

Appendix IV.

References

- a. Lake Tapps Boat Management Plan
- b. White River Management Agreement
- c. Overview of Cascade Water Alliance Agreements
- d. 1954 Deed
- e. 1958 Easement
- f. Shoreline Analysis Report for City of Bonney Lake's Shorelines:
Lake Tapps and Fennel Creek
- g. Washington Department of Fish and Wildlife Aquatic Invasive Species flyer

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EXHIBIT "B" TO ORDINANCE NO. 2005-34s

Lake Tapps Boat Management Plan



Ordinance No. 2005-34s, Exhibit "B"

Adopted

Effective Date



ACKNOWLEDGEMENTS

Pierce County Executive

John Ladenburg

Pierce County Council

Shawn Bunney, District 1, Chair

Calvin Goings, District 2

Roger Bush, District 3

Tim Farrell, District 4

Barbara Gelman, District 5

Richard Muri, District 6

Terry Lee, District 7

Lake Tapps Boat Management Plan Team

Katherine Brooks	Pierce County Planning & Land Services/Facilitator
Melody Carlson	Boating Recreation Interest/Realtor
Michael Dobb	Pierce County Parks & Recreation Services/Co-Facilitator
Gordon Gipson	Lakefront Property Owner – Deer Island/ Boating Advisory Commission
David Holmes	Lakefront Property Owner – Driftwood Point
Tom Jenkins	City of Bonney Lake Police Department
Gary Johnson	Lakefront Property Owner – Church Lake
Rick Kuss	East Pierce Fire & Rescue – Board Chair
Russ Larson	Boating Sales and Repair
Gerald Lawrence	Pierce County Sheriff's Department – Sergeant, MSU
Michele McGrady-Kvam	Puget Sound Energy – Staff Biologist
Colleen McIntyre	Lakefront Property Owner – Tapps Island
Jan Wolcott	Pierce County Parks & Recreation – Director
Darcy Zarelli	Lakefront Property Owner – Tacoma Point

Pierce County Parks and Recreation Services

Jan Wolcott, Director

Michael Dobb, Superintendent of Recreation

Pierce County Planning and Land Services Department

Chuck Kleeberg, Director

C.E. "Chip" Vincent, Principal Planner – Advance Planning Division

Katherine Brooks, Senior Planner – Advance Planning Division

Pierce County Sheriff's Department

Lieutenant Peter Cropp – Marine Services Unit

Sergeant Gerald Lawrence – Marine Services Unit

Craig Adams, Prosecuting Attorney

Pierce County Budget & Finance Department
Mary Schmidtke, Budget Manager

City of Bonney Lake Police Department
Lieutenant Tom Jenkins
Sergeant Tom Longtine
Officer Vince Sainati

East Pierce Fire & Rescue
Rick Kuss, Fire Commissioner
Barry Barquest, Battalion Chief

Washington State Parks and Recreation Commission Boating Programs
Dona Wolfe

Washington Alliance for Mandatory Boater Education (WAMBE)
Steve Greaves, Chairman

Mary Bridge Children's Hospital
Suzanne Mayr, Health Educator, Safe Kid's Coalition

The Lake Tapps Boat Management Plan (LTBMP) Team and Pierce County Staff would like to express our sincere appreciation to the City of Bonney Lake Police Department and East Pierce Fire & Rescue Department for graciously hosting the LTBMP meetings. Thank you.

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INTRODUCTION

Lake Tapps has, since its creation, served multiple uses such as the means for hydropower generation, municipal water supply reservoir and a facility for recreational uses such as boating, fishing and swimming. Over the past several decades, recreational use and activities on Lake Tapps have increased significantly. With this increase in use there has come a correlating decrease in the quality of the Lake environment, recreational experiences and an increase in safety issues related to boating conflicts.



Lake Tapps

The Lake Tapps reservoir was formed in connection with the White River Hydroelectric Project, which Puget Sound Energy (f/k/a Puget Power and Light Company) owned and operated from the time the project was built in 1911 to January 15, 2004. Hydroelectric generation at White River ceased after the Federal Energy Regulatory Commission required Puget Sound Energy (PSE) to comply with uneconomic terms and conditions as a condition of operations. The Lake Tapps reservoir also provides recreation opportunities for the community, and although the project is not currently producing electricity, local residents asked PSE to agree to maintain the reservoir at certain pool levels during peak recreation periods.

In March 2004, the Lake Tapps Community (later renamed to Lake Tapps Community Council) and PSE entered into an Agreement Regarding Reservoir Management of Lake Tapps. This agreement established a normal full pool level for Lake Tapps during the annual recreational period, the requirement for the community to prepare a draft boat management plan for PSE review, and other miscellaneous items related to management of the lake bottom and floating debris collection.

In response to all of these considerations, the Pierce County Council enacted Resolution 2004-91 on July 6, 2004 establishing an ad-hoc advisory committee referred to as the Lake Tapps Boat Management Plan (LTBMP) Team to develop a boat management plan for Lake Tapps. Pierce County staff and the representatives from the community who served on the team have discussed boating related topics and issues (such as safety and law enforcement, boating access and capacity, rafting, speed, and noise) and provided recommendations that are intended to address boat management on Lake Tapps. This plan does

not address lake management issues such as milfoil control and water quality, which would be addressed through other planning venues.

The plan is organized into introduction and background chapters that discuss the various issues. The final chapter contains the recommendations and necessary actions to address the issues discussed in the plan. The appendices at the end of the plan provide details on various issues such as the public workshop survey results, proposed mandatory boater education legislation, and proposed code changes.

HISTORY AND OVERVIEW

History of Lake Tapps

Prior to 1911, the Lake Tapps area was comprised of four smaller lakes and wetland areas surrounded by largely undeveloped forest and agricultural land. Lake Tapps was created in 1910-1911 by the construction of earthen embankments around this area and has since become the largest lake in Pierce County. Lake Tapps reservoir was originally formed in connection with PSE's hydroelectric operations at White River.

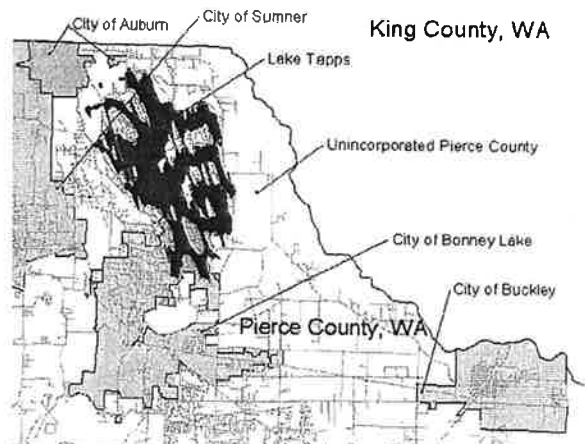


Lake Tapps prior to 1911

In the 1950s, PSE sold most of the land around the Lake Tapps reservoir to the Lake Tapps Development Company, but retained the right to modify the level of Lake Tapps reservoir as needed for hydroelectric operations. Because the Federal Energy Regulatory Commission issued an uneconomic license to PSE, hydroelectric energy production at the White River project ceased. Pursuant to an agreement between the Lake Tapps Community and PSE, the normal full pool level of Lake Tapps is being maintained at between 541.5 mean sea level (msl) and 543 msl during the annual recreation period (April 15 through October 31 each year), subject to PSE's ongoing right to manage the lake for its operations.

General Description of Lake Tapps

Lake Tapps is located in north central Pierce County, just south of the Pierce/King County line. The lake is immediately surrounded by unincorporated Pierce County and the City of Bonney Lake and is located in close proximity to the cities of Sumner, Auburn, and Buckley.



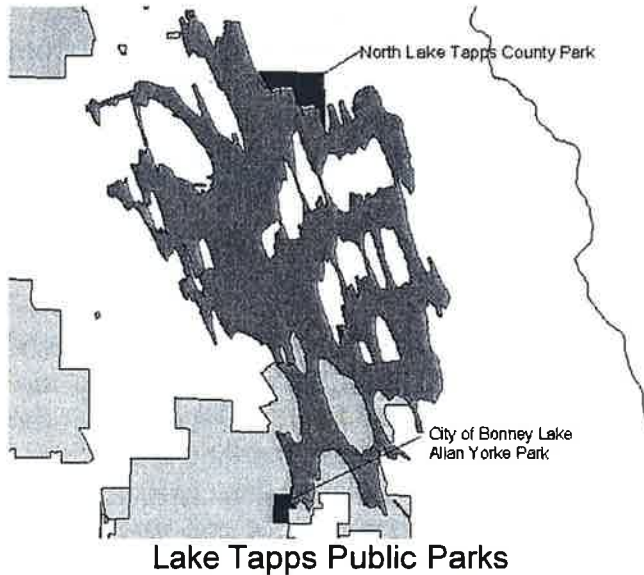
Lake Tapps Plan area

The outer-most lake shoreline edge has an irregular shape and there are numerous small islands; the largest islands are Tapps and Snag. The east side of the lake is an isolated area with a concentration of snags remaining from inundation of the original forest. On the north and northeast shorelines, several dikes are visible from the water. The southern shoreline contains another public park and the western portion of the lake is heavily developed. A 1992 report estimated that

approximately 78% of the lake's shoreline and islands were, at that time, developed with residential uses.

At its peak height, the lake contains about 2,700 surface acres. The typical reservoir high water mark is 543 msl.

Public and Private Recreational Facilities



Because of its large size and proximity to the greater Seattle and Tacoma metropolitan area, this lake is considered a regionally significant recreational resource. Primary recreational activities at Lake Tapps include boating, swimming, picnicking, fishing, and golfing. There are a number of recreational developments on the lake, including several which provide opportunities to the public. The following is a summary of the recreational facilities, both public and private, available on or near Lake Tapps.

North Lake Tapps County Park and Marina (Public)

North Lake Tapps Park is a gated, 80-acre facility with 7,000 lineal feet of shoreline along Lake Tapps managed by a year-round, on-site manager. The park is located on the northeastern edge of the main body of the lake. Facilities at this park include a boat launch, small docks, swimming area, picnic area, and separate parking lots for the boat launch and the day use parking lot. Hours of operation at the park are October 1st through March 31st from 7:30 a.m. to 4:00 p.m. and April 1st through September 30th from 7:30 a.m. to 8:00 p.m. There is a seasonal gatekeeper on duty from 9:30 a.m. to 7:00 p.m. weekdays and 7:30 a.m. to 7:00 p.m. on weekends.

Park attendance has increased steadily and significantly over the last several decades with current attendance estimated at 250,000 people per year. On a busy summer day the park can experience an average of 1,800 people and a maximum of 56 boats on the lake coming from the park. In 2000, the Pierce County Council removed the parking fee for Lake Tapps Park through Ordinance No. 2000-104. In 2003, the Parks and Recreation Department had to close the

gate over 20 times because the park had reached maximum capacity. Also, while a gatekeeper was on duty (128 days) approximately 4,050 individually paid launches and another 1,800 pass entries were recorded. The total number of average boat launches per day in 2003 is estimated at 45. During years when there was a parking and boat launch fee at the park, capacity was only reached 2 to 3 times per year. There are 291 total parking spaces within the park; 228 parking stalls for cars (5 disabled) and 56 for boat trailers (2 disabled).

Despite the large numbers of visitors, recent park improvements to eliminate double parking and parking on grass, create larger boat trailer spaces, and construct road roundabouts has resulted in the reduction of 32 parking units from what was available in previous years. These improvements deviated from the original planned improvements, which called for removing spoils from the lake and increasing the park land mass projected to further increase capacity. That plan was abandoned because of money and environmental mitigation requirements. At this time, no other capital improvements to the County park are scheduled nor are there any future improvements identified in the current 20-year Capital Facilities Plan.

In July 2004, the County Council adopted Resolution 2004-49, which established new parking and boat launch fees for North Lake Tapps Park. The parking fee is \$7.00 per vehicle or motorcycle and the launch fee is \$10.00. Discounts on daily fees are offered for seniors and disabled veterans. Annual parking/launch passes are available for \$75.00 in 2004. After 2004, Pierce County resident parking/launch passes will be \$75.00 and \$150.00 charged for non-resident parking/launch passes. There is a special event fee of \$500.00 per event. The new parking and boat launch fees are anticipated to generate about \$90,000-100,000 per year, with a large portion of this revenue going to the Sheriff's Department and the remaining amount to the Parks Department. The intent is for the fees collected to be utilized for operational costs at North Lake Tapps Park.

The Pierce County Sheriff's Department provides enforcement services to the North Lake Tapps Park. See the Law Enforcement and Safety section for more details.

Bonney Lake City Park (Public)

The Bonney Lake City Park, referred to as Allan Yorke Park, is a 32-acre facility with 600 lineal feet of lake shoreline located at the southern end of the Lake Tapps. The park provides swimming, a boat launch, picnic areas and shelters, walking paths, and areas for field and court games. This park has two main arterials running through it, thus people pretty much come and go with no specific count of attendance.

The boat launch at Allan Yorke Park is not gated. Boaters may launch 24 hours a day, seven days a week. During the summer, there is a City of Bonney Lake Parks Department employee assigned to collect launch fees. The Parks

Department employee is usually present until 5-6 pm. Capacity of launches is usually determined by parking capacity. When trailer parking is full the launch is closed, which has happened on numerous occasions. The park experiences a sharp increase in boat launches once the County park reaches capacity. In addition, there has been a marked increase in city park patrons since the County reinstated a parking fee for vehicles at North Lake Tapps County Park. There are usually about 40 launches on a busy weekend day and, depending on parking, weather, and the turn around in the trailer parking area, it could be up to 60 launches in a day. On weekdays, it's pretty unusual to have more than 10 launches.

There is no charge for parking at Allan Yorke Park. The boat launch fee was \$10 in 2004 and there has been discussion about raising this fee to \$12.00 in 2005.

Tapps Island Golf Course (Public)

Tapps Island Golf Course is a 9-hole public golf course facility located on Tapps Island. The golf course was opened for play in April, 1977.

Puget Sound Energy Company Park (Private)

The Puget Sound Energy Company Park (PSE Park) is a gated park, managed by a year-round, on-site manager, located adjacent to North Lake Tapps County Park and Marina in the northeastern part of Lake Tapps. The PSE Park is approximately 40 acres in size and has about 4,500 lineal feet of shoreline along Lake Tapps. In 1994, a separate access road to the PSE Park was constructed to prevent unauthorized users entering the PSE Park and non-payment of North Lake Tapps County Park and Marina fees. The PSE Park is only utilized for company employees, retirees, and company functions, and contains 18 cabins, two camping areas with 40 campsites, picnic shelters and tables, play areas, a swimming beach, a boat launch, and four docks.

The park is open in the summer season one week before Memorial Day through the middle of September (typically May 24 through September 12). The facility is completely closed October 1st to one week prior to Memorial Day. During the summer season, the park is open 5:00 a.m. to 11:00 p.m. to both active and retired PSE employees, as well as retired Puget Sound Power & Light (PSPL) and Washington Natural Gas (WNG) employees and their guests. Cabins are assigned through a lottery system and camp sites are available on a first come, first served basis. In 1999, approximately 27,345 people visited the park with an average day use (Monday - Sunday) of 115 people per day. By 2003, with the merger of PSE and WNG, these numbers had increased to about 45,500 visitors with an average day use (Monday - Sunday) of 125 people. There are 25 boat trailer parking spaces and an average of 10 boats per day launch from this facility.

PSE provides private parking, private boat trailer parking, signage, lighting, power supply, private storage and a private boat dock for the Pierce County

Sheriff's Department (PCSD)-Marine Services Unit and all PCSD equipment is in a locked, secure facility. The PCSD leaves their boat in the water for most of the season for emergency response in the evening hours. PCSD uses the facility almost daily; they also have marine training here on occasions. In addition, the Auburn Fire Department-Special Operations and Dive Team conduct yearly training and refreshers at the PSE park facility. Training includes maneuvering around stumps and snags, which remain on the lake bottom as a result of the creation of the reservoir.

Community Parks (Private)

There are nine gated, private homeowner association parks, totaling over 80 acres, located on or near the shoreline of Lake Tapps. Community organizations established by Lake Tapps Development (LTD) manage these parks. The level of development varies somewhat among these parks, but all provide some degree of swimming, boating, and other day use activities. Six of the parks have boat ramps that provide water access for members. The Church Lake Homeowner Association offers two parks, each having its own boat ramp.

Public Involvement

Public involvement is an essential component in the development of an effective boat management plan. Input from the public provides unique insights into the problems and assets, related to recreational activities on the lake and creates awareness of and involvement in the planning process. Identifying the needs and desires of citizens, businesses and recreational providers allows for more clearly defined plan issues and recommendations and strengthens the overall effectiveness of a boat management plan. The Lake Tapps Boat Management Plan (LTBMP) Team utilized several public involvement methods in the development of the plan.

Citizens Advisory Committee - Lake Tapps Boat Management Plan Team

The development of the LTBMP could not have been accomplished without the LTBMP Team. Appointed through Resolution 2004-91, this ad-hoc citizen's advisory committee consisted of 15 members representing a variety of interests and geographic locations both within and outside the plan area. This group was charged with the task of developing a boat management plan for Lake Tapps and funding strategy for ensuring safe boating activity and protecting the long-term recreational use of Lake Tapps. The LTBMP Team conducted a series of meetings, generally held at the City of Bonney Lake



December 2004 Public Workshop

Public Safety Building, starting in July 2004 and continuing through March 2005. Over 35 public meetings were held during this time period.

Public Workshop

On December 1, 2004 the LT BMP Team held a public workshop at Sumner High School's Performing Arts Center. This workshop was used to provide information to the general public on the issues surrounding boating activity on Lake Tapps and gave the public an opportunity to provide valuable input into the development of the boat management plan recommendations. Approximately 125 members of the community attended the workshop and offered feedback and some suggestions in addressing boating safety on Lake Tapps. See Appendix A for a summary of the survey results.

Individual Notification to Property Owners in the Lake Ridge Cove and the Channels between Lake Ridge Addition and Deer Island and Deer Island and Island 21

On February 8, 2005 a letter was mailed out to the waterfront property owners who live in the Lake Ridge Cove and the channels between Lake Ridge Addition and Deer Island and Deer Island and Island 21. The letter was a notification that the LT BMP team was reviewing the current waterski exemption to the 5 mile per hour speed limit requirement for possible elimination or modification and solicitation for their input on this issue. The LT BMP team received many emails, letters and telephone calls from interested residents with their comments and suggestions on this issue. Most of these comments reflected a desire to retain the current speed limit exemption as is and utilize some method (decals or flags) to identify the vessels that belong to the homeowners whom the exemption applies to or to institute certain hours when this exemption would apply. A few comments supported elimination of this exemption and cited safety and property damage as their primary concerns.

Pierce County Boating Advisory Commission

The Pierce County Boating Advisory Commission (BAC) reviewed the draft final plan at their public meeting held on February 17, 2005. The BAC discussed the plan and issues contained therein but offered no formal recommendations to the LT BMP team. The final plan and proposed regulation changes will be transmitted to the BAC for their consideration and opportunity for separate recommendations to the County Council.

Lake Tapps Community Council

The Lake Tapps Community Council (LTCC) is the outgrowth of the original Lake Tapps Community working group and is comprised of the following organizations:

- ó The Friends of Lake Tapps
- ó The Save Lake Tapps Coalition
- ó Church Lake Maintenance Association
- ó Driftwood Point Maintenance Company
- ó Inlet Island Maintenance Company

- ó Snag Island Maintenance Association
- ó Tacoma Point Improvement Club
- ó Tapps Island Association
- ó West Tapps Maintenance Company

On February 23, 2005, the LTCC reviewed the draft final plan and offered some suggestions for amendments. The LTCC commented that the rafting recommendation may not address the problem fully as it still allows partiers to congregate and float near each other. They also thought the recommendation to charge a walk-in fee at the Pierce County park should be eliminated. Finally, the group thought that a more permanent oversight committee should be formed to continue to monitor the boating situation on Lake Tapps (i.e., they felt uncomfortable dissolving the LTBMP team).

SAFETY AND LAW ENFORCEMENT

Boating Safety, Injuries and Accidents

Recreational Boating Safety in Washington State

Washington State experiences many boating accidents per year. Actual reported incidents from the time period of 1985 to 2002 are 1,056 boating accidents and 526 boating fatalities. The U.S. Coast Guard estimates that fewer than 10% of boating accidents are reported, thus the number of actual accidents for the same time period could be as high as 10,000.¹ Analysis of accident reports indicates that 87% of boaters who were involved in an accident had not completed a boater safety education class or had no formal exposure to boating safety education and 96% of victims of boating fatalities did not have any boating safety education.

During the time period of 1975 through 1984, Washington averaged 163 boating accidents and 34 boating related fatalities per year. In 1985, Washington State began administering a recreational boating safety program, which includes boating accident reporting, safety education, enforcement of boating laws, boat registration, and placement and maintenance of aids to navigation. From 1985 through 2001, the average number of boating accidents decreased to 150 and boating related fatalities per year decreased to 30. It is interesting to note that since administration of the State's recreational boating safety program began the number of accidents and fatalities has decreased despite the fact that the State's population dramatically increased during this same time period.

Even though improvements have occurred over the years, there is still a concern that some boaters do not understand or pay attention to basic right-of-way conventions or, worse, demonstrate a lack of courtesy toward other boaters. In response to this perception, the State Legislature passed SB 5898 in the 2003 legislative session, which directed the Washington State Parks and Recreation Commission (State Parks) to review recreational boating safety accidents and suggest ways in which accidents, fatalities, and near misses could be further reduced. The bill also directed State Parks to consider mandatory boater education and the need for Homeland Security precautions for boaters.

In December 2003, State Parks released a report titled "Recreational Boating Safety in Washington: A Report on Methods to Achieve Safer Boating Practices." This report provides a summary of the review process and statistics used in the analysis and offers a set of conclusions and recommendations (shown with an arrowed indent) to help increase boater safety including:

¹ Washington State Parks and Recreation Commission - Boating Programs. "Recreational Boating Safety in Washington: A Report on Methods to Achieve Safer Boating Practices." December 31, 2003.

- **Conclusions 1, 2 & 3:** The number of boating accidents in Washington State is too high and other states have shown a reduction in serious accidents through the use of mandatory boating safety education. Most accidents and fatalities (94%) involve motor-driven boats with motors of 10 hp or more.
 - ⇒ Continue the statewide boating safety education and information program targeting certain types of boating activities as analysis of accident report data suggests.
 - ⇒ Make completing and passing a course on boat safety a requirement for most recreational boaters in Washington. Recommend to the State Legislature key elements of mandatory boating safety education programs.
 - ⇒ Make boating safety education mandatory for all operators of motor driven vessels of 10 hp or more.
- **Conclusion 4:** Over forty percent (40%) of boating fatalities occur in non-powered boats.
 - ⇒ Give canoeing and kayaking organizations up to six years to find ways of reducing fatalities among this segment of the boating public. If at the end of six years no reduction in the fatality rate of manually powered boaters has occurred, recommend that this group of boaters also be required to take safety education classes.
- **Conclusion 5:** Law enforcement visibility on the water contributes to safer boating practices.
 - ⇒ Increase law enforcement presence on the water. Seek methods to provide additional financial support for this increased presence.
- **Conclusion 6:** Boaters can contribute to Homeland Security.
 - ⇒ Ensure up-to-date information on Homeland Security is available to boaters through boating safety publications, media releases, etc.

One of the outcomes of this report was the formation of a group called Washington Alliance for Mandatory Boating Education (WAMBE), whose mission is to promote and enhance safe and enjoyable water recreation by ensuring adoption of minimum boat operator education legislation in Washington. In the 2004 Washington State legislative session, WAMBE submitted proposed legislation to require mandatory boater education in Washington State. This proposed law was tabled in committee and never adopted. As of the date of the writing of this plan, it appears that WAMBE will be submitting a refined proposal to the Washington Legislature for consideration during the 2005 legislative session. A summary of this proposed legislation is provided in Appendix B.

Injuries and Accidents on Lake Tapps

Table 1 Water Related Reported Incidents provides a breakdown of law enforcement and fire and rescue responses on Lake Tapps for the years 2003 and 2004. When possible, this table indicates when accidents or injuries are related to rafting activities, carbon monoxide (CO) poisoning, alcohol, or speed of boats.

TABLE 1. WATER RELATED REPORTED INCIDENTS ON LAKE TAPPS FOR 2003 AND 2004							
Date	Day of Week	Time	Description of Incident	Speed Related	CO Related	Rafting Related	Alcohol Related
2003							
6/06/03	Friday	1600 (4:00 pm)	Drowning	N/A			
6/06/03	Friday	2351 (11:51 pm)	Boat vs. dock	22 mph			
6/26/03	Thursday	2026 (10:26 pm)	Intoxicated male	N/A	N/A	N/A	Yes
7/20/03	Sunday	1620 (4:20 pm)	Fell off personal watercraft	Unknown			
7/29/03	Tuesday	1936 (7:36 pm)	Boat vs. boat	Unknown			
8/03/03	Sunday	0331 (3:31 am)	Drowning	N/A	Yes	No	Yes
1/12/03		0911 (9:11 am)	Kayak accident	N/A			
2004							
4/25/04	Sunday	0346 (3:46 am)	boat hit a log boom	Yes			Yes
4/30/04	Friday	2000 (8:00 pm)	boat capsized				
5/14/04	Friday	1851 (6:51 pm)	wake boarding accident	Unknown			
6/18/04	Friday	1848 (6:48 pm)	boat accident	Unknown			
7/03/04	Saturday	1235 (12:35 pm)	PWC accident w/injury	Yes	No	No	Unknown
7/03/04	Saturday	1508 (3:08 pm)	Noise complaint issued	No	No	Yes	Yes
7/04/04	Sunday	1618 (4:18 pm)	wake boarding	Unknown			
7/04/04	Sunday	1742 (5:42 pm)	injured on boat	N/A			
7/04/04	Sunday	2327 (11:37 pm)	Hit & run	Yes	No	No	Unknown
7/13/04	Tuesday	1022 (10:22 am)	Drowning	N/A			
7/24/04	Saturday	1725 (5:25 pm)	PWC vs. swimmer/citation	Yes	No	No	Unknown
7/25/04	Sunday	2201 (10:01 pm)	boat vs. inner tube	Unknown			
7/31/04	Saturday	2100 (10:00 pm)	Reckless operation/arrest	Yes	No	No	Unknown
8/01/04	Sunday	1232 (12:32 pm)	wake boarding	Unknown			
8/08/04	Monday	1439 (2:39 pm)	PWC accident/injury	Yes	No	No	No
8/09/04	Tuesday	1626 (4:26 pm)	Accident/non-injury	Unknown	No	No	Unknown
8/14/04	Saturday	2240 (10:40 pm)	boat vs. causeway	Yes			Yes
8/18/04	Wednesday	2303 (11:03 pm)	boat vs. boat	Yes			Yes

The Water Related Incidents report for 2003 and 2004 indicates only three accidents occurred before 4:00 p.m. in the evening and 15 (about 83%) occurred after 4:00 p.m. Most accidents occurred between 4:00 and 6:00 p.m. It is also important to note only a very small percentage (US Coast Guard estimates 10%) of accidents are actually reported and only accidents that result in injuries or \$500.00 or more in damage need to be reported by law.

Boating Safety and the Consumption of Alcoholic Beverages

While the primary factors in boating accidents are lack of operator education or careless/reckless, operation some accidents are caused by alcohol impaired drivers and occupants. Use of alcohol can result in poor judgment, slowed reflexes, inattentiveness, and other altered responses which can lead to accidents and injuries.

Pierce County Code 8.88 Watercraft Regulations prohibits the operation of a vessel while under the influence of alcohol (Boating Under the Influence - BUI). While it is illegal to operate a boat while under the influence of alcohol it is not illegal to have open containers of alcohol within a boat that is underway. However, there is a State law (RCW 46.61.519) that prohibits any drinking or open container of alcoholic beverages in a vehicle on a highway but this currently does not address vessels on the water.

Safe Operation of Boats and Personal Watercraft

In some cases, operating a boat or personal watercraft on water is different than operating a vehicle on land. Not only does the type of equipment needed vary but the rules of safe operating procedures do as well. Boaters who do not understand these safety needs and procedures are at risk of incurring accidents or injury (or worse) for themselves as well as others who may be traveling with them or recreating in the same vicinity. To safely operate a boat the boater should have knowledge of the following:

- ó Rules of the water right-of-way (which direction is appropriate for traveling and passing);
- ó Navigation aids (road signs on the water);
- ó Characteristics of types of boats;
- ó Emergency procedures;
- ó Appropriate speeds for water/weather conditions; and
- ó Appropriate fueling procedures.

Carbon Monoxide (CO) Poisoning

Carbon monoxide (CO) is an odorless, colorless gas produced from the incomplete combustion of carbon-based fuels such as gasoline or wood. CO poisoning can occur in open-air environments in conjunction with boat exhaust. Recreational boaters are largely unaware of the dangers of open-air CO poisoning and the boat manufacturing industry has not provided adequate engineering or user notification to help solve this problem.

Although the introduction of the catalytic converter to automobiles reduced CO concentrations in automobile exhaust by >90%, emissions-control devices have not been introduced to the propulsion engines of recreational watercraft vessels. Ambient CO concentrations have been measured as high as 27,000 parts per million (ppm) in the stern of boats involved in CO poisoning fatalities. The World Health Organization has set a cap of exposure limit at 87 ppm during a 15 minute interval. There have been documented instances where individuals have reached a CO exposure level that can cause unconsciousness in less than one minute. From 1990 through 2002, compiled statistics² indicate 17 fatalities and 37 nonfatal poisonings on U.S. waters resulting from CO poisoning. While many of the poisoning victims were exposed on or near the swim platform, several fatalities also occurred among persons seated in the stern of the boat. Dramatic as these statistics are, they probably greatly under represent the actual number of drowning accidents resulting from CO poisoning as most drowning victims are not tested for CO levels. The National Institute of Occupational Safety and Health (NIOSH) maintains a website with information on boats and CO poisoning.

In August 2003, a Sumner High School graduate drowned in Lake Tapps just 20 feet from the dock in a private cove³. Her family learned that she had died of CO poisoning produced by the exhaust of a nearby idling boat. To increase public awareness of this dangerous problem, signs have been installed at the City of Bonney Lake Allan Yorke Park which warns swimmers and boaters of the dangers of CO poisoning. In addition, on Memorial Day 2005, East Pierce Fire & Rescue (EPF&R) in conjunction with Mary Bridge Children's Hospital will be providing public education regarding CO levels on boats at the Pierce County Park. They are hoping to make this area a pilot project and are working on putting up signs at all the parks warning of the potential for CO poisoning on or near boats.

Law Enforcement and Fire and Rescue Services

Pierce County Sheriff's Department

Area of Coverage

Pierce County has 361 lakes of one acre or more in size and approximately 101 square miles of salt water area. The Pierce County Sheriff's Department (PCSD) Marine Services Unit (MSU) provides law enforcement services to these water bodies and also has responsibility for the rivers in Pierce County such as the Puyallup, Carbon, Stuck and White.

² Case listing compiled by an interagency working group consisting of the U.S. Department of the Interior, National Park Service, CDC's National Institute for Occupational Safety and Health, and the U.S. Coast Guard.

³ The Enumclaw Courier-Herald, "Sign warns of carbon monoxide danger". September 15, 2004.

Staffing - General

The PCSD-MSU currently has 20 authorized deputies who fill these positions as an extra duty assignment, which is considered a part-time assignment. Each deputy has a primary duty assignment (Patrol, Traffic, Civil, Community Support Team, etc.) and performs MSU duties when time allows during normal work hours or on overtime. If an emergency call comes in, deputies will leave their primary duty assignment to respond if on duty. If not enough deputies are on duty to respond to the emergency then others will be called out from home. Routine patrols for the bodies of water in Pierce County are scheduled to be performed on overtime. Staffing levels in the PCSD do not allow for deputies to be pulled from their primary duty assignment to perform routine patrols of the waters on straight time. The limited MSU budget cannot support a full time unit and provide the same level of service across the County. When the School Resource Officers (SROs) come out of the schools for the summer they are assigned to patrol. During this period, an MSU deputy has been assigned to work MSU full time during the week for the past few summers.

In addition to the MSU, the PCSD maintains a Dive Team, composed of specially trained deputies, which respond to drowning accidents in lakes. The Dive Team makes every effort to provide recovery as quickly as possible. Recovery efforts in Lake Tapps can be very treacherous and complicated because of low visibility (only about 6-24 inches) and a lake bottom that is littered with logs, tree stumps, piles of brush, and junk.



