ENVIRONMENTAL INDICATOR (EI) RCRIS CODE (CA725)

Current Human Exposures Under Control

Facility Name: TEKTRONIX, INC.
Facility Address: 13700 SW. Karl Braun Drive, Beaverton, OR 97005
Facility EPA ID #: ORD 009020231

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).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Code (CA725)
Page 2

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)?

"Contaminated" Media	Yes	No	?	Rationale / Key Contaminants
				SEE BELOW

☐ **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):

Tektronix Beaverton Campus is located at 14200 SW Karl Braun Drive, south of SW Jenkins Road, and east of SW Hocken Avenue. The site consists of about 300 acres with Beaverton Creek flowing east to west through its center. The site is in an area of mixed commercial, industrial and residential land use.

Site History: Tektronix has conducted manufacturing, engineering, research and development, and assembly of electronic measurement, displays and controls instruments since 1957. More recently, operations have changed to mainly assembly of components. The site has operated a waste management and treatment facility under a RCRA Part B Permit. Tektronix entered into a Consent Order effective March 2002, which incorporated the Site Corrective Action Program.
The RCRA Part B Permit was updated and reissued on June 27, 2006.

Sediment and sludge removed from the treatment ponds were disposed of on-site, generally in the southwest portion of the campus (Westpark and the area now occupied by Building 78). These sludges contained heavy metals and organic solvents such as TCE. Spills also occurred on-site; subsurface contamination may have resulted from past operating practices. This is a RCRA cleanup site, which began a comprehensive site characterization in about 1986; the campus operated under a RCRA corrective action compliance order since 1989 and converted to a cleanup consent order in March 2002. There are five areas on the Tektronix property that have been subject to RCRA characterization and cleanup: Buildings 40, 16, 12, 02, and Westpark. Since 1989, levels of TCE in groundwater have ranged up to 42.5 ppm, and levels of PCE have ranged up to 8.5 ppm. (GMW 8/25/97) Tektronix has reported the discovery of fuel oil in soil and groundwater near Building 28. Although the source and quantity are not known, the contamination was found beneath concrete vault that acts as secondary containment for underground fuel oil transfer pipelines. The Building 73 area is adjacent to the Mears Property (ECSI

#1592), where an environmental investigation is being conducted by Eaton Corp. (MTP 6/13/03) A Remedial Investigation of soil contamination at the Westpark Parcel has been completed. Relatively low levels of a number of metals were detected in on-site soil.

Sediments and sludge from the surface impoundments adjacent to Building 40, which were in use until 1984, were dried in the vicinity of Building 16, and disposed of on the southwest side of the property and also disposed to the ground in other areas of the site including West Park, Buildings02 and 38, and near Beaverton Creek. Spills are known to have occurred adjacent to Buildings 02 and 12. Source of release near building 73 is not known.

Cadmium, chromium, copper, lead, nickel, zinc; VOCs such as trichloroethylene (TCE) and perchloroethylene (PCE), and associated breakdown products; petroleum hydrocarbons.

Based on subsurface investigations and remedial actions performed under RCRA corrective action, there is no evidence that VOCs associated with the five confirmed release locations have migrated beyond Tektronix' property boundaries. However, VOCs have migrated towards Beaverton Creek via groundwater, and are entering the creek. Sediment sampling conducted in 2006 indicate that metals from historic facility operations are present in sediments in Beaverton Creek and extend downstream from the site for at least 1,800 feet.

This site has significant chlorinated solvent contamination in groundwater. Groundwater discharges to surface water in Beaverton Creek, which flows west across the southern portion of the site. The investigation and assessment of risk for human and environmental receptors for Evaluation Area 1 (Building 40, 02, 10/12, 16 and Beaverton Creek) has been completed. Investigation for the balance of the site is completed, and the risk assessment for human and environmental receptors for this area is underway. Remediation of groundwater is on-going at several source areas.

