Archaeological Monitoring and Inadvertent Discovery Plan for the USG Interiors Puyallup Site Cleanup Action Project, City of Puyallup, Pierce County, Washington

Submitted to:
USG Interiors
CDM Smith, Inc.

Submitted by:
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Seattle, Washington
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This report was prepared by HRA Archaeologist Carol Schultze, PhD, RPA, who meets the Secretary of the Interior's professional qualifications standards for archaeology. It is intended for the exclusive use of the Client and its representatives. It contains procedures to follow for archaeological monitoring during ground disturbing activities, as well as procedures to follow regarding inadvertent discovery of archaeological resources and human remains. It does not constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by the appropriate reviewing or permitting agency. This plan should be submitted to the appropriate state and local review agencies for their comments prior to the commencement of the project.

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1. Introduction and Project Description

The USG Interiors Puyallup Site Cleanup Action Project (Project) is located at 925 River Road in the City of Puyallup, Pierce County, Washington (Figure 1-1). The Project location consists of 1.58 acres located in the Puyallup River Valley at the intersection of State Route (SR) 167/River Rd. and 11th St. NW. This location is in Section 39, Township 20 North, Range 4 East, Willamette Meridian, and appears on the United States Geological Survey (USGS) Puyallup 7.5 minute topographic quadrangle map.

USG Interiors, LLC (USG), and CDM Smith, Inc. (CDM Smith) will be remediating arsenic-contaminated soil, groundwater, and sediment on the Puyallup site. The arsenic in the soil is derived from fill material brought to this location during a time period prior the early 1970s when USG had used slag from the ASARCO copper smelter in Ruston as a raw material in the production of mineral fiber insulation. It wasn't until later that the association between arsenic and other metals in ASARCO slag was determined. CDM Smith proposes to carry out the cleanup using a method of solidification/stabilization of the contaminated fill soil that contains concentrations greater than 90 mg/kg arsenic. This method does not entail the bulk removal of soils; it uses vertical auger mixing of vadose soils with a cement/bentonite/iron mixture to treat soils *in situ* to a maximum depth of about 16 feet below ground surface. Limited sediment removal will occur in Hylebos Creek. In addition, in situ treatment of groundwater will occur by the injection of ferrous iron and an oxidant in the affected aquifer using a limited number of introduction trenches and direct push technology (DPT) borings

Given the archaeological sensitivity of the location, the Washington State Department of Ecology (Ecology) has requested the evaluation of potential presence of archeological conditions of significance and archaeological monitoring of ground-disturbing activities associated with the Project, as necessary. CDM Smith is assisting USG with its implementation of the remedial action. CDM Smith contracted with Historical Research Associates, Inc. (HRA), for the preparation of a monitoring and inadvertent discovery plan (MIDP) for use during ground disturbing activities on the project (Sections 6 and 7).

1.1 Regulatory Context

This remediation will take place under Agreed Order DE 11098 between Ecology and USG under the Model Toxics Control Act (MTCA). In the early 1980s, USG became aware of the association between ASARCO slag that had been used as fill material at the Puyallup property and arsenic contamination. USG subsequently purchased the Puyallup property in October 1982 to facilitate its cleanup. That same year, USG voluntarily approached Ecology to negotiate an administrative

process to govern removal of industrial waste fill from the area of impacts (AI), which continues under the current Order (CDM Smith 2014; Dames & Moore 1983). Additionally, this project and any cultural materials that may be present on the property are subject to Washington State regulations regarding the protection of Native American burials and archaeological sites under the Revised Code of Washington (RCW) 27.44 and 27.53, respectively.

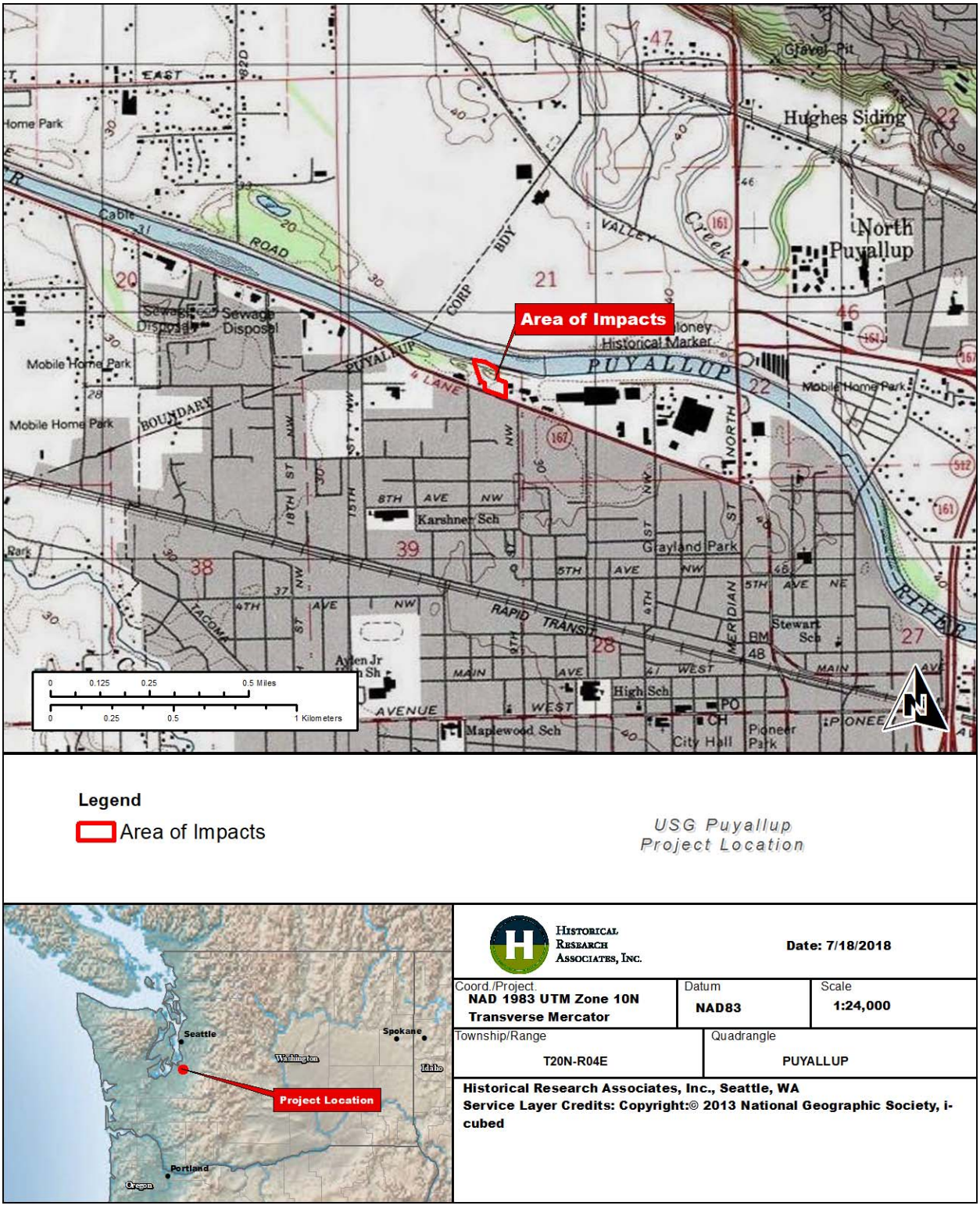

Figure 1-1. Project location and vicinity.

