



*Transmitted Electronically*

September 9, 2009

Ms. Alyssa Hughes  
On-Scene Coordinator  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street  
Atlanta, Georgia 30303

**Subject: Incident Response Letter Report  
Severn Peanut Company Fire  
Severn, North Hampton County, North Carolina  
TDD No.: TNA-05-001-0091  
Contract No. EP-W-05-053**

Dear Ms. Hughes:

The Oneida Total Integrated Enterprises - T N & Associates, Inc. (OTIE-TN&A) Superfund Technical Assessment and Response Team (START) has prepared this Incident Response Letter Report detailing the activities conducted in support of the U.S. Environmental Protection Agency (EPA). The scope of this response was to provide technical support to the EPA On-Scene Coordinator (OSC) during a phosphine gas release at the Severn Peanut Company located at 1333 Severn Road North, North Hampton County, Severn, North Carolina. Specifically, START was tasked to document response activities and on-site conditions with written logbook notes and digital photographs, conduct perimeter air monitoring using AreaRae<sup>®</sup> instruments, and prepare an incident response letter report.

This Incident Response Letter Report summarizes the incident, the response, and provides a summary of the activities. Figures are provided as Attachment A. The log of AreaRae<sup>®</sup> minimum and maximum readings is provided as Attachment B, the photographic log is provided as Attachment C, and a complete copy of the field logbook notes are provided as Attachment D.

### **Site Background**

Severn Peanut Company houses the largest dome silo of its kind in the country. The dome is 192 feet (‘) in diameter by 100’ high. The walls of the dome are constructed with 22 inch (”) thick concrete at the base, tapering to 10” thick at the top. Within the concrete there is 3” thick R19 insulation and a membrane roof on the exterior. The silo holds a total of 21 million pounds of peanuts, which occupy an

estimated 1,345,000 cubic feet (ft<sup>3</sup>). The total volume within the dome is 1,791,000 ft<sup>3</sup>, leaving approximately 500,000 ft<sup>3</sup> of head space.

Aluminum phosphide tablets, used as a fumigant throughout the grain industry, were applied to the peanut silo on August 4, 2009. Industrial Fumigant Company (IFC) applied 28.4 grams/1,000 ft<sup>3</sup> of fumigant, for a total of 49,000 grams applied using 98 flasks containing 500 grams each. Standard procedure is to drop the flasks into the dome through the 1' by 3' plate at the top. After application, the plate is replaced and bolts are tightened. The aluminum phosphide reacts with water to produce phosphine gas that disperses throughout the peanuts and serves as a rodenticide. Under normal conditions, the reaction takes place within 7 to 10 days, after which the phosphine gas reaches a level suitable for release into the atmosphere (less than 0.3 parts per million [ppm]).

On Monday, August 10, 2009, an employee of the Severn Peanut Company detected the smell of burning peanuts. At approximately 1600 hours on August 11, 2009, smoke was observed emanating from the top of the dome peanut silo. The employee immediately notified his supervisor and the local fire department. The local fire department, North Carolina Regional Response Team (NC RRT), and North Hampton County Emergency Management Agency (EMA) responded to the scene. Following the initial assessment by first responders, EPA assistance was requested. At 2024 hours on August 11, 2009, EPA tasked START to provide emergency response personnel to the site. START mobilized two personnel to the site at 0915 hours on August 12, 2009 as requested by the responding OSC. Prior to mobilization, START prepared a site-specific Health and Safety Plan (HASP) for the incident.

### **Response Activities**

START arrived on site on August 12, 2009 and met with the EPA OSC, EPA Emergency Response Team (ERT) personnel, and representatives from the peanut plant. The fire chief, police, EMA, and NC RRT personnel had all demobilized from the scene awaiting a change in status. EPA and the responsible parties (RPs), Severn Peanut Company and IFC representatives, discussed the situation and several alternative means for extinguishing the fire. Phosphine levels measured via tube, inserted to a depth of 15 feet below the top of the dome, had reduced from 580 ppm on August 11, 2009, to 265 ppm on August 12, 2009. As of August 12, 2009, no phosphine had been detected outside the dome.

The EPA OSC consulted the Agency for Toxic Substances and Disease Registry (ATSDR) to obtain a public health consult regarding phosphine gas. The permissible exposure limit (PEL) for phosphine is 0.3

ppm with an Immediately Dangerous to Life and Health (IDLH) value of 50 ppm. Based on the short life of phosphine in an open environment, ATSDR recommended an action level of 0.25 ppm to consider protective measures.

START responders and EPA discussed the situational status and identified several viable methods for extinguishing the fire. The RPs brought in a phosphine specialist on August 13, 2009 to provide additional input on the best alternative to mitigate the fire.

Representatives from the insurance companies for the RPs arrived on-scene on August 13, 2009. The entire group held an operational briefing to discuss specific goals, ideas as to how to proceed, and concerns. Several ideas were discussed, of which the most probable consisted of pressure feeding carbon dioxide or argon into the bottom of the dome through the fans to force the oxygen up and out the top of the dome, depleting the oxygen source for the fire and extinguishing it.

START contacted their company's structural engineer Lee Paulus in order to find out information regarding the dome's structure. Mr. Paulus contacted the dome manufacture company, DOMETECH International, to discuss the structural integrity of the dome under the fire conditions. Based on the manufacturer, the dome is capable of withstanding temperatures up to 1,000 degrees Fahrenheit (°F). The dome is manufactured with 20 thermal cables that constantly measure the interior temperature. On August 13, 2009, the maximum temperatures inside the dome were only approximately 250°F.

While the RPs discussed alternatives for fire mitigation and procurement issues, the EPA OSC, EPA ERT, START, and representatives from IFC traveled to the silo to collect air monitoring readings. Readings were acquired using phosphine sensors on four AreaRAEs. During the equipment set up, it was determined that with phosphine sensors can be triggered by the presence of several gases including carbon monoxide (CO). According to the AreaRae manufacturer, the presence of 1,000 ppm of CO, may elevate a phosphine reading by 1 ppm. Therefore, only 50,000 ppm of CO in the dome could skew the air reading to indicate the maximum detection limit (50 ppm) of phosphine. While the AreaRAEs were being prepared with the phosphine sensors, readings were taken from inside the dome through the polyethylene tube using a handheld pump with midrange Draeger® tubes. Using this technique, 33 ppm of phosphine was detected. By the end of the day, the level of phosphine had reduced to 20 ppm.

The RPs later met to discuss an action plan. The insurance company for IFC planned to supply a mobile laboratory to analyze air samples collected on-site. The RP group decided to obtain laboratory readings of the phosphine levels before deciding on a plan for extinguishing the fire.

