Boeing Fabrication Auburn Site
Open House Meeting Summary

EnviroIssues

Meeting Date, Time and Location

June 13, 2013 ● 6:30 p.m. to 9:30 p.m.
Filipino American Community Hall
103 6th Ave N, Algona, WA 98001-7443

Note:

This meeting summary was prepared by EnviroIssues for the WA State Department of Ecology. This document provides an overview of the discussion during the Question & Answer session of the June 13, 2013, Boeing Fabrication Auburn Open House Meeting. This is not a transcription. An audio file is available of the Open House Question & Response session from the WA State Department of Ecology.

Staffing

Name	Title	Organization
Robin Harrover	Site Manager	Ecology
Ed Jones	Vapor Site Engineer	Ecology
Dennis Johnson	Section Manager	Ecology
Nancy Lui	Community Outreach Coordinator	Ecology
Josh Baldi	Acting Director, Northwest Region	Ecology
Jim White	Toxicologist	Ecology
Larry Altose	Communications Manager	Ecology
Millie Piazza	Environmental Justice	Ecology
Dean Yasuda	Chemical Engineer	Ecology
Hideo Fujita	Hydrogeologist / Environmental Engineer	Ecology
Kathy Davis	Communications Manager	Ecology
Nancy Farman	Community Outreach	Ecology
K Seiler	Hazardous Waste and Toxic Reductions Program Manager	Ecology
Erin Kochaniewicz	Community Outreach Specialist	Department of Health
Barbara Trejo	Health Assessor / Hydrogeologist	Department of Health
Joanne Snarski	Site Assessments and Toxicology Section Manager	Department of Health
Rhonda Kaetzel	Toxicologist	King County Public Health
Angie Thomson	Community Outreach	EnviroIssues
Diann Strom	Community Outreach	EnviroIssues
Jenna Rahm	Community Outreach	EnviroIssues
James Bet	Auburn Remediation Project Manager	Boeing
Steven Tochko	EHS Remediation Manager	Boeing
Mark Ross	General Manager, Auburn Site, Boeing Fabrication	Boeing

Name	Title	Organization
Peter Weickmann	Auburn Site Leader, Environment, Health & Safety, Boeing Fabrication	Boeing
Rich White	Government Relations	Boeing
Susan Champlain	Government Relations	Boeing
Kamara Sams	Environment Community Relations	Boeing
Beverly Holland	Auburn Site Communications, Boeing Fabrication	Boeing
Jim Swortz	Environmental Engineer	Boeing
Jennifer Wynkoop	Project Manager	Landau Associates
Eric Weber	Principal Hydrogeologist	Landau Associates
Chip Halbert	Principal Engineer	Landau Associates
Lauren Knickrehm	Project Engineer	Landau Associates
Clint Jacob		Landau Associates
Sarah Fees		Landau Associates
Diana Quinn	City Administrator	City of Algona
Mayor Dave Hill	Mayor	City of Algona
Gary Clendenin	Consultant to City of Algona	ICF International

Meeting Format

The Boeing Fabrication Auburn Site meeting was an open house that included a facilitated question and answer (Q&A) session. Staff was on-hand to answer questions from attendees during both the open house and the Q&A. Angie Thomson opened the Q&A at 7 p.m., explained the format, reviewed the questions submitted during the open house, and took additional questions from the audience.

A total of 98 people attended the open house.

Meeting Agenda:
6:00 – 7:00 p.m. – Open house
7:00 – 9:30 p.m. – Facilitated Q&A

Meeting Materials

The following materials were available at the meeting to help residents better understand the contamination, investigations, health risks, and next steps, as well as provide feedback on the project.

- Meeting guide
- Comment form
- Q&A slip
- Handouts
    1. Questions and Answers
    2. Meeting board set
    3. Model Toxics Control Act (MTCA) FAQs
    4. Vapor intrusion fact sheet

- Display boards
  - Station 1: About the site and contamination
    - About the Boeing Fabrication Auburn Site
    - Groundwater contamination
    - Investigation process to date
    - Plume map
    - Placemats:
      - Shallow, intermediate and deep zone concentrations maps
      - Where do we know contaminated groundwater is located?
  - Station 2: Investigations – past and future
    - State cleanup process – MTCA
    - Investigation timeline
    - Upcoming investigations and activities
    - What we're doing now
    - Cleanup and community commitments
  - Station 3: Health risks and healthy actions
    - Is public drinking water safe?
    - Chicago Avenue Ditch
    - Is my home's indoor air safe?
    - Can I eat fruits and vegetables from my garden?
    - Healthy actions
    - Placemats: water well maps
  - Station 4:Investigations – Groundwater
    - 2013 groundwater investigations in Algona
    - Groundwater investigations study area and results
  - Station 5: Investigations - Vapor intrusion
    - About vapor intrusion
    - Vapor intrusion testing underway now (includes VI Assessment Area Fig. 7 map)
    - Vapor intrusion study area
    - Next steps following initial study
  - Station 6: City of Algona
  - Station 7: Comments

Facilitated Question and Answer Session

Groundwater contamination and April 2013 investigation

Question 1: Groundwater flow is not very predictable, so how far are you going to test it – will you go into south Algona and how broadly will you test groundwater?

