



## Draft Environmental Assessment

Sedro-Woolley Fire Station

Grant Request EMW 2009 FC 01076R

City of Sedro-Woolley

March 8, 2010



**FEMA**

**U.S. Department of Homeland Security**

FEMA Region X

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## Acronyms and Abbreviations

ARRA	American Reinvestment and Recovery Act
AFG	Assistance to Firefighters Grant
EA	Environmental Assessment
EO	Executive Order
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SR	State Route
SWFD	Sedro-Woolley Fire Department
T&Es	Threatened and Endangered Species
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency

## **1.0 Introduction**

The proposed project is intended to expand and enhance fire protection capability for Sedro-Woolley and the surrounding area. The proposed location, at 1218 North Township Road in Sedro-Woolley, Washington, will not only create an additional fire station, thereby expanding the total fire-fighting capacity of the Sedro-Woolley Fire Department (SWFD), but will also distribute this capacity over a broader area. This will enable the SWFD to reduce response times, and have redundant capability in case a response route is blocked by a passing train, damage from a natural disaster, or other incident.

The Federal Emergency Management Agency (FEMA) is involved in this project as a funding agency, providing an American Recovery and Reinvestment Act (ARRA) Assistance to Firefighters Station Construction Grant (AFG). The City of Sedro-Woolley was selected for an award in October of 2009. The ARRA is an economic stimulus package and the purpose of the Fiscal Year 2009 funds is to create or save jobs in recession-hit areas which includes supporting 'shovel-ready' projects. Moreover, ARRA will further help achieve AFG goals of firefighter safety and improved response capability/capacity based on need, through the construction, renovation, or modification of fire stations.

Prior to the FEMA application, the U.S. Federal Highway Administration (FHWA) completed review of the proposed project location as part of the Fruitdale and McGarigle Road transportation improvements project. Action included use of the parcel to stockpile soil unsuitable for road improvements. Some of the FHWA completed environmental review documentation will be incorporated herein.

Because the FHWA action did not consider fire station construction or require completion of an Environmental Assessment, this has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations Parts 1500 through 1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this Environmental Assessment (EA) is to analyze the potential environmental impacts of the proposed Sedro-Woolley Fire Station. FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

## **2.0 Purpose and Need**

The objective of the AFG station construction initiative is to provide financial assistance directly to fire departments on a competitive basis to build new or modify existing fire stations in order for departments to enhance their response capability and protect the

community they serve from fire and fire-related hazards. One priority considered is whether the grant will be used to expand fire protection coverage to meet increased service demands in the applicant's community.

The problem being addressed by this project is the increase in demand that growth in the Sedro-Woolley area has placed on the fire department. In just the last decade, Sedro-Woolley has grown from a population of 8,658 in 2000 to 10,030 in 2008 (U.S. Census data). According to the SWFD, callouts have increased from 1,553 in 2005 to 1,755 in 2008. Additional development has also occurred toward the north end of Sedro-Woolley as indicated by a newer residential subdivision to the east of the proposed fire station.

The existing station is located at 325 Metcalf Street in Sedro-Woolley, and is staffed by a Chief, Assistant Chief, 4 part-time positions, and 35 volunteers. According to SWFD statistics, 77.55% of calls are for rescue and emergency medical response.

### **3.0 Alternatives**

A number of alternatives to achieve Sedro-Woolley's stated purpose and need have been evaluated over the past few years, taking into account key emergency response operational factors.

#### **3.1 No Action Alternative**

Under the no action alternative, no FEMA funding would be available. If the City of Sedro-Woolley were to not expand their existing fire station or build additional capacity at a different location they would have to wait until a later date to implement an action alternative, or attempt interim operational enhancements. However, this would not address the existing problems of increased response-times and potential blockage of response-routes.

#### **3.2 Proposed Action**

The proposed action is to use a City-owned property (about 2 acres) located on 1218 North Township Road (also known as SR 9), on the north side of Sedro-Woolley, and build a new 6,000 square foot fire station and associated parking and stormwater management features. The project area is rural and consists mostly of grazing or crop land-uses. Although no longer present, the project site recently had a home and garage/barn on it. The parcel is bound to the north and east by residential properties; and to the south and west by a field and woods. Willard Creek is about 250 ft to the east of the property. This property, due to its location, would provide a more direct response-capability to areas north of State Route (SR) 20 as shown by Figure 1. The existing fire station, located at 325 Metcalf Street, would continue to cover areas south of SR 20, especially the portions of Sedro-Woolley nearest the Skagit River.

Plans have been prepared for the fire station and an architectural drawing is shown in Figure 2.

### **3.3 Other Alternatives Considered but Dismissed**

Two Action Alternatives have also been considered, and one or both could be implemented if the preferred and Proposed Action is not used. However although both alternatives would expand on the fire department's existing capacity, they have operational constraints that would limit their effectiveness.

#### Expand and Re-Model the Existing Fire Station

The existing fire station, located at 325 Metcalf Street, in downtown Sedro-Woolley, has multiple bays for fire engines and other equipment, training rooms, living quarters, and administrative office space. Fire trucks return to the station and are able to pull in to the back of the engine bays, so that backing is not required. Figure 1 shows the location of the existing station as well as the locations of the Proposed Action and Alternative Action.

The existing fire station could be expanded by building an addition to the existing building. However, a nearby city park limits the scope of any such expansion. Assuming that additional fire trucks and staff were available, this would enable the fire department to respond to additional calls at the same time, but would not reduce the distance they would need to travel to respond to calls in the outlying areas of the city. It would also not provide redundancy in response capability from the equipment and personnel being distributed throughout the city. An expanded fire station would also require additional parking, resulting in impacts on adjacent properties.

#### Build a New Fire Station off of Portobello Avenue

The SWFD could build a second fire station off of Portobello Avenue, near its intersection with Fruitdale Road. This property is smaller than the one being used for the Proposed Action and would not have the ability for fire engines to pull into the engine bays through a back entrance. The lack of a pull-thru ability is not a minor matter for a fire department. Backing a fire truck takes additional time and, even with a ground guide, exposes the fire department to increased risk of accidental damage to equipment, facilities, and personnel. It also forces the fire truck to maneuver in front of the station, possibly in conflict with street traffic.

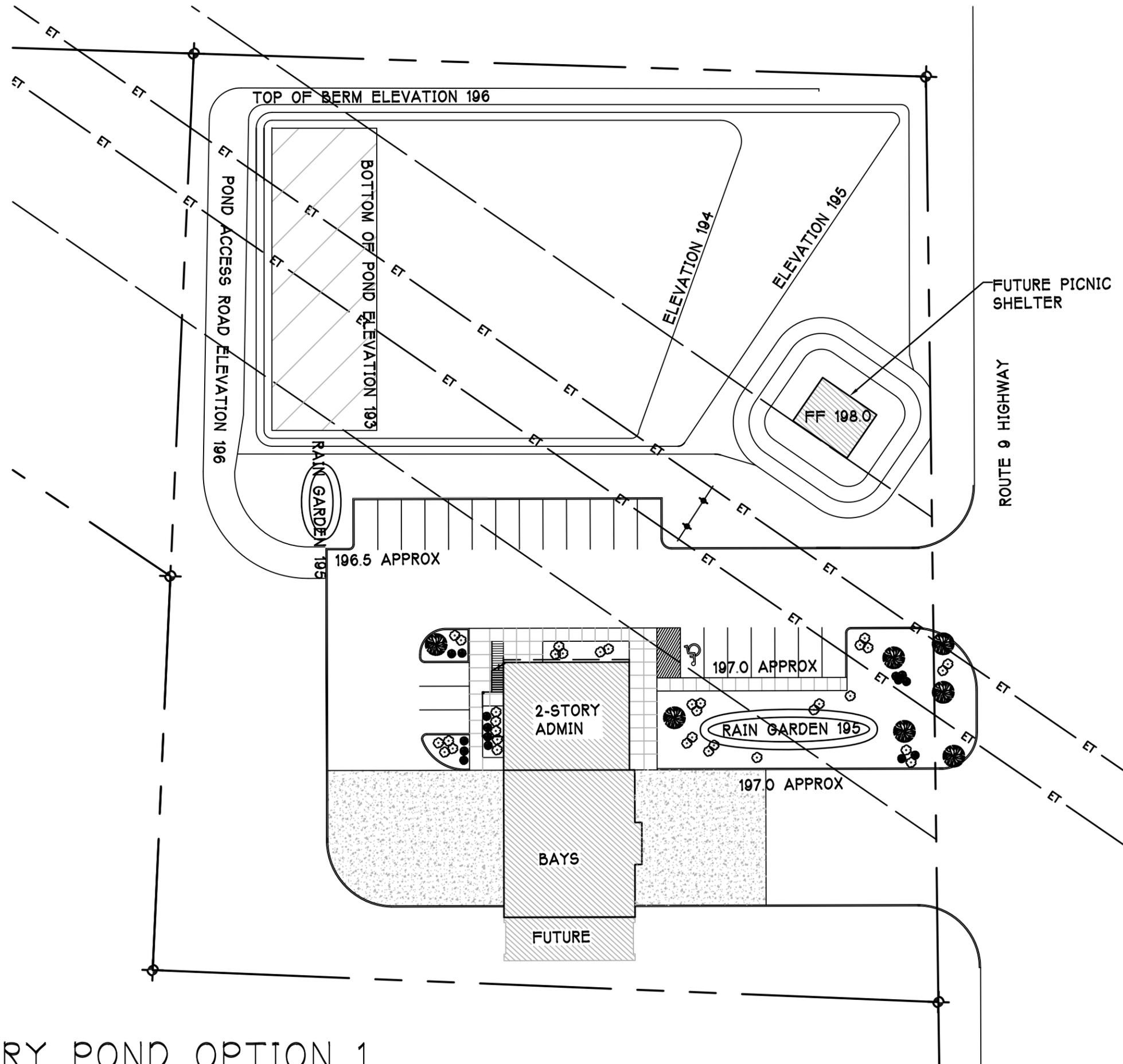
A new fire station at this location would also reduce response times to areas that the Proposed Action would serve. However, the Portobello Avenue location does not have as good a connection with the city's arterial roadways. It would have longer response times than the Proposed Action.

No other alternatives besides those discussed above were considered. The Proposed Alternative was the only alternative considered to fully meet the Purpose and Need.

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SITE PLAN-DRY POND OPTION 1

SCALE= 1"=40'

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## 4.0 Affected Environment and Potential Impacts

For each resource category, the impact analysis follows the same general approach for the No Action and Proposed Action Alternatives. When possible, quantitative information is provided to establish impacts. Qualitatively, these impacts will be measured based on small, moderate, or large impacts as outlined in the chart below.

Impact Scale	Criteria
Small	Environmental effects would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the resource.
Moderate	Environmental effects would be sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
Significant	Environmental effects would be clearly noticeable and would be sufficient to destabilize important attributes of the resource.

Impacts are disclosed based on the amount of change or loss of the resource from the baseline conditions. Impacts may be direct or indirect. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later in time or are farther removed from the area, but are still reasonably foreseeable (40 CFR Part 1508). Cumulative impacts are discussed in Section 4.7.

### 4.1 Physical Resources

#### 4.1.1 Geology and Soils

Construction of the proposed fire station will not require substantial alteration of nearby soils or topography. The site is on a gradual slope, with higher ground to the north and a forested drainage area to the west. According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service website, the soil type in the vicinity of the proposed fire station is Skipopa silt loam, with a 3 to 8 percent slope<sup>1</sup>. It is found on terrace-like landforms, and is composed of volcanic ash and loess over glaciolacustrine deposits<sup>2</sup>. This matches the local topography, including the presence of a nearby lake.

This type of soil has a low permeability, having a drainage classification as being 'somewhat poorly drained', and tends not to be in areas where flooding or ponding occurs. Furthermore, as previously noted, portions of the proposed project site are being used to stockpile imported spoil material.

<sup>1</sup> <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

<sup>2</sup> Glaciolacustrine refers to sediments that are deposited into lakes from glaciers

There is no evidence of nearby faulting or the tell-tale escarpment of landslides. Construction standards will comply with local seismic design codes.

### Environmental Consequences

#### *No Action:*

Because there would be no construction, a No Action scenario would have no change on local soils and geologic conditions. The existing station would support emergency response operations as it currently does.

#### *Proposed Action:*

Given the relatively low level of disturbance to local topography, the proposed fire station will have a small impact on local soils and geologic conditions. The project would not likely be impacted by geologic conditions as the surrounding soil appears to be stable. Consistent with a National Pollution Discharge Elimination System (NPDES) permit in effect for the site, best management practices (BMP) will be employed during site construction to minimize soil erosion offsite during site work. Although the project area is predominantly agricultural land uses, because the project site is within the city limits of Sedro-Woolley, review per the Farmland Protection Policy Act is not required.

## **4.1.2 Air Quality**

Sedro-Woolley is not within a U.S. Environmental Protection Agency designated Attainment or Maintenance Area for air quality.

### Environmental Consequences

#### *No Action:*

With no construction under this alternative fire-response operations will continue as they are now, presumably with a gradual increase in activity given increased population and development in the Sedro-Woolley area. A No Action scenario would have a small effect on air quality.

#### *Proposed Action:*

Given the low level of traffic associated with fire station operation, and that an expanded capacity to extinguish fires would protect air quality, the proposed fire station will have a small adverse effect on air quality from operation and small beneficial effect from shorter response times. Site soils would be covered and/or wetted during construction to minimize fugitive dust.

### **4.1.3 Climate Change**

The climate in the Skagit County area, and throughout much of the neighboring counties, is characterized by a transition from low coastal areas to the Cascade Mountain Range. This transition in elevation is accompanied by a variation in rainfall. For example, the average annual rainfall in a coastal city like Anacortes, in western Skagit County, is 26 inches, with rainfall increasing to 32 inches in Mount Vernon and to 65 inches per year in Concrete in eastern Skagit County. Sedro-Woolley is about halfway between Anacortes and Concrete.

A second fire station will likely result in expanded service through additional fire-fighting equipment, such as fire trucks, and through increased travel by paid and volunteer staff. However, such increases in vehicular traffic, on a large scale, will be the same whether the traffic were concentrated at the existing fire station or distributed over two or more stations.

Additionally, a second fire station will require additional energy for lighting and heating, and result in additional emissions from construction equipment on a temporary basis. This increase in energy usage, and emissions from fire fighting equipment and staff vehicles is inconsequential compared to existing conditions in Skagit County, and is likewise inconsequential in its effect on climate change.

## **4.2 Water Resources**

### **4.2.1 Water Quality**

Stormwater in Sedro-Woolley either infiltrates into the ground or flows into local waterbodies such as Willard Creek, which is approximately 250 feet west of the Proposed Action, either directly or indirectly through the city's stormwater collection system. The storm drain system, as described by the City, is intended to prevent flooding by conveying rainwater away from buildings, roads and other places. Because storm drains ultimately convey water to surrounding rivers, the city ordinance prohibits anything other than uncontaminated rain water from entering the storm drain system. Willard Creek is listed on the Washington State Department of Ecology (DOE) 303(d) list, with a classification of 'w' for fecal coliform. In accordance with the Strahler stream-order classification system used by the DOE Willard Creek, being a headwater stream in the vicinity of the project, has a stream-order of 1.

#### Environmental Consequences

##### No Action:

Because there would be no construction, a No Action scenario would have no change in water quality conditions.

Proposed Action:

The proposed project will result in approximately 36,590 square feet (0.84 acres) of impervious surface, between 7,400 square feet of roof space and sidewalk (0.17 acres), and 24,400 square feet (0.56 acres) of pavement surrounding the fire station. The existing surface, totaling 101,060 square feet (2.32 acres), consists of plowed fields, lawn and pasture, and compacted dirt or gravel roadway. The existing amount of impervious surface, from the driveway and compacted areas formerly under structures, is estimated to be 5,000 square feet. The net increase in impervious surface will, therefore, be 31,590 square feet (0.725 acres). Approximately 64,470 square feet (1.48 acres) will still be available to infiltrate stormwater or wastewater. The project will not result in more than 1 acre being disturbed and will therefore not trigger NPDES requirements beyond those already in place with the FHWA action.