1.2 Area of Impacts and Recommended Monitoring Areas

The AI for the project consist of all locations where cultural resources eligible for listing in the National Register of Historic Properties (NRHP) could be impacted by the proposed activities. HRA recommends defining the AI to encompass all possible areas of direct ground disturbance (Figure 1-2). Since project activities will be limited to ground disturbance, no indirect or direct impacts to architectural features are anticipated.

Geotechnical boreholes completed on the AI identified modern fill on the site above intact native point bar and channel deposits (CDM Smith 2014). Intact archaeological deposits will not be present in the redeposited fill soils; therefore, archaeological monitoring is only recommended below the depth of fill. Across the AI, this is a depth below 10 feet (ft) to 15 ft.

The proposed injection points and wells will not bring any material to the surface, therefore there no archaeological monitoring is recommended for those activities. As shown in Figure 1-3, there will be three areas of open excavation. These include 1) a ferrous iron introduction trench , 2) a stormwater infuiltration gallery, and 3) an upland sediment/stream bank removal area. The depth of these excavations is currently not known. For 1 and 2, archaeological monitoring is recommended for any excavations below the fill deposit (i.e 10 ft) and into native sediments. Any excavation along the stream bank has the potential to disturb intact deposits, particularly if the water flow has already created erosion along the stream channel. The locations of these activities as plotted on Figure 1-3 are conceptual and subject to change as project planning continues. The figures in this MIDP should be revised if necessary.

Archaeological monitoring is recommended for all excavation along the stream channel (area 3), and for excavation below 10 ft in areas 1 and 2.

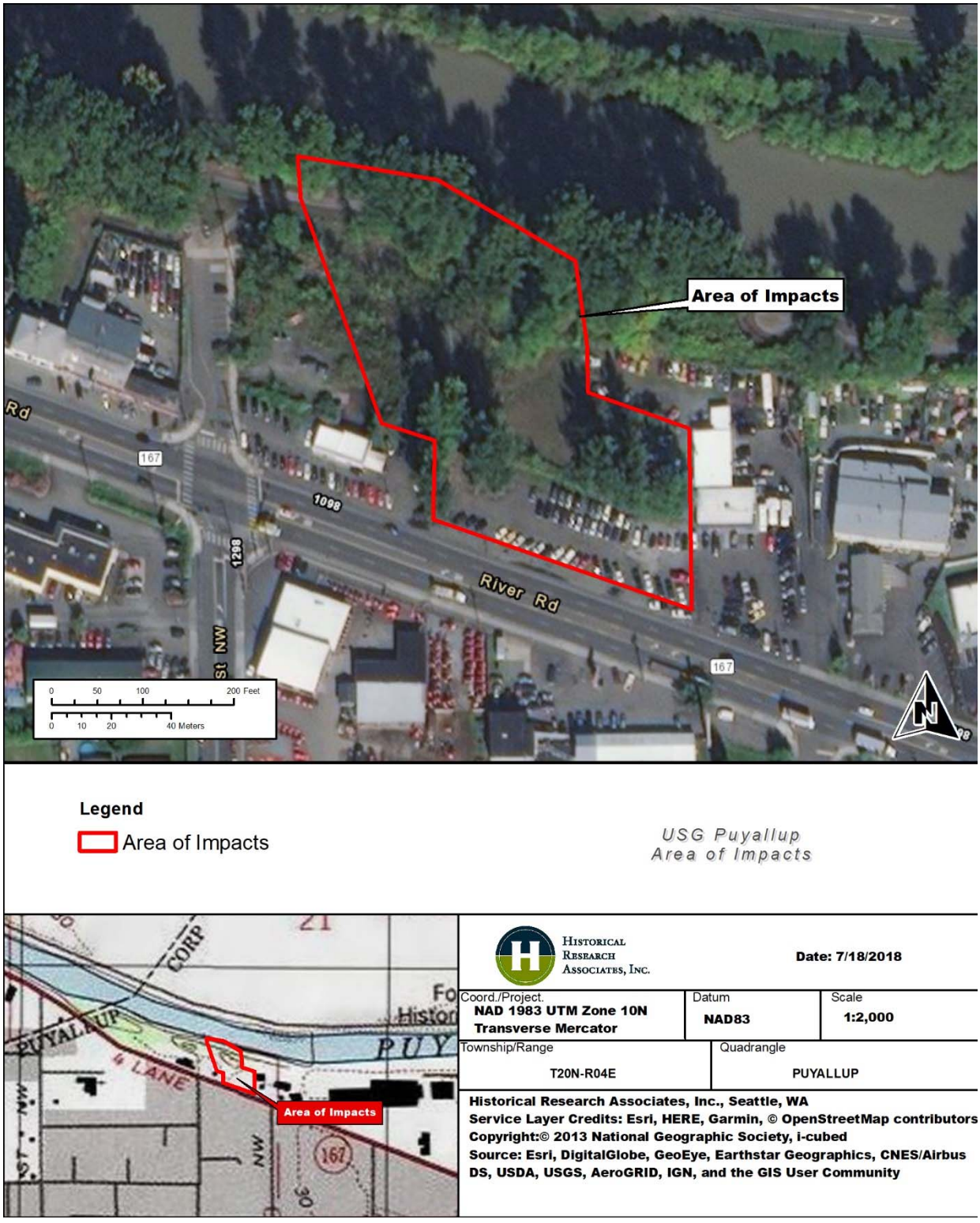

Figure 1-2. Area of impacts.

Figure 1-1. Recommended monitoring locations; conceptual and subject to change as project planning continues.

2. Archival Research

This chapter provides a review of archival data, including previous cultural resources surveys; documented archaeological sites, historic sites, structures, and objects; and historic maps. Understanding previous sites and studies in the vicinity of a project is important for understanding how intensively work has been conducted in the area. This archival research is also necessary for developing expectations for this project, which will be outlined in Section 5.

2.1 Research Methods and Materials Reviewed

HRA Archaeologist Carol Schultze, PhD, RPA, conducted an archival search for records pertaining to locations within 1 mile (mi) of the AI. Schultze searched the Department of Archaeology and Historic Preservation (DAHP)'s online database, the Washington Information System for Architectural and Archaeological Records Data (WISAARD), for archaeological site records, cultural resource survey reports, historic register information, and cemetery records. The statewide archaeological predictive model on DAHP's WISAARD was reviewed for probability estimates for archaeological resources and to aid in developing the field strategy.

HRA's in-house library and on-line resources were used to obtain information on the environmental, archaeological, and historical context of the AI. Historic nineteenth- and twentieth-century plats from the General Land Office (GLO), maps from the United States Surveyor General (USSG), and Pierce County atlases were reviewed for historic structures, features, and land-use patterns within the vicinity of AI. The GLO plats are available online at the U.S. Department of the Interior's Bureau of Land Management (BLM) website, while the USGS maps are available on the USGS website. County atlases were reviewed online through HistoricMapWorks.com. Since the work will be in the soil, and architectural resources over 50 years of age will not be impacted physically or visually, a review for buildings, structures, and objects (BSOs) was not conducted.

