

Monsanto

FROM
NAME-LOCATION-PHONE:

E. R. Billen, Sauget, Illinois 2010

DATE : January 24, 1979

cc. F. Basile
P. Kirk
D. Mayer
*W. Springrose - AA3K

SUBJECT :

REFERENCE :

TO : *Glen Shoptaw
AA3A G.O.



Attached are two writeups on the Sturgeon incident.
One by the field team and one of plant location
involvement and communications.

We'll discuss these and plant preparedness informally
starting at 9:00 February 1 here at the plant.

Earl Billen

md
att.*

C00541

Monsanto

FROM : F. J. Basile, Jr., W. G. Krummrich Plant (2671)
(NAME-LOCATION-PHONE)

DATE : January 23, 1979

cc:

SUBJECT : ORTHOCHLOROPHENOL TANKCAR
SPILL AT STURGEON, MISSOURI

REFERENCE :

TO : E. R. Billen
D. T. Mayer
J. W. Molloy
W. E. Scruggs

Attached is our final report on subject incident.

Frank J. Basile, Jr.
F. J. Basile, Jr.

P. T. Kirk
P. T. Kirk

J. Starzyk
J. Starzyk

J. L. Wolfsberger
J. L. Wolfsberger

tm
attachments

ORTHOCHLOROPHENOL TANK CAR
SPILL -- STURGEON, MISSOURI
JANUARY 10, 1979

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WGK

(Statements/Comments of J. Wolfsberger, F. Basile, J. Starzyk & P. Kirk, 1/18/79)

EVENTS OF 1/11/79

BACKGROUND: At 11:30 p.m., 1/10/79, Don Womack, Night Superintendent, had contact with Chemtrec. The material was identified at that time as Carbolic Acid. He (Womack) advised (Chemtrec) that the easiest method of control was to cover the car with sand, and to build dikes for the containment of any liquid. About 12:30 am, 1/11/79, D. Womack called Don Mayer. At approximately 1:30 am, the material was positively identified as Orthochlorophenol (OCP). It was established that the tank car contained 20,000 gallons of material.

STARZYK: At 2:30 a.m., 1/11/79, I was notified by the Night Supt. of a leaking tank car in Sturgeon, Missouri, approximately 20-25 miles north of Columbia; population 787. At that time I called Phil Kirk, informed him of the incident and that I was looking for someone to go with me.

KIRK: I notified Dave Metherd by telephone of the incident about 15 minutes after Joe Starzyk called me. I passed along the information and told him Joe Starzyk and I would be leaving as quickly as possible.

STARZYK: At approximately 3:30, we met at the plant and received directions from the Night Supt. as to the location of the derailment/accident. Our directions were to proceed north on Route 63. The railroad tracks run adjacent to Route 63 and we were told we would be able to see the car upon arrival in Sturgeon. We proceeded to Sturgeon, but no car was visible. We continued driving to Moberly, Mo., which is approximately 15 miles north of Sturgeon. We then called the Moberly Police. They responded quickly by sending someone from the Sheriff's Department to take us to Sturgeon. We went to the site, where Western Environmental Services, Inc. (WES) was already on the scene on behalf of the N & W Railroad (6:00--6:30 a.m., 1/11/79.)

KIRK: At that point, Joe Starzyk and I went immediately to the tank car to verify that it was our car, containing our product. Upon entering Sturgeon, we noticed a strong OCP odor. We determined the product was ours. We noticed the odor about a mile from the scene. Most of the contents had leaked out. The train had been heading west on the northern track of a two-track system. Joe Starzyk walked the track and found that the spill had covered one quarter to one-half mile along the south side of the track, between the rails and approximately 6-10 feet on the south side of the rail. There were no pools of material visible. There was a strong odor in the air (8:00--9:00 am, 1/11/79.)

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- STARZYK: At this time WES was working the N&W Railroad to determine the best means to get new trucks under the car and clear the rail line. The hope was to be able to reopen the line as quickly as possible. In our observation there was no apparent damage to the rails at the point of the initial incident -- where it failed. There was no visible break or any other obstruction on the tracks. We could see nothing indicating what caused the wheels of the cars to fold under. At the area, the temperature was approximately 50°F. Wind was from the East. There were 2-6 inches of snow on the ground.
- STARZYK: Upon looking at the car, the front (or west) draw-bar was missing. Also, the front truck of the car was shoved east toward the center of the car. One set of wheels was missing. As I walked the track, the missing set of wheels and the draw-bar were found within 50' of the initial spill. Approximately 6' from the west end of the car, the bottom of the car bubbled upward and it appeared that the external insulated shell had been punctured at the weld. This is where the contents had poured out.
- KIRK: Dead center on the bottom of the car, I observed what appeared to be a puncture/rip in the bottom outer shell, apparently caused by a wheel or part of a truck (external shell.) We did not see the failure in the internal tank itself.
- KIRK: At approximately 7:00--8:00 a.m., after the observation on the site, we proceeded back to the Command Center at the Sturgeon Fire Department. Upon entering the Command Center, someone commented that the technical people were here. At this time I was approached by three or four people from the news media. There was a flurry of questions ranging from what is the material to what are the health hazards. I responded informing them the material was OCP. They asked if the material was scattered everywhere -- where the material was. I told them the material was contained in ditches alongside the tracks, and that it was stabilized and not flowing anywhere.
- BASILE: At approximately 8:00 am on 1/11, I talked with Don Mayer, having heard the report on the radio of the carbolic acid spill which had taken place near Sturgeon. That is when I became aware that it was not carbolic acid and we needed to get involved. My first call was at 8:17 a.m. to Jeff Waldbeser at the Queeny Plant, for the purpose of identifying Missouri Department of Natural Resources (DNR) contacts, and the name I was given was Rick Roberts, Section Chief for Hazardous Waste, Missouri DNR. We brainstormed that a possible site for disposal of the cleanup material might be the ChemDyne facility at Wright City, MO. At 8:23 a.m., I tried to call Rick Roberts. He was not in his office. I spoke with another fellow by the name of Rob Pattenfort. He told me that MO DNR did not have the expertise to technically assess the situation and referred me to U.S. EPA (Region VII) in Kansas City, MO. Contact there was a Mr. Scott Richey. At 8:55 a.m., I called Mr. Richey and spoke with both he and a gentleman by the name of Harry Gilmer. I was advised that Region VII had dispatched three men to the scene and that the extent of the damage they knew at the time was a 1/4 to 1/2" hole in the car and that material was on the ground

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BASILE (Cont'd)

and in a dry ditch. They suggested landfilling the material as it was cleaned up or possibly disposing in place through some sort of chemical reaction. Harry Gilmer was designated to me at that time as being the key person in Region VII EPA who would oversee the total effort. At 9:15 I checked with Hap Horner, WGK Chief Chemist, about the possibility for chemical reaction in place utilizing potassium permanganate. It was judged impossible since an aqueous solution of potassium permanganate would be required. We probably would not get much reaction and the solution might well freeze.