In accordance with state and local standards, the fire station will have an on-site stormwater collection and treatment system which will treat stormwater with a rain garden, and use a detention pond to attain flow-control (see Figure 2). This treated stormwater will then be discharged through a control structure to an existing drainage ditch along the north side of the property that discharges into Willard Creek. The proposed project would have a small effect on Willard Creek's water quality.

#### **4.2.2 Wetlands**

The property being used for the Proposed Action has one non-jurisdictional wetland, covering approximately 900 square feet. This wetland is located toward the north boundary of the property and will not be affected by construction of a fire station. A wetland investigation in June of 2009, found that the wetland is a closed depression, and has no connection with 'waters of the U.S.'. As such, the isolated wetland is not under the jurisdiction of the U.S. Army Corps of Engineers (see Appendix B).

In addition, as defined in Sedro-Woolley Municipal Code 17.65.025, wetlands "do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street or highway." As the wetland area does not receive sufficient hydrology to maintain the saturated soils necessary without input from drainage ditches and swales, it would be considered an artificial wetland by the City of Sedro-Woolley and is, therefore, not regulated as a critical area.

#### Environmental Consequences

No Action:

With no construction, the No Action scenario would have no effect on wetlands.

*Proposed Action:*

Because the wetland feature on the parcel has been impaired by past agricultural uses, and does not meet pertinent regulatory definitions, and is avoided by construction; consistent with Executive Order 11990, Wetlands Protection and the Clean Water Act; the proposed action avoids wetlands.

### **4.2.3 Floodplains**

Siting for a fire station is of particular concern relative to floodplains, as these are considered 'Critical Actions' under Executive Order 11988, Floodplain Management. Federally-assisted critical actions must be located above the 500-year floodplain, unless there are no practicable alternatives; because even a small risk is too great relative to emergency response service the community depends on with a fire station. The proposed station site is located upland from the Skagit River, and toward the top of a hill on a gradual slope. The parcel is designated a flood zone X according to FEMA's Flood Insurance Rate Map, outside the 500-year floodplain. In addition, the Sedro-Woolley Municipal Code, 17.66.190, requires that, "Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Special Flood Hazard Area (SFHA) (one hundred year floodplain)."

#### Environmental Consequences

*No Action:*

With the No Action scenario there would be no change in existing conditions. The absence of a second fire station, if the existing fire station or its fire-response routes were susceptible to flooding, would not alleviate such issues. Thus the No Action scenario could have a small adverse effect on services, because of the lack of local back-up, should they be disrupted by flooding.

*Proposed Action:*

Due to its upland location, construction of the fire station will not act as a constriction on any floodplain. And due to its on-site stormwater system, will not substantially change drainage patterns. Therefore, affects to any downstream floodplains are small.

### **4.3 Coastal Resources**

Although the City of Sedro-Woolley is not near the coast, Skagit County is designated a coastal county by the WA Department of Ecology. This designation is due to various portions of Skagit County being on the coast of Puget Sound, including the City of Anacortes and numerous river deltas.

#### Environmental Consequences

##### *No Action:*

If no work is undertaken there will be no change to the area in regards to coastal resources or to the county's designation.

##### *Proposed Action:*

The proposed project is not within the portion of Skagit County that has coastal resources. Construction and operation of a fire station will have no effect on coastal resources or on the county's designation.

### **4.4 Biological Resources**

#### **4.4.1 Vegetation**

The project area can generally be characterized as rural residential and agricultural land uses. The existing site is covered by grasses and weeds, or bare dirt from prior agricultural plowing. Adjacent site vegetation includes shrubs and trees lining Willard Creek, and landscaping planted by adjacent property owners.

#### Environmental Consequences

##### *No Action:*

If no construction work is undertaken then there will be no change in existing vegetation.

##### *Proposed Action:*

The project will remove most, if not all, of the few remaining trees and replant new trees as part of the landscaping plan. Much of the grasses will remain as these areas are being left undeveloped. New plantings will include native trees, shrubs, and lawn; mostly in between the fire station building and North Township Road. This will tend to replicate what will be removed to construct the facility. The proposed project would have a small effect on vegetation.

#### **4.4.2 Threatened and Endangered Species and Critical Habitat**

Per Section 7 of the Endangered Species Act, the Proposed Action has been evaluated for effects to threatened or endangered species (T&Es) and designated critical habitat. The Proposed Action will take place within an area that is already highly disturbed from past farming activities. This area is also surrounded by residential and agricultural development. A review of Washington Department of Fish and Wildlife data yielded no occurrence records for T&Es or critical habitat

on the project site. FHWA's review for placement of stockpiled materials on the site determined there would be No Effect to listed species, given the scope of work and species absence from the project site. Willard Creek, located 250 feet west of the project site, supports Coho salmon further downstream.

#### Environmental Consequences

##### *No Action:*

If no work is undertaken the No Action scenario would cause no changes to existing conditions relative to threatened and endangered species.

##### *Proposed Action:*

Because there will be no in-water work and the potential for sediments to reach the creek due to stormwater treatment and vegetated buffer area are minimal, No Effect to Coho salmon are anticipated.

### **4.4.3 Wildlife and Fish**

There are no lakes or fishbearing streams on the property. There are forested areas to the west of the property which could provide habitat for wildlife, such as deer, raccoons, songbirds, and rabbits. Willard Creek provides some connectivity to similar habitats, north and south of the project limits. Nearby roads such as Bassett Road and Sapp Road present breaks in this connectivity, but are not barriers to wildlife.

#### Environmental Consequences

##### *No Action:*

If no work is undertaken, the No Action scenario would have no change in existing conditions for wildlife and fish.

##### *Proposed Action:*

Because the proposed site retains little habitat value since it has been under agricultural use, effects to wildlife will be small from construction and operation of a new fire station. Additionally, construction of the fire station will not alter adjacent wooded areas.

## **4.5 Cultural Resources**

As part of the FHWA action and per Section 106 of the National Historic Preservation Act, a cultural resources investigation was completed for the proposed action site. The report includes a prehistoric and historic context for the project area, research methodology, and findings (see Appendix E).

### **4.5.1 Historic Properties**

#### Environmental Consequences

##### *No Action:*

If no work is undertaken there will be no effect on cultural resources.

*Proposed Action:*

A total of nine test pits were dug on the Proposed Action site during a field investigation for archaeological resources. No cultural resources, artifacts, or features were identified during this surface and subsurface investigation. Cultural resource work also included a pedestrian survey and background research regarding the property. The State Historic Preservation Officer (SHPO), by letter dated February 25<sup>th</sup>, concurred that this project would result in No Historic Properties Affected. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity should be discontinued, the area secured, and the SHPO and FEMA notified.

#### **4.5.2 American Indian / Religious Sites**

The property is owned by the city so is, therefore, not a tribal land, nor is it on or near a reservation. According to the US National Park Service (2010), tribes with historical interests in the project region include the Upper Skagit, Swinomish, Stillaguamish, Lummi, and Confederated Tribes of the Colville Reservation. The cultural resources investigation completed for the FHWA action provides an overview of tribal occupation patterns in the region (see Appendix E).

##### Environmental Consequences

*No Action:*

If no work is undertaken there will be no effect on American Indian / Religious Sites.

*Proposed Action:*

The cultural resources investigation completed on the site found no evidence of cultural material or features that may be of tribal interest. Thus the proposed fire station is not expected to affect any sites with religious or cultural significance. Tribes will have an opportunity for comment as part of the public involvement process of this draft EA.

## 4.6 Socioeconomic Resources

### 4.6.1 Environmental Justice

Executive Order (EO) 12898 clarifies existing Title VI requirements of federal officials and those receiving federal funds to consider possible disproportionate and high adverse environmental effects to minorities and low-income populations. According to U.S. Census data<sup>3</sup>, the population in Sedro-Woolley, in 2000, consisted of the following:

Total	8658	100.0 %
Non-minority	7963	92.0
Minority	1321 <sup>4</sup>	15.26
Low-Income	950	11.3

U.S. Census maps indicate that some minorities live north of SR 20, with some in the vicinity of the proposed fire station. However, these maps do not mean that there are distinct minority neighborhoods, nor do they imply that reported populations live in public housing.

#### Environmental Consequences

##### *No Action:*

If no work is undertaken there would be no change in socioeconomic conditions. All people, including any minority and low income populations present, would not benefit from a second fire station. Thus the No Action scenario could have a small adverse effect on minority and low income populations depending on their proximity to the existing fire station and the effect that constraints on outreach might have on safety education. As many non-minorities and higher income populations would share this same lack of benefits any impacts of a No Action scenario would not be disproportionate.

##### *Proposed Action:*

Given the diverse population in the Sedro-Woolley area, and the age of the data (none was available for 2008, the latest update), it is safe to assume that some minority or low-income populations could live near the proposed fire station property. However, demographics were not part of the city's site selection criteria for a new fire station location. Furthermore, the new fire station will provide equal benefits to the community through expanded fire protection coverage. Thus, given the nature of the project there will be no 'high adverse and disproportionate' effects to minority and low income populations associated with the project.

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<sup>3</sup>[http://factfinder.census.gov/servlet/SAFFacts?\\_event=Search&geo\\_id=&\\_geoContext=&\\_street=&\\_county=Sedro-Woolley&\\_cityTown=Sedro-Woolley&\\_state=04000US53&\\_zip=&\\_lang=en&\\_sse=on&pctxt=fph&pgsl=010&show\\_2003\\_tab=&redirect=Y](http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=Sedro-Woolley&_cityTown=Sedro-Woolley&_state=04000US53&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010&show_2003_tab=&redirect=Y)

<sup>4</sup> This includes double reporting, such as someone who is white and Hispanic

## 4.6.2 Noise

Fire stations can generate a wide range of noise levels, from quiet most of the time to loud when equipment sirens are activated during call-outs. According to a research paper submitted to the National Fire Academy in 2003, sirens were measured, for the purpose of firefighter exposure levels, at between 86 and 92 decibels when in close proximity to the siren. Call-outs typically involve a fire truck and support vehicle or Medic van, which would be expected to use both lights and a siren. Residents and businesses in the immediate vicinity of a new fire station would be briefly subjected to this noise at approximately half the current call-out rate – presuming that each station responds to half the service demand. This would equate to nearly 900 call-outs per year, or 2.5 per day. In addition, exposure to this noise could come at any time during the day or night. Also, as stated in the City of Sedro-Woolley’s Municipal Code<sup>5</sup> sounds created by emergency equipment are exempt from the noise ordinance.

### Environmental Consequences

#### *No Action:*

If no work is undertaken there will be no change in noise patterns around the existing fire station, other than a possible small increase in call-outs commensurate with Sedro-Woolley’s population growth. The No Action scenario would have a small effect on noise.

#### *Proposed Action:*

The project area along SR 9 would be characterized as quiet because of the dominant land uses of rural residential and agricultural. Construction of the fire station will temporarily increase ambient noise levels from site preparation through facility completion as a result of additional traffic and equipment use. Because construction activities will be conducted during the daytime, adverse noise impacts to adjacent residents is expected to be small.

Noise conditions in the project area will change as a result of the new fire station, in particular because activation of emergency sirens is inherent to such a facility. It should also be noted that the sirens are intended for public safety. Because call-outs are not expected to be frequent and nearby residents are likely to be away at work during the day, day-time adverse noise impacts from the sirens are expected to be small. Night-time sirens could adversely affect most nearby residents and could wake people who are sensitive to night-time noise. This would be considered a moderate impact since night-time operations would be limited to emergency events that may not occur on a daily or even weekly basis, and the noise interruption would be brief in duration. According to the city’s assistant fire chief, night-time call-outs have recently averaged approximately 250 per year. These call-outs would be distributed between both fire stations.

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<sup>5</sup> City of Sedro-Woolley’s Municipal Code Chapter 9.46.030

Other noise associated with the new fire station would be staff arriving at and departing from the fire station. Though more frequent than call-outs, this noise would not involve sirens and would blend in with existing traffic noise from the adjacent roadway, thus a small adverse affect.

Finally, by moving some of the emergency response function to a different location, a commensurate reduction in adverse noise effects can be expected from the existing fire station operation in downtown Sedro-Woolley.

### 4.6.3 Traffic

Most of the vehicular trips associated with the fire department as a whole will still be associated with the existing downtown fire station. These trips include call-outs, and arrivals/departures from staff, volunteers, visitors, and deliveries. A second fire station would have its own localized traffic, resulting from call-outs and a reduced level of staff, volunteers, and deliveries. Fire fighters start their shifts at 6 a.m., and end them at 6 p.m.; which is not during the p.m. traffic peak.

#### Environmental Consequences

##### *No Action:*

If no work is undertaken then there would be no change in existing traffic patterns, other than what would be expected from more call-outs associated with Sedro-Woolley population growth. The No Action scenario would have a small adverse effect on traffic.

##### *Proposed Action:*

The proposed new fire station site is located on SR 9, which is considered an arterial at this location. Coordination will be required with the Washington State Department of Transportation for an Access Connection Permit. The level of trip generation for the new fire station could be expected to add up to 24 trips per day, broken down as follows:

Call-outs	3 out, 3 back, times 2 vehicles	12 trips
Staff / volunteers	2, on average, 4 trips / day	8 trips
Deliveries	2 per day, 2 vehicles	4 trips

As shown above, trips associated with a new fire station are minimal – approximately equal to the impact of two homes sharing a common driveway. In addition, call-out trips originate from the fire station but do not have consistent destinations. Furthermore, at the proposed location, the trips will blend in with a state highway, instead of impacting a neighborhood local roadway. Thus, the fire station will have a small adverse impact on local traffic.

Also, by moving some of the emergency response function to a different location, a commensurate reduction in emergency response related traffic volume can be expected at the existing fire station in downtown Sedro-Woolley.

#### **4.6.4 Public Service and Utilities**

Public services include police and fire protection, animal control, and street maintenance. Utilities include electrical, natural gas, water, sewer, refuse collection, and communications.

##### *Environmental Consequences*

###### *No Action:*

If no work is undertaken there will be no change on utilities. The absence of a second fire station, considering the purpose and need of the project, would continue to place a strain on delivery of fire response as a public service. Therefore, the No Action scenario would have a small to moderate adverse effect on public services.

###### *Proposed Action:*

As the fire station would be manned 24 hours a day, no additional police protection would be needed, and there would be no need to augment other public services as a result of the new fire station beyond what is already provided. The above listed utilities are either buried or supported overhead by utility poles. Other than tie-in, no additional utilities would need to be installed as a fire station would not need anything beyond the above listed utilities. Operation of the fire station will not exceed the existing capacity of the existing utilities in the project area. Accordingly the new fire station will cause only small adverse effects to local public services and utilities.

#### **4.6.5 Public Health and Safety**

By its nature, a fire station provides benefits to public health and safety. Such facilities are often used to provide flu shots, blood pressure checks, and other services that promote public health. In addition, these facilities are also used to educate youth about fire and bicycle safety and as headquarters for disaster response. Similarly vehicles responding to calls typically use emergency beacons, lights, and sirens so as to warn approaching vehicles.

##### Environmental Consequences

###### *No Action:*

If no work is undertaken the existing fire station will continue to perform its public health and safety functions from its current location and from borrowed locations or using vehicles. As described in the Purpose and Need Section, the No Action scenario would likely have a small adverse effect on public health and safety capabilities. These effects could worsen over time with Sedro-Woolley's population growth and development patterns.

###### *Proposed Action:*

The proposed expansion in fire response capability will have a moderate beneficial affect on public health or safety in Sedro-Woolley and the regional emergency response system it supports as a result of the expanded capacity.

Response times will be reduced for call-outs in the north end of the City, providing a particular benefit to residents and business in that area.

#### **4.7 Hazardous Materials and Wastes**

Aside from the use of common lubricants and cleaning agents, no additional pollutants would be dispersed by operation of a fire station. Consideration of potential site contamination was considered during development of alternative sites.

