Honeywell

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September 14, 2011

By Fed Ex

Mr. Brian Stonebrink
Arizona Department of Environmental Quality
1110 W. Washington Street
Phoenix, AZ 85007

Subject: Submittal of Honeywell's responses to the June 9, 2011 ADEQ and EPA comments on the *Final Focused Human Health Risk Assessment* (FHHRA) *Report, Honeywell 34th Street Facility, Phoenix, Arizona* dated March 2011

Dear Mr. Stonebrink:

On March 18, 2011, Honeywell International Inc. (Honeywell) submitted its *Final Focused Human Health Risk Assessment Report, Honeywell 34th Street Facility, Phoenix, Arizona* to the Arizona Department of Environmental Quality (ADEQ) and the U.S. Environmental Protection Agency (EPA). The ADEQ and EPA provided comments on this document on June 9, 2011. This letter transmits Honeywell's responses to those comments.

If you should have any questions or require discussion, please contact me at (973) 455-4279 or Tasha Lewis at 480-295-3932. For your convenience, my e-mail address is troy.j.meyer@honeywell.com and Tasha's email address is tasha.lewis@ch2m.com.

Sincerely,

Troy Kennedy
Honeywell - Health, Safety, Environment and Remediation
Remediation Portfolio Director

Copies w/attachment:

Jeanene Hanley, ADEQ (1 hard copy)
Martin Zeleznik, USEPA (2 hard copies)
Gerry Hiatt, USEPA (1 hard copy)
Janet Rosati, USEPA (1 electronic copy)
Sue Kramer, Shaw Environmental, Inc. (2 hard copies and 2 electronic copies)
Ben Lane, City of Phoenix Aviation (1 electronic copy)
Mary Moore, Lindon Park Neighborhood Associations (1 hard copy)
Rick Loewen, Honeywell (1 electronic copy)
Tao Wu, Honeywell (1 electronic copy)

Attachment 1
Honeywell Responses to the June 9, 2011 ADEQ and EPA Comments on the Final FHHRA Report Dated March 2011

Acronyms and Abbreviations

1,4-DX	1,4-dioxane
A.A.C	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
BSVE	biologically enhanced soil vapor extraction
CAP	corrective action plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	chemical of potential concern
ED	exposure duration
ELCR	excess lifetime cancer risk
EPA	United States Environmental Protection Agency
EPC	exposure point concentrations
FHHRA	focused human health risk assessment
FR	Federal Register
FS	feasibility study
HQ	hazard quotient
LUST	leaking underground storage tank
mg/kg	milligram per kilogram
MCL	maximum contaminant level
MTBE	methyl tert-butyl ether
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PAH	polynuclear aromatic hydrocarbons
PCE	tetrachloroethene or tetrachloroethylene
PSHIA	Phoenix Sky Harbor International Airport
RAGS	Risk Assessment Guidance for Superfund
RBSL	risk-based screening level
RI	remedial investigation

RME	reasonable maximum exposure
RSL	regional screening level
SGHHSL	Soil Gas Human Health Screening Levels
SRL	soil remediation level
TCE	trichloroethene or trichloroethylene
TM	technical memorandum
TPH	total petroleum hydrocarbons
$\mu g/m^3$	microgram per cubic meter
µg/L	microgram per liter
VAL	vapor action level
VI	vapor intrusion
VOC	volatile organic compound
WP	work plan

Comment No.	Pages	Section	Comment	Response
1			**Off-site Exposure Areas** It is not clear to a reader of the general public, until further into the document (approximately Section 2 or 3), that there are two off-site exposure areas having different receptor groups. The terminology referring to the PSHIA exposure area as "offsite PSHIA" vs. "PSHIA" interchangeably contributes to this in part. The other component contributing to this confusion is the location of the information regarding the residential off-site area remanded to Appendix H, noted several times throughout the text. [Note: Figure 3-3 footnote (3) incorrectly refers to the offsite exposure area risk estimates in Appendix I]. The executive summary (ES-3) indicates that the current and future residential receptor occurs only in the Off-site Exposure Area, followed by Exhibit ES-l which shows residents exposed to groundwater in Honeywell North, Honeywell South, and offsite PSHIA. In section 2, Exhibit 2-1, there is no indication off future residential for North, South, and PSHIA, but it is introduced in Exhibit 3-1 following the discussion of section 3.1.4 demonstrating that groundwater cannot be used in the study area. Understandably, due to prior discussions and agreement, the bulk of the information for the offsite scenario was largely placed in the appendices. However, for purposes of clarity, the sections noted may need a stronger presentation that there will be an evaluation of on-site (North and South) and off-site PHSIA future residential receptors for direct and indirect groundwater exposures regardless of the fact that the current/future "real" off-site residential receptor is relegated to evaluation in Appendix H. The rationale that these are kept separate should be reiterated, i.e., the COPCs for the "real" offsite resident are considered in the context of the greater commingled plume.	The text will be clarified with respect to "off-site" terminology. The "Off-site Phoenix Sky Harbor International Airport (PSHIA)" exposure area will be referred to as the "PSHIA" exposure area. The rationale for treating the Off-site Exposure Area separately will be further strengthened.
2		Exhibits ES-2 and 7-6	**1,4-Dioxane** Exhibits ES-2 and 7-6 have a footnote indicating that the less than 5% detection frequency of 1,4-dioxane may justify the removal of it from the COPC list in the future. It appears from the data present on the CD that	The adequacy of the 1,4-dioxane detection limit should be evaluated with respect to the ability to determine if significant risk exists. Since the 0.67-microgram per liter (µg/L) Regional Screening Level (RSL) is based on a 1E-6 target cancer risk, the 1-µg/L reporting limit corresponds to an excess lifetime cancer risk (ELCR) of 1.49E-6,

