DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	Yakima Hops, Inc. and Hop Union USA, Inc
Facility Address:	P.O. Box 1411; Yakima, WA 98907 (approx. 121 acres at 1st Ave NW in Mabton, Yakima County)
Facility EPA ID #:	WAH 0001 0488

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

_____X_____ If yes - check here and continue with #2 below.
_____ If no - re-evaluate existing data, or
_____ if data are not available skip to #6 and enter"IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	IN	Rationale / Key Contaminants
Groundwater	X			See below
Air (indoors) [2]		X		No significant VOC detections at the site in groundwater and soil.
Surface Soil (e.g., <2 ft)		X		See below.
Surface Water		X		See below.
Sediment		X		See below
Subsurf. Soil (e.g., >2 ft)		X		See below.
Air (outdoors)		X		No significant VOC detections at the site in groundwater and soil.

___ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

___ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Site Description:
The site includes a hop farm, residence, equipment storage areas, an area where poles used in hop farming were treated with a diesel based wood preservative solution containing Pentachlorophenol (PCP), and an area where drums containing used motor oil were stored. The site has been used for agricultural purposes since at least 1957. Hop pole wood treating and storage had occurred at the site since at least the early 1980s. The residence is located approximately 790 feet south west of the former hop pole dip tanks associated with the main PCP contamination at the site and there is a hop field between the residence and former dip tanks/hop pole storage areas. The residential well is approximately 765 feet to the southwest of the three monitoring wells initially installed in the former dip tank area. Groundwater flow at the site is northeasterly; therefore the residential well is upgradient of the former dip tanks and associated monitoring wells.

See attached Figure 2 for a site map/overview (from the February 2005 Site Characterization and Interim Corrective Action Measures Report). Areas to the north of the site are agricultural grazing lands, lakes, the Yakima River and associated wetlands. Other than the on-site seasonal irrigation pond, the nearest surface water body is Round Lake, which is located in the Yakima River floodplain approximately 200 feet northeast of the former dip tanks. There is an unnamed tributary draining into the lake approximately 360 feet north of the site. The Yakima River is approximately 0.5 miles north of the site.

The following discussions of whether human health exposures are under control are in regards to the current use of the site – agricultural (industrial). A future change in use to residential will require reassessment of the human health exposure.

Groundwater

The most recent on-site monitoring well groundwater results (November 4, 2004) show PCP is below levels of concern. The domestic well was sampled on October 4, 2004. Monitoring results showed PCP was non-detect.

Site groundwater is now non-detect for PCP and with the exception of a 0.315 ug/L detection in one well in 2002, has been non-detect in repeated monitoring between April 30, 2002 and November 2004 (the highest detection was 7.6 ug/L). It is unknown how much, if any, PCP contaminated groundwater historically reached the lakes/wetlands/Yakima River prior to removal of the units. See the surface water discussion for further information.

Metals were analyzed in the initial round of samples for MW-1, MW-2 and MW-3 (11/9/2000). At that time the metals levels were below EPA maximum contaminant levels (MCLs) for drinking water and Washington State Model Toxics Control Act (MTCA) levels of concern for residential (MTCA B) and industrial (MTCA C) groundwater cleanup goals. Since metals were not contaminants of concern at the time, no further metals monitoring was considered.

Upon comparing historical monitoring well metals data against current NWQC, MTCA criteria, and federal MCLs, arsenic and lead now may be contaminants of concern at the site. The tables below summarize current/historic PCP, arsenic and lead levels (all criteria and results are in ug/L) and groundwater levels of concern:

	Highest PCP result	Most recent PCP result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	2.3	ND	1100	7.3
MW-2	2.32	ND	1100	7.3
MW-3	**7.6**	ND	1100	7.3
MW-4*	ND	ND	1100	7.3
MW-5*	ND	ND	1100	7.3

* Installed at a later date, only one set of data.