Answer: The groundwater in this area generally flows to the north-northwest from Boeing facility. As it has carried the contamination with it, it has gone into northeast Algona. The results of the drilling work show volatile organic compounds (VOCs) were not detected in a significant portion of the study area. Based on those results, Ecology is not interested in conducting further studies in that area.

For the northeastern portion of Algona, we will be conducting additional investigations, so stay tuned for updates on ongoing work.

Question 2: The area's groundwater table fluctuates. For groundwater testing, is humidity, time of day and temperature are taken into account, and how long was the drilling conducted?

Answer: Yes, groundwater does fluctuate; however the time of day, humidity and temperature do not generally influence groundwater sampling. We can sample morning or night because the groundwater isn't influenced by the atmosphere.

The overall drilling project took about a month, and to collect one sample it takes about an hour.

Question 3: Will there be follow-up groundwater sampling at different times of day and different times of year?

Answer: As a follow up to the drilling work, Boeing has submitted a proposal to Ecology to install permanent monitoring wells in the Algona neighborhood. There are some monitoring wells there already, which we monitor quarterly (every three months). The new wells we've proposed would also be monitored every three months, and will help us capture any seasonal variability.

We've not determined the final depth yet, but generally the wells would be in the shallow groundwater zone, which is between 0 feet to 30 feet. Some of the wells will be at the water table-surface to help us understand what's going on with vapor intrusion, and others would be deeper to help us characterize what is going on generally in the aquifer.

Question 4: Will Boeing or Department of Health sample for other contaminants Boeing has used in the past, like cadmium and chromium?

Answer: There have been many investigations of the Boeing facility's soil and groundwater in the past, which included testing for cadmium and chromium. These metals move with groundwater, but they don't move in the same way as trichloroethene (TCE). Historical data does not show high concentrations of those contaminants in the groundwater.

Ecology is focusing on what we know is in the groundwater – we've had consistent detections of TCE and have defined the plume. There are maps in the back that show our understanding of the current extent of the contamination. In the future, we will be finalizing the Remedial Investigation report, which will include a summary of the historic work completed, and more information about the other contaminants we sampled.

Question 5: Why weren't all sampling sites drilled down to 20 feet?

Answer: The drilling depths served two different objectives. For the samples drilled to 5 feet below ground, the objective was to understand the water table-surface as it relates to vapor intrusion. In some cases we had to drill deeper (7 feet to 9 feet) to reach the water table surface. We had a dense sampling grid to ensure we captured what is going on at the water table surface.

For the deeper samples, our objective was to generally understand what is going on with the aquifer and how the groundwater is moving. With that objective we didn't need to have as dense of a sampling grid, which is why we didn't sample to 25 feet below ground at each location.

Question 6: Samples from the roadbed were at 5 feet below ground, while a sample site was drilled to 25 feet below ground across the street from my house. Contamination was found at 25 feet, while it wasn't found in the roadbed. Why were holes drilled in the roadbed instead of in yards? Boeing is trying to avoid finding contamination.

Answer: Boeing is trying to find any contamination as quickly as possible. In order to avoid a long process of receiving permission from multiple landowners to test on their property, Boeing obtained permission from the City of Algona to conduct testing in the roadbed. Conditions in the roadbed would be very similar to what would be found in homes.

Question 7: What side of Government Canal was tested?

Answer: Previous investigations of the Boeing side of Government Canal were reviewed as part of the remedial investigation currently taking place. Government Canal was investigated in the 1990s. Boeing discharged into it at one point. Cadmium, chromium and other chemicals were detected in the soil. Where levels of these contaminants in soils exceeded state standards, it was excavated and removed. Government Canal was considered a No Further Action by Ecology at that time.

Question 8: What other contamination has been cleaned up by Boeing beyond Government Canal?

Answer: There have been other cleanup projects at the Boeing facility, and most were part of decommissioning process for portions of the facility we no longer own. For this project one source, the degreaser in the 17-05 building, has been removed. At the 17-05 building, Boeing conducted bioremediation, where we injected chemicals into the ground to stimulate biological growth to eliminate the contamination source. This is why when you look at the contamination maps you see a dilute plume without any real hot spots of contamination.

