BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 99-1 SUMAS ENERGY 2 GENERATION FACILITY	APPLICATION NO. 99-1 EXHIBIT ECS-T

DEPARTMENT OF ECOLOGY'S PREFILED TESTIMONY

ERIK C. STOCKDALE

Background

Q: Please state your name for the record.

A: Erik C. Stockdale

Q: Where do you work and what is your title?

A: I am a senior wetland specialist with the State of Washington, Department of Ecology (Ecology). I work at Ecology's Northwest Regional Office in Bellevue.

Q: How long have you worked there?

A: Since October 1992.

Q: Have you attached a Curriculum Vitae to your prefiled testimony?

A: Yes, I have. It is Ecology's Exhibit ____ (ECS-1) to this prefiled testimony.

Q: Does this fully describe your work experience and education?

A: Yes, it does.

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Investigation of Application

Q: Are you familiar with the application filed by Sumas Energy 2, Inc. (Sumas 2) for the proposed Sumas Energy 2 Generation Facility?

A: Yes.

Q: Have you reviewed any material regarding this project?

A: Yes. I reviewed the following:

(1) Sumas Energy 2 Cogeneration Facility's application to EFSEC;

(2) the draft environmental impact statement (draft EIS or DEIS);

(3) list of issues;

(4) Prefiled Testimony of Katy Chaney;

(5) Prefiled Testimony of John Wong;

(6) the United States Army Corps of Engineers Public Notice,

(7) the applicant's proposed wetland mitigation plan; and

(8) the 1995 David Evans & Associates Inc. wetland delineation report.

Q: Have you visited the site?

A: Yes. I visited the site on May 10, 2000 with Mr. Tom Luster of Ecology and Ms. Joan Marchioro of the Attorney General's office. We arrived at approximately 10:30 a.m. and walked the site for about three hours. The attached photos, Exhibit ____ (ECS-2), document the conditions of the site during our visit. The map attached to the photo log, Exhibit ___ (ECS-3), indicates the approximate location and orientation of the photos. We did not walk the routes of the proposed utility corridors.

Overview of Testimony

Q: What areas of expertise will your testimony discuss?

A: I have been asked to review the project for wetland and other aquatic resource impacts. I have also been asked to review the wetland and aquatic resource mitigation design for the

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proposed project. Impact areas include the facility site as well as the utility corridors for power and gas.

Q: What opinions are you offering with regard to the proposed project?

A: My testimony will discuss how Sumas 2's proposal:

(1) begins with a flawed and therefore inadequate wetland delineation;

(2) contains a wetland mitigation proposal that will not replace lost wetland functions because it is based on an inadequate estimate of wetlands being affected; and

(3) proposes inadequate wetland buffers (i.e. not supported by best available science).

Basics of Wetlands and Wetland Mitigation

Q: What is a wetland?

A: Wetlands are among the most important and productive ecosystems on Earth. They are neither truly aquatic ecosystems nor truly terrestrial ecosystems. Essentially, they are the transitional edge between the two. Wetlands are quite variable in their appearance. They can be at the edge of a river or a lake and on saltwater. They can be a shallow pond or swamp; a marshy field or forested bog. They can be shrubby areas filled with willows. But all wetlands share three common characteristics: hydric soils, water tolerant plants, and the presence of water for a significant number of days during the growing season.

Wetlands are variable in size, type, and location. Some wetlands dry out during the summer while others remain wet all year long. Water is the driving landscape force that influences the presence and variability among wetlands. In all, wetlands cover approximately 938,000 acres in Washington, or about 2 percent of the land in the state. Wetlands provide many important functions that we value as a society.

Many of our agricultural areas in Western Washington were originally developed in wetland areas in floodplains because of the deep, rich soils and shallow ground water table. Prior to modification, these areas flooded frequently and supported a complex network of

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wetlands and braided channels. Once they were diked from the rivers and estuaries that flooded them, they were drained and put into agricultural development.

