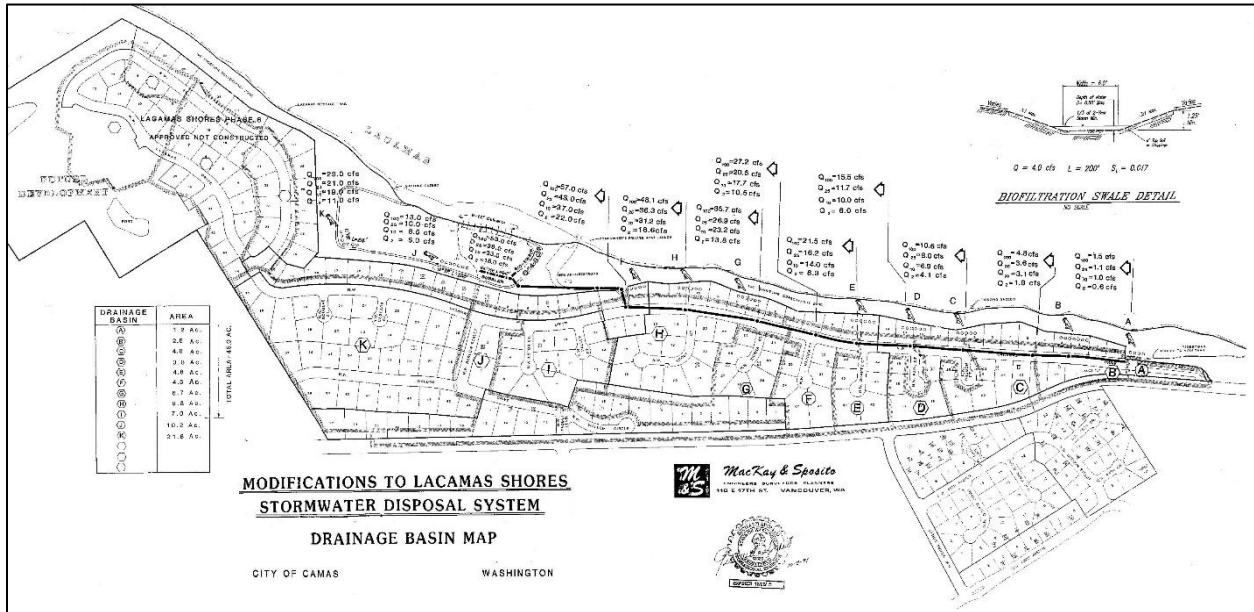
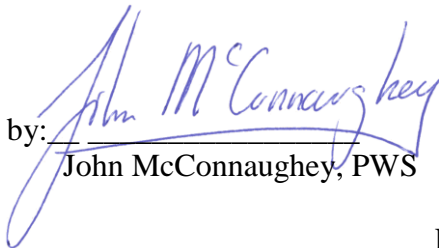


# LACAMAS SHORES HOA MEADOWLANDS PARK WETLAND DELINEATION & PROPOSED VEGETATION PLAN

Lot 84839000 in Camas, Washington  
#41 SEC 33, 34 & 28 T2N R3EWM 12.27A



Evaluated by:   
John McConnaughey, PWS

ETC Job EVA15006

February 2017

Prepared for:  
Lacamas Shores HOA  
Matthew McCants, President  
PO Box 751, Camas WA 98607



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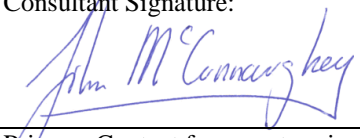
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**COVER PHOTO (page 1):**

Stormwater basin contributing area: From: MacKay and Sposito, Inc., "Modification to Lacamas Shores Stormwater Disposal System". July 9, 1996. (See appendix G6).