Air monitoring readings taken from the dome using the handheld pump Draeger® tubes were at 6 ppm on August 14, 2009. A certified industrial hygienist arrived on-site to provide consultation to the RPs during the fire fighting operations. An additional monitoring instrument, a QRAE four gas meter, would be utilized during the opening of the dome top hatch. The instrument was used to log the phosphine and CO readings during the event.

EPA and START began air monitoring activities around the perimeter of the dome using the AreaRAEs. No elevated levels of phosphine were detected outside the dome. Interior levels of phosphine attained using the tube extending into the dome continued to drop. A crew consisting of two members from IFC and one START member traveled to the top of the dome in level B personal protective equipment (PPE) to perform a reconnaissance of the “nut house”, which is the structure on top of the dome where the plate opens up into the dome. START brought an AreaRAE, a camera, and a thermocouple to attain information regarding the characteristics of the atmosphere within the dome. IFC brought additional tubing to lower equipment down the hatch and obtain phosphine readings. During the time the crew members were in the “nut house”, phosphine levels were on the order of 10 ppm, with a maximum of 17 ppm and a minimum of 4 ppm at the door. CO maxed out at 1,500 ppm. It was noted on the AreaRAE sensor sheets that for every 50 ppm of CO present, phosphine levels may have been inaccurately detected at 1 ppm. Once the crew descended from the top of the dome, data from the AreaRAE was downloaded and saved. The AreaRAE readings are provided as Attachment B.

The RPs and responders met on August 15, 2009 for a planning meeting to lay out a course of action for the fire fighting operations. It was determined that a crew of hazardous materials (hazmat) trained fire fighters would ascend the dome house in full turn out gear and open the plate. During the initial plate opening, a rescue crew, three fire fighting units, and Emergency Medical Services (EMS) crews will be on standby at the base of the dome. The hazmat fire crew would take the QRAE monitoring instrument with them so that levels in the dome would be known during operations. Once the plate was open, the crew would descend to the ground outside the dome and begin fire fighting operations. Fire fighting operations would consist of using a conveyor belt to deliver approximately 76,000 pounds (lbs) of dry ice in pellet form to the top of the dome. The dry ice would then be dropped into the dome through the plate

opening. Following the initial drop of dry ice the dome would be monitored. Two additional 40,000 lb loads of dry ice were planned for drop on the morning and evening of August 17, 2009.

During the planning meeting, the group established Incident Command Structure (ICS) for the operational period beginning at 0800 hours August 16, 2009. The local fire chief was designated the sole incident commander. EPA and START comprised the Air Monitoring Branch. All fire fighting units were divided into various groups and divisions within the operation section.

On August 16, 2009, at 0830 hours, all participants signed in at the Incident Command Post/Staging Area and attended the Operational Briefing conducted by the Deputy Incident Commander. Incident Action Plans (IAPs) were distributed during the briefing. The EPA OSC detailed the air monitoring operations and described the hazards posed by the presence of phosphine gas. Individuals involved in the ground support operations, dome top operations, and air monitoring support mobilized to the dome after the Operational Briefing and prepared to support with water operations in the event of a fire. A back-up unit with foam supply was staged and on alert at the Incident Command Post.

The EPA OSC and START personnel set up three AreRAEs along a 50' perimeter surrounding the dome. Two units were placed downwind, and one unit upwind where ground support teams were staged. The fourth unit was attached to the EPA vehicle and was operated as a mobile unit. A weather station, with wind vein, was also attached to the vehicle. A wind sock was placed at the top of the tower by EPA and START for all responders to view during operations.

Prior to the entry team's ascent to the top, Draeger® readings were taken from the tube descending into the dome. Phosphine readings were approximately 1.5 ppm. The team, composed of three Williams Fire Specialists, traveled to the dome house in full turn out gear and supplied air. They carried the QRAE monitoring device with them. Once in the dome house, the team removed the plate from the floor of the dome, obtained temperature readings with a thermocouple cable, and collected air quality readings with the QRAE. Phosphine levels reached a maximum value of 4 ppm, with CO reaching 350 ppm. The team completed the entry and began their descent within approximately 20 minutes.

Plant personnel began dry ice operations after the entry crew safely reached the ground. A 4-gas meter was given to the operator of the conveyor system to ensure adequate oxygen levels. A total of 76,000 lbs of dry ice were loaded into the dome by 1900 hrs. A 2 minute delay between loads was applied due to

extreme cooling of the conveyor system by the dry ice. Once the operations were complete, the plate was replaced and sealed until the morning of August 17, 2009. During operations, downwind AreaRAE (number 3) reached a maximum value of 0.7 ppm for phosphine. A Draeger® tube reading was taken next to the unit, and no elevated readings were indicated. The mobile unit was driven in accordance with wind direction, and no additional elevated readings were attained.

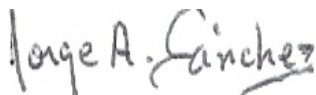
EPA and START demobilized from the site on the morning of August 16, 2009. The photographic log of site activities is presented as Attachment C and a complete copy of the logbook notes is included as Attachment D.

### **Conclusion**

The Deputy Incident Commander continued operations as planned on Monday September 17, 2009 with the application of 40,000 lbs of dry ice in the morning, and an additional load of 40,000 lbs of dry ice in the evening. The plate was replaced and sealed, and the dome has remained closed until an entry can be made to confirm that the fire was successfully extinguished.

If you have any questions or comments regarding this letter report, or require any additional information, please feel free to contact myself or Greg Kowalski, START Program Manager, at 678-355-5550.

Sincerely,

A handwritten signature in dark ink that reads "Jorge A. Sanchez". The signature is written in a cursive, slightly slanted style.

