

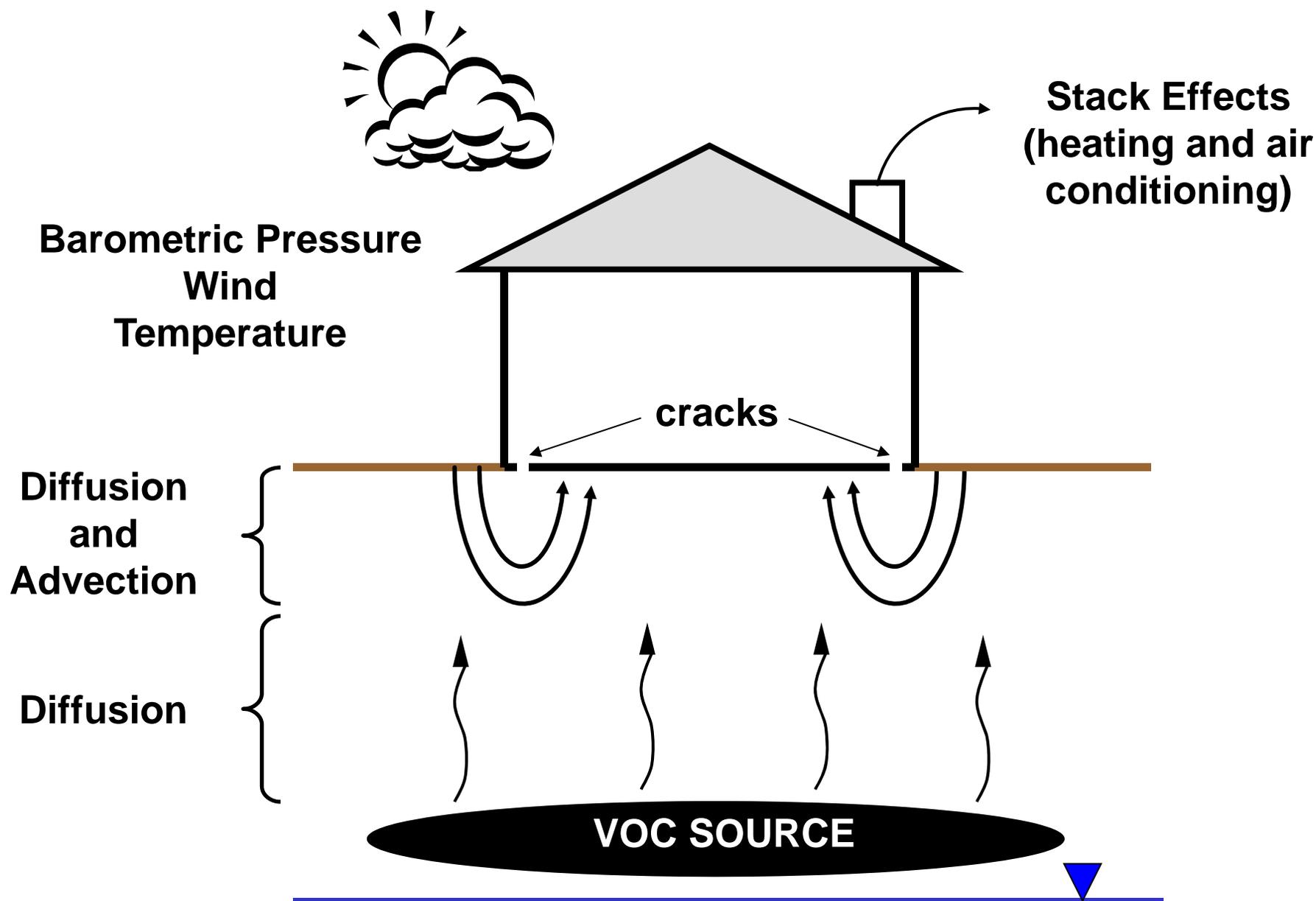
**DEPARTMENT
OF
TOXIC SUBSTANCES CONTROL**

**DTSC Investigation Update
Autumnwood Development
Wildomar, CA**

September 19, 2014

**Bill Bosan, PhD, Theo Johnson, C.Hg., CEG
and Marina Perez, PPS**

Vapor Intrusion – Conceptual Model



File Date: 12/02/2013 12:52:07 PM; Plotted by: jpb; Project Name: NB101607SP; Location: Wildomar, CA; Project No.: NB101607SP; Figure 2; Proposed Sample Locations



