



# State of Louisiana

Louisiana Department of Health  
Office of Public Health

March 9, 2018  
Louisiana Department of Environmental Quality  
605 N. Fifth Street  
Baton Rouge, LA 70821

Dear Mr. Algero,

The purpose of this letter health consult is to inform you about the results of the Dalcour air sample data and medical records review. In addition, this health consult includes the review of medical records received by the Louisiana Department of Health/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDH/OPH/SEET) between August 4, 2017 and October 24, 2017.

## **1-Event Description and History**

On August 4, 2017, the Plaquemines Parish Health Department received 4 formal health complaints from residents who reside in the Dalcour, Louisiana area, a sparsely populated rural community located on the East Bank of Plaquemines Parish. The Plaquemines Parish Health Department referred these health complaints to LDH; all health effects were reported to be related to potential exposures to barge offloading.

LDH received a total of 24 health complaints between August 4, 2017 and October 24, 2017. Some calls referenced multiple family members. Thirty-three (33) medical records release forms were sent by LDH out to those who called with health complaints and had sought medical treatment. Of those 33 release forms, 11 were completed and returned to LDH. The forms were then sent to pertinent medical facilities where treatment was sought. A total of 10 medical records were received and reviewed by LDH. (See Medical Record Review and LEEDS query in Appendix F).

Since the residents' health concerns were related to potential exposures from barge offloading, and the LDEQ regulates the operations from mid-stream loaders, the LDH referred these concerns to the LDEQ on August 4, 2017. On August 18, 2017, the LDH received a Louisiana State Police (LSP) report which indicated that 15 residents in the Braithwaite area had reported respiratory issues since the ships from the mid-stream bulk cargo loading area, located across the river from the Dalcour community, recently began offloading materials onto the barges. In the LSP report, it was noted that some of the materials reportedly being offloaded by the barges include talc, silica, ferrous manganese,

pig iron, and iron fines, however, it is not certain if any of these industrial activities are related to the respiratory symptoms experienced by the residents.

The closest potential sources of airborne contaminants identified by LDEQ are the Chevron Oronite Refinery located at 10285 Hwy 235 in Belle Chasse, La. and 3 midstream loaders: High Tide, Bob Frane, and Bayou Special which are all owned by Cooper Consolidated III, LLC that operate in Dalcour, La.

Chevron Oronite manufactures:

- Lube oil and greases along with more than 30 unique lubricating oil additives and intermediates and is a minor source of Toxic Air Pollutants (TAPs)
- A minor source of Hazardous Air Pollutants (HAPs).

Cooper Consolidated III, LLC transfers the following cargo in the Mississippi River:

- Sugar
- Fertilizer
- Iron ore fines
- Pet coke
- Talc
- Silica
- Pig Iron

## **2-Chevron Oronite Emissions**

The Chevron Oronite facility, which is located at 10285 Hwy 235 in Belle Chasse, Louisiana, operates under a Title V air permit. The facility is permitted to emit the following hazardous air pollutants (HAPs): PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and VOCs (See table B-1 for permitted emissions in tons per year). In addition, the facility is permitted to release the following: volatile organic toxic air pollutants (TAPs): cumene, ethyl benzene, ethylene glycol, maleic anhydride, methanol, n-hexane, naphthalene, phenol, MTBE, xylene (mixed), styrene, acetaldehyde, acrolein, 2,2,4-trimethylpentane, formaldehyde, toluene, propylene oxide, benzene; PAHs (See table B-2 for amounts

emitted in tons per year); and non-volatile organic TAPs: ammonia, hydrogen sulfide, sulfuric acid, and zinc compounds (See table B-3 for amounts emitted in tons per year).<sup>1</sup>

### **3-Cooper Consolidated III, LLC**

Cooper Consolidated III, LLC is a stevedoring service that transfers cargo such as sugar, fertilizer, iron ore, pet coke, talc, silica and pig iron in the Mississippi River. This facility is not required to have an air permit. The various cargo that was uploaded or downloaded at this facility by month during the year 2017 was provided by Cooper Consolidated III, LLC. (See Table C-1).<sup>1</sup>

### **4--Environmental Data Collection**

#### **Mobile Air Monitoring Laboratory**

The LDEQ's Mobile Air Monitoring Laboratory (MAML) can be deployed throughout the state on special monitoring projects to provide instantaneous, onsite data that can be used to address a multitude of air quality issues.

- On August 25, 2017, the LDEQ stationed the MAML at 5511 Hwy 39 in Dalcour, La to sample the air for nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), and particulate matter 2.5 (PM<sub>2.5</sub>) for 3 hours. Continuous meteorological parameters such as wind speed, wind direction, temperature, barometric pressure, and relative humidity were also obtained during this time. In addition, one VOC grab summa canister was sampled at 5979 Highway 39 and analyzed on that day (See Map in Appendix A).<sup>2</sup>
- On October 28, 2017 thru October 30, 2017, the LDEQ stationed the MAML at 5979 Hwy 39 in the Dalcour, La. area and continuously collected a total of 46 continuous hourly air monitoring readings for NO<sub>2</sub>, CO, SO<sub>2</sub>, H<sub>2</sub>S, nonmethane organic carbon (NMOC), methane, total hydrocarbons (THC), and PM<sub>2.5</sub>. Continuous meteorological parameters such as wind speed, wind direction, temperature, barometric pressure, and relative humidity were also obtained. During this October sampling period, it was noted that there were brisk winds and the midstream loading of ferrochrome was being conducted (See Map in Appendix A).<sup>1</sup>
- Continuous 8 hour readings were collected by the MAML and analyzed from October 28 thru October 30, 2017 for carbon monoxide and hydrogen sulfide. Twenty-four hour averages were calculated for PM<sub>2.5</sub>(See Map in Appendix A).<sup>1</sup>
- On October 28, 2017 and October 29, 2017, one air canister grab sample was collected and analyzed for volatile organic compounds and sulfur compounds on each day (2 samples total). The 2 air samples were tested by ALS Environmental Laboratory located in Simi Valley, California.<sup>1</sup>