At 9:25 a.m. I called back to Harry Gilmer and advised him that I had just learned (from Don Mayer) that the spill was approximately 19,000+ gallon and of our recommendation against trying to chemically react utilizing the potassium permanganate. Mr. Gilmer suggested that if any of the material needed to be transported it probably should be drummed. At 9:30 a.m., I received a call back from Scott Richey. He asked if we considered material recovery. At 9:50 a.m. I called Mike Pierle, MCI Environmental, to advise him of the situation. At the same time Howard Curtis advised me that, to the best of our knowledge, all of the material had gone into the ground and recovery was not possible since we do not have the necessary equipment for handling contaminated soil, chat, etc. At 9:55 I called Mr. Richey and advised him of no recovery option at our location.

At 10:20 I called Rick Roberts from MO DNR and reiterated that the material was OCP. They were still calling it carbolic acid at that time. I asked about the possibility of utilizing the Wright City landfill location for disposal and was advised that we would need to communicate with that facility, and that WES should coordinate supplemental permit requirements through Rob Pattenfort. In lieu of completing the written supplemental permit requirements, verbal authorization from MO DNR could be given. It was a matter depending on how fast the cleanup people from WES wanted to proceed.

At 10:30 there was a meeting in the Plant Manager's conference room. Phil Kirk called in simultaneously from the scene and confirmed that all 20,000 gal. was on the ground, the entire town had been evacuated, he had advised WES to measure for TLV and that there might be some possibility for neutralization with caustic soda. Further discussion in that meeting caused Joe Wolfsberger and myself to be put on alert for the possibility that it might be necessary for us to go to the scene to provide air sampling and waste disposal expertise. At approximately 11:00 a.m., Joe and I were advised that we were being sent by Monsanto.

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KIRK: 10:30--11:00. Back at the scene, Channel 4 news was there. I talked to Larry Connors and advised him that at the time, I did not have anything to release and that we should have someone to talk with him within the hour. At this time I knew Bob Neunreiter was en route to the scene and I was awaiting his arrival before making further press releases. Immediately following, Channel 4 news made their helicopter available to myself, the N&W Railroad personnel, and WES. We went up in the helicopter to survey the spill scene. From the air we could see where the spill had started at the crossing. We could see a slight orange cast on the snow on the south side of the tracks, for a distance of approximately 1,000 yards. After landing, I obtained a 35 mm camera from a news reporter. At that time we took approximately 20 shots of the rail car and the entire site. I then went back toward the Command Center and met Bob Neunreiter as he arrived, approx. 11:30--12:00. I briefed him on all events preceeding his arrival.

At approximately 11:00 a.m., the WES on-scene representative, requested that Monsanto send Frank and Joe. By the time I passed this request on to the plant, Frank and Joe were already on their way. I was approached by several people from the press. Bob Neunreiter, Corporate P.R., was not yet on the scene and my comments to the press included what the material was--OCP; that the material was contained in the ditches alongside the tracks. I was asked by WES about safety precautions for their people and I told them and the press, that the only immediate safety hazard I saw was for personnel in contact with the liquid at the scene. I was asked questions by the press relating to health hazards in the evacuated area. My comments were that the town was evacuated by people unknown to me and it was a safety precaution. The EPA and N & W R.R. would have to make a decision on the rehabilitation of the town. At that time to avoid further questions, I returned to the scene of the spill which was a half-mile from the Command Center.

STARZYK: The N&W Foreman, (the man who was going to get the car back on the tracks) inspected the car and while doing so, got chlorophenol on his hand and sleeve and suffered a slight burn. He was told to wash with water and have a nurse or physician look at it. We heard through some source that in addition to the injured man, two other people (firemen) reported to the hospital for observation, with coughing and lung irritation. To our knowledge they were not hospitalized.

WOLFSBERGER: About 11:15 I contacted Bruce Ely of DMEH and brought him up to date on what was going on. I told him what the people have been relating up to now, and what we had advised WES to do. I asked him if he had any other comments or suggestions. He said "No" and we let it go at that.

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WOLFSBERGER: I got Jack Garrett's home number in case we needed toxicological information during the night. Frank and I gathered up the necessary equipment including sampling pumps and collection tubes and proceeded to Lambert Airport where we took a charter flight to Columbia, MO. En route we circled over the Sturgeon area in an attempt to get an overview of the site. Arrival at the Columbia Airport was approximately 3 p.m. At that time we contacted Howard Curtis advising him of our arrival, and what we had seen from our flight over the area. At this point we had identified the location where the car had been taken. We then rented a car and drove to the motel to calibrate our pumps. We had decided to retain the pilots to fly our samples back to the lab after they had been collected. The pilots accompanied us to the motel where they waited for the samples (3:00--3:30). At approximately 4:15 pm, we left the motel for the accident site. Arrival was around 4:50. We checked in with the other Monsanto personnel at the site and set out immediately to locate pumps to begin sampling. After setting the first three pumps, Joe Starzyk, Phil Kirk and I returned to the motel to pack up additional sampling equipment which had been left earlier to complete battery charging.

KIRK: At approx. 12:30--1:00 p.m., 1/11, I contacted the plant and advised them that Bob Neunreiter was on the scene and would be handling press releases. Bob had arrived at about 10:30 a.m. I communicated with Don Mayer and was told to refer technical questions on neutralization to Dan Lynch of the WGK Lab. Dan Lynch was put on stand-by. I was given his home phone number and I was to contact the WES Chemist, Mr. Steve Meith and tell him to get in contact with Dan Lynch at the plant to discuss neutralization procedures. At this time I was also advised from the plant that Joe Wolfsberger and Frank Basile should be on the scene by approximately 3:30--4:00 p.m. At about 2:30 p.m. I was again in contact with Don Mayer and advised that Dan Lynch and Mr. Meith had had a conversation, and decided that procedures should be to scatter crushed limestone over the top area of the spill and that this action would hopefully suppress the odors in the area. I was also advised we would take air samples at the site and at this time, I proceeded to talk to Mr. Dennis Bell, U.S. EPA Rep. for Region VII on the site, for him to get in touch with his home office and find out if our samples and lab analysis information could be used by the EPA to determine if the town could be re-occupied. Lime spreading started (approximately) between 3:30--4:00 and continued through 11:00 p.m.