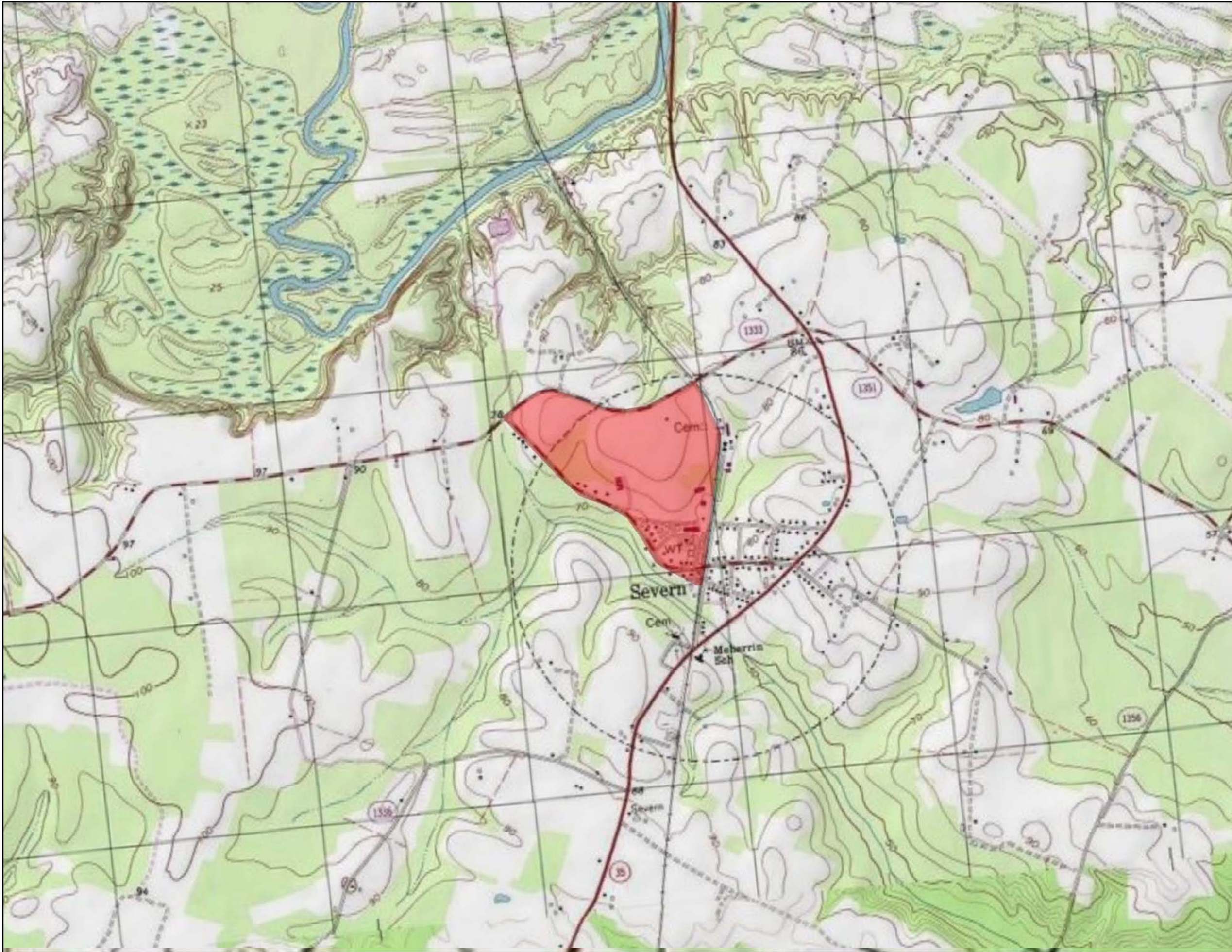
Jorge Sanchez  
Project Manager

CC: Katrina Jones, EPA Project Officer  
Darryl Walker, EPA Project Officer  
Greg Kowalski, START Program Manager  
START file

## **ATTACHMENT A**

### **Figures**



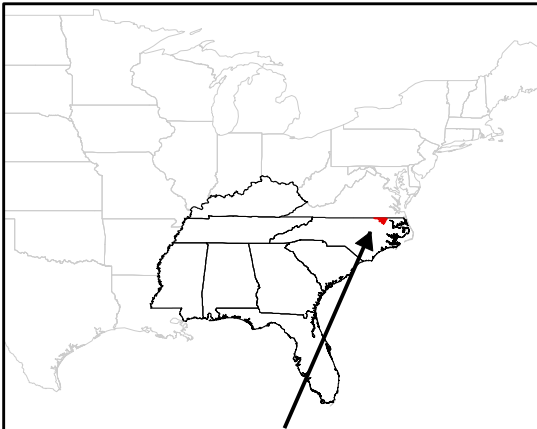


## Legend

 Site Area



Feet  
0 750 1,500 3,000



Severn,  
North Hampton County,  
North Carolina



United States Environmental Protection Agency

SEVERN PEANUT COMPANY FIRE  
SEVERN,  
NORTH HAMPTON COUNTY,  
NORTH CAROLINA  
TDD No: TNA-05-001-0091



**FIGURE 1  
TOPOGRAPHICAL SITE MAP**

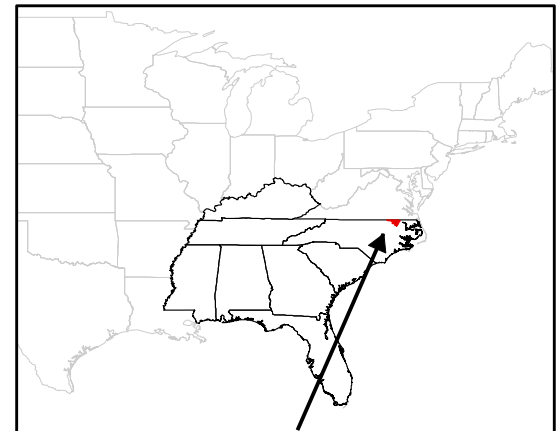
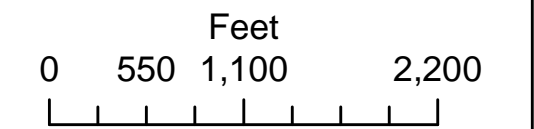