**WETLAND DELINEATION / DETERMINATION SUMMARY**

<input checked="" type="checkbox"/> Applicant <input checked="" type="checkbox"/> Owner Name, Firm and Address: Lacamas Shores Home Owners Association Matthew McCants, President PO Box 751, Camas WA 98607	Business phone # Mobile phone # 913-251-2491 FAX # E-mail:
<input checked="" type="checkbox"/> Authorized Agent for Wetland & Habitat Issues : John McConnaughey Environmental Technology Consultants 375 Portland Ave Gladstone, OR 97027	Business phone # 360-696-4403 FAX # 503 657-5779 Mobile phone # 503-580-2465 E-mail: <a href="mailto:JohnM@etcEnvironmental.net">JohnM@etcEnvironmental.net</a>
I either own the property described below or I have legal authority to allow access to the property. I authorize the Department access the property for the purpose of confirming the information in this report.	
Typed/Printed Name: _____ Signed _____ Date: _____	
Special instructions regarding site access: Public access is granted using the Lacamas Lake Heritage Trail System. No special permission is required, though notification is requested.	
Project Name: Meadowlands Park	Latitude: 45.6119° Longitude: -122.4357°
Proposed Use: Stormwater management, recreation, view space	Tax Lots # 84839000 12.27 acres
Project Street Address (or other descriptive location):	Township T2N Range R3E Sec 28, 33, 34
No situs address. Between Lacamas Lake and NW Lacamas Drive	#41 SEC 33, 34 & 28 T2N R3EWM 12.27A
City: Camas County: Clark	NWI Quad(s): CAMAS
The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.	
Consultant Signature: 	February 1, 2017
Primary Contact for report review and site access is <input checked="" type="checkbox"/> Consultant <input type="checkbox"/> Applicant/Owner <input type="checkbox"/> Agent	
<b>Summary of Study Area and Wetlands Delineated</b>	
Size of parcel 84839000	534,481 SQFT (12.27 acres)
<b>TOTAL STUDY AREA</b>	<b>534,481 SQFT (12.27 acres)</b>
Wetland "A" (PF01B, PSS1B, PEM1C and POW)	257,739 SQFT = 5.92 Acres
Wetland "B" (PF01B)	2,220 SQFT = 0.05 Acres
<b>TOTAL Wetland + Waterway area</b>	<b>257,734 SQFT = 5.97 Acres</b>
Wetland Areas by Cowardin Class	
PFO1B	228,264 SQFT = 5.34 Acres
PEM1C	7,685 SQFT = 0.18 Acres
PEM1B	18,640 SQFT = 0.43 Acres
POW	3,145 SQFT = 0.07 Acres
Any non-jurisdictional wetland areas on site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Acres: 5.92
Coastal Zone Management Area?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Acres:
Shoreline Area?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Acres:

## INTRODUCTION

### **PURPOSE OF THIS REPORT:**

For some years residents of the Lacamas Shores Home Owners Association, (LSHOA), have been concerned with the management of Clark County Tax Lot 84839000, otherwise known as "Meadowlands Park". Meadowlands Park is a 12.27 Acre parcel wholly owned by the Lacamas Shores Home Owners Association.

In 2014 members of the LSHOA approached the city with a request to manage the vegetation in the park. City of Camas Planning Manager Robert Maul responded:

...."You will want to consult a certified wetland biologist to conduct a wetland delineation and assessment. It is clear that there are wetlands on site, but the boundaries; categorization and habitat functions of those wetlands have not been assessed for many years if even at all.".....(email dated 3/14/2014. See Appendix G1 for the entire email).

This report is in response to Mr. Maul's requirement. It is hoped that this report will assist the City in evaluating the LSHOA's proposed vegetation management plan.

As a note, from my own review of available documents, I conclude that:

- LSHOA owns and is responsible for the management of stormwater facilities within Meadowlands Park.
- No permits are needed for the performance of maintenance activities that are consistent with the facility's design standards.

Responsibilities are detailed in a 1988 Order of Remand. Such an order is unusual for such developments, and reflects some of the controversy that is associated with this development and others near Lacamas Lake, (see Appendix G2).

Responsibilities are also detailed in the Covenants Conditions and Restrictions which are part of the LSHOA's governing document (see Appendix G11).

The vegetation plan presented is consistent with original design and also with the, guidelines described in the Stormwater Partners guidelines: "Managing Stormwater – An introduction to maintaining stormwater facilities for private property owners and HOAs". (Appendix G3). It is not clear to me why the city needs to review the LSHOA's maintenance plans, as long as said plans are consistent with the proper functioning of the storm water facility. Camas Chapter 16.51.120.A appears to exempt the requested activity from a requirement to produce a critical area report:

I have not seen any document that would require such a submittal previously for the underlying permit.

16.51.120 A. Critical Area Report not Required. Activities which have been reviewed and permitted or approved by the city, or other agency with jurisdiction, for impacts to critical or sensitive areas, do not require submittal of a new critical area report or application under this chapter, unless such submittal was required previously for the underlying permit.

**PROPOSED USE:**

No change in use is proposed. This proposal only modifies the vegetation in a manner consistent with the CCRs and the Stormwater Partners guidelines.