PCSD Dive Team practice on Lake Tapps

Most agencies in Washington State have boating programs structured similar to the PCSD-MSU, providing coverage using extra duty assignments. Some jurisdictions assign an officer full time during the summer as the PCSD does when the SROs come out of the schools. There are three known full time programs; Seattle Police Department (22+ officers providing 24/7 coverage), Clark County Sheriff's Office (up to 2 deputies) and King County Sheriff's Department (up to 8 deputies). However, in the recent past Clark County and King County cut back and the current status is unknown at this time. Few agencies have either the number or acreage of water bodies that Pierce County has responsibility for. Most have one or two small lakes so they are able to more easily focus their attention on the activities on their waters. Even so, they face the same problems on their waters as the PCSD-MSU with an increasing number of users and inappropriate operation of vessels.

Staffing on Lake Tapps

On average Pierce County provides about 485 employee hours of PCSD-MSU coverage on Lake Tapps per year. With two deputies per boat this equates to approximately 242 patrol hours. Scheduled hours of patrol on Lake Tapps are

flexible and an attempt is made to keep them somewhat varied. However, most of the activity occurs during the middle of the day so those hours are targeted for patrol. Shifts typically will not start before 10:00 a.m. and usually end by 9:00 p.m. Some shifts are specifically scheduled to be out until at least 10:00 p.m. or later.

Funding

Two primary sources of revenue, County and State, fund PCSD-MSU operations. In addition, small amounts of revenue are generated from citations and receipted into the General Fund. The County budget monies come from the County's General Fund, as allocated by the Council. The State monies come from revenues generated by vessel owners paying their annual registration. There is a base registration fee of \$10.50 for each registered vessel. The first \$1.1 million in registration fees collected by the State goes to the State's general fund. Any additional monies are allocated to approved boating programs based on the percentage of registered vessels in that county.

WAC 352-65-040 establishes minimum standards for boating safety program approval and thus the ability to receive State funds for the program. Assigned boating safety program personnel must complete the 40 hour Washington State Parks Basic Marine Law Enforcement Academy within one year of being assigned and they must be commissioned to enforce all boating laws and regulations. State Parks will only allow commissioned reserves and full time officers in the basic marine law enforcement academy. Full time officers have priority over reserves. Pierce County's policy on boating safety volunteers is that they be trained and commissioned as a reserve, complete the state basic marine law enforcement academy, attend regular Marine Services Unit training and use only Sheriff's Department vessels. To become a Reserve with the Pierce County Sheriff's Department a candidate must go through similar pre-employment screening that a candidate for Deputy Sheriff would. This includes an oral board, medical examination, background check, criminal history check, credit check, polygraph exam, psychological evaluation, have a high school diploma or GED, be drug free and hold a valid Washington State drivers license. There is no Civil Service written exam. Once selected, the candidate must successfully complete a 220 hour Reserve academy, which takes about 6 months to complete by attending classes one weekday evening a week and all day on Saturdays. They then go through a Field Training Officer program. Reserves are required to work a minimum of two shifts a month and attend the monthly general meeting.

The State money is required to go into a dedicated account and can only be spent on boating safety program expenses such as equipment, supplies, repairs and maintenance, insurance, moorage, fuel, wages and benefits, and other expenses that directly support the boating safety program. The PCSD distributes some of the State monies collected for Pierce County to the cities of Bonney Lake and Gig Harbor. And starting in 2005, the County will also distribute monies to the Cities of Lakewood and Tacoma, once they initiate approved

boating programs. Table 2 provides an overview of the PCSD-MSU budget for the years 2002 through 2004:

Budget year	County Money	State Money	Total
2002	\$43,620	\$170,150 ¹	\$213,770
2003	\$35,630	\$185,000 ^{1, 2}	\$220,630
2004	\$35,640	\$182,000 ¹	\$217,640

¹ Does not include monies distributed to Bonney Lake and Gig Harbor.

² Does not include expenditure for major overhaul of Reliance drive system.

The monies that are collected from North Lake Tapps Park parking fees will be divided between the PCSD and the Pierce County Parks and Recreation Department. The tentative agreement at this time is that 25% of the monies collected at North Lake Tapps Park will be dedicated for maintenance and upkeep of the park. The Sheriff's Department will have access to up to 75%. As the Sheriff's Department incurs expenses related to enforcement within the park they may request reimbursement up to that 75% figure. At this time, these revenues are not used for patrols on the lake.

Facilities and Equipment

The PCSD owns the vessels listed in Table 3. Some are used for routine patrol while a couple of them have specific rescue applications. The 19' RAIV is primarily used on Lake Tapps and occasionally a second or third boat is brought to the lake for a shift. Additionally, the PCSD is usually granted two loaner personal watercraft from local dealers. A private facility for housing PCSD-MSU equipment for Lake Tapps is provided at the Puget Sound Energy Employee Park.

Year	Make	Model	Power
1989	Almar	17' Sounder	150 hp Mercury O/B
1991	Almar	16' Patrol/Rescue	90 hp Mariner Jet O/B
1992	Zodiac	20' RIB	175 hp Mercury O/B
1995	Yamaha	Wave Venture PWC	Jet
1995	Almar	32'	Twin 315 Cummins Diesel I/O
1995	Almar	18' RAIV	150 hp Mercury O/B
1997	Duroboat	15' Skiff	25 hp Yamaha O/B
1998	Almar	19' RAIV	200 hp Mercury O/B
2000	Zodiac	16' F470	55 hp RescuePro O/B

Citations

Citations issued by the PCSD-MSU on Lake Tapps are typically for registration violations, missing required equipment (e.g., Personal Flootation Devices, extinguishers, mufflers, etc.), and for operation violations such as speed too close to shore/docks/bridges, direction of travel, no waterskier observer, underage operator, allowing person underage to operate vessel, improper waterskiing in the channels, negligent operation, reckless operation and BUI. Pierce County staff conducted an analysis of PCSD vessel safety inspection stops on Lake Tapps during 2002 and 2003. The analysis indicates that the majority of stops were made for boat owners who do not live within one of the Lake Tapps homeowners associations (between 76% in 2002 and 78% in 2003). Approximately 16 to 17% of the stops made involved Lake Tapps waterfront homeowners. Table 4 provides a breakdown of the analysis results.

TABLE 4. NUMBER OF LAW ENFORCEMENT VESSEL SAFETY INSPECTION STOPS ON LAKE TAPPS BY RESIDENCE LOCATION FOR 2002 AND 2003		
Residence Location	Year 2002	Year 2003
Waterfront Homeowners	37 (17%)	45 (16%)
Lake Tapps homeowners associations (non-waterfront homes)	16 (7%)	17 (6%)
Outside Lake Tapps homeowners associations	165 (76%)	221 (78%)
Total	218	283

City of Bonney Lake Police Department

Area of Coverage

The City of Bonney Lake Police Department (BLPD) Marine Services Unit (MSU) patrol area is geographically defined as south and east of the north ends of Interlake Islands and Inlet Island.

Staffing

The BLPD-MSU does not have any assigned full-time officers but instead operates on an overtime only basis. Currently, there are six police officers and one sergeant who are actively involved in the BLPD-MSU. These officers conduct MSU functions on their off-duty time as staffing, weather, activity on Lake Tapps as personal time allows. The BLPD-MSU's emphasis is on patrolling on warm weekend days, when there is usually a considerable amount of activity on the lake. Normal patrol hours on weekends are 12:00 pm to 7:00 pm. Night operations are conducted upon occasion. The BLPD-MSU is available to assist PCSD when requested. It should be noted that a recently completed performance audit of the Bonney Lake Police Department has suggested elimination of the MSU and replacement with a volunteer system.

Funding

In 2003, the total budget for this unit was \$16,170.00, which dropped to \$15,300.00 in 2004. The majority of this funding comes from vessel registration

fees (collected and disbursed by Pierce County) and boat launch revenues. These funds pay for personnel salaries, uniforms, supplies, repairs and training expenses.

Facilities and Equipment

The BLPD-MSU operates a 21-foot Boston Whaler patrol vessel on the southern end of Lake Tapps. There is no permanent public facility for this patrol vessel, which is moored at a private dock.

East Pierce Fire and Rescue Department

Staffing

The East Pierce Fire and Rescue (EPF&R) maintains a Dive Team consisting of nine divers, both career and volunteer firefighters. All divers hold the minimum of Open Water, Dive Rescue 1 and EMT Certification. The unit trains regularly in Puget Sound, Lake Tapps, and surrounding lakes and ponds. Other department members are trained to serve in dive support, receiving annual water safety training. Many serve in specialties such as surface rescue specialists, boat operators, shore hands, and diver tenders. The addition of the Tri-District partnership with Pierce County Fire Districts 12 and 20 has placed other interested firefighters in training to become members of the Dive Team. The unit serves primarily as rescue divers and supports the PCSD Dive Team in recovery operations. EPF&R assist local fire and police departments through mutual aid agreements.

Funding

In the 2004 annual budget, over \$17,000 was dedicated to the water safety program for equipment purchase as well as dive physicals, training, repair, maintenance, etc. Funding team members is provided for out of annual budget salaries and overtime expenditures. General tax revenues and no additional funding (other than \$1,485 from Pierce County for providing fire protection and basic life support for the County Park) support the program.

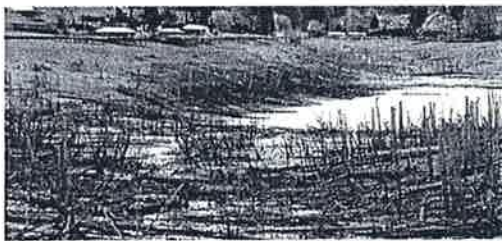
Facilities and Equipment

There is not a full-time, 24-hour-a-day crew dedicated specifically to water rescue incidents. Station 4-6, located on the northwest part of Lake Tapps, is an un-staffed station that houses the water rescue facility. This facility houses a 27-foot octopon vessel named the "Osprey" (Marine 4-6). Built in 1989, the station's purpose is to house the Osprey and water rescue equipment. Personnel from Station 4-6, a staffed station located less than a half mile away, respond to this station and launch Marine 4-6 to all water rescue incidents on Lake Tapps. Also, Station 4-1, another staffed station in the City of Bonney Lake, houses an inflatable "Avon" type pontoon boat with a small outboard for other responses as needed. In addition, other stations and personnel are dispatched as needed.

Public Education and Outreach

Preventing and preparing the public for water emergencies is an important part of the EPF&R Public Education Program (ongoing CPR classes reaching approximately 2,000 persons annually, as well as the annual “Stay on Top of the Water” program, which is taught to junior high school students in the White River and Sumner School Districts). These classes, taught by Dive Team members, reach over 500 students annually and are critical to water safety. EPF&R are also partners in a life jacket loaner program and life jackets are available at Station 4-1 in Bonney Lake and at the Pierce County Park marina.

Hazardous Conditions in Lake Tapps



Lake Tapps lake bottom snags

Because Lake Tapps was originally four separate lakes, the current lake bottom is riddled with tree stumps, piles of brush and snags in the lake bottom, and floating debris in the water. This condition can cause boating navigation issues and, as described above, complicate rescue and recovery operations on the lake.

Unfortunately, marking hazardous locations around the lake serves to increase liability and therefore is not currently being practiced. However, in the past, the PCSD has towed floating debris such as logs and brush over to the Pierce County Park, with disposal services provided by the Pierce County Public Works Department. In addition, the agreement between PSE and the Lake Tapps Community establishes a goal to create a community Lake Watch Program that identifies hazardous debris removal in Lake Tapps.

BOATING CAPACITY AND ACCESS

Boating Capacity and Overcrowding

Lake Tapps supports many enjoyable boating activities such as water skiing, sailing, and fishing. However, while this lake is an outstanding recreational resource, over the years overcrowding of motorized watercraft vessels on the lake has become an issue; especially on hot days in the summer months. This overcrowding problem has resulted in a decrease in the quality of life on and around the lake; based on anecdotal information gathered from lakefront homeowners and as identified in previous studies commissioned by Puget Power (Puget) and Puget Sound Energy (PSE).

Boating Use Studies

In October 1982, Puget conducted a study to determine the instantaneous peak boating use on Lake Tapps. This study indicated that on average about 400 boats (45% or higher motorized) could be expected on Lake Tapps at a given time on peak use days. Using the assumption that about eight percent (8%) of the lake's surface isn't suitable for boating, this corresponds to a space ratio of approximately six acres per boat. Furthermore, the majority of the boating activity (somewhere between 50 and 95%) originated from private homeowner association facilities or residential waterfront lots. At that time there were 941 permanent waterfront residences (63% of total 1,501 platted lots), 116 lots without residences, 982 total docks and boathouses, and 855 vessels (of all kinds) counted. Furthermore, it was determined that the majority of the boating activity fluctuates considerably. In the early morning hours and week days most boating activity originates from local lakefront and near lakefront homeowners (homeowner/improvement club or Lake Tapps subdivision members), while on weekends and evenings there is a significant increase in "off-lake" boaters. As a result of this data, Puget concluded that better planning should be utilized to avoid development of more facilities, such as boat ramps, which would further aggravate these conditions and additional measures should be implemented for regulation and management of boat access to the lake. This should be accomplished through development of a boat management plan for Lake Tapps that addressed these issues and also the issue of overuse in terms of safety and recreational quality/user satisfaction. The plan should give equal consideration to public and private recreational boating and evaluate the application of a zoning approach⁴ in managing overuse and user conflicts.

In 1992, Puget provided the Federal Energy Regulatory Commission (FERC) with an update on residential development but did not have any newer information on estimated boat use. The number of waterfront lots with

⁴ Titre, J., and K.C. Chilman. 1992. Coping with Problems of Overuse on Lakes. Recnotes. Vol. R-92-1. Natural Resource Research Program, Waterways Experiment Station, Corps of Engineers. February 1992.

residences had increased to 1,298 (approximately 78% of total 1,661 platted lots) and the number of vacant lots without residences was 363.

In May 1998, PSE conducted a boating resource survey and submitted this information to FERC. This survey indicated that the number of waterfront lots with residences had increased to a total of 1,572 (approximately 96% of total 1,622 platted lots) and the number of vacant lots without residences had dropped to 50. There were 48 boats counted on the lake and 1,292 boats on property for a total of 1,340 boats.

Over the 16-year time period between the 1982 and 1998 boat use surveys, the percentage of waterfront lots with residences along Lake Tapps increased 59% (941 to 1,572) and the total number of platted lots increased by 65% (1,057 to 1,622). The number of boats counted on the lake and adjacent to the lake from 1982 (855) to 1998 (1,340) increased by 63%. These statistics indicate a strong correlation between the number of residential houses and boats on the lake.

A more recent informal boat and shoreline survey was conducted on Lake Tapps on September 4 and 6, 2003. Two Lake Tapps residents circumnavigated the lake and all of its islands, coves, etc. and counted boats and related boating access facilities. Most boats and watercraft that were counted were in the water at dockside and some were located on the shore but were still visible from the water. The survey indicated that there were 1,620 docks; 180 boat ramps; two public parks; nine community parks; two airplanes; one golf course; 1,127 power boats; 791 personal watercraft (jet skis); 686 non-power boats; and 2,604 total watercraft. This survey indicates that the number of watercraft on the lake had increased by 1,264 (49%) from the 1998 inventory. The 2003 survey mainly counted resident watercraft, which may not adequately account for watercraft entering public and private boat launches. It should also be noted that the count was made after Labor Day, which historically has been the end of the summer "lake full" season and it was estimated that if the count had been made two or three weeks earlier there may have been up to 100 additional boats in the water.

In June 2002, a preliminary plat/shoreline substantial development permit was approved to allow 28 new single family lots (Fairweather Cove Estates) along Lake Tapps. A community dock (extending 40 feet long and 100 feet parallel to the shoreline) and six joint use docks for the 13 waterfront lots and the 15 non-waterfront lots was also approved in association with this new subdivision. Construction of these homes and docks will increase the total number of resident vessels.

Recreation Planning Standards for Boating

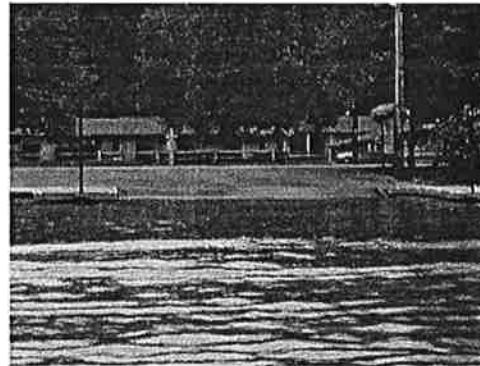
Recreation Planning Standards recommended for boating range from 1 to 20 acres per boat, with up to 40 acres per boat recommended for water skiing. Boating activity on Lake Tapps in 1982 was well in excess of the more limiting standards and very close to the more permissive standards. By 2003, the

number of watercraft on Lake Tapps may have exceeded the minimum recreation standard of one acre per boat.

Access to Lake Tapps

There are two public parks on Lake Tapps that have boat launch facilities. In addition, the Puget Sound Energy employee's park has one boat launch and there are six private homeowner association boat launches that allow non-lakefront resident members access to the lake (see Introduction Chapter for details). The 2003 informal shoreline survey, discussed above, identified 180 private individual boat ramps that access Lake Tapps.

Lake access at the two public parks is mostly controlled through the number of boat trailer parking spaces available. The Pierce County Park has 56 boat trailer parking spaces. When this park reaches parking capacity the main gates are closed and no additional vehicles are allowed entrance into the park to launch. The City of Bonney Lake Allan Yorke Park parking lot is gravel and there is no defined number of boat trailer parking stalls. When parking capacity at this park is reached City of Bonney Lake residents who have purchased annual boat launch passes are still allowed to launch their boats when they park their boat trailers at another location. Other individuals are denied access to launch once the parking lot is full. However, the Allan Yorke Park launch is not gated and an attendant is only on duty until 5-6 p.m., so unrestricted boat launching may occur after attendant hours.



Allan Yorke Park Boat Ramp

There is some concern that unauthorized individuals are accessing Lake Tapps through homeowner association launches and private individual launches. All of the homeowner launches are secured with either a gate or a chain with a lock. The associations are aware that keys to these locks have been distributed to people who do not live within the homeowner association subdivisions and efforts are being made to try to curtail this situation. There have also been incidents of unauthorized individuals accessing the lake through private resident ramps and along undeveloped causeways and dikes.

QUALITY OF LIFE

Rafting

Over the last several years a new phenomenon has occurred on Lake Tapps. Groups of boats are tied together in large rafting parties. These rafting parties usually occur in the cove areas of the lake, sometimes as close as 10 or 15 feet from homeowner's docks. In the summer of 2004, the rafting/party boats in some coves often exceeded 100 boats at one time.



Rafting activity on Lake Tapps

Unfortunately, the boaters and occupants in these rafting parties are often engaged in illegal (drug use), immoral (live sex acts, nudity, urinating into the lake, etc.) and environmentally destructive behavior (throwing objects out of boats into the lake). In addition, noise from radios and bullhorns (used to communicate between the boats) is often loud enough to negatively impact lakefront properties. Alcohol use and misuse is also a factor.

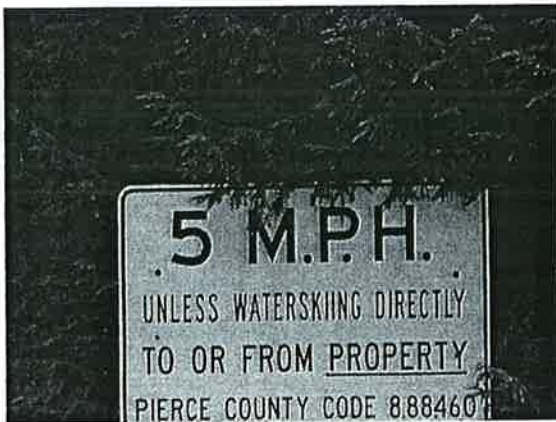
Rafting party activity has also increased on other lakes around the nation and become a serious problem. For example, Lake Havasu (a man-made lake just down stream from Lake Mead that crosses Arizona and into California) began to experience the party coves/boats rafting together about four or five years ago. At first they thought it was great, with an influx of boaters, more people buying more goods, more income, etc. Then these activities grew troublesome with increased noise levels, rowdiness, drunkenness, and blocking other tourists from certain parts of lake. Eventually, the situation got beyond fun and party; drunken fights broke out and the need for law enforcement and emergency response services increased to handle the conflicts and injuries. Finally, "drug traffickers" moved in and the rowdiness and fighting got so bad that three murders occurred. To help solve this situation, the local residents banded together with a judge and police to increase law enforcement and levy heavy fines and/or make arrests. Some boats were towed and they even confiscated a few boats, trailers and cars. It took two boating seasons to get the situation under control.

Because of safety issues regarding the fire department's rescue vessel being blocked in and its path impeded by congregating boats, Pierce County enacted an ordinance in 2002 prohibiting the congregation of boats within 1,000 feet of the fire district emergency boat launch located in the Lake Ridge-Deer Island Cove (which in effect was the entire cove). This eliminated rafting in the "old

party cove” but served to disperse the activity to other coves around the lake. It is currently not illegal for boats to raft together in any other portion of Lake Tapps and law enforcement agents do not have the right to randomly pull over boats and search them for alcohol and drugs.

Speed of Vessels and Wake Generation

Wake generation is when a vessel travels at a speed that is great enough to cause a wave to move out from the boat in either direction. Some wakes are large enough to cause damage to docks, vessels moored at docks and swimmers (especially children).



Waterskiing Exemption Sign at entrance to Lake Ridge Cove

To address the issue of wake, the Pierce County Watercraft Regulations (PCC 8.88.150) prohibits the operation of a vessel at a rate of speed that produces a damaging wake and establishes a five mile per hour (mph) speed limit within 200 feet of any shore, dock, bridge, or public swimming area, or within 100 feet of swimmers or of any vessel, or within 300 feet of any public boat launch [fresh water]. PCC 8.88.151 contains similar requirements for salt waters.

However, the Pierce County Watercraft Regulations (PCC 8.88.460.B) contain an exemption from the five mph speed limit on Lake Tapps for waterskiing activity in the Lake Ridge Cove and the channels between Lake Ridge Addition and Deer Island and Deer Island and Island 21. Over the years this exemption has been abused by people who don't adhere to the requirements outlined in the exemption and injuries, and damage to property has resulted.

In addition, a new water sport “wake boarding or wake surfing” has gained popularity. This has resulted in boats being fitted with wake generating devices (bladders and wings) that cause larger wakes discharging from the boat. While this may be good for the wake boarding activity, waves from these boats are causing damage to property and endangering swimmers.

Noise

There are two main issues involving excessive noise levels on Lake Tapps. The first is the level of noise that is coming from clusters of boats or rafting parties. The second is the level of noise caused by the operation of certain types of boats. Sometimes individuals engaged in rafting activities play overly loud music and use bullhorns to shout back and forth between the boats. The Pierce County Public Disturbance Code (PCC 8.72) contains regulations that address this type of noise but, it currently only specifies noise related to vehicles and does not apply to vessels. Some boats that do not have proper muffler systems can emit loud noise when operating. PCC 8.88 requires vessels to have proper muffler systems. Lakeside property owners have been driven inside their homes by the extreme noise from these loud boats and blaring music.

RECOMMENDATIONS

Rafting

Rafting activities have escalated over the last several years causing a negative impact on the environment and lakefront property owners. A majority (61%) of the December 1, 2004 public workshop survey respondents (hereinafter referred to as survey respondents) said rafting should either not be allowed on the lake or not allowed within coves and channels or within 500 feet of the shoreline (see Appendix A). Almost half of the respondents (46%) said rafting should be allowed in one designated area along Dike 4. It was also noted that 88% of the survey respondents live on lakefront property and only 2% live more than a ¼ mile away from the lake. While the “no rafting” alternative is easier to enforce it should be recognized that the lake is a regional resource and people who don’t live on the lake may need areas where they can drift, picnic, and enjoy the day. As a means of striking a compromise between these two interests, the following recommendations are proposed.

Recommendation

Prohibit rafting (defined as two or more vessels connected in some manner) in all coves and channels and/or within 500’ of any shoreline, except for one designated rafting area along Dike 4 (see Appendix C with proposed code amendments and map that depicts designated Dike 4 rafting area).

Recommendation

The penalty for a violation of the new rafting requirements should be a Class IV Civil Infraction.

Recommendation

Puget Sound Energy should install signage along the Dike 4 shoreline that addresses private property and trespassing on the shoreline.

Recommendation

Pierce County should consider establishing a minimum setback from the Dike 4 shoreline and a maximum number of rafters allowed within the designated Dike 4 rafting area.

Mandatory Boater Education

Many accidents that occur during recreational boating activity result from vessel operators who have not had any level of boater education. There is currently a movement to pass a statewide mandatory boater education requirement for Washington State (see Appendix B). It was noted that 78% of the survey

respondents favored mandatory boater education legislation. In order to foster this concept the following recommendation is proposed:

Recommendation

The Pierce County Council, City of Bonney Lake Council, Lake Tapps Community Council, and Puget Sound Energy should actively support legislation to enact a statewide mandatory boater education requirement.

Noise

Loud noise coming from boats (especially party rafting activities) cause a negative impact on lakefront and near lakefront property owners and other recreationalists. The survey results indicated that most respondents (86%) wanted local jurisdictions to enforce loud noise coming from vessels. In order to address these concerns the following recommendations are proposed:

Recommendation

Amend the Pierce County Motor Vehicles, Public Disturbance and Public Nuisance Noise Code (PCC, 8.72.090.H.1 and 8.72.120.C) to add the word "vessel" which would authorize the Pierce County Sheriff's Department to enforce obnoxious, noisy disturbances coming from boats or personal watercraft (see Appendix D with proposed code amendments).

Recommendation

Continue to enforce the laws that require boats and personal watercraft vessels to have proper muffler systems.

Recommendation

Monitor the rafting activities during the 2005 boating season to determine if clustering of vessels near the shoreline is negatively affecting safety and quality of life and revisit this item during the end of the 2005 boating season review.

Speed Limit – Waterskiing Exemption

There are safety and property damage issues related to the speed limit waterskiing exemption in the Lake Ridge Cove and the channels between, Lake Ridge Addition and Deer Island, and Deer Island and Island 21. Currently, 176 waterfront properties receive this exemption. 50% of the survey respondents thought that the exemption should be eliminated (again noting that 88% of the survey respondents live on lakefront property). However, many of the homeowners in these three areas are in favor of keeping this exemption as it is.

The LTBMP team had a lot of discussion on this issue. On one hand this special exemption is not allowed anywhere else on Lake Tapps or on any other lake in

Pierce County and as such this special exemption creates a contradiction and inconsistency in the law and an inequity among application of the law to all waterfront property owners. If the logic is that it is safer for boats to travel five miles per hour or less within 200 feet of a shoreline then this logic should also hold true within these narrow channels. Also, more than just the homeowners waterski in these areas and this creates problems with ability to enforce the current exemption. This also raises the question of whether it is an inappropriate use of the taxpayer's dollars for law enforcement in one special area (i.e., self-created need for additional patrols to enforce a situation that serves a select few). Patrol time to enforce this exemption takes time away from law enforcement services on other areas of the lake. However, the homeowners were granted this exemption many years ago and perceive that eliminating this exemption would take away from their private property rights and enjoyment of the lake. At this time there is little evidence, in the way of documented accident incidents or reported property damage, that this exemption creates a safety problem. Therefore, at this time no recommendation to modify or eliminate this exemption is being proposed; however, the following recommendation is proposed:

Recommendation

Monitor the Lake Ridge cove and Deer Island/Island 21 channels for accidents and safety incidents during the 2005 boating season and revisit this item during the end of the 2005 boating season review.

Speed Limit – Maximum Speed Limit

Vessels that travel at high rates of speed have the potential to cause accidents and some fatalities on the lake have resulted from high speed of travel. A large percent of survey respondents (62%) thought that there should be a maximum speed limit on Lake Tapps. Of these, 47% thought that the maximum speed limit should be 60 miles per hour.

Recommendation

Amend the Pierce County Watercraft Regulations (PCC, 8.88) to establish a maximum 60 mile per hour speed limit on Lake Tapps (see Appendix E with proposed code amendments).

Speed – Speed Limit Marker Buoys and Signs

Speed limit marker buoys help to visually identify speed restriction zones on Lake Tapps. There were a large number of survey respondents (75%) that thought more speed limit marker buoys should be placed on Lake Tapps. Of these, 68% said they would be willing to help pay for purchasing more speed limit marker buoys and signs through increased homeowner association/improvement club

dues. The decision on where to place speed marker buoys and signs should, however, be a cooperative effort between the Lake Tapps Community Council, Pierce County Sheriff's Department, and City of Bonney Lake Police Department.

Recommendation

The Pierce County Sheriff's Department – MSU, Bonney Lake Police Department – MSU, homeowner associations/improvement clubs, lakefront homeowners, and the Pierce County Boating Advisory Commission should work cooperatively to identify where speed limit marker buoys and signs should be placed on Lake Tapps.

Recommendation

Pierce County should form a partnership with City of Bonney Lake homeowner associations/improvement clubs and lakefront homeowners for the purchase, maintenance, and installation of speed limit marker buoys and signs on Lake Tapps.

Recommendation

Re-sign the Lake Ridge cove and Deer Island/Island 21 channels speed limit waterski exemption areas with new signage that clearly identifies the scope of the exemption.

Alcohol

The misuse of alcohol has been a factor in boating and personal watercraft accidents on Lake Tapps. While 74% of the survey respondents thought local jurisdictions should control the use of alcohol on Lake Tapps, there did not seem to be overwhelming support for changing the laws related to alcohol use on the lake. The current Watercraft Regulations contain laws regarding boating under the influence (BUI) and establish a .08% alcohol limit for the vessel operator.

Recommendation

Increase local law enforcement efforts to provide better enforcement of the BUI laws.

Recommendation

Provide more signage at public parks and private homeowner association/improvement club parks and boat launches regarding the laws related to alcohol use and boating.

Recommendation

Initiate boating safety emphasis patrols at certain times during the boating season to focus on BUIs (similar to the patrols that target driving while under the influence).

Floating Debris

The agreement between the Lake Tapps Community and Puget Sound Energy (PSE) contains a requirement for the community to develop a Lake Watch Program to address floating debris. Over half of the survey respondents (65%) agreed that a program should be developed to collect floating logs, brush, etc.

Recommendation

The Lake Tapps Community Council should formulate a plan to address floating debris cleanup in conformance with the Lake Watch Program requirements contained in the agreement between the Lake Tapps Community and PSE.

Capacity and Vessel Access

Lake Tapps provides a regional recreational boating resource and the use of the lake has grown over the last several decades. With this increased use have come some problems with overcrowding and rafting. An overwhelming majority of survey respondents (93%) thought that public boat launches should be secured from unauthorized entry during hours when the public parks are closed. The North Lake Tapps County Park boat launch is closed during hours when the park is closed, however the City of Bonney Lake Allan Yorke Park boat launch is not. Many of the survey respondents (84%) thought that the Allan Yorke Park boat launch should have designated hours of operation (with closing time no later than 8:00 p.m.) and that the boat launch should be secured so that vessels cannot launch during times when the launch is closed. 88% of the survey respondents also indicated the Allan Yorke Park boat launch should be closed when the park's parking lot is full and 85% thought the City of Bonney Lake should improve the Allan Yorke Park parking lot to clearly designate car and boat trailer parking stalls to prevent overflow parking of boat trailers. Finally, homeowner associations/improvement clubs and private lakefront property owners can help secure private boat launches from unauthorized entry. The following recommendations are proposed to address these issues:

Recommendation

The City of Bonney Lake should designate boat launch hours for the Allan Yorke Park (with a closing time of no later than 8:00 p.m.) and then install a security measure to ensure that vessels cannot launch during hours when the launch is closed.

Recommendation

The City of Bonney Lake should improve the Allan Yorke Park parking lot to clearly designate car and boat trailer parking stalls to prevent overflow parking of boat trailers.

Recommendation

The City of Bonney Lake should close the Allan Yorke Park boat launch when the parking lot is full.

Recommendation

Private homeowner associations/improvement clubs should control their boat launch access at their private boat launches and should continue to implement security measures to prevent unauthorized boat launches.

