FORD NEWPORT BEACH OPEN HOUSE
WELCOME / CHECK IN
BACKGROUND AND SITE HISTORY
Site History 1957-1993

- Ford operated an aeronutronics facility from 1957 to 1993
- Operations included the research, engineering and manufacture of aerospace systems
  - Missile guidance components, rocket motors and computer hardware
- Volatile organic compounds (VOCs) were used to clean metal parts
  - Trichloroethylene (TCE) and tetrachloroethylene (PCE)

Facility was closed and demolished in 1993

Site Cleanup 1993-1996

- Oversight provided by Santa Ana Regional Water Quality Control Board (Water Board)
- Cleanup in accordance with regulatory standards established in the 1990s
- Soil and groundwater remediation included:
  - Bioremediation
  - Excavation and disposal of soils
  - Groundwater and soil vapor treatment systems
- In 1996/97, the Water Board and Orange County Health Care Agency determined no further remediation was required for the main area for the anticipated land reuse
- Site was rezoned and redeveloped
WHAT ARE VOCs?

**VOCs: Volatile Organic Compounds (VOCs)** get their name from their ability to pass easily from a liquid into a gaseous state. VOCs, which include TCE and PCE, are commonly used in industry as well as in the home. Recent research has shown that VOCs in soil and groundwater can evaporate as vapors, and can collect under buildings potentially affecting the quality of indoor air. This process is called vapor intrusion.

**TCE: Trichloroethylene (TCE)** is used as a solvent for degreasing metal parts during the manufacture of a variety of products. It can also be found in consumer products, including some wood finishes, adhesives, paint removers, and stain removers. Due to its widespread use, very low levels of TCE are common in the air of homes and businesses and in outdoor air in urban areas.

**PCE: Tetrachloroethylene (PCE)** is a chemical compound that is commonly used in clothes dry cleaning and metal degreasing. It is also used to make other chemicals and can be found in some consumer products.

### Common Household Sources of Volatile Organic Compounds (VOCs)

- Air fresheners (including electric varieties and room sprays)
- Scented candles
- Perfume/cologne
- Beauty products (e.g., hairspray, hair dye, aerosolized products)
- Pepper spray
- Paints, varnishes and lacquers
- Nail polish and nail polish removers
- Paint thinner
- Paint, varnish, rust and lacquer removers
- Shoe polish
- Adhesives/glues (e.g., wood glue, craft glue, model glue, carpet glue)
- Markers
- Cleaning agents (e.g., bleach, ammonia)
- Rubber cement and epoxy adhesives
- Toilet disinfectant
- Moth balls
- Gasoline
- Automobile exhaust
- Cigarette smoke
- Cleaning solvent (e.g., carburator/car part cleaner)
- Petroleum products
- Carpet/rug/upholstery cleaners
- Plastic foam insulation
- Refrigerant
- Printing inks
- Insecticides, fungicides and pesticides
- Flame retardant fabrics
- Plastic products
- Polyresin molded decorations (particularly from China)
- Soil or space fumigant
- Building materials (e.g., particle board)
- White correction fluid (for typewriters and print)
- Furniture polish and floor polish
- Residential wood combustion
- fiberglass
- Dry cleaning chemicals
- Metal degreasers and metal cleaners
- Drain cleaners

*Source: California Water Board*
As a condition of regulatory approval, Water Board required Ford to continue to monitor groundwater for VOCs
- Groundwater has been regularly monitored since 1996

Soil gas investigation work conducted in 2006, 2008 and 2012 found TCE and PCE below acceptable health risk levels at the time
- Soil gas samples (collected from tiny air pockets between soil grains) collected periodically

In 2014, the USEPA published a memo for TCE, specific to sensitive receptors

In 2016, the Water Board’s environmental screening levels were updated and made more stringent

In June of 2018, TCE and PCE were detected in soil gas above the current environmental screening levels at some areas of the site

Based on the results of soil gas sampling in June of 2018, Ford initiated a soil vapor and vapor intrusion investigation
TIMELINE

