0.255	0.309	0.751	0.191
Carbon Tetrachloride	0.108*	0.101*	0.098*	0.130*	0.103*	0.102*	0.105*
Chloromethane	0.421	0.484	0.301	0.866	0.568	0.578	0.549
Cyclohexane	ND	ND	0.210	ND	0.045*	ND	ND
Dichlorodifluoromethane	0.340	0.510	0.380	0.759	0.617	0.620	0.606
Ethylbenzene	ND	0.162	0.206	ND	0.133	0.066*	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND
MEK	--	--	0.454	0.609	1.554	0.389	0.574
MIBK	ND	0.050*	ND	ND	0.041*	ND	ND
Methylene Chloride	--	--	0.193	0.126*	--	--	0.160
Propene	0.318	1.250	1.134	1.589	1.804	2.027	1.040
Styrene	ND	ND	0.064*	ND	ND	0.046*	ND
Tetrachloroethene	0.052*	0.051*	0.145	ND	0.059*	0.062*	ND
Toluene	0.216	2.086	1.029	0.294	1.623	0.780	0.134*
Trichlorofluoromethane	0.282	0.281	0.245	0.344	0.286	0.304	0.309
m/p-Xylene	0.109*	0.766	0.962	0.132*	0.618	0.295	ND
n-Heptane	ND	0.097*	0.342	ND	0.081*	0.070*	ND
n-Hexane	0.063*	0.136	0.579	0.151*	0.151	0.144	0.074*
o-Xylene	ND	0.191	0.182	0.045*	0.161	0.072*	ND

\* Concentration estimated - results below quantitation limit, above MDL

-- Compound present in blank canister

ND non-detect

**Table 5 TO-15 Samples collected after restart of ArcelorMittal facility**

Sample ID	O2014003376	O2014003379	O2014003382	O2014003375	O2014003378	O2014003383	O2014003377
Sample Date	4/14/2014	4/15/2014	4/16/2014	4/14/2014	4/15/2014	4/16/2014	4/14/2014
Sample Type	24 hr	24 hr	24 hr	24 hr	24 hr	24 hr	24 hr
Sample Location	Monessen Boat Dock	Monessen Boat Dock	Monessen Boat Dock	Monessen Fire Station	Monessen Fire Station	Monessen Fire Station	Walnut Ridge
Units	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Compound							
1,1,2-Trichlorotrifluoroethane	0.141	0.093*	0.106*	0.106*	0.098*	0.120*	0.111*
1,2,4-Trimethylbenzene	0.060*	ND	ND	0.048*	0.029*	0.023*	0.115*
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	0.031*
1-Ethyl-4-methylbenzene	0.025*	ND	ND	ND	ND	ND	0.025*
2-Hexanone	0.089*	ND	ND	0.033*	ND	ND	ND
Acetone	8.480	4.092	--	6.501	4.715	5.901	10.610
Acrolein	0.966	0.435	--	0.764	0.548	0.553	1.426
Benzene	0.714	1.354	0.145	1.285	2.972	0.179	4.936
Carbon Tetrachloride	0.157	0.102*	0.112*	0.119*	0.105*	0.122	0.124
Chloromethane	0.820	0.258	0.337	0.403	0.845	0.845	0.792
Cyclohexane	0.043*	ND	ND	ND	ND	ND	0.084*
Dichlorodifluoromethane	0.749	0.280	0.337	0.385	0.730	0.839	0.643
Ethylbenzene	0.036*	ND	ND	ND	ND	0.037*	0.052*
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND
MEK	0.730	0.331	--	0.460	0.392	0.670	0.900
MIBK	0.058*	ND	ND	ND	ND	ND	0.049*
Methylene Chloride	--	--	--	--	--	0.168	--
Propene	0.715	--	--	--	1.454	0.751	1.560
Styrene	0.033*	ND	ND	0.036*	0.047*	ND	0.119*
Tetrachloroethene	0.056*	ND	ND	ND	ND	ND	ND
Toluene	0.342	0.370	0.146	0.530	0.700	0.237	1.973
Trichlorofluoromethane	0.415	ND	0.332	0.334	0.328	0.411	0.383
m/p-Xylene	0.131*	0.084*	0.083*	0.146*	0.132*	0.148*	0.364
n-Heptane	ND	ND	ND	ND	ND	ND	0.064*
n-Hexane	0.140	ND	ND	0.104*	ND	0.051*	0.184
o-Xylene	0.046*	ND	ND	0.045*	0.038*	0.037*	0.101*

\* Concentration estimated - results below quantitation limit, above MDL

-- Compound present in blank canister

ND non-detect

**Table 6 PM10 samples**

	Prior to Restart			After Restart			
Sample Date	3/31/2014	4/1/2014	4/2/2014	4/11/2014	4/14/2014	4/15/2014	4/16/2014
Lab Sample ID	I2014012401	I2014012402	I2014012403	I2014012404	I2014012405	I2014012406	I2014012407
units	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
Arsenic	0.00248	0.00116	0.00124	0.00176	0.00138	0.00146	0.00097
Beryllium	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Cadmium	0.00140	0.00041	0.00032	0.00170	<0.00028	<0.00028	<0.00028
Chromium	0.00653	<0.00551	<0.00551	<0.00551	<0.00551	<0.00551	<0.00551
Lead	0.03896	<0.00551	0.00631	0.01255	<0.00551	0.00827	0.00651
Manganese	0.05151	0.01765	0.01748	0.01800	0.01205	0.01831	0.02366
Nickel	<0.00551	<0.00551	<0.00551	<0.00551	<0.00551	<0.00551	<0.00551
Particulate Matter	40.19608	18.32108	17.83088	19.91422	14.21569	19.91422	20.46569
Zinc	0.09146	0.03565	0.03634	0.03287	0.02131	0.02495	0.03513

## References

1. U.S. Environmental Protection Agency. [\*Integrated Risk Information System \(IRIS\) on Benzene\*](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 2009.
2. U.S. Environmental Protection Agency. [\*Integrated Risk Information System \(IRIS\) on Styrene\*](#). National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
3. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Styrene*. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.
4. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Toluene*. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 2000.