- On October 28, 2017 and October 29, 2017, one 24-hour composite sample of airborne metals were collected each day for metal analysis. <sup>1</sup>

## **5 -Environmental Data Evaluation**

### **5.1- MAML stationed at favorable downwind sites on August 25, 2017 and October 28-30, 2017**

Sampling performed by the MAML was continuous analysis for hydrogen sulfide (H<sub>2</sub>S), sulfur dioxide (SO<sub>2</sub>), total hydrocarbons (methane/nonmethane organic carbons), nitrous oxide (NO), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), and PM<sub>2.5</sub> along with continuous monitoring of the meteorological parameters. The following are the instrumentation, methods, and detection limits for each parameter analyzed with the MAML. <sup>2</sup>

- An Advanced Pollution Instrumentation Model IOIA Fluorescent Analyzer, following EPA Equivalent method EQSA-0990-077 was used for H<sub>2</sub>S. Detection limit: 0.4 ppb.
- An Advanced Pollution Instrumentation (API) Model 100A Fluorescent Analyzer following EPA Equivalent method EQSA-0990-077 was used for SO<sub>2</sub> analysis. Detection limit: 0.4 ppb.
- For THC (Methane/NMOC) analysis, a Thermo Electron model 55C analyzer was employed. There is no EPA reference method for this analysis. Detection limit: Methane 20 ppbc, NMOC 150 ppbc.
- A Thermo Electron model 42C instrument was employed for NO-NO<sub>2</sub>-NO<sub>x</sub> monitoring using EPA reference method RFNA-1289-074. Detection limit: 0.4ppb.
- A Thermo Environmental Instruments 48C instrument was used for CO analysis using EPA reference method RFCA-0981-054 Detection limit: 0.04 ppm.
- For PM<sub>2.5</sub> analysis a Rupprecht & Patashnick Co., Inc. TEOM Series 1400a Continuous Ambient Particulate Monitor was used. This instrument follows EPA Automated Equivalent Method EQPM1090-079 for the monitoring of PM<sub>10</sub> and has the EPA designation of Correlated Acceptable Continuous Monitor (CACM) when operated in the PM<sub>2.5</sub> configuration. Detection limit: N/A.
- For VOA grab sample analysis, the MAML used an Agilent 7890A gas chromatograph equipped with an Agilent 5975C mass spectrometer and followed a modified EPA method TO-15. Practical Quantitation Limit (PQL) is 0.5 ppbv.

Calibrations were within the Standard Operating Procedures (SOPs) for all parameters measured.

Hydrogen Sulfide (H<sub>2</sub>S) does not have a National Ambient Air Quality Standard (NAAQS), but is regulated by the Louisiana Toxic Air Pollutant Ambient Air Standard (LAC33:Part III Table 51.2) , 8 hour average, which is 330 ppb. <sup>3</sup> Also, ATSDR's

acute EMEG comparison value for H<sub>2</sub>S is 70 ppb. The NAAQS sets a primary 1 hour average of 75 ppb for sulfur dioxide (SO<sub>2</sub>) averaged over three years<sup>4</sup>. ATSDR's acute EMEG comparison value for SO<sub>2</sub> is 10 ppb (See Table E-4). For carbon monoxide, the NAAQS sets a primary 1 hour average of 35 ppm averaged over three years.<sup>4</sup> The NAAQS sets primary standards for PM<sub>2.5</sub> particle pollution at 12 ug/m<sup>3</sup> for an annual mean of 12 ug/m<sup>3</sup> and 35 ug/m<sup>3</sup> for a 24 hour sample averaged over 3 years.<sup>4</sup> There are no screening values for contaminants analyzed as methane, nonmethane organic carbon, total hydrocarbon, or carbon monoxide in air. Methane is not an air toxic compound and normal concentrations of methane in the air is 2.0 ppm. Nonmethane organic carbon equals total hydrocarbon minus methane.

### **5.2- Grab Summa canister samples collected on August 25, 2017 and October 28-29, 2017**

The summa grab canister samples collected by the LDEQ on August 25, 2017 and October 28-29, 2017 were collected from 2 different locations (See Map in Appendix A). For analysis of the samples, the MAML used an Agilent 7890A gas chromatograph equipped with an Agilent 5975C mass spectrometer and followed a modified EPA method TO-15.<sup>1</sup> Detection Limit: Does not apply

The VOCs detected in the August 25, 2017 grab sample (collected at 5511 Highway 39 in Dalcour, La) are the following: Freon-12, chloromethane, Freon-11, carbon disulfide, Freon-113, methylene chloride, acetone, , 2-butanone, carbon tetrachloride, benzene, toluene, tetrachloroethylene, , 1,2-dibromoethane, chlorobenzene, ethylbenzene, m/p-xylene, styrene, o-xylene, 1-ethyl-4methylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, m-dichlorobenzene, benzyl chloride, p-dichlorobenzene, o-dichlorobenzene, and 1,2,4-trichlorobenzene.