##### Environmental Consequences

###### *No Action:*

If no work is undertaken there will be no change to existing conditions as they relate to hazardous materials and wastes.

###### *Proposed Action:*

The proposed site was most recently used for residential and agricultural purposes. Typical hazardous materials associated with these uses include: drain cleaning chemicals such as sodium hypochlorite and sodium hydroxide, herbicides such as Roundup (a post-emergent) and Ronstar (a pre-emergent), motor oil and similar lubricants, gasoline and diesel fuels, lead-acid batteries, and fertilizers with ammonium nitrate and potassium. A review of US EPA and WA Department of Ecology hazardous materials and site contamination databases indicated that Voluntary Cleanup Program sites, as well as sites with Leaking Underground Storage Tanks and Underground Storage Tanks, are within a half mile of the proposed fire station. Two Confirmed or Suspected Contaminated sites are within a mile of the proposed fire station. The stockpiling of materials done as a FHWA Categorical Exclusion did consider whether hazardous materials or wastes would be encountered or generated by that project, in accordance with questions in Part 4, Section 5, on the project's Environmental Classification Summary. A letter, regarding the Fruitdale-McGarigle road project, amended its ECS to account for the stockpiling of material at the proposed fire station location; and disclosed the above database findings.

No hazardous materials or wastes were observed on the site or immediately adjacent to it, either before or after the stockpiling of materials from the other project. Furthermore the spoil material that has been imported to the site from the FHWA project – from a variety of locations along Fruitdale-McGarigle Road – is not known to contain contaminants. Accordingly, based on past use and site evaluation, the new fire station is not expected to generate any hazardous materials or wastes or be affected by them.

## **4.8 Cumulative Impacts**

No development is pending expansion of fire protection services. In addition, planned growth is already happening toward the north end of Sedro-Woolley. A second fire station has been part of the City's capital improvements plan and it will not accelerate growth or change zoning.

## **5.0 Project Conditions and Mitigation Measures**

Project conditions and mitigation measures include:

- The City shall secure and comply with applicable permitting (see Section 6).
- The City is responsible for selecting, implementing, monitoring, and maintaining best management practices to control erosion and sediment, reduce spills and pollution, and provide habitat protection; consistent with permitting requirements.
- Site soils will be covered and/or wetted during construction as needed to minimize fugitive dust.
- Construction activities will be conducted during the daytime, to reduce adverse noise impacts.
- In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity shall be discontinued, the area secured, and the SHPO and FEMA notified.
- If any hazardous materials are found during construction; these shall be characterized, remediated, and disposed of as appropriate, and otherwise handled in accordance with applicable local, state, and federal laws and regulations.
- The site stormwater management system shall be operated and maintained consistent with its intended design.
- Any change to the approved scope of work stated in the FEMA grant application and described in this EA as the proposed action will require re-evaluation for compliance with NEPA and other laws and Executive Orders.

## **6.0 Agency Coordination, Public Involvement and Permits**

As part of the FHWA action, the City coordinated with WSDOT Local Programs and consulted with the State Historic Preservation Officer and nearby tribes.

The SWFD has complied with the State Environmental Policy Act (SEPA) as implemented by the City of Sedro-Woolley, the lead SEPA agency. This act, or process, involves disclosing proposed actions, their potential impacts, and

identifies mitigations as necessary to avoid and minimize expected impacts. The SEPA process distributes a checklist summarizing the proposal's actions and effects to local and state agencies who are provided an opportunity to comment on the proposal. Other interested parties and individuals can also use this time to comment or express their concerns.

Public involvement about the proposed fire station completed to date included discussion with the Sauk Mountain View Estates property owner's association, during consideration of an alternative location. A public notice is required for this draft EA. The public, tribes, and public agencies; will have the opportunity to comment on the draft EA for 30 days after notice publication. The notice identifies the action, location of the proposed site, participants, location of the draft EA, and who to write to provide comments (see Appendix F). In coordination with the City, FEMA will review all written comments submitted for any significant and substantive issues that need to be further evaluated, and will address as in a final EA, as appropriate.

Construction at the Proposed Action site will require a clearing and grading permit, building permit, and approval by those utilities connected to the new fire station. As North Township Road is also a state highway, re-development of the property will also require an Access Connection Permit from the Washington State Department of Transportation, Northwest Region.

## **7.0 List of Preparers**

John C. Heinley, P.E.  
Christina Neff  
Ann Weckback  
Ross Widener

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## 9.0 Appendices

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## **Appendix A: Biological Evaluation**

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## BIOLOGICAL EVALUATION MEMORANDUM

**TO:** FEMA / SEDRO-WOOLLEY FIRE DEPARTMENT  
**FROM:** ROSS WIDENER  
**SUBJECT:** ANALYSIS OF EFFECTS ON ENDANGERED AND THREATENED SPECIES  
**DATE:** 1/20/2010

In compliance with the Endangered Species Act of 1973, and FEMA's Environmental Program, the following analysis considers whether the project will have any potential effects on Endangered or Threatened Species as listed by NOAA Fisheries and by the U.S. Fish & Wildlife Service. This memorandum also considers effects to Critical Habitat, fisheries as required by the Magnuson Stevens Act, and to the Bald Eagle as required by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The Bald Eagle is no longer a listed species under the Endangered Species Act, but is included here as part of a comprehensive analysis of wildlife and for federal requirements.

### Background and Project Description

The project, also known as the Proposed Action, will construct a 6000 square foot fire station at 1218 North Township Road, in Section 13, Township 35 North, Range 4 East. This property was formerly used as a farm; this included a residence, barn and other out-buildings, and plowed fields. All buildings on the property have since been removed. Adjacent properties include other farms, residential development, a state highway, and a drainage known as Willard Creek to the west of the proposed fire station.

Construction will result in short-term noise impacts from equipment; limited excavation for foundations and a stormwater treatment facility; installation of the fire station building, lighting, and pavement for parking and access; and landscaping near the fire station. Over half of the property will be left with grass vegetation and weeds, as a buffer between the station and Willard Creek where there are concentrations of trees and shrubs. Intermittent long-term noise impacts are anticipated due to sirens and other fire response related noise, but no additional traffic lanes will be created as part of this project.

The property has approximately 5000 square feet of impervious surface, from the existing access roadway and compacted areas where buildings once occupied the land. As proposed, out of a total of 105,000 square feet (2.41 Acres), there will be approximately 40,000 square feet (0.92 Acres) of impervious surface from buildings and pavement. A stormwater detention and treatment facility will be constructed to prevent excess discharges to Willard Creek or adjacent properties.

### Species and Habitat

Willard Creek is the nearest waterbody that could provide habitat for, or otherwise support, fish. According to NOAA Fisheries, this creek supports downstream populations of Coho salmon. Willard Creek is approximately 250 west of the project site, and drains to the Skagit River, over two miles away. Trees and shrubs indicate the presence of this drainage, though flow is not necessarily continuous.

The site of the proposed fire station is mostly covered by grasses, weeds, and a combination of deciduous and evergreen trees near the former residence and state highway. Disturbed areas still remain from past plowing.

A non-jurisdictional closed depression wetland, covering approximately 900 square feet, is located toward the north end of the property. It has no connection with other waterbodies, and as it does not receive sufficient flow to maintain saturated soils without drainage ditches and swales, it is considered to be an artificial wetland.

According to the U.S. Fish & Wildlife Service, listed species in Skagit County include:

Bull trout (*Salvelinus confluentus*)

Canada lynx (*Lynx canadensis*)

Gray wolf (*Canis lupus*)

Grizzly bear (*Ursus arctos* = *U. a. horribilis*)

Marbled murrelet (*Brachyramphus marmoratus*)

Northern spotted owl (*Strix occidentalis caurina*)

Critical Habitat has been designated for Bull trout, Marbled murrelet, and for the Northern spotted owl. However, none is present at the proposed fire station site.

Due to the suburban level of development adjacent to the proposed fire station, including a two-lane state highway on the eastern boundary of the property, and past use as a farm, there is no habitat for listed terrestrial species such as Canada Lynx, Gray wolf, and Grizzly bear. As predators, these species require separation from people and access to relatively large areas of undeveloped country. Marbled murrelet is a coastal bird, and both it and the Northern spotted owl are associated with areas that are forested with mature trees. Even those areas with trees along Willard Creek are sparse compared to habitat typically inhabited by these listed birds. In addition, the trees on the property are not conducive to perching or roosting, being near traffic associated with the state highway. The project will not result in any in-water or near-water work, so will have no impact on fish habitat.

As the proposed fire station site is located away from coastal areas and is upland from fish habitat, its construction will have no impacts on fisheries associated with the Magnuson Stevens Act.

## Action Area

An action area is a geographic boundary within which a listed species or its habitat could be affected if the species or habitat were present. The impacts of a project, due to a combination of noise, sedimentation, habitat removal, or other potential actions with impacts, define this boundary. The project will not include any in-water or near-water work, so there will be no aquatic component of the Action Area. Construction noise will be limited to construction equipment such as bulldozers and trucks, and will not include blasting or pile-driving. Long-term noise impacts will include intermittent exposure to sirens from fire trucks and other vehicles. However, these noises will for the most part emanate from existing roads. Therefore, the Action Area for this project is estimated to be within a half-mile of the project site.

## Effects

In order for there to be effects, beneficial or adverse, to listed species the species must either be potentially present with the project's Action Area, or its habitat must be present with the Action Area and be directly or indirectly modified by the project. Indirect Effects are land use and other changes that are caused by a project, albeit later in time. Effects can also result from impacts that would not otherwise happen 'but for' the project, also known as interdependent and interrelated actions.

Direct effects from this project will include removal of limited amounts of vegetation, noise, increased impervious surface (though minimized by stormwater detention and treatment), and effects from flood-lights. However, due to an absence of existing habitat on the property and minimal habitat along Willard Creek, listed species will not be present to be affected by these project impacts. No development is dependent on this construction to proceed so there are no indirect effects or effects from interdependent and interrelated actions.

Based on the analysis presented in this report, it is concluded that no listed species will be impacted as a result of the project. Therefore, the appropriate effect determination is **No Effect** under the Endangered Species Act, and **No Adverse Effect** under the Magnuson Stevens Act. As the project will not disrupt nesting, roosting, or wintering habitat for the Bald Eagle, there will be **No Effect** to the Bald Eagle.

## **Appendix B: Hydraulic Report**

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# Stormwater Report

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Fire Station #2  
Owned by  
City of Sedro-Woolley

Property located at  
1218 North Township Street  
Sedro-Woolley, WA

*To address runoff from buildings, access, and parking*

*Prepared for:*

**Carletti Architects**

116 E. Fir Street Suite A  
Mount Vernon, WA 98273  
(360) 424-0394

**January 27, 2010**

*Prepared by:*



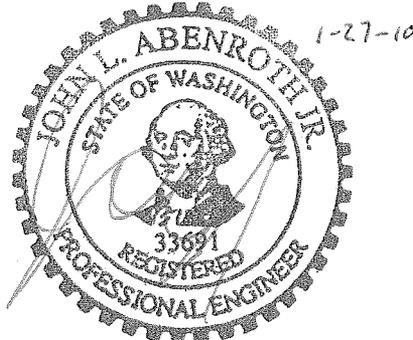
806 METCALF STREET, SEDRO-WOOLLEY, WA 98284  
360-855-2121 360-855-1658FAX

[info@sseconsultants.com](mailto:info@sseconsultants.com) [www.sseconsultants.com](http://www.sseconsultants.com)

Fire Station #2  
City of Sedro-Woolley  
for  
Carletti Architects

**STORMWATER REPORT**

**January 27, 2010**



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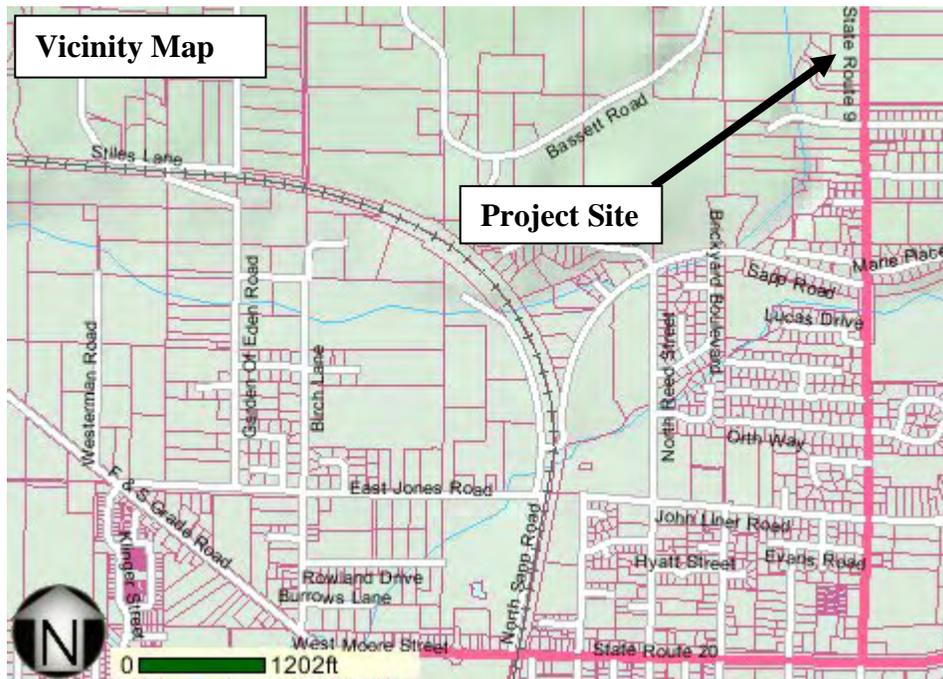
## LIST OF APPENDICES

### **APPENDIX: Calculations and Geotechnical Report**

## 1.0 PROJECT SUMMARY

### 1.1 Description & Background

The proposed project will construct a new fire station building including paved access and parking on an existing 2.32 acre lot. This will include the construction of a rain garden system to treat the stormwater, and a detention pond to provide flow control. This system treats and detains the stormwater from the site and discharges through a control structure to the existing ditch along the north property line. The site location is shown in the vicinity map below.



The overall site layout allows stormwater runoff to sheet flow off of the proposed parking, and enter the rain garden system. Roof runoff will be connected directly to the detention pond.

### 1.2 Design Assumptions and Criteria

The stormwater design is in accordance with the 2005 Stormwater Management Manual for Western Washington published by the Department of Ecology (DOE Manual). These standards require the use of the stormwater software Western Washington Hydrology Model (WWHM).

## 2.0 EXISTING CONDITIONS

### 2.1 Existing Site Use

The site is located off Township Street (AKA State Route 9) in Sedro-Woolley (see vicinity map). The project site covers 2.32 acres. The modeled site conditions are forest as shown in Table 2.1. The developed conditions are listed in Table 2.1, and described in Section 3.0

**Table 2.1:** Contributing Drainage Basins

Existing Condition		Area (Acres)
Pasture	Modeled as forest	2.32
<b>TOTAL</b>		<b>2.32</b>

Developed Conditions		Area (Acres)
Roof/sidewalk	Impervious	0.17
Access/Parking	Impervious	0.56
Lawn/landscape	Pervious	1.48
Pond bottom area	impervious	0.11
<b>TOTAL</b>		<b>2.32</b>

### 2.2 Existing Topography and Soils

The stormwater runoff on the existing site is generally from northeast to southwest as sheet flow. The Soil Conservation Service (SCS) Soil Survey of Skagit County identifies the soils on this site as Skipopa Silt Loam Soils. These soils are classified as Hydrologic Group D, which are to be modeled in WWHM as C soils. A geotechnical report has been completed and has determined that on site infiltration is not viable. For this reason, the rain gardens will have under drains which will be routed to the detention pond.

### 2.3 Existing Drainage

The existing drainage patterns are generally via sheet flow across the project site (pervious grass/pasture areas). During large storm events, water sheet flows across the site and leaves the property as sheet flow. This stormwater enters the nearby tributary of Brickyard Creek.