**DISCLAIMER:**

ETC has not evaluated the current functioning of the storm water treatment facility for compliance to the permit conditions.

This report documents the investigation, best professional judgment and conclusions of the investigator. It is correct and complete to the best of my knowledge. Wetland boundaries shown in this report should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Washington Department of Environmental Quality or the local planning authority.

**QUALIFICATIONS OF JOHN MCCONNAUGHEY**

I earned a Bachelor of Science degree from the University of Oregon in 1978 and in 1984 I earned a Masters of Fisheries Science degree from the University of Alaska at Juneau, (since renamed the University of Alaska, Southeast). The Juneau curriculum specializes in the study of Pacific salmon. I held positions with agencies tasked with salmon research and management beginning with summer jobs in 1979 in Rogue River, the Oregon Dept of Fish and Wildlife, and then with the Alaska Department of Fish and Game in Ketchikan Alaska, in 1980. I worked on salmon projects with ADF&G in Anchorage and Juneau for 5 years before moving to American Samoa to serve as a fisheries projects leader for the Department of Marine and Wildlife Resources. Upon returning stateside, I worked for the Yakama/Klickitat Fisheries Project out of Yakima Washington for 5 years leading four research projects studying aspects of salmon supplementation projects in the Yakima River.

I have been employed with Environmental Technology Consultants for the past 6 years. In 2010 I earned certification as a Professional Wetland Scientists, (PWS) from the Society of Wetlands Scientists, (SWS).

No part of my compensation is dependent on the outcome of my investigations or conclusions I may draw from the observed data.

## MEADOWLANDS PARK

### CURRENT USE:

The park was created in the late 1980's, and performs multiple functions. From the documents I examined, there are two required uses for the park, 1) for stormwater treatment, and 2) a trail system linking the north and south ends of the Lacamas Heritage Trail. The approximate areas and functions are shown in Table 1, (below):

The stormwater design and monitoring program are described in the July 1993 issue of Water Environment Technology, (see Appendix G5). That article does not discuss the 1992 and 1996 expansion and modification to the system. More technical documents exist that detail the stormwater facility, however Water Environment Technology article does a good job of encapsulating the thinking and design that went into the facility.

In 1992 the facility was modified to accommodate water from the South end of NW Lacamas Drive which was being developed at that time.

In 1996 another modification was made to accommodate water from the Lake Height's Phase 1 subdivision. Lake Heights is not part of the Lacamas Shores subdivision, nor do residents pay due towards the maintenance of Meadowlands Park.

<b>Table 1. Wetlands, uses and approximate areas of Meadowlands Park.</b>		
<b>Meadowlands Park</b>	<b>ACRES</b> <b>12.27</b>	<b>DESCRIPTION</b>
Wetland "A" Stormwater treatment	5.87	Total area used for storm water treatment, including the original 1988 design and additions and modifications in 1992 and 1996. Stormwater from the Lacamas Shores, and the Lake Heights subdivisions, and from portions of NW Lake Road are piped to this facility.
Wetland "B" Jurisdictional wetland	0.05	A small wetland area between the picnic area and boat ramp. It is not part of the storm facility, and was part of a larger wetland complex prior to being cut off and isolated by the boat ramp road. Total size is 0.11 acres, 0.05 of which is within the park boundary.
Athletic Field	1.01	A grass field in the center of the park.
Playground	0.09	Playground equipment on the SW side of the athletic field.
Paved road & parking	0.49	Road access and parking for the boat ramp and picnic areas. The boat ramp itself is offsite. There is also a 20x45' storage shed.
Picnic & Barbeque area	0.81	A recreational area for the LSHOA on the South end of the park, also contains rest rooms.

<b>Meadowlands Park</b>	<b>ACRES 12.27</b>	<b>DESCRIPTION</b>
Trail system ~3,000 linear feet	0.69	A gravel trail system that connects with the Lacamas Lake Heritage Trail System. The LSHOA is responsible for trail maintenance within Meadowlands Park.
Open space	3.27	Other areas not included in the above.
(Areas discussed in this report include only lands within tax lot 84839000. Some of the above areas continue offsite).		

**DOCUMENTS AND PERMITS ASSOCIATED WITH MEADOWLANDS PARK:**

A number of documents related to the permitting of Meadowlands Park appear to have been lost with the passage of time. As most of the permit work was done prior to the formation of the LSHOA, and done without input from the LSHOA, the HOA does not have the documents.

