Table 3-1
Applicable or Relevant and Appropriate Requirement
Boeing Auburn Draft Cleanup Action Plan
Auburn, Washington

ARARs for Development of Cleanup Levels	Source	Description/Rationale
Model Toxics Control Act	WAC 173-340	Establishes administrative processes and standards in Washington State to identify, investigate, and clean up facilities where hazardous substances have come to be located.
Washington State Surface Water Quality Standards	WAC 173-201A	Establishes water quality standards for surface waters of the state of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of chapter 90.48 RCW.
Federal Clean Water Act Water Quality Standards	40 CFR 131 and 40 CFR 131.45	Establishes the requirements and procedures for developing, reviewing, revising, and approving water quality standards by the States as authorized by section 303(c) of the Clean Water Act. Promulgates human health criteria for priority toxic pollutants in surface waters in Washington.
Washington State Maximum Contaminant Levels in Drinking Water	WAC 246-290-320	Establishes maximum contaminant levels allowed in public drinking water systems in Washington State.
National Primary Drinking Water Regulations	40 CFR 141	Establishes primary drinking water regulations pursuant to section 1412 of the Public Health Service Act, as amended by the Safe Drinking Water Act (Pub. L. 93-523); and related regulations applicable to public water systems.
Potential Action Specific ARARs	**Source**	**Description/Rationale**
Washington Hazardous Waste Management Act and implementing regulations: Dangerous Waste Regulations	RCW 70.105; WAC 173-303	These regulations establish a comprehensive statewide framework for the planning, regulation, control, and management of dangerous waste. The regulations designate those solid wastes that are dangerous or extremely hazardous to human health and the environment. The management of excavated contaminated soil from the Site would be conducted in accordance with these regulations to the extent that any dangerous wastes are discovered or generated during the cleanup action.
Washington Solid Waste Management Act and its implementing regulation: Criteria for Municipal Solid Waste Landfills	RCW 70.95; WAC 173-351	These regulations establish a comprehensive statewide program for solid waste management including proper handling and disposal. The management of any contaminated soil removed from the Site would be conducted in accordance with these regulations to the extent that this soil could be managed as solid waste instead of dangerous waste.
Hazardous Waste Operations	WAC 296-843	Establishes safety requirements for workers conducting investigation and cleanup operations at sites containing hazardous materials. These requirements would be applicable to onsite cleanup activities and would be addressed in a Site health and safety plan prepared specifically for these activities.
Federal NPDES Permit and State Construction Stormwater General Permit	WAC 173-220	Construction activities that disturb one or more acres of land typically need to obtain an NPDES Construction Stormwater General Permit from Ecology. A substantive requirement would be to prepare a SWPPP prior to earthwork activities. The SWPPP would document planned procedures designed to prevent stormwater pollution by controlling erosion of exposed soil and by containing soil stockpiles and other materials that could contribute pollutants to stormwater.
Clean Water Act, Section 401, Water Quality Certification	33 USC 1340; WAC 173-225-010	Section 401 of the Federal Water Pollution Control Act provides that applicants for a license or permit from the federal government relating to any activity that may result in any discharge into the navigable waters shall obtain a certification from the state that the water quality standards will be met. Ecology's Water Quality Section would review any Nationwide Permit No. 38 issued by the US Army Corps of Engineers. Ecology would also review any associated draft and final design of the chosen cleanup action alternative to document substantive compliance with the Washington State Water Pollution Control Act requirements.
State Environmental Policy Act	RCW 43.21.036; WAC 173-11-250 through 268	Under the SEPA rules, MTCA and SEPA processes are to be combined to reduce duplication and improve public participation (WAC 97-11-250). Ecology is the lead agency for implementing the substantive requirements of SEPA as described in WAC 197-11-253. Ecology is likely to determine that it will act as the lead agency for implementing the requirements of SEPA for cleanup actions at the Site. A SEPA checklist will be completed and attached to the draft Cleanup Action Plan. It is expected that a determination of non-significance will be issued, as the alternatives evaluated in this FS are unlikely to have a significant adverse environmental impact.
Washington Minimum Standards for Construction and Decommissioning	WAC 173-160-381	Ecology or its delegated authority establishes requirements for the installation and decommissioning of monitoring wells.
Underground Injection Control Program	WAC 173-218	UIC registration would be required for the injection of any materials below ground surface for the purposes of groundwater cleanup. This would include injection of reducing agents such as zero valent iron, electron donor substrates for bioremediation, oxidants for chemical oxidation, or other chemical activation agents or catalysts; or reinjection of treated groundwater.
Uniform Environmental Covenants Act	RCW 64.70	Regulation that addresses recording environmental covenants on the Boeing Auburn facility. Institutional controls; an environmental covenant will be a required element of the final remedy selected.
Right-of-Way Use and Construction	AubMC Chapter 12.60 and 12.66; AlgMC Chapter 14.04	Requires a written permit for any proposed activities that use ROW, including construction activities and movement of equipment. It may be necessary to install additional wells in ROWs.
Fire Hydrant Access	AubMC Chapter 13.16; AlgMC Chapter 13.02	Specifies an application and approval process for connecting to the City of Auburn water supply system. Fire hydrant access is possibly needed for injections.
Environmentally Critical Areas	AubMC Chapter 16.10; AlgMC Chapter 16.18	Specifies development standards for actions affecting environmentally critical areas, including wellhead protection areas, streams and riparian zones, wetlands, geological hazard areas, landslide areas, and erosion or seismic hazard areas.