The VOCs detected in the October 28-29, 2017 grab samples (collected at 5979 Hwy 39 in Dalcour, La.) are the following: Freon-12, chloromethane, Freon-11, Freon-113, methylene chloride, acetone, 2-butanone, carbon tetrachloride, benzene, toluene, n-hexane, n-heptane, ethanol, ethylbenzene, ethyl acetate, m/p-xylene, o-xylene, propene, 1,2,4-trimethylbenzene, alpha-pinene, dichlorodifluoromethane, trichlorotrifluoroethane, and trichlorotrifluoromethane.

There are no National or local screening values for VOCs so the VOC parameters that had levels detected in the air were compared to the Texas Commission of Environmental Quality's (TCEQ) effects screening levels (ESLs). The TCEQ has assigned short term (one hour averaging period) ESLs which are used to evaluate the potential for health effects to occur as a result of short-term exposure to concentration of constituents in the air.<sup>5</sup>

### **5.3- 24-hour grab air samples for sulfur compound analysis collected on October 28-29, 2017**

Two individual 24 hr samples of speciated volatile sulfur compounds were collected by LDEQ's MAML stationed at 5979 Hwy 39 using a modified EPA method TO-15. The

samples were analyzed at the ALS Laboratory in Simi Valley, California for twenty sulfur compounds per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). The short-term monitored values of speciated compounds cannot be compared to regulatory or health-based standards.<sup>5</sup>

#### **5.4- 24-hour air samples for metal analysis collected on October 28-29, 2017**

Two individual 24 hr. composite air samples were collected by LDEQ's MAML stationed at 5979 Hwy 39 and were tested for metals.

The following metals were detected in the samples:

- **October 28, 2017:** aluminum, antimony, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, and zinc
- **October 29, 2017:** aluminum, barium, calcium, chromium, copper, iron, magnesium, manganese, potassium, sodium, vanadium, and zinc

Comparison values (either EPA or ATSDR's) were available for the following detected metals in the air: aluminum, arsenic, barium, lead, manganese, nickel, and vanadium (See Table E-6). For compounds where comparison values were not available, the State of Louisiana (LAC33:III) 8 hour ambient air standards were used. The State of Louisiana (LAC33:III) assigns 8 hour ambient air standards for the following metals measured: antimony, arsenic, copper, manganese, nickel, and zinc. All metals were below their respective CVs with the exception of arsenic for the sample collected on October 28, 2017. Arsenic was not detected in the air sample collected on October 29, 2017.

#### **6-Exposure Pathways**

Based on sampling locations, the potentially exposed population includes Plaquemines Parish residents who reside both downwind and in the surrounding areas of the Chevron Oronite Refinery and the 3 midstream loaders.

#### **7-Discussion:**

There are no standards with which to compare the single short term measurements. The NAAQS sets primary and secondary standards for air pollutants to protect public health and the environment. Air monitoring results are compared to these standards to determine exceedances that may be harmful to health. The NAAQS standards are based on monitoring air over a set time interval (e.g., 24-hr, annual) averaged over 3 years. The air monitoring performed at the Dalcour, La. area was one time short term measurements and therefore, cannot be compared to the NAAQS standards.

Particulates (PM<sub>2.5</sub>) were detected by LDEQ's MAML located approximately 0.7 miles downwind from the Chevron Refinery on August 25, 2017. PM<sub>2.5</sub> point measures ranged from 12.4-23.6 ug/m<sup>3</sup> (See Table E-1). Although fine particulates (PM<sub>2.5</sub>) were detected in the air, it is not possible to attribute the particulates to a single facility since there are many other background sources of air pollutants in the area such as car, truck, bus and off-road vehicle (e.g., construction equipment) exhausts. The highest hourly hydrogen

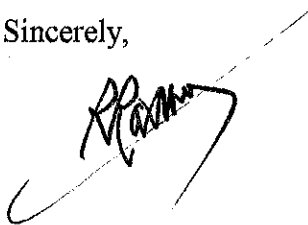
sulfide concentration detected on August 25, 2017 was 1.0 ppb; the highest amount of sulfur dioxide detected was 1.0 ppb; the highest amount of carbon monoxide detected was 2.1 ppm; and the highest nitrogen dioxide detected was 2.0 ppb. The highest amount of hydrogen sulfide and sulfur dioxide detected were well below ATSDR's acute EMEG comparison values (See Table E-4). All VOCs measured from the grab sample collected on August 25, 2017 revealed background levels and do not pose a public health concern.

No sulfur compounds were detected in the speciated samples collected near the Chevron Refinery on October 28-29, 2017.

### **8-Conclusion**

The air monitoring results from locations around the Chevron Refinery and Cooper Consolidated owned sites do not show elevated levels of hazardous compounds that might contribute to health effects. The air pollutants detected are at levels below health-based comparison values. It is unlikely that any isolated event triggered a residential outbreak of respiratory symptoms. More regular air-quality monitoring for particulates to coincide with periods of varying stevedoring operations may help better inform the local sensitive population if their outdoor activities should be limited during certain times to reduce risk of exacerbation of pre-existing illness. In addition, residents with respiratory sensitivity may benefit from exercising standard precautions and reducing their exposure to particulate matter. Monitoring local air pollution warnings and pollen counts and limiting time outdoors during these periods is always advisable. When performing activities that may promote resting particulates to become airborne, such as mowing a lawn, watering the lawn the day prior will weigh down particulates and reduce exposure. Also, when specific sensitivities to allergens are identified by medical practitioners and emergency medications are recommended, these recommendations should be followed.