Recommendation

Residents of lakefront property with private boat launches should secure their boat launches from unauthorized entry by uninvited individuals. The Lake Tapps Community Council should provide educational information on the problem of unauthorized entry during times when homeowners are gone or on vacant lots and the recommendation to secure private boat launches.

Additional Law Enforcement Services on Lake Tapps

The need has grown over the years for additional law enforcement coverage on Lake Tapps. This is due to many factors including the increase in the number of users, the new rafting phenomenon, and the increase of the boating season (three months to six months). There are already many boating laws in place and there is also a need for adequate law enforcement services to enforce these existing laws. A large number of survey respondents (86%) thought Pierce County and the City of Bonney Lake should provide more law enforcement services on Lake Tapps. The preferred method for providing additional law enforcement services was to re-allocate funds from other programs and services (72%) to create a full-time, regular duty Marine Services Unit (63%). Other ideas were also discussed including changing current State law to direct additional funding for Marine Services Unit operations. These revenues are currently uncaptured or being retained in the State's General Fund. Survey respondents also suggested charging a user fee for people who walk into public parks; however, it should be noted there is a liability concern regarding charging a fee for "walk-ins" because of the Recreation Immunity Act.

Recommendation

Re-allocate funds within the County budget from other programs and services to create a full-time, regular duty Marine Services Unit to provide adequate law enforcement services on Lake Tapps during the boating season including:

- Establish a full-time Pierce County MSU which should include a minimum of two regular assigned deputies;
- Augment to the regular, full-time MSU with a minimum of 30 backup, part-time deputies who are trained to conduct MSU activities; and
- Provide an adequate amount of law enforcement patrol hours on Lake Tapps for each boating season (April through October). The County

should provide 500 patrol hours on Lake Tapps each boating season.
Note: This assumes two assigned staff on the boat during patrol hours, which would cost approximately \$64,555 straight-time pay and \$91,145 if based on overtime pay.

Recommendation

Maintain the MSU functions within the City of Bonney Lake Police Department as it currently exists.

Recommendation

Lobby the State Legislature to change Washington State law to help generate additional revenues for Marine Services Unit operation including:

- o Require State licensing for all watercraft vessels, not just motorized vessels over 10 horsepower; and
- o Direct a certain percentage of the watercraft sales tax revenues to jurisdictions that have approved law enforcement boating programs; similar to what is done with boat registration fees.

Recommendation

Increase the boat launch fee for North Lake Tapps County Park to \$12.00 per vehicle and maintain consistent launch fees with the City of Bonney Lake rates (Note: The City of Bonney Lake is proposing to raise their launch fee at Allan Yorke Park in 2005 to \$12.00).

Monitoring and Adaptive Management

If initiated, these recommendations should serve to increase safety and reduce user conflicts on Lake Tapps. However, determining if the implemented recommendations are adequately addressing the issues will require monitoring past the 2005 boating season. If any of the recommendations fall short of mitigating problems, adaptive management should be employed with follow-up recommendations.

Recommendation

Authorize the Lake Tapps Boat Management Plan (LTBMP) Team to conduct a review of the 2005 boating season in the fall of 2005 and, if necessary, make additional recommendations to the County Council.

Recommendation

When reauthorizing the LTBMP Team, do not reappoint LTBMP Team members who have not been somewhat regularly engaged in attending meetings.

Recommendation

A permanent oversight group should be formed to continue monitoring the boat management situation on Lake Tapps.

APPENDIX A – PUBLIC WORKSHOP SURVEY RESULTS

TABLE 5. LAKE TAPPS BOAT MANAGEMENT PLAN SURVEY TABULATION RESULTS		
MAIN ISSUES	Yes # (%)	No # (%)
Rafting		
Should rafting be allowed on Lake Tapps?	42 (39%)	48 (45%)
Should rafting be allowed on Lake Tapps but prohibited within 500 feet of any shoreline?	34 (32%)	51 (47%)
Should rafting be prohibited within all coves and channels on Lake Tapps?	60 (56%)	25 (23%)
Should rafting only be allowed in one designated area (along Dike 4 shoreline)?	50 (46%)	35 (33%)
Other potential area(s)? <input type="checkbox"/> Middle of Lake and large bodies of water <input type="checkbox"/> County Park <input type="checkbox"/> No more than 2 boats allowed anywhere 200' from shore		
Mandatory Boater Education		
Should the local jurisdictions support the effort to adopt state legislation requiring mandatory boater education (i.e. send letter of support)?	85 (78%)	19 (18%)
Noise		
Should the local jurisdictions change the laws to authorize law enforcement officers to enforce obnoxious, noisy disturbances and loud music on vessels?	92 (86%)	12 (11%)
Speed of Vessels		
Should Pierce County repeal the special exemption for waterskiing activity in the Lake Ridge Cove and the channels between Lake Ridge Addition and Deer Island and Deer Island and Island 21 (PCC 8.88.460.B) that allows speeds in excess of 5mph?	53 (50%)	45 (42%)
Should local jurisdictions establish a speed limit in areas of Lake Tapps where there is currently no speed limit (e.g. open water areas in middle of lake), with an exception for sanctioned racing events?	66 (62%)	29 (27%)
If yes should this speed limit be 60 mph?	50 (47%)	32 (30%)
If no, what speed limit would you suggest?		
30 mph	2 (2%)	
35 mph	1 (1%)	
40 mph	4 (4%)	
45 mph	4 (4%)	
50 mph	13 (12%)	

TABLE 5. LAKE TAPPS BOAT MANAGEMENT PLAN SURVEY TABULATION RESULTS		
MAIN ISSUES	Yes # (%)	No # (%)
65 mph	1 (1%)	
75 mph	2 (2%)	
100 mph	1 (1%)	
110 mph	1 (1%)	
150 mph	2 (2%)	
Should more speed limit marker buoys be placed on Lake Tapps?	80 (75%)	17 (16%)
Would you be willing to help pay for more speed limit marker buoys through increased homeowner association/improvement club dues?	73 (68%)	24 (22%)
Alcohol Use		
Should local jurisdictions control the use of alcohol on Lake Tapps?	79 (74%)	21 (20%)
Should a law be established to prohibit open containers of alcoholic beverages in a vessel that is underway (includes motoring and drifting), similar to the open container law for automobiles?	47 (44%)	47 (44%)
Should a law be established to reduce the allowable amount of alcohol in a boat operator to 0%?	31 (29%)	62 (58%)
Size of Vessels		
Should there be a limit on the size of vessels allowed on Lake Tapps?	48 (45%)	47 (44%)
If so, what maximum size would you suggest?		
18 feet	1 (1%)	
20 feet	2 (2%)	
21 feet	1 (1%)	
22 feet	2 (2%)	
23 feet	1 (2%)	
24 feet	4 (4%)	
25 feet	11 (10%)	
26 feet	3 (3%)	
27 feet	1 (1%)	
28 feet	1 (1%)	
30 feet	11 (10%)	
35 feet	1 (1%)	
40 feet	2 (2%)	
Floating Debris Cleanup		
Should a program be developed to collect floating logs, brush, etc. once a year?	70 (65%)	24 (22%)

TABLE 5. LAKE TAPPS BOAT MANAGEMENT PLAN SURVEY TABULATION RESULTS		
MAIN ISSUES	Yes # (%)	No # (%)
Capacity and Vessel Access		
Should public boat launch facilities be secured from unauthorized entry?	100 (93%)	4 (4%)
Should the City of Bonney Lake designate boat launch hours for the Allan Yorke Park and then install a security measure to ensure that vessels cannot launch during hours when the launch is closed?	90 (84%)	11 (10%)
Should the City of Bonney Lake improve the Allan Yorke Park parking lot to clearly designate car and boat trailer parking stalls to prevent overflow parking of boat trailers?	91 (85%)	10 (9%)
Should the City of Bonney Lake close the Allan Yorke Park boat launch when the parking lot is full (consistent with procedure for Pierce County Park)?	94 (88%)	5 (5%)
Should private homeowner association/improvement club boat launches be secured from unauthorized entry?	91 (85%)	11 (10%)
Should homeowner association/improvement club members give out access codes or keys for gates on secure boat launches to non-members?	20 (19%)	81 (76%)
Should boat launches on private lots be secured from unauthorized entry?	74 (69%)	22 (21%)
Additional Law Enforcement Services on Lake Tapps		
Should Pierce County and City of Bonney Lake provide more law enforcement on Lake Tapps?	92 (86%)	6 (6%)
If yes, do you agree with any of the following methods to provide more law enforcement on Lake Tapps?		
Homeowner Association members/improvement clubs/lakefront property owners/non-profits enter into a contract with Pierce County to help pay for additional law enforcement (i.e. self imposed cost-share program)?	52 (49%)	36 (34%)
Creation of a new taxing authority that allows for provision of police services?	50 (46%)	40 (37%)
Creation of a full-time, countywide Marine Services Unit?	68 (63%)	23 (21%)
Move the patrol staff from other duties and assignments?	59 (55%)	29 (27%)
Re-allocate funds from other programs and services?	77 (72%)	18 (17%)
Change in State law that allows County governments the authority to charge extra fees or taxes to help pay for more law enforcement?	56 (52%)	32 (30%)
GENERAL QUESTIONS		
What age group are you in?		
19-24	1 (1%)	

TABLE 5. LAKE TAPPS BOAT MANAGEMENT PLAN SURVEY TABULATION RESULTS		
MAIN ISSUES	Yes # (%)	No # (%)
25-34	4 (4%)	
35-44	29 (27%)	
45-54	31 (29%)	
55-64	24 (22%)	
65+ years	13 (12%)	
How many children do you have residing at home?		
0	45 (42%)	
1	19 (18%)	
2	25 (23%)	
3	11 (10%)	
4	0	
5	0	
6+	0	
In which local jurisdiction do you reside?		
City of Bonney Lake	10 (9%)	
City of Sumner		
City of Puyallup	2 (2%)	
City of Tacoma		
City of Auburn		
Unincorporated Pierce County	90 (84%)	
Unincorporated King County	1 (1%)	
Do you reside on Lake Tapps (lakefront)?	94 (88%)	
Do you reside within ¼ mile of Lake Tapps?	5 (5%)	
Do you reside greater than ¼ mile of Lake Tapps?	2 (2%)	
Do you reside in a Lake Tapps subdivision with a homeowners association or improvement club?	76 (71%)	14 (13%)
If you reside in a Lake Tapps subdivision with a homeowners association or improvement club, which one:		
Church Lake Maintenance Co.	2 (2%)	
Driftwood Point Maintenance Co.	24 (22%)	
Inlet Island	3 (3%)	
Snag Island Maintenance Co.	6 (6%)	
Tacoma Point Improvement Club	23 (21%)	
Tapps Island Association	12 (11%)	
West Tapps Maintenance Co.	11 (10%)	
Do you own or rent your residence?		
Own	97 (90%)	
Rent	2 (2%)	
How long have you lived here?		
0-1	3 (3%)	
2-5	12 (11%)	

TABLE 5. LAKE TAPPS BOAT MANAGEMENT PLAN SURVEY TABULATION RESULTS		
MAIN ISSUES	Yes # (%)	No # (%)
6-10	23 (21%)	
11-15	24 (22%)	
16-20	9 (8%)	
21+ years	29 (27%)	
Do you use Lake Tapps for recreational boating?	92 (86%)	2 (2%)
If yes, how many times per boating season?		
1-5	3 (3%)	
6-10	6 (6%)	
11-15	2 (2%)	
16-20	2 (2%)	
20+	66 (61%)	
Don't use	1 (1%)	
Do you own a boat or Personal Watercraft vessel?	69 (64%)	3 (3%)
If so, what type(s)?		
Boat (ski, runabout)	82 (77%)	
Personal Watercraft (jet ski)	47 (44%)	
Sailboat	3 (3%)	
Paddle Boat	1 (1%)	
Row Boat	1 (1%)	

Other Suggestions:

Rafting

- More police/enforcement (marine)
- Groups six or less; two boats
- Three boats or less rafting at anytime
- Two boats or more = no; no boats tied together = dangerous
- Totally disallow or designate area
- Limit to two rafts
- Illegal over a certain number of boats
- Five or fewer; no rafting allowed
- Inspections in areas of rafting to discourage
- Do not allow anchoring in lake anywhere without property owners approval
- No rafting
- Rafting by dike 4 area only or in an old floom area

Mandatory Boater Education

- Require training in treading water and survival swimming skills
- Three complaints and our boat is off the lake
- Keep it simple – online
- Only for new boat owners or under 21 years of age

Other Suggestions Cont.:

Noise

- 0 Enforce current noise laws
- 0 No hydroplanes
- 0 Homeowners buy and donate equipment
- 0 Send three warnings and then ticket for public complaint
- 0 Deputize volunteers
- 0 Control after dark only
- 0 Prohibit un-muffled boats from launching
- 0 Use 200' instead of 50' distance
- 0 Buy a decibel meter
- 0 Do away with three independent calls before officers take action
- 0 Three strikes and you're out
- 0 Over transom exhaust or dry exhaust may be the exception
- 0 No 2-stroke water craft of any kind

Speed of Vessels

- 0 No Hydroplanes
- 0 One-time special fees for marker buoys; not everlasting
- 0 Enforce existing laws
- 0 Allow homeowners to buy and install marker buoys
- 0 Would pay for marker buoys in front of own property
- 0 Education
- 0 Through use permit
- 0 Pay for more marker buoys through tax money
- 0 Fully utilize all monies from boater registration fees for MSU
- 0 Limit hours and speeds in Lake Ridge/Deer Island channels to be able to ski during dawn to 3:00 p.m. after that limit speed to 5 mph
- 0 More speed limit marker buoys be placed in channels

Alcohol Use

- 0 Follow .08 limit
- 0 Consider public intoxication ordinance
- 0 Enforce existing laws
- 0 Boating should be the same as cars; use DWI laws
- 0 0.02%
- 0 Control open containers
- 0 Better enforcement in park; monitor alcohol in park
- 0 Don't make new laws unless we can have more police enforcement
- 0 Get the boats out at dawn and after 7:00 p.m.

Other Suggestions Cont.:

Size of Vessels

- 0 No race boats
- 0 No heads
- 0 Exempt pontoon boats
- 0 Size not prohibited; wake is
- 0 If you can trailer it, should be okay

Floating Debris Cleanup

- 0 Through homeowner associations; organize at homeowner association level
- 0 Volunteer program
- 0 Provide site for debris cleanup year-around (e.g. public parks); establish a designated area where homeowners can deposit debris found in lake; drop-off site at public park
- 0 Program in place now
- 0 Include coves
- 0 Fine for throwing brush in lake
- 0 Donate to parks for bonfires
- 0 Hotline number to call in a problem
- 0 Deadheads a problem
- 0 Possibly PSE or Cascade could help fund volunteer work

Capacity and Vessel Access

- 0 Add a gate at boat launch
- 0 Limit the number of boats on Lake Tapps during peak hours
- 0 Charge higher launch fees, especially for non-lakefront users and non-Pierce residents
- 0 Public launches should be closed after 8:00 p.m.
- 0 Close public parks at 7:00 p.m.
- 0 Tax boat launches
- 0 Raise boat launch fees by \$10.00
- 0 Add on Lake Facilities
- 0 Homeowner association security at discretion of club
- 0 Educate homeowners on how to secure their private lots
- 0 Close Allan Yorke Park and secure boat launch at dusk; police be there to welcome the drunks when they come in late
- 0 Demand pricing for boat launch; Saturday and Sunday more expensive and less expensive on weekdays
- 0 Close public boat launches

Additional Law Enforcement Services on Lake Tapps

- 0 Move patrol staff during the busy season
- 0 Community service to collect and distribute as we feel necessary
- 0 Need to get away from OT enforcement; need marine unit for summer not paid time and a half

Other Suggestions Cont.:

Additional Law Enforcement Services on Lake Tapps Cont.

- Volunteer patrols; deputize volunteers to help in boat management; Local Service District and homeowners deputies to notify authority of violations; use volunteers to write letters to boat owners where violations have been observed; Homeowners could call or email boat violators registrations
- Higher launch fees to pay for deputies
- Dedicate part of park launch fees to pay for law enforcement
- Regional taxing authority; take authority away from city/county government
- Tax the people that use the lake full-time during the season
- Capture more fees from State
- Full-time law enforcement
- Use permits
- P.C. Sheriff's could send letters saying "It was reported to us that on (date) at (time) your boat was seen (incident). Please verify with the operator that this activity which is a violation of the current law and encourage compliance."
- Fees from citations issues applied to fund law enforcement – increase penalties for infractions
- Use the DARE officer during summer months
- More evening patrols
- More law enforcement on warmer days and less on cooler days

Comments

Rafting

- Rafting is a major concern
- Designating a rafting area is just moving the problem
- Lack of law enforcement
- Want ability to float in protected coves with family
- Designating area is best idea
- Rafting drains our law enforcement man hours
- Rafting "externalities" cannot be designated to a specific area without disproportionate burden on local homeowners
- A move to minimize impact on homeowners will draw strong support from all
- If cruising could be dealt with in the late '70s, why is rafting and bad behavior so difficult to deal with?

Mandatory Boater Education

- Mandatory boat safety
- Undecided
- We are the most regulated County in the world

Comments Cont.

Noise

- 0 Decibel meters are cheap
- 0 Noise from unmuffled jet boats
- 0 Middle of night (1-2 am) noise a problem
- 0 Noise is the #1 nuisance on the lake
- 0 A edible meter in one hand and a ticket book in the other

Speed of Vessels

- 0 5 mph law should be changed to no wake
- 0 Window decal to identify local boats for waterski exemption
- 0 Would approve not being able to ski from dock
- 0 Don't take away ski out privilege in Deer Island
- 0 Jet boats spraying water above waterline is a nuisance to others as well as a danger

Capacity and Vessel Access

- 0 Allan Yorke park boat launch is the biggest contributor to rafting
- 0 Charge walk-ins at County Park

Additional Law Enforcement Services on Lake Tapps

- 0 Where is my money from Park/Sales tax going and why can't this be used? Is it ending soon?
- 0 A new taxing authority/service area will keep money raised to go directly to boater safety.
- 0 Funding is key
- 0 Enforce existing laws
- 0 I pay more taxes than Lake Washington waterfront and receive less water security
- 0 Focus on enforcement not new laws
- 0 We want safety – we will pay for it
- 0 Sheriff would better serve us in their cars – not on the lake
- 0 Why are we paying time and a half for law enforcement officers? Why not hire more officers and pay straight time? It doesn't make sense.
- 0 Better prioritization of the Sheriff's office would go a long way in improving the cost effective use of manpower (coordinate staffing levels to projected temperatures)

Other

- 0 PWCs seem to be more trouble than boats. The PWCs are carrying passengers, towing floats, towing skiers, and people are falling off PWCs and having trouble re-boarding. They do not carry flags (for person in the water) so others do not realize a person has fallen off the PWC. PWCs are operated with no regard for regular boats and skiers. The boats (aside from rafters) are not the main problem.
- 0 Homeowners pay enough; no new taxes

Comments Cont.

Other Cont.

- 0 Raise launch and park fees to help pay for the use of the lake
- 0 It ain't broke; quit trying to fix it; the lake is fine
- 0 Control the direction of travel
- 0 Control the age limit on PWC; underage jet ski drivers with little enforcement (especially from park)
- 0 Need to include rules that are enforceable
- 0 Schedule of operation
- 0 Pierce County parks creates the majority of problem
- 0 Sheriff tied up at Tapps Island Clubhouse
- 0 Why not give to homeowners association. It would have been given to a larger group.
- 0 All points are well taken and seem to be on the right track
- 0 Excellent staff/excellent meeting
- 0 Come up with a system where land owners can mark their docks so that law/fire officers can find homes from the water side
- 0 This is a major regional resource. We should not restrict use to the point that we destroy the value. A lake of this size will always be a management work "in progress." We don't need to pursue creating new laws to cure potential issues.
- 0 If this is indeed a "regional" recreation area, costs associated with in should be paid by "regional" resources
- 0 Where does maintenance money go that we pay to West Tapps Maintenance?
- 0 Grandfather the existing docks
- 0 Thank you Shawn Bunney and staff for the time and effort

APPENDIX B – SUMMARY OF MANDATORY BOATER EDUCATION LEGISLATION

Need for Requirement

- ó Improve boating safety
- ó Reduce boating accidents
- ó Improve enjoyment of boating activities
- ó Improve insurance rates

Proposed Mandatory Boater Education (MBE) Law

- ó Sets a standard for boater education (boater education standards consistent with National Association of State Boating Law Administrators guidelines)
- ó Each non-exempt boater required to take and pass a boater education course (boater education course is typically a 8-12 hour course)
- ó Provide proof of course completion to state agency and pay \$10 to \$15.00 to obtain a certification card (accept proof of prior boater education course or passage of an equivalency exam)
- ó One-time only requirement, good for life, not a license
- ó Replacement cards issued (\$5.00)
- ó Must be 16 years of age to carry a Boater Education Card to operate a motor vessel under mechanical power of 10hp or more or under direct supervision of someone 16 years of age or older carrying a Boater Education Card
- ó Must carry card while operating vessel
- ó Penalty for violation of not having a Boater Education Card but Court may consider suspension of penalty for completion of course within 60 days

Exemptions from the MBE Law

- ó Operators chartering with dockside checklist
- ó Operators in commercial fishery
- ó Operators with U.S.C.G. licenses
- ó Law enforcement operators
- ó Non-resident less than 60 days
- ó Non-resident with equivalent State card
- ó Within 60 days of bill of sale
- ó Sanctioned racing events

Proposed Phased MBE Law Implementation

- ó Phase-in period based on age with ages 16 to 21 first
- ó All boaters covered by 2015
- ó Costs for implementation and on-going administration of new law will be paid for by card fees

Proposed MBE Educators

- ó Commercial providers
- ó Not-for-profit providers
- ó U.S. Coast Guard Auxiliary
- ó U.S. Power Squadron
- ó On-line courses, exams

Webpage Links

- ó Washington Alliance for Mandatory Boater Education www.wambe.org
- ó National Association of State Boating Law Administrators www.nasbla.org

APPENDIX C – DESIGNATED AND PROHIBITED RAFTING AREAS

8.88.040 Definitions.

As used in this Chapter, unless the context or subject matter clearly requires otherwise, the following words or phrases shall have the following meanings:

- I. "Raft or Rafting" means to tie, connect, fasten, hold, or secure two or more vessels together or to an object other than a dock that is secured to the shoreline, while on the water.
- I.J. "Restricted or designated areas" means an area that has been marked to be used for, or closed to, certain designated purposes.
- J.K. "Restricted visibility" means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms, or any other similar causes.
- K.L. "Scuba diver" means any free-swimming person who uses an artificial or mechanical means to replace air.
- L.M. "Skin diver" means any free-swimming person who does not use an artificial or mechanical means to replace air.
- M.N. "Sunrise" means the time when the sun appears above the sensible horizon as a result of the earth's rotation which may be shown by a sunrise chart for Tacoma or an area of Pierce County, Washington.
- N.O. "Sunset" means the time when the sun disappears below the sensible horizon as a result of the earth's rotation which may be shown by a sunrise chart for Tacoma or an area of Pierce County, Washington.
- O.P. "Towboat" means any vessel engaged in towing or pushing another vessel or anything other than a vessel.
- P.Q. "Waters of Pierce County" means all unincorporated water within the geographical boundaries of the County.

8.88.460 Class "A" Lakes.

B. Regulations for Specific Lakes.

1. Lake Tapps.

- f. It shall be unlawful to raft two or more vessels together in any cove or channel or within 500 feet of shore on Lake Tapps, except in a designated area along Dike 4 near the Pierce County Park. The designated area is generally rectangular in shape, starts 200 feet north of the southwest corner of Dike 4 and extends northerly along the shoreline 1,000 feet and from shore 250 feet west.

Lake Tapps
Dike 4 Designated Rafting Area



MAP LEGEND

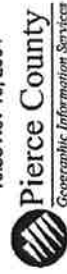
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Scale: 1:10644



Planning and Land Services

10:58 Nov 10, 2004



Pierce County
Geographic Information Services

APPENDIX D – PUBLIC DISTURBANCE CODE CHANGES

8.72.090 Public Disturbance Noises.

H. Public disturbance noise from portable or motor vehicle audio equipment: While in park areas, residential or commercial zones, or any area where residences, schools, human service facilities, or commercial establishments are in obvious proximity to the source of the sound, it is unlawful for any person to negligently cause, make, or allow to be made from audio equipment under such person's control or ownership the following:

1. Sound from a motor vehicle or vessel sound system, such as a tape player, radio, or compact disc player, which is operated at such a volume that it could be clearly heard by a person of normal hearing at a distance of 50 feet or more from the vehicle or vessel itself;

8.72.120 Enforcement.

C. The Sections of this Chapter relating to motor vehicles and vessels and noise emanating from vehicles and vessels, shall be subject to enforcement proceedings with or without a citizen's complaint.

APPENDIX E – MAXIMUM SPEED LIMIT CODE CHANGES

8.88.460 Class "A" Lakes.

All lakes which are 500 acres or more are Class "A" lakes. The Class "A" lakes are: Lake Tapps, Alder Lake, and Lake Kapowsin.

A. Special Restrictions for Class "A" Lakes.

1. It shall be unlawful to operate a motor-powered vessel in excess of five miles per hour between sunset and sunrise on any Class "A" lake.
2. It shall be unlawful to operate any vessel in excess of 60 miles per hour on any Class "A" lake.

WHITE RIVER MANAGEMENT AGREEMENT

Between

The Puyallup Tribe of Indians,
The Muckleshoot Indian Tribe and
Cascade Water Alliance

August 6, 2008

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WHITE RIVER MANAGEMENT AGREEMENT

This White River Management Agreement (hereinafter "Agreement") is entered into by and among the Puyallup Tribe of Indians (the "Puyallup Tribe"), the Muckleshoot Indian Tribe ("Muckleshoot Tribe"), and Cascade Water Alliance ("Cascade"). The Puyallup Tribe, the Muckleshoot Tribe, and Cascade are collectively referred to as the "Parties."

I. RECITALS

WHEREAS, Cascade joined with Puget Sound Energy ("PSE") in pursuing Water Right Application Nos. S2-29934 and S2-29920, Storage Application No. R2-29935, and Water Right Change Application No. CS2-160822CL, intending to acquire the Municipal Water Right from PSE to develop a Municipal Water Supply Project meeting the demands of Cascade's service area;

WHEREAS, in June 2003, the Washington State Department of Ecology ("Ecology") issued a Report of Examination ("ROE") approving Water Right Application Nos. S2-29934 and S2-29920, and Storage Application No. R2-29935;

WHEREAS, the ROE was appealed to the Washington State Pollution Control Hearings Board ("PCHB") by various parties, including the Puyallup Tribe and the Muckleshoot Tribe;

WHEREAS, in January 2004, Puget Sound Energy ("PSE") ceased operation of the White River Hydroelectric Project;

WHEREAS, in August of 2004 the PCHB remanded the ROE back to Ecology for further consideration;

WHEREAS, in January 2008 Cascade and PSE completed negotiations upon the terms and conditions under which Cascade would purchase the Municipal Water Right, the Lake Tapps Reservoir and Associated Facilities;

WHEREAS, Cascade now seeks to resolve concerns raised by the Puyallup Tribe and the Muckleshoot Tribe with regard to the Municipal Water Right and proposed diversions of water from the White River and Lake Tapps Reservoir and to provide for a dispute resolution process to address any future issues that may arise among the Parties related to the interpretation, implementation or enforcement of this Agreement;

WHEREAS, the Puyallup Tribe and the Muckleshoot Tribe wish to provide for timely and effective restoration, protection and enhancement of fishery resources, fishery habitat and water quality in the lower White River, and in the Puyallup River (below its confluence with the White River). The Puyallup Tribe and the Muckleshoot Tribe further wish to protect the flow in these waters from further appropriation by others; and

WHEREAS, the Parties desire to avoid further litigation and establish a process to cooperatively address future issues related to the interpretation, implementation or enforcement of this Agreement cooperatively in a manner consistent with their above-stated interests;

NOW, THEREFORE, in consideration of the mutual covenants and representations herein contained and for other good and valuable consideration as set forth below, and in separate contemporaneous agreements between the Puyallup Tribe and Cascade, and the Muckleshoot Tribe and Cascade with respect to the Municipal Water Right, the Parties agree as follows:

II. TERMS AND CONDITIONS

A. Defined Terms

1. "Agreed Flow Regime" refers collectively to the Minimum Flows, the Diversion Optimization Plan and the Ramping Rate established in Sections II.B. 1 – II.B.5 of this Agreement.
2. "Associated Facilities" consists of all structures and property, and any future replacements, which were components of the former White River Hydroelectric Project, or will be components of the WSP, including, but not limited to, the diversion canal, dikes, concrete outlet tunnel, forebay, penstocks, powerhouse, turbines, and Tailrace.
3. "Buckley Gage" shall mean U.S. Geological Service ("USGS") streamflow station No. 12099200 - White River above Boise Creek at Buckley, WA, or any other USGS streamflow station subsequently designated by agreement of the Parties.
4. "Coordinating Committee" shall mean the committee established under the provisions of Section II.L.
5. "Control Date" shall mean the date upon which the transaction between Cascade and PSE closes or the date upon which Cascade becomes the Operator as defined in Section II.A.16, whichever occurs first.
6. "Diversion Dam," whether characterized as "White River Diversion Structure" or "Barrier Dam" means the dam, intake and associated facilities as built, or as rebuilt in the future, at or near the City of Buckley (at approximately river mile 24.3) that functions to divert water from the White River into a flowline to the Lake Tapps Reservoir.
7. "Effective Date" means the date of execution hereof by the last Party to execute this Agreement.
8. "Fall Drawdown" shall mean the reduction of the level of the Lake Tapps Reservoir in the fall to expose portions of the lake bed for the purpose of preventing macrophyte growth or for the purpose of conducting maintenance at the Lake Tapps Reservoir and/or Associated Facilities.

9. "Force Majeure" means events that are beyond the reasonable control of a Party (including its contractors and subcontractors) and that did not occur through the fault or negligence of a Party (including its contractors and subcontractors), including, but not limited to: acts of God; mandatory government regulations and restrictions; and, sudden natural events, such as earthquakes and volcanic eruptions, that delay or prevent the timely performance of any obligation under this Agreement despite the Parties' best efforts to fulfill the obligation.
10. "Lake Tapps Reservoir" means the waters and the real property below 545' msl, more particularly described in the recorded Deed No. 1686523 executed on June 22, 1954 by Grantor, Puget Sound Power & Light Company for the benefit of Grantee, the Lake Tapps Development Co., Inc., and recorded at Pages 485-495 of Volume 1063, Office of County Auditor for Pierce County, Washington ("1954 Deed").
11. "Mean Sea Level" or "msl" when used herein refers to the elevation of the Lake Tapps Reservoir above the mean sea level established by the National Geodetic Vertical Datum of 1929.
12. "Minimum Flow" or "MF" means the minimum streamflow as measured at the Buckley Gage below which Cascade will not cause the White River to fall as the result of diversions from the White River into the Lake Tapps Reservoir.
13. "Municipal Water Right" means, for the purposes of this Agreement, any permit (or subsequent certificate) issued under water right application nos. S2-29934 (surface water permit to divert up to 2,000 cfs not to exceed 72,400 acre feet per year (af/y)) and S2-29920 (secondary permit to divert water from the Lake Tapps Reservoir for the WSP up to a maximum instantaneous rate of 150 cfs, with an average annual rate of 100 cfs, and a maximum annual quantity of 72,400 af/y), and storage application no. R2-29935 (reservoir permit to store in the Lake Tapps Reservoir up to 2,000 cfs of water, not to exceed 72,400 af/y) and any change of use permit issued under water right change application no. CS2-160822CL (change of use application to add additional uses for continuing recreation, reservoir maintenance, and water quality in the Lake Tapps Reservoir) all with regard to PSE's existing (but not operational) hydropower claim.
14. "Municipal Water Supply Project" or "WSP" means the proposed municipal water supply project that, when constructed, will use the Lake Tapps Reservoir as a source of municipal water for Cascade.
15. "Normal Full Pool" means a water level at the Lake Tapps Reservoir between 541.5 mean sea level ("msl") and 543 msl, as measured at USGS reservoir gaging station no. 12101000, or any other USGS reservoir gaging station subsequently designated by the Parties.
16. "Operator" means Cascade and/or a Qualified Operator as defined in Section II.A.17. Cascade shall remain responsible for implementing all of its

obligations under this Agreement, notwithstanding any contract into which it may enter for operation of some or all the WSP.