2.2 Archival Research Results

2.2.1 Cultural Resources Surveys

A total of eight cultural resources studies have been conducted within 1 mi of the AI (Table 2-1). No cultural materials, archaeological sites, or isolates within or adjacent to the AI were recorded by these projects. Two of these studies were directly adjacent to the AI. Craig Holstine and Joan Robinson completed a cultural resources desktop review for three alternatives for the SR 509 to SR 161 corridor, running along the southern edge of the AI. No cultural resources were identified (Holstine and Robinson 1992). A more recent project was completed directly adjacent to the AI to the north. Michael Shong carried out pedestrian survey along the proposed extent of the Riverfront

Trail project. No subsurface investigation was conducted and no cultural resources were recorded (Shong 2003).

Pierce County completed an architectural study of the city of Puyallup's historic-period downtown in 1983 (Pierce County 1983). Other agencies have conducted periodic updates to this study (BOLA 2007, 2010; Tonkin 1993). These studies resulted in seven historic properties being listed in the NRHP and Washinton Heritage Register (WHR), including those described in Section 2.2.3.

Additional cultural resource studies within 1 mi of the AI include those carried out for transportation and infrastructure improvements. Roger Kiers and Holstine completed a cultural resources study for a bridge replacement project, crossing the Puyallup River, located 0.7 mi to the east of the AI. They examined sonicore samples at 5 to 10 ft intervals to depths reaching 100 ft and excavated shovel-and-auger probes on the north side of the Puyallup River. Backhoe trenches were also monitored and five BSOs were evaluated (Kiers and Holstine 2012). No precontact cultural resources were identified, and the Meridian Street Bridge was recommended as eligible for listing in the NRHP. However, DAHP has not yet concurred with this recommendation, according to the WISAARD archival website.

Improvements to the Puyallup Station in downtown Puyallup triggered a cultural resources review, including review of geotechnical bore samples provided by HWA Geosciences and evaluation of buildings and structures. No cultural resources were recorded, and the project was recommended as having no adverse effect on NRHP-eligible resources (Beckner et al. 2015).

Dave Munsell carried out a cultural resources study for a conservation project located 0.9 mi to the southwest of the AI. Surface survey was completed, however no test pits were excavated. No cultural resources were identified (Munsell 2017).

Table 2-1 Previously Cultural Resources Studies within 1 mi of the AI.

Reference	NADB#	Title	Distance and direction from AI	Cultural Materials Identified Within or Adjacent to the AI
Holstine and Robinson 1992	1334156	*A Cultural Resources Addendum to Washington State Department of Transportation's SR 167: SR 509 to SR 161 Corridor Adoption Project, Pierce County, Washington*	Adjacent S	None
Shong 2003	1342152	*Heritage Resources Investigations For The City Of Puyallup Riverfront Trail Project-Phase 3, Pierce County, Washington*	Adjacent N	None
Pierce County 1983	1350031	*Pierce County Cultural Resource Inventory Volume VII Central Planning Area: City Of Puyallup, Pierce County, Washington*	0.8 mi S	None
Tonkin 1993	1350244	*Upgrading Puyallup's Downtown Buildings Historic Preservation Downtown Design Charette Contract Extension Two For Puyallup Main Street Association, Pierce County, Washington*	0.8 mi S	None
BOLA 2007	1350128	*Puyallup Historic Survey Report Puyallup, Washington for The City of Puyallup, Pierce County, Washington*	0.8 mi S	None
BOLA 2010	1681284	*Puyallup Northwest Residential Survey: Appendix to Puyallup Historic Survey Report Puyallup, Washington for The City of Puyallup, Pierce County, Washington*	0.6 mi S	None
Kiers and Holstine 2012	1682967	*Cultural Resources Discipline Report, State Route 167 Puyallup River/Meridian Street Bridge Phase, SR 167 Extension – Puyallup to SR 509 Freeway Construction Project, Pierce County, Washington*	0.7 mi W	None
Beckner et al. 2015	1687855	*Puyallup Station Access Improvements Project Cultural Resources Technical Report, Pierce County, Washington*	0.8 mi SE	None

Table 2-1 Previously Cultural Resources Studies within 1 mi of the AI.

Reference	NADB#	Title	Distance and direction from AI	Cultural Materials Identified Within or Adjacent to the AI
Munsell 2017	1689409	*Natural Resources Conservation Service Short Report for Cultural Resources Identification Survey, Pierce County, Washington*	0.9 mi SW	None

2.2.2 Previously Recorded Archaeological Sites

There are no precontact or historic-period archaeological sites recorded within 1 mi of the AI. The nearest precontact site is the Bray Site (45PI01276), located 2.6 mi to the northeast, on the opposite (north) side of the Puyallup River. The Bray Site is a large late precontact-period plant processing encampment on a high glacial outwash terrace overlooking the confluence of the White and Puyallup Rivers. Thousands of artifacts, including flakes, plant processing tools, and projectile points were found. Earth ovens were also observed as a common feature type on the site (Chatters and Kaehler 2012).

The closest historic-period site to the AI is 45PI0826, a 1940s domestic debris scatter located 1.2 mi to the northwest on the opposite side of the Puyallup River. This site was possibly related to a homestead and orchard, based on historic aerial photographs (Boersma 2008). The nearest archaeological site on the same side (south) of the Puyallup River as the AI is 45PI01360, located 3.1 mi to the southeast. It is an abandoned 1.5 mile segment of the Cascade Junction-Wilkeson Branch of the Northern Pacific & Cascade Railroad, which was sold to the Northern Pacific Railroad (NPRR) in 1898 (Trautman 2015).

2.2.3 Historic Register Properties

Within 1 mi of the AI is one property (JH Lotz house, 45PI0219) listed in the NRHP and one property (Stewart Brew house, 45PI0976) listed in the WHR. Both of these are located in the historic district of downtown Puyallup. The JH Lotz house is located 0.8 mi south of the AI. It is named after the architect who designed it, and it was constructed in 1891 (Maddox 1979). The Stewart Brew house is located 0.8 mi to the southeast of the AI. It was built in 1889 and is associated with the the Stewart family, who are among the original Euroamerican settlers of Puyallup (Lowry n.d.).

2.2.4 Cemeteries

The nearest cemetery to the AI is the Firwood Native American Cemetery, located 0.8 mi to the north. The earliest recorded burial was from 1883, and it continues in use into the present day (DAHP 2018).

2.2.5 Native American Place Names

The AI is within the traditional territory of the Puyallup people and is within 0.2 mi of the boundaries of the Puyallup reservation (Ruby and Brown 1992; USSG 1864). The nearest winter village to the AI was likely ***tsaqw"qwabc***, located on the southern bank of the Puyallup River, approximately 3 mi northeast of the City of Puyallup (Smith 1940a:10). Smith reports an additional village on the bluffs overlooking the AI, approximately 3 mi to the northeast, called ***sq'wadabc***, which was named for Simon's Creek (Smith 1940a:10). It is reported that the people of this village had strong contacts with the Duwamish people who lived along the White River.

2.2.6 Historic-Period Plat and Map Research

HRA examined historic-period plats and maps to identify cultural features in the AI. The earliest available plat of the AI and vicinity is the 1864 GLO (USSG 1864), which shows the AI along the original course of the Puyallup River, and its proximity to the Puyallup Indian Reservation (Figure 2-1). There is also a trail that runs directly toward the AI from the south. USGS topographic maps show the original path of the Puyallup River prior to development of the area and the boundaries of the Puyallup Indian Reservation (USGS 1900).

