

9.4 Habitat Features

Proposed wetland habitat features include the placement of large woody debris, such as downed logs and stumps. Placement is to occur at the edges of the reduced buffer areas, within created wetlands, and within and around the ponded areas. The density is proposed at approximately 67.5m³/hectare (35.75cy/ac) at a coniferous/deciduous ratio of 7:1 to 17:1, and of a size in which at 30% are at least 21cmf (8.25") in diameter (Azous, 1998). This density equates to an approximate minimum of 23 downed snags or stumps per acre for a total of approximately 47 stumps or logs. This assumes a stump sized at 6 feet long by 3 diameter feet.

10.0 MONITORING

The site will be monitored for Years 1 through 5, 7 and 10. Monitoring is to occur in late summer or early fall of each year. Monitoring will consist a visual estimate of percent survival and also photographs taken from established photo points. In addition to the reported percent survival, an estimate of typical height will be stated with respect to the trees and shrubs.

It is proposed that the site be monitored for a period over 10 years after planting and that a letter report be submitted subsequent to each monitoring effort. An 80% survival of the planted trees and shrubs is proposed, except for Year 1 when 100% replacement will occur. At the end of the ten year monitoring, should their be less than 80% survival, then replanting and monitoring will continue until such is achieved, or a contingency plan developed, approved and functioning.

10.1 Vegetation Monitoring

Permanent sampling points are to be established in the wetland creation/mitigation area along four permanent north-south transects at 150-foot intervals. All stations are to be permanently marked with metal posts for easy identification and location. Photographs are to be taken at select points for annual comparison.

Sampling will be accomplished by recording the dominant species in each vegetation layer, trees within a 30 foot radius and shrubs within a ten foot radius. For areas planted with emergents, a 1-m² quadrants placed 1 meter from the permanent marker, and species within each quadrant will be identified and given a percentage cover score based on the proportion the of area each species occupies with in the quadrant.

10.2 Soils Monitoring

Surface soils samples will be taken at two points along each transect, one in the constructed wetland area and the other in the enhanced buffer. Soils will be inspected for hydromorphic features, color and texture. Wetland soil samples should test positive for the hydromorphic features such as dark

matrix (value of 2 or less), and possibly with mottles. The character and composition of the stream channel, at its interception with the transect, will be described and recorded. Although surface saturation is a hydrology criteria, surface saturation of the requisite duration during the growing season will be regarded as an indicator of hydric soil development.

10.3 Hydrology Monitoring

Wetland hydrology will be assessed in the soil sample pits and also through general observation of ponded or areas with apparent surface saturation. Measurements are to be taken to the depth of saturation and the depth of water. A statement or evidence on the surplus or deficiency of rainfall is to be stated. Sampling is to occur during late fall and early spring for Years 1 and 2, or until there is adequate documentation that that hydrology is sufficient to meet the performance standard. Thereafter the sampling will occur in the late fall or early spring.

Table 10-1 Monitoring Calendar

Year	1	2	3	5	7	10
Vegetation	F	F	F	F	F	F
Soils	F	F	F	F	F	F
Hydrology	F, Sp	F, Sp	F, Sp*	F, Sp*	F	F
Wildlife	F, Sp	F, Sp	F	F	F	F
Maintenance needs	Su, F	Su, F	Su, F	Su, F	Su, F	Su, F
Monitoring report due	Dec	Dec	Dec	Dec	Dec	Dec
Report Due	As built report due within 90 days of installation					

F-fall, Sp-spring, Su-summer * Spring also if required, otherwise fall only

10.4 Wildlife Monitoring

Observed bird species observed will be recorded for inclusion in the annual monitoring report. Identified nests and nesting pairs will be noted and the approximate location and habitat type recorded. Observations for birds will occur at the same inspection of the wetland mitigation monitoring. Any amphibians will also be also be noted for inclusion in the monitoring report.