ETC has contacted the following agencies:

<b>AGENCY</b>	<b>RESPONSE</b>
LSHOA	Some records were located and given to ETC for review.
Scientific Resources Inc	Stan Geiger (now retired) provided a large number of photos, and a copy of his article (Appendix G5)
Vanport Manufacturing	Says that their records related to the Lacamas Shores development were discarded years ago.
MacKay and Sposito	Says that their records related to the Lacamas Shores development were discarded a couple years ago.
USACE	In response to a FOIA request they were unable to locate any records.
City of Camas	The city has given us access to examine and provided copies of the records they have.

Documents found that were determined significant to this investigation are listed on the first page of Appendix G. Documents that were not located, but were either referred to in other documents, or would be normally included in the permit process are shown in the table below:

<b>Documents not found but referenced in found documents</b>	<b>Referring Document</b>
Draft Environmental Impact Statement for the Lacamas Shores Project – The White Company 1987	Appendix G4
Final Environmental Impact Statement for the Lacamas Shores Project – The White Company 1987	Appendix G4
Substantial Development Permit (City of Camas Permit No. 2-87)	Appendix G2
Shoreline Conditional Use Permit (Camas Permit No. 590-14-7806)	Appendix G2
Dept of Ecology approval for 1992 SW revisions	Appendix G6



<b>Documents not found but would normally be part of the permit process</b>	<b>Comment</b>
Wetland delineation report	Several maps were found showing existing wetland areas in Meadowlands Park, and so it is likely a delineation study was conducted.
SEPA	Would normally be required. The SEPA is likely attached to the Shoreline Conditional Use Permit.
Mitigation plan	May not have been required. One preliminary drawing of the stormwater facility had areas shaded as "potential mitigation areas", however no other mention of mitigation was found.
Grading permit	Would normally be required.

## **Landscape Setting and Land Use**

### **Study Area**

Meadowlands Park, (Lot 84839000) is described as a 12.27 acre lot in Clark County GIS. Other documents examined reference much of the area as an old landslide. Photos from the 1980's show what appears to be a cleared area that is in various stages of regrowth.

### **JURISDICTION:**

- City of Camas, Washington
- Bordering shoreline management areas, (Lacamas Lake is a Waters of the State). A buffer designated as a conservancy zone, separates the lake from Meadowlands Park. A Shoreline urban conservancy zone extends
- No mapped floodplain areas are on the parcel
- No NWI wetland areas are mapped on the property.
- Clark County GIS shows no wetland areas on the property.
- City of Camas "Camas Wetlands Map" shows a small area of the property mapped as "wetlands presence".
- Priority Habitat and Species – The Riparian buffer from Lacamas Lake extends a short distance onto the property.
- Critical Area Recharge Areas (CARA). Does not apply. (CARA does not apply unless residential property is being used for other activities that may affect the drinking water supply. CARA also does not apply to legal activities established prior to August 1, 1997, which would include using the field as a pasture area or production of hay).

### **LANDSCAPE SETTINGS**

The property is a bench area above Lacamas Lake that slopes toward the lake. The SW property line is on a steep slope that rises up about 30ft to NW Lacamas Drive.

### **PREVIOUS AND CURRENT LAND USES, & SITE ALTERATIONS**

The Lacamas Shores development was made on a property referred to as the "Shipler" property in some documents. The Shipler parcel extended to the Lacamas Lake shoreline. Resulting from a lawsuit a condition of development, a roughly 100ft "Conservancy Zone" was established projecting landwards from the lake's edge, and that area deeded to the city.

From aerial photography it appears the area was logged at various times.

1955, 1968, 1974. Mostly forested, a small clearing toward the NE corner.

1978 – Much of the Southern end is cleared.

1984 – Most of the lot and surrounding area appears to have been logged several years prior to the photo.

1990 – Streets and some homes of Lacamas Shores are constructed.

## **Wetland Delineation and Assessment**

### **Methods**

**General Wetland Delineation Methodology:** This investigation was carried out in accordance with the guidelines set forth in the Corps of Engineers Wetland Delineation Manual (Technical Report Y-87-1, 1987) and it's recent 2010 update, version 2.0. A paired plot methodology was used.

**Site Specific Methodology:** Because there is no proposed change of use, and because most of the wetlands appear to be permitted as a storm water treatment facility, the delineation employed a conservative approach to mapping the wetland extents.

