

**ENVIRONMENTAL INDICATOR (EI) RCRIS CODE (CA725)**

**Current Human Exposures Under Control**

Facility Name: **COLUMBIA HELICOPTERS, INC.**  
Facility Address: **14452 Arndt Road, NE., Aurora, OR 97002**  
Facility EPA ID #: **ORD 009673609**

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?

- If yes** - check here and continue with #2 below.
- If no** - re-evaluate existing data, or
- If data 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).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> 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)?

**“Contaminated” Media      Yes      No      ?      Rationale / Key Contaminants**

<b>“Contaminated” Media</b>	<b>Yes</b>	<b>No</b>	<b>?</b>	<b>Rationale / Key Contaminants</b>
Groundwater	✓			1,2 DCA, 1,1 DCE, TCA, TCE
Air (indoors)		✓		
Soil (surface, e.g., <2 ft)	✓			TCE, TCA, PCE, benzene, toluene
Surface Water		✓		
Sediment		✓		
Soil (subsurface e.g., >2 ft)		✓		
Air (outdoors)		✓		

- 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.
- 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):**

Columbia Helicopters, Inc. (CHI) has owned and operated a helicopter operations and maintenance facility in Albany, Oregon, since 1976. CHI uses various chemicals for repair and maintenance operations. From August 1976 to February 1985, wastes from parts cleaning, paint stripping, and plating operations were discharged into an on-site dry well. In 1986, CHI removed contaminated soil from the drywell area. The main contaminants found in the soil and groundwater were solvents (TCA, TCE, toluene, benzene, DCA and DCE). Because of concerns about the structural stability of the adjacent shop building, excavation ceased before all contaminated soil could be removed. After the excavation was backfilled with clean material, approximately 3 inches of asphalt pavement was placed over the excavation and surrounding area.

From 1986 to 1996, CHI continued to investigate the nature and extent of solvent contamination in the groundwater, surface water, and soil. Results of these investigations indicated that the contamination had migrated off-site to the northeast and appeared to be concentrated in the upper portion of the shallow aquifer. Based on deep borings and a review of well logs, a clay-rich layer appears to exist that separates the shallow aquifer from the deeper Troutdale aquifer. This clay-rich layer appears to minimize movement of contamination from the shallow to the deep aquifers. Contamination has not been detected in the deep aquifer. In September 1993, EMCON conducted a follow-up investigation to further evaluate the horizontal and vertical extent of VOC contamination in the upper aquifer. The investigation consisted of drilling and collecting soil and one-time depth-discrete groundwater samples from three borings. Results showed the following:

- Residual soil contamination with elevated levels of VOCs and total petroleum hydrocarbons (TPH) (as high as 19 mg/kg of TCA and 1,610 mg/kg of TPH) exists near the former dry well and underground tank;
- Concentrations of VOCs (up to 17,000 ug/L for TCA) were detected in groundwater samples collected from the upper portion of the upper aquifer (15 to 40 feet bgs) in the dry well area. VOCs were not detected in discrete groundwater samples collected at 60, 79, and 101 feet bgs, which indicates that dense nonaqueous phase liquids (DNAPLs) may not be present immediately above the

clay-rich aquitard beneath the dry well area; and

- The intermediate and deep portions of the upper aquifer at 40 to 80 feet bgs are impacted by elevated VOCs approximately 200 feet downgradient of the northeast property corner.

In 1991, CHI installed an interim system that pumps contaminated groundwater from the shallow aquifer along the eastern property line (using five wells) and treats the water to remove the solvent contamination. This allows for contaminated groundwater to be captured before it migrates off-site. On May 31, 1996, groundwater remediation activities were moved from Hazardous Waste Program authority to Environmental Cleanup Program authority. A Feasibility Study was finalized in September 1996. DEQ completed the Record of Decision (ROD) for soil and groundwater cleanup, signed on 12/19/97. The Consent Order to carry out the requirements of the ROD was signed on 4/25/00.

The ROD requires the following:

- Ongoing monitoring for surface water and sediments;
- Continuation of the groundwater extraction and treatment system;
- Enhancement to the existing groundwater extraction system by the addition of an extraction well;
- Performance evaluation of the enhanced groundwater extraction and treatment system to demonstrate it is achieving the remedial goals;
- Replacement of two domestic wells the lower Troutdale Aquifer located downgradient of the site;
- Natural attenuation for the off-site portion of the groundwater plume with lower VOC concentrations not being captured by the groundwater extraction system;
- Groundwater monitoring;
- Institutional controls and contingency measures;
- Installation of a soil vapor extraction system in the former dry well area to remove VOCs from the unsaturated zone; and
- Maintenance of surface asphalt cap.

**Footnotes:**

<sup>1</sup>. *“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).*

<sup>2</sup>. *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.*

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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 <sup>3</sup>
Groundwater		✓		✓			
Soil (surface, e.g., <2 ft)		✓		✓		✓	
Surface Water							
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

**Instructions for Summary Exposure Pathway Evaluation Table:**

- Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated”) as identified in #2 above.
- 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.