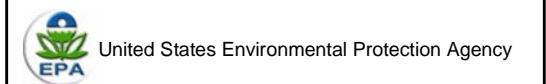


## Legend

-  One Mile Radial Ring
-  Site Boundary



Severn,  
North Hampton County,  
North Carolina



SEVERN PEANUT COMPANY FIRE  
SEVERN,  
NORTH HAMPTON COUNTY,  
NORTH CAROLINA  
TDD No: TNA-05-001-0091


**FIGURE 2**  
**ONE MILE RADIAL RING MAP**









**Legend**

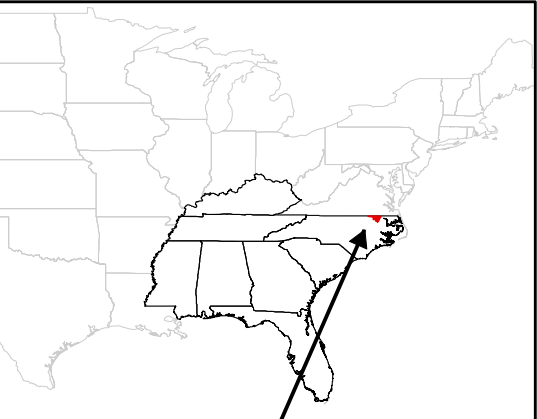
 Site Area

 Peanut Dome


 N

Feet

0 240 480 960




Severn,  
North Hampton County,  
North Carolina

 United States Environmental Protection Agency

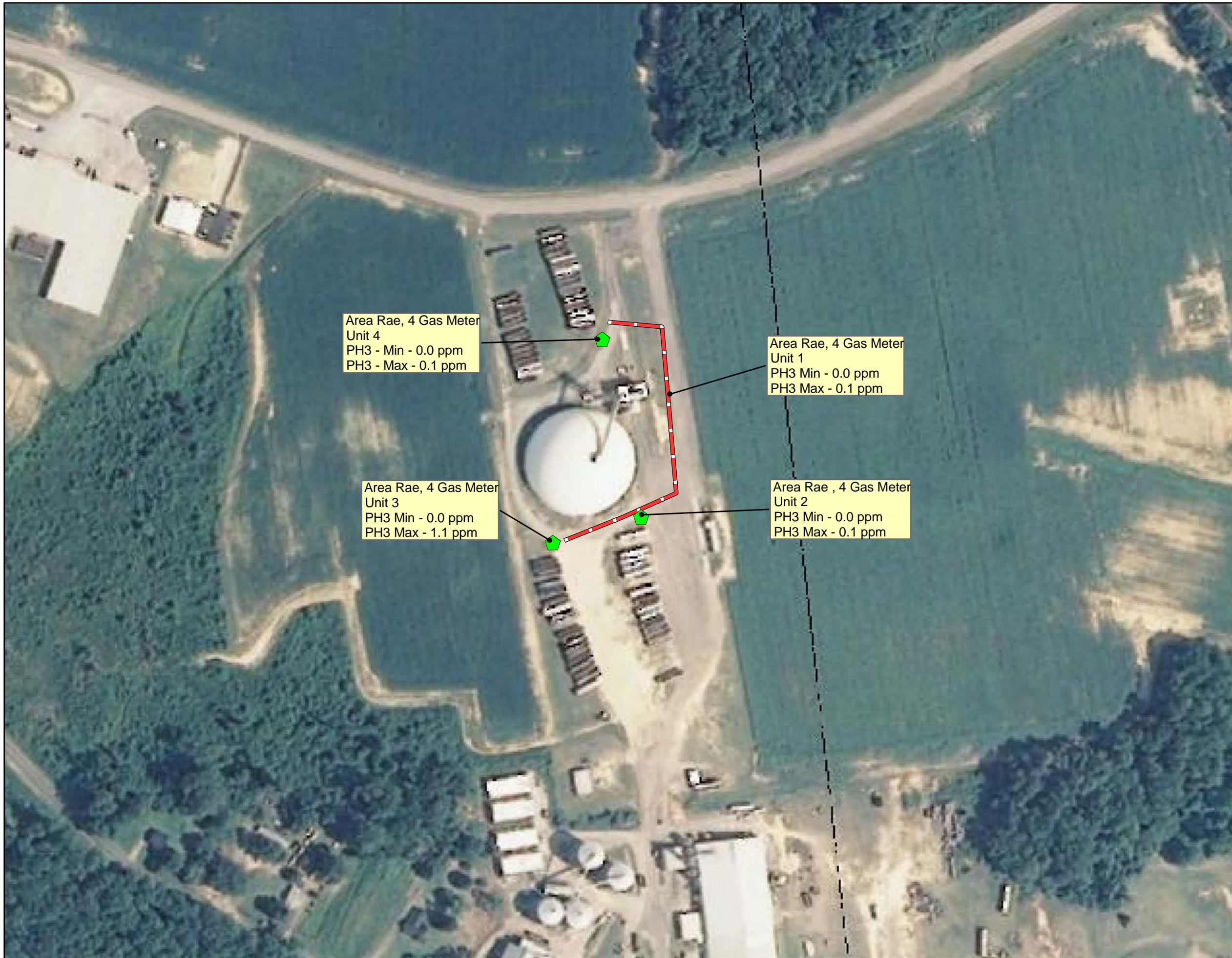
SEVERN PEANUT COMPANY FIRE  
SEVERN,  
NORTH HAMPTON COUNTY,  
NORTH CAROLINA  
TDD No: TNA-05-001-0091

**FIGURE 3  
AERIAL SITE MAP**







**ATTACHMENT B**  
**AreaRAE Readings**



## Legend

-  Path Of Mobile Area Rae, 4 Gas Meter Unit 1
-  Stationary Area Rae, 4 Gas Meter Locations

Notes:

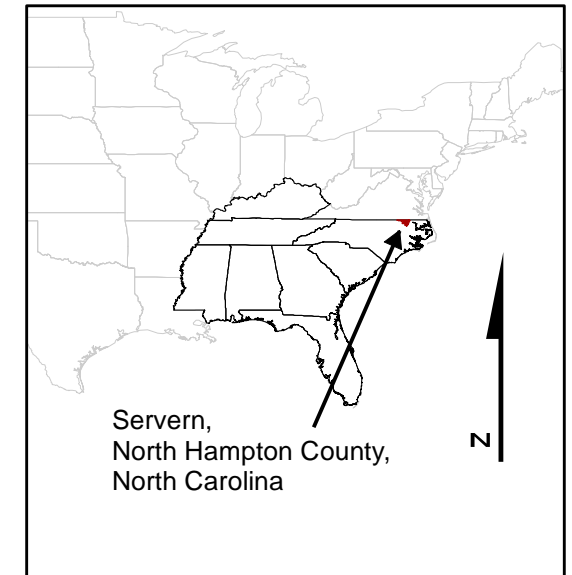
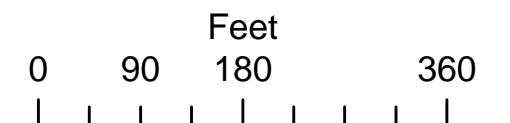
Max - Maximum

Min - Minimum

PH3 - Phosphine

ppm - Parts Per Million

Readings taken on 08/16/09



United States Environmental Protection Agency

**SEVERN PEANUT COMPANY FIRE**  
**SEVERN,**  
**NORTH HAMPTON COUNTY,**  
**NORTH CAROLINA**  
**TDD No: TNA-05-001-0091**

**FIGURE 4**  
**MOBILE AND STATIONARY**  
**AREA RAE LOCATIONS**





**ATTACHMENT C**  
**Photographic Log**



**Photograph No.: 1**

**TDD Number:** TNA-05-001-0091

**Date:** August 12, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Severn Peanut Company dome. The silo holds 21 million pounds of peanuts.