Abbreviations and Acronyms:

AlgMC = Algona Municipal Code
AubMC = Auburn Municipal Code
ARARs = Applicable or relevant and appropriate requirements
CFR = Code of Federal Regulations
Ecology = Washington State Department of Ecology
MTCA = Model Toxics Control Act Cleanup Regulation
NPDES = National Pollutant Discharge Elimination System
Pub = publication
RCW = Revised Code of Washington
ROW = right-of-way
SEPA = State Environmental Policy Act
Site = Boeing Auburn Plant
SWPPP = stormwater pollution prevention plan
WAC = Washington Administrative Code
UIC = underground injection control
USC = United States Code

Table 3-2
Soil Cleanup Levels
Boeing Auburn Draft Cleanup Action Plan
Auburn, Washington

Analyte	RI Soil SL (mg/kg)	Method B		Constituent Exceeds pCUL in Groundwater	Soil Protective of Groundwater Vadose at 13°C	Method C		Background Soil Metals Concentration (a)	Soil CUL (mg/kg)	Basis for CUL
		Method B Non-Cancer Direct Contact	Method B Cancer Direct Contact			Method C Non-Cancer Direct Contact	Method C Cancer Direct Contact			
VOLATILES										
Trichloroethene	0.00357	40	12	X	0.025	1,800	2,900	N/A	0.025/1,800	Soil protective of groundwater. Once groundwater pCUL is met, cleanup level will be adjusted to Method C non-cancer direct contact.
TOTAL PETROLEUM HYDROCARBONS AND ASSOCIATED VOLATILES										
Ethylbenzene	6.05	8,000	--	X	5.9	350,000	--	N/A	5.9/350,000	Soil protective of groundwater. Once groundwater pCUL is met, cleanup level will be adjusted to Method C non-cancer direct contact.
Total Xylenes	14.6	16,000	--	X	14	700,000	--	N/A	14/700,000	Soil protective of groundwater. Once groundwater pCUL is met, cleanup level will be adjusted to Method C non-cancer direct contact.
Petroleum Hydrocarbons	30/100/2,000 (b)	1,500 (c)		X		1,500 (c)			1,500	Generic Method C cleanup level
METALS AND CYANIDE										
Cadmium	1.0	80	--	X	0.69	3,500	--	1.0	1.0/3,500	Protection of groundwater adjusted for natural background. Once groundwater pCUL is met, cleanup level will be adjusted to Method C non-cancer direct contact.
Copper	284	3,200	--	X	280	140,000	--	36	280/140,000	Soil protective of groundwater. Once groundwater pCUL is met, cleanup level will be adjusted to Method C non-cancer direct contact.
Cyanide (d)	48	50	--	X	(e)	2,200	--	N/A	2,200	Method C non-cancer direct contact.

Abbreviations and Acronyms:

-- = not listed
°C = degrees Celsius
CLARC = Cleanup Levels and Risk Calculation
COC = constituent of concern
CUL = cleanup level
DRO = diesel-range organics
GRO = gasoline-range organics
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
N/A = not applicable
ORO = oil-range organics
pCUL = preliminary cleanup level
RI = remedial investigation
SL = screening level
TPH = total petroleum hydrocarbons

Notes:

CULs based on Feb. 2021 CLARC Updates (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC)

Grey Shading = contaminant eliminated as a COC in media identified based on no exceedances of pCUL in the FS but is a COC in groundwater.