Question 9: I live on 6th Avenue North and you tested 500 feet from my house and didn't find anything at 5 feet, so has it already washed through here during the last 20 years and could it clean itself out?

Answer: It is unlikely the groundwater would be completely clean if there had been contamination. TCE can degrade overtime; however, we would expect to see it in our samples if it had been there. We know from the flow of the groundwater, which is generally to the north and northwest, that the contamination has not impacted the southern portion of Algona.

Ecology has been reviewing the shallow groundwater contamination (0-30 feet), as well as the intermediate zone (31-60 feet) and deep zone (61 feet down to the Osceola Mudflow). The shallow groundwater contamination in Algona is consistent with the groundwater flow.

We have not seen indications of TCE or VOC releases from the southern portion of the Boeing site that have migrated offsite. However, Ecology is still filling some data gaps on contamination related to the intermediate and deep zones. If we find contamination in those zones, then we will continue to investigate the groundwater in that area.

Question 10: Do you have any indication why TCE and tetrachloroethene (PCE) were detected in the Junction Neighborhood? The Boeing contamination was found in 2002 and our neighborhood was built in 2003. Could the excavation or soil used to fill the wetland have brought in the contamination?

Answer: During the April investigation, there were geoprobe explorations north to south through the Junction Neighborhood, and at 25 feet below ground there was a very low level detected. The groundwater flows south to north, so we would not expect to have high concentrations there; however, we will have to verify the results when we sample. Historic pumping may have changed the gradient slightly and caused that very low detection level. It is an outlier, so we're going to have to make sure it isn't a bigger problem.

Question 11: Is TCE in Algona because of the Chicago Avenue Ditch? Boeing should be very careful about making statements that are not completely accurate and verifiable.

Answer: The Chicago Avenue Ditch is very probably the cause.

Question 12: Does Boeing have permission from GSA to drill on their sites?

Answer: Boeing submitted an access agreement to GSA and is waiting to hear back. We expect to hear from them in early August.

Health

Question 1: What are the health effects and risks of long-term low level exposure?

Answer: We are talking about two chemicals of concern – TCE and vinyl chloride (VC). If you were exposed to enough TCE (and likely more than you'll get at this site) over a long period of time, you might have a slight risk of liver cancer, non-Hodgkin's lymphoma and kidney cancer. The main health effect of VC exposure is liver cancer.

Before a chemical can affect you, you must have contact with it. As far as we know for this area, most of the chemicals are in a small portion of Algona and most of it is underground, so most people have not had a lot, if any, contact with these chemicals. The only location where the chemical was detected in surface water, so far, is the Chicago Avenue Ditch. Based on risk calculations using the levels detected to date, there is a less than 1-in-a-millon chance of increased risk of cancer from surface water exposure.

The other exposure concern we have for this site is vapor intrusion, where chemical vapors from the groundwater move through the soil and into basements and crawl spaces, where they can get trapped in indoor air in homes. The levels seen at this site are very low, compared to what we see at other sites, and based on our experience at other sites with the same chemicals, we are not expecting to see the contaminated groundwater affecting indoor air quality. However, we want to make sure that is not happening, so we are doing sampling to be sure.

Question 2: If the groundwater contamination is below state and federal requirements, then why are you sampling?

Answer: We are testing because the contamination levels may pose a potential concern for indoor air quality. Based on experience from other sites, the levels seen here are very low and we don't expect to see indoor air problems.

Question 3: Does the water table pose a risk because it is close to the surface?

Answer: Yes, the water table is close the surface, which is why testing is being done. We've looked at other sites with similar situations and higher levels of these chemicals, and we've not seen impacts to indoor air. There will be testing of some surface water, too.

Question 4: What information exists about VOCs – TCE, PCE and VC, and adverse pregnancy outcomes? Could those outcomes have been seen 10 to 15 years ago?

Answer: Effects depend on the level of exposure. If a woman is exposed to 200-1,000 times the amounts seen onsite there might be a problem. Based on low levels of TCE in indoor air, some studies suggest there could be fetal heart malformation issues. At the levels seen here, Department of Health is not expecting to see those kinds of health outcomes.

The amounts of TCE at this site are very low in comparison to amounts that would cause effects in animals. For pregnant mice or rats exposed to high levels of TCE, there might be some heart defects in the offspring.

As for levels from 10-15 years ago and effects, we do not have enough historical data about Algona. Ecology has just started the investigation in this area, and based on groundwater flow and the extent of the plume, we have defined the study area and identified where the contamination is in Algona. We are proceeding cautiously and conducting indoor air testing where there is indication of contamination in the groundwater.

Question 5: If the contamination stopped 20 years ago, and we looking at data from 5 to 10 years ago, is there any way for us to know what the levels were before and how they have/will decrease over time?