For additional information about the downstream conveyance system and the existing offsite drainage, refer to Section 6 and Section 7 of this report.

### **3.0 DEVELOPED SITE CONDITIONS**

Site improvements include a new building, driveway, utilities, a rain garden stormwater treatment system, and detention pond to serve the project. The geotechnical engineer determined that the soils in the area of the proposed rain garden system are too high in fines (silt and clay) and are not suitable for infiltration. The rain garden system will provide treatment of stormwater runoff. Detention is provided by the detention pond. A landscaped area will surround the proposed rain garden which will be sloped to convey the stormwater to the rain garden. The existing and proposed land use areas are summarized in Table 2.1.

### **4.0 DRAINAGE APPROACH AND ANALYSIS**

#### **4.1 Design Approach**

The access driveway and parking areas which serve the development will have a cross slope of approximately 1 to 2% towards the nearby rain gardens. The cross slope will cause stormwater to flow to the edge of the paved areas where it will sheet flow across grass or landscaped areas and enter the rain garden system. The rain garden system is described in this section as well as Section 4.2 below.

Impervious roof areas and pervious areas within the site do not require treatment, so stormwater from these areas will bypass the rain garden and be connected directly to the proposed detention pond.

The rain garden system is proposed as two segments to minimize the amount of fill required for the construction.

The rain garden system includes an under drain (gravel filled trench) beneath the rain gardens. This allows the rain garden to provide water quality treatment and then delivers the stormwater to the detention pond. The flow through the orifices in the control structure controls the flow rate leaving the pond and was modeled to meet the release rate criteria (flow control) using WWHM.

This is an approved Low Impact Development (LID) technique which improves the function of the drainage system to better mimic natural conditions. The stormwater runoff from impervious and pervious areas will sheet flow to the proposed rain garden system.

#### **4.2 Rain Garden Treatment System**

The proposed water quality treatment system will use rain gardens. A soils analysis was completed to determine that the site is not viable for infiltration. The engineering

geologist identified the onsite soils as having a high content of fines (clay or silt) so the site is not suitable for infiltration. Treatment is provided within the rain garden plants and topsoil. This soil infiltrates at a rate of one inch per hour and the under drain collects this treated stormwater which is then conveyed to the detention pond.

This 1 inch per hour rate was entered into WWHM and was used to size the rain garden facilities.

The hydrologic analysis, the sizing of the infiltration system, and the water quality pre-treatment calculations for this site were completed using WWHM. These calculations can be found in the Appendix. As shown in the calculations, the modeled rain garden is 40 feet long by 14 feet wide (560 square feet). The rain garden has a 12 inch maximum pond depth with an additional 12 inches of free board (minimum). This will meet the treatment standards by infiltrating (into the under drain) over 91% of the stormwater leaving the pollution generating impervious surfaces of the site. The system has two rain gardens which exceed this minimum area.

### **4.3 Detention Pond**

The calculations mentioned above also demonstrate the size of the detention pond. The pond has an adjacent wide flat area that is intended to be used as a park/play area. The pond is 115 feet by 40 feet with side slopes set at 3 to 1; however, one side slope is designed to be a 1% slope to create the gentle sloping park/play area. The riser is 2.7 feet tall, and only once every 10 years on average with the water depth exceed 1.5 feet. The total volume of the pond available for storage is 0.60 acre-feet. The pond was designed assuming no infiltration occurs beneath the pond and rain gardens.

## **5.0 CONVEYANCE**

The perforated infiltration pipe below the rain garden system also connects to an overflow catch basin within the rain garden. This will allow the rain garden system to overflow 9% of the runoff (untreated) to the detention pond during large storm events.

During large storm events in excess of the 50 year storm, the surface depression within each rain garden can serve as additional detention. The stormwater velocity is assumed to be at or near zero in detention systems. The modeled peak 100 year flow leaving the site is less than 0.5 CFS, so a 6 inch perforated pipe will not cause a restriction in flow.

## **6.0 UPSTREAM ANALYSIS**

An upstream analysis was conducted for the site to determine if stormwater currently enters the site along the exterior perimeter of the site.

The topography around the existing site prevents stormwater “run on” from offsite areas. The ditch along the north side of the site prevents stormwater runoff from entering the site from the north. The property to the east is the State Highway which prevents storm water from entering the site from the east (except for few hundred square feet of pavement, an insignificant amount of existing pavement). The property to the south and west is lower in elevation (downhill) so that run off from these areas does not enter the project site.

## **7.0 DOWNSTREAM ANALYSIS**

The stormwater system serving this site is designed to the DOE standards to mitigate stormwater impacts. A downstream analysis was conducted and a site visit confirmed that the runoff from the site will flow to west and enter a tributary to Brickyard Creek, eventually reaching the Skagit River. The discharge from the site meets or exceeds the release rate standards.

## **8.0 EROSION CONTROL BMP's**

Listed below are some of the erosion control BMP's which can be used on this project:

- **BMP C 101 Preserving Natural Vegetation:** Preserving existing vegetation will enhance the ability of this BMP's sediment removal and erosion prevention capabilities.
- **BMP C 102 Buffer Zones:** BMP C101 and C102 are essentially identical for this site. See description above for BMP C101.
- **BMP C 104/233 Staking clearing limits/silt fence.** By identifying the clearing limits and or placing silt fence at the perimeter of the project, the likelihood of sediment transport is reduced.
- **BMP C 105 Stabilized Construction Entrance:** The entrance to the disturbed area will be stabilized early in the project to prevent tracking and reduce erosion.
- **BMP C 120 Seeding, C 121 Mulching, C 123 Plastic Covering, C 125 Top Soiling:** The site will be stabilized with seeding mulching covering, of top soiling to encourage re-vegetation and prevent erosion while the vegetation becomes established as well as protect any stockpile slope areas.
- **BMP C 220 Inlet Protection** is provided to prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Typical maintenance procedures are shown in Table 8.1.

**Table 8.1: BMP Maintenance**

**Maintenance and inspection procedures are to be conducted routinely. Record keeping of the work described below is an important component of a successful maintenance program. The ESC Lead shall be responsible for inspection, maintenance, and reporting activities.**

### **Procedures**

Listed below are the inspection and maintenance practices which will be used to maintain erosion and sedimentation control.

- Inspection Frequency: All permanent and temporary Erosion and Sedimentation Control (ESC) measures (such as check dams, gravel berms, silt fences, culvert inlets, stabilized construction entrance, and on-site drainage ditches) will be inspected at least weekly and following a storm event of 0.5 inches of precipitation within a 24 hour period.
- All measures are to be maintained in good working order. If a repair is necessary, it is to be initiated within 24 hours of when it is identified as needing attention, maintenance work, or repair.
- Built-up sediment will be removed from the rock check dams when it has reached twelve inches in height.
- Temporary and permanent seeding and mulching areas will be inspected for bare spots, and washouts, and replacement seeding/mulching work will be conducted. All other soil stabilization areas shall be inspected and maintained so as to provide a sufficiently thick and consistent cover over the soil.
- Maintain rock construction entries by preventing excess buildup of sediment/soil in the entry area.
- Inspect all culvert inlets which have stormwater runoff from the project site discharging into the inlet. Clean and remove sediment to maintain flow capacity.
- If there are significant and fairly rapid rates of sediment collected within the sediment controls, then additional temporary stabilization measures should be installed.

### **Record keeping of Inspection and Maintenance Activity**

A record of the inspections, results, dates, and maintenance measures implemented, is to be kept. Inspection forms are provided in Section 9 of this report.

## 9.0 STORMWATER SYSTEM MAINTENANCE

Routine maintenance is an important part of any stormwater system. The following tables are copied from the 2005 DOE Manual. The major facilities listed below should be inspected and maintained as described. All other drainage features should also be regularly inspected (every 6 months, during and after large storm events, or more frequently if needed) and maintained as needed to maintain the effectiveness of the drainage system as a whole. This table applies to the long term ongoing maintenance of the permanent facilities and does not replace the maintenance of the short term controls found in the TESC to be performed during construction. Please note that neither the DOE Manual nor the LID Manual list any specific maintenance criteria for rain gardens. For this reason, the maintenance criteria for other similar facilities have been included here.

**Table 9.1:** Inspection Frequency Table

**Project: Sedro-Woolley Fire Station #2 Project**

**No. 1 – Detention Ponds**

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size garbage can). In general, there should be no visual evidence of dumping.  If less than threshold all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public.  Any evidence of noxious weeds as defined by State or local regulations. (Apply requirements of adopted IPM policies for the use of herbicides).	No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with local health department)  Complete eradication of noxious weeds may not be possible. Compliance with State or local eradication policies required
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants  (Coordinate removal/cleanup with local water quality response agency).	No contaminants or pollutants present-
	Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents destroyed and dam or berm repaired. (Coordinate with local health department; coordinate with Ecology Dam Safety Office if pond exceeds 10 acre-feet.)

## No. 1 – Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
	Beaver Dams	Dam results in change or function of the facility.	Facility is returned to design function.  (Coordinate trapping of beavers and removal of dams with appropriate permitting agencies)
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site.  Apply insecticides in compliance with adopted IPM policies
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering with access or maintenance, do not remove  If dead, diseased, or dying trees are identified  (Use a certified Arborist to determine health of tree or removal requirements)	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).  Remove hazard Trees
Side Slopes of Pond	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion.  Any erosion observed on a compacted berm embankment.	Slopes should be stabilized using appropriate erosion control measure(s); e.g., rock reinforcement, planting of grass, compaction.  If erosion is occurring on compacted berms a licensed civil engineer should be consulted to resolve source of erosion.
Storage Area	Sediment	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or outletting condition of the facility.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.
	Liner (If Applicable)	Liner is visible and has more than three 1/4-inch holes in it.	Liner repaired or replaced. Liner is fully covered.

## No. 1 – Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Pond Berms (Dikes)	Settlements	<p>Any part of berm which has settled 4 inches lower than the design elevation.</p> <p>If settlement is apparent, measure berm to determine amount of settlement.</p> <p>Settling can be an indication of more severe problems with the berm or outlet works. A licensed civil engineer should be consulted to determine the source of the settlement.</p>	Dike is built back to the design elevation.
	Piping	<p>Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue.</p> <p>(Recommend a Goethechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.</p>	Piping eliminated. Erosion potential resolved.
Emergency Overflow/ Spillway and Berms over 4 feet in height.	Tree Growth	<p>Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping.</p> <p>Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.</p>	Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed civil engineer should be consulted for proper berm/spillway restoration.
	Piping	<p>Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue.</p> <p>(Recommend a Goethechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.</p>	Piping eliminated. Erosion potential resolved.
Emergency Overflow/ Spillway	Emergency Overflow/ Spillway	<p>Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway.</p> <p>(Rip-rap on inside slopes need not be replaced.)</p>	Rocks and pad depth are restored to design standards.
	Erosion	See "Side Slopes of Pond"	

#### No. 4 – Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris (Includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
	Structural Damage	Structure is not securely attached to manhole wall.	Structure securely attached to wall and outlet pipe.
		Structure is not in upright position (allow up to 10% from plumb).	Structure in correct position.
		Connections to outlet pipe are not watertight and show signs of rust.	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed.
		Any holes--other than designed holes--in the structure.	Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing.	Gate is watertight and works as designed.
		Gate cannot be moved up and down by one maintenance person.	Gate moves up and down easily and is watertight.
		Chain/rod leading to gate is missing or damaged.	Chain is in place and works as designed.
		Gate is rusted over 50% of its surface area.	Gate is repaired or replaced to meet design standards.
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
Manhole	See "Closed Detention Systems" (No. 3).	See "Closed Detention Systems" (No. 3).	See "Closed Detention Systems" (No. 3).
Catch Basin	See "Catch Basins" (No. 5).	See "Catch Basins" (No. 5).	See "Catch Basins" (No. 5).

## No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch  (Intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.	
	Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.	

## No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
	Contamination and Pollution	See "Detention Ponds" (No. 1).	No pollution present.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure.  (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

## No. 10 – Filter Strips

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Recommended Maintenance to Correct Problem
General	Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.	Remove sediment deposits, re-level so slope is even and flows pass evenly through strip.
	Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.	Mow grass, control nuisance vegetation, such that flow not impeded. Grass should be mowed to a height between 3-4 inches.
	Trash and Debris Accumulation	Trash and debris accumulated on the filter strip.	Remove trash and Debris from filter.
	Erosion/Scouring	Eroded or scoured areas due to flow channelization, or higher flows.	For ruts or bare areas less than 12 inches wide, repair the damaged area by filling with crushed gravel. The grass will creep in over the rock in time. If bare areas are large, generally greater than 12 inches wide, the filter strip should be re-graded and re-seeded. For smaller bare areas, overseed when bare spots are evident.
	Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire filter width.	Level the spreader and clean so that flows are spread evenly over entire filter width.



## **10.0 SUMMARY AND CONCLUSIONS**

The proposed project will construct a new building including access and parking on an existing 2.32 acre lot. This will include the construction of a rain garden system and a detention pond to mitigate stormwater impacts from the site. The design meets the standards within the DOE Manual.

# **APPENDIX A**

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## **CALCULATIONS AND GEOTECHNICAL REPORT**

Western Washington Hydrology Model  
PROJECT REPORT

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Project Name: 209068 carletti final  
Site Address:  
City :  
Report Date : 1/21/2010  
Gage : Burlington  
Data Start : 1948/10/01  
Data End : 1999/09/30  
Precip Scale: 1.00

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**PREDEVELOPED LAND USE**

Name : Basin 1  
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
C, Forest, Mod	2.32

<u>Impervious Land Use</u>	<u>Acres</u>
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Element Flows To:		
Surface	Interflow	Groundwater

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**MITIGATED LAND USE**

Name : Basin 1  
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>Acres</u>
C, Lawn, Mod	.12

<u>Impervious Land Use</u>	<u>Acres</u>
SIDEWALKS FLAT	0.04
PARKING FLAT	0.56

Element Flows To:		
Surface	Interflow	Groundwater
Trapezoidal Pond 2,	Trapezoidal Pond 2,	

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Name : Basin 2  
Bypass: No

GroundWater: No



0.633	0.018	0.010	0.000	0.018
0.667	0.018	0.010	0.000	0.019
0.700	0.018	0.011	0.000	0.019
0.733	0.019	0.012	0.000	0.019
0.767	0.019	0.012	0.000	0.020
0.800	0.019	0.013	0.000	0.020
0.833	0.020	0.013	0.000	0.020
0.867	0.020	0.014	0.000	0.020
0.900	0.020	0.015	0.000	0.021
0.933	0.021	0.015	0.000	0.021
0.967	0.021	0.016	0.000	0.021
1.000	0.021	0.017	0.000	0.022
1.033	0.021	0.018	0.059	0.022
1.067	0.022	0.018	0.168	0.022
1.100	0.022	0.019	0.308	0.023
1.133	0.022	0.020	0.474	0.023
1.167	0.023	0.020	0.663	0.023
1.200	0.023	0.021	0.871	0.024
1.233	0.023	0.022	1.098	0.024
1.267	0.024	0.023	1.341	0.024
1.300	0.024	0.024	1.600	0.025
1.333	0.024	0.024	1.874	0.025
1.367	0.025	0.025	2.162	0.025
1.400	0.025	0.026	2.464	0.026
1.433	0.025	0.027	2.778	0.026
1.467	0.026	0.028	3.105	0.026
1.500	0.026	0.029	3.443	0.027
1.533	0.026	0.029	3.793	0.027
1.567	0.027	0.030	4.154	0.028
1.600	0.027	0.031	4.526	0.028
1.633	0.027	0.032	4.909	0.028
1.667	0.028	0.033	5.301	0.029
1.700	0.028	0.034	5.704	0.029
1.733	0.028	0.035	6.116	0.029
1.767	0.029	0.036	6.538	0.030
1.800	0.029	0.037	6.969	0.030
1.833	0.029	0.038	7.409	0.030
1.867	0.030	0.039	7.858	0.031
1.900	0.030	0.040	8.315	0.031
1.933	0.030	0.041	8.782	0.032
1.967	0.031	0.042	9.256	0.032
2.000	0.031	0.043	9.739	0.032
2.033	0.031	0.044	10.23	0.033
2.067	0.032	0.045	10.73	0.033
2.100	0.032	0.046	11.24	0.033
2.133	0.032	0.047	11.75	0.034
2.167	0.033	0.048	12.27	0.034
2.200	0.033	0.049	12.80	0.035
2.233	0.034	0.050	13.34	0.035
2.267	0.034	0.051	13.88	0.035
2.300	0.034	0.053	14.44	0.036
2.333	0.035	0.054	14.99	0.036
2.367	0.035	0.055	15.56	0.037
2.400	0.035	0.056	16.13	0.037
2.433	0.036	0.057	16.71	0.037
2.467	0.036	0.058	17.30	0.038
2.500	0.037	0.060	17.89	0.038