Explanation:

- Soil Gas sample location
- Sub-slab sample location
- Soil/Soil Gas sample location
- Soil/Soil Gas/Groundwater sample location

--- Limits of project area

All locations are approximate

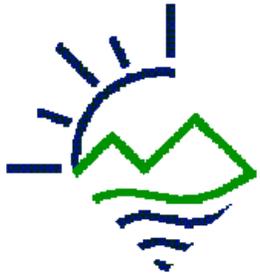
Basemap modified from ESRI World Imagery 2013

SAMPLE LOCATIONS
Autumnwood Development
Wildomar, California

By: jpb	Date: 12/02/2013	Project No. NB101607SP
---------	------------------	------------------------

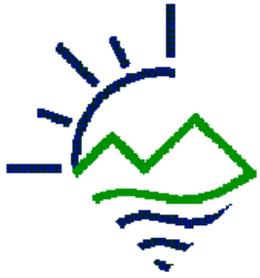


Figure **2**



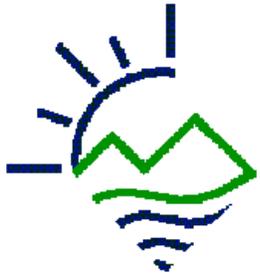
Draft Report Sampling Results

- All metals are within background
- No organochlorine pesticides (OCPs) were detected
- No Polychlorinated Biphenyls (PCBs) were detected
- Only one semi-volatile organic compound (SVOC), bis-2ethylhexylphthalate, was detected at the detection limit (2.6 mg/kg)
- No volatile organic compounds (VOCs) were detected in groundwater
- No formaldehyde was detected in groundwater



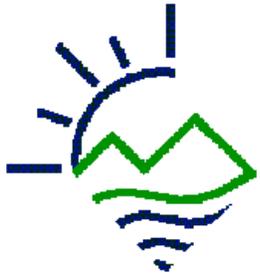
Level 4 Data Validation

- DTSC's Environmental Chemistry Laboratory (ECL) conducted an independent review of the Level 4 data
 - Assess the data usability for risk assessment and decision making
 - ECL concluded that the data are useable for risk assessment, with some specific limitations, as discussed below



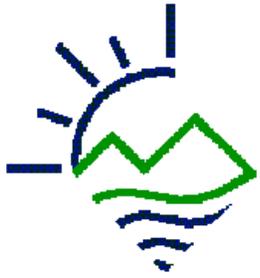
Level 4 Data Validation, Groundwater

- ECL determined that benzene was detected below the reporting limit of 0.5 $\mu\text{g/L}$ in Sample 1-GW-19-24 (Location 1 on Figure 2)
- Assume benzene is present in groundwater at the estimated concentration of 0.2 $\mu\text{g/L}$
- Corresponding soil gas concentration would be 45.4 $\mu\text{g/m}^3$
 - Below the soil gas CHHSL, 85 $\mu\text{g/m}^3$
 - Contribution of benzene to soil gas or indoor air would be negligible



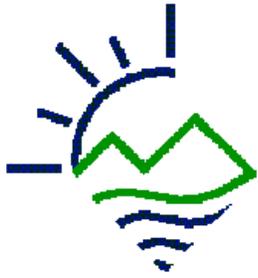
Level 4 Data Validation, Groundwater Cont.