Sincerely,



Raoult Ratard, MD, MS, MPH, FACPM  
State Epidemiologist  
LDH/Office of Public Health

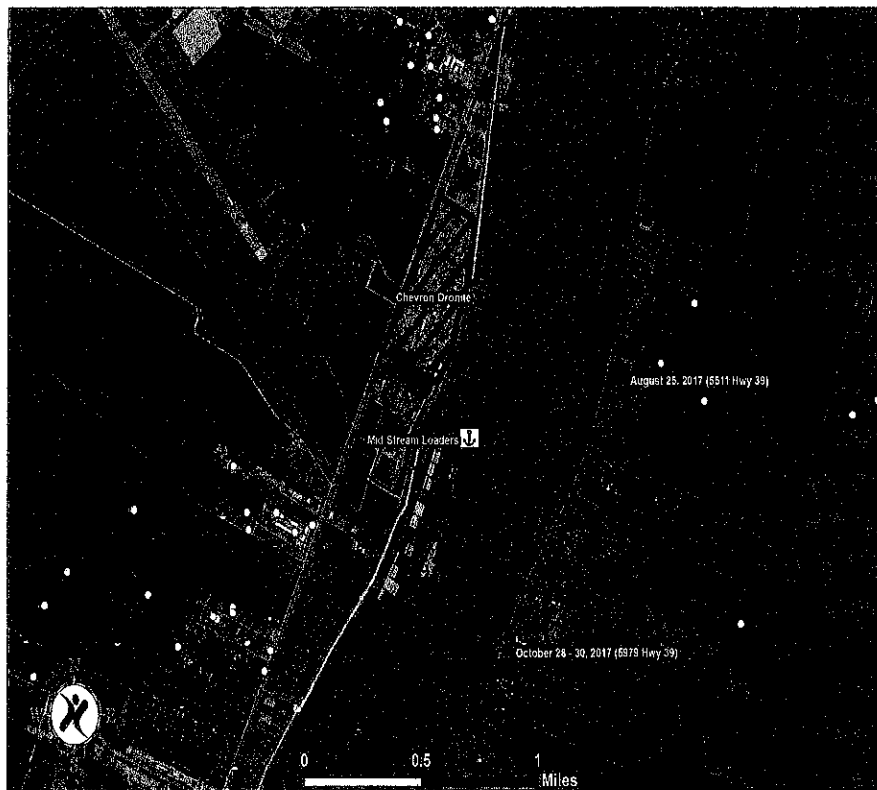
### References

- 1.) Dalcour, La. Midstream Loaders/Chevron Oronite Refinery, Louisiana Department of Environmental Quality's Mobile Air Monitoring Lab, October 28, 2017.
- 2.) Dalcour, La. Midstream Loaders/Chevron Oronite Refinery, Louisiana Department of Environmental Quality's Mobile Air Monitoring Lab, August 25, 2017.
- 3.) Louisiana Title33 Environmental Quality. <http://deq.louisiana.gov/assets/docs/Air/Enforcement/Title33.pdf>. Accessed on October 18, 2017.
- 4.) United States Environmental Protection Agency (USEPA). National Ambient Air Quality Standards (NAAQS); Air and Radiation. Last updated on December 14, 2012.
- 5.) Texas Effects Screening Levels. Accessed url on January 5, 2017. [http://www.tceq.state.tx.us/toxicology/esl/list\\_main.html/#esl\\_1](http://www.tceq.state.tx.us/toxicology/esl/list_main.html/#esl_1)
- 6.) Louisiana Department of Environmental Quality's Proposed Revisions to Louisiana Toxic Air Pollutant Ambient Air Standards. Accessed March 7, 2018 at URL: <http://deq.louisiana.gov/assets/docs/Air/Asbestos/AsbestosRegulations.pdf>



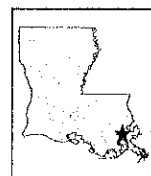
### APPENDIX A- MAP

#### A-1: Dalcour, La. Map showing LDEQ's Sample Locations and Population Density



Dalcour, LA  
January 31, 2018

\* MAML  
Population Density\*  
○ 1 Dot = 25 People



Map produced January 31, 2018 by the Louisiana Department of Health / Office of Public Health / Section of Environmental Epidemiology and Toxicology (SEET) using data provided by the Louisiana Department of Health, Louisiana Department of Education, and the Louisiana Department of Children and Family Services, \* 2010 population density randomly distributed by census block (may not be included on the map)  
Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

**APPENDIX B: Chevron Oronite Permitted Emissions in Tons per Year**

**Table B-1: Chevron Oronite Permitted Hazardous Air Pollutant (HAP) Emissions in Tons per Year**

PM10	PM2.5	SO2	NOx	CO	VOC
20.09	20.09	379.21	201.24	229.33	103.54

**Table B-2: VOC Toxic Air Pollutants (TAPS) in Tons per Year**

Pollutant	Amount
Cumene	0.28
Ethyl Benzene	0.07
Ethylene Glycol	0.22
Maleic Anhydride	0.25
Methanol	4.46
n-Hexane	2.78
Naphthalene	0.86
Phenol	1.27
MTBE	0.01
Xylene (mixed)	3.73
Styrene	<0.01
Acetaldehyde	0.03
Acrolein	<0.01
2,2,4-trimethylpentane	0.01
Formaldehyde	1.70
Toluene	0.12
Propylene Oxide	0.02
Benzene	0.03
Polyaromatic Hydrocarbon	<0.01
<b>TOTAL VOC TAPs</b>	<b>15.84</b>

**Table B-3: Non-VOC Toxic Air Pollutants (TAPS) in Tons per Year**

Pollutant	Amount
Ammonia	0.16
Hydrogen Sulfide	1.59
Sulfic Acid	4.42
Zinc (and compounds)	0.25
<b>TOTAL</b>	<b>6.33</b>