2.533	0.037	0.061	18.49	0.039
2.567	0.037	0.062	19.10	0.039
2.600	0.038	0.063	19.71	0.039
2.633	0.038	0.065	20.33	0.040
2.667	0.039	0.066	20.95	0.040
2.700	0.039	0.067	21.59	0.041
2.733	0.039	0.069	22.22	0.041
2.767	0.040	0.070	22.87	0.042
2.800	0.040	0.071	23.52	0.042
2.833	0.041	0.073	24.18	0.042
2.867	0.041	0.074	24.84	0.043
2.900	0.041	0.075	25.51	0.043
2.933	0.042	0.077	26.18	0.044
2.967	0.042	0.078	26.86	0.044
3.000	0.043	0.079	27.55	0.045
3.033	0.043	0.081	28.24	0.045

**Name** : Trapezoidal Pond 2 (detention pond)  
**Bottom Length:** 115ft.  
**Bottom Width:** 40ft.  
**Depth :** 2.7ft.  
**Volume at riser head :** 0.6037ft.  
**Side slope 1:** 3 To 1  
**Side slope 2:** 3 To 1  
**Side slope 3:** 100 To 1  
**Side slope 4:** 3 To 1  
**Discharge Structure**  
**Riser Height:** 1.7 ft.  
**Riser Diameter:** 12 in.  
**NotchType :** Rectangular  
**Notch Width :** 0.031 ft. (3/8")  
**Notch Height:** 0.500 ft.  
**Orifice 1 Diameter:** 0.84375 in. (27/32") **Elevation:** 0 ft.  
  
**Element Flows To:**  
**Outlet 1**                      **Outlet 2**

**Pond Hydraulic Table**

<u>Stage(ft)</u>	<u>Area(acr)</u>	<u>Volume(acr-ft)</u>	<u>Dschrg(cfs)</u>	<u>Infilt(cfs)</u>
0.000	0.106	0.000	0.000	0.000
0.030	0.114	0.003	0.003	0.000
0.060	0.122	0.007	0.005	0.000
0.090	0.131	0.011	0.006	0.000
0.120	0.139	0.015	0.006	0.000
0.150	0.148	0.019	0.007	0.000
0.180	0.156	0.024	0.008	0.000
0.210	0.164	0.028	0.009	0.000
0.240	0.173	0.033	0.009	0.000
0.270	0.182	0.039	0.010	0.000
0.300	0.190	0.044	0.010	0.000
0.330	0.199	0.050	0.011	0.000
0.360	0.207	0.056	0.011	0.000
0.390	0.216	0.063	0.012	0.000
0.420	0.225	0.069	0.012	0.000
0.450	0.233	0.076	0.013	0.000

0.480	0.242	0.083	0.013	0.000
0.510	0.251	0.091	0.013	0.000
0.540	0.260	0.098	0.014	0.000
0.570	0.268	0.106	0.014	0.000
0.600	0.277	0.114	0.014	0.000
0.630	0.286	0.123	0.015	0.000
0.660	0.295	0.131	0.015	0.000
0.690	0.304	0.140	0.016	0.000
0.720	0.313	0.150	0.016	0.000
0.750	0.322	0.159	0.016	0.000
0.780	0.331	0.169	0.017	0.000
0.810	0.340	0.179	0.017	0.000
0.840	0.349	0.189	0.017	0.000
0.870	0.358	0.200	0.017	0.000
0.900	0.367	0.211	0.018	0.000
0.930	0.376	0.222	0.018	0.000
0.960	0.385	0.233	0.018	0.000
0.990	0.394	0.245	0.019	0.000
1.020	0.403	0.257	0.019	0.000
1.050	0.413	0.269	0.019	0.000
1.080	0.422	0.282	0.019	0.000
1.110	0.431	0.295	0.020	0.000
1.140	0.440	0.308	0.020	0.000
1.170	0.450	0.321	0.020	0.000
1.200	0.459	0.335	0.020	0.000
1.230	0.468	0.349	0.021	0.000
1.260	0.478	0.363	0.022	0.000
1.290	0.487	0.377	0.024	0.000
1.320	0.497	0.392	0.026	0.000
1.350	0.506	0.407	0.028	0.000
1.380	0.515	0.422	0.030	0.000
1.410	0.525	0.438	0.032	0.000
1.440	0.535	0.454	0.034	0.000
1.470	0.544	0.470	0.036	0.000
1.500	0.554	0.486	0.039	0.000
1.530	0.563	0.503	0.042	0.000
1.560	0.573	0.520	0.044	0.000
1.590	0.583	0.538	0.047	0.000
1.620	0.592	0.555	0.050	0.000
1.650	0.602	0.573	0.053	0.000
1.680	0.612	0.591	0.056	0.000
1.710	0.621	0.610	0.067	0.000
1.740	0.631	0.629	0.136	0.000
1.770	0.641	0.648	0.238	0.000
1.800	0.651	0.667	0.366	0.000
1.830	0.661	0.687	0.515	0.000
1.860	0.671	0.707	0.682	0.000
1.890	0.681	0.727	0.865	0.000
1.920	0.691	0.748	1.064	0.000
1.950	0.701	0.768	1.277	0.000
1.980	0.711	0.790	1.502	0.000
2.010	0.721	0.811	1.741	0.000
2.040	0.731	0.833	1.991	0.000
2.070	0.741	0.855	2.252	0.000
2.100	0.751	0.877	2.524	0.000
2.130	0.761	0.900	2.807	0.000
2.160	0.771	0.923	3.099	0.000

2.190	0.781	0.946	3.401	0.000
2.220	0.791	0.970	3.713	0.000
2.250	0.802	0.994	4.034	0.000
2.280	0.812	1.018	4.363	0.000
2.310	0.822	1.042	4.701	0.000
2.340	0.832	1.067	5.048	0.000
2.370	0.843	1.092	5.403	0.000
2.400	0.853	1.118	5.766	0.000
2.430	0.864	1.144	6.137	0.000
2.460	0.874	1.170	6.515	0.000
2.490	0.884	1.196	6.901	0.000
2.520	0.895	1.223	7.294	0.000
2.550	0.905	1.250	7.695	0.000
2.580	0.916	1.277	8.103	0.000
2.610	0.926	1.305	8.518	0.000
2.640	0.937	1.333	8.939	0.000
2.670	0.947	1.361	9.368	0.000
2.700	0.958	1.389	9.803	0.000
2.730	0.969	1.418	10.24	0.000

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**ANALYSIS RESULTS**

**Flow Frequency Return Periods for Predeveloped. POC #1**

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.044869
5 year	0.082493
10 year	0.112639
25 year	0.156209
50 year	0.192412
100 year	0.231659

**Flow Frequency Return Periods for Mitigated. POC #1**

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.023604
5 year	0.043005
10 year	0.061615
25 year	0.093744
50 year	0.125468
100 year	0.165365

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**Yearly Peaks for Predeveloped and Mitigated. POC #1**

<u>Year</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1950	0.116	0.034
1951	0.075	0.044
1952	0.075	0.024
1953	0.056	0.023
1954	0.027	0.020
1955	0.033	0.019
1956	0.041	0.017
1957	0.036	0.018
1958	0.064	0.033
1959	0.028	0.016
1960	0.067	0.027
1961	0.044	0.035
1962	0.028	0.020

1963	0.005	0.016
1964	0.029	0.016
1965	0.033	0.017
1966	0.059	0.032
1967	0.029	0.015
1968	0.038	0.017
1969	0.082	0.032
1970	0.023	0.018
1971	0.015	0.015
1972	0.079	0.061
1973	0.038	0.019
1974	0.037	0.024
1975	0.076	0.040
1976	0.316	0.589
1977	0.024	0.020
1978	0.030	0.017
1979	0.048	0.022
1980	0.027	0.016
1981	0.076	0.035
1982	0.044	0.017
1983	0.091	0.039
1984	0.045	0.036
1985	0.090	0.030
1986	0.018	0.016
1987	0.059	0.034
1988	0.044	0.030
1989	0.122	0.018
1990	0.026	0.018
1991	0.067	0.092
1992	0.114	0.173
1993	0.048	0.017
1994	0.043	0.017
1995	0.009	0.014
1996	0.013	0.017
1997	0.053	0.017
1998	0.243	0.030
1999	0.049	0.018
2000	0.028	0.017

---

**Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1**

<b>Rank</b>	<b>Predeveloped</b>	<b>Mitigated</b>
1	0.3159	0.5894
2	0.2425	0.1732
3	0.1222	0.0921
4	0.1157	0.0605
5	0.1140	0.0442
6	0.0910	0.0404
7	0.0899	0.0390
8	0.0820	0.0355
9	0.0792	0.0349
10	0.0764	0.0346
11	0.0763	0.0344
12	0.0748	0.0337
13	0.0748	0.0326
14	0.0674	0.0320
15	0.0667	0.0315

16	0.0642	0.0301
17	0.0588	0.0298
18	0.0587	0.0295
19	0.0562	0.0269
20	0.0532	0.0241
21	0.0489	0.0236
22	0.0483	0.0235
23	0.0483	0.0225
24	0.0450	0.0201
25	0.0442	0.0199
26	0.0441	0.0198
27	0.0440	0.0188
28	0.0430	0.0186
29	0.0409	0.0185
30	0.0385	0.0183
31	0.0379	0.0183
32	0.0372	0.0177
33	0.0359	0.0177
34	0.0329	0.0175
35	0.0327	0.0175
36	0.0303	0.0173
37	0.0294	0.0173
38	0.0293	0.0172
39	0.0282	0.0172
40	0.0279	0.0171
41	0.0278	0.0170
42	0.0269	0.0169
43	0.0266	0.0166
44	0.0256	0.0164
45	0.0237	0.0161
46	0.0231	0.0158
47	0.0183	0.0156
48	0.0153	0.0156
49	0.0125	0.0150
50	0.0086	0.0147
51	0.0053	0.0144

---

**POC #1**

**The Facility PASSED**

**The Facility PASSED.**

<b>Flow(CFS)</b>	<b>Predev</b>	<b>Dev</b>	<b>Percentage</b>	<b>Pass/Fail</b>
0.0224	3982	3992	100	Pass
0.0242	3451	3410	98	Pass
0.0259	3016	2966	98	Pass
0.0276	2678	2436	90	Pass
0.0293	2384	2073	86	Pass
0.0310	2155	1759	81	Pass
0.0327	1919	1388	72	Pass
0.0345	1694	1130	66	Pass
0.0362	1509	971	64	Pass
0.0379	1341	847	63	Pass
0.0396	1200	700	58	Pass
0.0413	1062	614	57	Pass
0.0430	943	560	59	Pass
0.0448	853	495	58	Pass

0.0465	779	423	54	Pass
0.0482	719	380	52	Pass
0.0499	650	316	48	Pass
0.0516	585	281	48	Pass
0.0533	524	244	46	Pass
0.0551	477	212	44	Pass
0.0568	443	180	40	Pass
0.0585	405	164	40	Pass
0.0602	364	150	41	Pass
0.0619	331	132	39	Pass
0.0636	303	123	40	Pass
0.0654	279	113	40	Pass
0.0671	255	103	40	Pass
0.0688	233	100	42	Pass
0.0705	205	97	47	Pass
0.0722	187	95	50	Pass
0.0739	162	92	56	Pass
0.0757	146	88	60	Pass
0.0774	135	84	62	Pass
0.0791	125	80	64	Pass
0.0808	118	77	65	Pass
0.0825	112	73	65	Pass
0.0842	105	66	62	Pass
0.0860	102	64	62	Pass
0.0877	96	60	62	Pass
0.0894	89	59	66	Pass
0.0911	85	56	65	Pass
0.0928	82	54	65	Pass
0.0945	79	52	65	Pass
0.0963	74	52	70	Pass
0.0980	72	50	69	Pass
0.0997	70	50	71	Pass
0.1014	67	49	73	Pass
0.1031	64	48	75	Pass
0.1048	59	47	79	Pass
0.1066	57	47	82	Pass
0.1083	54	46	85	Pass
0.1100	52	44	84	Pass
0.1117	50	44	88	Pass
0.1134	49	42	85	Pass
0.1151	44	42	95	Pass
0.1169	43	42	97	Pass
0.1186	42	40	95	Pass
0.1203	41	40	97	Pass
0.1220	40	40	100	Pass
0.1237	38	38	100	Pass
0.1255	37	37	100	Pass
0.1272	37	36	97	Pass
0.1289	36	35	97	Pass
0.1306	36	34	94	Pass
0.1323	35	32	91	Pass
0.1340	34	31	91	Pass
0.1358	33	30	90	Pass
0.1375	33	28	84	Pass
0.1392	33	27	81	Pass
0.1409	32	27	84	Pass
0.1426	30	27	90	Pass

0.1443	29	25	86	Pass
0.1461	29	25	86	Pass
0.1478	29	23	79	Pass
0.1495	28	23	82	Pass
0.1512	28	22	78	Pass
0.1529	27	21	77	Pass
0.1546	25	20	80	Pass
0.1564	25	20	80	Pass
0.1581	25	19	76	Pass
0.1598	24	19	79	Pass
0.1615	22	16	72	Pass
0.1632	22	13	59	Pass
0.1649	20	13	65	Pass
0.1667	20	12	60	Pass
0.1684	19	12	63	Pass
0.1701	18	12	66	Pass
0.1718	17	11	64	Pass
0.1735	16	10	62	Pass
0.1752	14	10	71	Pass
0.1770	14	9	64	Pass
0.1787	13	9	69	Pass
0.1804	13	9	69	Pass
0.1821	13	9	69	Pass
0.1838	12	9	75	Pass
0.1855	12	9	75	Pass
0.1873	12	9	75	Pass
0.1890	11	9	81	Pass
0.1907	11	8	72	Pass
0.1924	10	8	80	Pass

---

**Water Quality BMP Flow and Volume for POC 1.**

**On-line facility volume:** 0 acre-feet

**On-line facility target flow:** 0 cfs.

**Adjusted for 15 min:** 0 cfs.

**Off-line facility target flow:** 0 cfs.

**Adjusted for 15 min:** 0 cfs.

---

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Hydrologic Soil Group—Skagit County Area, Washington  
(Sedro-Woolley Fire Station #2)



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Units

### Soil Ratings

 A

 A/D

 B

 B/D

 C

 C/D

 D

 Not rated or not available

### Political Features

 Cities

### Water Features

 Oceans

 Streams and Canals

### Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

## MAP INFORMATION

Map Scale: 1:839 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Skagit County Area, Washington  
Survey Area Data: Version 6, Sep 22, 2009

Date(s) aerial images were photographed: 7/24/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Skagit County Area, Washington				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
125	Skipopa silt loam, 3 to 8 percent slopes	D	3.4	100.0%
<b>Totals for Area of Interest</b>			<b>3.4</b>	<b>100.0%</b>

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Lower

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## **Appendix C: Environmental Justice Memorandum**

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## ENVIRONMENTAL JUSTICE MEMORANDUM

**TO:** FEMA / SEDRO-WOOLLEY FIRE DEPARTMENT  
**FROM:** ROSS WIDENER  
**SUBJECT:** ANALYSIS OF POSSIBLE PROJECT IMPACTS ON POPULATIONS  
**DATE:** 1/20/2010

In compliance with Presidential Executive Order 12898, and FEMA's Environmental Program, an environmental justice analysis was conducted for the Sedro-Woolley Fire Department's Fire Station 2 Project. The purpose of EJ analysis is to identify minority and low-income groups in the project area, keep these groups informed about project plans and activities, and encourage their participation in projects.