WOLFSBERGER: 7 p.m. Discussed with the Region VII EPA Chemist, Mr. Robert Kloepper, who was conducting their sampling, to review TLV's and sampling techniques. At that time it was indicated that the only constituent of the material for which there is a TLV is phenol and that the TLV is 5 ppm.

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WOLFSBERGER: About 7:15 p.m. we returned to the site and set additional pumps for a total of eight (8) sampling pumps throughout the town. The wind was from the southeast. All samples were set downwind of the accident site. At this time the first set of sample pumps were collected and the samples were prepared for shipment to our lab. Around 8:45 p.m. we received a question from the Fire Chief regarding the removal of livestock. One of the local farmers had been advised by a veterinarian to remove all his livestock (cattle and hogs) from the exposure situation. Our comment on this was that we did not have veterinarian expertise and would not go against the advise of a veterinarian. We then questioned how long the transfer would require and advised that if it would be longer than an hour, proper respiratory protection should be worn by personnel performing the job. We then brought in a case of respirators and instructed the Fire Chief on the proper method of use and requested that he provide these respirators and instruction on use to the farmer and/or his helpers. At 9:00 p.m. the remaining samples were picked up and prepared for transport to our lab. During this time period reporters from the Columbia Tribune interviewed me regarding sampling techniques and analysis. At 9:30 p.m. the samples were driven to the motel and turned over to the waiting pilots by Kirk/Starzyk/Neunreiter. The pilots were then driven to the airport where they boarded the plane and flew to Bi-State Airport in Cahokia, IL. At about 10:30 p.m. the plane left for Bi-State. (Kirk, Starzyk & Neunreiter remained at the motel. Frank Basile and I remained at the Command Center.)

EPA Region VII took a total of three samples: two at the feed yard where the tank car came to a stop and one along Wall Street (also known as Railroad Street) approximately 100 feet from the tracks. Again, all samples were downwind. They removed samples around 8:00 p.m. in the evening and drove them to Kansas City for analysis. (Refer to sampling diagram for exact locations of EPA samples as well as Monsanto samples.)

Around 10:30 p.m. a reporter from the Associated Press called concerning the sampling technique proceedings. Information was given on the type of samples taken, and the procedure for getting them back to our lab for analysis. The fact that we did have an accredited industrial hygiene lab was communicated. The reporter was then referred to Bob Neunreiter for additional information.

Between 10 and 12:00 p.m. the Command Center received a series of phone calls from the Mayor of Clark which is a nearby community approximately 5 miles northwest of Sturgeon (downwind.) He reported odor complaints from a number of people in his community. Around 11:00 pm Frank Basile, a local fireman, and myself proceeded to the location in Clark where reports of odors had come. At the first two locations none of us could detect any unusual odor. At the third location a smell of natural gas was in the air. At approx. 11:15 pm, the samples arrived at Bi-State Airport in Cahokia, and were picked up by WGK plant personnel and brought to the lab for analysis. Frank Basile and Joe Wolfsberger left the scene at about 12:00 p.m.

EVENTS OF 1/12/79

WOLFSBERGER: At 12:30 a.m., 1/12/79, we received a call from Howard Curtis telling us the samples had arrived and that analyses had begun. I requested that the first three samples taken be analyzed first since they would be the highest exposure samples.

At approximately 2:00 am, I received a call from the EPA Lab giving their results. At approx. 3:30 am, I received a call from the WGK Lab (Ron McEntire) with the results from the first three analyses. At approx. 7:30 am, I received a call from Harry Gilmer of the EPA and discussed our preliminary results and told him what our first set of results were. At 7:45 am, I got the rest of the results from Ron McEntire. I called Mr. Gilmer back and gave him our results. He talked about a joint statement from the EPA and Monsanto about re-occupying the town. I did not make a comment on this but told him our results are available for his use and to do with them as he saw fit. I also talked to him about an earlier statement the EPA had made that the odor threshold of the chemicals was in the Parts Per Million (PPM) range. I told him that the actual odor threshold was in the Parts Per Billion (PPB) range and that we would probably have continued problems unless this misconception was corrected. About 7:00--8:00 am, I talked with Bob Neunreiter and brought him up to date on our results and what had been going on. Bob Neunreiter then departed for Sturgeon. At about 8:15 am, Frank Basile and I left for the site.

BASILE: (1/11-- approximately 5--11:00 pm)

I had several conversations with Mr. Harry Gilmer, Mr. Rob Robertson, Chief of the MO DNR Solid Waste Program and Rick Roberts' boss, and Mr. Roland Miller of WES, discussing possible alternatives for disposal of the material to be cleaned up. What the EPA finally decided (Region VII) was that all solid material could be disposed of by bulk landfilling at the Wright City, MO site. They were very specific as to what solid material was to be defined as. Solid material included chemically contaminated chat, dirt, wood or rails which would be disposed of in bulk. All other material, whether liquid or crystallized, in the snow, but not penetrating through to the ground would have to be drummed. Its ultimate disposal would be determined later.

In one conversation with Gilmer, he discussed the possibility of recycling. He asked me to look into it once again. I mentioned to him that some discussion had been given to disposing of the drummed material by incineration and that I did not see any immediately acceptable contractors at this time.

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BASILE (1/12 -- 8:00--8:30 am)

The liming for odor control had resumed and WES was probing the spill area. It had been determined that there was, in fact, penetration of the chemical to the ground in approximately the last 75-100 yards of the spill. The first portion of the spill, that is, approximately 900 yards, had only contaminated the snow and ice. It was felt by WES that by skimming this material, clean snow or ice could be uncovered beneath and left in place.

8:45 am -- Joe Wolfsberger and I arrived on the site and discussed the air sampling results with the EPA official on site (D. Bell.)

At 9:30 am, all Monsanto people on site (5) met with the Missouri Dept. of Agriculture officials to discuss the effects of the chemical on agriculture and livestock. We gave them our air concentration values and gave them the chemical analysis of the material. We told them the EPA, Region VII had the toxicity information and they could get it from EPA at Kansas City. It was then approx. 10 a.m. and I called Howard Curtis and asked him to talk to our lab people about reconsidering the possibility of recycling.