Samples collected 11/9/2000	Arsenic result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	**26.0**	**11**	**0.58**
MW-2	**21.0**	**11**	**0.58**
MW-3	**17.0**	**11**	**0.58**

Samples collected 11/9/2000	Lead result	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	**33.0**	NR	NR
MW-2	**29.0**	NR	NR
MW-3	**9.0**	NR	NR

NR = not researched

Background levels of lead and arsenic in groundwater near the site is unknown. Although arsenic and lead may become contaminants of concern for the site, they are not at levels of concern for human health under current use conditions (agricultural with a single residence upgradient from historic hop pole treating activities) as the monitoring wells are not used as domestic water supplies. Under current use conditions, ‘contaminated’ groundwater on/from the site is not a completed exposure pathway for human health.

Outdoor/Indoor Air

Air monitoring has not been required for this facility as no significant VOC detections at the site in groundwater and soil have been documented.

Surface Water

New/future surface water contamination has now been minimized due to interim measures taken to remove contaminated soils. See the discussion under sediment regarding the irrigation pond. See the discussion under surface soil/subsurface soil and groundwater for potential historical contamination pathways.

Since PCP has a high affinity to adsorb to soils, it is considered sufficiently unlikely that PCP contained in groundwater would be detected in surface water and therefore confirmation sampling of surface water was not conducted.

Background levels of lead and arsenic in groundwater near the site is unknown. Even if the arsenic and lead groundwater 'contamination' is due to heretofore undocumented use of materials containing arsenic and lead, the contamination is only known to be in the monitoring wells associated with the historic wood treating process and the data was collected four years before the corrective actions taken to address soil and groundwater contamination from the PCP wood treating process. It is unknown if the groundwater from the monitoring wells ends up migrating into Round Lake/wetlands (Yakima River flood plain) to the north and/or the Yakima River. Even if site groundwater were to reach the river, there would be significant dilution long before it reaches the river a half a mile away. It is likely the adjacent wetlands/lake would act as a buffer between the site and the Yakima River. Round Lake and the wetlands are not known to be areas used for recreational fishing. Groundwater to off-site surface water is not considered to be a completed exposure pathway for human health.

Sediment

The only sediment on the site that could potentially be contaminated is sediment in the irrigation ponds with a bank at least 20 feet lower than the surface adjacent to the former dip tanks. According to the Site Characterization and Interim Corrective Action Measures Report (ICAM) the pond is used seasonally to store irrigation water and no practices that could potentially result in a hazardous substance release, or evidence that a hazardous substance release has occurred, have been identified in this area.

New/future sediment (both on and off site) contamination from current contaminants of concern has now been minimized due to interim measures taken to remove contaminated soils.

Based on a review of available information and data, EPA has concluded that activities on site are unlikely to have resulted in significant contamination of sediment.

Surface soil/subsurface soil (remaining discussion is specific to areas of concern on the site)

Dip tank area contamination:
Remaining product and dip tanks associated with the pole preservation process have been removed. PCP contaminated soil was removed to 12 feet (14 feet in a small area just east of the tanks) below ground surface (bgs). Confirmation samples taken at a depth of 6 feet along the walls of the excavated area showed PCP to be ND.

Known PCP contamination has been removed to levels below the cleanup goal (3 mg/Kg) agreed to by EPA and the Yakama Tribe. However, prior to a change in land use, further characterization of soil, especially at the surface, will be required west and south of the excavation area. Worst case hypothetical surface PCP contamination is below levels protective of current land use (industrial).

Treated hop pole storage area contamination/dioxin risk assessment:

Known PCP contamination has been removed to levels below the cleanup goal. However, prior to a change in land use, further characterization of soil, especially at the surface, will be required near/around storage areas already evaluated/excavated for PCP contamination. There may also be further storage and/or runoff pathways that need to be sampled. However, worst case hypothetical surface PCP contamination (based on historical data) is below levels protective of current land use (industrial).