- 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):**

Groundwater, surface water, and air may serve as transport media for constituent movement from the CHI site to potential human receptor populations. Although groundwater is the primary source of potable water for residents surrounding the site, the major source of drinking water is the deeper Troutdale (Unit F) aquifer. Analyses of samples collected from this aquifer have not detected VOCs.

Construction and/or trench workers may be exposed to groundwater where excavations encounter groundwater. Exposure pathways for trench and/or construction workers may include direct contact with contaminated water, inhalation of volatiles while in the excavation, and incidental ingestion.

The potential magnitude of human exposure via surface water appears low. TCA is the only VOC detected in the spring northeast of the site, but at concentrations much lower than the MCL.

The potential magnitude of human exposure via air appears to be low. Most of the site is covered by asphalt and buildings; however, VOCs have migrated off-site. The nearest residential population is approximately 0.25 to 0.5 mile(s) north of the site. (See ROD dated 12/19/97).

**Footnotes:** <sup>3</sup> *Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)*

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (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):**

Potential magnitude of exposures expected to be low. Based on a Corrective Measures Study (CMS) risk assessment conducted in 1996, and remedies specified in the 12/19/97 ROD (which the 4/25/2000 Order to carry out the ROD has required), the risks are at acceptable levels. Through a combination of active treatment, natural attenuation and institutional and engineering controls, the selected remedies that are in place ensure that risk to humans will not exceed  $1 \times 10^{-6}$ , and there will not be adverse impacts on the environment. (See Staff report [dated July 11, 1997], ROD [dated December 19, 1997] pages 4-10 and 4-11, and Question 1 for requirements specified in the ROD).

**Footnotes:**

<sup>4</sup>. *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.*

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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):**

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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):
- 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 **COLUMBIA HELICOPTERS** facility, EPA ID #**ORD 009673609**, located at **1442 Arndt Road, NE., Aurora, OR 97002**, 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:**

_____	2/07/01
Barb Puchy	Hazardous Waste Specialist
(Print Name)	(Title)

**Supervisor:**

_____	_____
(Signature)	(Date)
Anne Price	Manager, Hazardous Waste Policy
(Print Name)	<u>and Program Development</u> (Title)

Oregon Department of Environmental Quality  
(EPA Region or State)

**Locations where References may be found:**

DEQ - Northwest Region, 2020 SW.4th Avenue, Ptlid.97201

**Locations where References may be found:**

EUGENE  
\_\_\_\_\_

**Contact telephone and E-mail numbers:**

<u>BILL MASON</u>	<u>541-686-7838, Ext. 257</u>	_____
(Name)	(Phone Number)	(E-Mail)

**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.**

**ENVIRONMENTAL INDICATOR (EI) RCRIS CODE (CA750)**

**Migration of Contaminated Groundwater Under Control**

Facility Name: **COLUMBIA HELICOPTERS, INC.**  
Facility Address: **14452 Arndt Road, NE., Aurora, OR 97002**  
Facility EPA ID #: **ORD 009673609**

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?

- If yes** - check here and continue with #2 below.
- If no** - re-evaluate existing data, or
- If data are not available**, skip to #8 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).

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2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> 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?

- 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):**

Columbia Helicopters, Inc. (CHI) has owned and operated a helicopter operations maintenance facility in Albany, Oregon, since 1976. CHI uses various chemicals as part of its repair and maintenance operations. From August 1976 to February 1985, wastes from parts cleaning, paint stripping, and plating operations were discharged into an on-site dry well. The main contaminants found in the soil and groundwater were solvents. In 1986, CHI removed contaminated soil from the drywell area. Because of concerns about the structural stability of the adjacent shop building, excavation ceased before all contaminated soil could be removed. After the excavation was backfilled with clean material, approximately 3 inches of asphalt pavement was placed over the excavation and surrounding area.

From 1986 to 1996, CHI continued to investigate the nature and extent of solvent contamination in the groundwater, surface water, and soil. Results of these investigations indicated that the contamination had migrated off-site to the northeast and appeared to be concentrated in the upper portion of the shallow aquifer. Based on deep borings and a review of well logs, a clay-rich layer appears to exist that separates the shallow aquifer from the deeper Troutdale aquifer. This clay-rich layer appears to minimize movement of contamination from the shallow to the deep aquifers. Contamination has not been detected in the deep aquifer. In September 1993, EMCON conducted a follow-up investigation to further evaluate the horizontal and vertical extent of VOC contamination in the upper aquifer. The investigation consisted of drilling and collecting soil and one-time depth-discrete groundwater samples from three borings. Results of the groundwater sampling showed the following:

- Concentrations of VOCs (up to 17,000 ug/L for TCA) were detected in groundwater samples collected from the upper portion of the upper aquifer (15 to 40 feet bgs) in the dry well area. VOCs were not detected in discrete groundwater samples collected at 60, 79, and 101 feet bgs, which indicates that dense nonaqueous phase liquids (DNAPLs) may not be present immediately above the clay-rich aquitard beneath the dry well area; and
- The intermediate and deep portions of the upper aquifer at 40 to 80 feet bgs are impacted by elevated VOCs approximately 200 feet downgradient of the northeast property corner.