KIRK: Joe Starzyk and I were back on the scene at approximately 9:30 am, 1/12. The only pertinent conversation was one with County Work officials about possible contamination of road equipment being used at the site. I advised him of protective equipment necessary for his workers which included full rainsuit, rubber boots and gloves, face shield, and respirator. He questioned me about what to do with contaminated equipment. I told him the equipment could be cleaned with hot water wash and that it was possible to drive the tires of contaminated equipment through the crushed lime-stone, and wash to neutralize. I also advised him that washing of equipment containing large amounts of the OCP should be approved by the EPA as the runoff water would contain some phenolics.

BASILE: At approximately 11:30 am, I called Howard Curtis and he advised me that recycling was possible but not given our present equipment capabilities and arrangement--in other words, we did not have the capability in-house. I repeated to Region VII EPA's Rep. D. Bell that recycling was not possible for Monsanto. At approximately 11:35 am, the EPA called back to their people on site. These people then discussed with the Fire Chief the EPA's opinion that re-occupation of the town could occur. This judgement was based on a Kansas University pathologist's decision. The town Fire Chief, Steve Paulsell, made the announcement at approximately 11:58 a.m. that the town could be re-occupied and there was no immediate area of danger to health and that all townspeople should stay away from the immediate area of the spill. WES was to cordon it off.

EPA officials made note to Monsanto personnel on the scene that our toxicologist had not returned their toxicologist's phone call. Joe Wolfsberger called DMEH and asked why our people had not returned the call.

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BASILE: (Continued)

They said they had talked to Gilmer but not to the EPA toxicologist. Our toxicologist had only been in communication with Mr. Gilmer. At 12:00 noon, Wolfsberger, Basile, Neunreiter left the site and talked with Roland Miller of WES, returned to Columbia, and departed for St. Louis.

KIRK: It was interpreted that the immediate area to be cordoned off would be 200 yards either side of the spill. All announcements were filmed. A second individual (name unknown) announced that all closed, covered food would be no problem and could be consumed and that all foodstuffs left in the open air and uncovered should be discarded. He also noted this was a safety precaution; that there was no true hazard:

1:30 p.m. -- Joe Starzyk and I, Steve Meith and Roland Miller, both of WES went to the lumber yard where the tank car had stopped (largest concentrations of the spill.) At this time we probed the rail bed. After digging approximately one foot, we could not reach any uncontaminated material in the road bed. At the time of our departure at approximately 2:30 pm, Roland Miller was setting up a meeting with the N&W Railroad Representative. He was tentatively to discuss with him plans to close the railroad for possible excavation of the road beds. We also noted at the scene near the lumber yard that by digging a hole approximately one foot deep, 6 inches in diameter, the material was still in the ground in a liquefied state, and within a period of about 10 minutes the material flowed in and filled this hold with liquefied material. At this point Joe and I left the scene. We were the last of the Monsanto representatives. We left our phone numbers.

STARZYK: At some point in time on 1/12, there was a call that came into the Fire Department from a woman who had five pregnancies and no children, and who was pregnant at this time. She asked if she could safely return to town. Dennis Bell, the EPA Rep, confirmed that it was okay for the woman to return to the town.

EVENTS OF 1/15/79

BASILE: At approximately 9 am, 1/15/79, I received a call from Roland Miller of WES requesting that Monsanto return to Sturgeon for the purpose of conducting air sampling in the vicinity where cleanup of the spill had already occurred. This request was made since the U.S. EPA would require such data before agreeing that the cleanup was complete. I consulted with Earl Billen, Howard Curtis, and Don Mayer about sending Joe Wolfsberger and myself back to the scene. We felt that the US EPA should be undertaking this effort since it is their ultimate decision to approve and disprove cleanup.

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BASILE (Cont'd)

However, if U.S. EPA was not available or willing to do same, Monsanto would be willing to assist on a one-time basis until such time as WES could find a suitable contractor for further air sampling. I called Mr. Miller back promptly and communicated this information to him, and he told me that, in fact, EPA did not intend to sample at this time and again, he requested that we return to the scene on a contract basis, if necessary. My response to him was that we would come back. I advised him that Joe Wolfsberger and I would be arriving on 1/16 at approximately 9:00--10:00 a.m. WES was, at that time, trying to locate a qualified contractor for conducting air sampling.

EVENTS OF 1/16/79

WOLFSBERGER: On 1/16/79, we arrived at Columbia, Missouri at approximately 10 a.m. and calibrated five pumps. We then left Columbia for the site at approx. 10:30 a.m. At 11:00 am, we arrived at the site of the OCP tank car spill and met with Roland Miller and Steve Mieth of WES to discuss location of sampling to be carried out, and to establish sampling points in the vicinity of the track area which had been cleaned thus far, approximately 1000 feet from where the spill began in Sturgeon. After putting out the first five pumps, we returned to the WES trailer, calibrated five additional pumps, and began sampling additional areas where the spill had not yet been cleaned up. In addition to area samples, a personal sample was run on one of the WES workers cleaning up the spill. One of the area samples was placed in the school yard on the south site of the spill site. Sample results are attached.

BASILE: At approximately 12:30--1:00 ^{hr}pm, we met with Mr. Tanner, Superintendent for N&W Railroad and discussed our concerns over methods suggested thus far for reacting the material in the vicinity of the spill and subsequent cleanup of same. We gave the recommendation that any railroad ties which were contaminated with material should be removed and the digging should be to the depth of any contamination.

WOLFSBERGER: We advised Mr. Tanner that we did not anticipate a health problem during the warmer summer months, but thought because of the odor problem an emotional issue might arise. This odor problem is compounded by the fact that, based on what EPA had told the town, the people believe that if you can smell the chemical, you are over-exposed. EPA never corrected themselves on the actual odor threshold of the chemical which is in PPB, not PPM.

BASILE: As our discussion continued, we expressed some concern over WES' intentions to utilize a Calgon carbon treatment unit since, to us, this is undemonstrated technology. Our recommendation was that before any such unit be brought into service a laboratory bench scale test be conducted to prove the method. The cleanup occurring at this time consisted of removing all contaminated

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snow and/or chat and loading it into gondola railroad cars. The decision for ultimate treatment and/or disposal had not yet been firmed. We expressed concern that, even given ideal conditions, the treatment of the spill material with lime for the purposes of salting out the OCP as Orthochlorophenate could not successfully occur.