Q: What activity is undertaken to determine whether wetlands are present on a parcel of land?

A: This is referred to as conducting a wetland delineation. Wetlands have many distinguishing features, the most notable of which are the presence of water at or near the surface, wetland soils, and vegetation adapted or tolerant of saturated soils. These three **characteristics** (wetland hydrology, hydric soils, and hydrophytic vegetation) are sometimes referred to as "**parameters**." The State of Washington uses the same wetland delineation manual used by the federal government. It contains the field methods used to "delineate" the edge of a wetland based on these three parameters.

Q: How is a wetland delineation performed?

A: A wetland delineation is performed by a trained wetland specialist, or a team of wetland specialists, using the State of Washington Wetland Delineation Manual (or the 1987 U.S. Army Corps of Engineers delineation manual). The field methods in the delineation manual are used to determine if "**field indicators**" for each of the three **parameters** are present on a property.

Q. Can you conduct a wetland delineation at any time of the year?

A. No. A delineation needs to be conducted during the growing season (generally March 1-October 31). On agricultural areas, however, delineations should be conducted from late February to mid May, while wetland hydrology is present. This is important because agricultural fields are highly disturbed, native vegetation is absent, and the soil has been plowed. A wetland delineation needs to be based on an accurate assessment of wetland hydrology. It would not be appropriate to conduct a wetland delineation on a property such as the Sumas 2 site during the dry season (summer and early fall) as it would result in an

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inaccurate delineation. Delineations can take half a day to several days to conduct, depending on the difficulty of the site and size.

Q: What is meant by wetland "functions" and "values"?

A: **Wetland functions** are the physical, chemical, and biological processes that occur in a wetland, or under the direct influence of a wetland. They include hydrologic, chemical, and biological functions such as:

- conveyance and storage of floodwater, and food desyncronization;
- biogeochemical cycling;
- water quality improvement;
- groundwater recharge/discharge;
- stream baseflow support;
- food chain support; and
- habitat for fish and wildlife, including shorebirds, migratory waterfowl, passerines, fish, amphibians, mammals and a whole host of species dependent on wetlands for all or part of their life cycle requirements.

Many of the functions performed by wetlands result in direct or indirect benefits and services to society. These benefits and services have been called **wetland values**. Wetland functions and values are roughly equivalent to the "beneficial uses" of a wetland. It is the beneficial uses of wetlands the State of Washington has an interest in protecting under its various wetland permitting authorities.

Q: How would you define a wetland impact?

A: Wetland impacts are human-induced impacts that adversely affect the functions of a wetland. Impacts can be direct or indirect. **Direct impacts** include filling, draining, and clearing. They can also include hydrologic changes to a wetland, such as the addition of a significant amount of water to a wetland, or the diversion of water away from a wetland. Water quality impacts to wetlands include the addition of nutrients, sediments, or contaminants

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to a wetland. Other impacts include the introduction of exotic or non-native species**. Indirect impacts** result from direct impacts and can be delayed in space and time from the direct impacts.

Q: What is the difference between an impact and an effect?

A: Impacts are the human influences that cause ecological stress, and effects are the resultant changes.

Q: What are some examples of common effects from the loss of wetlands?

A: The loss of wetlands in the United States has resulted in:

- increased flooding (in terms of damage as well as frequency);
- decreased base flow support to streams and river systems;
- degraded water quality;
- increased sedimentation;
- decreased biodiversity;
- decreased food chain support;
- fragmentation of critical habitat; and
- decreased ground water recharge-discharge

It is important to note that the position of a wetland in the landscape will determine the functions it provides, and therefore the effect of losing that wetland.

Many wetland functions provide direct economic benefits to our society. In 1993, a study by the Congressional Office of Technology Assessment stated the following: "For example, the Congaree Bottomland Hardwood Swamp in South Carolina removes a quantity of pollutants from watershed water resources equivalent to that which would be removed by a $5 million water treatment plant (citing a USEPA 1995 study). In another case, scientists estimate that a 2,500 acre wetland in Georgia saves $1 million in water pollution control costs annually. These cost figures relate only to the water quality improvement function of wetlands.