### **Previous Studies**

Several documents and maps found the City of Camas Archives showed areas mapped as "existing wetlands", portions of which were used for the storm water facility. Evidently a delineation study was done, however the report was not found. That the Department of Ecology approved the development and stormwater system suggests they also approved the wetland maps done at that time.

Maps entitled "Wetland Biofilter Monitoring Program for the Lacamas Shores Development" dated 2/1/1989, (see Appendix G7), show an area of about 58,036 SqFt of "existing wetland" on the parcel, compared to about 257,734 SqFt estimated by this study. It appears the stormwater facility has expanded the wetland areas by about 440%.

The 1989 maps do not show wetlands or streams on other parts of the Lacamas Shores development.

## **Mapping Method**

A Topcon GRS-1 GPS with remote antenna was used to collect positional information. A Topcon BR-1 beacon was used to collect DGPS corrections. The manufacture states this provides sub-centimeter resolution, though in my experience accuracy is only  $\pm 2$  ft. Several Property corners were found that bordered Meadowlands Park. These were used to for reference.

GPS data was converted to Washington State Plain South for mapping purposes.

## **Precipitation Data and Analysis**

This wetland determinations reported here were conducted in December 2016 and January 2017. November and December 2016 showed higher than normal precipitation, and January 2017 was also above normal. Surface hydrology was abundant through the wetland areas, and served as a guide for estimating wetland hydrology, (the point at which the water table is 12" below surface).

## **Description of All Wetlands and Other Non-Wetland Waters**

Two wetland areas were found on the property described below:

**Wetland "A", 255,541 SqFt, (5.87 Acres)**. The HGM classification is Sloped Wetland. This wetland extends off the lot and connects to Lacamas Lake. Three small streams originating from the storm water pipes and snake through the area. Maps entitled "Wetland Biofilter Monitoring Program for the Lacamas Shores Development" dated 2/1/1989, (see Appendix G7), show an area of about 58,036 SqFt of "existing wetland" on the parcel, compared to about 257,734 SqFt estimated by this study. It appears the stormwater facility has expanded the wetland areas by about 440%.

Photos from 1989 show most of Wetland "A" as an emergent wetland. Alder, Ash and Red Osier Dogwood have colonized much of the wetland area now turning it to a mixed scrub/shrub and forested wetland. The approximate Cowardin areas of Wetland "A" are now:

PEM1B, about 0.43 Acres. An area approximately in the middle, dominated by a Cattail and Juncus association. Most of the rest of the original stormwater area has converted to a forested or shrub area.

PFO1B & PSS1B, about 5.19 Acres. These are areas where Red Osier Dogwood, Blackberries, Alder and Ash now dominate. Dense growths of shrubs and trees intermingle, it is not realistic to describe these associations as separate areas for the purpose of assigning Cowardin associations. Graminoids and groundcover plants are mostly out competed in these areas.

PEM1C, about 0.18 Acres. This is the swale built in the 1992 modification, and again in the 1996 modifications. Juncus and an unidentified grass are the dominant vegetation.

There used to be a lot of cat tails in this swale, but there were dug out about 5 years ago by the City of Camas.

POW, about 0.07 Acres. This is a small settling pond also built in the 1992 Modification. It is drained by 2 storm drains connected to 24" corrugated plastic pipes that discharge into the conservancy zone.

The Western Washington Wetland Rating Form was not used to rate Wetland "A". The rating form serves to determine the buffer size, and stormwater facilities do not have buffers in the City of Camas.

**Wetland "B", PFO1B, 2,220 SqFt, 0.05 Acres.** HGM classification is Depressional. This is a small isolated wetland that extends a short distance offsite for a total area of 4,974 SqFt, (0.11 Acres). The construction of the boat ramp, access road, and Lacamas Lake Trail have cut off this area hydrologically by building a berm between it and the lake, creating a small depressional wetland. Portions of this area were mapped as wetland in 1987, though it was a sloped wetland prior to development. The dominant vegetation is Alder, Cedar and Blackberry.

<b>Table 4. Wetland B areas.</b>		
WETLAND B	SqFt	Acres
Total Area	4,947	0.11
Area within taxlot	2,220	0.05
Pre development Area	960	0.02
Net wetland created	3,987	0.09
165ft buffer area	140,396	3.22
Adjusted buffer area	46,612	1.07

Wetland "B" rates as a CAT-II wetland with a habitat score of 7 on the 2014 Rating Form for Western Washington.