At approx. 1:15 pm, we went to lunch with Roland Miller and Steve Mieth from WES. We expressed much the same concerns to them as we had communicated to the N&W Railroad people. At approx. 2 pm we went back into the field to remove all air sampling pumps. At approx. 3:00 pm we departed for Moberly, Missouri, for the purpose of observing the tank car. Upon arrival at N&W's yard, we were met by Mr. Ted Marlott, Claims Agent for N&W, who requested that we sign liability release forms for our presence on the premises. We did so and then observed the tank car. The tank car was lying on its side such that the puncture from which the leak occurred was up in the air. The puncture itself had been filled with urethane foam for odor containment. We were told that what material remaining inside the car had solidified. We did not visually inspect the inside of the car to determine same. As our discussion continued with Mr. Marlott, he explained to us that the railroad has, at this point, determined that there was a yoke associated with the coupler mechanism which fractured, allowing the coupler to proceed forward thus allowing the connecting pin between the two to drop out. The theory is that this is what ultimately led to the incident. At first the railroad had set out to review the possibility that this connecting pin had itself broken. They consulted with a Univ. of Mo. Mech. Engr. Professor whose specialty is metallurgy, and his judgement was that there was no way that this pin could have broken since it is approx. 1 foot in length times 3 inches in diameter. Based on this judgement the railroad people went back and looked again and discovered the broken yoke.

We took some photographs of the tank car in place. At that time we requested the railroad people to prepare six lengths of 1½ inch pipe for the purpose of taking soil core samples back at the scene of the spill in the vicinity where cleanup has already occurred. The purpose of this request was to try to assist WES in ascertaining that they have effectively removed all of the material.

At approximately 4:30 we left Moberly to return to Sturgeon. At approx. 5:00 pm, we arrived in Sturgeon and made the request of WES to utilize the pieces of pipe for the purpose of core sampling. Six core samples were taken in and around the areas already cleaned and were prepared for us to take back to the plant. We departed Sturgeon for Columbia at approx. 6:30 pm.

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WOLFSBERGER: Upon return to the motel, the pumps were re-calibrated and corrected volumes were calculated.

EVENTS OF 1/17/79

WOLFSBERGER: We left Columbia at 7:30 am, and arrived at the plant at approx. 10:00 am. Air and soil samples were turned over to Ron McEntire for analysis.

BASILE: At approx. 1:00 pm, a visual inspection of the soil samples was made. Because of the granular nature of the soil sample taken, a good core was not obtained in any of the samples. As a result, a qualitative analysis of the phenol content was run rather than a quantitative. These qualitative tests indicated that some chlorophenol did remain in the soil on two of the samples.

WOLFSBERGER: Air sample results indicated chlorophenol and phenol concentrations in the PPB range with the highest area sample concentration of 30 PPB. The personal sample taken showed higher results, but the total chlorophenol and phenol concentration was less than 1 PPM. The first five results were communicated to the WES on-site personnel at approximately 3:30 pm. The remaining five samples were reported on the morning of 1/18/79.

BASILE: At the same time the final air sample results were communicated, we asked WES for an update on cleanup procedure. They indicated they have rented some laboratory space in Columbia, and in fact, have bench scale tested the procedure for converting the phenol to a phenate salt successfully. Some of the organics did not salt out, but the major portion did. (All of these actions are being undertaken with the joint occurrence of U.S. EPA, Region VII, WES and the N&W Railroad.) Their intent at this time is to proceed to dig a pond on approximately one acre worth of real estate which WES has leased in the vicinity of where the tank car came to rest. All spill material will be treated with lime in the pond and a hot water supply is immediately available for the purpose of making the reaction occur. WES also has portable agitation equipment available for this process. The water resulting from the treatment process will be filtered through a diatomaceous earth filter, sampled, and if suitable, released to the water shed. Any remaining unreacted organic material will be drummed and its ultimate destination will probably be contract incineration. If the water is found to be unacceptable, it too will be drummed and sent for incineration. All solid contaminated material such as chat from the road bed, soil, railroad ties and any solids which will be cleaned up from the pond area will be sent for landfill to Wright City, MO. The gondola cars will be decontaminated with a caustic wash and this wash will also be channeled through the ponding process for cleanup.

WOLFSBERGER AND BASILE: With this, we advised Mr. Miller that our active involvement in the cleanup would terminate and that we would appreciate it if he would keep us informed of the cleanup procedure. We also advised him we would be available for further consultation if required.

HOLIDAY
I AM

314-478-2821

487225

PAGE _____ OF _____ PAGES

DEPARTMENT OF MEDICINE AND
ENVIRONMENT HEALTH
ST. LOUIS, MISSOURI

INDUSTRIAL HYGIENE
MONITORING DATA FORM

JOB NO.: _____

REFERENCE JOB NO. _____

Monsanto

PLANT	DEPARTMENT	PROCESS DESCRIPTION/WORK ACTIVITIES
SUBSTANCE MONITORED	STD. VALUE	PERMISSIBLE LIMIT
CHEMICALS HANDLED (POSSIBLE INTERFERENCES)		ATM. PRESSURE 766 mm. Hg.
		TEMPERATURE -12.22 °C (°F)
		SHIFT SAMPLED (CIRCLE) Day 2nd 3rd

PL. NO.	SAMPLE LOCATION / TYPE	EQUIP. NO.	FLOW SETTING		CALIB. FLOW RATE	SAMPLE TIME			VOLUME (ADJ.)	ANAL. RESULTS	AIR CONCENTRATION	HRS. LOC.
			INITIAL	FINAL		ON	OFF	TOTAL				
1	209 WEST SMITH	F-23	29cc/min			7:41pm	9:08pm	87min	2.5230			
									2.410			

NAME/JOB CLASSIFICATION
SOCIAL SECURITY NO.

COMMENTS (ENGR. CONTROL, PROTECTIVE EQUIP., WEATHER CONDITION)

DATE 1/11/79

2	CORNER OF SMITH & N. RUBY	4-18	32cc/min			7:40pm	9:06pm	86min	2.488			
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NAME/JOB CLASSIFICATION
SOCIAL SECURITY NO.

COMMENTS

DATE

3	309 N. FAIRGROUND	3-09	30cc/min			7:40pm	9:11pm	91min	2.620			
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NAME/JOB CLASSIFICATION
SOCIAL SECURITY NO.

COMMENTS

DATE

4		2	30cc/min									
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NAME/JOB CLASSIFICATION
SOCIAL SECURITY NO.