Q. How much of our national wetland base have we lost?

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A. Over a period of 200 years, the lower 48 states lost an estimated 53 percent of their original wetlands. Conservative estimates indicate that Washington has lost 31 percent of original acreage. Alaska has lost a fraction of one percent while Hawaii has lost an estimated 12 percent of its original wetland areas, and California has lost over 95 percent. On average, this means that the lower 48 states have **lost over 60 acres of wetlands for every hour** between the 1780's and the 1980's. (Sources: 1. Dahl, Thomas E. 1990. Wetlands Losses in the United States, 1780's to 1980's. US Dept. of the Interior, Fish & Wildlife Service, Washington, D.C. 13 pp.; and 2. Peters, D.D. 1990. Wetlands and Deepwater Habitats in the State of Washington. U.S. Fish & Wildlife Service, National Wetlands Inventory, Portland, OR 8pp).

Q: What are cumulative impacts?

A: Cumulative impacts are the incremental effect of an impact added to other past, present, and reasonably foreseeable future impacts.

Q: Why is it important to consider cumulative impacts?

A: Significant impacts can result to remaining wetlands in a watershed from numerous small but seemingly minor individual impacts. These impacts are magnified when inadequate mitigation is provided.

Q: Would you describe generally what is wetland mitigation?

A: Wetland mitigation is a concept that is frequently misunderstood. The term **mitigate** means literally "to make less severe or painful; to moderate" (Webster's New Collegiate Dictionary 1977). In the wetland regulatory context it essentially means *to reduce the total adverse impacts of a project to an acceptable level.* This can be accomplished through a variety of methods. Wetland mitigation is usually defined in terms of a series of steps that should be taken in sequential order.

The sequential order is as follows:

(1) **Avoiding** adverse impacts (either by finding another site or changing the

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location on-site);

(2) **Minimizing** adverse impacts by limiting the degree or location of a project on-site;

(3) **Rectifying** adverse impacts by **restoring** the affected environment;

(4) **Reducing** the adverse impacts by preservation and maintenance operations over the life of the project;

(5) **Compensating** for adverse impacts by replacing or providing substitute resources or environments; and

(6) **Monitoring** the impacts and taking appropriate corrective measures.

Following this process is referred to as **sequencing**. Most people equate wetland mitigation with step five, and this has led to the use of the term "compensatory mitigation" to distinguish this type of mitigation from the broader definition. The mitigation sequence is found in state and federal law, including State Environmental Policy Act ("SEPA") (WAC 197-11-768), Growth Management Act ("GMA"), Shoreline Management Act ("SMA"), National Environmental Policy Act ("NEPA"), and Section 404 of the federal clean water act (33 U.S.C. 1344).

In most cases, Ecology (as well as EPA and the Corps of Engineers) requires that an applicant demonstrate that they have followed this sequence in developing their project before permit approval is granted. Lower quality wetlands usually do not warrant the first step of avoiding the impact altogether. This is based on our assumption that these types of wetlands can be successfully replaced. With other wetlands, particularly higher quality wetlands, we are usually stringent in requiring that project proponents demonstrate that they have followed the sequence.

Ecology strives to work with project proponents to help design their project so that they can accomplish their objectives while avoiding and minimizing impacts to wetland resources. The earlier Ecology is involved in the process the more successful we can be in finding a win-

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win solution.

Q: What regulatory authority does Ecology have over wetlands?

A: Ecology uses three main statutes to regulate wetlands. Two state laws, the State Water Pollution Control Act (Chapter 90.48 RCW) and the Shoreline Management Act (Chapter 90.58 RCW), give Ecology authority to regulate wetlands. Ecology also uses the State Environmental Policy Act (SEPA) process as a mechanism to identify potential wetland-related concerns early in the permitting process.