Comment No.	Pages	Section	Comment	Response
			many of the reporting limits for non-detects were 1 µg/L, and there were numerous parameter listing for U results of this contaminant. Since the predominant reporting level is less than the screening level of 0.67 µg/L, this may not prove the case with further data collection.	which should be rounded to 1E-6 using the Risk Assessment Guidance for Superfund (RAGS)-stipulated one significant figure. Thus, the 1-µg/L reporting limit offers adequate sensitivity for assessing detection frequency.
3	1.2.7.1		**Section 1.2.7.1, ADEQ Approved 2004 LUST Corrective Action Plan** This discussion is helpful in pointing out the genesis of the BSVE, and discusses the applicable Tier 1 corrective action standards at the time the CAP was approved. However, it is important to note that Tier 1 standards are not necessarily the corrective action standards that the residual vadose soil, smear zone, and groundwater concentrations that the "LUST site" will be compared to. Because of the vapor intrusion pathway, additional chemical contribution to the evaluation of health risk and hazard will extend beyond the MTBE, benzene, and naphthalene stated.	Comment acknowledged. However, consistent with the title of Section 1.2.7 (Previous Human Health Risk Assessments), this section is only intended to provide a summary of the prior documents. Section 1.2.7.1 summarizes the text directly from the ADEQ-approved *Revised Corrective Action Plan* (CAP)*, Honeywell 34th Street Facility, Phoenix, Arizona. ADEQ Facility No 0-002227, LUST File Nos. 0393.02 through 039310*. Because of the vapor intrusion pathway, Honeywell has evaluated the soil gas data for a wide range of analytes extending beyond MTBE, benzene, and naphthalene (refer to Section 2.5 Chemicals of Potential Concern [COPC] identification). Based on these data, Honeywell calculated cumulative risks/hazards using U.S. Environmental Protection Agency (EPA) risk-based concentrations (not Tier 1 corrective action standards), presented a map of the highest calculated risks and hazards regardless of depth (see Figures 5-1A), and identified the risk drivers. Honeywell is moving forward with the next step of the vapor intrusion evaluation and has submitted the *Prioritization and Selection of Buildings for a Phase 2 Soil Gas-to-Indoor Air Vapor Intrusion Assessment, Honeywell 34th Street, Phoenix, Arizona Technical Memorandum* (VI TM) and the *Phase 2 Soil Gas-to-Indoor Air Vapor Intrusion Assessment Work Plan Honeywell 34th Street Facility, Phoenix, Arizona* (VI WP), collectively known as the VI TM/WP to conduct indoor air sampling at the Honeywell 34th Street Facility. The VI TM/WP was submitted on August 23, 2011 to both ADEQ and EPA. While the CAP states that "the residual methyl tert-butyl ether (MTBE), naphthalene, and benzene remaining in groundwater will be evaluated at the completion of the active remediation of groundwater and free-phase hydrocarbons," the Final Focused Human Health Risk Assessment (Final FHHRA) evaluated risks associated with chemicals detected at the site (refer to Section 2.5 COPC Identification). Exhibit ES-2 and Exhibit 7-6 identify the COPCs by media and scenario based on the COPC identification process and calculated risks.
4		1.2.8.5	**Section 1.2.8.5, Vapor Action Levels**	While the biologically enhanced soil vapor extraction (BSVE) vapor action levels (VALs) have been used during the operation of the