COMMENTS

DATE

5	SENIOR CITIZENS HOUSING	5-21	32cc/min			7:38pm	9:13pm	95min	3.070			
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NAME/JOB CLASSIFICATION
SOCIAL SECURITY NO.

COMMENTS

DATE

EQUIPMENT	NO.	MANUFACTURER	MODEL/SER. NO.

ANALYTICAL METHOD: DMEH NO.

PRECISION (CV_T) BY: _____

CALIBRATION BY _____

LOCATION _____

[illegible]

TOTAL STROKES	CC/ STROKE

		1	2	3	4	5	6	
		POH	OCP	PCR	DCP	TCP	Total OCP's	
T-A	23	0.01	0.05	0.02	0.01	—	0.37	Mg/m ³
T-A	18	<0.01	0.04	0.01	0.01	—	0.28	
T-A	09	<0.01	0.06	0.02	0.01	—	0.38	
T-A	21	<0.01	0.01	0.01	0.01	—	0.32	

OTHER CONTAMINANTS MONITORED

[illegible]

EPA SAMPLES

① ϕ_{OH} 1009 ppm
CC ϕ_{OH} .004

② ϕ_{OH} 1556 ppm
CC ϕ_{OH} .013 ppm

③ ϕ_{OH} .033 ppm
CC ϕ_{OH} .19 ppm

Dr ~~ESTABLISHED~~
PHELY

866-374-4285

BLANK - 0.08

1	2	3	5
ϕ_{OH} 101 mg/m ³	ϕ_{OH} <.01 mg/m ³	ϕ_{OH} <.01 mg/m ³	ϕ_{OH} <.01 mg/m ³
OCB .05	OCB .04	OCB .06	OCB .01
PCB .02	PCB .01	PCB .02	PCB .01
DCB .01	DCB .01	DCB .01	DCB .01
TCB -	TCB -	TCB -	TCB -

(238) ϕ_{OH} 1002 ppm	ϕ_{OH} <.002 ppm	ϕ_{OH} <.002 ppm	ϕ_{OH} <.002 ppm
(174) OCB .009	OCB .007	OCB .010	OCB .002
(174) PCB .003	PCB .002	PCB .003	PCB .002
(1097) DCB .001	DCB .001	DCB .001	DCB .001

Monsanto

DEPARTMENT OF MEDICINE AND
ENVIRONMENT HEALTH
ST. LOUIS, MISSOURIINDUSTRIAL HYGIENE
MONITORING DATA FORMPAGE 2 OF 2 PAGEJOB NO.: REFERENCE JOB NO.

PLANT	DEPARTMENT
SUBSTANCE MONITORED <u>Chlorophenols 5-011</u>	STD. VALUE <u>0-011-5 ppm 17 mg/l</u>
CHEMICALS HANDLED (POSSIBLE INTERFERENCES)	

PROCESS DESCRIPTION/WORK ACTIVITIES <u>SOIL SRE STURGEON, MO</u> <u>WORK FOR WESTERN ENV.</u>		
ATM. PRESSURE <u>~760</u> mm. Hg.	TEMPERATURE <u>-1</u> (°C) (°F)	SHIFT SAMPLED (CIRCLE) <u>Day</u> 2nd 3rd

SPL. NO.	SAMPLE LOCATION / TYPE	EQUIP. NO.	FLOW SETTING		CALIB. FLOW RATE	SAMPLE TIME			VOLUME (ADJ.) <u>liters</u>	ANAL. RESULTS	AIR CONCENTRATION	HRS. LOC.	
			INITIAL	FINAL		ON	OFF	TOTAL					
<u>26</u>	<u>FIELD STORE where carbene</u> <u>to rest</u>	<u>6-10</u>	<u>32cc/min</u>	<u>51</u>	<u>40.5</u>	<u>12:18</u>	<u>2:14</u>	<u>116</u>	<u>4.70</u>				
NAME/JOB CLASSIFICATION			COMMENTS (ENGR. CONTROL, PROTECTIVE EQUIP., WEATHER CONDITION)									DATE <u>1/16/78</u>	
SOCIAL SECURITY NO.													

<u>27</u>	<u>School yards</u>	<u>7-1</u>	<u>32cc/min</u>	<u>27.5</u>	<u>29.75</u>	<u>12:33</u>	<u>2:25</u>	<u>102</u>	<u>3.03</u>				
NAME/JOB CLASSIFICATION			COMMENTS									DATE	
SOCIAL SECURITY NO.													

<u>28</u>	<u>Along 4th & 5th N. CURVE in Parkway</u> <u>grove</u>	<u>8-29</u>	<u>32cc/min</u>	<u>32</u>	<u>32</u>	<u>12:41</u>	<u>2:20</u>	<u>99</u>	<u>3.17</u>				
NAME/JOB CLASSIFICATION			COMMENTS									DATE	
SOCIAL SECURITY NO.													

<u>29</u>	<u>In front of home at</u> <u>512 JONES ST.</u>	<u>9-28</u>	<u>32.5cc/min</u>	<u>55</u>	<u>43.5</u>	<u>12:48</u>	<u>2:16</u>	<u>88</u>	<u>3.83</u>				
NAME/JOB CLASSIFICATION			COMMENTS									DATE	
SOCIAL SECURITY NO.													

<u>30</u>	<u>MINE CUNNINGHAM - WES</u> <u>LABORER on Cleburne Dig. Rig</u>	<u>10-22</u>	<u>32cc/min</u>	<u>22</u>	<u>27</u>	<u>12:54</u>	<u>2:23</u>	<u>89</u>	<u>2.40</u>				
NAME/JOB CLASSIFICATION			COMMENTS									DATE	
SOCIAL SECURITY NO.													