Nineteenth- and twentieth-century Pierce County maps and atlases were reviewed for features within the AI and vicinity. These illustrate the gradual development of the AI related to the expansion of the city of Puyallup (Metsker 1951, 1960; NETRonline 1940). In the Metsker 1951 atlas, the AI is bounded to the north by the Puyallup River with property subdivisions to the south (Figure 2-2). Kroll, Anderson, and Sanborn maps were not available for this location; however, USGS maps from the remainder of the twentieth century confirm that there was continued gradual development of the AI and vicinity (USGS 1961, 1962, 1975, 1991).

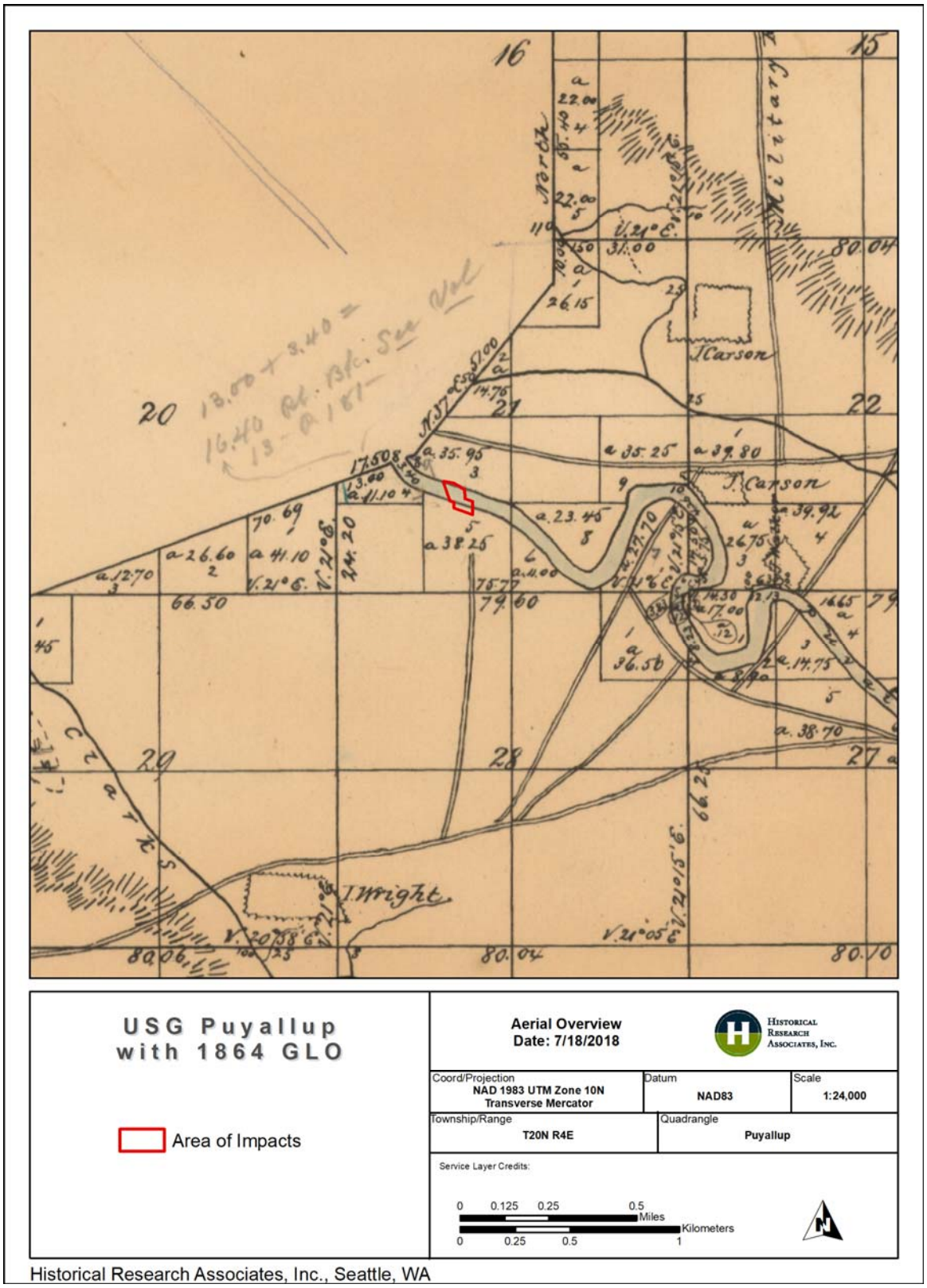

Figure 2-1. The AI location shown in reference to the 1864 GLO plat map.