Answer: Robin mentioned that we've only had monitoring wells in Algona since December. However, there is more historical data available for the eastern part of the Boeing facility.

Concentrations can change over time. As TCE moves away from the source area, it generally disperses and concentrations become lower, or they remain the same. They also go down over time depending on how TCE breaks down into other products or conditions in the aquifer facilitate it.

This site is unusual because we've observed TCE spreading so far from the Boeing facility. There is no real way to go back and know what happened before, although if we know more about the release we can do modeling and learn more about historic conditions of the plume. What we know now starts from 2009, when we began sampling outside the plant.

Question 6: What about the long-term exposure of the people that have lived in the area for 20-plus years?

Answer: For historical exposure, we can try to extrapolate data, but it would not be very accurate. The problem with testing humans is the data will be unreliable based on lifestyle choices and other environmental influences that can affect the results.

Until January of this year, we did not know there was contaminated groundwater in Algona. We need to understand the situation and determine an engineering strategy that will handle the groundwater contamination.

The biggest potential for exposure to humans would be at the site where the chemicals were used, and the effects on workers at the plant are outside the purview of Ecology. Concentrations onsite have been found in the hundreds of parts per billion (ppb), but outside the site levels more like 10 ppb have been seen.

Question 7: Is there any data that will be made available comparing health outcomes in Algona to neighboring communities?

Answer: It sounds like you are requesting a health study be conducted to count if people have certain health effects. Department of Health has no plans to do so at this point. We are waiting on the results of the indoor air testing to determine whether to go forward with something like that.

Vapor intrusion study

Question 1: How did you pick the homes to be sampled for vapor intrusion?

Answer: The 23 homes were selected because the contamination levels in groundwater suggested there may be a possibility of effects to indoor air. The threshold levels for Algona are 1 µg/L (ppb) for TCE and 0.23 µg/L (ppb) for VC.

The threshold numbers are calculated values based on information from the U.S. Environmental Protection Agency (EPA) database – the EPA has been investigating vapor intrusion seriously for about 15 years. They pulled data in from around the country to in order to try and determine the correlation between groundwater contamination, vapor intrusion and air quality.

Question 2: Will vapor intrusion testing be done at different times of the year, and using different methods? How long does the indoor air quality testing take?

Answer: We will be sampling as quickly as we can beginning in July, but we then need to go back and sample these same homes in the winter. There are potential seasonal affects on the indoor air quality, so we want at least these two samples.

The method is to put air monitors in the downstairs living and bedroom areas, and at least one in the basement if there is one. There is also a canister position outside, so we can determine how much of the outdoor air is coming inside.

We can also conduct soil air sampling when there isn't a basement or a slab foundation– this involves drilling a one-inch hole in the slab and inserting a probe to extract a soil air sample for analysis. This

helps us determine how concentrations in the soil affect indoor air quality, and in turn if the contaminants are from vapor intrusion or other sources.

In homes where TCE levels were found to be highest, we have a second device which passively detects the level of contaminants in the air – this can be in place for three weeks, to determine the average levels over that period.

Question 3: Vapor intrusion testing involves two 24-hour testing periods, once in summer and once in the winter. That is 48 hours of monitoring over a one-year period. Will that represent enough data for an accurate average of the condition?

Answer: True, we do not know air concentrations when samples are not being taken. Accuracy depends on how steady concentrations are. If there were sporadic spikes, then it would be hard to catch with two 24-hour samples. There are three-week passive samples available, but those are not good for all chemicals and sampling over longer periods has been a challenge for a long time. The 24-hour samples will be coupled with the soil gas concentration measures, crawl space samples and quarterly groundwater samples.

Question 4: Is there a contingency plan if indoor air quality levels are determined to be an immediate concern?

Answer: If indoor air quality is detected to be at a level that will cause a health risk, Boeing has a conceptual design that can be implemented quickly. Boeing's mitigation plan is to have a blower installed in crawl spaces that will remove contaminated air from the home and move it into atmosphere.

A similar system has been used for radon contamination. A perforated pipe with holes is laid down in the crawl space along the home's foundation, covered with plastic to seal it, and a fan vents the air into the atmosphere.

Question 5: Are homeowners expected to pay the additional cost for electricity to run the fan?

Answer: Homeowners would not be expected to pay. The fans usually require about 150 watts, similar to having 150 watt bulb on all the time. Boeing will also pay any costs associated with increased heat in homes with the mitigation system.

Question 6: As recently as May 23rd, the EPA was accepting comments on new vapor intrusion testing guidelines, possibly using EPA-Region 9's as a guide – will your testing standard be based on the old standard or these new standards?