17. "Qualified Operator" shall mean PSE, the United States Army Corps of Engineer, or another entity that is reasonably qualified to operate the Diversion Dam.
18. "Ramping Rate" is the rate of change in River Stage, measured in inches per hour, at which the White River water elevation rises or lowers in response to changes in the quantity of water diverted into Lake Tapps or discharged from Lake Tapps through the Tailrace.
19. "River Stage" is the height of the water surface above an established datum plane.
20. "Spring Refill" shall mean the late winter or early spring refill of the Lake Tapps Reservoir to Target Elevations.
21. "Tailrace" means the canal through which water from Lake Tapps is discharged into the White River.
22. "Target Elevations" means the target surface water elevation of the Lake Tapps Reservoir established under Section II.B.5. and measured at USGS reservoir station no. 12101000, or any other USGS gaging station subsequently designated by agreement of the Parties.

B. Agreed Flow Regime

1. Cascade shall divert water and/or contract with a Qualified Operator to divert water from the White River into the Lake Tapps Reservoir in accordance with the Diversion Optimization Plan in Section II.B.3 and the Ramping Rates in Section II. B.4 to achieve or exceed the Minimum Flows in Section II.B.2 all as established by this Agreement.
2. Minimum Flows. Water may be diverted from the White River to the Lake Tapps Reservoir if and only if the diversion does not reduce the instream flow of the White River (measured at the Buckley Gage) below the Minimum Flows (MF) established by the Minimum Flow Table set out below (Table 1).
Notwithstanding the foregoing, to avoid stranding fish in the diversion canal between the headgate and fishscreens, Cascade may divert up to 20 cfs of water from the headgate and through the fishscreens during those periods of time that the flow is below the MF, set out in Table 1, due to natural flow conditions.

Minimum Flow Table (Table 1)

<u>Time Period</u>	<u>Minimum Flows ("MF")</u>	<u>Time Period</u>	<u>Minimum Flows ("MF")</u>
January 1-14	650 cfs	July 1-23	800 cfs
January 15-31	525 cfs	July 24-31	650 cfs
February 1-14	550 cfs	August 1-6	650 cfs
February 15-29	500 cfs	August 7-31	500 cfs
March 1-14	550 cfs	September 1-14	500 cfs
March 15-31	725 cfs	September 15-30	500 cfs
April 1-14	775 cfs	October 1-14	500 cfs
April 15-30	825 cfs	October 15-31	500 cfs
May 1-14	875 cfs	November 1-14	500 cfs
May 15-31	875 cfs	November 15-30	550 cfs
June 1-14	800 cfs	December 1-14	550 cfs
June 15-30	800 cfs	December 15-31	600 cfs

3. Diversion Optimization Plan.

Unless otherwise agreed by the Parties in writing, the following Diversion Optimization Plan shall be implemented on the Control Date as defined in Section II.A.5. of this Agreement:

- a. On an annual basis, beginning on February 15 and continuing until the Lake Tapps Reservoir is refilled to Normal Full Pool in accordance with the Spring Refill Plan, or until July 1, whichever is earlier (the "Refill Date"), water may be diverted into the Lake Tapps Reservoir in an amount not to exceed 1000 cfs if and only if the instream flow of the White River at the Buckley Gage exceeds the MF established by Table 1.
- b. On an annual basis, beginning on the Refill Date, (as defined in Section II.B.3.a), until September 15 or the subsequent date the Operator commences drawing down the water level of the Lake Tapps Reservoir, whichever is later ("Fall Drawdown Date"), water may be diverted into the Lake Tapps Reservoir in an amount not to exceed 400 cfs if and only if the instream flow of the White River at the Buckley Gage exceeds the MF established by Table 1.

- c. On an annual basis, beginning on the Fall Drawdown Date (as defined in Section II.B.3.b) until February 15, water may be diverted into the Lake Tapps Reservoir in an amount not to exceed 150 cfs if and only if the instream flow of the White River at the Buckley Gage exceeds the MF established by Table 1.
 - d. To maintain desired elevations in the Lake Tapps Reservoir while minimizing diversions from the White River, Cascade shall limit discharges from Lake Tapps Reservoir into the Tailrace to no more than 50 cfs, which is the estimated leakage through the powerhouse under current conditions, except during the Fall Drawdown. If technically feasible and if the associated cost is not unreasonable, Cascade shall at the point in time when it modifies the Lake Tapps Reservoir outlet structures in conjunction with development of the intake for the water treatment plant, endeavor to reduce the amount of leakage and further decrease discharges from the Lake Tapps Reservoir outside of the Fall Drawdown period.
 - e. All diversions from the White River and all discharges from the Tailrace, shall comply with Sections II.B.3.a. through II.B.3.d. above, and shall further comply with the Ramping Rate in Section II.B.4. and the Gaging provisions in Section II.D.
 - f. The diversions provided for under Sections II.B.3.a. through II.B.3.c. above shall at no time result in the reduction of streamflow in the White River below the MF as established in Section II.B.2.
4. Ramping Rate. The water intake facility to the Lake Tapps Reservoir and the discharge through the Tailrace from the Lake Tapps Reservoir shall at all times:
- a. Comply with applicable law;
 - b. Be operated so that the Ramping Rate does not exceed one inch per hour (increase or decrease) as measured respectively at the Buckley Gage and the Lake Tapps Diversion Gage at Dieringer, USGS Gaging Station No. 12101100; and
 - c. Be operated so that between February 16 and June 15 of each year, daylight downramping shall not be permitted. Daylight shall be defined for this purpose as commencing one hour before sunrise and ending one hour after sunset.
5. Target Lake Elevation.
- a. Subject to compliance with the Minimum Flows, the Diversion Optimization Plan, the Ramping Rate, and Section II.B.5.b., the Parties anticipate that:

- (1) Cascade will endeavor to maintain the Lake Tapps Reservoir elevation between April 15 and September 14 so that the Lake Tapps Reservoir target water surface elevation is Normal Full Pool;
 - (2) Between September 15 and November 30 Cascade may draw down the Lake Tapps Reservoir water surface elevation to 530' msl;
 - (3) Cascade will endeavor to maintain the Lake Tapps Reservoir elevation between December 1 and February 14 so that the Lake Tapps Reservoir target water surface elevation is 530' msl; and
 - (4) Between February 15 and July 1, Cascade may fill the Lake Tapps Reservoir to Normal Full Pool.
- b. The Coordinating Committee may act pursuant Section II.L. to authorize Cascade to alter the Target Lake Elevations and the draw down and refill schedules provided in Section II.B.5.a. provided that such alteration shall not adversely impact salmonids, reduce flows, or impair water quality in the White River.

C. Flow Monitoring

1. Cascade shall be responsible for the monitoring of the following flows:
 - a. The streamflow at the Buckley Gage;
 - b. The diversion from the White River into Lake Tapps;
 - c. The discharge into the Tailrace;
 - d. The diversion from Lake Tapps into the WSP; and,
 - e. The water surface elevation of the Lake Tapps Reservoir.
2. Cascade shall ensure that all streamflow monitoring is conducted on a real-time basis, and that all elevation monitoring of the Lake Tapps Reservoir is conducted on a daily basis, to insure compliance with the Minimum Flows, the Diversion Optimization Plan and the Ramping Rates established in this Agreement. For the purpose of this Agreement, "real-time" shall mean flow measurement no less than once every fifteen (15) minutes and data transmittal from the gage no less than once per hour.
3. Cascade shall provide the Muckleshoot Tribe and Puyallup Tribe with access to all monitoring information on a real-time basis, and in the case of the Lake Tapps Reservoir elevation levels on a daily basis.

4. All gages required under this Agreement shall utilize the most accurate gaging equipment and methodology as determined by the USGS. The gages shall be evaluated at least every five (5) years.

D. Gaging

1. Cascade shall consult with the Puyallup Tribe, the Muckleshoot Tribe and the USGS in Cascade's development of a plan to replace the current diversion canal gaging equipment ("Diversion Canal Gage"). Cascade shall replace the Diversion Canal Gage with an agreed state of the art piece of gaging equipment designed to provide real-time metering of the diversion canal flow.
2. Cascade shall fund USGS to operate and maintain the gaging equipment, telemetry and data production for:
 - a. the gages identified in Section II.C.1.;
 - b. the Buckley Gage;
 - c. the additional USGS gages listed on **Exhibit 1** attached hereto; and,
 - d. any additional gages agreed to by the Parties.
3. In the event that USGS determines that any of the gages listed in Section II.D.2. should be replaced or relocated to a more suitable site, Cascade shall promptly carry out and fund such replacement or relocation.
4. Any Party may convene the Coordinating Committee, established under Section II.L., to address issues associated with operation, maintenance, repair of the gages listed in Section II.D.2. to ensure compliance with the terms and conditions with this Agreement.
5. All gages required under this Agreement shall have the capacity to measure and report surface water flow and water quality parameters identified in **Exhibit 2**.

E. Project Maintenance

Cascade shall develop and implement a Project Maintenance Plan within ninety (90) days of the Control Date. The Puyallup Tribe and the Muckleshoot Tribe shall be afforded a reasonable opportunity to review and comment upon the Project Maintenance Plan. The right to comment or any comment made pursuant to that right shall not be construed as a limitation on either Tribe's right to enforce this Agreement through the dispute resolution provisions of this Agreement or judicially, if judicial relief is available.

At a minimum the Project Maintenance Plan shall include the following provisions:

1. Fish Screens.

- a. Cascade shall maintain the fish screens in the diversion canal so that they continue to meet or exceed their design specifications for fish passage and all applicable federal or state requirements; provided that, if Cascade replaces the existing screens during the term of this Agreement, any new screens shall meet all then applicable state and federal requirements and be at least as efficient as the existing screens in safely returning fish to the White River.
- b. Within sixty (60) days of the Control Date, the Coordinating Committee shall meet and develop a plan to assess the effectiveness of the fish screens and to conduct annual effectiveness testing and inspections of the fish screens. The effectiveness testing and inspections of the fish screens shall be conducted by Cascade. Cascade shall provide the Tribes with thirty (30) days notice of the effectiveness testing and inspections of the fish screens and permit the Tribe to participate in the testing and inspections.

2. Outlet Screening.

- a. If required by law, regulatory agency or otherwise agreed upon by the Parties, Cascade will take such measures, as may be necessary, to either screen the outlet of the Lake Tapps Reservoir or to prevent the introduction of exotic or predatory species from the Lake Tapps Reservoir into the White River.
- b. The Coordinating Committee shall in conjunction with the selection of a consultant to conduct the Tailrace Study, also select a consultant to study and prepare a report to the Parties on the risk of introduction of predatory or exotic species from the Lake Tapps Reservoir into the White River and the need for outlet screening or other measures to minimize said risk ("Outlet Screening Study").
- c. Cascade shall be solely responsible for funding the Outlet Screening Study and shall invite input from the Federal, State, and Tribal fishery management agencies. The Parties each reserve all of their legal rights and remedies with respect to the need for outlet screening or other measures to prevent introduction of exotic or predatory species from the Lake Tapps Reservoir into the White River, and are free to take positions and pursue legal remedies with respect to this matter outside of the dispute resolution provision of this Agreement.

3. Sediment Trapping. Cascade shall use best efforts to maintain the sediment trapping functions of the current diversion canal and settling basins to prevent sediment and nutrients from entering the Lake Tapps Reservoir to further protect and enhance the water quality of the Lake Tapps.

4. Rock Chutes. Cascade shall maintain the rock chutes in good working order.
5. Other Facilities. Cascade's Project Maintenance Plan may address other facilities required to maintain the Lake Tapps Reservoir and the Associated Facilities.

F. Fall Drawdown and Spring Refill Plans

1. Each year prior to the commencement of the Fall Drawdown, the Parties shall consult on measures consistent with the Agreed Flow Regime to accomplish the drawdown and refill of the Lake Tapps Reservoir in a manner that minimizes potential adverse impacts on salmonids in light of anticipated hydrological conditions ("Annual Drawdown Plan").
2. Each year prior to the Spring Refill, Cascade shall consult with the Tribes and relevant federal and state fishery resource agencies to develop a plan for the Spring Refill that, among other things, takes into account anticipated hydrological conditions that minimize impacts on fishery resources while seeking to achieve Normal Full Pool consistent with Section II.B.5.a.(1) ("Annual Refill Plan"). The Annual Refill Plan shall include provisions for establishing the date for beginning Spring Refill, the elevation within the Normal Full Pool range at which time Cascade shall reduce diversion in accordance with Section II.B.3.b., and the target date for achieving the appropriate Normal Full Pool.
3. Cascade may, in its discretion, consult with interested parties, including, but not limited to, Pierce County and the Lake Tapps community, with regard to the development and implementation of the Annual Drawdown and the Spring Refill.

G. Tailrace

1. Tailrace Study.
 - a. Within sixty (60) days of the Effective Date of this Agreement, the Coordinating Committee shall meet and engage in good faith discussions with regard to fish attraction at the Tailrace. It is anticipated that a focused study to identify water quality and fishery concerns, and to determine the nature and scope of the improvements needed at the Tailrace to address the identified concerns, will be necessary ("the Tailrace Study").
 - b. The Coordinating Committee shall select a consultant to conduct the Tailrace Study and agree upon the scope of the Study. Cascade shall be solely responsible for funding and carrying out the Tailrace Study and the Parties shall invite input and recommendations from Federal, State and Tribal fishery management agencies.
 - c. After considering such comments and conducting other necessary and relevant analysis as may be necessary, the Tailrace Study shall set forth its factual findings and specific recommendations. Such recommendations

shall address the development and implementation of any needed procedures (and schedules) for the implementation of improvements to the Tailrace (the "Tailrace Plan").

2. Tailrace Plan.

- a. The purpose of Tailrace Plan shall be to:
 - (1) improve water quality discharged from Lake Tapps, and
 - (2) prevent the entry, delay, stranding and/or delayed migration of salmonids in the Tailrace.
- b. Implementation of the Tailrace Plan shall commence within ninety (90) days of the completion date of the Tailrace Study. If required by law, regulatory agency or otherwise agreed upon by the Parties, Cascade will install a tailrace barrier to prevent stranding or delayed migration of salmonids. The Parties each reserve all their legal rights and remedies with respect to the need for a Tailrace Barrier to prevent the entry, stranding, or delays in migration of salmonids in the Tailrace and are free to take positions and pursue legal remedies with respect to this matter outside of dispute resolution provisions of this Agreement.
- c. The Tailrace Plan shall be attached to this Agreement as **Exhibit 3** and may be amended and modified by the written agreement of the Parties.

H. Water Resource Operation Manual

1. Cascade shall develop a water resource operational manual (the "Operational Manual") for presentation to the Coordinating Committee one year after Cascade assumes Operational Control. The purpose of the Operational Manual is to implement the provisions of this Agreement. At a minimum, the Operational Manual shall include provisions to address the Minimum Flows, Diversion Optimization Plan, Ramping Rate, Target Lake Elevation, Flow Monitoring, and Gaging.
2. Prior to its release to the public, a draft of the Operational Manual shall be provided to the Puyallup Tribe and the Muckleshoot Tribe for their review, comment and approval, which shall not be unreasonably withheld.
3. Cascade shall update the Operational Manual as needed, but in any event at least annually, to maintain compliance with the provisions of this Agreement. Updates to the Operational Manual shall be presented to the Coordinating Committee for approval. Approval of the Operational Manual by the Tribes shall not relieve Cascade of any obligation under this Agreement.

I. Force Majeure

1. Cascade shall not be liable for any failure, delay or default in performance under this Agreement to the extent proximately caused by a Force Majeure event where Cascade has used best efforts (1) to anticipate any potential Force Majeure event and (2) to address the effects of any potential Force Majeure event as it is occurring and following the potential Force Majeure event, such that the delay of the timely performance of any obligation under this Agreement is minimized to the greatest extent practicable.
2. Cascade shall give the Puyallup Tribe and the Muckleshoot Tribe prompt written notice, with full details, following the occurrence of a Force Majeure event relied upon as the cause of the delay of timely performance of any obligation under this Agreement.
3. Diverting water in excess of the Agreed Flows into Lake Tapps for the purpose of improving water quality or for recreational purposes shall not be deemed a Force Majeure event, or alleged Force Majeure event.
4. Neither the foregoing Sections II.I.1 through II.I.3 governing Force Majeure, nor any other provision of this Agreement relieves, or is intended to relieve, Cascade of the obligation to insure that diversions of water into Lake Tapps permitted under Section II.B. do not reduce the flow of the White River below the Minimum Flows established in Table 1, or exacerbate Minimum Flow shortfalls resulting from natural conditions or actions of the United States Army Corps of Engineers at Mud Mountain Dam, provided that, under the following two conditions Cascade is excused from compliance with the Minimum Flows of Table 1 for the amount of time necessary to respond to the following Force Majeure events:
 - a. A Force Majeure event which damages the headworks so that it is physically impossible for Cascade to reduce or cease diversions shall temporarily excuse Cascade of its Minimum Flow obligations, for the minimum time necessary to make emergency repairs; and
 - b. A Force Majeure event whereby Cascade is requested to divert more water into the Lake Tapps Reservoir in response to an environmental emergency declared by the Washington Department of Ecology, the United States Environmental Protection Agency, or another authorized emergency response agency for the purpose of reducing flows in the White River to facilitate emergency cleanup of a major hazardous substance spill or release into the White River downstream of the headworks of the diversion canal. Such event shall temporarily excuse Cascade of its Minimum Flow obligations for the minimum time necessary to allow for the emergency clean up activities.

J. Water Right Trust

1. Cascade shall transfer that portion of the perfected hydropower water right that it obtains from PSE in excess of the quantity of water that it is permitted to divert into Lake Tapps under the terms of this Agreement ("Trust Water") to the State Water Trust for the purpose of providing instream flows in the White River. The transfer will be in a form acceptable to the Puyallup Tribe and the Muckleshoot Tribe and will be in perpetuity. The transfer will be revocable only by the written agreement of the Parties. Cascade shall complete the transfer as soon as practicable after the Effective Date of this Agreement.
2. In the event that Cascade fails to or is unable to complete the transfer of the Trust Water to the State Water Trust as provided in Section II.J.1, Cascade shall transfer undivided interests in the Trust Water to the Puyallup Tribe and the Muckleshoot Tribe upon their request. If Cascade does transfer the Trust Water to the Puyallup Tribe and the Muckleshoot Tribe, the Puyallup Tribe and the Muckleshoot Tribe agree to dedicate the Trust Water to instream flows. Cascade, the Puyallup Tribe and the Muckleshoot Tribe shall work together and use best efforts to take all actions and implement all such measures as may be available to them jointly or individually to prevent the out of stream or consumptive use of the Trust Water by third parties.
3. The Trust Water dedication for instream flow purposes to the State Water Trust or the Tribes under Section II.J.1 and II.J.2. shall not affect the right to use twelve (12) cfs for fish hatchery operations under Certificate of Change to Water Right Claim No. 160822, dated April 15, 1994. Cascade shall continue to hold said water right and make such water available for hatchery operation by the Muckleshoot Tribe as provided in the Certificate of Change.

K. Water Quality

1. Maintenance and Improvement of Lake Tapps Reservoir Water Quality
 - a. The Parties shall use best efforts to work with the appropriate local agencies, including but not limited to Pierce County, to facilitate development of a management plan that would protect the water quality of the Lake Tapps Reservoir to the maximum extent practicable by addressing stormwater discharges and filtration from septic systems into the Lake Tapps Reservoir and/or any other factor determined to significantly impact water quality of the Lake Tapps Reservoir, and be consistent with state and federal law.
 - b. The Tribes will each determine the extent of their own participation in issues related to the foregoing efforts to maintain and improve the water quality of the Lake Tapps Reservoir.

2. Water Quality Monitoring

- a. Within sixty (60) days of the Effective Date of this Agreement, the Coordinating Committee shall meet for the purpose of developing a good faith schedule to work together to develop and implement a water quality monitoring plan ("WQ Monitoring Plan"). The WQ Monitoring Plan shall include, but is not limited to, the following:
 - (1) Protocols for measurement (methods, quality assurance, frequency of measurement, parameters measured, monitoring locations);
 - (2) Provisions to ensure that the water released from Tailrace shall meet applicable water quality standards;
 - (3) Staffing; and
 - (4) Data management and analysis.
- b. The WQ Monitoring Plan shall be attached to this Agreement as **Exhibit 4** and may be amended and modified by the agreement of the Coordinating Committee.

L. Coordinating Committee

1. Formation of Coordinating Committee

- a. The Parties agree to cooperate in good faith to implement the letter and spirit of this Agreement. The Coordinating Committee is intended to facilitate such cooperative efforts.
- b. The Coordinating Committee shall be composed of the Chief Executive Officer of Cascade, the Director of the Puyallup Tribe Natural Resources Department, and the Chairperson of Muckleshoot Tribal Fisheries Commission, or their respective delegates. The Parties may invite additional staff or policy representatives to attend and participate as non-voting members in any Coordinating Committee meeting.
- c. The Coordinating Committee shall meet whenever requested by a Party, but in any event shall meet at least once each calendar year to assess compliance with this Agreement, recommend needed changes to the Flow Monitoring and Gaging, develop the Annual Drawdown Plan and the Annual Refill Plan based upon anticipated hydrological conditions, discuss the Tailrace Study and the Outlet Screening Study, exchange data, and identify other issues that relate to the interpretation, implementation and enforcement this Agreement. By mutual agreement of the Parties, the Coordinating Committee may address other matters that relate to the WSP.

- d. The Coordinating Committee may conduct public outreach activities that may include presentation of study results, the Annual Drawdown Plan, the Annual Refill Plan, hydrological data, and fishery information.

2. Committee Procedures

- a. If a Party desires to convene a meeting of the Coordinating Committee, it may do so by advance written notice to the other Parties of at least five (5) days, which such notice shall also identify the matter or matters to be submitted to the Coordinating Committee for consideration, except that in the case of an emergency such advance written notice shall not be required. If a meeting of the Coordinating Committee is called in accordance with Section II.L.1.c. or this Section II.L.2.a., then the Committee shall promptly meet and confer in good faith, and endeavor to render a decision as to the matter or matters under consideration.
- b. Decisions of the Coordinating Committee shall be by consensus where the Parties shall each have one vote. If the Coordinating Committee has rendered a decision that, for any reason, is not to a Party's satisfaction, then any Party may submit the matter (or the Committee's decision, as the case may be) to dispute resolution in accordance with Section II.M.

M. Dispute Resolution

1. Except as otherwise provided in this Agreement, any dispute or claim arising either between two of the Parties or among all three of the Parties regarding the interpretation, implementation, or enforcement of this Agreement or its performance or nonperformance, including a Party's alleged failure to comply with any provision of this Agreement ("Dispute"), shall be settled by the procedures set out in this Section II.M. of this Agreement and not by court action except as provided in this Section.
2. Statement of Positions. In the event of a Dispute, the complaining Party or Parties ("Disputing Party or Parties") shall first promptly provide the non-complaining Party or Parties with a general written statement of its claim(s) and position(s). This statement need not be complete and will not limit the claims of the Disputing Party or Parties in any further procedure. If the Parties involved in the Dispute cannot informally resolve the Dispute within 14 days of the non-complaining Party or Parties receipt of the written statement(s), the Disputing Party or Parties may proceed as set forth in Sections II.M.3 and II.M.4 below.
3. Mediation Procedure. If the Disputing Party or Parties cannot resolve the Dispute with the non-complaining Party or Parties pursuant to Section II.M.2, then either the Disputing Party or Parties, or the non-complaining Party or Parties may commence mediation by notice of selection of a third party, neutral mediator and proposed time(s) and date(s) for the mediation. If the other Party or Parties do not propose an alternative mediator within fifteen (15) days of such notice,

then the mediation shall occur before the first person proposed. If the Parties to the Dispute do not agree on a mediator, then the selection of the mediator shall be determined by Judicial Arbitration and Mediation Services ("JAMS") or a comparable organization who shall select a qualified mediator with experience in the subject matter of the Dispute. The mediation shall take place in King or Pierce County, Washington, and the mediator's fees shall be equally shared either between the two Parties or among the three Parties to the Dispute. If the mediation resolves the Dispute, the resolution shall be memorialized in writing. If the Parties to the Dispute cannot resolve the Dispute through mediation, any Party participating in the mediation may terminate mediation. Upon termination of mediation, any Party to the Dispute may submit the Dispute to binding arbitration under Section II.M.4. Notwithstanding the foregoing the Parties to the Dispute may by written agreement waive mediation of any Dispute and proceed to binding arbitration.

4. Binding Arbitration. If the Parties to a Dispute do not resolve the Dispute pursuant to Sections II.M.2 and II.M.3 above, the Dispute shall be resolved by binding arbitration in King or Pierce County, Washington, as follows:
 - a. AAA Rules Apply. The arbitration shall be under the then existing Commercial Arbitration Rules of the AAA or a like successor organization.
 - b. Arbitrators. The Parties to the Dispute shall attempt to agree on an arbitrator with relevant natural resource or related dispute resolution expertise. If they cannot so agree, then the selection of the arbitrator shall be determined by Judicial Arbitration and Mediation Services ("JAMS") or a comparable organization who shall select a qualified arbitrator with experience in the subject matter of the Dispute. After the appointment of the arbitrator, and before any hearings or conferences with the arbitrator, the arbitrator shall take an oath of impartiality, and the Parties to the Dispute may communicate directly with the arbitrator only by using the same procedures as would be proper for the Parties or their representatives to communicate with a superior court judge relating to litigation pending in a superior court of the State of Washington for King or Pierce County. The arbitrator's fees shall be jointly shared either between the two Parties or among the three Parties involved in the Dispute. Any attempt by a Party or Parties to assert a position solely for the purpose of causing delay, increasing costs or vexing another Party or other Parties shall be subject to Rule 11 sanctions and responsible for paying all costs and fees incurred by the Parties as a result, direct or indirect, of that Party's efforts undertaken in violation of Rule 11.
 - c. Discovery. The Parties to a Dispute shall be permitted to obtain discovery from each other of documents and other tangible evidence at a time reasonably prior to the arbitration hearing. No more than two depositions shall be permitted to be taken by each Party to the Dispute.

- d. Governing Rules and Awards. To the extent applicable, the Washington Arbitration Act, Chapter 7.04A RCW, as amended at the time of the arbitration, shall govern any judicial proceedings, resolve any issue of arbitration, and procedurally govern arbitration under or related to this Agreement. The arbitrator shall resolve any Dispute in accordance with this Agreement, including the applicable law designated by the Parties in Section II.M.7. Unless otherwise agreed to by the Parties, the arbitrator shall not decide the Dispute on summary disposition. The Parties agree that the arbitrator shall have authority, without resort to any court, to award any remedy, order or relief, including without limitation awards, orders granting preliminary and permanent affirmative, mandatory, prohibitory injunctive, or specific performance relief relating to any obligation under this Agreement, compensatory damages (but expressly excluding punitive or exemplary damages), and sanctions for abuse or frustration of the arbitration process to the same extent that a court with personal and subject matter jurisdiction could award, order or issue or any other specific performance of any obligation. The Parties agree that the obligation to arbitrate under this Agreement and any award, order or judgment of the arbitrator under this Agreement shall be final and may be specifically enforced in the Superior Court of the State of Washington for King or Pierce County. Each Party to the Dispute shall bear its own attorney, expert and other fees and costs associated with the arbitration, except that the prevailing Party or Parties in any action brought to enforce this arbitration clause shall be entitled to recovery of its reasonable attorney's fees from the other Party or Parties to the Dispute.
5. Puyallup Tribe Limited Waiver of Sovereign Immunity. The Puyallup Tribe voluntarily grants Cascade a limited waiver of its sovereign immunity, and that of its officers and employees acting for the Puyallup Tribe in their official capacities, and consents to binding and mandatory arbitration for the limited purpose of claims by Cascade regarding the interpretation, implementation, and enforcement of this Agreement, the enforcement of the obligation to arbitrate, and the enforcement of any award, order or judgment of the arbitrator(s) in any arbitration authorized by this Section II.M. The Puyallup Tribe consents to suit by Cascade for the purpose of judicial enforcement of an arbitration award in accordance with this Section II.M in a suit brought in the Superior Court of the State of Washington for King or Pierce County. The Puyallup Tribe agrees that it will not raise sovereign immunity as a defense in any judicial action brought by Cascade to enforce an arbitration award in accordance with this Section II.M. This limited waiver shall expire upon the expiration or termination of this Agreement pursuant to Section II.W. The limited waiver of sovereign immunity granted to Cascade herein shall not extend to any monetary award or judgment, other than for mediator or arbitrator fees, and costs, and attorney fees expressly authorized in this Section. The Puyallup Tribe also grants the Muckleshoot Tribe a limited waiver of its sovereign immunity for the sole purpose of permitting the joinder of the Puyallup Tribe as a party in connection with the arbitration or litigation of a

claim by the Muckleshoot Tribe against Cascade authorized in this Section II.M, for which the Puyallup Tribe is a necessary or indispensable party.

6. Muckleshoot Tribe Limited Waiver of Sovereign Immunity. The Muckleshoot Tribe voluntarily grants Cascade a limited waiver of its sovereign immunity, and that of its officers and employees acting for the Muckleshoot Tribe in their official capacities, and consents to binding and mandatory arbitration for the limited purpose of claims by Cascade regarding the interpretation, implementation, and enforcement of this Agreement, the enforcement of the obligation to arbitrate, and the enforcement of any award, order or judgment of the arbitrator in any arbitration authorized by this Section II.M. The Muckleshoot Tribe consents to suit by Cascade for the purpose of judicial enforcement of an arbitration award in accordance with this Section II.M in a suit brought in the Superior Court of the State of Washington for King or Pierce County. The Muckleshoot Tribe agrees that it will not raise sovereign immunity as a defense in any judicial action brought by Cascade to enforce an arbitration award in accordance with this Section II.M. This limited waiver shall expire upon the expiration or termination of this Agreement pursuant to Section II.W. The limited waiver of sovereign immunity granted to Cascade herein shall not extend to any monetary award or judgment, other than for mediator or arbitrator fees, and costs, and attorney fees expressly authorized in this Section. The Muckleshoot Tribe also grants the Puyallup Tribe a limited waiver of its sovereign immunity for the sole purpose of permitting the joinder of the Muckleshoot Tribe as a party in connection with the arbitration or litigation of a claim by the Puyallup Tribe against Cascade authorized in this Section II.M, for which the Muckleshoot Tribe is a necessary or indispensable party.
7. Governing Law. The Parties agree that this Agreement and all questions concerning the performance of this Agreement shall be interpreted, construed and enforced in all respects in accordance with applicable laws of the State of Washington, without reference to rules relating to choice of law.
8. No Jurisdiction in Tribal Court. This Agreement and actions taken pursuant to this Agreement shall not be interpreted under any circumstances as consent by Cascade to jurisdiction in a Tribal Court over any claims or disputes arising under this Agreement. The Puyallup Tribe and the Muckleshoot Tribe expressly waive any right they may have to require Cascade to exhaust its remedies in a Tribal Court before bringing an enforcement action pursuant to Section II.M.4.d. of this Agreement. The Puyallup Tribe and the Muckleshoot Tribe agree that they will not prosecute, maintain, or institute any action, suit, administrative action or proceeding of any kind or nature against Cascade in a Tribal Court for any matter within the scope of this Agreement.
9. Specific Performance. The Parties agree that there is no adequate remedy at law with respect to their respective undertakings and obligations under this Agreement and that the Parties shall be entitled to specific performance of those undertakings and obligations in any arbitration or action authorized under this Agreement.

N. Good Faith; Commitment to Support Agreement

1. The Parties covenant and agree to act in good faith and to support the terms and validity of this Agreement.
2. The Parties, at their discretion have the right to participate in the state administrative process to assure Ecology's Municipal Water Right is consistent with this Agreement and provides for implementation of the Agreed Flow Regime set forth in this Agreement.
3. Cascade shall, during the term of this Agreement, support and defend the validity of the Agreement and shall not seek, either directly or indirectly, to invalidate the Agreement or undermine or modify its terms and conditions through administrative, legislative, judicial or other means.

O. Reservation of Rights

Each Party reserves all of its rights and interests except as explicitly addressed by the terms of this Agreement. In particular, but without limitation, except as explicitly spelled out in the Agreement, the Agreement does not in any way define, affect, limit or modify the inherent or treaty-reserved fishing, hunting, gathering or water rights of the Puyallup Tribe and the Muckleshoot Tribe and does not in any way define, limit or modify the inherent sovereign rights, or rights reserved by treaty or provided by executive order, statute or common law of the Puyallup Tribe and the Muckleshoot Tribe.