Based on requirements specified in the RCRA Corrective Action program, pump-and-treat systems have been in place and operating in three separate areas at the site. Groundwater treatment and monitoring are occurring under the guidance of DEQ Cleanup staff in cooperation with DEQ RCRA staff, with a preliminary cleanup level of 5 ppb established for TCE. Final cleanup levels will be established in the ROD. Prior to DEQ's issuance of a RCRA Part B permit in 1990, Tektronix removed all accessible sludges that it had previously disposed of on-site. Investigation in the Building 73 area is being conducted by a former operator of the adjacent Mears Property. Additional work in this area will be conducted in May 1997 by Eaton Corp.

(5/8/02 MDK/SRP) A Consent Order was signed by DEQ on January 3, 2002. An agency-initiated RCRA Part B Permit modification incorporating corrective action for the site under the Consent Order was effective as of March 29, 2002. The first deliverable under the Consent Order was a Project Management Plan, submitted on October 14, 2002. Tektronix continues with monitoring and reporting activities required under RCRA corrective action authority.

(MTP 6/13/03) Tektronix has completed a remedial investigation and risk assessment for the West Park Parcel. The risk assessment shows that site soil, and indoor/outdoor air for vapors emanating from contaminated soil and groundwater, do not pose a significant threat to human health or the

environment. DEQ issued a No Further Action (NFA) determination on August 26, 2003, for soil and shallow groundwater for the indoor/outdoor air pathway, at the West Park Parcel. Groundwater and its potential impacts to ecological receptors in Beaverton Creek, will require further evaluation at the West Park Parcel.
The post-closure RCRA permit for Tektronix was renewed in June, 2006 which also requires that the Corrective Action activities under the Order be completed and that Groundwater monitoring continues.

(7/11/03 MDK/C&ER) DEQ approved a Project Management Plan and an RI Work Plan for Evaluation Area 1. Soil and groundwater sampling for Phase I will occur through September 2003. A data report for Phase I is expected in Late 2003.

(6/20/05 MDK/CU&ER) Phase I data report was submitted on December 11, 2003. A scoping document for Phase II was submitted on September 10, 2004, and approved by DEQ. Work plan for Phase III was submitted on September 2, 2004, and approved by DEQ. The Phase II and III work was conducted in late 2004 and early 2005. A work plan for Phase 5 was submitted on January 24, 2005, and DEQ provided comments on February 8, 2005. Phase 5 work is ongoing. Results of Phase II, III, and 5 will be incorporated into the Remedial Investigation (RI) report anticipated in fall 2005. Phase 4 will be re-evaluated during the remedy design phase.

(12/21/06 MDK/CU&ER) For Evaluation Area 1 the RI Report was submitted and reviewed by DEQ and approved or May 11, 2006; an ERA was submitted, reviewed by DEQ, additional field studies conducted in summer 2006, and is pending approval; a Human Health Risk Assessment (HHRA) was submitted, reviewed by DEQ and approved on June 26, 2006; and a draft FS Report is anticipated to be submitted in 1st quarter 2007. For Evaluation Areas 2-6, a RI workplan was submitted, reviewed by DEQ on November 15, 2005, then after a new consultant was retained an addendum to the RI workkplan was submitted, reviewed by DEQ and approved on July 3, 2006; soil and groundwater sampling under RI workplan was conducted in summer/fall 2006; a data summary/data gap analysis for Phase II will be submitted late in 2000 or early in 1st quarter 2007; an air sampling plan will be submitted in January 2007; a statewide groundwater monitoring plan will be submitted by 1st quarter 2007; a draft RI is expected to be submitted by May 2007. A removal action was made to remove 6 unlined sludge ponds and a concrete sludge holding pond. DEQ approved an IRAM workplan January 1, 2005, removal work conducted from April 20, 2005 to July 1, 2005, and a report "Final Interim Remedial Action Measures Report" (Kennedy/Jenks) submitted on August 11, 2006. Other actions include demolition of Building 46 during 2004, and construction of a soccer field based on a data report and HHRA were conducted and reviewed by DEQ; demolition of Building 10 in late 2004; dismantling in 2004 of groundwater remediation system at Building 10/12 based upon DEQ review of "Remediation System Evaluation Building 10/12" submitted on July 6, 2004 and dismantling approved by DEQ on August 5, 2004.