1957
- Ford Aeronutronic Operations

1993
- Site demolished, environmental investigation, and remediation

1996
- Advances in science and changes in regulatory screening levels:
  - More sensitive instrumentation
  - Lower laboratory detection limits
  - Identification of the potential for vapor intrusion
  - Improved investigation techniques
- Soil and groundwater remediation complete for the main area, site rezoned and redeveloped

2014
- USEPA publishes a memo for TCE, specific to sensitive receptors

2016
- Most recent Water Board update to Environmental Screening Levels
- TCE and PCE detected above updated Environmental Screening Levels

2017
- Water Board requests compilation and re-evaluation of all existing data (Conceptual Site Model)

2018
- Water Board requests additional investigation activities
- Ford initiates soil gas and vapor intrusion investigation

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- Soil and groundwater remediation complete for the main area, site rezoned and redeveloped

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2018
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Soil and groundwater remediation complete for the main area, site rezoned and redeveloped

Advances in science and changes in regulatory screening levels:
- More sensitive instrumentation
- Lower laboratory detection limits
- Identification of the potential for vapor intrusion
- Improved investigation techniques

Water Board requires ongoing groundwater monitoring

Water Board requests compilation and re-evaluation of all existing data (Conceptual Site Model)

USEPA publishes a memo for TCE, specific to sensitive receptors

TCE and PCE detected above updated Environmental Screening Levels

Ford initiates soil gas and vapor intrusion investigation
NORTH AREA
SOIL GAS INVESTIGATION (subsurface)

What does the blue shading represent?
Commercial areas for proposed indoor air sampling

What do the different colored dashed lines represent?
- The green contour lines indicate the approximate area of concentrations above 240 micrograms per cubic meter for TCE Environmental Screening Level
- The purple contour lines indicate the approximate area of concentrations 230 micrograms per cubic meter for PCE Environmental Screening Level

What is a soil gas probe?
A soil gas probe is a small, cylindrical hole that extends to about 15 feet deep that soil vapor samples are extracted from

What does the green shading represent?
Residential areas for proposed indoor air sampling

Information represented on the map is current as of 9/18 and is subject to change as investigations progress
What does the green shading represent?
Residential areas for proposed indoor air sampling

What is a soil gas probe?
A soil gas probe is a small, cylindrical hole that extends to about 15 feet deep that soil vapor samples are extracted from
WHAT IS VAPOR INTRUSION AND HOW IS IT INVESTIGATED?

Groundwater
- Groundwater monitoring has been ongoing since 1996

Soil Gas
- As a result of advances in science and technology, as well as resulting changes in regulatory screening levels, Ford is conducting additional soil gas investigations to determine location and extent of subsurface soil gases
  - Subsurface soil gases occur when VOCs pass from groundwater into the soil gas above by volatilization

Vapor Intrusion
- There is a potential for soil gas to move towards the ground surface and potentially impact indoor air
  - Ford is conducting indoor air sampling to determine if there are any impacts from subsurface soil gas
**Purpose**
Determine if VOCs (TCE and PCE) in indoor air are above Water Board Environmental Screening Levels

**Sampling Process**

- **Indoor Air Samples**
  - Building survey: pre-sampling questionnaire
  - Identification of household items that contain VOCs
  - Placement of canisters in targeted areas
  - Leave canisters for 24-hours to collect air (8-hours for business)
  - Return to retrieve canisters
  - Process typically takes 2 hours in total

- **Sub-slab (directly beneath foundation, typically in garage) or perimeter soil gas samples collected (outside) for correlation with indoor air samples**

**Indoor Air Testing and VOCs in Household Use**
Measuring chemicals in indoor air can be tricky because many common household items and materials can affect levels.

Carpets, cleaning products and building materials can off-gas chemicals.
VAPOR INTRUSION INVESTIGATION PROCESS

1. Volatile chemicals are identified in the soil, groundwater, or vapors coming from the soil. Sites where VOCs were historically used are being re-evaluated.