Comment No.	Pages	Section	Comment	Response
			This section and the accompanying Appendix C was confusing to see in light of the discussion provided in the Draft Report. Previously, the draft document largely discussed VALs in association with either the Draft Appendix G (Underground Utility Vaults), or the BSVE system operation. It was not clear at that time that VALs other than "vault" VALs were going to being used as a trigger for "unacceptable" exposures to on-site workers should the forced-air design of the BSVE result in soil vapor concentrations exceeding these various VALs shown in this revised report. Neither the March 22, 2010, Technical Memorandum nor the 2006 CH2MHill document were reviewed for the purpose of estimating appropriate risk thresholds or exposures for on-site workers during this remediation period. Although the concept is a good one, it is not clear how or whether the BSVE operating conditions significantly affect assumptions of the J&E model, thereby affecting the accuracy of the risk estimates.	BSVE system, they were not used to estimate baseline risks for the vapor intrusion pathway in this FHHRA. The VAL information was included in the risk assessment document per a stakeholder's request and is for reference only. The evaluation of baseline risks was based on data collected pre-BSVE operation. The cumulative risks associated with the pre-BSVE data were greater than 1E-06 and therefore warranted a subsequent phase of vapor intrusion assessment. Honeywell submitted the VI TM/WP which also assesses the cumulative risks since the BSVE system was turned on in 2009. The J&E assumptions for the FHHRA calculations were intended to reflect baseline conditions, and the FHHRA data pre-date the BSVE system. Thus, the BSVE system has no impact on the baseline data and the FHHRA assumptions or calculations. However, based on the evaluation of new data collected under operational conditions (i.e., since the BSVE system was turned on in 2009), potential exposures are being mitigated by operation of the BSVE. The cumulative risks associated with data collected since the BSVE system was turned on were estimated using the same assumptions/calculations as those used in the FHHRA (i.e., VALs will not be used) and are presented in the VI TM/WP. As agreed with ADEQ and the EPA on June 30, 2010, the discussion regarding the VALs was moved to Appendix C. Communication regarding the VALs has been previously provided to ADEQ and EPA in the following documents: • Air Injection Pilot Test Work Plan (2005) • Air Injection Pilot Test Report (2006) • VAL Documents (2006 to 2010) • Underground Storage Tank Quarterly Remediation Status Reports (2006 to 2011)
5			**Uncertainty** It may be worth mentioning that due to the predominance of non-TO-15 data for soil gases and the differences in the target analytes among the methods used the indoor air vapor intrusion COPCs may warrant revision as more structured sub-slab soil gas sampling is conducted.	Honeywell conducted shallow soil gas surveys in the late 1990s and early 2000s as a sensitive method for identifying releases of site-related VOCs to soil. The analyte lists for these numerous samples were appropriately based on site knowledge. The detection limits for these non-TO-15 data were satisfactory relative to the source-characterization data quality objectives, and the resulting data were instrumental in identifying releases and clearing areas where releases had not occurred.

Comment No.	Pages	Section	Comment	Response
				Honeywell elected to include these data in the FHHRA because of the breadth of spatial coverage they provide, while being fully aware that (a) the analyte list targeted likely site-related chemicals and (b) the detection limits were, in many cases, above concentrations corresponding to 1E-06 but within the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) target risk range of 1E-06 to 1E-04 (most were less than 1E-05). These data could have been screened out in the data selection process for some of the reasons raised in this comment and in previous regulatory comments on this issue. However, Honeywell maintains that including these data was the correct choice and the information they provide is invaluable. The analysis and presentation of these data in the FHHRA do not necessitate revision of the COPC list for future investigations. While the site was characterized broadly using non-TO-15 data, TO-15 data were collected and focused on areas of known/significant releases. These data, combined with an overall site knowledge of chemical usage and characterization, adequately support the selection of vapor-intrusion COPCs. Honeywell is confident that the vapor intrusion COPC list identified in the revised FHHRA report is suitable for use in further vapor-intrusion investigations and, ultimately, for assessing remedies that conforms to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements.
6			**Off-Site Risk Estimates**: The risk assessment presents detailed information on vapor intrusion risks for numerous locations on Honeywell property. In contrast, relatively few risk estimates are developed for off-site exposures. Off-site vapor intrusion risks are a major U.S EPA concern because a large number of these properties are residential areas where children, the elderly and other sensitive receptors live or can otherwise be exposed and because exposures off-site will be more difficult for Honeywell to control. What plans exist to develop a more complete understanding of off-site vapor intrusion risks?	As agreed to with the agencies on June 30, 2010, the off-site risks associated with the "Off-site Exposure Area" will be incorporated into the sitewide Operable Unit (OU) 2 Remedial Investigation (RI)/Feasibility Study (FS).
7			**Screening of COPCs to COCs**: The Work plan specifies using risk-based screening levels and frequency of detection to screen COPCs (chemicals of potential concern) into or out of the risk assessment as	Agreed. Table 7-1 will be added to the FHHRA to further clarify the basis for including or excluding each analyte. This includes references to (a) the initial screening criteria mentioned in this comment (Section 2) and (b) the outcome for analytes retained