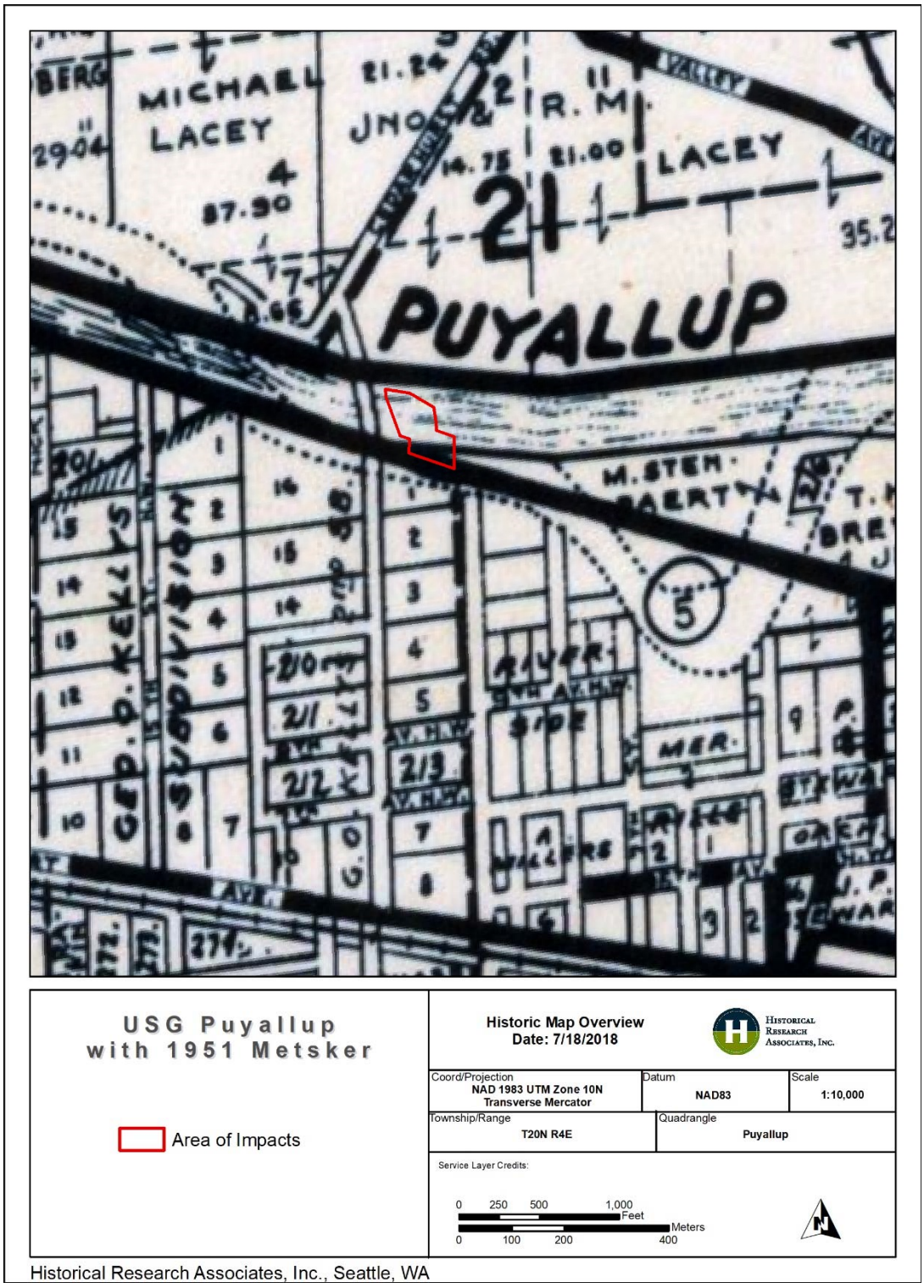

Figure 2-2. The AI location shown in reference to the 1951 Metsker map showing twentieth-century development.

2.2.7 DAHP Predictive Model

The DAHP archaeological predictive model uses standardized and repeatable statistical methods (Bayesian and Kriging) with statewide environmental and cultural resources data to define areas as having varied probability of the presence of precontact archaeological resources. Data on geology, soils, landform, elevation, aspect, slope percent, and distance to water, as well as information gleaned from historic-period GLO plats, were correlated with locations of known archaeological sites to determine the probability that another location could be expected to contain an archaeological site, under a similar set of environmental conditions (Kauhi and Markert 2009:2–3).

DAHP's model combines local information from field surveys to identify locations with five resulting sensitivity management groups: Very High Risk (5), High Risk (4), Moderate Risk (3), Low Risk (2), and Very Low Risk (1), with each representing the predicted risk that archaeological materials could present. The DAHP predictive model map indicates a High to Very High Risk of encountering archaeological sites in the AI.

3. Environmental Context

This section provides a brief overview of the local environment, including historic modification to this landscape and natural resources. Understanding the local environment, including geology, climate, flora, and fauna, is important for understanding how people used the landscape in the past. This environmental context is necessary for developing expectations for this Project, which will be outlined in Section 5.

3.1 Topography and Geology

The AI is located on the southern bank and floodplain of the Puyallup River, where very deep Holocene deposits can be expected. More generally, the AI is located within the Puget Lowland, a physiographic trough that runs from Canada to the Columbia River and is part of a broad regional depression (the Puget Trough province), extending from Canada to the Willamette Valley in Oregon, that developed as a result of subduction and coastal uplift (Orr and Orr 1996).

During the most recent glacial episode, known as the Fraser Glaciation (circa 19,000 to 16,000 years ago), the region surrounding the AI was scoured and covered by the Puget Lobe of the Cordilleran Ice Sheet. The Puget Lobe extended as far south as Centralia, Washington, and measured up to 4,000 ft thick, its weight depressing elevations in Puget Sound (Dethier et al. 1995; Porter and Swanson 1998). After approximately 17,000 years ago, the continental glaciers in northwestern Washington receded rapidly northward, leaving proglacial lakes and depositing glacial till, drift, and outwash sediments over a majority of the area. The Puget Lobe of the Cordilleran ice sheet covered the Puyallup area with approximately 2,400 ft of vertical ice for nearly 3,000 years. This ice sheet extended as far south as Tenino at 17,000 years before present (B.P.) (Porter and Swanson 1998). By 16,000 years ago, the glaciers had retreated completely, and the landforms of the Puget Sound region responded through rapid isostatic rebound, taking the next several thousand years (until approximately 12,500 years ago) to achieve equilibrium with sea levels (Beechie et al. 2001). Also, when the ice sheet retreated, ocean water flowed into the glacially-scoured Puget lowlands. These embayments stretched to Puyallup from Commencement Bay and terminated in ancient deltas. At 5700 B.P., the northeastern flank of Mount Rainier collapsed, sending a massive lahar down the ancestral White River Valley and Green and Puyallup River Valleys in an event called the Osceola Mudflow (Dragovich et al. 1994). Debris from this event was an unsorted mixture of andesitic rock and clayey sand matrix which caused the White River to cut a new channel north and join the Green River (Shong 2003).

The geology of the AI is largely unconsolidated Quaternary alluvial deposits to great depths. The sediments are characterized as nonconsollidated or semi-consolidated alluvial and colluvial silts, sands, clay, and cobble deposits. These include material of lacustrine, marsh, lahar, glacial and

volcanic origin, as well as areas of artificial fill (DNR 2018). Soils mapped within the AI is designated as Puyallup fine sandy loam. This forms on floodplains and terraces out of alluvial deposits and is well drained (USDA 2018).

3.2 Flora and Fauna

With exception to the urbanized areas, the Western Hemlock (*Tsuga heterophylla*) Zone is the primary vegetative zone west of the Cascade Range, between the Coastal Zone and approximately 3,300 ft above sea level. This wet, mild, maritime climate is generally characterized by less than 100 inches of precipitation annually, most of which falls as rain, and summer droughts typical of western Washington (Franklin and Dyrness 1973). Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) are the major forest tree species, with an understory characterized by devil's club (*Oplomanax horridum*), vine maple (*Acer circinatum*), dull Oregon grape (*Mahonia nervosa*), oceanspray (*Holodiscus discolor*), and various ferns. Deciduous trees such as red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and black cottonwood (*Populus balsamifera*), with an understory of salmonberry (*Rubus spectabalis*), often replace western red cedar in riparian and disturbed areas (Franklin and Dyrness 1973; del Moral 1997).

Vegetation on the Puget Lowland has been variable since the last glacial maximum. Changing conditions and natural disasters have shaped the distribution of plants and patterns of vegetation zones. By about 10,000 B.P., changes in solar insolation, sea surface temperature, and atmospheric trace gases had produced a warm-dry climate in the Pacific Northwest. Pollen records in the southern Puget Lowland between 10,000 and 6000 B.P. indicate a predominance of Douglas-fir, oak, red alder, grass, and prairie herbs (Brubaker 1991:21). By 6000 B.P., the climate was becoming cooler and moister. Pollen levels of Douglas-fir and alder decreased while western red cedar and western hemlock pollen increased. Dendrochronological and historical records describe numerous catastrophic fire events that have affected patterns of vegetation zones across the western Washington landscape over the past 1,000 years (Hollenbeck 1987). The mixed conifer forest stands along the Puyallup River are generally younger than 200 years as a result of natural causes such as forest fires, landslides, and mudflows (Dragovich et al. 1994), as well as human influences including timber production, urban land use, and agricultural development.

The physical and floral diversity of the region provides for varied fauna within the lower Puyallup River watershed. Common animal species throughout the area, prior to Euroamerican settlement, included blacktail deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), black bear (*Ursus americanus*), cougar (*Felis concolor*), bobcat (*Felis rufus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), muskrat (*Ondatra zibethica*), bald eagle (*Haliaeetus leucocephalus*), and a variety of owls and small song birds. Wetland habitats typically supported a specialized but diverse array of fauna that included raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), beaver (*Castor canadensis*), and a variety of migratory waterfowl and woodland birds (Larrison 1968).