(10/18/07 MDK/CU&ER) A final EA1 HHRA was submitted on 8/17/06. The draft FS report for EA1 was submitted on 2/2/07 and DEQ comments were issued on 5/19/07. A revised EA1 ERA dated 2/9/07 was submitted

and DEQ provided approval on 4/13/07. A final RI report for EA1 dated 4/23/08 was submitted. As a result of FS review, Tek proposed additional investigation of toxicity of Beaverton Creek sediments. The Phase III work plan addendum was submitted on 5/24/07 and approved on 6/25/07. The work was conducted in July through September 2007, and a final report submitted on 10/15/07, currently under review. A revised FS for EA1 will be submitted in mid December 2007. For EA2-6, a project meeting will be held in late October 2007 with a draft HHRA work plan and annual monitoring report to follow in fourth quarter 2007. A submittal date for a draft EA2-6 RI is yet to be determined.

(8/13/08 MDK/CU&ER) DEQ approved revisions to the FS on June 19, 2008 and a final FS was submitted on July 17, 2008. DEQ will prepare a staff report proposing a final remedy for EA1 and anticipates a public comment period for the proposed remedy by the end of 2008. DEQ provided review comments on the EA2-6 draft HHRA work plan on June 19, 2008, and confirmed preparation of a EA2-6 draft ERA using the EA1 ERA as a format guide.

Source files in DEQ's Northwest Region office, including WQ and RCRA Permitting and Corrective Action.

State of Oregon Department of Environmental Quality (DEQ), Guidance for Conducting Ecological Risk Assessment, Level I, II, III, IV, December 2001.

DEQ, January 3, 2002, "Order On Consent, ECSR-NWR-01-13"

Landau Associates, 2003, Human Health Risk Assessment, West Park Parcel, Tektronix, Inc., Beaverton, Oregon, June 2003.

Landau Associates, 2003a, Data Report, West Park Parcel, Tektronix, Inc., Beaverton, Oregon, April 28, 2003.

Landau Associates, 2003b, Technical Memorandum, Risk Assessment Approach, Tektronix West Park Parcel, Beaverton, Oregon, March 7, 2003.

Landau Associates, 2003c, Remedial Investigation Work Plan, Tektronix Inc., Beaverton, Oregon, February 7, 2003.

Landau Associates, 2002, Project Management Plan, Tektronix, Inc., Beaverton, Oregon, October 14, 2002.

Maul, Foster & Alongi, (MFA), 2000, Preliminary Scoping Document for Tektronix Remedial Investigation. September 27, 2000.

MFA, 2002, Semiannual Performance Report, RCRA Corrective Action Program, Tektronix, Inc. (RCA Part B Permit No. ORD009020231. June 1, 2002.

Windward Environmental LLC, 2007, Technical Memorandum: Phase III Sediment Chemistry and Toxicity Testing at Beaverton Creek Operational Unit (Draft), October 9, 2007.

Landau Associates, 2007c, Remedial Investigation Report, Tektronix, Inc. (Final), March 23, 2007.

Landau Associates, 2007b, Ecological Risk Assessment, Tektronix, Inc. (Final), February 9, 2007.

Landau Associates, 2007a, Agency Review Draft Feasibility Study Tektronix, Inc. February 2, 2007.

Landau Associates, 2006, Human Health Risk Assessment Tektronix, Inc. (Final), August 17, 2006.

Landau Associates, 2008, Feasibility Study Tektronix, Inc. (Final), July 17, 2008.

Footnotes:

[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.*

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Code (CA725)
Page 4

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							
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

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.