Answer: EPA has a vapor intrusion guidance document out for review, with new standards that are supposed to be more sensitive. Ecology has its own standards, which were issued in draft form in 2009. They were written based on the 2002 EPA standards and other state standards. Some agreed-upon levels are different now based on new information, and Ecology and Department of Health will be using the best standards currently available to carry out this study.

Question 7: After this round testing in homes, what are the next steps? Will there be an additional round of home sampling? How many rounds of sampling will you have?

Answer: This indoor air testing is the first phase of vapor intrusion testing. After the results come back, we will have a better idea of how homes are being affected. If we find that homes are being affected, they will look into potentially sampling more homes.

Question 8: I heard in April you were going to test my home for vapor intrusion; however now my home isn't on the list to be sampled. Why is my home not on that list?

Answer: In April, shallow groundwater was sampled in the vicinity of 11th Avenue North. Ecology went out for an initial exterior survey of the homes near there, where we did get higher detection levels. Our visit was to determine the general design of the area homes.

After the groundwater sampling results came back, we reviewed the results and determined the homes to be sampled based on where contamination was highest. If your home is not on this list, it is because Ecology determined the ground water contamination is not high enough near your home.

Your neighbors who are being sampled either have more contamination present in groundwater or they have a basement.

Question 9: Did you test the groundwater contamination levels in every home?

Answer: Groundwater was only tested at the points covered by the study done in April. Homes nearest those points, where the groundwater is contaminated, are where we are conducting vapor intrusion testing.

It is good news if we are not sampling your home; it means that it's in an area where groundwater contamination was not found to be as high.

Question 10: The ditch across the street from my house was found to be contaminated in June of last year? All the water for my yard is pumped from this ditch.

Answer: The ditch contamination has nothing to do with vapor intrusion.

Question 11: Wouldn't it be better to sample everyone? The whole town is full of water and when it rains it comes to the surface.

Answer: We are looking at where the contamination is at in the water table. If you are beyond the contaminated area, it is unlikely there is an indoor issue at your home.

After the first 23 homes are tested, we will analyze the results and determine if we need to expand the number of homes tested.

Question 12: It is my understanding the homes to be sampled were decided on before the groundwater results were in. It seems to us there is a deliberate attempt to exclude "experts" from being present during vapor intrusion tests. Why is this happening?

Answer: The house selection began as soon as the groundwater data came in. We put the first set of data Ecology received on the website. We began with 23 houses; however we evaluated the data as it came in weekly increments and determined no others should be added.

The reason for this is the majority of data moved from north to south, and as you get further south there are lower concentrations and more non-detection. For this reason we did not add any houses south of 9th.

In terms of having representation at the home visits, it is my understanding that ICF representatives have been present at subsequent home visits. It's up to the homeowner whether they are there. If the homeowner would like them there, we are fine with that.

Question 13: My house is one of the homes selected for testing. I have two autoimmune disorders and you are telling me the solution is a fan to make my home safe?

Answer: Yes, if you are exposed to contamination from the groundwater, the fan system will be the remedy. The fan system will reduce the concentrations of the chemicals found in the indoor air, hopefully to undetectable levels. We would also monitor the air at a later date to see if the fan system is effective at reducing chemicals in the air.

If you have the disorders from other factors, we don't know the answer to that question; health concerns can be handled through Department of Health.

Question 14: The handout says the test results will be shared with each household that is tested. Does that mean the results will be published for each home?

Answer: To respect homeowner privacy, we are going to share the results with each homeowner individually, and a summary of the results will be shared with the community.

We are not planning to research the former occupants of these homes; however, they can find the summary (once completed) posted on the website.

Question 15: Is there a plan for folks near the areas where groundwater detected the contamination? Can people get access to air testing equipment to do so on their own?

Answer: From our perspective, we thought we were being conservative with the 23 homes chosen for the first phase of testing. Also, we are waiting to analyze the results and determine if more testing is needed on nearby homes.

Private citizens can contact their local libraries to rent testing equipment to sample their own air. All the sampling we are doing is being paid for by Boeing, as required by the Department of Ecology.

Question 16: Is any testing being done in the commercial area of Algona for the people who work near the contamination?

Answer: We are more concerned about getting residential areas taken care of right now. We will soon conduct a vapor intrusion assessment for Algona's commercial district. In commercial areas, large ventilation systems can be installed and adding fill material under the building puts the groundwater table at greater depths. These factors reduce the likelihood of negative indoor air impacts from vapor intrusion in commercial buildings.

Question 17: If vapor intrusion tests indicate there is no cause for concern over human health, will Boeing still work to clean up the plume?

Answer: Yes, groundwater cleanup will continue. The vapor intrusion studies determine protectiveness for homeowners and occupants.