PCP solutions are known to contain traces of dioxins/furans. Based on limited historical information on dioxin and furan levels in the soils historically contaminated with PCP, EPA required the collection of a dioxin/furan sample in the three excavated areas associated with historic hop pole storage and PCP contamination. The collection of these three dioxin samples was from native soil underlying the excavated areas that were backfilled. These three composite samples were collected in April 2006 and the results are summarized in a July 31, 2006, draft dioxin risk assessment (RA). The RA shows that the human health risk associated with the results of the three composite samples is less than $1X10^{-5}$ for industrial use, below the level of concern. The dioxin risk assessment is currently being reviewed by EPA to determine if a future residential use scenario would pose a risk greater than $1X10^{-5}$.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No	No	No	No
Air (indoors)	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	No	_No_	No	No	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
Air (outdoors)	No	No	No	No	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__X__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Contaminated groundwater is not a complete exposure pathway for on-site workers as monitoring well sampling stopped in 2004 (after multiple rounds of monitoring showed that PCP was no longer detected in the groundwater).

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

   _____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   _____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   _____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

   Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Yakima Hops, Inc. and Hop Union USA, Inc facility, EPA ID # WAH 0001 0488, located at 1st Ave NW in Mabton, Yakima County, WA, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - "Current Human Exposures" are NOT "Under Control."

_____ IN - More information is needed to make a determination.

Completed by	(signature)		Date	
	(print)	Laura Castrilli		September 28, 2006
	(title)	Environmental Scientist		

Supervisor	(signature)		Date	
	(print)	Rick Albright		
	(title)	Director, Office of Air Waste and Toxics		
	(EPA Region or State)	EPA Region 10		

Locations where References may be found:
RCRA site files U.S. EPA Region 10 1200 Sixth Avenue, AWT-121 Seattle, WA 98404

Contact telephone and e-mail numbers

(name)	Laura Castrilli
(phone #)	206-553-4323
(e-mail)	castrilli.laura@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final

2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	Yakima Hops, Inc. and Hop Union USA, Inc
Facility Address:	P.O. Box 1411; Yakima, WA 98907 (approx. 121 acres at 1st Ave NW in Mabton, Yakima County)
Facility EPA ID #:	WAH 0001 0488

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__X__ If yes - check here and continue with #2 below.
_____ If no - re-evaluate existing data, or
_____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__**X**___ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.
_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."
_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Site Description:

The site includes a hop farm, residence, equipment storage areas, an area where poles used in hop farming were treated with a diesel based wood preservative solution containing Pentachlorophenol (PCP), and an area where drums containing used motor oil were stored. The site has been used for agricultural purposes since at least 1957. Hop pole wood treating and storage had occurred at the site since at least the early 1980s. The residence is located approximately 790 feet south west of the former hop pole dip tanks associated with the main PCP contamination at the site and there is a hop field between the residence and former dip tanks/hop pole storage areas. The residential well is approximately 765 feet to the southwest of the three monitoring wells initially installed in the former dip tank area. Groundwater flow at the site is northeasterly; therefore the residential well is upgradient of the former dip tanks and

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

associated monitoring wells.

See attached Figure 2 for a site map/overview (from the February 2005 Site Characterization and Interim Corrective Action Measures Report). Areas to the north of the site are agricultural grazing lands, lakes, the Yakima River and associated wetlands. Other than the on-site seasonal irrigation pond, the nearest surface water body is Round Lake, which is located in the Yakima River floodplain approximately 200 feet northeast of the former dip tanks. There is an unnamed tributary draining into the lake approximately 360 feet north of the site. The Yakima River is approximately 0.5 miles north of the site.

Groundwater

The most recent on-site monitoring well groundwater results (November 4, 2004) show PCP is below levels of concern. The domestic well was sampled on October 4, 2004. Monitoring results showed PCP was non-detect.