(a) Puget Sound Region 90th percentile value (Ecology. 1994. Natural Background Soil Metals Concentrations in Washington State. Publication #94-115.Washington State Department of Ecology. October. https://fortress.wa.gov/ecy/publications/documents/94115.pdf.)
(b) MTCA Method A values used for SL. 30/100 is the SL for GRO (30 mg/kg is used if benzene is detected; 100 mg/kg is used if benzene is not detected). 2,000 is the SL for DRO/ORC
(c) Method B/C generic TPH cleanup level (Ecology. 2017. Model Remedies for Sites with Petroleum Impacts to Groundwater. Publication No. 16-09-057. Washington State Department of Ecology. December. https://apps.ecology.wa.gov/publications/documents/1609057.pdf)
(d) Cyanide CULs are evaluated based on free cyanide.
(e) Soil samples collected were in the vadose zone. There is no CUL for soil protective of groundwater vadose. The CUL for soil protective of groundwater saturated is 0.1 mg/kg.

Table 3-3
Groundwater Cleanup Levels
Boeing Auburn Draft Cleanup Action Plan
Auburn, Washington

Analyte	RI GW SL	ARAR Federal MCL	ARAR WA State MCL	Method A	Method B (Non-Cancer)	Method B (Cancer)	Adjusted 10-5	Groundwater CUL protective of Drinking Water Beneficial Use (µg/L)	Basis	Groundwater CUL protective of Surface Water Beneficial Use (µg/L)
VOLATILES										
Trichloroethene	0.54	5.0	5.0	N/A	4.0	0.54	5.4	4.0	Method B Non-Cancer	0.38 (a)
Vinyl Chloride	0.029	2.0	2.0	N/A	24	0.029	0.29	0.29	Method B Cancer, adjusted to cancer risk 10^{-5} based on MCL rule.	0.02 (a)
TOTAL PETROLEUM HYDROCARBONS AND ASSOCIATED VOLATILES										
Ethylbenzene	700	700	700	N/A	800	--	N/A	700	Federal/State MCL	N/A
Total Xylenes	1,600	10,000	10,000	N/A	1,600	--	N/A	1,600	Method B Non-Cancer	N/A
Diesel-Range Organics	500	--	--	500	(b)	(b)	N/A	500	Method A	N/A
Gasoline-Range Organics	800	--	--	800/1,000 (c)	(b)	(b)	N/A	800/1,000 (c)	Method A	N/A
METALS AND CYANIDE										
Cadmium	5.0	5.0	5.0	N/A	8.0	--	--	5.0	Federal/State MCL	N/A
Copper	640	1,300	1,300	NA	640	--	--	640	Method B non-cancer	N/A
Cyanide (d)	9.6	200	200	N/A	10	--	--	10	Method B non-cancer	N/A

Abbreviations and Acronyms:

-- = not Listed
µg/L = micrograms per liter
ARARs = applicable or relevant and appropriate requirements
CLARC = Cleanup Levels and Risk Calculation
COC = constituent of concern
CUL = cleanup level
GW = groundwater
MCL = maximum contaminant level
N/A = not applicable
RI = remedial investigation
SL = screening level
WA = Washington
WAC = Washington Administrative Code

Notes:

CULs based on Feb. 2021 CLARC Updates (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC)
(a) Human Health Fresh Water WAC 173-201A. Ecology has required that SWQS, which are applicable only for the protection of surface water beneficial uses, be used as groundwater CULs for TCE and VC.
(b) Method B values were not calculated.
(c) 800 µg/L is used if benzene is detected; 1,000 µg/L is used if benzene is not detected.
(d) Cyanide CUL evaluated based on free cyanide.

Table 3-4
Surface Water Cleanup Levels
Boeing Auburn Draft Cleanup Action Plan
Auburn, Washington

	RI GW SL (a)	Federal ARAR Human Health - Fresh Water CWA 304	WA State ARAR Human Health - Fresh Water WAC 173-201A	Method B Non-cancer	Method B Cancer	Surface Water CUL	Basis
VOLATILES							
Trichloroethene	0.3	0.6	0.38	120	4.9	0.38	WA State ARAR WAC 173-201A
Vinyl Chloride	0.02	0.022	0.02	6,600	3.7	0.02	WA State ARAR WAC 173-201A

Notes:

CULs based on Feb. 2021 CLARC Updates (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC)

(a) SLs were provided for different areas in the RI report. The most conservative SLs are presented here.