Question 18: People are concerned about their property values as well as their health. Boeing has a plan to install a fan and cleanup areas where vapor intrusion is found. How will Boeing work with people who want out of their homes as soon as possible, even if there are fans installed? Will Boeing buy properties?

Answer: Mitigation measures may be necessary if vapor intrusion is found in any homes. These instances will be handled on a case-by-case basis.

Next steps and overall cleanup process

Question 1: You know the source of the plume. What are you doing to contain it, or can you contain it onsite?

Answer: The plume is over a mile out from the Boeing facility. Our immediate concern is pathways of exposure – how and where people may come into contact with the contaminants.

The plume is already beyond the facility boundaries, so it is not possible to contain it. What we can do is clean up the highest concentrations found in groundwater, and there are various ways to do this, so that over time the plume stabilizes. However, this is a long term process.

Question 2: A Boeing representative showed me an area of the site where contaminants have been cleaned up. Why did they stop this cleanup process years ago, instead of continuing it outwards from this area?

Answer: Groundwater contamination concentrations on Boeing property were much higher than those found offsite. At the time of the onsite cleanup, we thought cleanup of the source area was the most important and didn't anticipate the contamination would spread offsite, as sample concentration levels dropped significantly.

These areas are now non-detects or at very low levels. We have now discovered a large area of the plume outside of the Boeing property, and we are working to address the highest concentrations of contaminants found offsite.

The first part of the onsite pilot project was to see if bioremediation worked in the unique environment presented at the Boeing facility. We found that it did, and now we are looking for the highest areas of contamination offsite in order to try this process again.

The plan now is to step offsite and follow up on this process. This investigation is to understand the entire area that we need to deal with.

Question 3: When was the bioremediation done?

Answer: Bioremediation for the 17-05 building started in 2005. The Model Toxics Control Act (MTCA) process requires investigations and then assessment on potential cleanup options – bioremediation is just one of multiple potential technologies that can be used. This process takes time.

Question 4: It looks like you did a quick, safe fix for the Boeing site, but for Algona you are waiting and taking your time to see what happens.

Answer: The reason we worked on the 17-05 building because it was the area with the highest concentrations. Cleaning up 17-05 prevented potentially more contaminants from leaking into the aquifer. Levels across the plume no longer show hot spots for contaminants because this area of highest concentration was removed. The source has been removed.

Question 5: Why did it take so long to get to this point, and how much longer will it be before cleanup begins?

Answer: The Resource Conservation and Recovery Act is the regulation driving cleanup. When Boeing applied for a permit to continue to operate, since they handle hazardous waste, that began the reviews of the facility and areas where waste was handled.

When we visit a facility, we go through a step by step process to take samples, analyze results and learn more along the way. Ecology doesn't assume there is contamination where there is no evidence for it.

The first offsite monitoring wells (in residential Algona) were installed in late 2012, and sample results from surface water sampling informed us that there was TCE contamination in the Chicago Avenue Ditch and at one monitoring well, which is why Ecology directed Boeing to conduct groundwater sampling in Algona in April.

Question 6: When will cleanup start?

Answer: The cleanup can start during the investigation process if there are threats to human health, but it is a long-term process.

The first thing we'll do is address indoor air quality. We have begun the investigation, and sampling will first be done this summer. We'll then look at the results and determine if there is an indoor air problem and begin implementing mitigation measures. If we find there is a problem, there are plans in place to take immediate action. The second thing will be to address areas of groundwater contamination. The first step will take about a year, the second will take longer.

Question 7: You first knew about this problem in Algona in December of 2012? In the February 19, 2013 meeting, Robin Harrover said she knew about the contamination for many years but did not bring it to light and apologized for it. These are state agencies that are supposed to protect us. I would like to hear someone speak to this issue.

Answer: What I was referring to in my apology, is that we have an outreach process and I did not know that contamination was in residential areas of Algona. We started receiving more information in 2009 about the extent of contamination. At that time, we could have given a status update to all of Algona, and I did not do that at that time. We are having this meeting tonight to try and do a better job at communicating with residents in the area.

Question 8: You explained the bioremediation cleanup process used at the Boeing site. Why is that method not being used in residential areas?

Answer: Ecology is working with Boeing and directing them to do cleanup of groundwater in the area, so that work is coming. It all takes a certain amount of work to submit plans and do the engineering to have a systematic approach to cleanup.

There is a degradation process; TCE breaks down into chemicals and we want to make sure we don't create a greater problem than there is currently. Concentrations in Algona are below levels we had when we did bioremediation.

Boeing has performed bioremediation before and one of the concerns for doing so near Algona is if we inject the material into the ground, it will re-surface. That is why we are looking at using hydraulic controls and continuing to do more research. Hydraulic control is putting in a trench, and pumping at low level to move the contamination. We are hoping to steer the contamination from the Chicago Avenue Ditch away from the neighborhood.