**Photograph No.: 2**

**TDD Number:** TNA-05-001-0091

**Date:** August 12, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Severn Peanut Company dome. The silo holds 21 million pounds of peanuts.



**Photograph No.: 3**

**TDD Number:** TNA-05-001-0091

**Date:** August 13, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Severn Peanut Company dome. Smoke from the "nut house".



**Photograph No.: 4**

**TDD Number:** TNA-05-001-0091

**Date:** August 13, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** IFC hazardous label, Phosphine gas.



**Photograph No.: 5**

**TDD Number:** TNA-05-001-0091

**Date:** August 14, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Preparation for Level B reconnaissance of the “nut house”.



**Photograph No.: 6**

**TDD Number:** TNA-05-001-0091

**Date:** August 14, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Level B reconnaissance of the “nut house”.





**Photograph No.:** 7

**TDD Number:** TNA-05-001-0091

**Date:** August 14, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Installation of sampling tubing.



**Photograph No.:** 8

**TDD Number:** TNA-05-001-0091

**Date:** August 15, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Severn Peanut Company dome.



**Photograph No.: 9**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Operational Briefing in the Incident Command Post/Staging Area.



**Photograph No.: 10**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Ground Support Operations. Wind sock installed by EPA and START.



**Photograph No.: 11**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Preparing for perimeter air monitoring using AreaRaes®.



**Photograph No.: 12**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** First Responders removing dome plate, obtaining temperature readings, installing thermo couplers and recording air quality readings from AreaRaes.





**Photograph No.: 13**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Addition of 76,000 pounds of dry ice for fire suppression.



**Photograph No.: 14**

**TDD Number:** TNA-05-001-0091

**Date:** August 16, 2009

**Photographer:** Jorge A. Sanchez, START

**Site Name:** Severn Peanut Company Fire

**Location:** Severn, North Hampton County, North Carolina

**Subject:** Addition of 76,000 pounds of dry ice for fire suppression.



**ATTACHMENT D**  
**Field Logbook Notes**

SEVERN PEANUT CO

001-0091-1230



*"Rite in the Rain"*®

ALL-WEATHER

**UNIVERSAL**

No. 371

"*Rite in the Rain*"  
ALL-WEATHER WRITING PAPER



Name Peanut Fire / Phosphine  
 Gas Release - Emergency Response  
 Address 1333 Screen Road North.  
Severn, North Carolina  
 Phone EPA-OSC-Allyssa Hughes  
404-229-9530

Project \_\_\_\_\_

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J.L. Darling Company.

## PAGE

## REFERENCE

DATE \_\_\_\_\_

[illegible]

08/11/2009

08:24 PM. call from ER Coordinator Russell Henderson to activate ER To a Silo Fire containing Percutis and producing phosphine gas in Severn, North Carolina. The incident description details that the Percutis Fire is in a Percutis Silo where Aluminum Phosphide was used 7 days ago as a pest/chodenticide; when on fire it will produce phosphine gas. Russell Henderson requested that Randy Watts activated the ON CALL Response and to mobilize ASAP from the Atlanta office. R1- Jorge Sanchez and R2- Douglas Fialy were activated, and should report to the OTIE office to pack materials and equipment and drive to the affected area.

09:30 Arrived at the OTIE office. Maetta, Jorge and began to put ER equipment and materials together, along with site HASP, Hospital Route, MSDS and PPE including SCBA.

Scale: 1 square=

08/11/09 cont.

09:38 PM - Russell Henderson called R1- Jorge Sanchez to stand down for the ER and wait for further notice. 10:30 completed packing HASP, Hospital Route and preparation for equipment.

08/12/09

07:50 AM. Russell Henderson called to activate the ER Response Team with R1- Jorge A. Sanchez and R2- Ryan Strubbs. He mentioned that Allyssa Hughes is on her way to the site and that OTIE needs to mobilize within the next two hours. The team will contact Allyssa Hughes for further details about the on going fire.

07:51 AM. Called Allyssa Hughes for briefing. She said and stated that she is on her way to the 62-warehouse to pick up air monitoring equipment, and then she will be back on the road. She said that there is no need for us to stop by the 62 warehouse and to get on the road.

08:00 AM. Arrived at the OTIE office Maetta, 64

Scale: 1 square=



08/12/09 cont

and began to complete packing the ER truck with: SCBA's, PPE, Multi-Race and printed HASP, Hospital Route and maps, figures and MSDS.

09:15 Left the OTE office Marietta, GA via 1333 Severn Road path, Severn, North Carolina with Ryan Stobbs & J. Sanchez.

11:13 AM Allysa Hughes called to get Traveling Status. She is 4 hours into the trip and wears two hoses behind her.

We will continue communication with her.

Weather Conditions: Partially cloudy, about 85°F. Light rain at times. Driving through I-20 to South Carolina then 95 to North Carolina to the site.

18:32 Arrived at Site Area, Severn, NC. Campagna Phil, Allysa Hughes, Jim the EPA along with site officials were present at the office trailer across from the Silo.

R.P. Watson President of Operations 18:55 Left the area via Comfort Inn Hotel in Franklin, NC.

20:00 AT meeting with Allysa Hughes

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08/12/09 cont

- R.P. Watson, III - Severn Peanut Co., Inc. Vice President.

- Randy Turner - Territory Manager. IFC - they applied the Aluminophosphide  $\rightarrow$  55% phosphine.

- Walter Natta  $\rightarrow$  the Travelers Company - Insurance

\* 21 million pounds coverage

\* Dome 22" concrete wall with 3" insulation and membrane outside of the dome.

Temp 450°F to maintain heat.

- Probes 85  $\rightarrow$  268°F  $\approx$  171°F

- No heat spots on one side of the dome toward the middle of the dome. The peanuts were

harvested in October. Fumigated at the end of the year.

- During winter they let it set.

- Tuesday August 4, 2009 tablets were placed for fumigation.

- 28.4 gms / 1,000 cu ft  $\Rightarrow$  49,000 grams Total. 500 grams per flock = 98 flocks.