**APPENDIX C: Cargo Transfers in 2017****Table C-1: Cooper Consolidated III, LLC – Type of Cargo Transfers for 2017**

<b>Types of Cargo Transfers</b>	<b>Month</b>
Pig Iron	12/30/16 - 01/03
Spodumene	01/03 - 01/04
Silicon Manganese	01/06 - 01/08
Ferro Manganese	01/06 - 01/08
Zinc Concentrate	01/07 - 01/09
Organic Soybeans (Import)	01/10 - 01/12
Organic Corn (Import)	01/10 - 01/12
Urea	01/18 01/22
MAP	01/18 - 01/19
Urea	01/20 - 01/26
Iron Ore Fines	01/25 - 01/30
Silicon Manganese	01/29 - 01/31
Ferro Manganese	01/29 - 01/31
Pig Iron	02/01 - 02/05
Fluor Spar	02/02 - 02/03
Urea	02/03 - 02/06
Urea	02/12 - 02/15
Urea	02/13 - 02/18
Iron Ore Fines	02/17 - 02/22
Pet Coke	02/19 - 02/24
Organic Soybeans (Import)	02/22 - 02/24
GTSP	02/24 - 03/02
MOP - GR	02/24 - 03/02
Slag	03/02 - 03/06
Pig Iron	03/03 - 03/09
Silicon Manganese	03/06 - 03/09
Ferro Manganese	03/06 - 03/09
Zinc Concentrate	03/09 - 03/10
Organic Soybeans (Import)	03/12 - 03/14
Organic Corn (Import)	03/12 - 03/14
Urea	03/12 - 03/15
Ferro Silicon	03/15 - 03/18
Zircon Sand	03/17 - 03/18
Spodumene	03/17 - 03/18
Pig Iron	03/21 - 03/26
Urea	03/24 - 03/29
Pig Iron	03/26 - 03/28

<b>Types of Cargo Transfers</b>	<b>Month</b>
Feldspar	03/29 - 04/05
Chrome Ore	03/31 - 04/02
Iron Ore Fines	04/04 - 04/06
Urea	04/09 - 04/12
GTSP	04/19 - 04/20
MOP	04/25 - 04/30
Iron Ore Fines	04/28 - 05/03
Salt	05/05 - 05/07
Organic Soybeans (Import)	05/14 - 05/18
Organic Corn (Import)	05/14 - 05/18
Silicon Manganese	05/16 - 05/19
Ferro Manganese	05/16 - 05/19
Talc	05/21 - 05/25
Pig Iron	05/31 - 06/03
Pig Iron	06/13 - 06/17
Iron Ore Fines	06/24 - 06/26
Ferro Chrome	07/02 - 07/05
Ferro Silicon	07/02 - 07/05
Silicon Manganese	07/02 - 07/05
Zinc Concentrate	07/03 - 07/05
Salt	07/05 - 07/08
Bauxite	07/05 - 07/07
Sodium Nitrate	07/07 - 07/10
Allganic Nitrogen	07/07 - 07/10
Potassium Nitrate (Bags)	07/07 - 07/10
Pig Iron	07/08 - 07/10
Ferro Chrome	07/10 - 07/13
Silicon Manganese	07/15 - 07/17
Ferro Manganese	07/15 - 07/17
Organic Corn (Import)	07/20 - 07/21
GTSP	07/23 - 07/28
MOP	07/23 - 07/28
Pig Iron	07/24 - 07/30
Sugar	07/30 - 08/01
Pig Iron	07/30 - 08/02
Feldspar	08/02 - 08/09
Pig Iron	08/04 - 08/10
Brown Fused Alumina	08/09 - 08/12

<b>Types of Cargo Transfers</b>	<b>Month</b>
Rotary Kiln Bauxite	08/09 - 08/12
Refractory Grade Bauxite	08/09 - 08/12
Pig Iron	08/10 - 08/15
Ferro Manganese	08/10 - 08/15
Pig Iron	08/13 - 08/17
Pig Iron	08/22 - 08/25
GTSP	08/27 - 09/01
MOP	08/27 - 09/02
Iron Ore Fines	09/01 - 09/07
Ammonium Sulphate	09/06 - 09/08
Sugar	09/15 - 09/18
Pig Iron	09/17 - 09/19
Potash	09/21 - 09/28
Sugar	09/22 - 09/24
Silicon Manganese	09/24 - 09/28
Ferro Manganese	09/24 - 09/29
Spodumene	09/24 - 09/30
Pet Coke	09/28 - 09/30
Pig Iron	09/28 - 10/03
Organic Soybeans (Import)	10/01 - 10/03
Pig Iron	10/04 - 10/13
Milled Rice	10/05 - 10/11
Dried Distiller Grain w/Solubles	10/05 - 10/11
Rye (Import)	10/12 - 10/19
Pig Iron	10/13 - 10/18

## APPENDIX D: EVALUATION PROCESS

### Screening Process

Comparison values (CVs) are media-specific concentrations of chemicals that are used by health assessors to screen environmental contaminants for further evaluation. These values are not used as predictors of adverse health effects. The comparison value used in the evaluation of the Dalcour air monitoring are listed below:

*Environmental media evaluation guides* (EMEGs) are estimated contaminant concentrations at which noncarcinogenic health effects are unlikely. They are calculated from the Agency for Toxic Substances and Disease Registry's (ATSDR) minimal risk levels (MRLs). EMEGs apply to acute (14 days or less), intermediate (15–365 days) and chronic (365 days or more) exposures.