2. Sample for vapors underground to determine area of concern. Crews drill into the ground to collect soil, groundwater, and soil gas samples. The sampling areas may grow or shrink based on test results.

3. Test for vapor intrusion inside homes and buildings within the area of concern. Testing beneath the home for vapors is called sub-slab soil gas sampling. It involves drilling small holes in your garage floor to collect soil gas samples from under the building. Indoor air samples are collected as well.

4. Take steps to mitigate for vapor intrusion. If testing finds vapor intrusion is a problem, there are actions that can be taken to quickly address the situation such as sealing cracks in the foundation, installing mobile air purifiers, adjusting the heating/ventilation system and in some cases installing a mitigation system to vent vapors from beneath the home.
WHAT YOU MAY SEE

Subsurface Soil Gas Sampling in Public Areas

- Utility Clearance
- Street Markings
- Identifying Utilities
- Removal of Street Markings after Restoration
- Soil Gas Probe Drill Rig
- Top of Soil Vapor Probe

Subsurface Soil Gas Sampling - Residential/Commercial

- Hand Auger
- Installing Perimeter Probe
- Sampling
- Top of Soil Vapor Probe

Indoor Air and Sub-Slab Sampling

- Pre-Sampling Building Survey
- Indoor Sampling Canister
- Sub-Slab Install (eg. garage)
- Sub-Slab Sampling
- Sub-Slab Patch (eg. garage)
SAMPLING RESULTS
INDOOR AIR SAMPLING RESULTS

- Sample results are provided in about 2 weeks
- At a minimum two rounds of sampling are needed per current Water Board sampling protocol guidance

Status of Access Agreements to date*
- 300 Access Agreements sent
- 62 Access Agreements signed

Residential Indoor Air Sampling Summary to date - TCE
- 28 Buildings sampled
  - 13 Non-detect
  - 8 Below Environmental Screening Levels
  - 7 Above Environmental Screening Levels and are being evaluated

Potential Mitigation Measures
- Seal cracks and openings in foundation
- Mobile air treatment units (temporary)
- Adjust heating and ventilation system parameters
- Install mitigation system beneath foundation to safely vent vapors into the atmosphere
- Continue testing indoor air to confirm effectiveness of mitigation measures

* This information is current as of September 21, 2018
**Notes**
(2) Source of soil vapor screening levels: February 2016 San Francisco Bay RWQCB ESLs of 240 (final screening level) and 1000 μg/m³ (“Trigger” level and noncancer ESL) for TCE.
(3) Indoor air concentrations will be evaluated with respect to the following:
- Outdoor air concentrations
- Sub-slab and/or crawl space concentrations, if applicable
- Presence of preferential pathways indicating possible migration via sewer line
- Indoor screening levels: 0.48 μg/m³ (long-term; U.S. EPA 2018 RSL and 2016 SFRWQCB ESL) and 2 and 6 μg/m³ [short-term; Accelerated and Urgent Response Action Levels, respectively; DTSC 2014 HHRA Note 5: Health-based Indoor Air Screening Criteria for Trichloroethylene (TCE)].
We are fully investigating the environmental issues and prioritizing health and safety. We have no information at this time on property values. We recommend contacting a real estate professional to obtain any further information regarding this or related issues.
NEXT STEPS
NEXT STEPS

Continue with subsurface soil gas investigation in common areas outside and indoor air investigation

Refine study areas based on results of subsurface soil gas investigation

Interim response measures as needed to address indoor air impacts

Develop long-term strategy for subsurface soil gas and/or groundwater

Community Outreach

Open houses to share key information

Fact sheets and results letters issued by mail and email

Website and project information line

CONTACT US

www.FordNBFacts.com 833-949-3673 info@FordNBFacts.com
SIGN-UP FOR INDOOR AIR SAMPLING
SANTA ANA REGIONAL WATER BOARD
AND
OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT
Santa Ana Regional Water Quality Control Board (SARWQCB) is one of nine Regional Boards which along with State Water Resources Control Board (SWRCB) are under the umbrella of California Environmental Protection Agency (CalEPA).