An assortment of resident and anadromous fish species are present in the rivers, tributaries, and independent creeks within the Puyallup River watershed. Contemporary Puyallup River fish include: Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), and chum (*O. keta*) salmon species, but other salmon species may have been present during the historic and precontact periods (Williams et al. 1975).

4. Cultural Context

This chapter provides a brief overview of 14,000 to 16,000 years of human occupation in North America, focusing specifically on western Washington and the Puget Sound region. Understanding the history of human occupation and land use in an area is crucial for interpreting archaeological data and for anticipating what kinds of archaeological sites may be encountered during a project. This context will contribute to the development of expectations for this Project, which will be discussed in Section 5.

4.1 Precontact Background

The cultural evolutionary changes described in the chronology of Ames and Maschner (1999:57–112) are based on technological advancement in the context of increasing sedentism and demographic growth. Their cultural chronology is divided into five periods: Paleo-Indian, Archaic, Early Pacific, Middle Pacific, and Late Pacific. Over this time, small nomadic groups reliant on general hunting and gathering subsistence strategies gradually shifted to more sedentary living, with permanent or semi-permanent winter villages and a seasonal round of specialized resources, focusing on certain abundant riverine and marine resources (Ames and Maschner 1999). A summary of their chronological sequence is provided in Table 4-1.

Table 4-1. Model of Precontact Change in the Puget Basin (after Ames and Maschner 1999:66).

Dates	Period	Land Use	Settlement	Subsistence	Technology
~11,800 B.C. to 10,500 B.C.	Paleo-Indian	Generalized marine, littoral, and/or terrestrial	Short-term use pit houses and shelters	Generalized marine, littoral, and/or terrestrial	Stone; bone, antler, and perishable materials likely
10,500 B.C. to 4400 B.C.	Archaic	Generalized littoral, neritic, and terrestrial	Short-term use pit houses and shelters	Generalized littoral, neritic, and terrestrial	Stone; some bone and antler; other perishable materials likely
4400 B.C. to 1800 B.C.	Early Pacific	Littoral, neritic, and terrestrial	Increased sedentism in seasonal villages	Increased focus on littoral resources and expanded use of neritic resources	Increase in ground stone, bone, antler, and perishable materials
1800 B.C. to A.D. 200/500	Middle Pacific	Neritic, littoral, and terrestrial	Winter villages of plank houses and seasonal camps	Increased focus on marine and riverine resources. Food storage technologies developed	A decrease in stone and diversification of tools and tackle of bone, antler, and perishable materials

Table 4-1. Model of Precontact Change in the Puget Basin (after Ames and Maschner 1999:66).

Dates	Period	Land Use	Settlement	Subsistence	Technology
A.D. 200/500 to A.D. 1775	Late Pacific	Neritic, littoral, and terrestrial	Large permanent villages and special use sites	Specialized marine, riverine, littoral, and terrestrial resource use and management. Extensive food storage	Tools and tackle of bone, antler, and perishable materials; very little stone

The earliest periods of human occupation in the Americas are not readily observed in coastal environments along the Puget Sound, due to the rise in sea levels at the end of the Pleistocene. As such, the earliest evidence of human occupation along the coast is likely to be under water. In other portions of North America, however, archaeologists have discovered evidence of human occupation beginning as early as 15,500 to 14,500 years ago, based on finds at Buttermilk Creek, Texas (Pringle 2011), and Meadowcroft Rockshelter, Pennsylvania (Adovasio et al. 1990), among others.

In the Pacific Northwest, at the Manis site near Sequim, a mastodon skeleton with evidence of human hunting activity has been radiocarbon dated to 13,800 years ago (Waters et al. 2011), although some remain skeptical of this find (Grayson and Meltzer 2015:184). A pre-Clovis occupation at Bear Creek in Redmond, Washington included concave-base points in contexts dating to 12,770–12,596 calibrated radiocarbon years ago (Kopperl et al. 2010). Corroboration for these early dates is found at the rock shelter site at Paisley Cave, Oregon, where human coprolites have been radiocarbon dated to between 12,750 and 14,290 years ago (Wolman 2008).

The Archaic period (circa 10,500 B.C. to 4400 B.C.) was a time of transhumant hunting and gathering with increasing emphasis on locally available resources. Artifact assemblages are characterized by temporally diagnostic lanceolate shaped forms, regionally called Olcott or Cascade points, and cobble implements (Kidd 1964). Bone and antler tools have also been found at sites dating to the Archaic period. It is toward the end of this phase that the coastlines of the Puget Sound islands would have begun to stabilize and a more modern climate regime would have been established.

The Pacific period (circa 4400 B.C. to A.D. 1775) is characterized by increasing local resource intensification (particularly directed toward salmon) and residential sedentism. Ames and Maschner (1999) suggest these traits evolved in three different sub-periods, characterized by demographic increase and increasing resource intensification (Ames and Maschner 1999:90, 94, 96). Semi-subterranean pit houses and semi-permanent winter village adaptations developed during this period (Nelson 1990:483). In the Puget Sound, the majority of remaining archaeological sites are coastal and riverine shell middens that date to the Pacific period.

4.2 Ethnographic Background

The AI is within the traditional territory of the Puyallup Indian Tribe (Haeberlin and Gunther 1930:9; Smith 1940a:6; Spier 1936:33) and is within 0.2 mi of the Puyallup Reservation (see Figure 2-1). Ancestors of the Puyallup peoples occupied villages along the banks of the Puyallup and White Rivers, including their tributaries (e.g., Clay Creek, Clarks Creek, Stuck River, Carbon River, South Prairie Creek, Vogt Creek), as well as on Commencement Bay, Vashon Island, Hylebos Creek, and Wapato Creek (Smith 1940a:10). Puyallup villages were generally located on waterways, such as the Puyallup River and locations near creeks and tributaries that may have been used for temporary camps during their annual subsistence harvests.

The Puyallup are classified as a Southern Lushootseed-speaking group of the Southern Coast Salish peoples (Smith 1940a:21; Suttles and Lane 1990). Southern Coast Salish social organization was one in which village and family groups were interconnected through kinship obligations and economic dependence, forming an extended kin group over a large geographical area (Smith 1940a:32–33). The indigenous settlement-subsistence system of the southern Puget Sound was tied to the area's river systems, with their abundant salmon and other fishery resources, temperate climate, and potential to facilitate transport along the waterways (Smith 1940a; Suttles 1990). The Puyallup people lived in multifamily villages, which consisted of one or more cedar plank longhouses (Haeberlin and Gunther 1930:15). These houses were constructed using cedar planks attached to wooden frames, the frames being composed of house posts and cross beams (Smith 1940a:9–12, 1940b). These villages were typically occupied nearly year-round and were seldom left completely vacant (Smith 1940b:5). At other times of the year, easily transported, temporary pole and mat structures provided shelter when family groups moved to various environmental zones to harvest resources, process them for storage, and then transport the supplies back to the permanent village.