Site groundwater is now non-detect for PCP and with the exception of a 0.315 ug/L detection in one well in 2002, has been non-detect in repeated monitoring between April 30, 2002 and November 2004 (the highest detection was 7.6 ug/L). It is unknown how much, if any, PCP contaminated groundwater historically reached the lakes/wetlands/Yakima River prior to removal of the units.

Metals were analyzed in the initial round of samples for MW-1, MW-2 and MW-3 (11/9/2000). At that time the metals levels were below EPA maximum contaminant levels (MCLs) for drinking water and Washington State Model Toxics Control Act (MTCA) levels of concern for residential (MTCA B) and industrial (MTCA C) groundwater cleanup goals. Since metals were not contaminants of concern at the time, no further metals monitoring was considered.

Upon comparing historical monitoring well metals data against current MTCA criteria, and federal MCLs, arsenic and lead now may be contaminants of concern at the site. The tables below summarize current/historic PCP, arsenic and lead levels (all criteria and results are in ug/L) and groundwater levels of concern:

	Highest PCP result	Most recent PCP result	MTCA A	MTCA B non-carcinogen	MTCA B carcinogen	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	2.3	ND	RND	480	0.731	1100	7.3
MW-2	2.32	ND	RND	480	0.731	1100	7.3
MW-3	**7.6**	ND	RND	480	0.731	1100	7.3
MW-4*	ND	ND	RND	480	0.731	1100	7.3
MW-5*	ND	ND	RND	480	0.731	1100	7.3

* Installed at a later date, only one set of data.

ND at 0.236 or 0.237 ug/L
RND = Researched-No Data

Samples collected 11/9/2000	Arsenic result	MCL	MTCA A	MTCA B Non-carcinogen	MTCA B carcinogen	MTCA C non-carcinogen	MTCA C carcinogen
MW-1	**26.0**	10	5	4.8	.058	11	0.58
MW-2	**21.0**	10	5	4.8	.058	11	0.58
MW-3	**17.0**	10	5	4.8	.058	11	0.58

Samples collected 11/9/2000	Lead result	MTCA A	MTCA B/C non-carcinogen	MTCA B/C carcinogen
MW-1	**33.0**	15	NR	NR
MW-2	**29.0**	15	NR	NR
MW-3	9.0	15	NR	NR

NR = not researched

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

__**X**___ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Since pentachlorophenol is now non-detect, the answer for this contaminant is yes. However, the answer for arsenic and lead is unknown since arsenic and lead only recently became potential contaminants of concern for the site.

Background levels of lead and arsenic in groundwater near the site is unknown. Although arsenic and lead may become contaminants of concern for the site, they are not at levels of concern for human health under current use conditions (agricultural with a single residence upgradient from historic hop pole treating activities) as the monitoring wells are not used as domestic water supplies. Under current use conditions, 'contaminated' groundwater on/from the site is not a completed exposure pathway for human health.

However, whether or not "contaminated" groundwater on/from the site poses a completed exposure pathway for ecological health is unknown. Respondents are in the process of analyzing groundwater samples (collected from the monitoring wells and the up gradient residential well in August of 2007) for arsenic and lead. These data are expected to answer questions about whether the historic results above MTCA criteria were due to older, less sensitive analytical methods or even possibly due to elevated background concentrations for these metals in area groundwater.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site=s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

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[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_____ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the _____ _____facility , EPA ID # _____ , located at_____. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

__X__ IN - More information is needed to make a determination.

Completed by	(signature)		Date	
	(print)	Laura Castrilli		September 25, 2007
	(title)	Environmental Scientist		

Supervisor	(signature)		Date	
	(print)	Rick Albright		
	(title)	Director, Office of Air Waste and Toxics		
	(EPA Region or State)	EPA Region 10		

Locations where References may be found:
RCRA site files U.S. EPA Region 10 1200 Sixth Avenue, Suite 900 AWT-121 Seattle, WA 98404

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