Comment No.	Pages	Section	Comment	Response
			COCs (chemicals of concern). While this is an accepted and appropriate procedure, it can create challenges for the 5 Year Review process *if not clearly documented*. The issue arises when, subsequent to the original risk assessment, there are significant future changes in toxicity values and/or detection limits. For example, a COPC may be screened out of the risk assessment based on the concentrations in impacted media being below (numerically less than) current risk-based screening levels (e.g., Superfund Regional Screening Levels, RSLs). However, if in the future, new toxicity information subsequently lowers the RSL, a 5 Year Review may not be able to determine protectiveness without additional assessment of that contaminant to determine if it makes a significant contribution to site-related risk. Having the original toxicity value clearly stated in the risk assessment, will allow a much easier future assessment about the risk contribution. Another example would be if a COPC has been screened out of further risk consideration due to a low frequency of detection and the detection limit is subsequently lowered. Then the 5 Year Review might conclude that additional investigation may disclose a significant frequency of occurrence (this is similar to the recent situation with respect to 1,4-dioxane at chlorinated solvent Superfund sites). Therefore, the FHHRA needs to include a section documenting the rationale, including numerical values, used for screening each COPC out of the risk assessment. It would be most helpful if this were summarized in a table presenting each COPC, rationale for exclusion (e.g., maximum detect less than risk-based screening level or frequency of detection less than 5%) and the relevant numerical values (e.g., soil, water, air RSL or detection limit range). This discussion should specifically address breakdown products of PCE, TCE and 1,1,1-TCA to include the dichloroethenes, dichloroethanes, vinyl chloride and chloroethane (in addition to any other COPCs).	through the quantitative risk assessment presented in Sections 3 though 5. The toxicity factors were based on values listed in the EPA's RSL table and were already presented in Appendix G. The following clarifying statement regarding breakdown products will be added to Section 2.5.1. *Some constituents associated with site releases are subject to biodegradation, resulting in the potential presence of daughter products. For example, degradation of PCE and TCE can form dichloroethenes and vinyl chloride and degradation of 1,1,1-TCA can form dichloroethanes and chloromethane. The potential presence of such daughter product has been considered in the data quality objectives for site investigations and routine monitoring, and they have been widely analyzed in soil, soil gas, and groundwater samples. Thus there are sufficient data to assess the nature, extent, and potential risks associated with biodegradation daughter products.*
8			**Construction Worker Exposure Scenario:** The	Use of the 1-year exposure duration for the construction-worker

Comment No.	Pages	Section	Comment	Response
			current exposure scenario for a construction worker is not health-protective and needs to be adjusted. The current construction worker exposure assessment assumes an exposure duration (ED) of only 1 year (Table 3-6). While this may be a reasonable assumption for a construction worker's exposure to contamination at the 34th Street facility, it is not a health-protective assumption for the construction worker over the course of a career. A one year ED inherently assumes that the construction worker has never before, and will never again, work at any contaminated site–this is an unreasonable assumption. It is highly likely that an individual construction worker exposed to sub-surface contamination at one industrial site (e.g., Honeywell 34th Street) has similarly been exposed previously at other industrial sites and will be exposed again in me future at still others. In order to provide a level of health protection commensurate with others EPA is charged with protecting (including on-site industrial workers, whose ED is assumed to be 25 years, and residents, whose ED is assumed to be 30 years) the ED has to be increased. Lacking specific data for Phoenix-based construction workers, a reasonable default would be to assume that a construction worker spends one-third to one-half of a career exposed to contamination and use an ED value of 8.3 to 12.5 years.	scenario is protective and consistent with multiple EPA guidance and directives. In contrast, support for the concepts underlying this comment and its specific recommendations cannot be found in EPA or Arizona regulations, guidance documents, or policies. The following statement encapsulates the logical extension of the EPA's *ad hoc* policy statement provided in this comment: > When conducting a CERCLA baseline human-health risk assessment responsible parties must now account for receptors' hypothetical exposures at unrelated sites over which the responsible party has no control and about which no knowledge exists. These hypothetical exposures and the associated risks will serve as a basis for defining remedial goals, selecting remedies and assessing remedy performance under the NCP in the same manner that actual, site-specific characterization, exposure and risk information is currently applied. Promulgation of this concept would require an overhaul of existing EPA risk-assessment and risk-management policies, both as written and as practiced since the inception of CERCLA. The EPA Office of Solid Waste and Emergency Response (OSWER) guidance that specifically addresses methodology for assessing construction-worker exposures is the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002 - OSWER 9355.4-24). This document defines the construction worker receptor as follows (underline emphasis added): > ***Construction Worker**. This is a short-term adult receptor who is exposed to soil contaminants during the work day for the duration of a single construction project (typically a year or less). If multiple non-concurrent construction projects are anticipated, it is assumed that different workers will be employed for each project.* This supports the following key points: (a) the EPA considers construction-worker exposure durations of a year or less protective of human health and (b) the EPA discounts the idea accounting for consecutive periods of construction worker exposure even at a single site. At an even more fundamental level is the bedrock concept of reasonable maximum exposure (RME), which underlies all of CERCLA risk assessment methodology. RAGS Part A defines RME