BLANK TUBE #11

EPA SAMPLES
 ① $\phi\text{-OH}$ 1009 ppm
 CC $\phi\text{-OH}$.004

② $\phi\text{-OH}$: 4556 ppm
 CC $\phi\text{-OH}$: .013 ppm

③ $\phi\text{-OH}$ - .033 ppm
 CC $\phi\text{-OH}$ - .19 ppm

Dr ~~XXXXXXXXXX~~
 PHILLY

866-374-4285

DLANIC - 008

1 $\phi\text{-OH}$.01 mg/m³
 OCP .05
 PCP .02
 DCP .01
 TCP -

2 $\phi\text{-OH}$ <.01 mg/m³
 OCP .04
 PCP .01
 DCP .01
 TCP -

3 $\phi\text{-OH}$ <.01 mg/m³
 OCP .06
 PCP .02
 DCP .01
 TCP -

5 $\phi\text{-OH}$ <.01 mg/m³
 OCP .01
 PCP .01
 DCP .01
 TCP -

(238) $\phi\text{-OH}$.002 ppm
 (174) OCP .009
 (174) PCP .003
 (097) DCP .001

$\phi\text{-OH}$ <.002 ppm
 OCP .007
 PCP .002
 DCP .001

$\phi\text{-OH}$ <.002 ppm
 OCP .010
 PCP .003
 DCP .001

$\phi\text{-OH}$ <.002 ppm
 OCP .002
 PCP .002
 DCP .001

EQUIPMENT	NO.	MANUFACTURER	MODEL/SER. NO.

ANALYTICAL METHOD: DMEH NO. []

PRECISION (CV_T) BY: _____

CALIBRATION BY _____

LOCATION _____

[illegible] (mg/m^3)

	<u>DOH</u>	<u>OCP</u>	<u>PCP</u>	<u>DCP</u>	<u>TCP</u>	<u>Total Org's</u>
Spl. #6 (10-T-A)	0.02103 ppm	0.461087 ppm	0.021004 ppm	<0.015002 ppm	—	0.59
Spl. #7 (1-T-A)	<0.015003 ppm	0.031006 ppm	0.041002 ppm	0.015002 ppm	—	0.53
Spl. #8 (24-T-A)	0.021005 ppm	0.111021 ppm	0.021004 ppm	<0.015002 ppm	—	0.19
Spl. #9 (23-T-A)	<0.015002 ppm	0.011032 ppm	0.021004 ppm	<0.015002 ppm	—	0.20
Spl. #10 (22-T-A)	0.30018 ppm	3.71705 ppm	0.011002 ppm	0.081012 ppm	—	4.27
Spl. #11 (11-T-A)	—	0.031006 ppm	—	—	—	0.07

OTHER CONTAMINANTS MONITORED

[illegible]

Monsanto

DEPARTMENT OF MEDICINE AND
ENVIRONMENT HEALTH
ST. LOUIS, MISSOURIINDUSTRIAL HYGIENE
MONITORING DATA FORMJOB NO.: _____
REFERENCE JOB NO. _____

PLANT	DEPARTMENT	PROCESS DESCRIPTION/WORK ACTIVITIES
		Spill Site STURGEON, MO
SUBSTANCE MONITORED	STD. VALUE	PERMISSIBLE LIMIT
Chlorophenol P-OH		P-OH - 5 PPM / 191 mg/m ³
CHEMICALS HANDLED (POSSIBLE INTERFERENCES)	ATM. PRESSURE	TEMPERATURE
	27.60 mm. Hg.	-1 (°C) (°F)
		SHIFT SAMPLED (CIRCLE) Day 2nd 3rd

SPL. NO.	SAMPLE LOCATION / TYPE	EQUIP. NO.	FLOW SETTING		CALIB. FLOW RATE	SAMPLE TIME			VOLUME (ADJ.)	ANAL. RESULTS	AIR CONCENTRATION	HHS. LOC.
			INITIAL	FINAL		ON	OFF	TOTAL				
6.1	MIDWAY BETWEEN CROSSING ACROSS FROM TOWN TAVERN	1-20	30 cc/min	28	29	11:21	2:04	163	4.73			
NAME/JOB CLASSIFICATION												DATE
SOCIAL SECURITY NO.												11/11/79

6.2	FIRST CROSSING Signal	2-27	30 cc/min	30	30	11:27	2:05	156	4.74			
NAME/JOB CLASSIFICATION												DATE
SOCIAL SECURITY NO.												

6.3	7 th crossing 113 MILL ROAD ST	3-37	32.5 cc/min	30	31:25	11:30	2:06	156	4.88			
NAME/JOB CLASSIFICATION												DATE
SOCIAL SECURITY NO.												

6.4	END of line COVER 205 MILL ROAD ST	4-34	32.5 cc/min	30	31:25	11:32	2:06	154	4.81			
NAME/JOB CLASSIFICATION												DATE
SOCIAL SECURITY NO.												

6.5	ACROSS FROM 213 RAILROAD	5-26	30.77	30	30:38.5	11:34	2:07	153	4.65			
NAME/JOB CLASSIFICATION												DATE
SOCIAL SECURITY NO.												

COLLECTION DEVICE

ANALYTICAL METHOD: DMEH NO.

PRECISION (CV_T) BY:

CALIBRATION BY

LOCATION

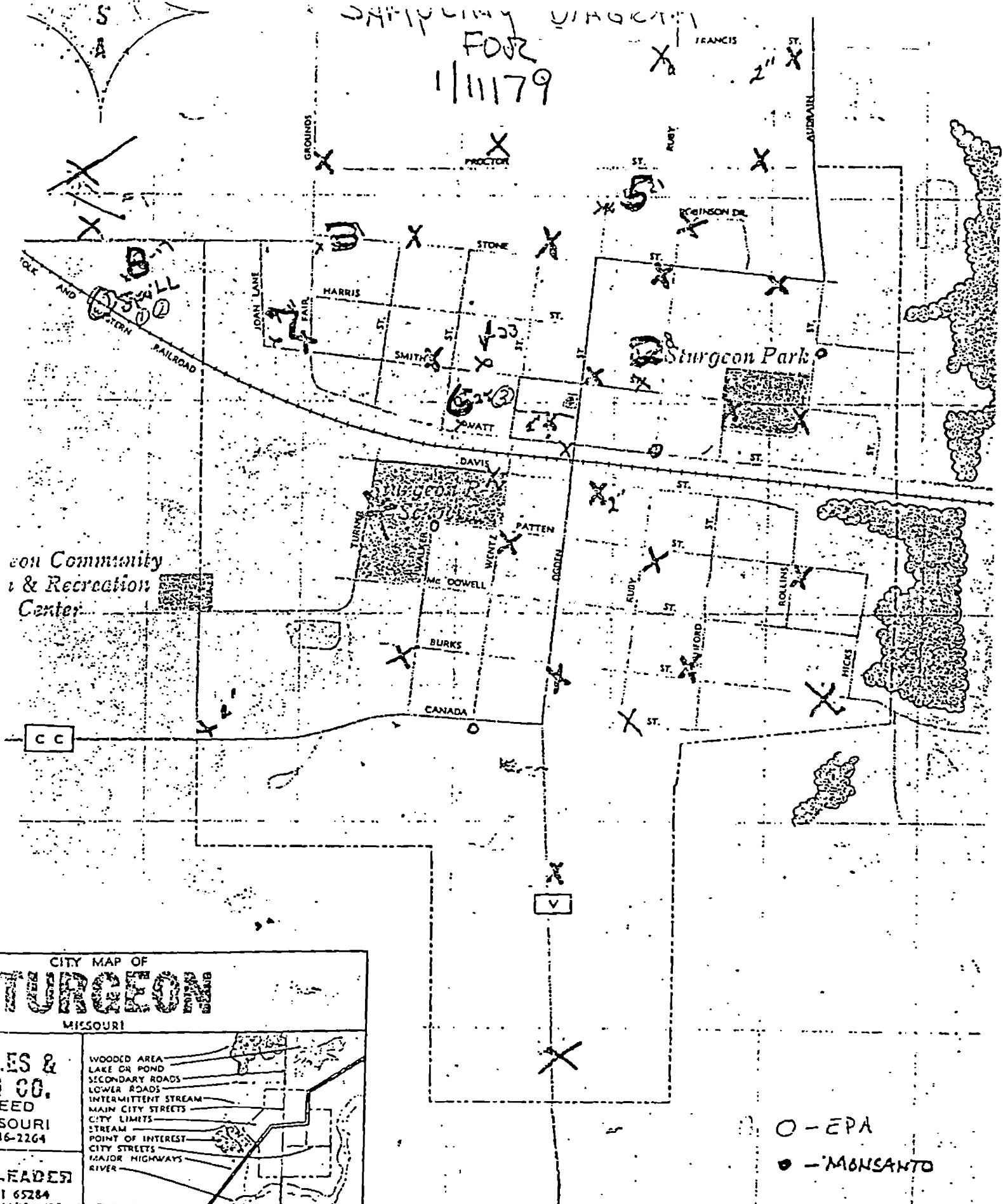
TOTAL STROKES	CC/ STROKE

 (mg/m^3) DATA CALCULATIONS: (Additional remarks)

OTHER CONTAMINANTS MONITORED

SPL. NO.	AIR CONTAMINANT	ANALYTICAL RESULT	AIR CONCENTRATION
I			
J			
K			
L			
M			
N			(
O			-
P			.
Q			
R			

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FOR
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CITY MAP OF
TURGEON
MISSOURI

LES &
CO.
DEED
MISSOURI
36-2264
Y LEADER
RI 65284

WOODED AREA
LAKE OR POND
SECONDARY ROADS
LOWER ROADS
INTERMITTENT STREAM
MAIN CITY STREETS
CITY LIMITS
STREAM
POINT OF INTEREST
CITY STREETS
MAJOR HIGHWAYS
RIVER

O - EPA
● - MONSANTO

6 ϕOH .05 mg/m^3
 OCP .15
 PCP .19
 DCP .05
 TCP .07

(.238) ϕOH .012 PPM
 (.174) OCP .026
 (.174) PCP .033
 (.137) DCP .007
 (.097) TCP .007

7 ϕOH .01 mg/m^3
 OCP .05
 PCP .02
 DCP .01
 TCP .03

ϕOH .0023 PPM
 OCP .010 PPM
 PCP .003
 DCP .001
 TCP .003

8 ϕOH .02 mg/m^3
 OCP .16
 PCP -
 DCP -
 TCP <.01

ϕOH .0048 PPM
 OCP .028
 PCP -
 DCP -
 TCP <.001

Gilman

866-374-4461

INDUSTRIAL HYGIENE MONITORING DATA FORM

DEPARTMENT OF MEDICINE AND
ENVIRONMENT HEALTH
ST. LOUIS, MISSOURI

JOB NO.: _____
REFERENCE JOB NO. _____

Monsanto

PLANT	DEPARTMENT	PROCESS DESCRIPTION/WORK ACTIVITIES
SUBSTANCE MONITORED	STD. VALUE	PERMISSIBLE LIMIT
CHEMICALS HANDLED (POSSIBLE INTERFERENCES)		ATM. PRESSURE <u>29.760</u> mm. Hg.
		TEMPERATURE <u>-12.22</u> (°C) (°F)
		SHIFT SAMPLED (CIRCLE) Day 2nd 3rd

L. NO.	SAMPLE LOCATION / TYPE	EQUIP. NO.	FLOW SETTING		CALIB. FLOW RATE	SAMPLE TIME			VOLUME (ADJ.)	ANAL. RESULTS	AIR CONCENTRATION	HRS. LOC.
			INITIAL	FINAL		ON	OFF	TOTAL				
6	213 KILGARD AVE. ON GRASS W/ AIR	9-25	25cc/min			5:23pm	8:06pm	163	392			
NAME/JOB CLASSIFICATION											DATE	
SOCIAL SECURITY NO.												

7	512 3034th AVE & KC TRACER ON PUMP	9-11	30cc/min			5:23pm	8:01pm	161	464			
NAME/JOB CLASSIFICATION											DATE	
SOCIAL SECURITY NO.												

8	WAYNE FRED STORE ON FENCE W/ AIR	8-17	25cc/min			5:23pm	8:01pm	158	379			
NAME/JOB CLASSIFICATION											DATE	
SOCIAL SECURITY NO.												

9	Blank Tube	9-15										
NAME/JOB CLASSIFICATION											DATE	
SOCIAL SECURITY NO.												

NAME/JOB CLASSIFICATION											DATE	
SOCIAL SECURITY NO.												

EQUIPMENT	NO.	MANUFACTURER	MODEL/SER. NO.
"			
"			
"			
"			
"			

ANALYTICAL METHOD: DMEH NO.

PRECISION (CV_T) BY: _____

CALIBRATION BY _____

LOCATION _____

[illegible]

DIAGRAM: WORK STATIONS/SURVEYED AREAS

	<u>LEH</u>	<u>QCP</u>	<u>PCP</u>	<u>DCP</u>	<u>TCP</u>	<u>TOTAL</u>
T-A-25	0.05	0.15	0.19	0.05	0.07	0.58
T-A-11	0.01	0.06	0.02	0.01	0.03	0.17
T-A-17	0.02	0.16	—	—	TRACE (0.01)	0.21
T-A-15	No Organics present					

m/.

DATA CALCULATIONS: (Additional remarks)

OTHER CONTAMINANTS MONITORED

[illegible]