Abbreviations and Acronyms:

ARAR = applicable or relevant and appropriate requirement
CLARC = Cleanup Levels and Risk Calculation
CWA = Clean Water Act
GW = groundwater
CUL = cleanup level
RI = remedial investigation
SL = screening level
WA = Washington
WAC = Washington Administrative Code

Table 5-1
Summary of Selected Remedial Alternatives
Boeing Auburn Draft Cleanup Action Plan
Auburn, Washington

AOC	Building	Description	Impacted Media	Selected Remedy	Description of Selected Remedy	COCs Exceeding CULs	Point of Compliance (Soil)	Point of Compliance (Groundwater)	Point of Compliance (Stormwater/surface Water)
A-01	17-06	Former USTs (TAU-01 and TAU-02)	Soil, Groundwater	A1: Excavation and Chemical Oxidation	Excavation of soil contamination; Application of *in situ* groundwater chemical treatment to excavation backfill. Periodic groundwater sampling after soil is removed until groundwater concentrations are below CULs.	Soil: TPH, Ethylbenzene, Total Xylenes Groundwater: TPH, Ethylbenzene, Total Xylenes	Standard; Site-Wide (with ICs for Method C soil CULs)	CPOC at Facility Boundary	N/A
A-09	17-07	Acid Scrubber Drain Line	Soil, Groundwater	B3: Future Excavation (and Monitored Containment)	Future excavation of soil contamination when Building 17-07 is demolished. Periodic groundwater sampling after soil is removed until groundwater concentrations are below CULs. Until excavation can occur, containment of contaminated soil and groundwater will continue by maintaining the asphalt/concrete, routine inspection and reporting of containment and periodic groundwater sampling of existing monitoring wells.	Soil: Cadmium, Copper Groundwater: Cadmium, Copper, Cyanide	Standard; Site-Wide (with ICs for Method C soil CULs)	Standard; Site-Wide	N/A
A-14	Site-wide	Site-wide TCE and VC contamination in soil and groundwater	Soil, Groundwater	D6: EISB at the Algona Focus Area and Site-Wide MNA	Enhanced in situ bioremediation injection at Algona Focus Area. Remediation of groundwater through naturally occurring biotic and abiotic degradation and other attenuation processes (MNA). Continue to monitor concentrations in groundwater with periodic groundwater sampling.	Soil: TCE Groundwater: TCE, VC	Standard; Site-Wide (with ICs for Method C soil CULs)	Standard; Site-Wide	N/A
A-15	Site-wide	Site-wide TCE and VC in stormwater and/or surface water	Stormwater	Remediation will be completed with AOC A-14		TCE, VC	N/A	N/A	Standard: Throughout Site Surface Water (and Chicago Avenue ditch and Auburn 400 basins)

Abbreviations and Acronyms:

AOC = area of concern
CPOC = conditional point of compliance
CUL = cleanup levels
EISB = enhanced *in situ* bioremediation
IC = Institutional Controls
MNA = monitored natural attenuation
N/A = not applicable
TCE = trichloroethene
TPH = total petroleum hydrocarbon
UST = underground storage tank
VC = vinyl chloride

Table 5-2
Summary of ARARs for Each AOC
Boeing Auburn Cleanup Action Plan
Auburn, Washington

		Chemical-Specific ARARs				Location-Specific ARARs		Action-Specific ARARs							
		Soil	Groundwater		Surface Water										
AOC	Description	MTCA Method C	MTCA Method A	MTCA Method B	MTCA Method B	WAC 173-201A, Water Quality Standards for Surface Waters of State of Washington	Uniform Environmental Covenants Act	Washington Hazardous Waste Management Act and implementing regulations: Dangerous Waste Regulations	Washington Solid Waste Management Act and its implementing regulation: Criteria for Municipal Solid Waste Landfills	Hazardous Waste Operations	State Environmental Policy Act	Washington Minimum Standards for Construction and Decommissioning	Underground Injection Control Program	Right-of-Way Use and Construction	Fire Hydrant Access
A-01	Former USTs (TAU-01 and TAU-02)	X	X				X	X	X	X	X	X			
A-09	Acid Scrubber Drain Line	X		X			X	X	X	X	X	X			
A-14/A-15	Site-wide TCE and VC contamination in soil and groundwater and stormwater and/or surface water	X		X	X	X	X			X	X	X	X	X	X

Abbreviations and Acronyms:

AOC = area of concern
CPOC = conditional point of compliance
CUL = cleanup levels
EISB = enhanced *in situ* bioremediation
IC = Institutional Controls
MNA = monitored natural attenuation
N/A = not applicable
TCE = trichloroethene
UST = underground storage tank
VC = vinyl chloride