Question 9: Is there a filtering system that can be used, such as charcoal?

Answer: There's a range of alternative methods for cleanup and we are researching the best method for the area and circumstances. We need more time to determine the best method.

Question 10: Will the past bioremediation cleanup clear up the TCE at 6th Avenue North?

Answer: No, the material Boeing injected near the 17-05 building will not get to 6th Avenue North. It did not get into the aquifer. There are microbes in the ground, the injected material is their food source and stimulates their growth, and this creates conditions in the aquifer that causes the breakdown of TCE. After the food source is consumed, the microbe population goes back to normal, and the material fades out.

Question 11: Boeing needs to be more transparent with what is being communicated. People are not getting answers to their questions. This community feels like you are trying to put a patch over us and we're not going to stand for that. Boeing needs to put vaporizers in every home and go to each house, talking with people and understanding why they are sick. Boeing is only covering over the hot spots. People want to know their house is safe.

Answer: Boeing is here to communicate what is happening. The investigation is ongoing and data is being collected. If the groundwater underneath your home is not contaminated, then your home is not impacted.

We really don't know if the contamination is causing a problem, but we do realize this is an important issue. Boeing is starting the investigation with 23 houses that are most likely to have a problem because of groundwater contamination. Our intention is to do the right thing for the impact we've caused. Boeing may go door-to-door, but the remediation approach needs to be developed in a systematic way. Vapor intrusion studies require a lot of effort; canisters are placed in multiple locations throughout the home including the crawl space. That data is then analyzed. Results will be available approximately one week after samples are collected.

Question 12: Boeing has been in this type of situation a number of times. They should just do what they did in other places quickly.

Answer: TCE was widely used in the aerospace industry, and other industries, beginning in 1940 until the 1980s when health hazards were identified. Each site is unique and there is not one cookie-cutter approach for dealing with contamination. Sites need to be characterized properly and the remedy that works in one area may not be appropriate elsewhere. Boeing needs to ensure the remediation approach does not cause more harm, because there can be serious consequences when injecting material into the ground.

Question 13: What will happen between the initial testing in July and follow-up testing in December?

Answer: Boeing will be gradually completing assessments, and currently has about ten homes signed up for the vapor studies that will begin in July. Boeing will also be working with Ecology in the overall site area, and installing several additional monitoring wells in Auburn. There is work outside of Algona to characterize the contamination.

Project and contamination background

Question 1: Did Boeing dump or spill the chemicals?

Answer: We do not know how the contamination was released. While we were decommissioning the facility we found the source to be vapor degreasers inside the building. So it wasn't spilled, it could have leaked out of degreaser.

Degreasers heat chemicals to vapor to clean grease and oil from parts, and some vapor is lost in the process through emissions control systems.

Question 2: Most buildings in commercial area used to be Boeing buildings and are old and probably more vulnerable. Is the plume located in the commercial areas?

Answer: Yes, the plume extends beyond the Boeing plant and through the commercial district of Algona. We have maps to show the extent of contamination.

Question 3: Is Boeing accepting responsibility for what has happened? If Boeing accepts responsibility, then Boeing is also accountable for everything that has happened because of their actions. We do not want to hear news stories about drinking water being cleaned up when our homes and our lives are still being impacted. Boeing needs to step up and truly be accountable.

Answer: Boeing accepts responsibility for cleaning up the TCE in the groundwater. Boeing is conducting the investigation. Boeing is installing monitoring wells and doing the work to understand if anyone has been exposed.

This is a long process, but Boeing is stepping up because this is a community where Boeing works and has employees. The source has been cut down and the investigation is ongoing. There has been some success, but it takes time to complete the work. If the investigation reveals that people are exposed, Boeing will take action. The first step is to collect the data, beginning with the 23 homes identified as most likely to have been affected by the situation.

Other

Question 1: Was this meeting rehearsed prior to tonight?

Answer: There was preparation work for the meeting; including development of over 20 informational boards, an agenda, and FAQs. Two meetings were held regarding the open house to discuss materials and organize the meeting, but the meeting was not rehearsed.

Question 2: I own a rental property in Algona. How will the contamination affect property values?

Answer: I don't know about property values, but take a look at the data we published on website. You can see where your home is located in relation to the investigation locations, and use this information to inform renters and future buyers.

Question 3: Who says the area will not be cancerous – Boeing, Department of Ecology, the scientists? Are people going to believe that data?

Answer: I don't know if there is an answer to that question. I understand you are raising that as an issue.

Question 4: All we need is a letter saying the property is not harmful to ensure we can re-sell or rent the property.