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. *Primary standards* provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. <sup>4</sup>

The Texas Commission on Environmental Quality TCEQ short term effects screening levels (ESLs)(one hour averaging period) were used to assess the potential for effects from exposure to concentrations of constituents in the air by the residents.<sup>8</sup> ESLs are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. ESLs are based on data concerning health effects, the potential for odors to be a nuisance, effects on vegetation, and corrosive effects. If predicted or measured airborne levels of a constituent **do not exceed** the screening level, adverse health or welfare effects are not expected. If ambient levels of constituents in air **exceed** the screening levels, it does not necessarily indicate a problem but rather triggers a review in more depth. "Short-term" generally indicates a one-hour averaging period. "Long term" indicates an annual averaging period. <sup>5</sup>

The Louisiana Toxic Air Pollutant Ambient Air Standards (LA AAS) define the limits at which concentrations of toxic air pollutants (those identified in Title III of the Clean Air Act Amendments of 1990) are considered to be unacceptable and require air pollution controls. These compounds are known or suspected to cause cancer or other serious health effects. <sup>6</sup>

**APPENDIX E: SAMPLE RESULTS**

**Table E-1: Hourly Mobile Air Monitoring Samples Collected by LDEQ (August 25, 2017)**

Date Collected	Time Range Collected	Nitrogen Dioxide range (ppb)	Carbon Monoxide(CO) range (ppm)	Hydrogen Sulfide(H2S) range (ppb)	Sulfur Dioxide (SO2) range (ppb)	PM 2.5 Range (ug/m3)
8/25/2017	3 hours	2.0-2.0	1.9-2.1	0-1.0	1.0-1.0	12.4-23.6

**Detection Limits:**

Nitrogen Dioxide = 0.4 ppb; Carbon Monoxide = 0.04 ppm; Hydrogen Sulfide = 0.4 ppb; Sulfur Dioxide = 0.4 ppb; PM 2.5= Not applicable

**Table E-2: Mobile Air Monitoring Samples Collected by LDEQ (October 28- October 30, 2017) – 8 Hour Readings**

Date Collected	Carbon Monoxide (CO) 8 hour average range (ppm)	Hydrogen Sulfide (H2S) 8 hour range (ppb)	PM 2.5 24 hour average Range (ug/m3)
10/28/2017	0.4-0.6	0.1-0.4	None collected
10/29/2017	0.3-7.5	0.0-1.6	6.5-6.9
10/30/2017	3.5-7.8	1.5-2.6	6.6-6.7

**Detection Limits:** Carbon Monoxide = 0.04 ppm; Hydrogen Sulfide = 0.4 ppb; PM 2.5= Not applicable

**Table E-3: Hourly Mobile Air Monitoring Samples Collected by LDEQ (October 28- October 30, 2017)**

Date Collected	Time Range Collected	Nitrogen Dioxide range (ppb)	Carbon Monoxide (CO) range (ppm)	Hydrogen Sulfide(H2S) range (ppb)	Sulfur Dioxide (SO2) range (ppb)	PM 2.5 Range (ug/m3)	Nonmethane organic carbon range (ppmc)	Methane Range (ppmc)	Total Hydrocarbon Range (ppmc)
10/28/2017	11 hours	4.0-11.0	0.0-0.9	0-1.0	2.0-3.0	2.8-8.5	0.19 – 0.62	1.95-2.03	2.14 –2.62
10/29/2017	24 hours	3.0-14.0	0.0-13.4	0-3.0	2.0-4.0	2.8-11.3	0.19 – 2.39	1.97 –2.75	2.16- 4.82
10/30/2017	9 hours	5.0-12.0	3.7-11.7	2.0-4.0	3.0-5.0	5.6-9.4	0.52-4.21	2.47-2.66	3.17-6.71

**Table E-4: Comparison Values for Hydrogen Sulfide, Sulfur Dioxide, and CO**

Chemicals of Concern	Comparison Value	Comparison Value Source
Hydrogen Sulfide	70 ppb	ATSDR's Acute EMEG
Sulfur Dioxide	10 ppb	ATSDR's Acute EMEG
Carbon Monoxide	35 ppm	NAAQS (hourly value)

**H<sub>2</sub>S Comparison Value:** Louisiana Toxic Air Pollutant Ambient Air Standard, 8 hour average = 330 ug/m<sup>3</sup> applicable to offsite locations).

**Detection Limit** = 3.0 ppb

**Table E-5: Air Monitoring VOC Summa Canister Grab Samples Collected by LDEQ on August 25, 2017 and October 28-29,2017 and analyzed by Gas Chromatography/Mass Spec**

Date Collected	LOCATION SAMPLED	PARAMETERS ANALYZED	DETECTION LIMITS/TEST METHOD	COMPARISON VALUES (SOURCES)
8/25/2017	5511 Hwy 39 Dalcour, La	VOCs	<0.2 ppb (GC\MS)	ATSDR's Air Comparison values or TCEQ's ESLs
10/28/2017	5979 Hwy 39 Dalcour, La.	VOCs	<0.2 ppb (GC\MS)	ATSDR's Air Comparison values or TCEQ's ESLs
10/29/2017	5979 Hwy 39 Dalcour, La.	VOCs	<0.2 ppb (GC\MS)	ATSDR's Air Comparison values or TCEQ's ESLs

The VOCs detected in the August 25, 2017 grab sample are the following: Freon-12, chloromethane, Freon-11, carbon disulfide, Freon-113, methylene chloride, acetone, , 2-butanone, carbon tetrachloride, benzene, toluene, tetrachloroethylene, , 1,2-dibromoethane, chlorobenzene, ethylbenzene, m/p-xylene, styrene, o-xylene, 1-ethyl-4methylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, m-dichlorobenzene, benzyl chloride, p-dichlorobenzene, o-dichlorobenzene, and 1,2,4-trichlorobenzene.