Scale: 1 square = \_\_\_\_\_

08/12/09 cont

- Range for 20 to 40 tanks to press 1,000 cubic feet.
- Dome Constructed in 2004
- Total Volume Exterior 1,976,503 cubic feet. Inside 1,791,000 cubic feet.
- Monday August 10, 2009 not at burning and next day police was called yesterday at 16:00 hrs.
- Oxygen at 13% inside the dome
- Tube from 25' into the dome was where the readings were taken by dagger yesterday 5:80 ppm - Today 265 ppm
- Outside Tube 10 ppm yesterday Today 100 ppm
- Every three to four hours Temperature readings taken. no much variation.
- Man. future Dome <sup>rectangular</sup> Rects.
- Lat. Plastics set for 10 days and aerate to see phosphorus levels 0.3 ppm + complete their work for that day.

Scale: 1 square=\_\_\_\_\_

08/12/09 cont.

- Peanut pile 1,348,000 c.b. feet
- Total 500,000 cubic feet of head space.
- 21:45 Completed dinner meeting w. Yb EPA OSC - Allyson Hughes
- Convene to meet at the Hotel lobby tomorrow at 07:45 hrs.
- 10:00 Sending information to Russell Henderson in order to calculate rates of reactions + Exothermic reaction from information gathered today during meetings with EPA
- Final thoughts: 1) It rained all the way from Atlanta to the site. Heavy rain at times. Forecast for tomorrow, Friday, Saturday + Sunday is the same with heavy rains
- 2) AERO RAE - PID - with Phosphine ships will be place at a perimeter around site tomorrow. PID may malfunction due to high humidity and rain.

Scale: 1 square=\_\_\_\_\_

08/13/09

09:45 Meeting with EPA-OSC-Allyssa  
 Hughes over breakfast at the hotel  
 lobby located in Franklin, Virginia  
 - discussed figures, maps, and  
 parameters for AEA-EA-KAE's positions  
weather: expecting high humidity  
 and light to heavy rain all day.

08:30 Meeting with all involved in the  
 Permitting, IFC, Insurance.  
 Mark Barrows → Incident Fire Investigators.

- 250 ppm of phosphine was detected  
 this morning by Randy for IFC
- 230°F readings this morning. From  
 the officals temperature appears to be  
 rising. A table will be provided.

- Dome Tech has the specifics for structural  
 integrity base on temperature.

- 50 ppm is the limit of danger.

- Last night O<sub>2</sub> was dropping to 0%

- CO<sub>2</sub> blanket seems to be the answer of  
 putting the fire out & displace the O<sub>2</sub>,  
 phosphine and help for Dust not to  
 Ignite another fire.

- Structural Engineer for calculation CO<sub>2</sub> injection

Scale: 1 square=\_\_\_\_\_

08/13/09

- CO<sub>2</sub> injection rate. Questions about  
 weakness. Structural Integrity.

- ≈ 350 people around the 1 mile  
 radius. the process says 263 sq mile

- IFC representative (2) arrived in office.

- \* DomTek Structural Engineer  
 Ryan Poole. 208-522-5520  
 and cell 435-830-2760.

- \* Lee Paulus - 414-606-6760

10:10 On our way to do reading with  
 Dragger at the Dome's lower vent  
 with EPA and IFC.

- Calling OTIE Mallockee to get  
 Structural Engineer for Dome integrity  
 → L Paulus @ OTIE solutions.

10:40 100 ppm →  $\div 3 = 33$  ppm.  
 Tube inside 15' from the top.

(One stroke of Dragger pump gave  
 100 ppm  $\div 3$  because rate = 33 ppm).

~~5~~ 5 ppm on the 1 to 4 range. 5 strokes  
 under 10. ( $n=3$  reading 9 strokes 100 ppm)  
 which comes at 33 ppm.

10:50 → Structural sounds No threat  
 of collapse taking place. Cracking

Scale: 1 square=\_\_\_\_\_

08/13/09 cont

maybe. No significant problem. Clunker  
(Iron Clunker) 600°F. Furnace  
aggregate product. Don does  
well. Fire at 400°F not bad  
Expense with turning to 3000°F  
same application. Call 414-383-7890.  
IFC - UP Dan Ponton, &  
11:45 Lunch Break.

Weather: Light rain.

98% humidity  
overcast

No Lightning

12:20 Meeting with PRP, IFC and  
Insurance company about plans  
Time table for the fire control,  
and oxygen depletion addition.  
- Puttable link with CIH and  
monitoring equipment for gas generation  
and reading. Technician & CIH.  
To monitor and have meetings.  
- Analyzed for offgassing the dome  
if there is no serious offgassing.  
- Fire control is under discussion  
1) First do analyzed for offgassing

Scale: 1 square=

08/13/09 cont

and health risk 2) Control fire  
Cattam Bob regarding Insurance  
13:15 Left site via hotel in Frankling,  
Virginia in order to close account  
and move to another hotel the  
Hanger Inn where The EPA-OJC-  
Allissa Hughes is staying. that way  
we can have meetings this afternoon  
and tonight. More convenient.  
14:00 Left hotel in Frankling, VA  
via hotel for Rowing Oaks, Rapids,  
North Carolina. about 1 hour away.  
15:30 Arrived at hotel in Roanoke  
Rapids, North Carolina, Hanger Inn.  
16:00 Proceeded to send Allissa  
Hughes information about phosphine  
and also instrumentation used to  
measure levels of the gas.  
- Dormitory  
Ryan Pooler  
208-522-5520  
cell 435-830-2760  
19:00 Out with Allissa Hughes business  
briefing meeting. ————— fore

Scale: 1 square=



08/14/09

09:00 Arrived at the Seaman Beach Camp  
 a/ven driving 40 miles from the hotel  
 where we were bumped by the EPA-OSC  
 Alyssa, Hughes.

Weather: Temperature = 80°F

Humidity = 80%

Light/Drizzle rain

⚡ Thunderstorm Forecast after noon.

### Dome Phosphine Readings

IFC took reading with Dragger at  
 15' feet from the top with tubing 6 ppm  
 09:30 - Meeting with all participants  
 of the plot, IFC, Friedgen  
 - Williams → Friedgen's company  
 in the USA.

- Phosphine → Monitoring areas about  
 11:00 Today. they are likely about  
 dropping dry ice on the pile.
- Planning on going up the stairs and  
 get readings, Take a look at the situation  
 and open the top to identify hazards
- Set thermal couples, set tubing, taking photos
- Take a safety issues for Level B with  
 IFC, OTIE and Friedgen.

Scale: 1 square = \_\_\_\_\_

08/14/09 cont.

10:00 - Calibrating AERONET &  
 putting chips for phosphine &  
 setting parameter with monitors.