☒ **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):

SEE description and supporting documents listed in Number 2. above. The pathways have been eliminated

Footnotes:

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

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Code (CA725)
Page 5

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):

_____
_____
_____
_____
_____
_____
_____

Footnotes:

[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.*

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Code (CA725)
Page 6

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):

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Code (CA725)
Page 7

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 **TEKTRONIX, INC.,** at **13700 SW. Karl Braun Drive, Beaverton, OR 97005,** Facility EPA ID #:**ORD 009020231** 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:

Barb Puchy — *(Print Name)*

Hazardous Waste Specialist — *(Title)*

Supervisor:

Brett McKnight — *(Signature)*

9/4/08 — *(Date)*

Brett McKnight — *(Print Name)*

Manager, Hazardous Waste Policy and Program Development — *(Title)*

Oregon Department of Environmental Quality
(EPA Region or State)

Locations where References may be found: DEQ Gresham-1550 NW Eastman Parkway, Suite290 Gresham, OR 97030

Contact telephone and E-mail numbers:

Mavis Kent *(Name)* (503) 229- 503-667-8414 x55008 *(Phone Number)* kent.mavis.d@deq.state.or.us *(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: TEKTRONIX, INC.
Facility Address: 13700 SW. Karl Braun Drive, Beaverton, OR 97005
Facility EPA ID #: ORD 009020231

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).

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 2

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?

☒ **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):

This site has significant chlorinated solvent contamination in groundwater. Groundwater discharges to surface water in Beaverton Creek, which flows west across the southern portion of the site. Investigation and assessment of risk for human and environmental receptors for EA1 is complete. Remediation of groundwater is on-going at several source areas. Investigation of EA2-6 is complete and assessment of risk for human and environmental receptors for EA2-6 is underway.

Based on requirements specified in the RCRA Corrective Action program, pump-and-treat systems have been in place and operating in three separate areas at the site. Groundwater treatment and monitoring are occurring under the guidance of DEQ RCRA staff, with a cleanup level of 5 ppb established for TCE. Prior to DEQ's issuance of a RCRA Part B permit in 1990, Tektronix removed all accessible sludges that it had previously disposed of on-site. Investigation in the Building 73 area is being conducted by a former operator of the adjacent Mears Property. Additional work in this area will be conducted in May 1997 by Eaton Corp.
The post-closure RCRA permit for Tektronix was renewed in June, 2006 which also requires that the Corrective Action activities under the Order (see below) be completed and that Groundwater monitoring continues.

(5/8/02 MDK/SRP) A Consent Order was signed by DEQ on January 3, 2002. An agency-initiated RCRA Part B Permit modification incorporating corrective action for the site under the Consent Order was effective as of March 29, 2002. The first deliverable under the Consent Order was a Project Management Plan, due May 28, 2002. Tektronix continues with monitoring and reporting activities required under RCRA corrective action authority.

(MTP 6/13/03) Tektronix has completed a remedial investigation and risk assessment for the West Park Parcel. The risk assessment shows that site soil, and indoor/outdoor air for vapors emanating from contaminated soil and groundwater, do not pose a significant threat to human health or the environment. DEQ has proposed a No Further Action (NFA) determination for soil only, and groundwater for the indoor/outdoor air pathway, at the West Park Parcel. Groundwater and its potential impacts to ecological receptors in Beaverton Creek, will require further evaluation at the West Park Parcel.

(7/11/03 MDK/C&ER) DEQ approved a Project Management Plan and an RI Work Plan for Evaluation Area 1. Soil and groundwater sampling for Phase I will occur through September 2003. A data report for Phase I is expected in Late 2003.

(6/20/05 MDK/CU&ER) Phase I data report was submitted on December 11, 2003. A scoping document for Phase II was submitted on September 10, 2004, and approved by DEQ. Work plan for Phase III was submitted on September 2, 2004, and approved by DEQ. The Phase II and III work was conducted in late 2004 and early 2005. A work plan for Phase 5 was submitted on January 24, 2005, and DEQ provided comments on February 8, 2005. Phase 5 work is ongoing. Results of Phase II, III, and 5 will be incorporated into the Remedial Investigation (RI) report anticipated in fall 2005. Phase 4 will be re-evaluated during the remedy design phase.