SARWQCB is in charge of issuing permits and enforcing the State policies to protect water quality.

SARWQCB has jurisdiction over the more populated areas of Orange, Riverside, and San Bernardino Counties (approximately 2,800 square miles), covering a population of approximately 5 million people.

SARWQCB works with the responsible parties that caused environmental contamination to conduct assessment and remediation of the impacted sites.

SARWQCB also coordinates and collaborates with public and other stakeholders who may have been affected by contamination.
The Office of Environmental Health Hazard Assessment (OEHHA) is the lead state agency for the assessment of health risks posed by environmental contaminants and is one of six departments within the California Environmental Protection Agency (CalEPA).

OEHHA’s mission is to protect human health and the environment through scientific evaluation of risks posed by hazardous substances.

OEHHA develops health-protective exposure levels for contaminants in air, water, and soil as guidance for regulatory agencies and the public.
NORTH AND BCA AREAS
VI EVALUATION STRATEGY
COMMERCIAL PROPERTIES
Former Ford Aeronutronic Property
Newport Beach, California

Deliver factsheets regarding upcoming SV sampling to businesses in the North and BCA Areas.

Install and sample SV probes at proposed locations in the North and BCA Areas.(1)

Contact building owners and provide factsheets based on concentration range.

Prepare isoconcentration maps for TCE using contours of 8,000 and 3,000 µg/m³ in soil vapor, if possible, based on highest concentration at each nested probe location.(2)

Perform step-out SV sampling where SV concentrations are >240 µg/m³.(3)

Prioritize IA sampling at commercial properties within 30 days.

Offer IA sampling based on magnitude of exceedance of current screening level.

Perform building surveys, indoor air sampling, and sub-slab sampling.

Perform seasonal SV sampling to confirm results; if results are <3,000 µg/m³, no further evaluation of VI in area of probe.

Perform seasonal IA sampling to confirm results; if results are similar, no further evaluation of VI for this building.

Perform immediate confirmation IA sampling and/or take interim response measures within one week; prepare long-term mitigation measures.

Perform immediate confirmation IA sampling and/or take interim response measures within one month; prepare for long-term mitigation measures.

Perform immediate confirmation IA sampling and/or take interim response measures within one month; prepare for long-term mitigation measures.

TCE concentration in IA, evaluated on a per-building basis.(4)

Notes:
(2) Source of soil vapor screening levels: February 2016 San Francisco Bay RWQCB ESLs of 3,000 (final screening level) and 8,000 µg/m³ (“Trigger Level”) for TCE.
(3) The Santa Ana Regional Water Quality Control Board recommended delineating to the residential value of 240 µg/m³ (instead of 3,000 µg/m³) because of mixed land use.
(4) Indoor air concentrations will be evaluated with respect to the following:
• Outdoor air concentrations
• Sub-slab and/or crawl space concentrations, if applicable
• Presence of preferential pathways indicating possible migration via sewer line
• Indoor air screening levels: 3 µg/m³ (long-term; U.S. EPA 2017 RSL and 2016 SFRWQCB ESL) and 8 and 24 µg/m³ [short-term; Accelerated and Urgent Response Action Levels, respectively; DTSC 2014 HHRA Note 5: Health-based Indoor Air Screening Criteria for Trichloroethylene (TCE)].