## **JURISDICTIONAL CONSIDERATIONS**

At the time Meadowlands Park was created and the existing wetlands repurposed for storm water management, this practice was allowed. The USACE regulates the discharge from stormwater facility under the Clean Water Act if said discharge is into a waters of the United States. However the facilities themselves are not considered wetlands subject to regulation in the late 1980's when the facility was permitted. Wetland "A" is not a jurisdictional wetland because it is a permitted stormwater facility.

Wetland "A" is categorized as an exempted wetland per Camas Municipal Code Chapter 16:

16.53.010.C.2, Exempted Wetlands. This chapter shall not apply to the following wetlands:  
b. Artificial. Wetlands created from nonwetland sites including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, stormwater facilities, farm ponds, and landscape amenities; provided, that wetlands created as mitigation shall not be exempted;

Other applicable sections of Camas Municipal Code that apply to Wetland "A". Note that the Lacamas Shores development and the 100+ foot conservancy zone predate the Shoreline Management Program.

16.53.050 D.6. Stormwater Facilities in Shoreline Jurisdiction. Stormwater facilities shall follow the specific criteria in the [Shoreline Master] Program, Chapter 6 at Section 6.3.15, Utilities Uses.

14.02.090 - OWNERSHIP AND MAINTENANCE RESPONSIBILITY.

A. Ownership and Maintenance Responsibility. Stormwater systems and facilities which collect, convey, treat, and/or infiltrate stormwater runoff, including residential developments and nonresidential developments, such as commercial, industrial, and school sites, are ultimately the responsibility of the applicant to operate and maintain, at a minimum until the end of the two-year warranty period or until turned over to an HOA or collective homeowners.

The portions of Camas's Shorelines Management Program that applies to stormwater facilities in Shorelines Jurisdictions are found Section 6.3.15 (Utilities Uses):

**FROM THE CAMAS SMP 6.3.15 Utilities Uses**

6. Stormwater control facilities, limited to detention ,retention, treatment ponds, media filtration facilities, and lagoons or infiltration basins, within the shoreline jurisdiction shall only be permitted when the following provisions are met:

- a. The stormwater facility is designed to mimic and resemble natural wetlands and meets the standards of CMC 14.02 Stormwater and the discharge water meets state water quality standards;
- b. Low impact development approaches have been considered and implemented to the maximum extent feasible.

Wetland "B" is not part of the stormwater system, and portions of it were mapped as a wetland prior to the construction of the boat ramp and road. It is therefore considered to be a jurisdictional water.

## **BUFFERS PER CAMAS TITLE 16.51**

It should be noted that Camas Title 16.51 was adopted in 2008, long after the Lacamas Shores development was permitted and built.

Buffers are not shown for wetland "A" as it is a permitted stormwater treatment facility, and so does not have buffers. Also the vegetation management requested by the LSHOA concerns mostly the wetland area itself, and not so much the surrounding areas.

Buffers for Wetland "B" would be for a CAT-III wetland, with a habitat score of 7, with a moderate intensity use. The presence of the access road for the boat ramp put the area into a moderate intensity use (see Table 16.53.040-4 "Land Use Intensity Matrix"). The appropriate buffer from Table 16.53.040-2 is then 165ft.

Camas Chapter 16.53.040.B.4.b, provides that buffers do not extend past pre-existing roads or structures that separate the wetland from what would otherwise be buffer areas:

Wetland "B" is functionally isolated by the roads, slopes and the paved areas and structures of the picnic area, and those structures were preexisting to the adoption of Chapter 16.53. Buffers therefore extend only to the isolating features, and not past them. The unadjusted 165' buffer is 3.22 acres, the adjusted buffer area is 1.07 acres, (see Sheet 2).

16.53.040.B.4.b

Functionally Isolated Buffer Areas. Areas which are functionally separated from a wetland and do not protect the wetland from adverse impacts shall be treated as follows:

- i. Preexisting roads, structures, or vertical separation shall be excluded from buffers otherwise required by this chapter;

## APPENDIX A) Figures

Sheet 1 – Meadowlands Park Wetlands and Stormwater Systems.