11:20 continue Calibration of AERONET

USEPA Units 1) EPA ID A80782

2) EPA ID A80779

3) EPA ID A80780

4) EPA ID A80781

- Preparing for Level B - SCBA
- Tank (PSI) ≈ 35-40 mi.
- Inspected 1) SCBA units

2) Respirators

⊗ Humidity increasing 88%

- Taken pictures of Dome
- A thermocouple unit will be taped on US.
- Long pH strips will be taped on US.
- Tyrex, yellow Tyrex, booties, gloves.
- \* IFC will be the partner with OTIE to  
 climb the dome. to drop thermal wt,  
 cameras, tubing, readings.
- 1) 15' feet tubing 7 readings
- 2) 20' feet tubing
- 3) Film camera
- 4) Still camera

Scale: 1 square = \_\_\_\_\_

08/14/09 cont.

11:40 - Dragger Tube reading from  
tubing going over and into the dome  
15' in. 1)  $\text{PH}_3$  0.1/a

Batch AR2F0761 CH 31101

Range 0.1 - 4.0 ppm

# of Pumps = 10 pumps

Reading of  $\text{PH}_3$  = 0.8 ppm

12:10 Walked around the dome and

Took AreaRAE for background readings.

\* There were no readings on AreaRAE.

12:45 START - Sanchez, IFC's Brian  
and Randy starting climb up  
the stairs to the catwalk for  
the dome. RS

12:50 IFC personnel (Brian & Randy)  
entered building on top of  
dome to install tubing and  
to take temp readings.

12:52 AreaRAE reading 7.7 ppm  $\text{PH}_3$

12:57 Guys out and coming back  
down stairs. RS

13:05 START - Sanchez said  $\text{PH}_3$   
maxed at 14.0 ppm and when  
exiting  $\text{PH}_3$  = 4.2 ppm +  $\text{O}_2$   
low was 0.3 ppm. ~~11. Stubb~~

Scale: 1 square =

08/14/09

13:10 AreaRAE #1 Peak readings

$\text{CO}$  = 1293 ppm

LEL = 47%

$\text{PH}_3$  = 17 ppm

$\text{O}_2$  = 22.3%

13:20 IFC - Brian & Severn Peanant  
worker going up in manlift.  
Going to take readings  
through a sampling port about  
half way up the side of the  
dome. RS

\* Latenote: IFC - Randy got a  
reading of 18.0 ppm  $\text{PH}_3$  with  
a Dragger tube at about 0830.

\* Latenote: At 1310 Randy of IFC  
got 10.5 ppm  $\text{PH}_3$  with a  
Dragger tube.

13:25 IFC - Brian installed a  
tube in the sampling port  
on the side of the dome.

$\text{PH}_3$  = 9.4 ppm

$\text{CO}$  = 1440 ppm

$\text{O}_2$  = 6.2%

AreaRAE #1  
readings from  
top

RS

Scale: 1 square =

08/14/09

13:25 AreaRAE #1 readings RS  
~~PH<sub>3</sub> = RS~~  
~~CO = RS~~  
~~O<sub>2</sub> = RS~~

14:20 IFC on manlift again  
 reinserting tubing in the  
 port in the side of the  
 room.

14:45 EPA - Hughes + START Hubbs  
 using Drager pump + tube  
 from the sample hose in  
 the port in the side of  
 the room

15:45 Bob → stating that there is  
 a loss already of the product.  
 - It will be difficult to put present  
 fire out with water.  
 - they are planning (PRP) to open  
 the hatch on top to let phosphine  
 gas out. EPA-OTIE will monitor  
 the operation from the perimeter.  
 - At this moment we do not have  
 enough people here to open the hatch.  
 We will need fire department, medics,

Scale: 1 square=

08/14/09 cont

15,000 pounds of Dry Ice w. the CO<sub>2</sub>.  
 #6,000 pounds left of it first and  
 second half later.

- 1) Perimeter of 1,000 feet, but for opening  
 the hatch, the HAZ team.
- 2) Use AreaRAEs to monitor for the perimeter.
- 2) Need the ambulance and the paramedics
- 4) A fire suppression team need to be available
- 6) Sunday is scheduled to open the top
- 7) the amount of Dry Ice will be determine  
 with the involvement of CIH + IFC,  
 PRP and Insurance.

16:00 Left the site area via the  
 Emergency Management, Northampton  
 County office to see location.

18:00 Arrived at the Heli/Reg. dist.

19:30 - Meeting Dinner with EPA-OSC  
 Allyssa + Hughes. To discuss plans +  
 operations for the rest of the weekend  
 + Calibration of AreaRAE will take place  
 tomorrow, while Allyssa + Jorge  
 goes to the site for Intrusion meeting.  
 Need to meet at 09:00 hrs tomorrow

21:30 Completed the EPA/OTIE meeting

Scale: 1 square=

08/15/09

08:10 Left the Hampton Hotel via  
Severn Peanut, Seven, North Carolina  
09:00 Arrived at the Severn Peanut  
Company where a ER - meeting is in  
progress with Fire Department, County  
Emergency Medicals, EFC,  
\* 40,000 pints every 4 hours after  
the initial 76,000 ~~initial~~ addition.  
- If problems need to add liquid  
CO<sub>2</sub> that transform into CO<sub>2</sub> gas.  
- If this does not work Foam will be used.  
To get the fire control and extinguish.  
- 2,000 gpm could be establish with  
the pumps (mobile) for H<sub>2</sub>O suppression.  
{ 2 Loads of air hoses apart  
to introduce dry ice with the  
conveyor belt. From 2 to 12  
hours to add the load of dry ice.  
\* 12 hour cycle starting Monday morning  
8:00/12 & Safety: 1) Medicals 2) Responders  
available (2-4) in case somebody  
goes down. Air lines available.  
- This morning 3 ppm of phosphine was  
detected.

Scale: 1 square=

8/15/09 cont.

10:00. Meth-natural gas works  
temp by 80°F  
Humid, 60% to 40%  
→ Weather for 8/16/09 for the  
opening of the manhole on the side  
\* Hot Zone 50' foot from the  
Top Housing. To keep people away.  
\* Staging and cell be establish by  
the fire hydrant next to the open building.  
\* One ambulance will be available for  
the county. Evacuation plan in progress.  
→ Tracy conducting the presentation. B  
→ Class A foam could be use better than B  
B will be more harmful than A.  
Preparing ICS → County Fire Chief  
Dennis IC  
Tim Deputy IC  
PIO → Sharon Lawm  
H&SO → Hank Fuller  
Operations → Tracy Johnson Kevin Breake  
LEA Air Monitoring Operator → Allgood Hugh  
→ Bob Slender IFC  
\* Red Cross Rehab with breakfast/lunch/Free  
meals  
+ Accountability → Signing sheets.