- ECL concluded that none of the groundwater samples contained formaldehyde above 100 $\mu\text{g/L}$
- Assume formaldehyde was present in groundwater at 100 $\mu\text{g/L}$
 - Corresponding soil gas concentration would be 1.38 $\mu\text{g/m}^3$
 - Estimated indoor air concentration of formaldehyde would be 0.003 $\mu\text{g/m}^3$
 - Below indoor air reporting limits
 - Below risk-based indoor air concentration of 0.19 $\mu\text{g/m}^3$



Level 4 Data Validation, Soil Gas

- ECL determined the presence of unidentified peaks and peak patterns in both the soil gas and sub slab chromatograms
- ECL reviewed all chromatograms and determined:
 - Pattern observed was primarily C5 – C11 aliphatic range fuel hydrocarbons
 - Samples for Tentatively Identified Compound (TIC) analysis were selected based on:
 - Samples with the highest number of peaks
 - Samples with the highest concentrations of peaks



Level 4 Data Validation, Soil Gas TICs

Table 9

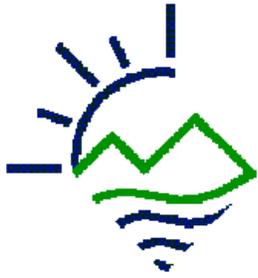
Soil Gas Analytical Results
Tentatively Identified Compounds (TICs)
 Autumnwood Development
 Wildomar, California

Tentatively Identified Compounds (TICs) ^a	Sample 12-SV-5-3PV			Sample 13-SV-5			Sample 7-SV-15		
	Soil Gas Concentration (µg/L)	Soil Gas Screening Level (µg/L)	Hazard Quotient (HQ)	Soil Gas Concentration (µg/L)	Soil Gas Screening Level (µg/L)	Hazard Quotient (HQ)	Soil Gas Concentration (µg/L)	Soil Gas Screening Level (µg/L)	Hazard Quotient (HQ)
C ₅ -C ₈ Aliphatics	7.2	350 ^b	0.02	40.1	350 ^b	0.1	10.6	350 ^b	0.03
C ₉ -C ₁₈ Aliphatics	1.18	150 ^b	0.01	ND	N/A	N/A	0.26	150 ^b	1.7E-03
Decahydro-2-methylnaphthalene (C ₉ -C ₁₆ Aromatic surrogate)	0.21	25 ^b	0.01	ND	N/A	N/A	ND	N/A	N/A
1-Ethyl-3-methylbenzene (xylene surrogate)	0.26	740 ^c	3.5E-04	ND	N/A	N/A	ND	N/A	N/A
1,3,5-Trimethylcyclohexane (cyclohexane surrogate)	0.11	3,150 ^c	3.5E-05	ND	N/A	N/A	ND	N/A	N/A
1,2,4-Trimethylcyclohexane (cyclohexane surrogate)	ND	N/A	N/A	ND	N/A	N/A	0.11	3,150 ^c	3.5E-05
	Hazard Index		0.04	Hazard Index		0.1	Hazard Index		0.03

^a All alkanes and alkenes were conservatively summed for each fraction; no toxicity data were available for 3-ethyl-oxirane, camphene and trans-1,2-dimethylcyclopropane, which were not included.

^b Soil gas screening levels were calculated using the TPH fraction RfC from the DTSC PEA Guidance Manual and an attenuation factor of 0.002.

^c Soil gas screening levels were calculated using the surrogate RfC from the EPA Region 9 RSL Table and an attenuation factor of 0.002.



Level 4 Data Validation, Sub-Slab TICs

Table 10

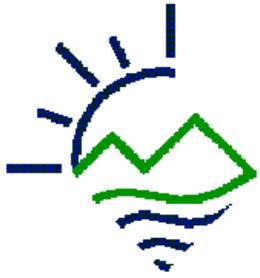
**Sub-Slab Soil Gas Analytical Results
Tentatively Identified Compounds (TICs)**