In addition, Ecology derives authority to regulate wetlands from the Federal Clean Water Act (CWA). Section 401 of the CWA requires that activities regulated under Section 404 of the CWA be reviewed and certified by the State meeting state water quality standards. Ecology is the designated state agency for issuing this water quality certification.

Q: Which regulatory tool(s) applies in this instance?

A: EFSEC, acting for Ecology, will rely on its Section 401 authority and RCW 90.48 to ensure that state water quality is not degraded and wetlands are adequately protected on the Sumas 2 property.

Q: Please describe more fully the CWA Section 401 water quality certification.

A: The water quality certification is the primary mechanism Ecology uses to implement the provisions of the State Water Pollution Control Act (Chapter 90.48 RCW) and the State's role in the CWA.

Section 404 of the CWA regulates the placement of fill in waters of the United States including wetlands. The U.S. Army Corps of Engineers administers the Section 404 permitting program. Section 401 of the CWA requires that proposed dredge and fill activities permitted under Section 404 be reviewed and certified by Ecology that the proposed project will meet state water quality standards. Wetlands are "waters of the state" and play an integral role in the protection of water quality. The Section 404 permit for a given project is deemed to be invalid unless it has been certified by the State under Section 401 of the CWA.

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The certification process requires an in-depth review by highly qualified technical staff. Ecology typically includes wetland specialists, water quality specialists, hydrogeologists, and engineers in its review process for complex projects.

In this case, Sumas 2 applied to the Army Corps of Engineers for a Section 404 permit to fill wetlands. EFSEC, acting for Ecology, must determine whether to issue a Section 401 Certification certifying that the project as proposed meets water quality standards.

Q: Given the information provided by the applicant, would you recommend issuance of a Section 401 water quality certification for the Sumas 2 project?

A: No. As more fully set out below, the currently proposed wetland mitigation package does not adequately mitigate for impacts to wetlands on the property. Ecology does not approve projects requiring a Section 401 Certification without ensuring that such impacts will be properly mitigated.

Q. If more wetland mitigation were to be proposed by Sumas 2, could the impacts from the project be mitigated?

A. Yes, I believe so. However, the information presently gathered by Sumas 2 is insufficient to support a revised mitigation proposal. The additional data gathered and the necessary components of a revised mitigation plan are described below at pages 14-18.

Inadequate Wetland Delineation

Q. You previously stated that the wetland delineation of the site is inadequate. Would you please explain your conclusion?

A. The evaluation of wetland impacts in the draft EIS is based on a wetland delineation that is inadequate. The wetland delineation for the proposal was conducted by David Evans & Associates in 1995. See Exhibit ECS-3. Pursuant to a memorandum of understanding in effect with the U.S. Army Corps of Engineers at the time, the U.S. Natural Resources Conservation Service (NRCS) verified the delineation. At the time (and to this day), NRCS used the Food Security Act (FSA) manual, not the 1987 Corps delineation manual, to verify wetland

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delineations on agricultural lands. The NRCS determined that much of the property was "prior converted cropland" according to the FSA and , therefore, not subject to regulation under federal law. However, the prior converted croplands on the site do fall within Ecology's regulatory authority and are significantly understated in the David Evans & Associates Delineation.

Q: What is a "prior converted cropland"?

A: "Prior converted croplands" are historic wetlands that have been put into agricultural use. The FSA excludes many wetland areas from Section 404 of the CWA if they meet certain cropping history and modified wetland hydrology criteria. The Corps of Engineers 1987 wetland delineation manual requires a minimum of two weeks of inundation **or** saturation (of the upper soil horizon) for an area to be a wetland. This wetland hydrology **parameter** was significantly relaxed in the FSA. As a result, agricultural wetlands have to have more than two weeks of inundation to be regulated as wetlands. That is, under the FSA an area has to have more than two weeks of standing water during the growing season in order for it to be regulated as a wetland.