P. Successors and Assigns

1. This Agreement shall be binding upon and inure to the benefit of the Parties' respective successors and assigns.
2. The Parties agree that Cascade may, with the written permission of the Puyallup Tribe and the Muckleshoot Tribe, assign or transfer its respective rights and obligations under the Agreement to a third party; provided that the assignee or transferee assumes in writing all of the obligations under this Agreement.
3. The Parties finally agree that any attempt by Cascade to transfer or assign this Agreement (or any amendment to this Agreement) in violation of this Section II.P. is void. A change of corporate form by Cascade shall not be considered an assignment for the purposes of this Section II.P; provided, that Cascade gives the other Parties to this Agreement reasonable prior notice of such change and the reasons for it; and provided further that the new entity is obligated by law or by written Agreement to assume all of the rights and obligations of this Agreement. Notwithstanding the dispute resolution provisions of this Agreement, the other Parties may seek judicial relief with respect to any proposed change in Cascade's corporate form.

Q. Construction and Interpretation

1. The headings, titles, and captions contained in this Agreement are merely for reference and do not define, limit, extend, or describe the scope of this Agreement or any provision herein.
2. The word "include(s)" means "including, without limitation."
3. Neither this Agreement nor any provision herein shall be construed against any Party due to the fact that said Agreement or any provision herein was drafted by said Party.

R. Modification

This Agreement may only be modified by written agreement of the Parties duly approved by resolution or ordinance of the Muckleshoot Tribe, the Puyallup Tribe, and Cascade.

S. Severability

If any provisions of this Agreement are determined to be unenforceable or invalid by a court of law, then this Agreement shall thereafter be modified to implement the intent of the Parties to the maximum extent allowable under law.

T. No Third Party Beneficiaries

No third Party is intended to, or shall have any rights under this Agreement. The Parties to this Agreement are the only ones with any right to enforce its terms.

U. Equal Participation in Drafting

The Parties have participated equally in drafting this Agreement and have been represented by legal counsel. No Party shall be deemed to have more responsibility than any other for any ambiguous language.

V. Notice

All notices under this Agreement shall be in writing and shall be deemed to have been made when personally served on the Party's designee, or on the third business day after notice is sent by first class mail, or an equivalent method of transmittal. A Party may change its designee by providing notice of the change in writing to the other Parties. The Parties initial designees are:

Puyallup Tribe:	Herman Dillon Sr., Chairperson Puyallup Tribal Council Puyallup Tribe of Indians 3009 E. Portland Ave. Tacoma, WA 98404
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with a copy to: John Howard Bell, Director
Law Office of the Puyallup Tribe of Indians
3009 E. Portland Ave.
Tacoma, WA 98404

Muckleshoot Tribe: Charlotte Williams, Chairperson
Tribal Council
Muckleshoot Indian Tribe
39015 172nd Ave. SE
Auburn, WA, 98092

with a copy to: Richard Reich, Tribal Attorney
Muckleshoot Indian Tribe
39015 172nd Ave. SE
Auburn, WA, 98092

Cascade: Ed Oberg, Chief Executive Officer
Cascade Water Alliance
11400 SE 8th Street, Suite 440
Bellevue, WA 98004

with copies to: Michael Gagliardo, Director of Planning
Cascade Water Alliance
11400 SE 8th Street, Suite 440
Bellevue, WA 98004

and to: Michael P. Ruark, General Counsel
Inslee Best Doezie & Ryder
777 - 108th Avenue NE, Suite 1900
P.O. Box C-90016
Bellevue, WA 98009-9016

W. Term of the Agreement

This Agreement shall be binding on the Parties on the Effective Date and shall continue in force and effect so long as Cascade or any successor or assign diverts water from the White River. The Agreement shall terminate only upon written agreement of the Parties duly approved by resolution or ordinance of the Muckleshoot Tribe, the Puyallup Tribe, and Cascade, or upon permanent cessation of diversions from the White River into the Lake Tapps Reservoir and surrender or other final extinguishment of the water rights authorizing said diversions.

X. Non-waiver

Waiver of any provision herein shall not be deemed a waiver of any other provision herein, nor shall waiver of any breach of this Agreement be construed as a continuing waiver of other breaches of the same or other provisions of this Agreement.

Y. Power of the Parties

Each Party by executing this Agreement warrants that it duly approved this Agreement and has the power to enter into the Agreement and to enforce its terms.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed as of this 6th day of August, 2008.

Puyallup Tribe:

Puyallup Tribe of Indians

By: Nancy Jones
Title: vice-Chair council
Dated: 8-6-08

Cascade:

Cascade Water Alliance

By: Lloyd Warner
Title: Chair
Dated: 08-06-08

Muckleshoot Tribe:

Muckleshoot Indian Tribe

By: Charlotte Williams
Title: Chairperson
Dated: August 6, 2008

PUYALLUP TRIBE OF INDIANS ACKNOWLEDGMENT

STATE OF WASHINGTON)
) ss
COUNTY OF KING)

On this 10TH day of AUGUST, 2008, personally appeared before me ~~Herman Dillon Sr.~~ ^{VICE} to me known to be the Chairperson of the Puyallup Tribe of Indians, and HENRY JOHN ^{ujd} acknowledged this instrument to be the free and voluntary act and deed of the Puyallup Tribe of Indians for uses and purposes therein mentioned, and on oath stated that he/she was authorized to execute said instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written



Elizabeth Bargala
Notary Public in and for the State of Washington
Residing at ENUNCLAW

CASCADE WATER ALLIANCE ACKNOWLEDGMENT

STATE OF WASHINGTON)
) ss
COUNTY OF KING)

On this 6TH day of AUGUST, 2008, personally appeared before me Lloyd Warren to me known to be the Chair of the Board of Directors of the Cascade Water Alliance, and acknowledged this instrument to be the free and voluntary act and deed of the Cascade Water Alliance for uses and purposes therein mentioned, and on oath stated that he/she was authorized to execute said instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written



Elizabeth Bargala
Notary Public in and for the State of Washington
Residing at ENUNCLAW, WA

- Exhibit 1 List of Gages
- Exhibit 2 Water Quality Parameters for Gages
- Exhibit 3 Tailrace Plan
- Exhibit 4 Water Quality (WQ) Monitoring Plan

EXHIBIT 1

Puyallup River Basin USGS Gages

Location & Justification

<u>12098500</u>	WHITE RIVER NEAR BUCKLEY, WA	Upstream of Lake Tapps Diversion and downstream of Mud Mt. Dam. Long Term record but only gage height has been measured in recent years. Corps provides funding and they have been working with USGS for several years to come with a more accurate alternative. River should be gaged above the diversion; either at/near this location or closer to the diversion.
<u>12099000</u>	WHITE RIVER CANAL AT BUCKLEY, WA	Located on the diversion canal. Gaging is crucial for determining diversion flows. Flows have not been metered for several years. Gaging facilities upgrades & methods should be per USGS recommendations and records should be put back online ASAP.
<u>12099200</u>	WHITE RIVER ABOVE BOISE CREEK AT BUCKLEY, WA	Located on White River mainstem below diversion and upstream of Boise Creek. Needed to measure instream flows. When Corps builds new dam, gaging location may move upstream from current site. This site should continue to be monitored on a short-term basis by the USGS as a check for flows at the new diversion gage. Also, a stage gage should remain in operation at this or a nearby location to ensure ramping rates are met.
<u>12099600</u>	BOISE CREEK AT BUCKLEY, WA	Located near mouth of Boise Creek. Gage will soon be moved upstream due to King County channel work along the White River. Boise Creek is an important salmon bearing stream and should continue to be gaged.
<u>12101100</u>	LAKE TAPPS DIVERSION AT DIERINGER, WA	Located at Tailrace. Gaging is needed to measure outflows.
<u>12100496</u>	WHITE RIVER NEAR AUBURN, WA	Located on the White River mainstem near Auburn & upstream of tailrace. Gaging here measures flow in the lower White River. Adding flow measured here to tailrace flows determines mainstem flows of the lower river for critical flow target for downramping. We recommend that Pierce County continue to fund the gage and work with the USGS on increases in gage accuracy.
<u>12101000</u>	LAKE TAPPS NEAR SUMNER, WA	Gage is needed to measure reservoir levels.
New Gage	HUCKLEBERRY CREEK	Gaging is needed on Huckleberry Creek, which is upstream of Mud Mt. Reservoir.
New Gage	CLEARWATER CREEK	Gaging is needed on Clearwater Creek, which is upstream of Mud Mt. Reservoir.
New Gage	UPPER MAINSTEM WHITE RIVER	Gaging is needed on the mainstem White River upstream of Mud Mt. Reservoir.
New Gage	NEW SEASONAL STAGE GAGE - Lower White River	A new seasonal stage gage may be needed downstream of tailrace to ensure downramping rates are met during reservoir evacuation.

Exhibit 2

Parameters For White River Water Quality Monitoring

I. Continuous Monitoring

For all streamflow monitoring gages, collection and computation of 15-minute unit value data and the publication of daily-mean values for the following parameters:

- temperature
- pH
- specific conductance
- dissolved oxygen
- turbidity
- chlorophyll

II. Discrete Water-Quality Sampling

For at least 3 sites in the White River Basin, the following discrete samples shall be collected using depth- and width integrated sampling techniques:

- nitrate plus nitrite
- nitrite
- total nitrogen
- ammonia
- orthophosphate
- total phosphate



Cascade Water Alliance Update

Lake Tapps Community Agreements

June 26, 2008 – The White River Management Agreement: In an historic action, The Muckleshoot Indian Tribe, the Puyallup Tribe of Indians and the Cascade Water Alliance have approved an agreement that provides for the protection of fish, habitat, water supply and recreation in the White River and Lake Tapps. The White River Management Agreement was more than four years in the making. The White River Management Agreement, to be executed by all three parties, includes a flow regime that provides for minimum flows in the White River and for diversions of water from the White River to Lake Tapps reservoir, provisions for operation and maintenance of the Lake Tapps system, continued maintenance of recreational lake levels, and restoration, protection and enhancement of fishery resources and habitat in the White River Basin. Additional agreements between Cascade and each Tribe provide Cascade security in its anticipated new municipal water rights and provide funding for fishing and natural resource programs, including operation of the Muckleshoot Indian Tribe hatchery, habitat restoration and enhancement projects.

April 13, 2009: Lake Tapps Homeowners Agreement: After 10 years of discussions and hard work, the Lake Tapps Community Council and Cascade Water Alliance signed documents that will ensure Lake Tapps is preserved for the community's use and enjoyment. The documents will ensure lake levels and address actions to be taken during potential droughts as well. Formal agreements were completed in May 2009.

February 5, 2010: Lake Tapps Area Water Resources Agreement: In the spirit of regional partnership and working toward solutions, the cities of Auburn, Bonney Lake, Buckley and Sumner today announced an innovative, unique agreement with the Cascade Water Alliance to ensure the four cities have water to help them meet their water needs over the next 50 years. The agreement, several years in the making, is the result of regional collaboration following Cascade's purchase of Lake Tapps from Puget Sound Energy for future municipal water supply. Under the landmark agreement, Cascade will leave water in the White River that will be available for the four cities to use when they apply for a water right from the State Department of Ecology. If their water rights are approved, the cities are assured water will be available if and when needed by any of the cities. In addition, the cities will work with Cascade to portion some of their existing water supply now provided by Tacoma Public Utilities.

Water Supply Agreements

Seattle: The Seattle Declining Block Contract Water Supply Agreement provides Cascade with a block of approximately 35 million gallons of water per day through 2023. Beginning in 2024, the available water begins to decline so that only approximately 5 million gallons per day is available after 2045.

Tacoma: The Tacoma Wholesale Water Agreement provides Cascade with 4 million gallons per day on a permanent basis and reserves up to an additional 6 million gallons per day through 2026. The amount of reserved water declines to zero by 2031.

Cascade continues to negotiate with both now for future water supply.

Transmission and Supply Planning

As part of its process to update its 2004 Transmission and Supply Plan, Cascade has completed a comprehensive Water Demand Forecast for its members through 2060 (including an uncertainty analysis to include potential impacts of climate change) which projects demands significantly lower than projected in 2004.

To complete the planning process, Cascade is evaluating supply sources available to meet the projected demands.

Our Connections Working Group, an advisory board, has been established to get broad stakeholder input during the planning process.

Environmental Impact Statement

The EIS was published Jan. 29, with the comment period running through March 15. There will be minimal adverse environmental impacts. Cascade will implement mitigation measures to reduce impacts, improve stream flows and fishing habitat in the basin. Cascade is working with DOE to develop water rights. Draft water rights will be published for public comment March 8. The final EIS and water rights are expected to be completed by June.

ORIG. RECORDED WITH
PIERCE COUNTY AUDITOR
IN VOL 1063, PAGES 455
THRU 495

\$190,000.

D E E D

The Grantor, PUGET SOUND POWER & LIGHT COMPANY, a Massachusetts corporation, sometimes hereinafter called "Puget", for the consideration of Ten Dollars (\$10.00) and other considerations, receipt of which is acknowledged, hereby conveys and warrants to LAKE TAPPS DEVELOPMENT CO., INC., a Washington corporation, Grantee, subject to the encumbrances, reservations, conditions and restrictions hereinafter set forth, that certain real property located in Pierce County, State of Washington, particularly described as follows:

All those tracts or parcels of land within that certain perimeter hereinafter described which lie between said perimeter and the contour line located at elevation five hundred and forty-five (545) feet above sea level around the Lake Tapps reservoir of Puget Sound Power & Light Company, expressly including within the foregoing description all those portions of the islands within Lake Tapps which lie above the 545-foot contour line and also those parcels or pockets of lowland, if any, within said perimeter which are separated from the waters of Lake Tapps by intervening shorelands above the 545-foot contour line,

EXCEPTING THEREFROM, however, the East half (E $\frac{1}{2}$) of the Northwest Quarter (NW $\frac{1}{4}$) of Section Ten (10), Township Twenty (20) North, Range Five (5) East, W.M.;

TOGETHER with the following rights, which shall not belong to the Grantee exclusively, in and to the use of the waters and the bed of Lake Tapps and the land between the 545-foot contour line and the shore of the lake, so far as Grantor may lawfully grant such rights, viz.:

(a) the right to use the waters of Lake Tapps for boating, swimming, fishing and any other usual or ordinary recreational purpose, but for no other purpose whatsoever;

(b) the right to moor floats upon the lake, drive stakes into the bed of the lake for mooring floats, boats and boat houses, and to build docks down to and into the lake waters, such docks, however, to be built only upon piling;

(c) the right to remove from the land below the 545-foot contour line and from the bed of the lake all trees, standing or dead, brush and growth of every kind and character, on said land, rubbish, dead trunks, stumps and other refuse, and to dredge the bottom of the lake and dispose of all such removed material in any lawful manner;

(d) the right to construct bridges over portions of said reservoir in order to gain access to the islands; provided, however, that in the construction of said bridges proper and adequate provisions shall be made for the flow of water under said bridges; provided, further, that no bridge shall be constructed without obtaining the prior written approval of Puget;

PROVIDED, that Grantee shall not exercise any of the privileges granted in the foregoing paragraphs (a), (b), (c) and (d) in such manner as to cause any injury or damage to Puget and Grantee shall not make any use of the lake which will prevent or hinder the full use of the waters of the lake by Puget for the operation of its White River generating plant or other uses incidental thereto, and there shall be no boating, swimming or other use of the waters inside the drift barrier maintained by Puget at the outlet gate, and every use which may be made of the water of the lake by Grantee or anyone pursuant to its permission shall be in full compliance with all laws of the State of Washington and the lawful regulations promulgated by the Department of Health of the State of Washington or any other governmental agency having jurisdiction thereof, and every person exercising any right hereunder shall do so at his own risk; provided, further, that the rights expressed in paragraph (a) shall be exercised by the Grantee in common with the employees of Puget and other persons who, with Puget's consent, may have occasion to enjoy the privileges of Puget's summer camp and picnic grounds located in the west half of the east half

of the northwest quarter of said Section 10.

Puget reserves the fee title to the bed of Lake Tapps and all land surrounding the shore of the lake and on the islands therein from the water line up to the 545-foot contour line and also reserves perpetually the following rights with respect to the land hereby conveyed, which rights shall belong exclusively to Puget, its successors and assigns:

(a) to raise the water within said reservoir at any time and from time to time up to the elevation of 545 feet above sea level, and to draw it down to any level, and to use the waters thereof for the operation of its White River generating plant, and to abandon said storage reservoir at any time, all without any liability for the damage suffered by the Grantee, or anyone claiming through or under the Grantee;

(b) to maintain, repair, renew and operate electric transmission and distribution lines wherever convenient for Puget upon all roads and roadways now existing or hereafter created or laid out in, through or across the said land, for the purpose of operating Puget's distribution system and rendering its utility service to the public, including the occupants of the land above described and also to use all such roads and roadways for access to Lake Tapps in order to maintain and operate said storage reservoir and the White River generating plant;

(c) to dredge the lake bottom at any place at any time in order to increase the storage capacity of the lake.

Said property is hereby conveyed subject to the foregoing reservations and subject also to the following conditions, encumbrances and restrictions:

(a) mineral rights and reservation of right to acquire rights of way, etc. as provided by Sections 7873 and 8082 of

See Enc. 11C-10
of Oct. 11,
1954
TF 123-85-29

Remington's Revised Statutes of the State of Washington as to all shorelands of the second class owned by the State of Washington situate in front of, adjacent to or abutting upon Sections Eight (8), Nine (9), Sixteen (16) and Twenty-one (21), Township Twenty (20) North, Range Five (5) East, W.M., with a total frontage of 543.10 lineal chains, measured along the meander line according to a certified copy of the government field notes of the survey thereof on file in the office of the Commissioner of Public Lands at Olympia, Washington, as contained in deed from the State of Washington to Puget Sound Traction, Light & Power Company, a corporation, dated January 5, 1916, and recorded January 13, 1916, under Auditor's Fee No. 434339 in Book 399 of Deeds, at page 516, records of Pierce County, Washington.

(b) reservation of so much of said lands as may be mineral lands or contain coal or iron, also the right to use surface lands and the right of access for the purpose of exploring and developing said minerals, as contained in deeds executed by Northern Pacific Railway Company, a corporation, recorded in Book 204 of Deeds, at page 50, under Auditor's Fee No. 156771, and in Book 17 of Deeds, at pages 435, 439 and 443, respectively, records of Pierce County, Washington; reference to which instruments is made for further particulars.

(c) the rights of certain property owners in Section Four (4), Township Twenty (20) North and Section Thirty-two (32), Township Twenty-one (21) North, both in Range Five (5) East, W.M. to the continued flow of a quantity of water through the creek flowing across the Northeast Quarter ($NE\frac{1}{4}$) of the Northeast Quarter ($NE\frac{1}{4}$) of Section Nine (9), Township Twenty (20) North, Range Five (5) East, W.M., which was the outlet of the original Lake Tapps, and the right of Puget to maintain and operate a valve at the outlet for the purpose of controlling such flow, as such

rights are set forth in those two certain agreements dated July 17, 1936, and October 19, 1936, recorded in the office of the County Auditor of Pierce County in Volume 566 of Deeds at page 485, and Volume 566 of Deeds at page 481, respectively;

(d) that certain 300-foot right of way for electric transmission lines through Sections Eight (8) and Seventeen (17) in Township Twenty (20) North, Range Five (5) East, W.M., granted to Bonneville Power Administration by Puget by instrument dated March 6, 1942, and recorded in Volume 689 of Deeds at page 789, records of Pierce County;

(e) all public roads;

(f) ~~Grantee shall have no right to and shall not (1) place any structure upon any part of the land below the 545-foot contour line which will decrease the storage capacity of Lake Tapps as it exists at the date hereof or which will prevent the use by Puget of its complete storage capacity by raising the level of the lake to the 545-foot contour line; (2) make any excavation or remove or disturb any of the soil either above or below the 545-foot contour line if such excavation, removal or disturbance would cause or tend to cause any flow or seepage from the lake, even if the lake should be raised to the 545-foot contour line; (3) cast any sewage, refuse, junk or other impure matter, into the lake or upon the land below the 545-foot contour line; (4) be a party to the vacation of any part of the public roads around Lake Tapps which are useful to Puget in the maintenance, repair or operation of said reservoir or the White River generating plant; (5) create any lien whatever upon the land lying below the 545-foot contour line by reason of any use it may make of such land.~~

(g) water, water rights and matters relating thereto.

All of the rights in favor of either party hereby created or reserved and all of the covenants, obligations and restrictions

set forth herein shall run with the land and with each and every part or parcel thereof and be binding upon all successors in interest of the Grantee; provided, however, that no successor in interest of the Grantee in any part or parcel of said property shall be liable by reason of the independent act of some other party constituting a breach of any covenant, obligation or restriction herein contained.

The elevation 545 feet above sea level shall be determined by reference to the bronze plaque embedded in the concrete floor of the gate house at the entrance to the tunnel leading from the westerly shore of the intake pond located in the Northwest Quarter (NW $\frac{1}{4}$) of Section Eight (8), Township Twenty (20) North, Range Five (5) East, W.M., to the White River generating plant, which bronze plaque has engraved upon it the figures "544.75" and for the purpose of this deed it is understood that said plaque is placed at the elevation of 544.75 feet above sea level.

The perimeter hereinabove mentioned is particularly described as follows:

- (1) Beginning at the SW corner of Section 4, Township 20 North, Range 5 East W.M.; running
- (2) Thence N along the W line of Section 4 to the SE corner of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 5;
- (3) Thence W to the W line of the E $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 5;
- (4) Thence N along said W line of the E $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 5 to the east-west center line of Section 5;
- (5) Thence E along the east-west center line of Sections 5 and 4 to the Coby County Road;
- (6) Thence Southerly along the Coby County Road and southeasterly along the Dike Road of Puget Sound Power & Light Company to the intersection of the Dike Road with the N line of Section 9;
- (7) Thence E along the N line of Section 9 and the N line of Section 10 to the Wood Church Relocated County Road;
- (8) Thence Southeasterly along the Wood Church Relocated County Road to the E line of Section 10;
- (9) Thence S along the E line of Sections 10 and 15 to the quarter corner between Sections 14 and 15;
- (10) Thence E along the east-west center line of Section 14 a distance of 600 feet;
- (11) Thence Southeasterly in a straight line to the southeast corner of the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 14;
- (12) Thence E to the E line of the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 14;
- (13) Thence S along the E line of the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 14 to the S line of Section 14;
- (14) Thence W along the S line of Section 14 to the SW corner of the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 14;
- (15) Thence S along the north-south center line of the NW $\frac{1}{4}$ of Section 23 to a point which is 416 feet N of the east-west center line of Section 23;
- (16) Thence Southeasterly in a straight line to a point on said east-west center line which is 416 feet E of the SE corner of the SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 23;
- (17) Thence W to the SE corner of said SW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 23;

- (18) Thence S to the SE corner of the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 23;
- (19) Thence W to the SW corner of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 22;
- (20) Thence S to a point on the E line of the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 22 which is 600 feet N of the S line of Section 22;
- (21) Thence Southeasterly in a straight line to a point on the S line of Section 22 which is 200 feet E of the SE corner of the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 22;
- (22) Thence E along the S line of Section 22 to the Y.M.C.A. County Road;
- (23) Thence Southerly along the Y.M.C.A. County Road and the Vandermark County Road through the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 27 to the S line;
- (24) Thence W to the NE corner of the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 27;
- (25) Thence S to the SE corner of the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 27;
- (26) Thence E to the E line of the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 27;
- (27) Thence S along the E line of the W $\frac{1}{2}$ of the W $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 27 to the S line of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 27;
- (28) Thence W along the east-west center line of the SE $\frac{1}{4}$ of Section 27 to the north-south center line of the section;
- (29) Thence N along the north-south center line of Section 27 to the SE corner of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 27;
- (30) Thence W to the W line of the E $\frac{1}{2}$ of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 27;
- (31) Thence N along said W line to the N line of the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 27;
- (32) Thence W to the NW corner of the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 27;
- (33) Thence S to the SE corner of the N $\frac{1}{2}$ of the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 27;
- (34) Thence W to a point which is 100 feet E of the NW corner of the E $\frac{1}{2}$ of the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 27;

- (35) Thence S 300 feet;
- (36) Thence W 100 feet to the W line of the $E\frac{1}{2}$ of the $SE\frac{1}{4}$ of the $NW\frac{1}{4}$ of the $SW\frac{1}{4}$ of Section 27;
- (37) Thence S to the S line of the $NW\frac{1}{4}$ of the $SW\frac{1}{4}$ of Section 27;
- (38) Thence W to the SW corner of the $SE\frac{1}{4}$ of the $NW\frac{1}{4}$ of the $SW\frac{1}{4}$ of Section 27;
- (39) Thence N to the NW corner of the $SE\frac{1}{4}$ of the $NW\frac{1}{4}$ of the $SW\frac{1}{4}$ of Section 27;
- (40) Thence W to the SW corner of the $N\frac{1}{2}$ of the $NW\frac{1}{4}$ of the $SW\frac{1}{4}$ of Section 27;
- (41) Thence N along the W line of Section 27 to a point which is 500 feet S of the NE corner of the $SE\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 28;
- (42) Thence Northwesterly to a point on the S line of the $NE\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 28 which is 150 feet W of the SE corner of the $NE\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 28;
- (43) Thence W to the W line of the E 660 feet of the $NE\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 28;
- (44) Thence N to the NW corner of the E 660 feet of the $NE\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 28;
- (45) Thence W on the S line of Section 21 to a point 800 feet W of the SE corner of Section 21;
- (46) Thence N parallel to the E line of Section 21 a distance of 450 feet;
- (47) Thence E parallel to the S line of Section 21 a distance of 800 feet to the E line of Section 21;
- (48) Thence N along the E line of Section 21 to a point 500 feet south of the NE corner of the $SE\frac{1}{4}$ of Section 21;
- (49) Thence Northwesterly to a point on the N line of the $SE\frac{1}{4}$ of Section 21 350 feet W of the NE corner of said $SE\frac{1}{4}$;
- (50) Thence W along the east-west center line of Section 21 to the W line of the $E\frac{1}{2}$ of the $SW\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 21;
- (51) Thence N along said W line to the NW corner of the $E\frac{1}{2}$ of the $SW\frac{1}{4}$ of the $NE\frac{1}{4}$ of Section 21;
- (52) Thence W to the SW corner of the $NE\frac{1}{4}$ of the $NW\frac{1}{4}$ of Section 21;

- (53) Thence N to a point 700 feet S of the NE corner of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 21;
- (54) Thence Northwesterly to a point on the N line of Section 21 which is 300 feet W of the NE corner of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 21;
- (55) Thence W to the SW corner of Section 16;
- (56) Thence N along the section line to a point 800 feet S of the quarter corner on the E line of Section 17;
- (57) Thence W parallel to the east-west center line of Section 17 a distance of 1100 feet;
- (58) Thence N parallel to the E line of Section 17 a distance of 800 feet to the east-west center line of Section 17;
- (59) Thence W to the center of Section 17;
- (60) Thence N along the center line of Section 17 to the SE corner of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 17;
- (61) Thence W to the SW corner of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 17;
- (62) Thence N to the NW corner of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 17;
- (63) Thence W along the N line of Section 17 to the existing Church Lake North County Road;
- (64) Thence Northwesterly along the Church Lake North County Road to its intersection, in the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 8, with the Forest Canyon County Road running easterly;
- (65) Thence Easterly along the Forest Canyon County Road to the north-south center line of Section 8;
- (66) Thence N along the north-south center line of Section 8 to a point 100 feet S of the center line of Puget Sound Power & Light Company's intake canal;
- (67) Thence E parallel with the N line of Section 8 to the north-south center line of the NE $\frac{1}{4}$ of Section 8;
- (68) Thence N to the NW corner of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 8;
- (69) Thence E along the N line of Section 8 to the SW corner of Section 4, which is the true point of beginning of this perimeter description.

IN WITNESS WHEREOF, the Grantor has caused this instrument

to be executed, and its corporate seal to be hereto affixed, by its proper officers thereunto authorized this 22nd day of June, 1954.

Corporate Seal

PUGET SOUND POWER & LIGHT COMPANY

By Frank McLaughlin /S/ President

Attest:

Walter S. Zachary
Assistant Secretary

STATE OF WASHINGTON }
COUNTY OF KING } ss.

On this 22nd day of June, 1954, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared FRANK McLAUGHLIN and WALTER S. ZACHARY, to be known to be the President and Assistant Secretary, respectively, of PUGET SOUND POWER & LIGHT COMPANY, the corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute the said instrument and that the seal affixed is the corporate seal of said corporation.

WITNESS my hand and official seal hereto affixed the day and year in this certificate above written.

Notary Seal

D. J. Torrance
Notary Public in and for the State of Washington, residing at Seattle.

1837750

Vol 1180 MAR 551

QUIT CLAIM DEED

The GRANTOR, LAKE TAPPS DEVELOPMENT CO., INC., a Washington corporation, for and in consideration of the sum of One and no/100 dollars (\$1.00) and other valuable considerations, receipt whereof is hereby acknowledged, does hereby convey and quit claim unto the GRANTEE, PUGET SOUND POWER & LIGHT COMPANY, a Massachusetts corporation, the following described real estate, situated in the County of Pierce, State of Washington, to-wit:

Portions of NE 1/4 of SE 1/4 of Section 5, and of NW 1/4 of SW 1/4 of Section 4, in Township 20 North, Range 5 East, W.M., described as follows: All of the land lying between the easterly margin of Forest Canyon Road as it is now established, and the shore of Lake Tapps and enclosed within the following described lines: Westerly of a line described as beginning at a point in a line bearing South 34° 59' 17" West 109.75 feet therein from the quarter corner common to said Sections 4 and 5; thence South 32° 05' 43" East 142.15 feet; thence South 10° 49' 17" West to the shore of Lake Tapps, and northerly of a line described as beginning at a point in a line bearing South 34° 59' 17" West, 498.81 feet thereon from said quarter corner of Sections 4 and 5; thence South 88° 58' 43" East to the shore of Lake Tapps.

4-017

Parcel 13

A portion of NW 1/4 of SW 1/4 of Section 4, Township 20 North, Range 5 East, W.M. described as follows: All of the land lying between the southerly margin of Forest Canyon Road, as it is now established, and the Shore of Lake Tapps and lying westerly of a line described as beginning at a point in the north line of said subdivision bearing South 87° 59' 44" East and 387.05 feet from the northwest corner thereof; thence South 30° 14' 03" West to the Shore of Lake Tapps; and easterly of a line described as beginning at a point in the west line of said subdivision bearing South 02° 53' 23" West and 12.36 feet from the northwest corner thereof; thence South 49° 46' 43" East to the Shore of Lake Tapps.

3-005

Parcel 14

That portion of Lot 38, Block 1 of Plat of Lake Tapps Evergreen Point as recorded in Vol. 16, pages 90-91 of Plats, records of Pierce County, described as lying easterly of a line beginning at a point on the northerly line of said lot lying South 79° 21' 04" West thereon and 72.38 feet from the most northeasterly corner of said lot; thence South 54° 23' 58" East to the shore of Lake Tapps. Together with that portion of the NE 1/4 of SW 1/4 of Section 4, Township 20 North, Range 5 East, W.M., lying between the Shore of Lake Tapps and the southerly margin of Forest Canyon Road as it is now established, and lying easterly of the plat of Lake Tapps Evergreen Point, and lying westerly of a line described as beginning at a point on the easterly line of said NE 1/4 of SW 1/4 lying South 09° 09' 44" West thereon and 292.42 feet from the northeast corner of said subdivision and running thence South 26° 16' 33" West to the Shore of Lake Tapps.