The VOCs detected in the October 28-29, 2017 grab samples are the following: Freon-12, chloromethane, Freon-11, Freon-113, methylene chloride, acetone, 2-butanone, carbon tetrachloride, benzene, toluene, n-hexane, n-heptane, ethanol, ethylbenzene, ethyl acetate, m/p-xylene, o-xylene, propene, 1,2,4-trimethylbenzene, alpha-pinene, dichlorodifluoromethane, trichlorotrifluoroethane, and trichlorotrifluoromethane.



**Table E-6: Detected Metal Results of 24-hour composite air samples Collected on October 28, 2017 and October 29, 2017**

Metals Detected	Sampled 10/28/17 (ug/m3)	Sampled 10/29/17 (ug/m3)	Comparison Value (ug/m3)	Comparison Reference
Aluminum	0.55	0.56	5.2	EPA's RSL
Antimony	0.0032	ND	11.9	8 hour average LAAAS
Arsenic	<b>0.0034</b>	ND	<b>0.00023;</b> 0.02	ATSDR's CREG; 8 hour average LAAAS
Barium	0.0149	0.0148	0.52	EPA's RSL
Calcium	2.37	2.19	None Available	N/A
Chromium	0.0406	0.0065	None Available	N/A
Copper	0.164	0.180	23.8	8 hour average LAAAS
Iron	0.36	0.208	None Available	N/A
Lead	0.0058	ND	0.15	EPA's RSL
Magnesium	0.65	0.59	None Available	N/A
Manganese	0.0306	0.0219	0.30; 4.76	ATSDR's EMEG; 8 hour average LAAAS
Nickel	0.0066	ND	0.09; 0.21	ATSDR's EMEG; 8 hour average LAAAS
Potassium	0.62	0.63	None Available	N/A
Sodium	18.1	18.6	None Available	N/A
Vanadium	ND	0.0029	0.10	EPA's RSL
Zinc	0.072	0.021	119	8 hour average LAAAS

## APPENDIX F: Medical Records Review and Louisiana Early Event Detection System (LEEDS) Query

### Methods

The Louisiana Early Event Detection System (LEEDS<sup>1</sup>) was queried for patient complaints of upper respiratory, lower respiratory and cough with primary residences in zip codes 70037 and 70040. These were combined to create a composite of 'respiratory complaints' to produce counts that were more meaningful for comparison. A percentage of emergency room visits was calculated by dividing weekly tallies of 'respiratory complaints' (numerator) by the total number of weekly emergency room visits (denominator). Figures 1 and 2 compare these percentages across 5/6-8/25 in 2016 to 2017.

In addition, medical records received were reviewed for possible common exposure pathway. These were requested from initial complainants as well as proactively seeking participation from members of the "Braithwaite Matters!" facebook page.

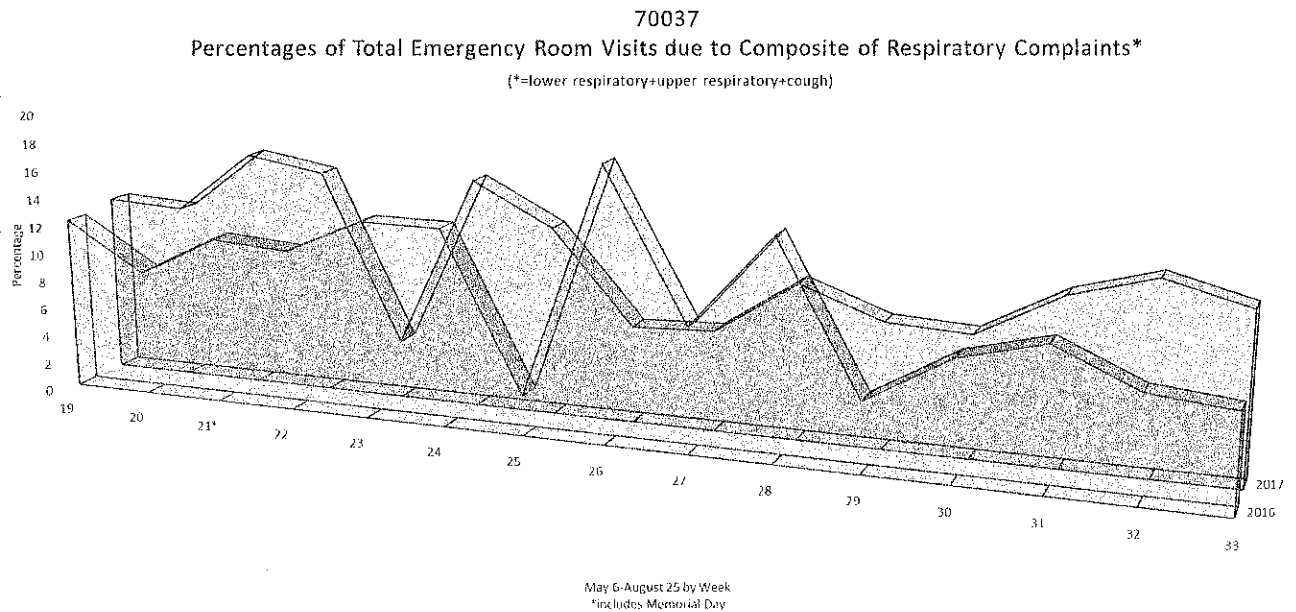


Figure 1: 70037 zip code. West bank of Mississippi river. There was an average weekly number of emergency room visits of 118 in 2017 compared to 111 in 2016 for residents in the 70037 area code from 5/6-8/25. There was a slight increase in the percentage of emergency room visits for respiratory complaints of 11.7% in 2016 to 16.7% in 2017 for the week including Memorial Day (5/29/17).