Autumnwood Development
Wildomar, California

Tentatively Identified Compounds (TICs) ^a	Sample 14G-SV			Sample 14B-SV			Sample 10B-SV		
	Soil Gas Concentration ($\mu\text{g}/\text{m}^3$)	Soil Gas Screening Level ($\mu\text{g}/\text{m}^3$)	Hazard Quotient (HQ)	Soil Gas Concentration ($\mu\text{g}/\text{m}^3$)	Soil Gas Screening Level ($\mu\text{g}/\text{m}^3$)	Hazard Quotient (HQ)	Soil Gas Concentration ($\mu\text{g}/\text{m}^3$)	Soil Gas Screening Level ($\mu\text{g}/\text{m}^3$)	Hazard Quotient (HQ)
C ₅ -C ₈ Aliphatics	109	14,000 ^b	0.01	246	14,000 ^b	0.02	30	14,000 ^b	2.1E-03
C9-C18 Aliphatics	345	6000 ^b	0.06	219	6,000 ^b	0.04	158	6,000 ^b	0.03
	Hazard Index		0.07	Hazard Index		0.06	Hazard Index		0.03

^a All alkanes and alkenes were conservatively summed for each fraction; no toxicity data was available for n-butyl alcohol, which was not included.

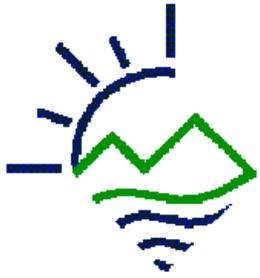
^b Soil gas screening levels were calculated using the TPH fraction RfC from the DTSC PEA Guidance Manual and an attenuation factor of 0.05.



Conclusions

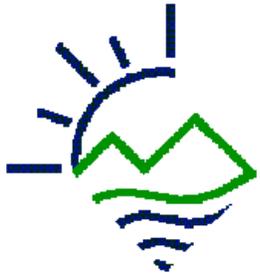
Based on multiple lines of evidence, the following conclusions were reached by DTSC regarding the potential for vapor intrusion at the Autumnwood Development

- Low levels of fuel related hydrocarbons and chlorinated compounds were detected in a diffuse pattern throughout the Study Area.
- No data reviewed, either historical or current, were indicative of a significant hazardous substance release or a significant source of contamination in soil, groundwater or soil gas.



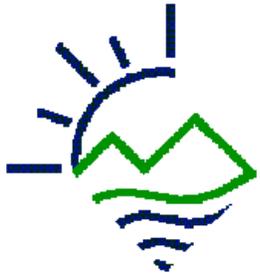
Conclusions Cont.

- VOCs detected in soil gas were so low or minimal that they do not pose a significant indoor air risk or hazard; and
- Based on multiple lines of evidence, including groundwater data, soil gas data, sub-slab soil gas data and previous indoor and outdoor air data, VOCs in the subsurface were so low or minimal that no discernable impact could be detected in the indoor air at Autumnwood.



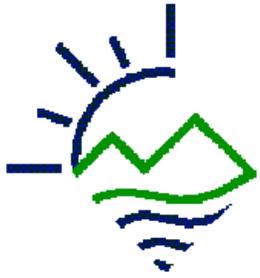
Independent Regulatory Agency Review

- DTSC submitted the Draft Autumnwood Development Investigation Report to the OEHHA and CDPH for an independent review and evaluation.
- OEHHA concluded the following:
 - “The data is of sufficient quality for DTSC to draw its conclusion that there is no evidence for a hazardous chemical release in the soil and groundwater, and that no detected chemical vapors from the soil are infiltrating homes at levels that would explain illnesses reported by the residents.”



Independent Regulatory Agency Review, Cont.

- CDPH concluded the following:
 - “Based on the data presented in the DTSC Report, CDPH agrees with DTSC’s conclusions regarding the investigation of the environmental media underneath the Autumnwood Development.”



DTSC Contact Information

For site documents and information, visit the DTSC website, Autumnwood Development Quick Link:
<http://www.dtsc.ca.gov/>

To contact DTSC staff regarding these investigation activities:

- **Dr. Bill Bosan**, Senior Toxicologist, (714) 484-5399, william.bosan@dtsc.ca.gov
- **Theo Johnson**, Senior Geologist, (714) 484-5414, theo.johnson@dtsc.ca.gov
- **Marina Perez**, Public Participation Specialist, (818) 717-6569 or toll-free, 1-866-495-5651, marina.perez@dtsc.ca.gov
- **Russ Edmondson**, Public Information Officer, (916) 323-3372, russ.edmondson@dtsc.ca.gov