Minority and low-income groups were identified in the project area via a demographics study that utilized 2000 census data. The data revealed that Census Tract 9515, which only includes areas within the project vicinity, had the following demographics:

Non-minorities	92.0%
Hispanic*	7.2%
American Indian / Eskimo	1.6%
Other	3.2%
Asian	0.8%
Black	0.3%
Hawaiian / Pac Islander	0.1%
Low-income, family	10.7%
Low-income, individual	11.3%

\*The above census numbers are greater than 100%, likely due to respondents indicating that they were of one race and also Hispanic.

Minority populations within the project area consisted primarily of Hispanics. The data indicated that 6.5% of the population spoke a language other than English at home. The most likely EJ populations that could be impacted would be those with low incomes and Hispanics.

Short-term noise increases, traffic control, and dust will be the primary impacts to people during construction of this project. Construction of a second fire station on this city-owned parcel will not displace anyone. No other social, environmental or economic impacts are anticipated as a result of this project. Short-term impacts are anticipated to affect all populations equally and will be minimized by conducting project activities Monday through Friday during normal business hours. Intermittent long-term noise impacts are anticipated due to sirens and other fire-response related noise, but no additional traffic lanes will be created as part of this project.

Traffic control will be necessary during construction, though nearly all of the construction will occur outside of the traveled way. Access to other properties will not be affected by the project. Congestion is not anticipated to be a problem while traffic control is in effect.

As shown by the attached distribution maps, minority and low-income populations reside within areas that the second fire station will serve. Both EJ and non-EJ populations will benefit from the project due to improved fire-response capability.

Based on the analysis presented in this report, it is concluded that EJ populations are not expected to experience disproportionately high adverse impacts as a result of the project.

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# Appendix D: Letters of Support

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United States Senate  
WASHINGTON, DC 20510-4704

COMMITTEES:  
APPROPRIATIONS  
BUDGET  
HEALTH, EDUCATION, LABOR,  
AND PENSIONS  
RULES AND ADMINISTRATION  
VETERANS' AFFAIRS

July 1, 2009

Mr. Ross Ashley  
Assistant Administrator  
DHS/FEMA/Grant Programs Directorate  
Tech World Building - South Tower 9<sup>th</sup> Floor  
800 K Street, NW  
Washington, DC 20472-3620

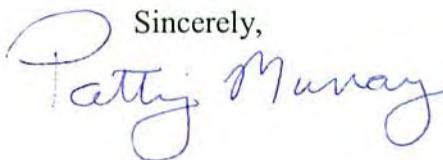
Dear Mr. Ashley:

I am writing in support of Sedro-Woolley Fire Department's (SWFD) application for an Assistance to Firefighters Station Construction Grant. SWFD will use these funds to construct a new fire station capable of housing five crew members and three trucks. This new fire station will help allow SWFD to manage an increased demand for fire, emergency medical rescue and hazardous material responses in Skagit County.

SWFD is automatic first on alarm for five rural districts, protecting 325 square miles and 26,000 residents. SWFD also supports all other Skagit County departments. I understand that the new fire station is based on a Green Design which will make the building environmentally friendly and includes passive heat and cooling, water conservation and minimal CO2 emissions.

I appreciate the work that the Sedro-Woolley Fire Department does to keep Skagit County safe and I urge you to consider its application. Please contact Mary Pederson in my Seattle office at (206) 553-5545 if you have any questions about my support.

Sincerely,



Patty Murray  
United States Senator

PM/mp

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**Appendix E: Cultural Resources Report and Consultation with Washington State Dept. of Archaeology and Historic Preservation**

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STATE OF WASHINGTON

**DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION**

*1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501*  
*Mailing address: PO Box 48343 • Olympia, Washington 98504-8343*  
*(360) 586-3065 • Fax Number (360) 586-3067 • Website: [www.dahp.wa.gov](http://www.dahp.wa.gov)*

January 4, 2010

Mr. Mark G. Eberlein  
FEMA – Region X  
130 – 228<sup>th</sup> Street SW  
Bothell, Washington 98021-9796

RE: Sedro-Woolley Fire Station Grant  
Log No: 010409-10-FEMA

Dear Mr. Eberlein:

Thank you for contacting our Department. We have reviewed the materials you provided for the proposed Sedro-Woolley Fire Station Construction Project at SR 9 and Bassett Road, Sedro Woolley, Skagit County, Washington.

We concur with the Determination of No Historic Properties Affected.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribes and this department notified.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.  
State Archaeologist  
(360) 586-3080  
email: [rob.whitlam@dahp.wa.gov](mailto:rob.whitlam@dahp.wa.gov)





July 23, 2009  
DAR Letter Report 0709E

Ross Widener  
Widener & Associates  
10108 32<sup>nd</sup> Avenue West, Suite D  
Everett, WA 98204

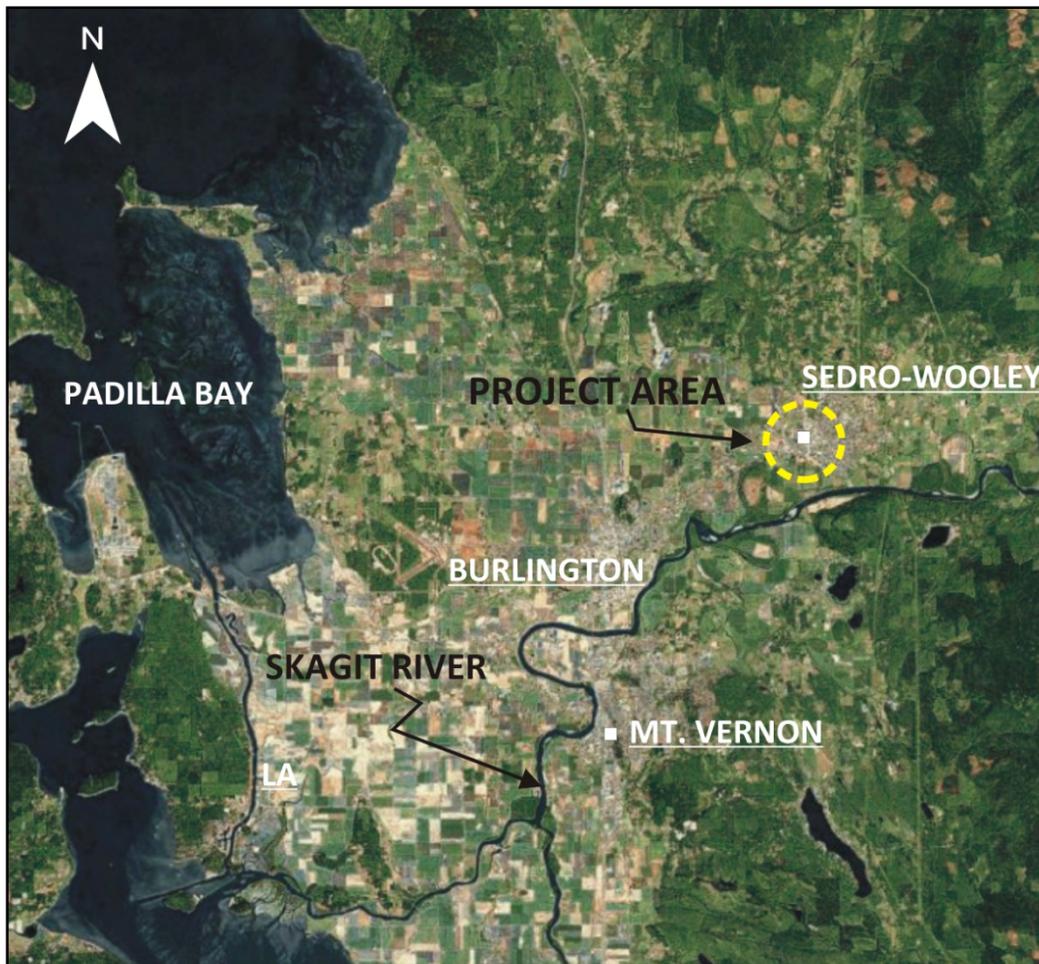
**RE: An Archaeological Review of the Proposed Fruitdale-McGargile Road Waste Soil Disposal Sites**

Mr. Widener,

The following letter presents the results of an archaeological review of two proposed waste disposal sites located within the Sedro-Woolley city limits in Skagit County, WA. Drayton Archaeological Research LLC (DAR) contracted with Widener and Associates to conduct this assessment to partially fulfill compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966. Skagit County proposes to widen Fruitdale and McGarigle Roads and make several additional improvements. These construction activities will produce a significant amount of back dirt and Skagit County plans to dump the material at one or both of the proposed lots. The area of potential effect (APE) has been defined as the waste materials staging area, as described below, and all stockpiling and grading activities are to be confined within this footprint. Presented in the letter below are data concerning the project, its setting and the results of a pedestrian survey and subsurface sampling regiment. No cultural resources were observed in the area of potential effect. This letter will serve as our final address of the issue.

**Project Location and Area of Potential Effects (APE)**

The two proposed Fruitdale Road-McGarigle Road waste material stockpile sites are located directly to the north and east of Sedro-Woolley, Skagit County, Washington in the SW  $\frac{1}{4}$  of the NW  $\frac{1}{4}$  of Section 24 and the NW  $\frac{1}{4}$  the NW  $\frac{1}{4}$  of Section 13, T35N, R5E, W.M. (Figure 1).



**Figure 1. Satellite image of western Skagit County illustrating the project area.**

The project area is bordered by residential developments, recreational facilities, and undeveloped land. Skagit County proposes to make improvements to Fruitdale and McGarigle Roads consisting of: roadway widening; installation of bus pullouts; pedestrian improvements; installation of retaining walls, curb and gutter; intersection improvements, relocation of power, cable, and telephone utilities; drainage improvements; installation of a sanitary sewer pump station, a storm water pump station and detention pond; and upgraded signage. These various construction activities will create a large amount of waste material (back dirt) that will need to be stockpiled off-site. Skagit County has two sites under consideration for this purpose (Figure 2).

The first site is located on the north side of Cook Road, just east of downtown Sedro-Woolley near Bingham City Park. This proposed stockpile area would encompass the existing BMX dirt jump area and the baseball field directly north of the BMX area. The second site is located north of Sedro-Woolley on the east side of State Route 9, just

south of Basset Road. This lot is a fallow plowed field that is the planned location of the Sedro-Woolley Fire Station 2.

For the purposes of this investigation the area of potential effect (APE) is understood to be the entire surface of each of the two lots. The waste material from the Fruitdale-McGargile road improvement project will be dumped on the lot, spread out across the surface of the site and graded. The City dump site is approximately three acres and the Fire Station site is approximately two acres. All stockpiling and grading activities will take place within the APE as described above. There are no extant buildings or structures within the APE and no buildings, structures or utilities are anticipated to be impacted as a result of construction activities.

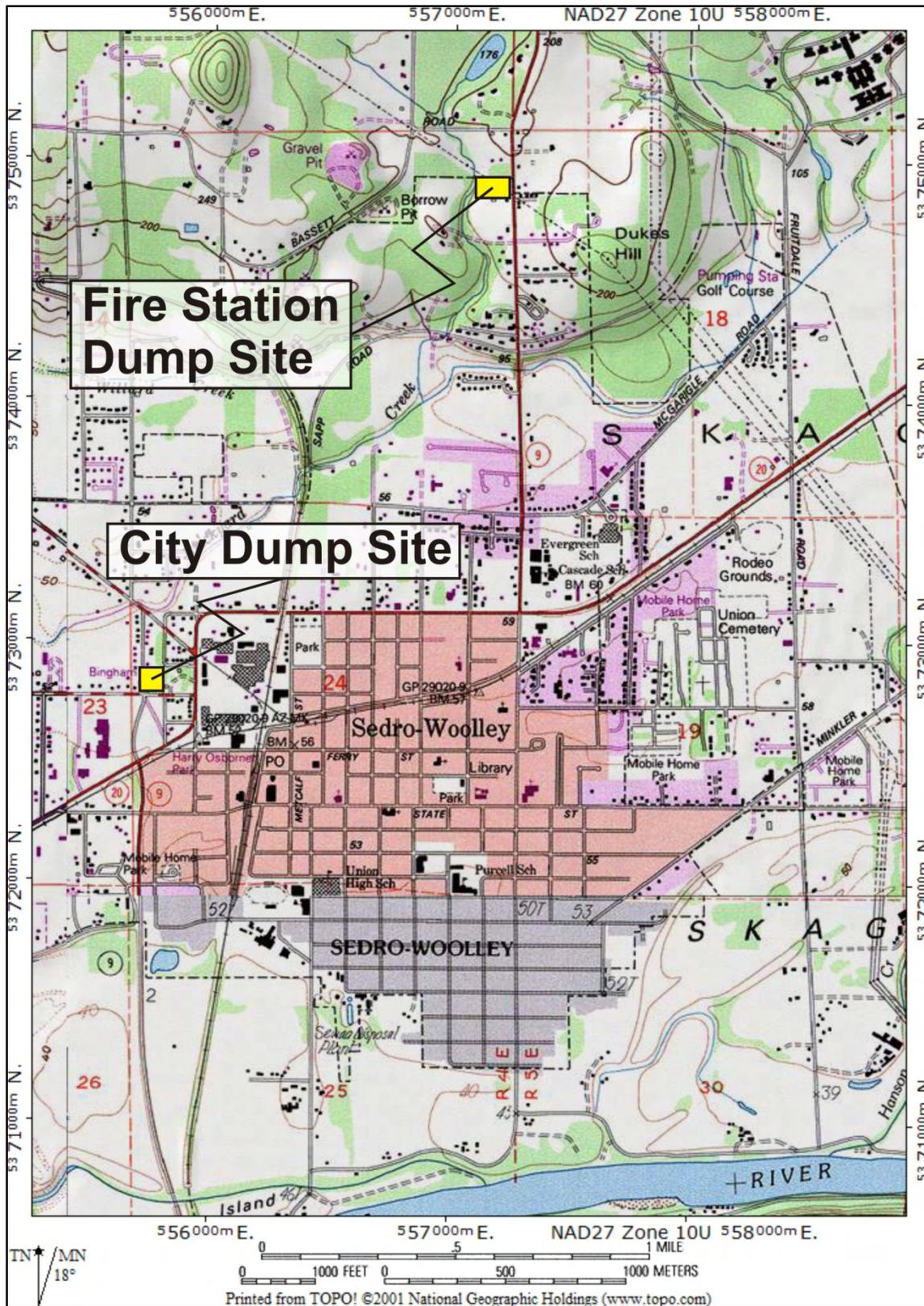


Figure 2. USGS 7.5" Quad. map illustrating the location of the two waste dump sites.



**Figure 3. The City dump site.**



**Figure 4. The Fire Station dump site.**

## Geomorphological Context

The project area is located within the Skagit River Valley at the northern end of the Puget Lowland and just west of the North Cascade Mountains. The Puget Lowland is a physiographic province that was shaped by at least four periods of extensive glaciation during the Pleistocene (Easterbrook 2003; Lasmanis 1991). The region has also been shaped by volcanic activity in the North Cascades and erosion and deposition by the Skagit River.

The bedrock just north of the project area is Darrington Phyllite (WDGER 2005). The Darrington Phyllite was formed as oceanic basalt and deep-ocean sediments deposited during the Jurassic Period were thrust onto the continent and metamorphosed during the Cretaceous Period (Dragovich et al. 1998).