(12/21/06 MDK/CU&ER) For Evaluation Area 1 the RI Report was submitted and reviewed by DEQ and approved or May 11, 2006; an ERA was submitted, reviewed by DEQ, additional field studies conducted in summer 2006, and is pending approval; a Human Health Risk Assessment (HHRA) was submitted, reviewed by DEQ and approved on June 26, 2006; and a draft FS Report is anticipated to be submitted in 1st quarter 2007. For Evaluation Areas 2-6, a RI workplan was submitted, reviewed by DEQ on November 15, 2005, then after a new consultant was retained an addendum to the RI workkplan was submitted, reviewed by DEQ and approved on July 3, 2006; soil and groundwater sampling under RI workplan was conducted in summer/fall 2006; a data summary/data gap analysis for Phase II will be submitted late in 2000 or early in 1st quarter 2007; an air sampling plan will be submitted in January 2007; a statewide groundwater monitoring plan will be submitted by 1st quarter 2007; a draft RI is expected to be submitted by May 2007. A removal action was made to remove 6 unlined sludge ponds and a concrete sludge holding pond. DEQ approved an IRAM workplan January 1, 2005, removal work conducted from April 20, 2005 to July 1, 2005, and a report "Final Interim Remedial Action Measures Report" (Kennedy/Jenks) submitted on August 11, 2006. Other actions include demolition of Building 46 during 2004, and construction of a soccer field based on a data report and HHRA were conducted and reviewed by DEQ; demolition of Building 10 in late 2004; dismantling in 2004 of groundwater remediation system at Building 10/12 based upon DEQ review of "Remediation System Evaluation Building 10/12" submitted on July 6, 2004 and dismantling approved by DEQ on August 5, 2004.

(10/18/07 MDK/CU&ER) A final EA1 HHRA was submitted on 8/17/06. The draft FS report for EA1 was submitted on 2/2/07 and DEQ comments were issued on 5/19/07. A revised EA1 ERA dated 2/9/07 was submitted and DEQ provided approval on 4/13/07. A final RI report for EA1 dated 4/23/08. As a result of FS review, Tek proposed additional investigation of toxicity of Beaverton Creek sediments. The Phase III work plan addendum was submitted on 5/24/07 and approved on 6/25/07. The work was conducted in July through September 2007, and a final report submitted on 10/15/07, currently under review. A revised FS for EA1 will be submitted in mid December 2007. For EA2-6, a project meeting will be held in late October 2007 with a draft HHRA work plan and annual monitoring report to follow in fourth quarter 2007. A submittal date for a draft EA2-6 RI is yet to be determined.

(8/13/08 MDK/CU&ER) DEQ approved revisions to the FS on June 19, 2008 and a final FS was submitted on July 17, 2008. DEQ will prepare a staff report proposing a final remedy for EA1 and anticipates a public comment period for the proposed remedy by the end of 2008. DEQ provided review comments on the EA2-6 draft HHRA work plan on June 19, 2008, and confirmed preparation of a EA2-6 draft ERA using the EA1 ERA as a format guide Source files in DEQ's Northwest Region office, including WQ and RCRA Permitting and Corrective Action.

State of Oregon Department of Environmental Quality (DEQ), Guidance for Conducting Ecological Risk Assessment, Level I, II, III, IV, December 2001.

DEQ, January 3, 2002, "Order On Consent, ECSR-NWR-01-13"

Landau Associates, 2003, Human Health Risk Assessment, West Park Parcel, Tektronix, Inc., Beaverton, Oregon, June 2003.

Landau Associates, 2003a, Data Report, West Park Parcel, Tektronix, Inc., Beaverton, Oregon, April 28, 2003.

Landau Associates, 2003b, Technical Memorandum, Risk Assessment Approach, Tektronix West Park Parcel, Beaverton, Oregon, March 7, 2003.