11.0 REPORTING

A monitoring report is to be submitted to the Corps of Engineers, EFSEC and City of Sumas in December of each monitor year. The first years' report will include description of the initial planting, and the progress and any measures taken for maintenance and replacement. Photographs are to be taken at select points for annual comparison.

After initial installation, as built drawings will be provided to the Corps of Engineers, EFSEC and the City of Sumas.

12.0 SITE PROTECTION

Signs are to be posted around the mitigation areas designating is as a "Native Growth Protection Area", with a statement of no dumping. The mitigation area is to be placed into a permanent conservation easement and recorded with Whatcom County. The mitigation site is to be physically surrounded with barbwire fencing.

13.0 CONTINGENCY PLAN

In the event that the mitigation continually fails to meet performance standards, the Corps, EFSEC and the City of Sumas will be notified of the ongoing deficiency. The notification will include a problem statement and a recommended remedial plan if one is apparent. The plan will require Corps, EFSEC and City of Sumas approval prior to implementation. A performance bond is to be posted with the City of Sumas or the Corps of Engineers and is to be released incrementally upon successful performance.

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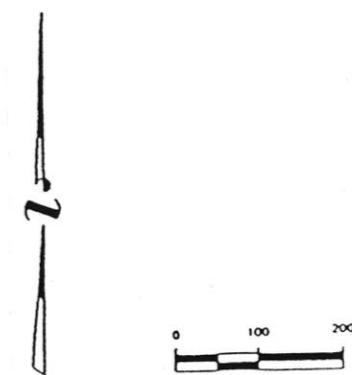
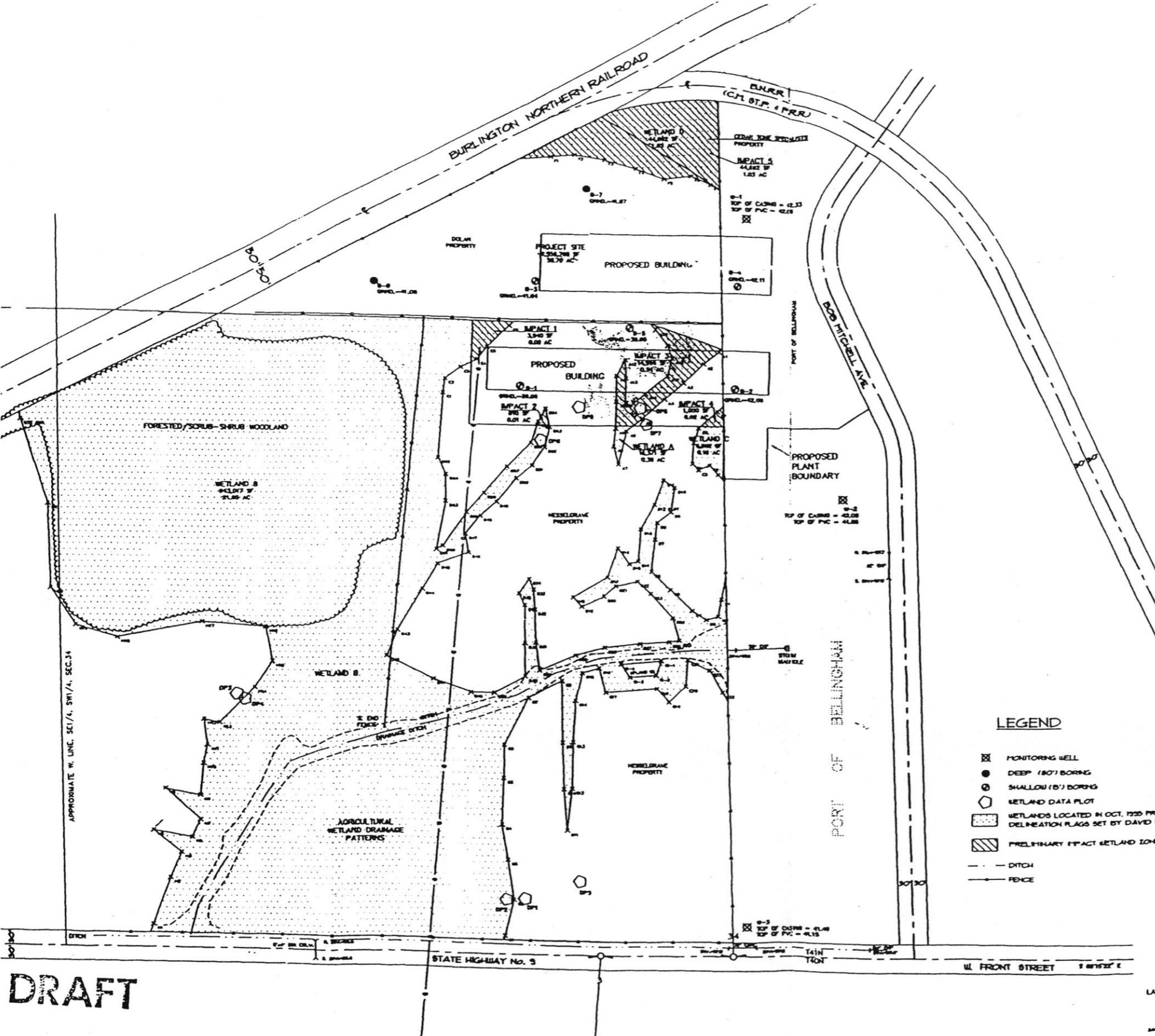
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APPENDIX A