Comment No.	Pages	Section	Comment	Response
				as (underline emphasis added): *The reasonable maximum exposure is defined here as the highest exposure that is reasonably expected to occur <u>at a site</u>.* EPA Region 9's administrative record shows a clear history of using 1-year exposure duration for the construction worker scenario. For example, this exposure factor has been used in the following documents: AMCO Chemical Superfund Site (CH2M HILL. 2011. Remedial Investigation Report, Final, AMCO Chemical Superfund Site, Oakland, California. Prepared for U.S. Environmental Protection Agency Region 9. January) Del Amo Superfund Site (GeoSyntec. 2006. Baseline Risk Assessment Report. Del Amo Superfund Site, Los Angeles, California, Prepared for Shell Oil Company and the Dow Chemical Company, September) Former Montrose Superfund Site – now Ecology Control Industries Property (Innovative Technical Solutions. 2010. Final Human Health Risk Assessment. Historic Storm Water Pathway – South. Ecology Control Industries Property, Torrance, California. Prepared for U.S. Environmental Protection Agency Region 9, August) Omega Chemical Superfund Site (CDM. 2007. Final Human Health Risk Assessment for On-Site Soils. Omega Chemical Superfund Site. Whittier, California. Prepared for Omega Chemical Site PRP Organized Group, November) Honeywell has conducted meetings and conference calls with EPA Region 9's risk assessor and managers to discuss the issue raised in this comment and verbally presented the rationale and supporting information previously presented. The EPA's response, to paraphrase, has been that RAGS and the Soil Screening Guidance are just guidance documents and that EPA Region 9 reserves the right to establish new policies outside of those presented in the guidance. However, the following EPA and/or Arizona state policies and regulations should be carefully considered before EPA Region 9 establishes new policies:

Comment No.	Pages	Section	Comment	Response
				1. It is the EPA's position, as stated in the 1990 preamble to the final rulemaking (55 Federal Register [FR] 8666) for the NCP (40 *Code of Federal Regulations* [CFR] 300) "*that a uniform process should be used to develop risk assessments and cleanup levels.*" The NCP preamble further states that RAGS was specifically developed "*to improve program efficiency and consistency*." Honeywell agrees with the agency that uniform and consistent application of risk-assessment and risk-management policies is necessary and that RAGS embodies such policies. As previously noted, RAGS does not support incorporation of hypothetical exposures from unknown sites outside a responsible party's knowledge or control. 2. The NCP is not guidance but is instead promulgated regulation representing a primary and enforceable statement of EPA policy. The statements within the NCP and the 1990 preamble indicating that exposures/risks are to be assessed and remedies are to be selected based on conditions "at a site" are too numerous to list. The section of the NCP describing the purpose of the Remedial Investigation and Baseline Risk Assessment provides perhaps the most relevant statement (emphasis added): *The lead agency shall characterize the nature of and threat posed by the hazardous substances and hazardous materials and gather data necessary to assess the extent to which* ***the release*** *poses a threat to human health or the environment or to support the analysis and design of potential response actions.* (40 CFR 300 430[d]) Honeywell has reviewed the remainder of the NCP, the 1990 NCP preamble, and the text of CERCLA for direct or even inferential support for EPA Region 9's position embodied by this comment. No such supporting references were identified. It is also important to consider that the methods used to derive EPA soil RSLs (www.epa.gov/region9/superfund/prg/) and the Soil Remediation Levels (SRLs) listed in Arizona Administrative Code (A.A.C.) Title 18 Chapter 7 (www.azsos.gov/public_services/Title_18/18-07.pdf) would need to be revised if a longer exposure duration (e.g., 12.5 years) were assumed for a construction worker based on exposure at other industrial sites. This is because nonresidential EPA RSLs and ADEQ SRLs are not

Comment No.	Pages	Section	Comment	Response
				based on a construction worker scenario, they do not account for exposure at other industrial sites, and the construction worker would be the more sensitive receptor for many chemicals compared with an industrial/commercial worker. This is important because A.A.C. R18-7-203(A) states that "*a person subject to this Article shall remediate soil so that any concentration of contaminants remaining in the soil after remediation is less than or equal to .... the pre-determined remediation standards prescribed in R18-7-205.*" It is also relevant when applying EPA RSLs since these values are used when "*identifying sites, or portions of sites, which warrant no further action or investigation*" (www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). In summary, Honeywell maintains that EPA (a) has not previously/consistently supported incorporation of hypothetical exposures from other sites into CERCLA human-health risk assessment; (b) the 1-year exposure duration is protective for a construction worker; and (c) the EPA request in this comment is not consistent with EPA and ADEQ policies, regulations, and guidance. Further internal agency review should be considered before issuing *ad hoc* policy statements of the magnitude implied by this comment. Honeywell respectfully requests that the EPA formally acknowledge withdrawal of this comment. As suggested by ADEQ in the August 8, 2011 conference call, the Uncertainty Analysis (Section 6) of the FHHRA will be revised to include a discussion of the issues raised in this comment/response about the non-site-related background exposures/risks for the construction worker and the impact on the overall conclusions.
9			**Potential Risks From Single-Event Exposures**: Exposure point concentrations for commercial/industrial and construction worker exposures were calculated using contaminant concentration data grouped by exposure area. While this is appropriate for assessing risks from chronic exposures, where there is repeated contact integrated across the contaminated area, it dilutes the impact of direct contact with specific locations where maximum detected concentrations exist. If maximum detect values are sufficiently higher than EPC values (which usually represent an estimate of the mean) it is possible that single-event exposures to the maximum detected concentration could elicit an	A table similar to Table 2-2 has been prepared and will be added to the Revised Final FHHRA Report. This table compares the sitewide maximum detected concentrations to noncancer industrial RSLs. The purpose of preparing this table was to select analytes for further consideration of acute health effects. This was done on the basis that the industrial/chronic/noncancer RSLs provide conservative screening criteria since acute oral references doses are typically many times higher (often orders of magnitude) for acute versus chronic effects. The result of this analysis indicated that none of the maximum soil concentrations exceeded their respective industrial noncancer screening levels. Thus, further evaluation of acute or subchronic health effects is unwarranted. The FHHRA will be revised to include this discussion.