While the primary food resource was salmon taken in the Puyallup River and its tributaries, the Puyallup also relied on wetland resources for medicinal plants, raw materials for making mats and baskets, and other food resources. Wetland plants with a variety of economic uses were gathered, such as cattails, for making mats to cover temporary shelters, the roots of Devil's Club for treating colds, skunk cabbage leaves for lining steaming pits, and crab apples to eat fresh or store for the winter months. Land mammals, such as beaver, were also hunted or snared in swamps and wetlands (Smith 1940b:4).

4.3 Historic Background

European exploration of the Puget Sound area began in 1792, when Captain George Vancouver landed in Puget Sound to claim the land for King George III of Great Britain. The first non-Native settlers to arrive in the Puyallup River Valley area were W. F. Tolmie and the traders of Hudson's Bay Company, who established a trading post at Fort Nisqually in 1833 (Gallacci 1982). Dr. William Tolmie, head of the fort, was reportedly the first Euroamerican to travel through the Puyallup River

Valley, in 1833 on an expedition to Mount Rainier. The first non-Native settlers in the valley are described as former employees of Fort Nisqually. Former employee Adam Benston reportedly lived along the Puyallup River with his Native American wife. The fort closed in 1869 (BOLA 2007; Gallacci 1982).

Settlement along the Puyallup River began in the 1850s when Ezra Meeker, among others, settled in the Puyallup area and began cultivating hops (Gallacci 1982). On February 18, 1877, Meeker platted the town of Puyallup, three years after a post office was established. By the 1870s, the railroad had placed a siding on J. P. Stewart's land claim (BOLA 2007). For a time, the Puyallup Valley became a major hop-producing area, whose commercial viability was boosted by a failure of the British hop crop in 1882. Meeker became extraordinarily successful for a time, writing books on, and promoting, hop cultivation. In 1891, he directly owned 500 acres of hop producing land and had an interest in nearly all the commercial hop farms in the Pacific Northwest. Distribution and sale of the hops was made possible through a spur of the Northern Pacific line (Becker 2006; Gallacci 1982).

In 1892, infestations by hop lice brought blight and economic ruin to the hop farms in the Puyallup Valley, which was followed by the national economic depression of 1893 (BOLA 2007). The local hop industry was further damaged by passage of federal Prohibition, as the 18th Amendment to the U.S. Constitution, in 1919 which outlawed manufacture, sale, or transportation of alcoholic beverages. After this time, many farmers in the valley abandoned hops for berry growing. The Washington State Legislature had allocated funding for the Puyallup Agricultural Experiment Station in March 1891, as part of the State College of Washington in Pullman (BOLA 2007; Price and Anderson 2002).

Transportation was a central element in shaping the economy and the development of the city of Puyallup. Early roads through the valley became important commercial routes after the establishment of railroad lines, starting with the Northern Pacific in the early 1880s. Following World War II, the automobile culture created greater impacts with the growth and the expansion of state highway programs and local road-building (BOLA 2007; Kiers and Holstine 2012).

The land was cultivated until the second half of the twentieth century. After World War II, the formerly agricultural lots were then developed into large commercial establishments; notably large auto dealerships and retail shopping centers (BOLA 2007; Luttrell 2004). River Road was established and commercial development of former agricultural fields in the vicinity of the AI began in the 1960s (Luttrell 2004).

The ASARCO smelter was located on Commencement Bay in Ruston and Tacoma, Washington. It operated from 1890 to 1986 as a smelter of lead and copper ore. The copper ore contained high concentrations of arsenic, as did the slag. From about 1959 to 1973, the USG Tacoma plant used ASARCO slag as a raw material for mineral fiber production. "Shot," baghouse dust, and off-specification product from the USG Tacoma plant were reportedly used as fill at the AI (CDM Smith 2014). This fill had elevated arsenic concentrations. An aerial photograph dating to February 1971 shows fill being placed on the northern portion of the AI, perhaps industrial waste from

USG's Tacoma, Washington plant (CDM Smith 2014). In the early 1980s, USG became aware of the association between ASARCO slag and arsenic contamination. USG subsequently purchased the Puyallup property in October 1982 to facilitate its cleanup.

A March 1985 aerial photo indicates the timing of waste removal actions. According to information submitted to Ecology by USG, industrial waste fill and underlying soil totaling approximately 25,536 tons were removed from the site for off-site disposal (CDM Smith 2014). The removed fill was replaced with clean fill to the previously existing grade.

5. Expectations for Precontact or Historic-Period Cultural Resources

Environmental factors (e.g., close proximity to water and available food and material resources) would have affected how humans used the landscape. Examination of the environmental variables and ethnographic and historic records provides information on what cultural resources may be expected within the AI and surrounding vicinity. The information HRA reviewed suggests a high probability of intact archaeological remains in the vicinity of the AI.

The AI is located along the southern bank of the Puyallup River and floodplain. Very deep floodplain deposits are anticipated in this location. The area may have been attractive to precontact and ethnographic period groups utilizing it for fishing, hunting, gathering, travel, and as a short-term residence. During the historic period, this location would have been useful for agriculture, settlement, and transportation. Many types of archaeological materials may be encountered during the proposed activities. These may include, but are not limited to:

- Precontact archaeological materials and features (ethnographic-period materials could include artifacts or features the same as those for precontact timeframes with the inclusion of some historic-period items).
    - Stone tools and flaking debris.
    - Antler or bone fragments (potentially with cut marks made by stone tools).
    - Charcoal concentrations and darkened or reddened earth.
    - Fire-modified rock (FMR), either singly or in clusters, which could indicate the presence of hearths or processing features.
    - Food and refuse materials from plants and animals.
- Historic-period archaeological materials.
    - Remnants of logging machinery or implements.
    - Low-fired and bisque ceramics with subdued colors, or blue/pink willow-like design; thick-bodied pieces indicating crockery.
    - Non-tempered glass; amethyst colored glass; stopper-topped glass jars or bottles; press-capped (cork gasket liner) heavy-walled soda or liquor bottles (not twist-top, thin-walled); zinc and vitreous glass-lidded glass canning jars with colored body.

- Miscellaneous fragments of metal (or plated) clothing closures (hooks and eyes, and suspender fittings, but not zippers), shell buttons, fragments of Bakelite houseware, celluloid.
- Sawed animal bone and fruit pits.
- Enameled ironware.
- Punch-opened and solder-sealed beverage cans; solder-sealed food tins; (not thin-walled aluminum and welded-steel cans).
- Older automotive parts.
- Knob-and-tube electrical insulators.
- Construction or structural materials such as concrete, milled lumber, brick, and metal rebar, hardware, and implements.

Ethnographic- or contact-period artifacts would be similar to those associated with precontact sites, with the potential inclusion of Euroamerican manufactured or trade goods (e.g., iron tools, glass or ceramic beads or vessels).

6. Procedures for Archaeological Monitoring and Inadvertent Discovery of Cultural Materials

6.1 Procedures for Archaeological Monitoring

The following steps will be followed during archaeological monitoring for the Project. The Project involves the cleanup of hazardous substances (i.e., arsenic). Therefore, the Project must also comply with regulations under the Occupational Health and Safety Administration (OSHA) related to the cleanup of hazardous waste (29 CFR Parts 1910.120 and 1926.65) and Washington State's Chapter 296-843 Washington Administrative Code (WAC) among other environmental regulations. When an archaeologist is required on-site, they must have the appropriate training, assumed to be 40-hour Hazardous Waste Operations (HAZWOPER) training, along with a site-specific orientation to the Project's hazards.