David Evans & Associates 1995 Wetland Delineation Map



Appendix A
 David Evans & Associates
 1995 Wetland Delineation Map

FIGURE 6
 WETLAND DETERMINATION MAP

BASIS OF BEARINGS

CENTERLINE OF W. FRONT ST., N 89° 0' 22" W, PER RECORD OF SURVEY FOR THE HANL BANK OF CANADA, RECORDED UNDER APP B-10-487 RECORDS OF THE AUDITOR OF WHATCOM COUNTY, WASHINGTON

VERTICAL DATUM

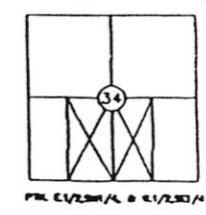
MEAN SEA LEVEL PER FEMA FLOOD INSURANCE RATE MAP FOR THE CITY OF BELLINGHAM

NOTE:

- 1) LOCATION AND SIZE OF PROPOSED BUILDINGS ARE SHOWN APPROXIMATE ONLY.
- 2) ELEVATIONS OF TOP OF PVC ARE WITHOUT 2" CAP

LEGEND

- ☒ MONITORING WELL
- DEEP (80') BORING
- SHALLOW (5') BORING
- WETLAND DATA PLOT
- ▨ WETLANDS LOCATED IN OCT. 1995 FROM DELINEATION FLAGS SET BY DAVID EVANS & ASSOC.
- ▨ PRELIMINARY IMPACT WETLAND ZONE
- - - DITCH
- FENCE



DRAFT



WETLAND MAPPING			
DATE AS NOTED	APPROVED BY	DATE OF JOB	
DATE 10/16/95	DCM ST/2		
FOR BOUNDARY PAPER LIMITED			
P.N. E1/2, 884/4 & 887, 887/4			
SEC. 34, T4P. 49N. R. 4E. S1P1			
CITY OF BELLINGHAM, WHATCOM COUNTY, WA			
			8735

BOUNDARY PAPER LIMITED
 WETLAND DELINEATION
 OCTOBER 1995

David Evans & Associates, Inc.
 1801 PLYMOUTH ST. SUITE 200, BELLINGHAM, WA 98225
 TEL: 360-738-4888 FAX: 360-738-4889

DATE PLOTTED 10-18-1995
 PLOTTER DYNALOX
 PLOT SIZE 11x17
 PLOT NO. 8735