Comment No.	Pages	Section	Comment	Response
			acute or sub-chronic health impact. Therefore it would be useful to compare maximum detected concentrations with acute or sub-chronic toxicity values to determine if this possibility exists.	
10			**1,4-Dioxane Detection Limits**: 1,4-dioxane (1,4-DX) is a common contaminant at chlorinated solvent Superfund sites, due to its use as a solvent stabilizer. There is an unexpectedly low frequency of detection of 1,4-DX at this Honeywell site, which suggests that historical detection limits at the site have not always been sufficient to detect significant 1,4-DX concentrations. A thorough review of detection limits and re-consideration of its potential role as a COC should be performed and thoroughly discussed in the risk assessment. If a decision is made to not include 1,4-DX as a contaminant of concern in the risk assessment, this needs to be made transparently clear in the COPC to COC section.	See response to ADEQ Comment No. 2.
11			**Soil Gas Units**: Tables in the draft present soil gas concentrations in units of µg/L (micrograms per liter); these should be changed to units of $\mu g/m^3$ (micrograms per cubic meter) to be consistent with units in which EPA, and others, express the toxicity values used for risk assessment.	Tables containing soil gas data have been revised and will be included in the Revised Final FHHRA to present the concentrations in micrograms per cubic meter ($\mu g/m^3$) to be consistent with presentation of data in OU 1 and OU 3.
12		Appendix C	**Vapor Action Levels (VALs)**: Some clarification is needed on the development and application of Vapor Action Levels specified in Appendix C. It is not clear if these are meant to be risk-based soil vapor screening levels used to interpret the potential risks posed by vapor intrusion exposures for the general public or if they have some other use. If intended as soil vapor screening levels, it is noted they are not in agreement with the Soil Gas Human Health Screening Levels (SGHHSLs) developed by U.S. EPA for assessing vapor intrusion potential at sites within Arizona (as illustrated by the table below comparing of VALs and SGHHSLs for PCE and TCE):	See response to ADEQ Comment No. 4.