During the Pleistocene the bedrock was depressed and deeply scoured by glaciers and sediments were deposited and often reworked as the glaciers advanced and retreated. The bedrock in the Skagit River region is mantled with glacial till and drift from the last glaciation (WDGER 2005). The Vashon Stade of the Fraser Glaciation began around 18,000 B.P. with an advance of the Cordilleran ice sheet into the lowlands (Porter and Swanson 1998). The Puget Lobe of the ice sheet flowed down into the Puget Lowland and reached its terminus just south of Olympia between 14,500 and 14,000 BP (Clague and James 2002; Easterbrook 2003; Waitt and Thorson 1983). The Puget Lobe was thicker towards the north and thinned towards its terminus. The depth of the ice near the project area is estimated to have been about 1600 meters (Easterbrook 2003).

The Puget Lobe began to retreat shortly after reaching its terminus. Marine waters entered the lowlands that had been carved out by the glacier and filled Puget Sound. The remaining ice was floated and wasted away rapidly. Everson glaciomarine drift deposits dating between 12,500 and 11,500 BP were released from the melting glacial ice and deposited on the sea floor across the northern and central Puget Lowland (Easterbrook 2003). The enormous weight of the ice had depressed the land but as the crust rebounded relative sea levels fell and exposed some of the drift deposits (Clague and James 2002; Easterbrook 2003). Glaciomarine drift deposits and continental outwash deposits dating to the Everson Interstade are located in the hills just north of the project area (WDGER 2005).

The Skagit River has continued to shape the region throughout the Holocene. It has deposited a wide swath of alluvium and built up a large delta into Puget Sound. Much of

the alluvium likely contains volcanic sediments from Glacier Peak (Dragovich et al. 1998). Glacier Peak has erupted numerous times during the Holocene and lahar deposits are present in large areas within the Skagit River Valley (Dragovich et al. 2002; Wdger 2005).

The project area is located above the Skagit River near Brickyard Creek, one of its tributaries. The soils within the City dump site project area have been mapped as Minkler silt loam. The soils within the Fire Station project area have been mapped as Skippopa silt loam (USDA-NRCS 2006). Minkler silt loam forms on river terraces in old alluvial and lacustrine deposits and is moderately well drained. The typical profile consists of a surface layer of dark grayish brown loam from 0-12 inches, a subsoil of olive gray silt loam from 12-15 inches, and a substratum of dark gray and gray, stratified loamy fine sand to very fine sandy loam from 15-60 inches. In some areas the surface layer is fine sandy loam or loam (Klungland 1989:78). Skipopa silt loam is found on terraces and formed in a mantle of loess and volcanic ash underlain by glaciolacustrine sediment. The typical profile consists of a surface layer of dark brown silt loam from 0-8 inches; a subsoil of dark yellowish brown silt loam from 8-16 inches; and a substratum of gray, olive and bluish gray silty clay. In some areas the surface layer is gravelly silt loam. In other areas the substratum has lenses of sandy material (Klungland 1989:99).

### **Prehistoric and Ethnohistoric Context**

In any investigation of the history of an area a discussion of the past inhabitants is necessary to appreciate the full spectrum of possible occupational remnants. It is also important to broadly discuss the land use relationship of the setting specifically and the general occupation of the area along the Skagit River.

Occupation of the landscape near the project area could have occurred as early as the retreat of the last glaciation. Sites with such antiquity are inevitably rare and difficult to date owing to the degradation of organic materials in the soil. The variety of resources and relatively level terrain in the Puget Lowlands lent itself well to occupation and utilization of the area. Cultural summaries for the broader region can be found in a multitude of resources including Ames and Maschner (1999), and Nelson (1990), and will therefore only be generally outlined here.

The Puget Sound lowland archaeology can be subdivided into three phases that include early (end of the last ice age to 5,000 years BP), middle (5,000 to 1,000 BP) and late stages of development (1,000 to 250 BP). The early period is characterized by an emphasis on the use of flaked stone tools including fluted projectile points, leaf-shaped

points and cobble-derived tools. Camps were frequently established along river terraces or outwash channels. The middle period coincides with a stabilization of the environment to something similar to today. The broad cultural patterns include a larger suite of specialized tools including smaller notched points, ground-stone, and bone or antler implements used for working with wood. Shell midden sites first appear during this period indicating a transition to a more maritime-based subsistence pattern. The late period is dominated by a settlement pattern along the coastline and along streams and rivers. Trade goods also appear indicating extensive trade networks up and down the coast as well as with inland Plateau peoples. Salmon became a primary food source at this time as sea levels had risen and riparian environments supported large runs of salmon and provided plentiful food for native populations. The project area is situated within the lower Skagit River Valley, an area populated by the Kikiallus and Nookachamps (Sampson 1972; Suttles and Lane 1990), two different bands of Skagit peoples. The Nookachamps historically occupied the Skagit River Valley from near present day Mount Vernon to Lyman (Sampson 1972). They are generally classified as Upper Skagit along with several other bands that occupied the Skagit River Valley from Mount Vernon up into the Cascades (Collins 1974; Ruby and Brown 1986; Sampson 1972; Suttles and Lane 1990). The Kikiallus are sometimes grouped with the Lower Skagit, who occupied a portion of Whidbey Island. The Kikiallus occupied the southern half of the Skagit River delta as well as Camano Island (Ruby and Brown 1986; Sampson 1972; Suttles and Lane 1990). Historically they had a large village with four longhouses near Conway (Ruby and Brown 1986:90; Sampson 1972), several miles south of the project area. The northern portion of the Skagit River delta, to the west of the project area, was historically occupied by the Swinomish. Other groups that frequently interacted with the Skagit included the Nuwaha, their neighbors to the north, the Stillaguamish, their neighbors to the south, and the Samish who lived on the islands to the west. All of these groups spoke the Northern Lushootseed dialect of the Southern Coast Salish language (Suttles and Lane 1990).

The Skagit people were skilled hunter/gatherers and craftsmen. During the spring, summer, and fall people moved around to temporary camps focusing primarily on resource acquisition. Temporary shelters were constructed of poles covered with cattail mats. Much of the food gathered during the summer was stored for winter when people congregated in permanent villages. Large winter houses were constructed from cedar posts, poles, and planks. The Skagit relied on salmon as a staple but ate a wide variety of other food as well including other fish, shellfish, waterfowl, land mammals, roots, and berries (Sampson 1972).

Diseases had swept through the Skagit region killing most of the native population even before settlers arrived. Most of the bands of Skagit as well as the Samish and Swinomish signed the Treaty of Point Elliot of 1855, which dissolved Indian title to their lands, although federally recognized tribes were permitted to fish at all usual and accustomed areas and to hunt and gather on uninhabited and unclaimed lands. The treaty set aside several temporary reservations of land. The Swinomish Reservation was one of the temporary reservations, but it was made permanent in 1873. Some of the native groups in the Skagit region moved there but many did not. Four separate organized groups operated on the Swinomish Reservation: Swinomish, Samish, Lower Skagit, and Kikiallus (Sampson 1972).

The first homesteaders in the Skagit River Valley came in the 1860s. A party of several men scouted the lower Skagit River in 1869 and brought their families and goods with them there the following year. One of the party reported that there were already 16 men with Indian wives living along the North and South Forks of the Skagit River at that time. The Skagit River delta was forested when the first settlers arrived and two large logs jams were present on the river just above and below present day Mount Vernon. One of the log jams is said to have had trees growing on top of it. Early settlers cleared and diked their lands and some set up logging camps (Willis 1973).

The period from 1890 to 1920 saw rapid growth in the Skagit River Valley (Willis 1975). The town of Sedro-Woolley was incorporated in 1898, officially merging the neighboring towns of Sedro and Woolley. Many new people arrived, more farm land was cleared, lumber and shingles were produced, the flats were substantially diked and drained, and the Skagit River Valley developed as a major agricultural center (Willis 1973). The major crops raised in the early days were hay, oats, and potatoes. Cattle and dairy farming was very important to the region and there were a number of creameries that operated in Skagit County in the early 1900s. Some flower bulbs were grown commercially as early as 1906, but it was not until after World War II when Dutch bulb growers arrived that the Skagit Valley became a major bulb producing region (Willis 1975).

### **Previous Archaeology**

A site file search of previously recorded archaeological sites and historic properties was conducted at the DAHP. No previously documented archaeological sites, historic buildings and/or structures are located within the project area. Two previously recorded archaeological sites are located within approximately one mile of the two stockpile project areas. A historic isolate (45SK314) and prehistoric isolate (45SK315) are located to the on the Skagit River floodplain (Brannan 2006).

Six cultural resource investigations have been conducted nearby. DAR conducted the preliminary archaeological assessment (Baldwin et al. 2009) for the Fruitdale-McGargile Road widening project, which is producing the waste material that will be stockpiled at the subject proposed dump sites. Equinox Research and Consulting International conducted an investigation (Bush et al. 2008) for a wetlands restoration project east of the Fruitdale-McGargile Road stockpile areas. No archaeological sites were encountered during that survey. Bonneville Power Administration (Brannan and Schmidt 2006) surveyed a small parcel adjacent to the Sedro-Woolley substation. Two isolates were recorded during that survey. Western Shore Heritage Services conducted a survey (Arthur et al. 2005) for a road improvement project east of the current project areas. No archaeological sites were encountered during that survey. Archaeological and Historical Services conducted two investigations (Luttrell and Gough 2004; Luttrell 2003) in the vicinity of the Fruitdale-McGargile Road project area. No archaeological sites were encountered during either survey.

### **Expectations**

Past archaeological work from the local area and the region suggest the survey location could possibly contain both prehistoric and historic cultural resources. Historic cultural resources might include historic trash scatters, structural remains, or artifacts associated with agricultural development. No prehistoric archaeological sites have been recorded in the vicinity of the Fruitdale-McGargile project. However, the project area was potentially used by native peoples for resource gathering and possibly for camping as well.

### **Field Methodology**

The archaeological assessment of the Fruitdale-McGargile Road Waste Material stockpile areas was conducted on July 14, 2009 by DAR archaeologists, Joshua Watrous and Mary Todd. Weather conditions were high overcast and slightly breezy. Assessment of the project area consisted of both surface and subsurface surveys. The goal of the field survey was to identify any extant cultural materials.

The site review began with a systematic pedestrian survey. The goal of the pedestrian survey was to identify any artifacts or anthropogenic soils exposed on the ground surface prior to the subsurface investigation. The pedestrian survey consisted of walking parallel transects spaced 20 to 25 meters part across the entire surface of the two proposed waste material dump sites.

Following the surface survey shovel probes (SPs) were systematically excavated across the two proposed waste material dump sites (Figure 5 & 6). SP placement was determined by the on site conditions such as the presence of paved driveways, BMX dirt jumps and areas of existing disturbance within the APE. The SPs consisted of cylindrical pits, approximately 45-50 cm in diameter and ranging in depth from 40 to 80 cm. Details regarding the location, depth, sediments encountered and general setting were recorded for each SP and are presented in Appendix A. All SPs were completely backfilled after inspection and their locations marked on the project map.

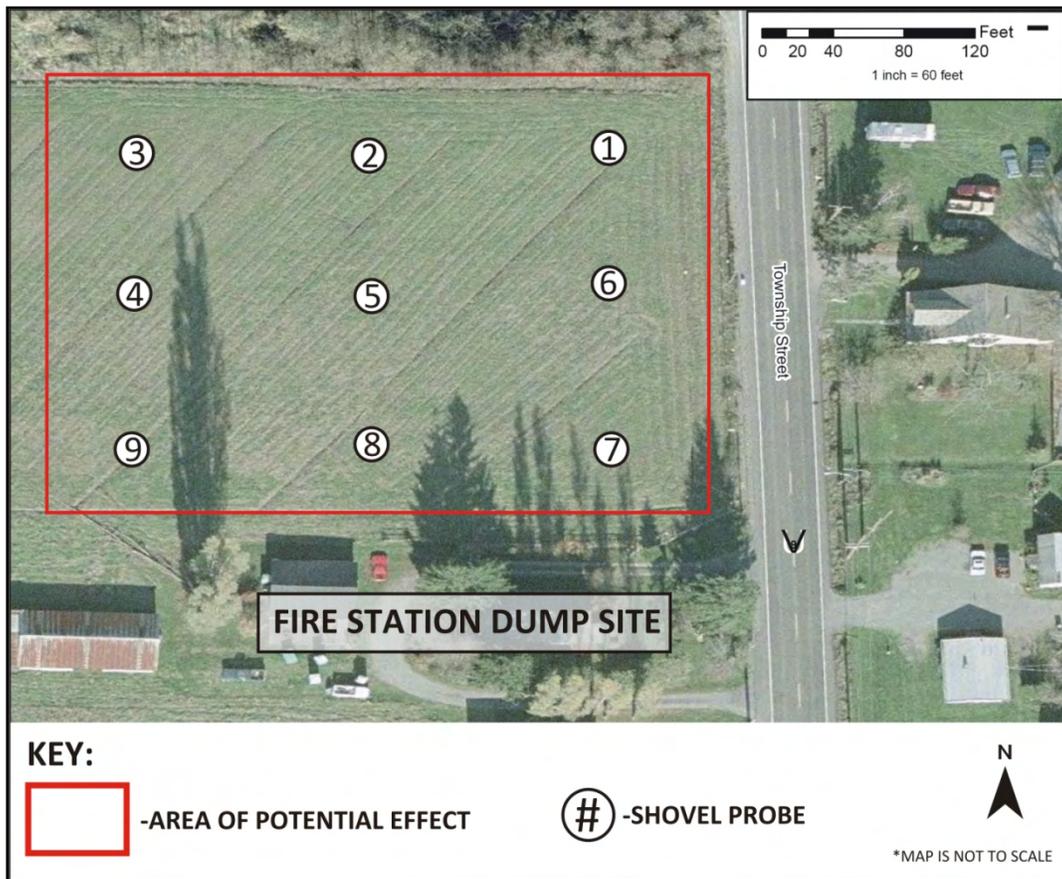


Figure 5. Fire Station dump site plan map illustrating SP locations.

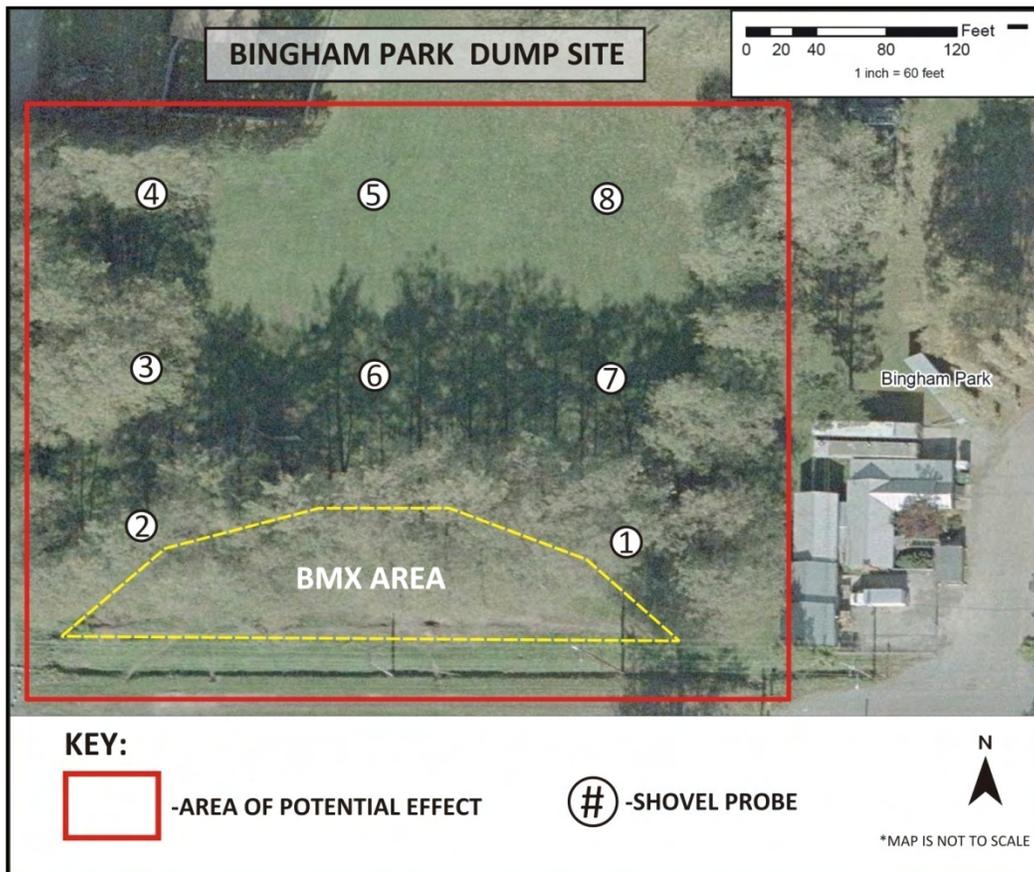


Figure 6. City dump site plan map illustrating SP locations.