Abbreviations:
IA = indoor air
SV = soil vapor
µg/m³ = micrograms per cubic meter
VI = vapor intrusion
BCA = Big Canyon Arroyo

NORTH AND BCA AREAS
VI EVALUATION STRATEGY
COMMERCIAL PROPERTIES
Former Ford Aeronutronic Property
Newport Beach, California

Date: 4/17/2018
Project 9615397106
Figure A2
Deliver factsheets regarding upcoming SV sampling to residences in the North and BCA Areas

Install and sample SV probes at proposed locations in the North and BCA Areas\(^1\)

Prepare isoconcentration maps for TCE using contours of 1,000 and 240 \(\mu g/m^3\) in soil vapor, if possible, based on highest concentration at each nested probe location\(^2\)

Perform step-out SV sampling where SV concentrations are >240 \(\mu g/m^3\)

Notes
\(^1\) Amec Foster Wheeler, 2017. Revised Addendum to Work Plan for Groundwater Investigation – North Area, Former Ford Aeronutronic Property, Newport Beach, California
\(^2\) Source of soil vapor screening levels: February 2016 San Francisco Bay RWQCB ESLs of 240 (final screening level) and 1000 \(\mu g/m^3\) ("Trigger" level and noncancer ESL) for TCE.
\(^3\) Indoor air concentrations will be evaluated with respect to the following:
- Outdoor air concentrations
- Sub-slab and/or crawl space concentrations, if applicable
- Presence of preferential pathways indicating possible migration via sewer line
- Indoor air screening levels: 0.48 \(\mu g/m^3\) (long-term; U.S. EPA 2017 RSL and 2016 SFRWQCB ESL) and 2 and 6 \(\mu g/m^3\) [short-term; Accelerated and Urgent Response Action Levels, respectively; DTSC 2014 HHRA Note 5: Health-based Indoor Air Screening Criteria for Trichloroethylene (TCE)].

Abbreviations
IA = indoor air
SV = soil vapor
\(\mu g/m^3\) = micrograms per cubic meter
VI = vapor intrusion
BCA = Big Canyon Arroyo

Perform immediate confirmation IA sampling and/or take interim response measures within one month; prepare for long-term mitigation measures

Perform seasonal IA sampling to confirm results; if results are similar, offer mitigation measures

Perform seasonal IA sampling to confirm results; if results are similar, no further evaluation of VI for this residence

Perform immediate confirmation IA sampling and/or take interim response measures within one week; prepare long-term mitigation measures

Perform confirmation IA sampling within 30 days; if results are similar, offer mitigation measures
## TCE Screening Levels

### Long-Term Exposure Screening Levels

<table>
<thead>
<tr>
<th>TCE</th>
<th>Sub-slab/Soil Gas Vapor Intrusion&lt;sub&gt;1&lt;/sub&gt;</th>
<th>Indoor Air Direct Exposure&lt;sub&gt;1&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>240 µg/m³</td>
<td>0.48 µg/m³</td>
</tr>
<tr>
<td>Commercial</td>
<td>3,000 µg/m³</td>
<td>3 µg/m³</td>
</tr>
</tbody>
</table>

### Short-Term Exposure Screening Levels

<table>
<thead>
<tr>
<th>TCE</th>
<th>Sub-slab/Soil Gas Vapor Intrusion&lt;sub&gt;1&lt;/sub&gt;</th>
<th>Indoor Air Direct Exposure—Accelerated&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Indoor Air Direct Exposure—Urgent&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>1,000 µg/m³</td>
<td>2 µg/m³</td>
<td>6 µg/m³</td>
</tr>
<tr>
<td>Commercial (8-hour workday)</td>
<td>8,000 µg/m³</td>
<td>8 µg/m³</td>
<td>24 µg/m³</td>
</tr>
<tr>
<td>Commercial (10-hour workday)</td>
<td>8,000 µg/m³</td>
<td>7 µg/m³</td>
<td>21 µg/m³</td>
</tr>
</tbody>
</table>

### Sources:

1. San Francisco Bay Regional Water Quality Control Board, Environmental Screening Levels, Updated February 2016
2. United States Environmental Protection Agency, July 9, 2014, Memorandum, EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion
Conceptual Model for Vapor Intrusion

- Commercial/Industrial
- Residential
- Slab
- Basement
- Soil Contamination
- Vapor Plume
- Groundwater
- Contaminated Groundwater Plume
- Vadose Zone
- Saturated Zone

Diagram showing the flow of vapor into buildings through slabs and basements, affecting soil and groundwater contamination.