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<tr><th>Comment No.</th><th>Pages</th><th>Section</th><th>Comment</th><th>Response</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Chemical</th><th>SGHHSL</th><th>BSVE Tier 1 (10-6)</th><th>Tier 1 Long Term (10-6)</th></tr>
<tr><td>PCE</td><td>180</td><td>27,000</td><td>21,000</td></tr>
<tr><td>TCE</td><td>520</td><td>79,000</td><td>7,000</td></tr>
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The SGHHSLs were developed to be protective of residential exposures while the VALs appear to have been developed to protect workers. Since residential exposure scenarios assume more frequent and longer duration exposure, it is anticipated that residential screening levels will be more conservative (i.e., set at lower concentrations), but the magnitude of difference is higher than would be expected based solely on residential vs. commercial/industrial exposure scenarios. Additional information on the intended use of VALs would be appreciated.
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<tr><td>13</td><td></td><td></td><td>Leaching of COPCs to Groundwater: The draft FHHRA states that “…leaching of COPCs in soil to groundwater is potentially complete but insignificant pathway based on modeling results using VLEACH” and further notes that “modeling predicted that vadose zone chemicals will not impact groundwater to concentrations above MCLs; therefore, this transport pathway was not evaluated quantitatively”. Even though its contribution to groundwater contamination may be at less than MCL concentrations, this does not mean that a COPC’s contribution to risk is negligible.</td><td>A table comparing the VLEACH results (LFR Levine Fricke, 2004) to the maximum contaminant levels (MCLs), cancer RSLs, and noncancer RSLs has been prepared and will be added to the Revised Final FHHRA. As reported previously, none of the predicted results exceeded their respective MCLs. Two analytes, 1,1-dichloroethane and trichloroethene, slightly exceeded their cancer RSLs based on 1E-06 cancer risk. None exceeded their respective noncancer RSLs. The two exceedances do not equate to ELCRs significantly greater than 1E-06 indicating that (1) the soil-to-groundwater contribution to overall future risk is negligible and (2) further assessment of this pathway is unwarranted.</td></tr>
<tr><td>14</td><td></td><td></td><td>Screening HQ Value: For screening purposes a Hazard Quotient value of 0.1 (not 1.0) should be used. This will help ensure that cumulative risks from exposure to multiple COPCs with additive non-cancer hazards will not be overlooked when each alone contributes an HQ less than unity.</td><td>A Hazard Quotient (HQ) value of 0.1 will be applied in the Revised Final FHHRA and is not expected to have any effect on the conclusions.</td></tr>
<tr><td>15</td><td></td><td>Table 3-6</td><td>Table 3-6 lists exposure frequency assumptions for child industrial and construction workers–assumed to be typographical error (?)</td><td>Consistent with the comment, the typographical errors will be corrected.</td></tr>
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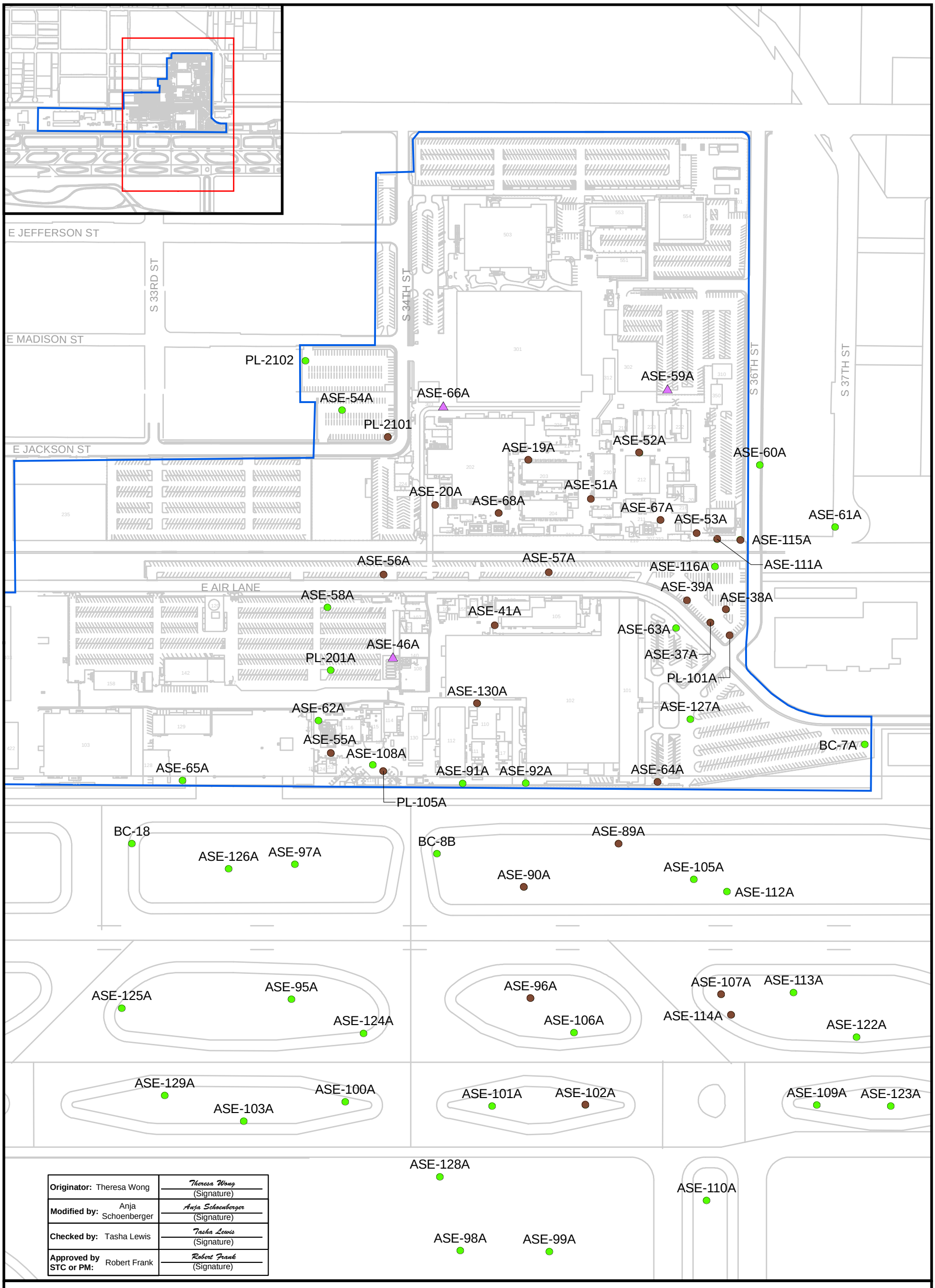
Comment No.	Pages	Section	Comment	Response
16		1.2.5.3	Specify numerical value of December 1997 residential soil remediation level discussed in 1.2.5.3.	The December 1997 residential SRL used to remediate the mercury found adjacent to Building 301 in 2003 was 6.7milligrams per kilogram (mg/kg) (mercury elemental). Soil with mercury concentrations exceeding 6.7 mg/kg were removed from the subsurface. The revised and current residential SRL (as of May 2007) for mercury is 23 mg/kg (mercury and compounds). Therefore, soil was remediated to below the current residential SRL as well. The Revised Final FHHRA will be edited to include this information.
17		1.2.5.4	Specify area and adjacent buildings for free-product removal action discussed in 1.2.5.4.	The free-product removal specified in Section 1.2.5.4 (7,500 gallons total) refers to free-product recovery from 27 different Honeywell monitoring wells distributed across Area 1 and Area 2 of the Facility. As part of this response, a figure of the Facility identifying the monitoring wells from which free product has been recovered to show the proximity of the wells to the Facility buildings is provided (see attached figure). The two monitoring wells specifically referred to in Section 1.2.5.4 (ASE-19A and ASE-20A) are located on opposite sides (northeast and southwest) of Building 202 in Area 2 of the Facility. The Revised Final FHHRA will be clarified accordingly.
18		1.2.5.5	Specify contaminants and numerical remedial values for remediation activity discussed in 1.2.5.5.	The remediation activity discussed in Section 1.2.5.5 involved a shallow spill of Mobilmet Sigma cutting oil in 2005 that was remediated by excavating the contaminated soils. Soil samples were analyzed for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and polynuclear aromatic hydrocarbons (PAHs), and the amount of soil removed was driven by TPH concentrations using the 1997 residential SRL of 4,100 mg/kg as the numerical remedial value. While the removal was driven by TPH concentrations in excess of the 1997 residential SRL, PAHs and VOCs were compared to and were below their respective residential SRLs. ADEQ's closure letter for this case file number stated that "remaining contaminant concentrations are at or below the residential Soil Remediation Levels as specified in Arizona Administrative Code (A.A.C.) R18-7-201 et seq. for the contaminants of concern." The Revised Final FHHRA will be edited to include this information.
19		1.2.6.1	Specify contaminants and numerical release/remedial values for BSVE activity discussed in 1.2.6.1.	The BSVE system is the approved remedy for soils and free product for Honeywell's Leaking Underground Storage Tank (LUST) program, which is under the oversight of ADEQ's Waste Programs Division, LUST Enforcement Unit. Details regarding operation of the system and its progress toward meeting the approved corrective action standards are presented to ADEQ and the EPA in Honeywell's