Answer: I don't know what has occurred on your property, and I cannot speak for historical practices at it. We can speak to the contamination we know is coming from the Boeing facility and the published results from the groundwater investigations conducted April. Ecology has published the data and that is what I have to offer.

Comment Forms

A total of four comment forms were received during the meeting. The questions and comments received on the comment forms are included in the table below.

Name	Questions	Comments
Steven Clark	If it's toxic in our houses – why isn't it more of a time concern? Why aren't our houses "Red Tagged" as un-inhabitable? Why isn't property values a topic of discussion?	
Jeff Sippo	A pregnant woman takes in the same amount of toxicity in 8 hours as a man in 70 yrs. What can my wife & two daughters expect in the future health wise? How accurate is this [vapor intrusion sampling] test? It is basically a photograph of that day so how can I be assured that any other day I could be taking in toxic vapors? I have a sump pump on my property taking in all my neighbors ground water, am I taking in elevated levels? I believe every house should be vapor tested from the 11th to 7th. Were the levels higher in the past? My property value has plummeted, will Boeing step in to assist to make up the lost money.	
Bret Brownfield		Sampling in the road fill – concern about sampling in road, which has fill rather native dirt
Fay Farrington		Wanted to know if there is a "list" to get on for house testing (she came late), asked for follow up

Questions Recorded During the Open House

Staff at each open house station recorded on flip charts questions and comments shared by meeting attendees. The summarized list of questions and comments recorded are listed below.

Summarized questions and comments from station flipcharts

Groundwater contamination

- Direction of groundwater flow
- Is the plume getting larger?
- Is the plume getting worse because of VC?
- Is flooding spreading the contamination?
- Is the ditch along Highway 167 flooding and spreading contamination?
- How dangerous is it?
- How did the pollution originally occur?
- Is the water in Government Canal clean?
- Is the plume moving? Is it predictable?
- How did you clean up the site?
- Can the chemical concentrations change over time?
- What is the lifetime?
- What do vapor degreasers look like?
- Why aren't all the wells down to 25 feet?
- What is the ultimate goal?

Investigations

- Will you do additional investigations?
- How does Ecology determine which sites to test?
- Will you continue testing/monitoring into the future?
- Boeing says there is no contamination in the ground. Why are you doing all this testing?
- Ecology is not telling us anything!
- Ecology employee went in backyard at 1031 Algona Blvd N and took sample
- Question/concern the plume and even with the sampling, how and what says these levels are not toxic – seems uncertain?
- Need better map key – couldn't understand where clean and where not?
- Do you come back and monitor?
- Where were the samples taken from Government Canal?
- Want more sampling along Government Canal – almost in every backyard – neighborhood built ten years ago – many serious illness in this neighborhood → 314 Junction Blvd
- If I want to do my own testing (vapor) how do I go about that and what does it cost?
- Are you drilling at the mall? GSA?
- Why drilling is only 5 feet deep?
- Will there be deeper drilling?

- Water should be tested more often and regularly
- When was 1st drilling off site?

Cleanup process and timeline

- Isn't there something Boeing could do quickly to clean up – right away
- Why hasn't cleanup started?
- How long will the cleanup take?
- What does Public Notice entail? How distributed?
- Why did it take so long to issue a public notice?
- Why didn't we tell them about contaminants 11 years ago?

Health risks

- Can I eat the vegetables in my yard?
- Is the drinking water okay?
- Cancer diagnoses up and down her street. White River Rd/Government Canal right behind her house. Would this be related to my cancer?
- Health census – for the whole area
- What are the health impacts?
- We need a medical doctor to evaluate this data and give us answers

Other

- How will this affect Algona property values?
- How does this affect my property (location specific)?
- Will Boeing buy our property?
- I'm afraid of the stigma Algona: contamination
- Property purchased for retirement will now be so de-valued – if renter moves out – how will I get the renters back?
- Another concern about selling in 3-5 years

Summary

Questions and comments were received in a variety of ways during the open house. The public input provided will help Ecology as it moves forward with further community outreach, project investigations and cleanup.

Questions and comments heard during the meeting have been summarized in the categories below.

- **Contamination and health risks (past and present):** Questions were frequently asked about the groundwater contamination as it relates to health, especially related to exposure from vapor intrusion. Community members are interested in knowing whether existing health conditions may have been caused by exposure to historic contamination.

- **Vapor intrusion study area and next steps:** Meeting attendees expressed concern about their homes not being tested for vapor intrusion, as well as Boeing's plans for mitigating vapor intrusion.
- **Timeline for investigations and cleanup :** A number of attendees inquired about how long the cleanup will take and how the cleanup will be conducted.
- **Property value impacts:** A topic of concern to residents was the impact the contaminated groundwater plume may have on property values in the area.