<sup>1</sup> LEEDS-A near real-time reporting system with approximately 70 participating Emergency Departments throughout the state. The system can be queried for pre-defined syndromes for surveillance of presenting symptoms and chief complaints.

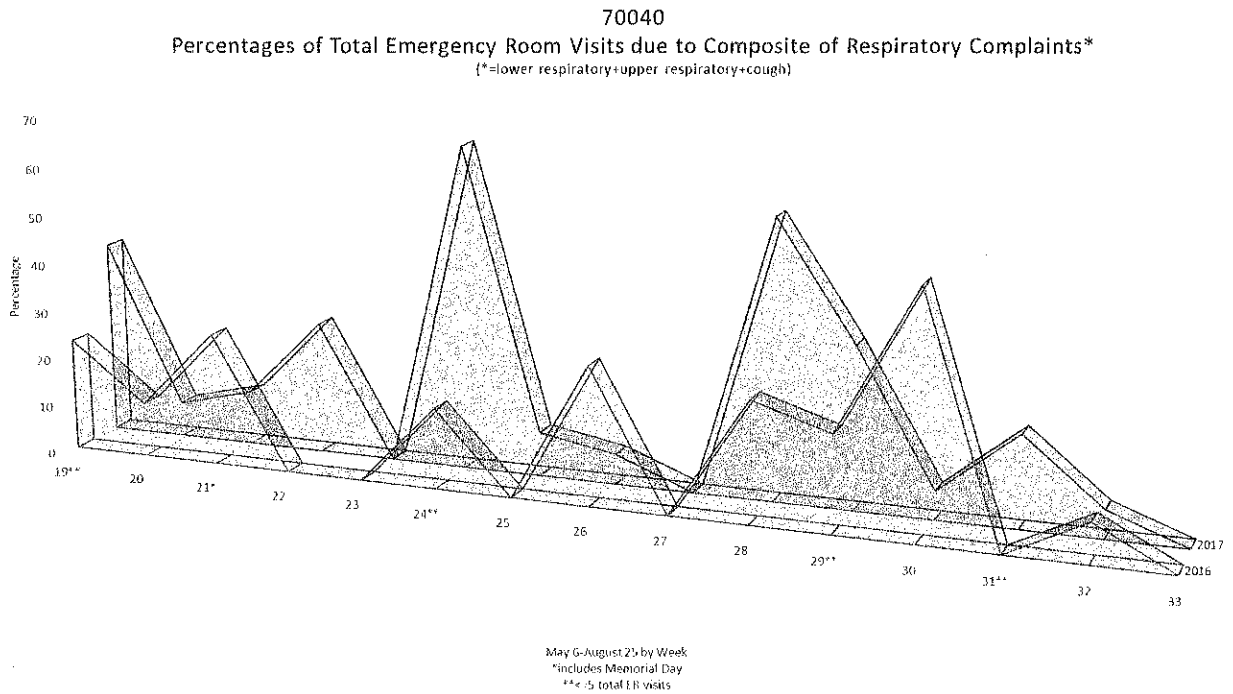


Figure 2. 70040 zip code. East bank of Mississippi river. There was an average weekly number of emergency room visits of 11.3 in 2017 compared to 9.4 in 2016 for residents in the 70040 area code from 5/6-8/25. Due to the relative isolation and decreased population density of the east bank of the Mississippi, residents may have visited urgent cares or primary care physicians for respiratory complaints which would not have been captured by LEEDS. Due to the low numbers of total visits and respiratory visits, reported percentages are of little value in determining relevance.

## ***Results***

### ***Demographics***

Of the 39 complainants, 29 were located in the 70040 area code. Other represented area codes included 70037, 70072, 70083, 70092 and 70130. Of the 33 complainants whom reported ages, 26 were 45 years of age or older and 20 complainants were 55 years of age or older. The average age was 54.7 (median=59) for those reporting their age.

### ***LEEDS Query***

The Louisiana Early Event Detection System (LEEDS) was queried using the pre-defined syndromic searches of lower respiratory, upper respiratory, cough. No trends were observed for Office of Public Health (OPH) region 1 (Orleans, St Bernard, Plaquemines and Jefferson Parishes) as an aggregate for time period Jan-Aug 2017 with the exception of normal seasonal influenza. LEEDS was also queried separately for the 70040 and 70037 zip codes for the same syndromes. From these results, a composite of 'respiratory symptoms' was generated. The resulting percentages of total Emergency room visits for 5/6-8/25 are demonstrated graphically in Figures 1 and 2.

The 70040 zip code has a much smaller population density in comparison to the 70037 area code. This may be why they are much less represented than the 70037 zip code in the emergency department data, both in respiratory complaints and total visits. 70040 represents the east bank of the Mississippi river and is also relatively isolated from emergency departments. They may have been more likely to seek care with their primary care physician or a local urgent care which would not be captured by the LEEDS system. In addition, LEEDS is continuously onboarding facilities as systems allow and the 70040 regional emergency departments may not be active yet.

### ***Medical Record Review***

All ten of the medical records received were reviewed in depth. Three of these had been ill-enough to be hospitalized for their respiratory complaints. Six residents had some chronic respiratory condition, such as COPD, asthma or allergies, documented prior to the occurrence of the present air quality complaints. Smoking history was noticeably absent from four records. The episodes for which medical care was sought ranged from May to Sept 2017 with no observable common event.