Scale: 1 square=



8/15/09 cont

Security with Police in their car for  
three enter roads. (Seven, Main Street,  
Evolution will take place tomorrow 1 mile.

### Personnel On Scene

- 1) Lester Rich → Forensic Fire Analyst  
hired by Travelers Insurance and their  
attorneys. Introducing investigation  
of the ALPH<sub>3</sub> tablets and base  
for insurance purposes. Once

the removal of the cover plate.  
\* Safety Meeting at 08:30 hrs

10:50 Ryan Stobbs bought a weather  
station with wind instrument and weather.  
In addition per Allyssa Hooper, we  
are also buying a wind sock.

\* 120 gallons w/ foam available class A.

\* Pat Roy - 1450 → 8232-396-3561

\* Marshal Lissick - Town Manager 536-8683

\* 704-309-6567 - Troy Johnson

\* 50 ppm is PH<sub>3</sub> Lethal Dose  
\* 15 minutes = 1 ppm average

12:10 left the site via Roanoke Rapids to get  
Supplies for tomorrow. 15:00 at the hotel.

Scale: 1 square = \_\_\_\_\_

08/16/09

06:30 - Meeting with EPA at hotel Lobby  
before heading to the site area Seven, NC  
- Very foggy, Partially Cloudy.

Weather: Temperature = 72.7°F

Humidity = 72% RH

Pressure = 29.99 in Hg

07:45 Arrived on site Seven, NC

- Commence setting up weather station  
and the air monitoring Area-Kies  
- Spoke to Troy Johnson - Hazmat unit -  
Williams Fire & Hazard Control - contacted  
by a private party for Travelers Insurance.

- Preparation: 1) OSC - EPA - Allyssa Hooper  
on site representing the government.

2) Ryan Stobbs & Jorge Sanchez representing  
OTIE Solutions - Contractor.

3) Reviewed Site Safety Plan with EPA  
and will proceed to set up Area-Kies.

08:05 Randy from IEC took a Dargger  
Tube reading 1.5 ppm. Range ~~0.1 to 4~~

0.1 to 4 ppm range = 10800 ppm

08:15 Reconnaissance of the area for monitoring

08:30 Safety Meeting in progress by Tom  
Zgers. All participants spoke.

Scale: 1 square = \_\_\_\_\_

08/16/09 cont.

09:00 Alyssa Hughes + Jorge Sanchez set up the wind sock at the end of the steps 120' feet high.  
 - Completed calibration of Aerobus  
 10:50 The Hatch was opened. Heat readings 110°F. Aerobus #3 reads 0.3 ppm. Aerobus #4 by the truck read 0.1 ppm when the wind changed direction. No visual from the heat camera dropped by Leslie + Smoke keeps emanating from the housing + low winds. Firefighters are still on the catwalk and preparing to complet set up to add the dry ice into the conveyor belt system and into the dome.

- Unit #2 CO reading 2.5 ppm; O<sub>2</sub> = 19.8%.

- Unit #3 still reads PH<sub>2</sub> = 0.3 ppm

- Unit #4 CO reads 0.9 ppm + PH<sub>2</sub> = 0.1 ppm

11:00 Unit #2 = CO = 1 ppm

VOC = 0 ppm

PH<sub>2</sub> = 0.0 ppm

O<sub>2</sub> = 18.9%

LEL = 0.1%

- Wind North South West 25W.

Scale: 1 square = \_\_\_\_\_

08/18/09 cont.

11:05 Weather Wind direction NSE

Wind speed 2.4 mph

Temp 96.5°F

Humidity 47% RH

Pressure 30.03 in Hg

Partially cloudy + Sunny

- Unit #3 CO = 0 ppm

VOC = 0 ppm

PH<sub>2</sub> = 0.3 ppm

0.4 ppm

LEL = 0%

O<sub>2</sub> = 20.9%

X { 0.01 ppm to 1.0 ppm Dragger  
 Range, 10 ppm. No readings

0.0 ppm Dragger

(4.6 PH<sub>2</sub> ppm pick)

Average 0.6 ppm

{ CO. } at 10:00  
 { 32.8 }  
 { 53.7 } on

→ ORAC = every 45 minutes

\* Steam build up seeping from top;

- Not so hot w/ a smoke

- will deliver dry ice and close top

just a little to leave oxygen

11:55 Beginning addition of Dry Ice

Scale: 1 square = \_\_\_\_\_

08/16/09 cont

12:00 ATOT of 8 Totes of Dry Ice were delivered to the Inland. The Dome was conveyer belt system. The system froze and now is being halted to let it warm up and continue the addition. - will go out to have lunch.

13:20 - Bumped Area #3 read 6.6 ppm for PH<sub>3</sub>. then called it for PH<sub>3</sub>. then bumped got 5.0 ppm then it read 0.6 ppm. Bumped again and got 4.2 ppm.

- Now is reading 0.0 ppm Area #3. The Area #3 are hot due to direct sun and high humidity. Sensor is giving problems.

13:30 Resume addition of Dry Ice. - Area #2 bumped - PH<sub>3</sub> = 5.6 ppm.

14:30 Another truck with 26 more Totes of 1,500 each pounds of Dry Ice arrived on site. The addition of each tote is followed by a 3 minute wait due to overloading of the conveyer system. - No more readings on phosphine are

Scale: 1 square=\_\_\_\_\_

8/16/09 cont.

detected at this time. Continue monitoring the area. Smoke continues to come out of the housing structure above the dome. The smoke now is clear. JFC was dismissed from the site.

Responders are leaving at a steady rate from the site. EPA-OSC Allysa Hughes directed START to begin to pack all equipment + material from the site area.

15:45 Left site area via the staging area to sign out and say goodbye to all responders attending the fire response.

16:30 Arrived at the hotel/Rooms. 1800 Final briefing with EPA-OSC Allysa Hughes. Dinner followed.

*[Signature]*  
8/16/09

Scale: 1 square=\_\_\_\_\_

08/17/09

08:00 Met with EPA-OSC at the lobby  
of the hotel. Conducted final  
briefing about the ER Response.

09:00 Left the hotel via A14, GA

Stop to get gas and to buy  
250 quarts of oil for the truck.

The oil gauge was about empty.

Need to take truck to the mechanic  
for a full service this week.

17:00 Arrived at the OTEC office

Marietta, Georgia. Met with Greg  
Koudski and briefed shortly about  
the Severn River fire operations.

17:30 Left the office via to our homes.

*[Signature]*  
08/17/09

Scale: 1 square=\_\_\_\_\_

Scale: 1 square=\_\_\_\_\_