## Results

### Geologic Observations

The soils within the project area have been mapped as Minkler silt loam and Skipopa silt loam. The City dump site is mapped as Minkler silt loam and the Fire Station site is mapped as Skipopa silt loam (USDA-NRCS 2006). The soil profiles observed in the shovel probes varied by their location on the landform, but generally conformed to the typical profiles of both Skipopa silt loam and Minkler silt loam. A typical City dump site SP soil profile consisted of between approximately 15 to 35 cm of brown silt loam overlying brown to gray fine sandy loam or a compact loamy sand (Figure 7).



**Figure 7. Minkler silt loam sediments observed in the City dump site SPs.**

The field at the Fire Station site SPs has been recently plowed and the upper 30 cm across the whole lot is mixed and disturbed. Due to the plowing activities the soil profile observed in the SPs at the Fire Station site were relatively constant, consisting of approximately 25 to 30 cm of dark brown organic rich silt loam overlying heavily mottled olive silty clay (Figure 8).



**Figure 8. Skipopa silt loam sediments observed in the Fire Station site SPs.**

### **Archaeological Observations**

Both surface and subsurface surveys were conducted across the entire project area. A total of eight shovel probes were excavated at the City dump site and nine shovel probes were excavated at the Fire Station site. No cultural resources, artifacts or features were identified during surface or subsurface inspection of the two project areas. A summary of the subsurface soil profiles encountered in each shovel probe is presented in Appendix A.

### **Recommendations**

Pedestrian survey, subsurface explorations and background research indicate there are no cultural resources within the two proposed Fruitdale-McGarigle Road Waste Material dump sites. These areas were likely used by Native people prior to Euro-American contact, but there were no indications or remnants of past occupation located during the survey. DAR recommends that the FHWA assert a determination of No Historic Properties affected to the Washington State Historic Preservation Officer and any interested tribes.

DAR additionally recommends the project proponents be familiar with Washington State laws, particularly Revised Code of Washington (RCW) Chapter 27.53.060, RCW 27.44.040 and RCW 68.50.645. The following is only offered as a guide and is not the complete text of any code, regulation or law.

Washington State law provides for the protection of all archaeological resources under RCW Chapter 27.53, Archaeological Sites and Resources, which prohibits the unauthorized removal, theft, and/or destruction of archaeological resources and sites. This statute also provides for prosecution and financial penalties covering consultation and the recovery of archaeological resources. Additional legal oversight is provided for Indian burials and grave offerings under RCW Chapter 27.44, Indian Graves and Records. That law states that the willful removal, mutilation, defacing, and/or destruction of Indian burials constitute a Class C felony. A recent addition to Washington legal code, RCW 68.50.645, Notification, provides a strict process for the notification of law enforcement and other interested parties in the event of the discovery of any human remains regardless of perceived patrimony. The assessment of the property has been conducted by a professional archaeologist and meets or exceeds the criteria set forth in RCW: 27.53 for professional archaeological reporting and assessment.

In the event that archaeological materials are encountered during the development of the property, an archaeologist should immediately be notified and work halted in the vicinity of the find until the materials can be inspected and assessed. At that time the appropriate persons are to be notified of the exact nature and extent of the resource so that measures can be taken to secure them. In the event of inadvertently discovered human remains or indeterminate bones, pursuant to RCW 68.50.645 all work must stop immediately and law enforcement should be contacted. Any remains should be covered and secured against further disturbance, and communication established with the Skagit County Sheriff's Department, the Assistant State Archaeologist at DAHP, and the Lummi Nation, Samish Nation, Swinomish Tribe, Upper Skagit Tribe and Sauk-Suiattle Tribe.

If you require further assistance or would like to discuss this matter further, please contact me. I can be reached by email or telephone. My contact email is [garth@draytonarchaeology.com](mailto:garth@draytonarchaeology.com) and my phone number is 360.332.2600. This letter will serve to complete the record of the archaeological oversight for the project and is our final address of the issue. I appreciate this opportunity to work with you and thank you for your business.

Sincerely,

A handwritten signature in purple ink, appearing to read 'Garth L. Baldwin', written in a cursive style.

Garth L. Baldwin, M.A., RPA  
Principal, DAR LLC

## APPENDIX A – SHOVEL PROBE DATA TABLE:

### CITY DUMP PARK

<b>Shovel Probe 1</b>		
CM Depth	Sediments	Comment
0-36cm	Brown silt loam with sparse rounded gravels and sparse charcoal fragments. Sediments are slightly dense and slightly moist. The boundary with the underlying sediments is abrupt and irregular.	No cultural material.
36-60cm	Heavily mottled (H <sub>2</sub> O oxidized) gray silt loam. Little to no gravels. Sediments are slightly dense and slightly moist.	No cultural material.
<b>Shovel Probe 2</b>		
CM Depth	Sediments	Comment
0-18cm	Red brown silt loam with little to no gravels. Sediments are slightly dense and slightly moist. Interface with underlying subsoil is abrupt and irregular.	No cultural material.
18-24cm	Light yellow brown silt loam. Sediments are slightly dense and slightly moist. Boundary with underlying substratum is diffuse and irregular.	No cultural material.
24-80cm	Heavily mottled gray fine sand with sparse silt/ fine loamy sand.	No cultural material.
<b>Shovel Probe 3</b>		
CM Depth	Sediments	Comment
0-24cm	Red brown silt loam with little to no gravels. Sediments are slightly dense and slightly moist. Interface with underlying subsoil is slightly diffuse and irregular.	No cultural material.
24-40cm	Light yellow brown silt loam. Sediments are slightly dense and slightly moist. Boundary with underlying substratum is slightly diffuse and irregular.	No cultural material.
40-80cm	Heavily mottled gray fine sand with sparse silt/ fine loamy sand.	No cultural material.
<b>Shovel Probe 4</b>		
CM Depth	Sediments	Comment
0-9cm	Red brown silt loam with little to no gravels. Sediments are slightly dense and slightly moist. Interface with underlying subsoil is slightly diffuse and irregular.	No cultural material.
9-12cm	Light yellow brown silt loam. Sediments are slightly dense and slightly moist. Boundary with underlying substratum is slightly diffuse and irregular.	No cultural material.
12-25cm	Dark brown silt loam with little to no gravels. Sediments are slightly dense and slightly moist. Interface with underlying substratum is abrupt and wavy.	No cultural material.
25-50cm	Heavily mottled gray fine sand.	No cultural material.
<b>Shovel Probe 5</b>		
CM Depth	Sediments	Comment
0-25cm	Very light brown silt loam with abundant rounded gravels. Sediments are moderately dense and dry. Interface with the	No cultural material.

	subsoil is abrupt and linear.	
25-50cm	Dark brown silt loam with a moderate amount of fragmented charcoal. Sediments are moderately dense and slightly moist. Interface with substratum is abrupt and linear.	No cultural material.
50-75cm	Heavily mottled gray fine sandy loam.	No cultural material.
Shovel Probe 6		
CM Depth	Sediments	Comment
0-16cm	Very light brown silt loam with abundant rounded gravels. Sediments are moderately dense and dry. Interface with the subsoil is abrupt and linear.	No cultural material.
16-30cm	Dark brown silt loam with a moderate amount of fragmented charcoal. Sediments are moderately dense and slightly moist. Interface with substratum is abrupt and linear.	No cultural material.
30-50cm	Heavily mottled gray fine sandy loam.	No cultural material.
Shovel Probe 7		
CM Depth	Sediments	Comment
0-30cm	Dark brown silt loam with a moderate amount of charcoal present. Sediments are slightly dense and slightly moist. Boundary with underlying subsoil is irregular and abrupt.	No cultural material.
30-60cm	Gray fine sand with silt and abundant mottling. Sediments are slightly dense and slightly moist.	No cultural material.
Shovel Probe 8		
CM Depth	Sediments	Comment
0-35cm	Dark brown silt loam with a moderate amount of charcoal present. Sediments are slightly dense and slightly moist. Boundary with underlying subsoil is irregular and abrupt.	No cultural material.
35-65cm	Gray fine sand with silt and abundant mottling. Sediments are slightly dense and slightly moist.	No cultural material.

## **FIRE STATION**

<b>Shovel Probe 1</b>		
CM Depth	Sediments	Comment
0-25cm	Dark brown/ dark gray brown silt loam with sparse gravels. Sediments are slightly loose and slightly moist. Boundary with underling sediments is abrupt and irregular.	No cultural material.
25-50cm	Gray silt loam with sparse gravels and abundant mottling. Sediments are moderately dense and slightly moist.	No cultural material.
<b>Shovel Probe 2</b>		
CM Depth	Sediments	Comment
0-25cm	Dark brown/ dark gray brown silt loam with sparse gravels. Sediments are slightly loose and slightly moist. Boundary with underling sediments is abrupt and irregular.	No cultural material.
25-50cm	Gray silt loam with sparse gravels and abundant mottling. Sediments are moderately dense and slightly moist.	No cultural material.
<b>Shovel Probe 3</b>		
CM Depth	Sediments	Comment
0-10cm	Gray brown silt loam with coarse sand and gravels. Sediments are slightly dense and slightly moist. Boundary with underlying sediments is diffuse and irregular.	No cultural material.
10-30cm	Gray clay loam with gravels and abundant mottling. Sediments are moderately dense and slightly moist.	No cultural material.
<b>Shovel Probe 4</b>		
CM Depth	Sediments	Comment
0-30cm	Dark brown silt loam with little to no gravels. Sediments are loose and slightly moist. Boundary with underlying substratum is abrupt and linear.	No cultural material.
30-45cm	Heavily mottled gray clay loam with sparse gravels. Sediments are moderately dense and slightly moist.	No cultural material.
<b>Shovel Probe 5</b>		
CM Depth	Sediments	Comment
0-35cm	Dark brown silt loam with little to no gravels and sparse charcoal. Sediments are loose and slightly moist. Boundary with underlying substratum is abrupt and linear.	No cultural material. Smells like manure.
35-50	Heavily mottled gray clay loam with sparse gravels. Sediments are moderately dense and slightly moist.	No cultural material.
<b>Shovel Probe 6</b>		
CM Depth	Sediments	Comment
0-40cm	Brown silt loam with sparse charcoal and sparse gravels. Sediments are loose and slightly moist. Boundary with underlying sediments is slightly diffuse and linear.	No cultural material.
40-50cm	Heavily mottled gray clay loam with sparse gravels. Sediments are moderately dense and slightly moist.	No cultural material.

<b>Shovel Probe 7</b>		
CM Depth	Sediments	Comment
0-20cm	Dark brown silt loam with very sparse gravels and sparse charcoal. Sediments are loose and slightly moist. Boundary with underlying sediments is diffuse and irregular.	No cultural material.
20-45cm	Red brown silt loam with abundant charcoal fragments (throughout SP but primarily in south wall). Sediments are slightly dense and slightly moist. Boundary is diffuse and linear.	No cultural material.
45-60cm	Gray clay loam/ clayey silt loam with abundant mottling.	No cultural material.
<b>Shovel Probe 8</b>		
CM Depth	Sediments	Comment
0-26cm	Dark brown silt loam with very sparse gravels and sparse charcoal. Sediments are loose and slightly moist. Boundary with underlying sediments is diffuse and irregular.	No cultural material.
26-46cm	Red brown silt loam with abundant charcoal fragments (throughout SP but primarily in south wall). Sediments are slightly dense and slightly moist. Boundary is diffuse and linear.	No cultural material.
46-75cm	Gray clay loam/ clayey silt loam with abundant mottling.	No cultural material.
<b>Shovel Probe 9</b>		
CM Depth	Sediments	Comment
0-20cm	Gray silt loam with moderate gravels. Sediments are slightly dense and slightly moist. Boundary is abrupt and irregular.	No cultural material. Sediments appear to be imported fill, overlying the plowed field.
20-50cm	Dark brown silt loam with sparse charcoal and sparse gravels. Sediments are loose and slightly moist. Boundary with underlying sediments is slightly diffuse and linear.	No cultural material.
50-70cm	Heavily mottled gray clay loam with sparse gravels. Sediments are moderately dense and slightly moist.	No cultural material.

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# CULTURAL RESOURCES REPORT COVER SHEET

Author: Garth L. Baldwin and Joshua B Watrous

Title of Report: An Archaeological Review of the Proposed Fruitdale-McGargile Road Waste Soil Disposal Sites

Date of Report: July 23, 2009

County (ies): Skagit Section: 17 Township: 38N Range: 3E  
Quad: Sedro Woolley Acres: ~5

CD Submitted?  Yes  No PDF of Report?  Historic Property Export Files?

Does this replace a draft?  Yes  No

Archaeological Sites/Isolates Found or Amended?  Yes  No

TCP(s) found?  Yes  No

Does this report fulfill a DAHP permit requirement?  Yes #  No

DAHP Archaeological Site #:

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## REPORT CHECK LIST

Report should contain the following items:

- Clear objectives and methods
- A summary of the results of the survey
- A report of where the survey records and data are stored
- A research design that:
  - Details survey objectives
  - Details specific methods
  - Details expected results
  - Details area surveyed including map(s) and legal locational information
  - Details how results will be incorporated into the planning process

## **Appendix F: Public Notice**

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**PUBLIC NOTICE**  
**Federal Emergency Management Agency**  
**Draft Environmental Assessment**  
**Sedro-Woolley Fire Station**

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide funding to the Sedro-Woolley Fire Department for a Assistance to Firefighters Station Construction Grant project in Sedro-Woolley, Washington. Funding would be provided as authorized by the American Recovery and Reinvestment Act.

FEMA prepared a draft environmental assessment (EA) for the proposed project pursuant to the National Environmental Policy Act (NEPA) of 1969 and FEMA's implementing regulations found in 44 Code of Federal Regulations (CFR) Part 10. The EA evaluates alternatives for compliance with applicable environmental laws, including Executive Orders #11990 (Protection of Wetlands), #11988 (Floodplain Management), and #12898 (Environmental Justice). The alternatives evaluated in the EA are the (1) no action; and (2) proposed action, the building of a second fire station.

The EA is available for review online at the FEMA environmental Web site at: <http://www.fema.gov/plan/ehp/envdocuments> under Region X. If no significant issues are identified during the comment period, FEMA will finalize the EA, issue a Finding of No Significant Impact (FONSI), and fund the project. Unless substantive comments are received, FEMA will not publish another notice for this project. However, should a FONSI be issued, it will be available for public viewing at <http://www.fema.gov/plan/ehp/envdocuments> under Region X.

The draft EA is also available for review on Monday March 15, 2010 at the Sedro-Woolley Municipal Building and Fire Station located at 325 Metcalf Street.

Written comments on the draft EA should directed no later than 5 p.m. on Wednesday April 14<sup>th</sup>, 2010 to Science Kilner, Deputy Regional Environmental Officer, FEMA Region X, 130 228th Street SW, Bothell, WA 98021, or by e-mail at [science.kilner@dhs.gov](mailto:science.kilner@dhs.gov). Comments also can be faxed to 425-487-4613.