3-006

Parcel 15

That portion of SE 1/4 of Section 4, Township 20 North, Range 5 East, W.M., lying westerly of the Dike Road of Puget Sound Power & Light Company and lying southerly of a line described as commencing at the southeast corner of said Section 4; thence North 87° 18' 11" West, along the southerly line of said Section, 1669.27 feet to the centerline of said Dike Road, thence along said Dike Road, North 23° 16' 11" West 628.63 feet; thence North 18° 03' 42" West, 1181.34 feet to the true point of beginning of said line; thence South 63° 08' 18" West along said line to the west line of said SE 1/4 of Section 4.

pho 4-008

Parcel 16

Parcel 13, 14, 15, 16, 17, 18, 19, 21

5-20-5-4-017

27-20-5 3-019

4-20-5 - 3-005

phn 4-008

10-20-5 2-002, 1-002, 1-003, 4-002

EXCISE TAX PAID \$ 10.00
REC NO 10522 DATE 2 3 51
L. R. JOHNSON, Pierce Co. Treas
Deputy

That portion of NE $\frac{1}{4}$ of Section 9, Township 20 North, Range 5 East, W.M., lying between the shore line of Lake Tapps and the centerline of the Dike Road of Puget Sound Power & Light Company, described as follows: Beginning at the intersection of said Dike Road with the North line of said Section 9, which point lies North 87° 18' 11" West 1669.27 feet from the Northeast corner of said Section 9; thence along said centerline South 23° 16' 11" East 914.67 feet; thence South 62° 06' 01" East 240.09 feet; thence North 72° 05' 34" East 424.00 feet; thence South 17° 54' 26" East 25.77 feet; thence South 28° 01' 27" West to the shore line of Lake Tapps; thence southwesterly, westerly and northwesterly along said shore line to the North line of said Section 9; thence South 87° 18' 11" East along said North line to the point of beginning. Together with a 100 foot strip measured at right angles to and lying easterly and northerly of this centerline of said Dike road, said centerline being defined as follows: Beginning at said intersection of the Dike road with the North line of Section 9; thence South 23° 16' 11" East 914.67 feet; thence South 62° 06' 01" East 240.09 feet; thence North 72° 05' 34" East 424.00 feet.

1-002

Parcel 17

That portion of NE $\frac{1}{4}$ of Section 9, Township 20 North, Range 5 East, W.M., lying between the shore line of Lake Tapps and the centerline of the Dike Road of Puget Sound Power & Light Company, described as follows:—Commencing at the intersection of the centerline of the Dike Road with the East line of said Section 9; thence North 33° 47' 08" West 12.76 feet; thence North 68° 40' 00" West 42.48 feet to the point of beginning; thence continuing North 68° 40' 00" West along said centerline 170.72 feet; thence North 85° 56' 27" West a distance of 428.79 feet; thence South 4° 03' 33" West 19.91 feet; thence South 57° 07' 27" East to the shore line of Lake Tapps; thence easterly along said shore line to a point which bears South 53° 15' 00" West from the point of beginning; thence North 53° 15' 00" East to the point of beginning. Together with a 100 foot strip measured at right angles to and lying northerly of the centerline of said Dike road, said centerline being defined as follows: Commencing at the point of beginning defined above; thence North 68° 40' 00" West 170.72 feet; thence North 85° 56' 27" West 428.79 feet.

1-003
Parcel 18

That portion of SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Section 10 lying between the shore line of Lake Tapps and the centerline of the Dike Road of Puget Sound Power & Light Company, described as follows: Beginning at a point on the centerline of said Dike road which point lies South 78° 00' 34" West 588.62 feet from the intersection of said road with the East line of said SW $\frac{1}{4}$ of NW $\frac{1}{4}$; thence continuing South 78° 00' 34" West along said centerline 477.20 feet; thence North 66° 23' 29" West 146.42 feet; thence South 45° 48' 29" East to the shore line of Lake Tapps; thence easterly along said shore line to a point which bears South 14° 35' 34" West from the point of beginning; thence North 14° 35' 34" East to the point of beginning. Together with a 100 foot strip measured at right angles to and lying northerly of the centerline of said Dike Road, said centerline being defined as follows: Commencing at the point of beginning defined above; thence South 78° 00' 34" West 477.20 feet; thence North 66° 23' 29" West 146.42 feet.

2-002
19

That portion of NW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 10, Township 20 North, Range 5 East, W.M. lying between the shore line of Lake Tapps and the centerline of the Dike Road of Puget Sound Power and Light Company, described as follows: Beginning at the intersection of the Dike Road centerline with the West line of said NW $\frac{1}{4}$ of NE $\frac{1}{4}$; thence along said centerline North 60° 59' 34" East 722.44 feet; thence South 4° 32' 26" East to the shore line of Lake Tapps; thence southwesterly along said shoreline to a point on the West line of said NW $\frac{1}{4}$ of NE $\frac{1}{4}$; thence North 0° 01' 41" East along said West line to the point of beginning.

1-002

21

Together with a 100 foot strip, measured at right angles to and lying northwesterly of the centerline of said Dike road, said centerline being defined as follows: Beginning at the intersection of said centerline with the West line of NE₁ of NE₁, thence North 60° 59' 34" East along said centerline a distance of 722.44 feet.

That portion of NE₁ of Section 10, Township 20 North, Range 5 East, W.M., lying between the shore line of Lake Tapps and the centerline of the Dike Road of Puget Sound Power & Light Company, described as follows: Beginning at a point on the Dike Road centerline which lies North 15° 12' 28" West 385.83 feet from the intersection of said centerline with the South line of said NE₁; thence continuing along said centerline the following courses and distances: North 15° 12' 28" West 281.29 feet; North 38° 39' 07" West 203.22 feet; North 70° 26' 45" West 603.19 feet; North 39° 34' 37" West 197.86 feet; North 16° 05' 28" West 366.03 feet; North 24° 17' 40" West 420.24 feet; thence South 71° 38' 20" West to the shore line of Lake Tapps; thence southerly and easterly along said shore line to a point on a line which bears South 70° 58' 32" West from the point of beginning; thence North 70° 58' 32" East to the point of beginning. Together with a 100 foot strip measured at right angles to and lying easterly of centerline of said Dike Road, said centerline being defined as follows: Commencing at the point of beginning defined above; thence North 15° 12' 28" West 281.29 feet; thence North 38° 39' 07" West 203.22 feet; thence North 70° 26' 45" West 603.19 feet; thence North 39° 34' 37" West 197.86 feet; thence North 16° 05' 28" West 366.03 feet; thence North 24° 17' 40" West 420.24 feet.

That portion of SE₁ of SE₁ of Section 10, Township 20 North, Range 5 East, W.M., lying between the shore line of Lake Tapps and the centerline of the existing Pierce County Road, described as follows: Beginning at a point on centerline of said existing road, which point lies North 1° 11' 20" East 891.42 feet from the southeast corner of said Section 10; thence along said existing centerline S2° 03' 16" East 377.90 feet and South 5° 22' 12" West 208.01 feet; thence South 35° 22' 12" West 377.06 feet; thence North 23° 21' 48" West 70.00 feet; thence North 35° 22' 12" East to the shore line of Lake Tapps; thence northerly along said shore line to a point on a line which bears North 71° 27' 16" West from said existing centerline; thence South 71° 27' 16" East to said centerline; thence South 2° 03' 16" East 302.45 feet along said centerline to the point of beginning. Except portion lying within County Road rights of way.

That portion of NW₁ NW₁ SW₁ of Section 27, Township 20 North, Range 5 East, W.M. lying between the centerline of the existing Pierce County Road and the shore line of Lake Tapps, described as follows: Commencing at a point on said existing centerline, which point lies South 53° 17' 05" East 62.11 feet from the West Section corner of said Section 27; thence S1° 50' 10" East 228.00 feet to the point of beginning; thence continuing along said centerline South 1° 50' 10" East 71.96 feet and South 55° 02' 34" East 405.69 feet; thence North 7° 23' 24" West to the shore line of Lake Tapps; thence northwesterly along said shoreline to a point on a line which bears North 74° 06' 10" East from the point of beginning; thence South 74° 06' 10" West to the point of beginning. Except portion lying within County Road rights of way.

Grantor herein reserves to itself and to its successors and assigns, the perpetual right to cross and re-cross the lands herein conveyed in order to gain access to the waters of Lake Tapps.

Vol. 1180 Page 554

1897750

1833220

IN WITNESS WHEREOF, Grantor herein has caused this instrument to be executed by its proper officers and its corporate seal to be hereunto affixed this 10 day



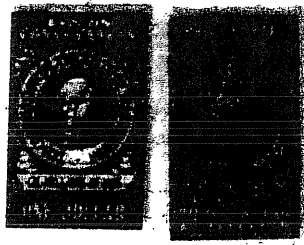
NOV 27 1958
RECORDED

LAKE TAPPS DEVELOPMENT CO., INC.

By Edmund A. Jeffers
President

ATTEST:

Richard A. Chappell
Secretary

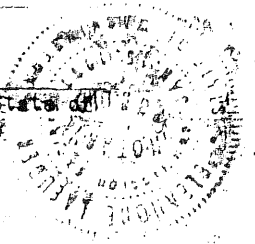


STATE OF WASHINGTON)
COUNTY OF KING) 32

On this _____ day of _____ A.D., 1958, before me personally appeared _____ to me known to be the President and _____ to me known to be the Secretary, of Lake Tapps Development Co., Inc, the corporation that executed the within and foregoing instrument, and each acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and each on oath stated that they were authorized to execute said instrument, and that the seal affixed is the corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.

Notary Public in and for the State of Washington, residing at Seattle.



Filed for record Dec 3 1958 10 a.m.
Request of P.J. Sind Race & L. Co.
JACK W. SONNTAG, Pierce Co. Auditor

FINAL

Shoreline Analysis Report for City of Bonney Lake's Shorelines: Lake Tapps and Fennel Creek

June 24, 2010
TWC Reference # 090808

Prepared for:

City of Bonney Lake
Community Development Dept
8720 Main Street East
Bonney Lake, WA 98391

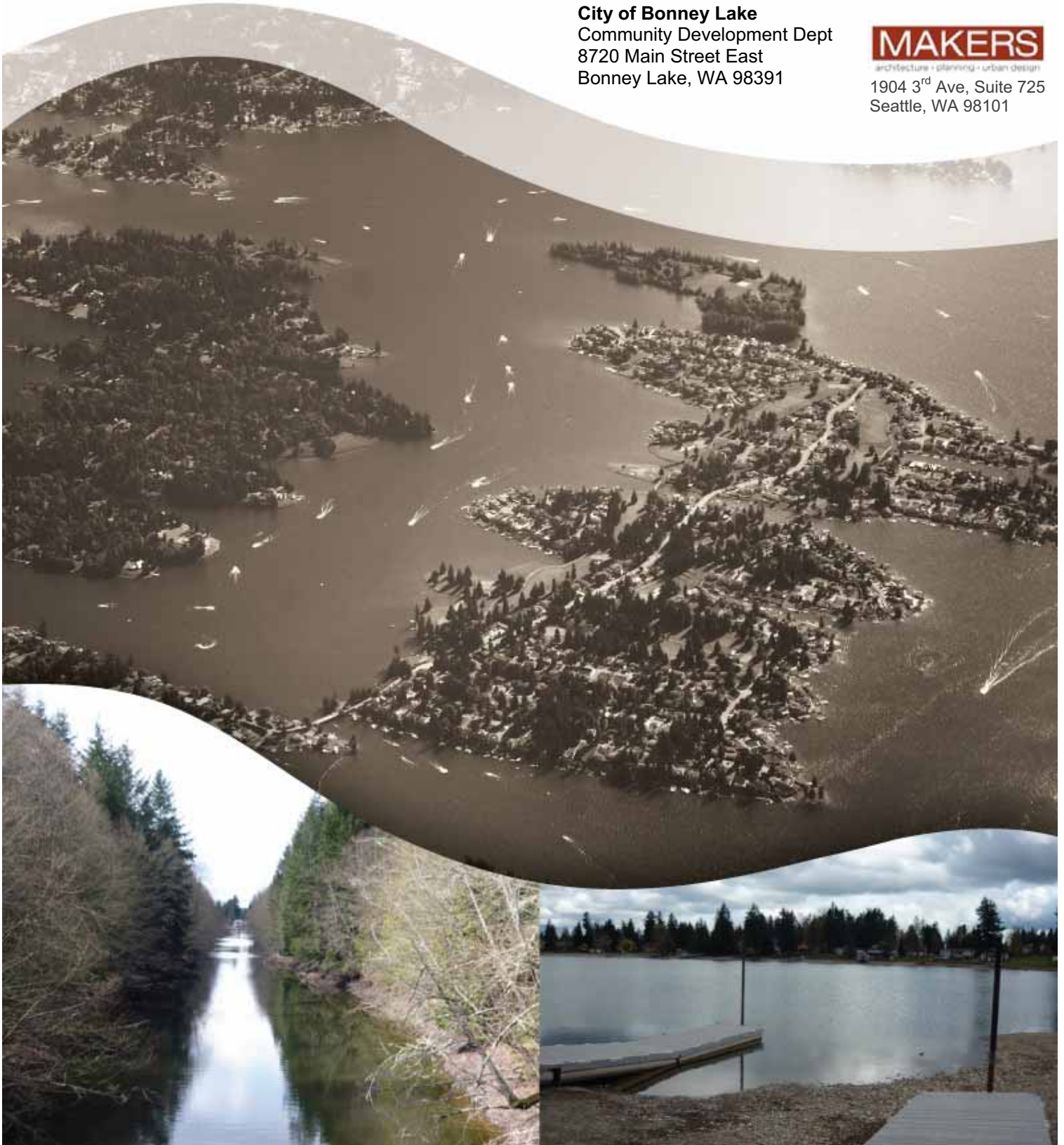
Prepared by:



750 Sixth Street South
Kirkland, WA 98033
p 425.822.5242
f 425.827.8136
watershedco.com



1904 3rd Ave, Suite 725
Seattle, WA 98101



Central cover photo courtesy of Flickr user Alaskan Dude under Creative Commons Attribution 2.0 Generic License.

FINAL

CITY OF BONNEY LAKE
GRANT No. G1000016

SHORELINE ANALYSIS REPORT

for City of Bonney Lake's Shorelines: Lake Tapps and Fennel Creek

Prepared for:

City of Bonney Lake
Community Development Department
8720 Main Street East
Bonney Lake, WA 98391

Prepared by:



750 Sixth Street South
Kirkland . WA 98033

p 425.822.5242
f 425.827.8136
watershedco.com



1904 3rd Ave, Suite 725
Seattle, Washington 98101



This report was funded in part
through a grant from the
Washington Department of Ecology.

June 24, 2010

The Watershed Company
Reference Number:
090808

The Watershed Company Contact Person:
Dan Nickel

Cite this document as:

The Watershed Company and Makers. June 2010. Final Shoreline Analysis Report for the City of Bonney Lake's Shorelines: Lake Tapps and Fennel Creek. Prepared for the City of Bonney Lake Community Development Department, Bonney Lake, WA.

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SHORELINE ANALYSIS REPORT

CITY OF BONNEY LAKE'S SHORELINES: LAKE TAPPS AND FENNEL CREEK

1 INTRODUCTION

1.1 Background and Purpose

The City of Bonney Lake (City) obtained a grant from the Washington Department of Ecology (Ecology) in 2009 to complete a comprehensive Shoreline Master Program (SMP) update. One of the first steps of the update process is to inventory and characterize the City's shorelines as defined by the state's Shoreline Management Act (SMA) (RCW 90.58). This inventory was conducted in accordance with the Shoreline Master Program Guidelines (Guidelines, Chapter 173-26 WAC) and project Scope of Work promulgated by Ecology, and includes all areas within current City limits. Under these Guidelines, the City must identify and assemble the most current, accurate and complete scientific and technical information available that is applicable. This shoreline inventory and analysis will describe existing conditions and characterize ecological functions in the shoreline jurisdiction. This will serve as the baseline against which the impacts of future development actions in the shoreline will be measured. The Guidelines require that the City demonstrate that its updated SMP yields "no net loss" in shoreline ecological functions relative to the baseline due to its implementation.

A list of potential information sources was compiled (Appendix A) and an information request letter was distributed to potential interested parties and agencies that may have relevant information (Appendix B). Collected information was supplemented with other resources such as City documents, scientific literature, personal communications, aerial photographs, internet data, and a brief physical inventory of the City's shorelines.

1.2 Shoreline Jurisdiction

As defined by the Shoreline Management Act of 1971, shorelines include certain waters of the state plus their associated "shorelands." At a minimum, the waterbodies designated as shorelines of the state are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater, lakes whose area is greater than 20 acres, and all marine waters. Shorelands are defined as:

"those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters

which are subject to the provisions of this chapter...Any county or city may determine that portion of a one-hundred-year-floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet therefrom... Any city or county may also include in its master program land necessary for buffers for critical areas (RCW 90.58.030)”

The northern portion of the City of Bonney Lake is located along the shoreline of Lake Tapps. Lake Tapps is approximately 4.5 square miles in size, and is therefore included in a classification of unique shorelines known as Shorelines of Statewide Significance. Fennel Creek exceeds the 20 cfs cutoff point after it leaves the main southern boundary of the City. However, the stream then briefly flows through a City owned parcel located on Rhodes Lake Road East (just downstream of Victor Falls). The entire jurisdiction assessment and determination process can be reviewed in greater detail in Appendix C of this report.

1.3 Study Area

The City of Bonney Lake is located in Pierce County, WA. The City encompasses approximately 5.5 square miles and is bordered nearly on all sides by unincorporated Pierce County jurisdiction, with a small shared border with Sumner along the northwest portion of the City. The City of Auburn is located generally north of Bonney Lake at the north end of Lake Tapps. Puyallup is located to the west, Buckley to the east, and Orting to the south. Only a portion of Lake Tapps is located in the City’s shoreline jurisdiction, while the remainder is located in unincorporated Pierce County. The upper portion of Fennel Creek passes through a substantial portion of the City, but as mentioned above, Fennel Creek does not meet the 20 cfs flow threshold (i.e. shoreline designation criteria) until further downstream, south of the main southern boundary of the City. Only briefly does the stream pass through the City owned parcel located on the south side of Rhodes Lake Road East. The study area for this report includes all land currently within the City’s proposed shoreline jurisdiction (Appendix C). The total area subject to the City’s updated SMP, not including aquatic area, is approximately 245 acres (0.38 square mile), and encompasses approximately 10.4 miles (54,761 feet) of shoreline.

2 CURRENT REGULATORY FRAMEWORK SUMMARY

2.1 City of Bonney Lake

The Shoreline Management Act of 1971 brought about many changes for local jurisdictions, including the City of Bonney Lake. The legislative findings and policy intent of the SMA states:

“There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, state, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines (RCW 90.58.020).”

While protecting shoreline resources by regulating development, the SMA is also intended to provide balance by encouraging water-dependent or water-oriented uses while also conserving or enhancing shoreline ecological functions and values. The SMP will be based on state guidelines, but tailored to the specific conditions and needs of individual communities. Considering that Lake Tapps is a Shoreline of Statewide Significance, the SMP will need to address specific management policies as listed in WAC 173-26-251 which gives preference to uses in the following order of preference which:

- (1) Recognize and protect the statewide interest over local interest;
- (2) Preserve the natural character of the shoreline;
- (3) Result in long term over short term benefit;
- (4) Protect the resources and ecology of the shoreline;
- (5) Increase public access to publicly owned areas of the shorelines;
- (6) Increase recreational opportunities for the public in the shoreline;
- (7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary."

The City's first Shoreline Master Program was adopted in 1975. The City has not subsequently updated the document other than minor revisions to the administrative provisions found separately in Chapter 16.08 (Shoreline Management) of the Municipal Code. Regulations applicable to critical areas which are located within shoreline jurisdiction underwent a comprehensive update in 2004, consistent with Growth Management Act requirements for use of "best available science." In those regulations, the City specified a stream buffer of 200 feet for Fennel Creek.

Most of the uses, developments, and activities regulated under the Critical Areas Regulations are also subject to the City's Comprehensive Plan, the Bonney Lake Municipal Code, the International Building Code, and various other provisions of City, State and federal laws. Any applicant must comply with all applicable laws prior to commencing any use, development, or activity. Bonney Lake will ensure consistency between the SMP and other City codes, plans and programs by reviewing each for consistency during periodic updates of the City's Comprehensive Plan as required by State statute.

2.2 State and Federal Regulations

State and federal regulations most pertinent to development in the City's shorelines include the federal Endangered Species Act, the federal Clean Water Act, the State Shoreline Management Act, and the State Hydraulic Code. Other relevant federal laws include the National Environmental Policy Act, Anadromous Fish Conservation Act, Clean Air Act, Coastal Zone Management Act, and the Migratory Bird Treaty Act. State laws which address shoreline issues include the Growth Management Act, State Environmental Policy Act, State Clean Water Act (RCW 90.48), tribal agreements and case law, Watershed Planning Act, Water Resources Act, Salmon Recovery Act, and the Water Quality Protection Act. A variety of agencies (e.g., U.S. Army Corps of Engineers, National Marine Fisheries Service, U.S. Fish and Wildlife Service, FEMA, Washington Department of Ecology, Washington Department of Fish and Wildlife) are involved in implementing these regulations, but review by these agencies of shoreline development in most cases would be triggered by in- or over-water work, discharges of fill or pollutants into the water, or substantial land clearing. Depending on the nature of the proposed development, State and Federal regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. With the comprehensive SMP update, the City will strive to ensure that Bonney Lake's SMP regulations are consistent with other State and Federal requirements and explore ways to streamline the shoreline permitting process. A summary of some of the key regulations and agency responsibilities follows.

Section 404: Section 404 of the federal Clean Water Act provides the Corps, under the oversight of the U.S. Environmental Protection Agency, with authority to regulate "discharge of dredged or fill material into waters of the United States, including wetlands" (http://www.epa.gov/owow/wetlands/pdf/reg_authority_pr.pdf). The extent of the Corps' authority and the definition of fill have been the subject of considerable legal activity. As applicable to the City of Bonney Lake's shoreline jurisdiction, however, it generally means that the Corps must review and approve most activities in streams, wetlands, and lakes. These activities may include lake or wetland fills, stream and wetland restoration, and culvert installation or replacement, among others. Similar to SEPA requirements, the Corps is interested in avoidance, minimization, restoration, and compensation of impacts.

Federal Endangered Species Act (ESA): Section 9 of the ESA prohibits "take" of listed species. Take has been defined in Section 3 as: "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The take prohibitions of the ESA apply to everyone, so any action of the City that results in a take of listed fish or wildlife would be a violation of the ESA and exposes the City to risk of lawsuit. Per Section 7 of the ESA, activities with potential to affect federally listed or proposed species and that either require federal approval, receive federal funding, or occur on federal land must be reviewed by the National Marine Fisheries Service

(NOAA Fisheries) and/or U.S. Fish and Wildlife Service (USFWS) via a process called “consultation.” Federally listed species are known to use Fennel Creek below Victor Falls, thereby placing them within shoreline jurisdiction. These species include Puget Sound Chinook (federally threatened), Puget Sound coho (federal species of concern), and possibly migratory bull trout (federally threatened).

Section 401 Water Quality Certification: Section 401 of the federal Clean Water Act allows states to review, condition, and approve or deny certain federal permitted actions that result in discharges to state waters, including wetlands. In Washington, the Department of Ecology is the state agency responsible for conducting that review, with their primary review criteria of ensuring that state water quality standards are met. Actions within streams, lakes or wetlands within the shoreline zone that require a Section 404 permit (see above), will also need to be reviewed by Ecology.

Hydraulic Code: Chapter 77.55 RCW (the Hydraulic Code) gives the Washington Department of Fish and Wildlife (WDFW) the authority to review, condition, and approve or deny “any construction activity that will use, divert, obstruct, or change the bed or flow of state waters.” As applicable to the City of Bonney Lake’s shoreline jurisdiction, however, it generally means that WDFW must review and approve most activities in any of the shoreline waterbodies. These activities may include pier and bulkhead repair or construction, stream alteration, and culvert installation or replacement, among others. WDFW can condition projects to avoid, minimize, restore, and compensate adverse impacts.

Instream Resources Protection Program-Puyallup River Basin, Water Resource Inventory Areas (WRIA) 10: WAC 173-510 applies minimum instream flow requirements to streams within the Puyallup River Basin (WRIA 10). This includes the White River, from which Lake Tapps receives diverted water. During periods of low stream flow in the White River, diversion to Lake Tapps may be decreased or stopped altogether. The purpose of this rule is to “retain perennial rivers, streams, and lakes in the Puyallup River basin with instream flows and levels necessary to provide protection for wildlife, fish, scenic-aesthetic, environmental values, recreation, navigation, and to preserve high water quality standards” (Ecology 1998).

3 ELEMENTS OF THE SHORELINE INVENTORY & SPECIFIC CONDITIONS

3.1 Introduction

Development of a shoreline inventory is intended to record the existing or baseline conditions upon which the development of shoreline master program provisions will be examined to ensure the adopted regulations provide no net loss of shoreline ecological functions. At a minimum, local jurisdictions shall gather the inventory elements listed in the Guidelines, to the extent information is relevant and readily available. Table 1 lists those relevant inventory elements in which data is available for the City’s shorelines. Areas of data gaps are listed in section 3.4. The table also describes the information collected for each of the required inventory elements. A list of inventory elements and the various data sources that were utilized for each element are provided in Appendix A. Figures depicting the various inventory pieces listed in Table 1 are provided in Appendix D (Figures 1-12).

Table 1. Shoreline Inventory Elements and Information Sources.

Inventory Element	Information Gathered	Data Sources	Appendix D Map
Existing Shoreline Environment Designations	Existing Shorelines	City GIS	Figure 1
Proposed Shoreline Jurisdiction	Shorelines, Wetlands, Floodways and Floodplains, City Boundary	City and County GIS, FEMA, Ecology	Figures 2-12
Land Use Patterns	Zoning and Comprehensive Plan Designations	City	Figures 2 and 3
Utilities	Surface/stormwater facilities, including streams	City and County	Figure 4
	Sanitary sewer	City and County	Figure 12
Impervious Surfaces	Roads, parking lots, & buildings	USGS	Figure 7

Inventory Element	Information Gathered	Data Sources	Appendix D Map
Shoreline Modifications	Piers/docks and other overwater structures (derived from aerial photo)	City	N/A ¹
	Armoring (derived from aerial photo)	City	N/A ¹
Public Access Areas	Waterfront parks and open spaces	City	Figure 10
Soils	Soil types	USDA NRCS (SSURGO)	Figure 11
Floodplains & Channel Migration Zones	Floodway, Floodplains; CMZ not applicable in City of Bonney Lake shoreline	County, FEMA	Figure 5
Transportation	Highways, arterials, local streets	City and County	various
Critical Areas	Streams	City, County, USDA NRCS, WDFW	Figure 4
	Wetlands, & habitat conservation areas	City, County, WDFW	Figures 6 and 9
	geologically hazardous areas	City and County	Figure 8
Areas of Special Interest	Priority Habitats and Species	WDFW	Figure 9
Water quality impairment	303(d)/305(b) waters and regulated sites	Ecology	N/A ²
Historical and Archeological Sites	Review of WISSARD	DAHP	N/A ³

¹ Inventory of shoreline modifications was performed via aerial photo interpretation. This was for quantification purposes only and did not include GIS data creation

² List of impaired waterbodies and corresponding impairment derived from Ecology website

³ Review of historical and archeological sites based on Washington Department of Archaeology & Historic Preservation. <https://fortress.wa.gov/dahp/wisaard/>

3.2 Assessment Unit Conditions

In order to break down the shoreline into manageable units and to help evaluate differences between discrete shoreline areas, the shorelines have been divided into assessment units based on waterbody, land use and ecological condition as follows and as illustrated on Figures 2-12 in Appendix D. The Lake Tapps assessment units are shown in Exhibit 1 below.

- Lake Tapps – Residential
- Lake Tapps – Park Facilities
- Lake Tapps – Printz Basin Flume
- Fennel Creek



Exhibit 1. City of Bonney Lake shoreline assessment units along Lake Tapps.

Table 2 expands upon the relevant above required inventory elements, providing specific detail and relevant data for each of the assessment units.

Table 2. Summary of Inventory by Assessment Unit.

Inventory Element	Shoreline Assessment Unit			
	Residential	Lake Tapps		Fennel Creek
		Park Facilities	Printz Basin	
Assessment Unit Dimensions	<ul style="list-style-type: none"> • 48,382.3 linear feet of shoreline frontage • 201.1 acres 	<ul style="list-style-type: none"> • 1727.4 linear feet of shoreline frontage • 9.7 acres 	<ul style="list-style-type: none"> • 3,362.4 linear feet of shoreline frontage • 27.7 acres 	<ul style="list-style-type: none"> • 1,289.2 linear feet of shoreline frontage • 6.8 acres
Zoning	<ul style="list-style-type: none"> • Residential (R-1) - 89% • Medium-Density Residential (R-2) - 9% • High-Density Residential (R-3) - 1% • Public Facilities (PF) – 1% • Single-Family Residential - 87% • Medium-Density Residential - 11% • High-Density Residential - 1% • Conservation/Open Space – 1% 	<ul style="list-style-type: none"> • Public Facilities – 74% • Residential – 26% 	<ul style="list-style-type: none"> • Residential (R-1) - 100% 	<ul style="list-style-type: none"> • Public Facilities - 100%
Comprehensive Plan	<ul style="list-style-type: none"> • Conservation/Open Space – 71% • Single Family Residential – 29% 	<ul style="list-style-type: none"> • Conservation/Open Space – 71% • Single Family Residential – 29% 	<ul style="list-style-type: none"> • Single-Family Residential - 100% 	<ul style="list-style-type: none"> • Public Facilities - 100%
Waterfront Parcels	465	9	1	1
Vacant Land	<ul style="list-style-type: none"> • 10.3 acres (25 parcels) • 2.3 acres (3 parcels) can be sub-divided 	N/A	N/A	N/A
Sub-dividable Land	<ul style="list-style-type: none"> • 9.4 acres (17 parcels) • 7.1 acres (14 parcels) are developed and 2.3 acres (3 parcels) are vacant 	N/A	N/A	N/A
Impervious Surface	33%	29%	2%	1%

Inventory Element	Shoreline Assessment Unit			
	Lake Tapps		Printz Basin	Fennel Creek
	Residential	Park Facilities		
Overwater Cover¹	<ul style="list-style-type: none"> • 516 piers, docks, or other structures • 5 lots w/o structures (1%) • ~83 boat canopies (18% of waterfront lots) 	<p>8 piers, docks, or other structures – includes swim enclosures</p>	No piers, docks, or other structures	NA
Shoreline Armoring²	<ul style="list-style-type: none"> • Not Armored: ~4,750 ft (10%) • Bulkhead: 90% • Boat Ramps: ~49 ramps (11% of waterfront lots) 	<ul style="list-style-type: none"> • Not Armored: ~1020 ft (59%) • Bulkhead: ~700 ft (41%) • Boat Ramps: 3 	<ul style="list-style-type: none"> • Not Armored - 100% 	NA
Stormwater Outfalls	15	1	0	0
Public Access	No formal physical public access, visual access from private properties and roadways	<ul style="list-style-type: none"> • Allan Yorke Park (public) • Church Lake Park (private) • Unnamed Inlet Island park (private) 	There are no public access opportunities.	There are no public access opportunities.
Critical Areas	<ul style="list-style-type: none"> • Wetlands – as percent of area (13%) • Floodplain – 10% • Geologically Hazardous Areas - 29% • Habitat Conservation Areas – 0% 	<ul style="list-style-type: none"> • Wetlands – 18% • Floodplain – 16% • Geologically Hazardous Areas - 0% • Habitat Conservation Areas – 54% 	<ul style="list-style-type: none"> • Wetlands – 25% • Floodplain – 8% • Geologically Hazardous Areas - 13% • Habitat Conservation Areas – 0% 	<ul style="list-style-type: none"> • Wetlands – 49% • Floodplain – 35% • Geologically Hazardous Areas - 85% • Habitat Conservation Areas – 0%
Listed Species	<ul style="list-style-type: none"> • None listed 	<ul style="list-style-type: none"> • None listed 	<ul style="list-style-type: none"> • None listed 	<ul style="list-style-type: none"> • Chinook salmon • Steelhead
Priority Habitat and Species	<ul style="list-style-type: none"> • Waterfowl Concentrations • Priority wetlands • Bald Eagle 	<ul style="list-style-type: none"> • Waterfowl Concentrations • Priority wetlands • Bald Eagle 	<ul style="list-style-type: none"> • Waterfowl Concentrations • Priority wetlands • Bald Eagle 	<ul style="list-style-type: none"> • Priority wetlands

Inventory Element	Shoreline Assessment Unit			
	Lake Tapps		Printz Basin	Fennel Creek
	Residential	Park Facilities		
Impaired Waters (303d/305b)	<ul style="list-style-type: none"> Invasive exotic species (Category 4C) Total Phosphorus (Category 1) 	<ul style="list-style-type: none"> Invasive exotic species (Category 4C) Total Phosphorus (Category 1) 	Invasive exotic species	N/A
Historical and Archeological Sites	Recorded artifacts ³	Recorded artifacts ³	None listed	None listed

¹ Assessment of overwater cover conducting using 2008 aerial photo. Digitized cover was not available in GIS.