Sheets 2, 3, 4 and 5. Maps required for correctly answering questions of the Washington State Wetlands Rating System:

<b>Map of:</b>	<b>To answer questions:</b>	<b>Sheet #</b>
Cowardin plant classes	D 1.3, H 1.1, H 1.4	2
Hydroperiods	D 1.4, H 1.2	2
Location of outlet ( <i>can be added to map of hydroperiods</i> )	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland ( <i>can be added to</i>	D 2.2, D 5.2	2
Map of the contributing basin	D 4.3, D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from	D 3.3	5

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## APPENDIX B) Data Forms

Data forms following this page:

P1 – Wetland "A" wetland pair

P2 – Wetland "A" upland pair

P3 – Wetland "B" wetland pair

P4 – Wetland "B" upland pair

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## APPENDIX C – GROUND LEVEL PHOTOGRAPHS



Photo 1. Storm Water Vault "B1" and wetland as it appeared in 1992. Looking NE from behind home at 2437 NW Lacamas Drive. Stan Geiger photo 2/21/1992



Photo 2. Same view as photo 1 taken 25 years later. ETC photo 2/20/2017.



Photo 3. Settling pond and drains built as part of the 1996 Stormwater modification.



Photo 4. Data plot P1. This is in the upper portion of the wetland areas created by the stormwater filtration facility. ETC photo 2017



Photo 5. Wetland "B", a small forested wetland, mostly seasonally saturated soils. Wetland "B" historically was part of a large wetland in the shoreline of Lacamas Lake, though became isolated through construction of the boat ramp and picnic facilities. ETC photo 2017



Photo 6. Picnic area. Part of the development that functionally isolates Wetland "B" from portions of it's 165ft buffer. ETC photo 2017

## **APPENDIX D) Wetland Rating Forms**

Western Washington Wetland Rating Form, (Version 2014 Update effective 1/1/2015).

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## **APPENDIX F) Proposed Revegetation Plan**

The proposed revegetation plan is consistent with the original design and specifications for the facility described in Appendix G9, and also with the Stormwater Partners publication copied here as Appendix G3.

ETC generally disfavors using tall grasses, particularly those that become highly flammable in the late summer unless kept mowed to a relatively short height. As such we generally recommend not using many of the seed mixes commonly sold for used for bioswales, as they often contain high percentages of grass seed. Grass seed is generally less expensive and therefore more often used. Instead we recommend seed mixes with a predominance of wildflowers, sedges and rushes, with some shorter grasses.

However should the agencies require regular mowing and removal of mowed material, then use a grass seed mix designed for bioswales. There are several on the market, select ones that use native species.

Consult with a native plant seed vendor for recommended application rates, availability and pricing.



**Table 5. ETC recommendations for native seed mix for water quality and storm water facilities that are not regularly mowed, where the goal is for low maintenance vegetation that will remain relatively short. This list derived from catalogues from Sunmark Seed International, Inc.**

<b>Sunmark Native Pacific Northwest Flower Mix</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Type</b>	<b>Color</b>
<i>Cheiranthus allionii</i>	Wallflower	B/P	Orange
<i>Clarkia amoena</i>	Dwarf Godetia	A	Pink/White
<i>Clarkia unguiculata</i>	Clarkia	A	Pink/Lavender
<i>Eschscholzia californica</i>	California Poppy	TP	Yellow/Orange
<i>Gilia capitata</i>	Globe Gilia	A	Blue
<i>Gilia tricolor</i>	Bird's Eyes	A	Lavender/White
<i>Layia platyglossa</i>	Tidy-Tips	A	Yellow/White
<i>Linanthus grandiflorus</i>	Mountain Phlox	A	White/Lavender
<i>Linum grandiflorum rubrum</i>	Scarlet Flax	A	Scarlet
<i>Linum perenne lewisii</i>	Blue Flax	P	Blue
<i>Lobularia maritime</i>	Sweet Alyssum	TP	White
<i>Lupinus densiflorus aureus</i>	Yellow Lupine	A	Yellow
<i>Lupinus polyphyllis</i>	Many Leaved Lupine	P	Mixed
<i>Nemophila maculate</i>	Five-Spot	A	White/Purple
<i>Nemophila menziesii</i>	Baby Blue-Eyes	A	Blue
<i>Papaver rhoeas</i>	Corn Poppy	A	White/Pink/Red
<i>Sisyrinchium bellum</i>	Blue-Eyed Grass	P	Purple
<b>ETC recommendations for additions to wildflower mix for use in stormwater facilities.</b>			
<i>Carex obnupta</i>	Slough Sedge		
<i>Festuca rubra rubra</i>	Native Red Fescue		
<i>Glyceria occidentalis</i>	Western Mannagrass		
<i>Glyceria elata</i>	Fowl Mannagrass		
<i>Agrostis exerata</i>	Spike Bentgrass		
<i>Spiraea douglasii</i>	Douglas Spirea		
<i>Alopecurus genicaultius</i>	Water Foxtail		
<i>Beckmannia syziganche</i>	American Sloughgrass		
<i>Alisma subcordatum</i>	American Water Plantain		
<i>Carex densa</i>	Dense sedge		
<i>Juncus effusus</i>	Common (Soft) rush		
<i>Schoenoplectus tabernaemontani (Scirpus validus)</i>	Softstem Bulrush		
<i>Scirpus microcarpus</i>	Small fruited Bulrush		