Landau Associates, 2003c, Remedial Investigation Work Plan, Tektronix Inc., Beaverton, Oregon, February 7, 2003.

Landau Associates, 2002, Project Management Plan, Tektronix, Inc., Beaverton, Oregon, October 14, 2002.

Maul, Foster & Alongi, (MFA), 2000, Preliminary Scoping Document for Tektronix Remedial Investigation. September 27, 2000.

MFA, 2002, Semiannual Performance Report, RCRA Corrective Action Program, Tektronix, Inc. (RCA Part B Permit No. ORD009020231. June 1, 2002.

Windward Environmental LLC, 2007, Technical Memorandum: Phase III Sediment Chemistry and Toxicity Testing at Beaverton Creek Operational Unit (Draft), October 9, 2007.

Landau Associates, 2007c, Remedial Investigation Report, Tektronix, Inc. (Final), March 23, 2007.

Landau Associates, 2007b, Ecological Risk Assessment, Tektronix, Inc. (Final), February 9, 2007.

Landau Associates, 2007a, Agency Review Draft Feasibility Study Tektronix, Inc. February 2, 2007.

Landau Associates, 2006, Human Health Risk Assessment Tektronix, Inc. (Final), August 17, 2006.

Footnotes:

[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).*

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 3

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.

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

Rationale and Reference(s):

See description and supporting documents listed in Number 2. above-controls are in place.

Footnotes:

[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.*

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 4

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):

There is discharge of contaminants into Beaverton Creek. Of the metals and VOCs that are in that discharge the only one that exceeds any exposure criteria is Trichloroethene. A site-specific exposure concentration of 1.33 ug/l was calculated and that exceeds acceptable risk for a swimmer in Beaverton Creek.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 5

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 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[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 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[3] 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[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):

There is discharge of contaminants into Beaverton Creek. Of the metals and VOCs that are in that discharge the only one that exceeds any exposure criteria is Trichloroethene. A site-specific exposure concentration of 1.33 ug/l was calculated and that exceeds acceptable risk for a swimmer in Beaverton Creek.
However, the swimmer scenario includes someone (the same person) swimming in Beaverton Creek multiple times per year for several years. Therefore, there is not a significant risk or exposure occurring at this time as no one swims in Beaverton Creek or wades in the creek for the length of time necessary for affects to occur.

Footnotes:

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

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 6

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[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 ecosystems), 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 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):

Footnotes:

[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 ecosystems.*

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 7

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):

Groundwater monitoring and remediation is ongoing, as required under the Order and Permit.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS Code (CA750)
Page 8

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 **TEKTRONIX, INC.**, at **13700 SW. Karl Braun Drive, Beaverton, OR 97005,** Facility EPA ID #:**ORD 009020231** under current and reasonably expected conditions. 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:

(Signature) *(Date)*

Barb Puchy — *(Print Name)*

Hazardous Waste Specialist — *(Title)*

Supervisor:

Brett McKnight *(Signature)* 9/4/08 *(Date)*

Brett McKnight — *(Print Name)*

Manager, Hazardous Waste Policy and Program Development *(Title)*

Oregon Department of Environmental Quality
(EPA Region or State)

Locations where References may be found:

DEQ Gresham- 1550 NW Eastman Parkway, Suite290
Gresham, OR 97030

Contact telephone and E-mail numbers:

Mavis Kent (Name) (503) 229- 503-667-8414 x55008 (Phone Number) kent.mavis.d@deq.state.or.us (E-Mail)

MOORE Fredrick

From: PUCHY Barb
Sent: Wednesday, September 03, 2008 10:01 AM
To: MOORE Fredrick; MCKNIGHT Brett
Cc: PUCHY Barb
Subject: TEK EI forms`

TEKTRONIX EI1.doc
(151 KB)

Fredrick- I've attached the updated EI forms for TEK. Mavis has reviewed and agreed this is current, so you can forward to EPA. Thanks.