² Assessment of shoreline armoring conducting using 2008 aerial photo. This assessment tallied the number of unarmored waterfront lots. Based on the total shoreline length and the number of waterfront parcels, an average length of 100 feet of water edge was estimated per lot.

³ Recorded artifacts along the Lake Tapps shoreline include lithic scatters and charcoal deposits. Documentation of harvest of anadromous fish and hunting of upland mammals also occurred on nearby streams and rivers (ESA 2007).

3.3 Opportunity Areas

Ecology's *Shoreline Master Program Guidelines* (173-26 WAC) includes the following definition:

"Restore," "Restoration" or "ecological restoration" means the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including but not limited to re-vegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions.

Consistent with Ecology's definition, use of the word "restore," or any variations, in this document is not intended to encompass actions that re-establish historic conditions. Instead, it encompasses a suite of strategies that can be approximately delineated into four categories: creation (of a new resource), restoration (of a converted or substantially degraded resource), enhancement (of an existing degraded resource), and protection (of an existing high-quality resource).

There is a critical distinction between restoration and mitigation. Mitigation will require applicants whose shoreline proposals will have adverse impacts to complete actions to mitigate those impacts or provide compensation in other ways for losses of ecological function. The City can encourage applicants to implement restoration actions that will improve ecological functions relative to the applicant's pre-project condition. As stated in WAC 173-26-201(2)(c):

It is intended that local government, through the master program, along with other regulatory and nonregulatory programs, contribute to restoration by planning for and fostering restoration and that such restoration occur through a combination of public and private programs and actions. Local government should identify restoration opportunities through the shoreline inventory process and authorize, coordinate and facilitate appropriate publicly and privately initiated restoration projects within their master programs. The goal of this effort is master programs which include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area of each city and county."

The Opportunity Areas discussions below present options for "restoration" that would improve ecological functions. For example, enhancement of riparian vegetation, reductions or modifications to shoreline hardening, minimization of in- and over-water structures, and improvements to fish habitat would each increase one or more ecological parameters of the City's shoreline. The City or City residents could implement these options voluntarily or, depending on specific project details, they could be required measures to mitigate adverse impacts of new shoreline projects.

3.3.1 Lake Tapps

Although Lake Tapps is geographically located in WRIA 10, it is disconnected from major waterways and salmon-bearing streams via the diversion flume in the City of Buckley (inlet) and the former Puget Sound Energy powerhouse channel (outlet). Otherwise, the lake is generally connected through localized effects of urbanization on watershed-level processes (e.g., generation and discharges of stormwater runoff, reduced groundwater recharge, deforestation, etc). As such, restoration opportunities on Lake Tapps are less about salmon conservation (as is common around the region) and more about water quality and habitat improvements for other terrestrial and aquatic wildlife.

Opportunities include:

- Collaborate on the removal of Eurasian milfoil and other invasive aquatic plants
- Remove non-native invasive terrestrial vegetation
- Enhance shoreline vegetation by planting native tree and shrub communities
- Encourage the joint-use of overwater structures
- Many residential (and some park) shoreline properties on Lake Tapps have the potential for improvement of ecological functions through: 1) reduction or modification of shoreline armoring, 2) reduction of overwater cover and in-water structures (grated pier decking, pier size reduction, pile size and quantity reduction, moorage cover removal), 3) improvements to nearshore native vegetative cover, and/or 4) reductions in impervious surface coverage

3.3.2 Fennel Creek

The Fennel Creek shoreline area will benefit most from continued preservation and protection.

3.4 Data Gaps

GIS information was not located or incomplete for the following parameters:

- Vegetative cover
- Shoreline modifications (digitized piers/docks and bulkheads)
- Toxic or hazardous material sites

Although information about each of the above items might help develop a fuller picture of shoreline conditions and processes, it is not expected that the absence of these items would have significant impacts on the selection of environment designations or the development of the SMP. Qualitative assessments of each component can be derived from aerial photo interpretation.

4 ANALYSIS OF ECOLOGICAL FUNCTIONS

4.1 Geographic and Ecosystem Context (WRIA 10)

The City of Bonney Lake is located in Pierce County in the Puget Sound Region, and contains freshwater shorelines associated with Washington State's Water Resource Inventory Area (WRIA) 10 – Puyallup-White River (Exhibit 2). The City's shorelines are more specifically located in the Lake Tapps Sub-basin (of the White River watershed) and the Fennel Creek Sub-basin (of the Puyallup River watershed). Characteristics for the White River Basin are described in the White River Basin Plan Characterization Report (Pierce County 2007). Additional characteristics for Lake Tapps as a whole are presented in the Draft Pierce County Inventory and Characterization Report (ESA 2007).

Lake Tapps, which was originally four small lakes, is now the largest lake/reservoir in Pierce County, totaling approximately 4.5 square miles in surface area (2,296 acres) and includes approximately 45 miles of shoreline. The City includes 9.5 miles of Lake Tapps shoreline frontage, resulting in 211 acres of shoreline jurisdiction area associated with the lake (includes the associated wetland complexes). An additional 27.7 acres of shoreline jurisdiction, including associated wetlands, is located along the Printz Basin.

Lake Tapps was formed in the early 1900's as a water reservoir for hydroelectric power generation by building nearly 2.5 miles of dikes and embankments around four small lakes. Water is diverted from the White River at a facility in the City of Buckley and then transported through a combination of flumes and open channels to Lake Tapps. Discharge from Lake Tapps enters back into the White River near the City of Sumner. Puget Sound Energy has recently ceased hydroelectric production in Lake Tapps and has sold the lake and the associated water right to the Cascade Water Alliance. Future lake operation (elevation and corresponding hydrograph) will be determined by Cascade Water Alliance (CWA) but coordinated through the Lake Tapps Community Council. Much like operations conducted during Puget Sound Energy's ownership, CWA plans to maintain higher water levels in the spring, summer and fall for recreational purposes. In late fall through winter, the lake levels are lowered to allow homeowners to repair and maintain docks and bulkheads and also to provide for dike maintenance/repair and control of milfoil.

In 2005, CWA and Pierce County entered into a Memorandum of Understanding (MOU) on management of Lake Tapps which outlines a coordinated effort for the long-term operation and management of Lake Tapps for public water supply and recreational purposes. CWA also works with the neighboring cities of Auburn, Buckley and Sumner to help assure all four cities of a consistent water supply for the next 50 years. The Washington State Department of Ecology is reviewing current information regarding the use of Lake Tapps as a municipal water supply.

Testing of Lake Tapps water quality by the Department of Ecology has found that the lake can be classified as oligotrophic (i.e. nutrient limited) but has recorded elevated levels of chlorophyll concentrations and hypolimnetic oxygen depletion which would indicate that the lake is more mesotrophic. (i.e. moderately productive) (Ecology 2006).

Within the southern portion of the City, shoreline jurisdiction includes a small segment of Fennel Creek, totaling ¼-mile, as it meanders through City owned property. The shoreline area for the stream is 6.8 acres. Fennel Creek is a tributary to the Puyallup River, and drains a total of approximately 11 square miles. Fennel Creek originates near the north side of SR-410 east of its intersection with 233rd Street East. The stream drains an area of various land uses including, agricultural, rural, and residential. Fennel Creek flows through several steep canyons before emptying into the Puyallup River.

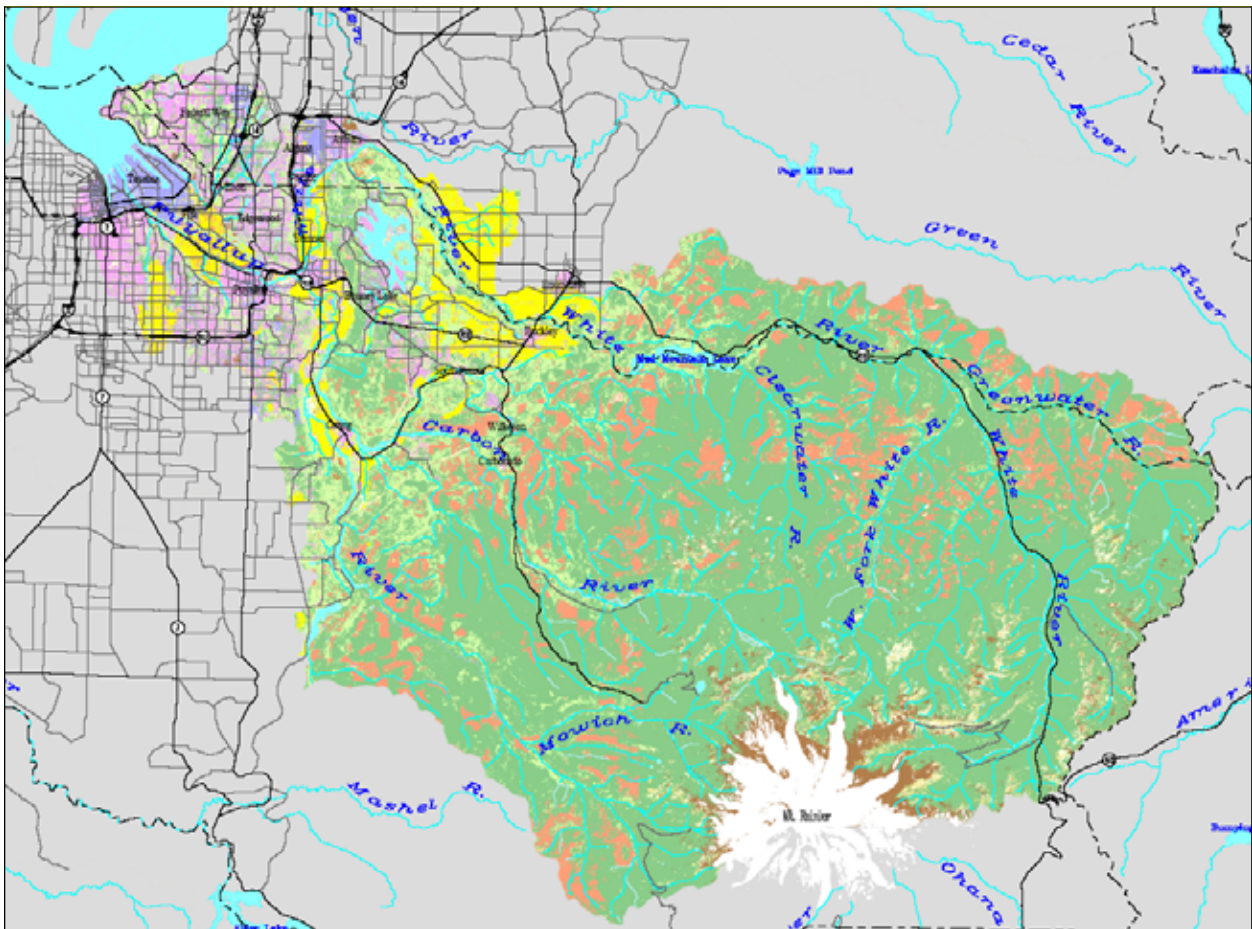


Exhibit 2. Puyallup-White River, Water Resource Inventory Area (WRIA) #10 (Department of Ecology).

4.2 Major Land Use Changes and Current Shoreline Condition

Bonney Lake incorporated as a City in 1949 with a population of 327. Soon, its popularity and natural beauty, combined with changing commuter habits, attracted

more and more residents, changing its character from that of a small town to that of a suburban community. By 2008 the City had grown to a population of approximately 16,800.

Single-family residences are the predominant land use within shoreline jurisdiction, as well as in the City as a whole. The housing stock is relatively new, with significant portions of the housing having been built in each of the subsequent decades since incorporation in 1949. Neighborhoods have developed at comparatively low densities, with typical lot sizes in excess of 10,000 square feet.

There is only one area in which single-family residences do not predominate. The corridor along SR-410 includes commercial and manufacturing areas as well as the City’s downtown core. The downtown area includes retail, offices, civic, parks and multi-family uses. However, no portion of this area is located within shoreline jurisdiction.

Around the City’s Lake Tapps shoreline, there are only 3 parks (1 public and two private) and one potential multi-family residential development located just north of Allan Yorke Park (Comprehensive Plan Designation of High Density Residential). While CWA operations of Lake Tapps as a water supply reservoir rather than former hydroelectric power generation may have some effect on the annual hydrograph, water levels are not expected to affect future land use changes. Regulations under the City’s SMP are also not likely to impact or regulate water withdrawal strategies by CWA. Future land use is discussed in greater detail in Section 5 of this report.

4.3 Analysis of Ecological Functions

Ecological processes and functions of the City of Bonney Lake’s shoreline areas are summarized in Tables 3 through 6. These tables are organized around the Department of Ecology’s list of processes and functions for freshwater lakes and streams. The list includes the evaluation of three major processes: 1) hydrologic; 2) vegetation; and 3) habitat. These are further broken down into the following functions which are in turn used to evaluate assessment unit performance:

Lake Functions	Stream Functions
<p>1. Hydrologic Functions</p> <ul style="list-style-type: none"> • Storing water and sediment • Attenuating wave energy • Removing excess nutrients and toxic compounds • Recruitment of large woody debris (LWD) and other organic material 	<p>1. Hydrologic Functions</p> <ul style="list-style-type: none"> • Storing water and sediment • Transport of water and sediment • Attenuating flow energy • Developing pools, riffles, and gravel bars • Removing excess nutrients and toxic compounds • Recruitment of LWD and other organic material
<p>2. Vegetative Functions</p> <ul style="list-style-type: none"> • Temperature regulation 	<p>2. Vegetative Functions</p> <ul style="list-style-type: none"> • Temperature regulation

Lake Functions	Stream Functions
<ul style="list-style-type: none"> • Water quality improvement • Attenuating wave energy • Sediment removal and bank stabilization • LWD and organic matter recruitment 	<ul style="list-style-type: none"> • Water quality improvement • Slowing riverbank erosion; bank stabilization • Attenuating of flow energy • Sediment removal • Provision of LWD and organic matter
<p>3. Habitat Functions</p> <ul style="list-style-type: none"> • Physical space and conditions for life history • Food production and delivery 	<p>3. Hyporheic Functions</p> <ul style="list-style-type: none"> • Removing excess nutrients and toxic compounds • Water storage and maintenance of base flows • Support of vegetation • Sediment storage
	<p>4. Habitat Functions</p> <ul style="list-style-type: none"> • Physical space and conditions for life history • Food production and delivery

Assessment of each function is based upon both quantitative data results derived from the GIS inventory information described in Chapter 3; a qualitative assessment based on aerial photography, field inventory (where possible); and existing assessment information prepared by such entities as the Pierce County’s Surface Water Management Division. As described in Chapter 3, the shoreline has been divided into broad assessment units based on waterbody, general land use, and ecological condition. In the ensuing tables, each assessment unit has been given an overall “rating” for ecological functions based on the available and relevant GIS information and the corresponding quantitative and qualitative evaluation. Rating was completed using a “low” to “high” function scale. The level categories are:

- Low (i.e. lowest quality functions)
- Low/Moderate
- Moderate
- Moderate/High
- High (i.e. highest quality functions)

4.3.1 Lake Tapps – Residential

The Lake Tapps – Residential assessment unit consists of those residential parcels located on Lake Tapps within the City’s jurisdiction. As indicated by the name of the unit, land use is entirely residential (primarily single-family), although there is one area of multi-family residential development within shoreline jurisdiction. The unit includes approximately 48,382 linear feet of shoreline – over 9 miles. Aerial oblique photographs (Exhibits 3 through 5) are from Ecology, taken in 2007. Water levels at the time the aerial

photos were taken are approximately three to four feet below the maximum summer elevation (USGS 2007).



Exhibit 3. Typical view of Lake Tapps shoreline – note high degree of armoring, high pier density (including covered moorage), and sparseness of shoreline vegetation.



Exhibit 4. View of west facing residential properties on Lake Tapps.



Exhibit 5. View of east facing residential properties on Lake Tapps.

Table 3. Function Summary of Lake Tapps – Residential

Lake Tapps – Residential	
Shoreline Processes and Functions within Assessment Unit	Alterations and Assessment of Functions
Hydrologic	
Storing water and sediment	LOW-MODERATE: The lake provides excellent water and sediment storage functions. However, the uplands surrounding the lake within shoreline jurisdiction have low water and sediment storage functions. Impervious surfaces (33% cover) and compact managed lawns interfere with infiltration of precipitation and rapidly send water “downstream.” Wetlands and other natural water and sediment storage features are generally lacking.
Attenuating wave energy	LOW-MODERATE: Bulkheading and other shoreline modifications have replaced native vegetation and natural woody debris as the features attenuating wave energy for approximately 90% of the shoreline length. Shoreline erosion is therefore not known to be a serious problem on the lake. Additionally, reduced lake levels during the winter months further reduce the potential for erosion.
Removing excess nutrients and toxic compounds	LOW: The lake is surrounded by intensively landscaped lakefront homes – only 5% of lots remain vacant. The upland shoreline areas are more often a source of nutrients and toxic compounds, via lawn treatment runoff (pesticides, fertilizers, herbicides), pet wastes, road and construction site runoff (hydrocarbons, metals, sediment), and septic systems. The lake is on Ecology’s 303d list for invasive exotic species (Category 4). Water quality studies conducted in 2004 and 2005 indicated phosphorous is the primary nutrient limiting algal growth, while nitrate and ammonia concentrations were relatively low (Pierce County 2007).
Recruitment of LWD and other organic material	LOW: Dense residential development and other upland modifications restrict the ability of this lake unit to recruit LWD and organic material.
Vegetation	
Temperature regulation	LOW: Lack of dense shoreline vegetation nearly eliminates potential for some shading of the shallow-water nearshore area. Vegetation is less effective at shading west- and south-facing shoreline areas due to afternoon sun from the southwest.
Water quality improvement	LOW: Residential areas surround the lake and are dominated by lawn and landscaping rather than dense buffers of native lakeside vegetation. These residential landscapes are sources of water quality contaminants such as fertilizers, herbicides and pesticides. In addition to the typical residential landscaping pollutants, runoff from surrounding urban areas carries hydrocarbons, metals, sediments, and other pollutants to the lake from roads, parking lots, and other developed areas. There are approximately 15 stormwater outfalls to the lake through this shoreline unit.

Lake Tapps – Residential Shoreline Processes and Functions within Assessment Unit		Alterations and Assessment of Functions
Attenuating wave energy		LOW: In its pre-buildout condition, the lake was ringed with mature mixed-forest communities. Those communities are now almost entirely absent around the lakeshore, so vegetation does not provide any significant wave attenuation function. As mentioned above, bulkheading up to 90% and other shoreline modifications have replaced native vegetation and natural woody debris as the features in place to reduce the effects of wave energy on uplands.
Sediment removal and bank stabilization		LOW: Under natural conditions, there would be an ongoing, underlying rate of shoreline erosion, which would contribute to maintaining substrate conditions. This rate would be partially determined and moderated by the presence of shoreline vegetation whose root systems would tend to hold bank material in place. Instead, the lake shore now has little shoreline vegetation and a large proportion of it is armored. While this “stabilizes” the banks, it limits natural recruitment of lakebed materials.
LWD and organic matter recruitment		LOW: Again, the loss of natural, forested shoreline vegetation and its replacement primarily with lawn and other types of landscaping has nearly eliminated LWD and organic matter recruitment potential along the lake shore. Any trees or LWD that enter the lake are likely to be quickly removed out of concern for safety or to reduce the risk of property damage.
Habitat		
Physical space and conditions for life history		LOW: Under natural conditions, the lake bottom would gradually rise in a shallow wedge such that incoming waves would roll up the bottom and onto the shore, losing energy. This reduced energy environment would be more hospitable to emergent vegetation, which further attenuates wave energy and provides a refuge for small fish and amphibians. Shallow nearshore areas in lakes typically provide rearing, foraging and migration habitat for fish. Shoreline armoring, however, generally reduces this low-energy shallow-water environment, creating a deeper, more turbulent nearshore area that is less hospitable to small fish and amphibians, as well as to emergent vegetation. Up to 90% of this shoreline unit is armored. The deeper water may also allow larger fish predators to prey on small fish. The absence of dense shoreline vegetation is a limiting factor in terrestrial species’ (birds, mammals, amphibians) use of the shoreline, since cover, food, nesting sites, travel corridors, etc. are limited or largely absent.
Food production and delivery		LOW: Food production from the uplands is limited by the lack of native seed- and fruit-bearing vegetation. This may be made up for, in part, by fruit trees and other non-native vegetation in yards which supplies some food for wildlife. Not only does native upland vegetation provide food directly for terrestrial wildlife, but it is a source of insects and other organic matter that drop into the water to provide food for fish and other aquatic life.

Lake Tapps – Residential	
Shoreline Processes and Functions within Assessment Unit	Alterations and Assessment of Functions
Summary	Accounting for the existing hydrologic, vegetative, and habitat conditions within the shoreline surrounding Lake Tapps (residential properties), the overall shoreline ecological function is considered LOW.

4.3.2 Lake Tapps – Park Facilities

There are a total of three park properties located on the shoreline of Lake Tapps within City jurisdiction, two of which are private. The lone public park, Allan Yorke Park, is located in the southwestern corner of Lake Tapps and includes approximately 700 feet of shoreline. The entirety of the shoreline is hardened with bulkheads. The park is bisected by West Tapps Highway East. Amenities on the eastern (waterward) portion of the park include a boat launch, fishing dock, and swimming areas. Upland amenities include ball fields, playgrounds, a skateboard park, tennis courts, and restrooms. The southernmost portion of the shoreline is owned by the Cascade Water Alliance (CWA), while the northern portion is owned by the City.

Church Lake Park is located just to the northeast of Allan Yorke Park. The park is made up of two parcels and includes approximately 800 feet of shoreline frontage. The park is not open to the public as it is commonly owned by nearby property owners. Park amenities include a basketball court, picnic areas, a boat launch and a dock.

The third and final park on Lake Tapps within City jurisdiction is located on the western shoreline of Inlet Island. The park is made up of four separate parcels, and just like Church Lake Park, is not open to the public. The park includes a volleyball court, playground, several buildings, a boat launch, two docks and an enclosed swimming area. The park includes a total of approximately 280 feet of shoreline frontage.

Aerial oblique photographs (Exhibits 6 through 8) are from Ecology, taken in 2007. Water levels at the time the aerial photos were taken are approximately three to four feet below the maximum summer elevation (USGS 2007).



Exhibit 6. View of the shoreline at Allan Yorke Park.



Exhibit 7. View of Church Lake Park (private).



Exhibit 8. View of the unnamed park on Inlet Island (private).

Table 4. Function Summary of Lake Tapps – Park Facilities

Lake Tapps – Park Facilities	
Shoreline Processes and Functions within Assessment Unit	Alterations and Assessment of Functions
Hydrologic	
Storing water and sediment	LOW-MODERATE: The lake provides excellent water and sediment storage functions. However, the uplands surrounding the lake within Shoreline jurisdiction have low water and sediment storage functions. Impervious surfaces (29%), compact managed lawns, and overall lack of native vegetation interfere with infiltration of precipitation and rapidly send water “downstream.” Wetlands and other natural water and sediment storage features are lacking.
Attenuating wave energy	MODERATE: Allan Yorke Park contains an armored shoreline with lawn or impervious surfaces and thus acts very similar to most of the residential areas along the lake. The other two private parks are both unarmored (based on aerial photos) and thus attenuate wave energy through natural gradient shorelines. In all cases, shoreline erosion is not known to be a serious problem on the lake. Additionally, reduced lake levels during the winter months further reduce the potential for erosion. Only 41% of the shoreline in this unit is armored.
Removing excess nutrients and toxic compounds	LOW: Park properties contain large areas of lawn and other landscaping. The upland shoreline areas are more often a source of nutrients and toxic compounds, via lawn treatment runoff (pesticides, fertilizers, herbicides), pet wastes, road and construction site runoff (hydrocarbons, metals, sediment), and septic systems. The lake is on Ecology’s 303d list for invasive exotic species (Category 4). Water quality studies conducted in 2004 and 2005 indicated phosphorus is the primary nutrient limiting algal growth, while nitrate and ammonia concentrations were relatively low (Pierce County 2007).
Recruitment of LWD and other organic material	LOW: The loss of natural, forested shoreline vegetation and its replacement primarily with lawn and other types of landscaping has nearly eliminated the ability of the lakeshore to recruit LWD and organic material.
Vegetation	
Temperature regulation	LOW: Lack of dense shoreline vegetation nearly eliminates potential for some shading of the shallow-water nearshore area. Vegetation is less effective at shading west- and south-facing shoreline areas due to afternoon sun from the southwest.
Water quality improvement	LOW: Park properties are dominated by lawn and landscaping rather than dense buffers of native lakeside vegetation. These landscapes can be sources of water quality contaminants such as fertilizers, herbicides and pesticides. In addition to the typical landscaping pollutants, runoff from surrounding urban areas carries hydrocarbons, metals, sediments, and other pollutants to the lake from roads, parking lots, and other

Lake Tapps – Park Facilities	
Shoreline Processes and Functions within Assessment Unit	Alterations and Assessment of Functions
Attenuating wave energy	<p>developed areas.</p> <p>LOW: Development of these park areas has removed most tree and shrub vegetation along the shoreline. Attenuation of wave energy is either performed by natural beach substrates (Church Lake Park or Inlet Island Park) or bulkhead (in the case of Allan Yorke Park), but not vegetation. Under natural conditions, shoreline vegetation would help attenuate wave energy through fallen woody debris or root structures along the shoreline edge. The absence of these conditions results in a LOW rating for the function even though wave energy might be attenuated by other circumstances.</p>
Sediment removal and bank stabilization	<p>LOW-MODERATE: Under natural conditions, there would be an ongoing, underlying rate of shoreline erosion, which would contribute to maintaining substrate conditions. This rate would be partially determined and moderated by the presence of shoreline vegetation whose root systems would tend to hold bank material in place. Instead, the lake shore now has little shoreline vegetation and a portion of it (Allan Yorke Park) is armored. While this “stabilizes” the banks, it limits natural recruitment of lakebed materials. Both Church Lake Park and Inlet Island Park have unarmored shorelines, but neither have substantial shoreline vegetation which contribute to sediment movement and stabilization.</p>
LWD and organic matter recruitment	<p>LOW: Again, the loss of natural, forested shoreline vegetation and its replacement primarily with lawn and other types of landscaping has nearly eliminated LWD and organic matter recruitment potential along the lake shore. Any trees or LWD that enter the lake are likely to be quickly removed out of concern for safety or to reduce the risk of property damage.</p>
Habitat	
Physical space and conditions for life history	<p>LOW/MODERATE: Under natural conditions, the lake bottom would gradually rise in a shallow wedge such that incoming waves would roll up the bottom and onto the shore, losing energy. This reduced energy environment would be more hospitable to emergent vegetation, which further attenuates wave energy and provides a refuge for small fish and amphibians. Shallow nearshore areas in lakes typically provide rearing, foraging and migration habitat for fish. Shoreline armoring, however, generally reduces this low-energy shallow-water environment, creating a deeper, more turbulent nearshore area that is less hospitable to small fish and amphibians, as well as to emergent vegetation. The deeper water may also allow larger fish predators to prey on small fish. The absence of dense shoreline vegetation is a limiting factor in terrestrial species’ (birds, mammals, amphibians) use of the shoreline, since cover, food, nesting sites, travel corridors, etc. are limited or largely absent.</p>
Food production and delivery	<p>LOW: Food production from the uplands is limited by the lack of native seed- and fruit-bearing vegetation.</p>

Lake Tapps – Park Facilities	
Shoreline Processes and Functions within Assessment Unit	Alterations and Assessment of Functions
	<p>This may be made up for, in part, by fruit trees and other non-native vegetation which supplies some food for wildlife. Not only does native upland vegetation provide food directly for terrestrial wildlife, but it is a source of insects and other organic matter that drop into the water to provide food for fish and other aquatic life.</p>
Summary	<p>Accounting for the existing hydrologic, vegetative, and habitat conditions within the shoreline surrounding Lake Tapps (Park Facilities), the overall shoreline ecological function is considered LOW.</p>

4.3.3 Lake Tapps - Printz Basin Flume

The Printz Basin Flume assessment unit consists of that portion of the Printz Basin Flume located within City jurisdiction. The White River is diverted into the flume at the Buckley Diversion Dam, approximately 8 miles upstream of Lake Tapps. The westernmost 1,400 feet of the flume is located within City limits.

The flume itself, as is the lake, is owned by the Cascade Water Alliance. Adjacent undeveloped properties to the north and south, upon which shoreline jurisdiction extends, are owned by Puget Sound Energy.

The unit includes approximately 3,362 linear feet (27.7 acres) of shoreline edge. Aerial oblique photographs (Exhibits 9 through 11) are from Ecology, taken in 2007. Water levels at the time the aerial photos were taken are approximately three to four feet below the maximum summer elevation (USGS 2007).



Exhibit 9. View of the Printz Basin Flume looking east. Printz Basin is visible in the distance.



Exhibit 10. View of the Printz Basin Flume as it flows into Lake Tapps.



Exhibit 11. View of the south side of the Printz Basin Flume, including associated wetland, as it flows into Lake Tapps.

Table 5. Function Summary of Printz Basin Flume.

Printz Basin Flume	
Shoreline Processes and Functions Occurring within Assessment Unit	Alterations and Assessment of Functions
Hydrologic	
Storage of water and sediment	LOW - MODERATE: The diversion flume carries water through a man-made channel along much of its length in the City. During high flows, the flume is contained within a bermed bank, and so the channel itself is designed to convey floodwaters. Several parts to the diversion flume (Printz Basin and Wickersham Basin) were designed as open areas for sediment deposition – neither of which is located in the City. Therefore, this portion of the diversion flume is not intended to store water or sediment, but rather convey this to the lake.
Transport of water and sediment	MODERATE: The flume has been formed through this area with the intention of conveying water and sediment into Lake Tapps and acting less like a sink. Although sediment deposition occurs throughout the diversion flume, it occurs more readily at the mouth of the flume into Lake Tapps.
Attenuating flow energy	MODERATE: The flume is designed less to attenuate flow energy as it is to convey water. However, in this area of the flume within the City of Bonney Lake, the channel is lined with vegetation that may act to reduce flow energy during high flow events. Recruitment of woody debris, especially LWD, may occur along the banks and also reduce energy. The Printz Basin, upstream of the City limits, includes a large open water area and associated wetland which serve to dampen and moderate stream flow fluctuations. Still, the decrease in channel roughness brought on by a reduction in accumulated woody debris and bank vegetation has reduced the stream channel's ability to absorb and dissipate stream flow energy.
Developing pools, riffles, and gravel bars	LOW/MODERATE: Reduction in roughness elements, via channelization and removal of LWD has resulted in a simpler channel form which is less conducive to the formation and maintenance of the basic habitat elements, including pools, riffles, and gravel point bars.
Removing excess nutrients and toxic compounds	MODERATE: Although the channelized flume is essentially cutoff from any large available floodplain, upland areas still provide a competent biofiltration function. However, the channel itself, due to its minimal length, reduced roughness, and linear flow, offers little ability to remove nutrients and toxic compounds.
Recruitment and transport of LWD and other organic material	MODERATE/HIGH: Streambank forest vegetation remains in-tact along much of the channel in the City, potentially allowing and contributing to recruitment and transport of LWD and organic material. However, a floating boom, located at the mouth of the lake, captures most of this floating debris and thus transport of this material to the lake is diminished.
Vegetation	

Alterations and Assessment of Functions	
Printz Basin Flume	Shoreline Processes and Functions Occurring within Assessment Unit
Temperature regulation	<p>MODERATE/HIGH: Well-vegetated banks and buffers improve shading conditions, in turn benefiting both temperature and dissolved oxygen. Although this section of the Printz Basin Flume is linear, the forested community along the banks provides shade along the majority of the channel length.</p>
Water quality improvement	<p>MODERATE: The linear channel offers less opportunity to improve water quality than a natural flowing sinuous channel. However, streambank vegetation along the flume, which consists of a mixed forest/shrub community, likely provides good water quality benefits to the aquatic environment.</p>
Slowing riverbank erosion; bank stabilization	<p>MODERATE/HIGH: Although the flume channel is man-made with high berms, the forested vegetation community provides additional stability to the banks, thereby reducing erosion.</p>
Attenuation of flow energy	<p>LOW/MODERATE: (As stated above), the decrease in channel roughness due to a reduction in accumulated woody debris and channel straightening has reduced the channel's ability to absorb and dissipate stream flow energy. In-water or bank vegetation provides more stability rather than flow attenuation.</p>
Sediment removal	<p>LOW/MODERATE: As stated above, the linear channel and lack of a truly active floodplain greatly diminishes the ability of shoreline vegetation to function properly. This includes the lack of sediment removal. Under more natural stream and floodplain conditions, vegetation would act to reduce flow energy and thus allow for sediment to settle out.</p>
Provision of LWD and organic matter	<p>MODERATE/HIGH: Shoreline vegetation along this flume section is dense, consisting of a mix of tree and shrub cover. Opportunities for LWD and organic matter to be introduced into the aquatic environment are high. However, the presence of a floating boom at the mouth to Lake Tapps reduces the likelihood that large material would reach the lake.</p>
Hyporheic	
Removing excess nutrients and toxic compounds	<p>MODERATE: The soils in this portion of the stream are generally poorly drained (Buckley loam – tends to be hydric) having been formed from Osceola mudflows. Given that the flume channel was man-made and not historically present to contribute to the development of a hyporheic zone, it is unlikely that the Printz Basin flume hyporheic zone performs any significant removal of excess nutrients or toxic compounds.</p>
Water storage and maintenance of base flows	<p>MODERATE: As above, the existing soils are not likely conducive to significant hyporheic flow, limiting the potential for water storage and base-flow maintenance.</p>

Printz Basin Flume	
Shoreline Processes and Functions Occurring within Assessment Unit	Alterations and Assessment of Functions
Support of vegetation	MODERATE: Though hyporheic flow is likely limited given the above conditions, the riparian vegetation adjacent to the flume channel likely benefits from the close association with hyporheic water storage.
Habitat	
Physical space and conditions for life history	MODERATE: Habitat in and along the Printz Basin flume varies. Although the vegetative community in the upland shorelands provides extensive habitat for terrestrial species (accumulated downed wood and snags, resulting in places for various wildlife species to find cover or suitable nesting and rearing sites), the aquatic environment provides much less complexity. Within the channel itself, less wood overall similarly results in less available protective cover, and diminishes the creation of pool/riffle sequences as well. The lack of side channels, backwaters and sinuosity has limited the amount of valuable edge habitat available, and further reduced overall complexity.
Food production and delivery	MODERATE/HIGH: Food production from upland areas is fairly good with native seed- and fruit-bearing vegetation. Not only does such vegetation provide food directly for terrestrial wildlife, but it is a source of insects and other organic matter that drops into the water and provide food, either directly or indirectly, for fish and other aquatic life.
Summary	
Accounting for the existing hydrologic, vegetative, hyporheic, and habitat conditions within the Printz Basin, the overall shoreline ecological function is considered MODERATE.	