In 1991, CHI installed an interim system that pumps contaminated groundwater from the shallow aquifer along the eastern property line (using five wells) and treats the water to remove the solvent contamination. This allows for contaminated groundwater to be captured before it migrates off of CHI's property. On May 31, 1996, groundwater remediation activities were moved from Hazardous Waste Program authority to Environmental Cleanup Program authority. A Feasibility Study was finalized in September 1996. DEQ completed the Record of Decision (ROD) for soil and groundwater cleanup, signed on 12/19/97. The Consent Order to carry out the requirements of the ROD was signed on 4/25/00.

Groundwater requirements in the ROD for are as follows:

- Continuation of the groundwater extraction and treatment system;
- Enhancement o the existing groundwater extraction system by the addition of an extraction well;
- Performance evaluation of the enhanced groundwater extraction and treatment system to demonstrate it is achieving the remedial goals;
- Replacement of two domestic wells the lower Troutdale Aquifer located downgradient of the site;
- Natural attenuation for the off-site portion of the groundwater plume with lower VOC concentrations not being captured by the groundwater extraction system;
- Groundwater monitoring; and
- Institutional controls and contingency measures.

**Footnotes:**

<sup>1</sup> *“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).*

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"<sup>2</sup> 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"<sup>2</sup>.
- If no**, (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"<sup>2</sup>) - skip to #8 and enter "NO" status code, after providing an explanation.
- If unknown** - skip to #8 and enter "IN" status code.

**Rationale and Reference(s):**

Controls are in place which have stabilized the migration of contaminated groundwater. (See December 19, 1997 ROD, and April 25, 2000 Consent Order).

These include:

(1) Installation of a pump and treat system: In 1991, CHI installed an interim system that pumps contaminated groundwater from the shallow aquifer along the eastern property line using five wells and treats the water to remove the solvent contamination. This allows for the capture of contaminated groundwater before it can migrate off-site.

(2) Enhancement of the existing groundwater extraction system: An additional extraction well has been added to the existing extraction system.

(3) Natural attenuation: It appears that natural attenuation is occurring based on decreasing parent compound concentrations and the presence of daughter compounds.

(4) Institutional controls: Institutional controls will be placed on the site pursuant to the ROD.

(5) Groundwater monitoring: Groundwater monitoring is ongoing.

**Footnotes:**

<sup>2</sup> "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.

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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):**

The upper groundwater aquifer discharges to surface water in the ravine northeast of the site through small seeps. The surface water near the point of discharge does not contain aquatic organisms (e.g., fish) that can be consumed by humans. Eventually, the stream discharges into the Pudding River. The Pudding is located approximately one mile east of the site, and flows north to discharge into the Molalla River, which in turn discharges into the Willamette River.

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5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> 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 ecosystems 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<sup>3</sup> 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 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 ecosystem.
- If no** - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: (1) the maximum known or reasonably suspected concentration<sup>3</sup> of each 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<sup>3</sup> 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):**

The selected remedy in the December 19, 1997, ROD for surface water is "No Further Action," other than continued groundwater monitoring and a demonstration that no adverse effects on surface water quality is reasonably likely to occur as a result of current or future contaminant migration. The No Further Action remedy for surface water was based on these reasons:

- Contaminants detected in seeps along the ravine east of the site were present at low concentrations (well below MCLs);
- The results of the RFI subsequent monitoring indicate that surface water in the ravine creek currently does not pose significant risk to human health or to environmental receptors; and
- The potential magnitude of human exposure via surface water is low. TCA is the only VOC detected in the spring northeast of the site, but at concentrations much lower than the MCL.

**Footnotes:**

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

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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 ecosystems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>4</sup>)?

**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 ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR (2) providing or referencing an interim-assessment,<sup>5</sup> 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 ecosystems, 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.

**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 ecosystems.

**If unknown** - skip to 8 and enter “IN” status code.

**Rationale and Reference(s):**

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**Footnotes:**

<sup>4</sup>. 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.

<sup>5</sup>. 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 ecosystems.

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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):**

The Consent Order (dated 4/25/00) to carry out the ROD requires groundwater monitoring.

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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" **COLUMBIA HELICOPTERS** facility, EPA ID #**ORD 009673609**, located at **1442 Arndt Road, NE., Aurora, OR 97002**. 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.

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

**Completed By:**

\_\_\_\_\_ 2/07/01 \_\_\_\_\_  
Barb Puchy \_\_\_\_\_ Hazardous Waste Specialist  
(Print Name) (Title)

**Supervisor:**

\_\_\_\_\_ \_\_\_\_\_  
(Signature) (Date)  
Anne Price \_\_\_\_\_ Manager, Hazardous Waste Policy  
(Print Name) and Program Development (Title)

Oregon Department of Environmental Quality  
(EPA Region or State)

**Locations where References may be found:**

DEQ - Northwest Region, 2020 SW.4th Avenue, Ptlid.97201

**Locations where References may be found:**

EUGENE  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Contact telephone and E-mail numbers:**

BILL MASON \_\_\_\_\_ 541-686-7838, Ext. 257 \_\_\_\_\_  
(Name) (Phone Number) (E-Mail)