HRA will arrange for a HAZWOPER-trained professional archaeologist who meets the Secretary of the Interior's qualifications (36 CFR Part 61; required by the State of Washington in RCW 27.53.030.8) to provide oversight for all cultural resources related activities on the site. If an archaeologist meeting the qualifications is not available, but an experienced archaeologist (e.g., one with several years' experience in a variety of archaeological field situations) is available to monitor construction activities, they will be allowed to do so given that a "Supervisory Plan for Archaeological Monitoring" has been filed with DAHP by HRA prior to their work at the site.

Archaeological monitoring will take place in the areas recommended in Section 1-2. Particular attention will be given to the stream bank sediments and any native sediments below the level of modern fill, or approximately 10 to 15 ft below ground surface.The monitoring depth in each portion of the AI should be informed by the geotechnical bore profile data provided in the Project's Cleanup Action Plan (CDM Smith 2014).

The archaeologist will record the monitoring work as follows: daily activities will be recorded on a Daily Record Form and in a field notebook. Overview photographs of the construction activities and stratigraphy, along with detailed photographs of particular locations, work in progress, and precontact or historic-period cultural materials, will be promptly logged in a field notebook. In addition, the archaeologist will complete and log in any needed sketches of discovery areas, features, and soil profiles. The locations of areas that have been monitored will be noted on maps or plans of the AI.

For safety reasons, the archaeologist will not enter any excavations deeper than than 4 ft to inspect a possible find until the excavation has been shored by the contractor, per WAC 296-155-657(1) (https://www.lni.wa.gov/Safety/Rules/chapter/155/WAC296-155.PDF#PartN).

During construction, the archaeological monitor will examine soils in excavations and back-dirt piles in a way that will not impact the Contractor's work or project safety requirements. If there is no space for backdirt piles in the AI, the monitor will observe loading of sediment directly into dump trucks. Equipment for examining sediments will include, as appropriate and as needed, a shovel, trowel, and screen of ¼-inch mesh. The archaeologist will watch for precontact or historic-period artifacts or layers/lenses of organic material or shell, and organically enriched midden soils that might indicate past human use.

6.2 Inadvertent Discovery of Cultural Materials

The following procedures will be followed if cultural materials are identified during ground disturbing activities when an archaeologist is not present. In the event that archaeological deposits are inadvertently discovered during soil removal in any portion of the AI, ground-disturbing activities in the vicinity of the find should be halted immediately, the CDM Smith onsite supervisor (on behalf of USG) and Ecology should be notified. Ecology would then contact DAHP and the interested Tribes, as appropriate. The area of work stoppage will be large enough to provide for the security, protection, and integrity of the discovery.

Ecology will take appropriate steps, including, when necessary, consulting with a Professional Archaeologist (i.e., an archaeologist meeting the qualifications set out by the Secretary of the Interior in Code of Federal Regulations, 36 CFR Part 61) to determine whether the discovery is an archaeological site or isolated cultural item. The onsite supervisor will take reasonable steps to protect the discovery by installing a temporary protective buffer measuring at least 50 ft radius from the discovery location. Work in the immediate area will not resume until treatment of the discovery has been completed or the discovery has been adequately protected.

6.3 Procedures for the Investigation of Cultural Materials

If the archaeological monitor or any member of the construction crew believes that they have encountered precontact or historic-period archaeological materials in any portion of the AI, the archaeologist will request that CDM Smith's onsite supervisor stop excavation work in the immediate area. If the archaeologist is not present at the time of discovery, the onsite supervisor will be responsible for stopping excavation work and immediately contacting the monitoring archaeologist.

Precontact archaeological materials include, but are not limited to: intact deposits of shell midden sediments; stone chips or tools clusters of FMR, charcoal, or other evidence of fire-related activities;

and faunal remains. Historic-period archaeological materials may include refuse or trash concentrations, domestic items, machinery fragments, or house foundations (see Section 5.0).

CDM Smith's onsite supervisor will authorize the archaeologist to stop work if the onsite supervisor cannot be located in cases where it appears that the crew may have encountered a cultural deposit and an immediate stoppage is needed. When the onsite supervisor is on site, the archaeologist will request that the onsite supervisor stop work. The construction may continue at another location if feasible. CDM Smith's onsite supervisor will inform the construction contractor(s) about the archaeologist's monitoring work and make provisions, within its agreement with the contractor, for work stoppage, and when applicable, for inspection of possible finds.

Halting of construction for inspection of possible precontact or historic-period archaeological materials may take only a few minutes, but rarely would exceed 30 minutes, to allow the monitoring archaeologist to identify whether it is an intact archaeological deposit. The archaeologist will take notes on the location observed (e.g., depth in metric units below surface), the sedimentary context, and other pertinent information, and will document the area with photographs. CDM Smith's onsite supervisor will establish a protective buffer of at least 50 ft radius surrounding the location of the possible precontact or historic-period archaeological materials to protect the materials and the archaeologist during this inspection. It may be necessary for the archaeologist to request continued mechanical excavation of soils adjacent to the find in order to confirm the extent and integrity of the find. The archaeologist will coordinate with the onsite supervisor to direct the contractor in such circumstances.

If the monitoring archaeologist believes that they have identified a precontact archaeological resource or a significant historic-period archaeological resource, CDM Smith's onsite supervisor will inform Ecology, which will then contact DAHP and the cultural resources representatives for the affected Tribes, as appropriate (Appendix A). Ecology and the onsite supervisor will take appropriate steps to protect the discovery site by installing a physical barrier (i.e., exclusionary fencing) and prohibiting all machinery, other vehicles, and unauthorized individuals from crossing the barrier.

Under RCW 27.53, all precontact archaeological sites are protected regardless of significance or eligibility for national, state, and/or local historic registers. A determination of eligibility for listing in the NRHP by DAHP must be obtained for historic-period resources. It is presumed that historic-period resources are eligible for listing in the NRHP unless and until DAHP makes a determination otherwise. Treatment measures may include mapping, photography, subsurface testing, sample collection, and/or other activities, as determined appropriate by DAHP and Tribal representative(s). Eligible precontact and historic-period resources will require a permit to disturb under RCW 27.53. Appropriate treatment measures will be stipulated under a permit obtained from DAHP.

7. Inadvertent Discovery of Human Remains

Any human remains that are discovered during implementation of the Project will be treated with dignity and respect. All personnel that examine the remains will have a current 40-hour HAZWOPER certification. They will follow a Health and Safety Plan (HASP) prepared for their activity and will wear the appropriate personal protective equipment (PPE).

If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause further disturbance to those remains **must** cease. The CDM Smith onsite supervisor (on behalf of USG) and Ecology will secure the area of the find and protect it from further disturbance. In addition, the finding of human skeletal remains **must** be reported to the Pierce County Medical Examiner **and** the Pierce County Sheriff in the most expeditious manner possible (see Appendix A for contact information). The remains should not be touched, moved, or further disturbed.

The Pierce County Medical Examiner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the Pierce County Medical Examiner determines the remains are non-forensic, they will report that finding to DAHP. DAHP will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian, and report that finding to any appropriate cemeteries and the affected tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

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Appendix A. Contact List

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Pierce County Medical Examiner
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