4.3.4 Fennel Creek

The Fennel Creek assessment unit consists of that portion of Fennel Creek that flows through City owned property just south of Rhodes Lake Road East (Exhibit 12). The parcel, approximately 9.7 acres in size, is completely surrounded by areas of unincorporated Pierce County, with the nearest areas of City jurisdiction located approximately 500 feet northwest of the parcel. Victor Falls, an 80-foot-high waterfall on Fennel Creek, is located just upstream of the City property. Fennel Creek is a perennial stream whose headwaters are located near the north side of SR-410 east of its intersection with 233rd Street East. The entire Fennel Creek Sub-basin drains approximately 11 square miles, of which three square miles are located within Bonney Lake. Victor Falls presents a fish passage barrier to anadromous fish attempting to migrate up Fennel Creek. Below the falls, and therefore on City property, Fennel Creek contains steelhead, coho, Chinook, and possible bull trout.

The City owned property, through which Fennel Creek passes is the location of the Victor Falls Springs, one of four wells from which the City draws its water. The City has assessed each of the four wells and determined that Victor Falls Springs is the least safe of the four due to its close proximity to nearby septic systems. However, nitrate levels at the well do not exceed the State Board of Health's maximum contaminant level.

The unit includes approximately 1,289.2 linear feet of shoreline.

Table 6. Function Summary of Fennel Creek.

Fennel Creek	
Shoreline Processes and Functions Occurring within Assessment Unit	Alterations and Assessment of Functions
Hydrologic	
Storage of water and sediment	<p>MODERATE/HIGH: Fennel Creek, below Victor Falls and within the City's shoreline jurisdiction, flows through a fairly wide and steep riparian ravine consisting of a mixed forested vegetative community. A narrow adjoining floodplain and riparian wetland areas contribute to this creek's ability to store water and sediment during high flow events. Although narrow at times, the creek is able to spread out across its floodplain during high flows, and so the floodplain is still able to store and attenuate flood flows and trap and store fine sediments. These fine sediments are incorporated into the floodplain topsoil to nourish vegetative growth, in turn supporting wildlife habitat.</p>
Transport of water and sediment	<p>MODERATE: The stream corridor has largely been undisturbed in this reach as it remains in protected City ownership for well water supply. However, increased development in the upper basin has likely altered the flow regime and the sediment transport capacity through this reach. This system may be less sensitive to such alterations, given that it is located just below Victor Falls.</p>
Attenuating flow energy	<p>MODERATE/HIGH: As mentioned above, this reach has largely remained undisturbed, with little floodplain encroachment. Riparian vegetation is well-established and generally abundant, providing energy attenuation during overbank flows.</p>
Developing pools, riffles, and gravel bars	<p>MODERATE/HIGH: Riparian vegetation is generally good, and includes a mix of deciduous and coniferous cover, thus contributing to LWD in the channel and the development of pools and riffles.</p>
Removing excess nutrients and toxic compounds	<p>MODERATE: Dense vegetation in the riparian wetland and floodplain areas provide a competent biofiltration function. These areas buffer the stream channel on this City-owned parcel and remove nutrients and toxics that may come from areas outside of shoreline jurisdiction. However, the soils (Xerochrepts 45 to 70 percent slope) are highly susceptible to slope failure, have high rates of runoff, and generally do not support a long-standing conifer community.</p>
Recruitment and transport of LWD and other organic material	<p>MODERATE/HIGH: Streambank forest vegetation remains in-tact along much of the creek both in and outside of the City's jurisdiction. This allows for potential recruitment and transport of LWD and organic material.</p>
Vegetation	
Temperature regulation	<p>MODERATE/HIGH: Well-vegetated banks and buffers improve shading conditions, in turn benefiting both temperature and dissolved oxygen. The combination of a well-established and maturing forest in the</p>

Fennel Creek	
Shoreline Processes and Functions Occurring within Assessment Unit	Alterations and Assessment of Functions
	<p>shoreline/buffer areas, steep sloped ravine, and a relatively narrow active channel during low-flow periods results in excellent shade being provided to the stream.</p> <p>MODERATE/HIGH: Riparian and flood plain areas are intact and well-forested, resulting in good biofiltration function. However, for fine sediments and pollutants originating from farther upstream, shoreline vegetation can only be effective at removing pollutants when stream flow is made to come in direct contact with the vegetation, which happens most effectively during flood events. Under low-flow conditions, there is less direct contact between the stream flow and the riparian vegetation, so considerably less biofiltration can occur. Water quality evaluations for Fennel Creek in 2006 by Pierce County rated the creek as Fair on the Benthic Index of Biotic Integrity (BIBI).</p> <p>MODERATE/HIGH: The well-forested stream banks provide good bank stabilization with streambank erosion occurring at rates consistent with well-functioning natural processes. However, the upper slopes of the ravine remain relatively unstable with high runoff rates and severe erosion hazards.</p> <p>HIGH: As mentioned above, this reach has largely remained undisturbed, with little floodplain encroachment. Riparian vegetation is well-established and generally abundant, providing energy attenuation during overbank flows. Complex flow patterns through areas of riparian wetlands and accumulated woody debris during flood events provide a rough channel, enhancing the stream's ability to absorb and dissipate flow energy.</p> <p>MODERATE/HIGH: Densely-vegetated forest vegetation, along with its associated leaf litter and forest duff, effectively filters and retains fine sediments. However, as mentioned above, the highly erodible soils of the forested ravine may contribute sediment inputs to the channel.</p> <p>HIGH: In contrast with most areas in the region, opportunity for the recruitment of large woody debris is good due to the forested condition and sloped ravine, and should improve further as the forest continues to mature. There are also good opportunities for the recruitment of small-to-medium woody debris and leaf litter that contribute to a decomposition-based food chain.</p>
Water quality improvement	<p>MODERATE: The soils in this portion the Fennel Creek shoreline are moderately well drained to somewhat excessively drained glacial till. Permeability varies but runoff tends to be very rapid. Given these conditions, the hyporheic zone is expected to be rather narrow, composed of the mapped floodplain area. The coarse substrate tends to be well drained, thus a higher likelihood that the hyporheic zone contributes to the removal of excess nutrients and toxic compounds.</p>
Slowing riverbank erosion; bank stabilization	
Attenuation of flow energy	
Sediment removal	
Provision of LWD and organic matter	
Hyporheic Removing excess nutrients and toxic compounds	

Fennel Creek	
Shoreline Processes and Functions Occurring within Assessment Unit	Alterations and Assessment of Functions
Water storage and maintenance of base flows	<p>MODERATE: Although the soils within this stretch of Fennel Creek likely contribute to water storage in the hyporheic zone, the area of available storage is minimized due to the steep ravine through which Fennel Creek flows.</p> <p>MODERATE: The glacial till that tend to be present in the hyporheic zone can be so well-draining and poor at wicking water upward that plants growing above these gravelly soils can be deprived of water even when an active water table is near the surface. However, the presence of a dense forested community is evidence that vegetation can be readily supported throughout this reach.</p>
Support of vegetation	<p>MODERATE: The glacial till that tend to be present in the hyporheic zone can be so well-draining and poor at wicking water upward that plants growing above these gravelly soils can be deprived of water even when an active water table is near the surface. However, the presence of a dense forested community is evidence that vegetation can be readily supported throughout this reach.</p>
Habitat	
Physical space and conditions for life history	<p>HIGH: Though second-growth, the forest community provides habitat of good quality and complexity and in good quantity for fish and wildlife. The vegetation is complex and maturing, with accumulating downed wood and snags, resulting in more places for various wildlife species to find cover or suitable nesting and rearing sites. This increase in dense shoreline vegetation increases the quantity and quality of habitat available for use by terrestrial species (birds, mammals, amphibians) since cover, food, nesting sites, travel corridors, etc. are available and functioning.</p> <p>Within the stream channel itself, an increase in logs and overall wood similarly results in more available protective cover, the creation of pool/riffle sequences, and an increase in habitat complexity as described above. Shallow, low-energy aquatic areas provide critical rearing, foraging, and refuge habitat for amphibians and juvenile fish, particularly salmonids. Below Victor Falls, Chinook and coho salmon as well as steelhead, are present.</p> <p>MODERATE/HIGH: The forest community along this portion of Fennel Creek should provide the food production that native wildlife are adapted to, including native seed- and fruit-bearing vegetation from wetland, floodplain, and upland areas. Not only does such vegetation provide food directly for terrestrial wildlife, but it is a source of insects and other organic matter that drops into the water and provide food, either directly or indirectly, for fish and other aquatic life.</p> <p>Accounting for the existing hydrologic, vegetative, hyporheic, and habitat conditions within the Fennel Creek shoreline, the overall shoreline ecological function is considered MODERATE/HIGH.</p>
Food production and delivery	<p>MODERATE/HIGH: The forest community along this portion of Fennel Creek should provide the food production that native wildlife are adapted to, including native seed- and fruit-bearing vegetation from wetland, floodplain, and upland areas. Not only does such vegetation provide food directly for terrestrial wildlife, but it is a source of insects and other organic matter that drops into the water and provide food, either directly or indirectly, for fish and other aquatic life.</p> <p>Accounting for the existing hydrologic, vegetative, hyporheic, and habitat conditions within the Fennel Creek shoreline, the overall shoreline ecological function is considered MODERATE/HIGH.</p>
Summary	
<p>Accounting for the existing hydrologic, vegetative, hyporheic, and habitat conditions within the Fennel Creek shoreline, the overall shoreline ecological function is considered MODERATE/HIGH.</p>	

5 LAND USE ANALYSIS AND IMPLICATIONS

5.1 Introduction

Land use patterns are an important consideration in SMP analysis because such analysis can identify opportunities for “preferred uses”, especially water-dependent, water-related and water-enjoyment uses. Land uses adjacent to the water are also a determinant in assigning environment designations to specific sections of the shoreline. Additionally, an analysis of land use conditions is necessary to determine potential land use changes and their effect on shorelines with respect to SMA objectives. Finally, the existing land uses and proposed environment designation boundaries and provisions must be mutually consistent with the City’s comprehensive plan.

As part of SMP development, the shoreline is to be classified into specific shoreline environment designations based upon existing land use patterns, baseline inventory results, goals stipulated in the City’s Comprehensive Plan, and Ecology criteria. Allowed uses, conditional uses, and prohibited uses will be defined for each designation. Ecology Guidelines include six recommendations for shoreline environment designations (listed below). However, each jurisdiction may use alternate or parallel environment designations, as appropriate, as long as they provide equal or better protection than the standard.

Ecology Recommendations

- Natural
- Urban Conservancy
- Rural Conservancy
- Aquatic
- High Intensity
- Shoreline Residential

This section of the Analysis Report examines conditions of Bonney Lake shorelines with respect to potential environment designation criteria and potential use provisions to meet SMP objectives

5.2 Assessment Unit Conditions

This section examines the data gathered in the inventory and describes for each assessment unit the (1) likely future land uses and activities, and (2) implications for shoreline management (Table 7). Likely or appropriate environment designations are listed for each assessment unit.

Table 7. Likely changes in land use and implications for shoreline management.

Reaches	Likely Changes in Land Use	Implications for Shoreline Management
Lake Tapps		
Residential	A majority of this reach is designated Single-Family Residential in the Comprehensive Plan and zoned R1 Single-Family, which allows single-family housing at a density of 4-5 net dwelling units per acre. There are a few areas that are designated Medium Density Residential in the Comprehensive Plan and are zoned R2 Medium Density Residential, which allows 5 - 9 dwelling units per acre. There is one area in the southwest portion of the lake that is designated High Density Residential and is zoned R3 High Density Residential, which allows 20 dwelling units per acre. A majority of these parcels are built out and are not likely to change use. Approximately 25 parcels within shoreline jurisdiction are vacant and have the potential to develop. Some redevelopment of existing housing stock may occur, but a majority of the housing stock has been built in the last few decades.	Shoreline Residential appears to be the most appropriate environment designation for the areas zoned R1 and R2 and Shoreline Residential – Multifamily appears to be the most appropriate environment designation for the areas zoned R3. While these areas are all in residential use, it is important to distinguish between single-family uses and multifamily uses because single-family is a preferred use in the SMA while multifamily development is not a preferred use, so the policies and regulations will be different.
Parks and Open Space	The parks and open spaces located within shoreline jurisdiction are designated Conservation/Open Space in the Comprehensive Plan and are generally zoned Public Facilities. (See Section 6.2 for a more detailed description of the parks.)	Urban Conservation – Open Space appears to be the most appropriate environment designation for these areas.
Printz Basin	The area of Printz Basin within shoreline jurisdiction is designated Single-Family Residential and is zoned R-1 Single Family residential, but is undeveloped and vegetated.	Urban Conservancy or Natural appears to be the most appropriate environment designation for this area.
Fennel Creek		
Fennel Creek	The area of Fennel Creek in shoreline jurisdiction is designated Public Facility and is zoned Public Facility. It is undeveloped and vegetated	Natural appears to be the most appropriate environment designation for this area.

6 PUBLIC ACCESS ANALYSIS AND IMPLICATIONS

6.1 Introduction

Public access includes the ability of the general public to reach, touch, and enjoy the water's edge, to travel on the waters of the state, and to view the water and the shoreline from adjacent locations.

WAC 173-26-221(4)(c) states that:

“Local governments should plan for an integrated shoreline area public access system that identifies specific public needs and opportunities to provide public access... This planning should be integrated with other relevant comprehensive plan elements, especially transportation and recreation.”

To support this planning, WAC 173-26-201(3)(c) calls for local governments to inventory existing and potential shoreline public access sites, including public rights-of-way and utility corridors. Because shoreline access includes visual access, important views of the water from shoreline areas were also identified.

Information about public access sites in the City was drawn from site visits, aerial photographs, the City's Comprehensive Plan Parks Element, the City's Park and Recreation Department staff and websites, and the City's and County's land use and parks maps.

6.2 City Parks

6.2.1 Allan Yorke Park

Allan Yorke Park is 33.92 acres and is located at the South end of Lake Tapps, at the intersection of Bonney Lake Boulevard and West Tapps Hwy. The available recreational uses at the park include ball fields, a boat launch, fishing dock, playgrounds, skateboard park, in-lake swimming areas, and tennis courts. Amenities include concessions, restrooms and water fountains. Future work will likely include trail or sidewalk connections to off-site parking areas located to the southeast in order to improve access to the shoreline.

Additionally, the lot to the north of Allan Yorke Park is planned for multi-family development. As conditioned with the approved permit, this development would include dedicating the immediate shoreline east of West Tapps Hwy to the City.

6.2.2 Church Lake Park

Church Lake Park is a 1.9 acre private park located on Lake Tapps used for recreational use. It includes a boat ramp, swimming enclosure in the lake, children’s play area, picnic space, and volleyball court. No change in use is anticipated for the future.

6.2.3 Inlet Island Park

Inlet Island Park is a 1.5 acre private park located on Inlet Island on Lake Tapps used for recreational uses. The park includes a boat ramp, swimming enclosure in the lake with floating swim dock, picnic facilities, play area, and tennis, basketball, and volleyball courts. No change in use is anticipated for the future.

6.3 Trails

6.3.1 Future Fennel Creek Trail

The City developed the Fennel Creek Trail Plan in 2007 to create a trail that follows Fennel Creek and would eventually connect to the portion of Fennel Creek in shoreline jurisdiction.

According to the plan, the Fennel Creek Trail will connect Allan Yorke Park to the Foothills Trail and the future Pierce County Flume Trail. The City of Bonney Lake will develop the portion within the city limits (approximately 5.2 miles) from Allan Yorke Park to Victor Falls, toward Foothills Trail, and to 214th Ave. E. – toward the Flume Trail. The trail will parallel the creek within the creek buffer to allow trail users to experience the sights and sounds of the woodlands and pastoral scenes along the creek corridor. Some of this corridor is currently in City or other public ownership. Much of it, however, is under private ownership. As such, the trail route must be developed over time as private property is purchased - or is acquired through the City’s subdivision approval process. Until trail property is acquired, the initial sections of the trail will be connected using existing public right-of-way as “short-term links”. To that end, sidewalks will need to be built along some of the streets.

6.4 Public Access Implications

The City only provides one public access and recreation site along Lake Tapps and should therefore continue to pursue opportunities to add new public access and recreation sites along the lake. The City should pursue opportunities for purchasing vacant parcels along the lake and the possibility of developing small public access sites. While the private parks provide access for residents along the lake, these private sites cannot replace the need for public access sites. Other than the potential expansion of Allan Yorke Park as described above, the City has not identified new opportunities for public access sites along Lake Tapps.

The City's Comprehensive Plan does identify the need for additional neighborhood parks, but according to the Level of Service standards used for the Comp Plan, the currently underserved areas are not within shoreline jurisdiction. The City should consider reevaluating this needs assessment with shoreline public access in mind.

Fennel Creek does not currently have public access in the area within shoreline jurisdiction, so the City should continue to work to implement the Fennel Creek Trail Plan.

7 SHORELINE MANAGEMENT RECOMMENDATIONS

The following are recommended actions for translating inventory and characterization findings into the draft SMP policies, regulations, environment designations, and restoration strategies for areas within shoreline jurisdiction. While CWA operations of Lake Tapps as a water supply reservoir rather than former hydroelectric power generation may have some effect on the annual hydrograph, water levels are not expected to affect future land use changes. Regulations under the City's SMP are also not likely to impact or regulate water withdrawal strategies by CWA.

7.1 Shoreline Master Program

7.1.1 Shoreline Environment Designation Provisions

- Recommendations for specific shoreline segments are discussed in section 5.0.

7.1.2 General Policies and Regulations

Shorelines of Statewide Significance

- Considering that Lake Tapps is a Shoreline of Statewide Significance, the SMP will need to address specific management policies as listed in WAC 173-26-251 which gives preference to uses in the following order of preference which:

- (1) Recognize and protect the statewide interest over local interest;
- (2) Preserve the natural character of the shoreline;
- (3) Result in long term over short term benefit;
- (4) Protect the resources and ecology of the shoreline;
- (5) Increase public access to publicly owned areas of the shorelines;
- (6) Increase recreational opportunities for the public in the shoreline;

- (7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary."

Critical Areas

- Consider whether the City's critical areas regulations should be incorporated into the SMP by reference or through direct inclusion (WAC 173-26-191).
- Maintain a 200-foot buffer on Fennel Creek to the extent consistent with existing conditions and the objectives of the Shoreline Management Act.

Flood Hazard Reduction

- Consider how to incorporate the various options developed by FEMA and others during development of the strategy for responding to National Marine Fisheries Service Biological Opinion evaluating FEMA's National Flood Insurance Program.

Public Access

- Work with the Community Services Department to identify potential locations for new public access sites and to identify improvements to increase the quality of existing public access to shorelines throughout the City.

Vegetation Conservation

- Establish appropriate residential setbacks on Lake Tapps, recognizing the existing conditions and potential for providing improved shoreline vegetation as part of setback modification options.
- Encourage through policy and regulation the control of invasive or noxious vegetation, including aquatic vegetation found in Lake Tapps. Coordinate with Pierce County Surface Water Management and Washington Department of Fish and Wildlife regarding preferred and effective aquatic vegetation removal mechanisms.

Water Quality, Stormwater, and Nonpoint Pollution

- Include policies and regulations that appropriately incorporate recommendations of the City's and County's water quality-related studies, particularly as related to impaired parameters listed by Ecology or outcomes of the NPDES Municipal Stormwater Permit requirements.
- Ensure that regulations allow for placement of any water quality-related structures or facilities in shoreline jurisdiction, including in the Aquatic environment.

- Consider whether special stormwater management provisions may be necessary beyond the standard City requirements contained in the adopted Ecology Stormwater Management Manual for Western Washington.

7.1.3 Shoreline Modification Provisions

Shoreline Stabilization

- Ensure “replacement” and “repair” definitions and standards are consistent with WAC 173-26-231(3)(a). Repair activities should be defined to include a replacement threshold so that applicants and staff will know when “replacement” requirements need to be met.

Piers and Docks

- Provide clear dimensional standards for new piers and replacement/modified piers for private residential use. Coordinate with Washington Department of Fish and Wildlife to ensure that standards are consistent with current agency practice on the lake.

Fill

- Restoration fills should be encouraged, including improvements to shoreline habitats, material to anchor LWD placements, and as needed to implement shoreline restoration.

Breakwaters, Jetties, Groins and Weirs

- Except for purposes of shoreline restoration (or possibly as part of flood hazard reduction), consider prohibiting these modifications.

Shoreline Habitat and Natural Systems Enhancement Projects

- The SMP should include incentives to encourage restoration projects, particularly in areas identified as having lower function. Emphasize that certain fills can be an important component of some restoration projects.

7.1.4 Shoreline Uses

Agriculture

- Consider prohibiting this use and removing it from this section.

Aquaculture

- Consider prohibiting this use and removing it from this section.

Boating Facilities

- Develop appropriate standards for community and public-access related overwater structures.

Commercial Development

- Consider prohibiting this use and removing it from this section.

Forest Practices

- Provide general policies and regulations for forest practices according to the WAC Guidelines.

Industry

- Consider prohibiting this use and removing it from this section.

Mining

- Consider prohibiting this use and removing it from this section.

Recreational Development

- Work with the Community Services Department and other entities that may own park land to identify issues related to park development. Park lands provide many opportunities for shoreline restoration and can serve as demonstration projects to the greater public. Policies and regulations related to parks management should provide clear preferences for shoreline restoration consistent with public access needs and uses. Existing natural parks should be protected and enhanced.
- In addition, ensure that water-dependent and water-oriented uses are given priority in parks over other uses.

Residential Development

- Address building setbacks, shoreline armoring, piers and docks, and vegetation conservation for residential properties. Developed lakes, such as Lake Tapps, have been impacted by nearshore vegetation removal, shoreline armoring, and piers. The SMP should consider developing regulations that encourage or require shoreline restoration when specific new development or redevelopment activities are proposed. A standard buffer and/or setback should be developed, with an aggressive but practical list of buffer/setback reduction options that would result in a net improvement in shoreline functions. These might include removal of bulkheads, shoreline plantings, landscape chemical reduction or elimination, and removal of other nearshore impervious surfaces, among others.
- Include a policy to educate waterfront homeowners about the use of fertilizers and chemicals and encourage natural lawn care and landscaping methods to reduce chemical output into surrounding shorelines.

- Encourage low impact development techniques that reduce impervious surface areas and use of ecologically responsible stormwater management.

Transportation/Parking and Utilities

- Include provisions for public transportation and utilities development in the shoreline jurisdiction. There are some roadways in SMA jurisdiction. Goals, policies and regulations for these activity types should require careful consideration of short-term and long-term impacts on shoreline functions and processes, particularly in their management of stormwater runoff, shoreline hardening and potential for generating a later need for shoreline hardening, and placement of in-water structures which can affect flows and substrates, among others.

7.2 Restoration Plan

A Restoration Plan document will be prepared as a later phase of the Shoreline Master Program update process, consistent with WAC 173-26-201(2)(f). The Shoreline Restoration Plan must address the following six subjects (WAC 173-26-201(2)(f)(i-vi)) and incorporated findings from this analysis report:

- (i) *Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;*
- (ii) *Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;*
- (iii) *Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;*
- (iv) *Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;*
- (v) *Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and*
- (vi) *Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.*

The Restoration Plan will “include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions

should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program.” The Restoration Plan will mesh potential projects identified in this report with additional projects, regional or City-wide efforts, and programs of the City, watershed groups, and environmental organizations that contribute or could potentially contribute to improved ecological functions of the shoreline.

8 REFERENCES

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9 LIST OF ACRONYMS AND ABBREVIATIONS

CAO	Critical Areas Ordinance
Corps.....	U.S. Army Corps of Engineers
CWA.....	Cascade Water Alliance
Ecology	Washington Department of Ecology
GMA.....	Growth Management Act
HPA.....	Hydraulic Project Approval
LWD.....	Large Woody Debris
NRCS.....	Natural Resources Conservation Service
PHS.....	Priority Habitats and Species
SMA.....	Shoreline Management Act
SMP	Shoreline Master Program
USFWS.....	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
WDFW	Washington Department of Fish and Wildlife

STOP



Milfoil

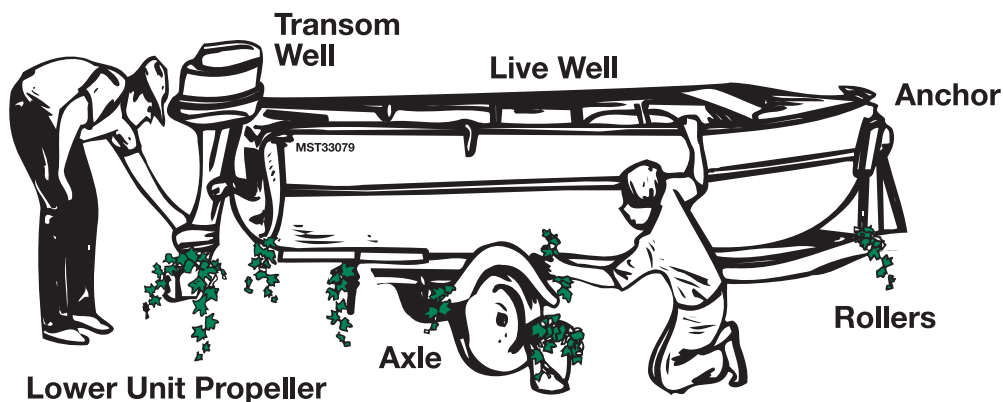


Zebra Mussel

It is **ILLEGAL** to transport or spread
Aquatic Invasive Species!

Before Launching & Before Leaving

You Must Remove ALL
Plants & Animals from Watercraft, Trailer and Gear.
You Must Drain ALL
Water from Fish/Live Wells, Holds and Bilges.



Unlawful to Transport Aquatic Plants - R.C.W. 77.15.290
Unlawful Use of Prohibited Aquatic Animal Species - R.C.W. 77.15.253
Unlawful Release of Fish, Shellfish or Wildlife - R.C.W. 77.15.250

To obtain information on free boat inspections, Report a sighting or
Find out more about Aquatic Invasive Species:
Call **1-888-WDFW-AIS (933-9247)** or go to **www.WDFW.WA.GOV**



**STOP AQUATIC
HITCHHIKERS!**
Prevent the transport of nuisance species.
Clean all recreational equipment.
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Appendix h. – Community Links for Lake Tapps:

Lake Tapps:

- Lake Tapps Planning Process and Management Plan: http://www.cascadewater.org/lake_tapps_management.php
- Lake Tapps News.org: www.laketappsnews.org
- USGS Lake Tapps Level Variances: http://waterdata.usgs.gov/wa/nwis/uv/?site_no=12101000
- Pierce County Lake Tapps Boat Management Plan: www.cascadewater.org/pdf/laketapps/Cascade-LakeTapps-Boat_Management_Plan.pdf
- Lake Tapps and Milfoil Treatment: http://www.cascadewater.org/lake_tapps_milfoil.php
- Cascade Water Alliance E-newsletter: www.cascadewater.org/enewsletter.php

City/Community Links:

- City of Auburn: www.auburnwa.gov
- City of Bonney Lake: www.citybonneylake.org
- City of Buckley: www.cityofbuckley.com
- City of Sumner: www.sumner.wa.us

- Bonney Lake Chamber: www.bonneylake.com
- Bonney Lake - Sumner Courier Herald: www.pnwlocalnews.com/pierce/bch

County Links:

- Pierce County Parks and Recreational Services: www.co.pierce.wa.us/pc/abtus/ourorg/parks/parks.htm
- Pierce County Sheriff Department: www.co.pierce.wa.us/pc/abtus/ourorg/sheriff/default.htm
- Pierce County Sheriff Marine Services Unit: www.co.pierce.wa.us/pc/abtus/ourorg/sheriff/marineservices.htm
- Pierce County Planning and Land Services: <http://www.co.pierce.wa.us/pc/services/home/property/pals/aboutus/aboutus3.htm>
- Pierce County Council: www.co.pierce.wa.us/pc/abtus/ourorg/council/default.htm
- Pierce County District 1 Council Member, Dan Roach: <http://www.co.pierce.wa.us/pc/abtus/ourorg/council/district1.htm>
- Pierce County Executive, Pat McCarthy: www.co.pierce.wa.us/pc/abtus/ourorg/exec/exec.htm
- Tacoma-Pierce County Health Department: www.tpchd.org/environment/surface-water
- East Pierce Fire and Rescue: www.eastpiercefirerescue.org

Washington State Department of Ecology – Water Quality: www.ecy.wa.gov/programs/wq/wqhome.html

Natural Yard Care Links:

- Washington State Department of Health – Lake Friendly Landscaping:
www.ecy.wa.gov/programs/wq/plants/lakes/landscaping.html
- Natural Yard Care Workshops and Garden Parties, Tacoma Pierce County:
www.co.pierce.wa.us/pc/services/home/environ/waste/recycle/compost/ehouseworkshops.htm
- Northwest Natural Yard and Garden, King County:
www.kingcounty.gov/environment/stewardship/nw-yard-and-garden.aspx
- Washington State University Extension Services:
 - Water Efficiency and Quality: www.extension.wsu.edu/gardening/water/Pages/default.aspx
 - Shoreline Stewards - Guide to Shoreline Living (Hood Canal, but much relates):
www.cru.cahe.wsu.edu/CEPublications/em4928e/em4928e.pdf
 - Properly Managing your Septic Tank System:
www.cru.cahe.wsu.edu/CEPublications/eb1671/eb1671.pdf
 - Simple Things Gardeners Can Do to Prevent Water Contamination:
www.cru.cahe.wsu.edu/CEPublications/eb1744/eb1744.html