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## Appendix G) Supporting Documents

- G1: Email from Planning Director Robert Maul dated 3/13/2014. (1 page)
- G2: SBH 88-33 Agreed Order of Remand. Shorelines Hearings Board 9/1/1988. (6 pages)
- G3: Managing Stormwater – An introduction to maintaining stormwater facilities for private property owners and HOAs. Stormwater Partners of SW Washington, February 2011. (30 pages)
- G4: Proposed Monitoring Plan and Contingency Alternatives Associated with the Use of an Existing Wetland as a Biofilter in the Lacamas Shores Development North of Camas, WA. (22 pages)
- G5: Mark Bautista and Stan Geiger., "Wetlands for Stormwater Treatment". In: Water Environment Technology, July 1993., pp 50-55 (8 pages)
- G6: Richard Sposito of MacKay and Sposito, Inc., "Modification to Lacamas Shores Stormwater Disposal System". July 9, 1996. (20 pages)
- G7: Scientific Resources Inc., "Wetland Biofilter Monitoring Program for the Lacamas Shores Development"., February 1, 1989. (5 pages)
- G8: Viewshed Plan Conservancy Zone Lacamas Shores. JD Walsh & Associates, Inc. June 1993. (11 pages)
- G9: Five-Year Stormwater Runoff and Wetland Biofilter Monitoring Program for the Lacamas Shores Residential Development Camas, Washington Fifth Year Report. Mark Bautista, SRI/Shapiro, 3/11/1994. (85 pages)
- G10: USACE response to FOIA request for documents pertaining to Meadowlands Park. (2 pages)
- G11: Section 2.7 "Wetlands and Other Improvements" from the Lacamas Shores HOA Covenants, Conditions and Restrictions (1 page)
- G12: Map of Camas Stormwater Facilities. (1 page)
- G13: Lacamas Shores Homeowner's Association interim guidelines for the maintaining the Bioswale and storm water systems, trails, and Open Space to City of Camas Standards. City of Camas, 1999.

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## Appendix G1 – Maul 3/13/2014

Email from Planning Director Robert Maul:

From: Robert Maul [mailto:RMaul@cityofcamas.us]  
Sent: Thursday, March 13, 2014 3:25 PM  
To: stevendbang@comcast.net; jgvincent2@frontier.com  
Subject: Vegetation Removal

Good morning, Gentlemen.

It was good to meet you the other week. As we discussed on site it sounds like there is a desire to clean up the stormwater facility and possibly the abutting common area. We certainly appreciate you reaching out before conducting any work on site.

Just a few reminders of what we discussed. First, the good news is that you do not need permission from the City to do invasive species removal (i.e. blackberries) in the stormwater facility or the common area/potential wetland area, but we do recommend that you give us a heads up so we're in the loop in case we get phone calls from other neighbors. The main caveat in invasive species removal is that no chemicals are to be used. Anita Ashton will be your point of contact at the City regarding your storm facility maintenance. You may already have it, but just in case her email address is AAshton@cityofcamas.us, and phone number is 817-7231.

The issue regarding the larger area containing the trees will require some assessment by the HOA prior to any work, other than blackberry removal, being done. You will want to consult a certified wetland biologist to conduct a wetland delineation and assessment. It is clear that there are wetlands on site, but the boundaries; categorization and habitat functions of those wetlands have not been assessed for many years if even at all. While invasive species removal is also allowed in those areas without permits, the work needs to be done by hand. No chemical applications and no heavy equipment. Tree removal can be authorized, but only after the city has had a chance to review the wetland study provided to us.

If work to be done that will require permits we will need authorization from the association prior to issuing any permits. As you move forward with this project please continue to use us as a resource. Again, I do greatly appreciate you keeping us in the loop. Please feel free to contact us if you have any additional questions, or need anything else.

Regards,

Robert Maul  
Planning Manager  
City of Camas

## APPENDIX H) Literature Citations

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