Comment No.	Pages	Section	Comment	Response
				periodic remediation status reports. The following text will be added to Section 1.2.6.1: *Per Honeywell's approved Corrective Action Plan (CAP), the contaminants of concern for the BSVE remedy are benzene, toluene, ethylbenzene, xylenes, methyl-tert-butyl ether, polynuclear aromatic hydrocarbons, and total petroleum hydrocarbons. The CAP presented the Tier 1 corrective action standards for the remedy, which were based on (at the time the CAP was submitted) ADEQ's 1997 residential soil remediation levels (RSRLs) and are currently based on the revised RSRLs (ADEQ, May 2007).* The methodology and results presented in the FHHRA constitutes a Tier 3 methodology under Arizona's LUST framework and will be the basis for deriving final cleanup criteria.
20		1.2.7.1	Specify contaminants and numerical risk-based screening levels for Corrective Action activity discussed in 1.2.7.1.	The Corrective Action activity discussed in Section 1.2.7.1 is the same activity (approved CAP) described in Section 1.2.6.1 and therefore has the same corrective action standards as those described in the FHHRA and in response to Comment 19.
21		Exhibit 3-1	Explain why Exhibit 3-1 notes a complete exposure pathway for contact with impacted surface soil in the off-site area.	This was an error (i.e., the exposure pathway for contact with impacted surface soil in the off-site area is incomplete), and Exhibit 3-1 will be corrected.



Originator:	Theresa Wong	*Theresa Wong* (Signature)
Modified by:	Anja Schoenberger	*Anja Schoenberger* (Signature)
Checked by:	Tasha Lewis	*Tasha Lewis* (Signature)
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Legend

- UST Groundwater Monitoring Well
- UST Groundwater Monitoring Well from which Free Product has been Recovered
- UST Groundwater Monitoring Well Connected to BSVE System
- Street and Airport Features
- Honeywell Facility

N
W E
S

0 150 300 600
Feet

Notes:
1. UST = Underground Storage Tank
2. BSVE = Biologically-enhanced Soil-vapor Extraction

FIGURE 1
UNDERGROUND STORAGE TANK GROUNDWATER MONITORING WELLS FROM WHICH FREE PRODUCT HAS BEEN RECOVERED

Honeywell 34th Street Facility
Phoenix, Arizona

CH2MHILL

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\FHHRA RTC_PHX_Fig1_UST_Monitoring_Well_Network.ai (09/2011)