The FSA's requirement of two weeks of inundation water is not an appropriate measure of wetland existence in the western part of Washington. Many of our wetlands in Western Washington are fed by groundwater and not surface flooding. Most of our wetlands simply do not have more than two weeks of standing water during the growing season. Ecology does not recognize the prior converted exemption because the prior converted label is **not based on science** and, therefore, does not reflect wetland function. As a result, many wetlands that are determined to be "prior converted croplands" still meet the criteria of biological wetlands in the 1987 Corps of Engineers wetland delineation manual and the 1996 Washington State Wetlands Identification and Delineation Manual.

The consequence of the regulatory "loophole" in the FSA is that tens of thousands of acres of agricultural areas in Western Washington are excluded from **federal** wetland

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regulations. This is in spite of the fact that those areas are biological wetlands that provide valuable wetland functions. However, as stated previously, they are **not exempt** from state or local regulations. Applicants who are granted a "prior converted cropland" exemption from the CWA for Section 404 purposes mistakenly assume that they are not subject to state and local wetland regulatory requirements. Sumas 2 has made this mistake.

Q. Why was this "prior converted" loophole adopted at the federal level?

A. In 1990, in an effort to forestall the agricultural lobby's attack on the CWA, the Army Corps of Engineers, supported by EPA, came out with a regulatory guidance letter that said that "prior converted croplands" were not waters of the United States, a key requirement for regulation under the CWA. While this made political sense at the time, it is not supported by science.

Q: What is your opinion of the wetlands on the site?

A: It is my opinion that the 1995 David Evans & Associates delineation, Exhibit ____ (ECS-3), understates the wetlands on the site. It is my understanding that the Army Corps of Engineers agrees that a portion of the "prior converted cropland" wetlands on the proposal site are biological wetlands. I confirmed that conclusion during my site visit on May 10, 2000. I determined that much of the site retains wetland characteristics. I did not conduct a wetland delineation on the site because it is a time consuming task.

Exhibit ____ (ECS –2) contains photographs I took during my site visit on May 10, 2000. Photograph 1 shows a ponded wetlands area outside the boundary of a delineated edge on the David Evans & Associates delineation. The photograph was taken in the southeast quadrant of the property, facing south. See Exhibit ____ (ESC-3). The approximate location of where the photographs were taken has been marked on Exhibit ____ (ESC-3). The bottom right hand of the photograph shows recent ditching work on the property, presumably conducted to decrease the size of the ponded area.

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Photograph 1a is a close-up of the area shown in Photograph 1. It shows shorebird prints in the mud. I observed several hundred shorebirds utilizing the site for feeding and resting during my visit. The birds were disturbed during our walking the site, but they would circle and return to the ponded areas. They did not leave the site in search of other habitat. The Sumas 2 site clearly provides important over-wintering habitat for shorebirds and waterfowl. (See Prefiled Testimony of Curt Leigh (WDFW) for more detail on the wildlife habitat value of the Sumas site.)

Photograph 2 was taken in the southwest quadrant of the property, facing north towards the forested/scrub shrub woodland. This area is to the west of area mapped as wetland by David Evans & Associates. The photograph clearly indicates prolonged inundation among last year's corn stubble.

Photographs 2a and 2b are close-ups of wetland vegetation growing in the ponded area shown in Photograph 2. The herbaceous vegetation shown, primarily buttercup (*Ranunculus repens*), are wetland plant species. Photographs 2c and 2d are also close-ups of area shown in Photograph 2. The photographs show an obligate wetland plant called water-starwort, as well as filamentous algae. These plants would not establish in upland areas, yet the David Evans & Associates delineation indicates this area as upland.

The ponding in areas in these photographs are mistakenly noted as uplands in the David Evans & Associates wetland delineation report for the project. The photographs clearly contradict the accuracy of the delineation report. Wetland conditions are more extensive on the site than indicated in the application.

Q: Why are "prior converted" wetlands of concern to Ecology?

A: The degraded vegetative communities of these wetlands "mask" important hydrologic and water quality functions the wetlands provide. The agricultural activity removes the native vegetation and disturbs the soil. Wetland functions related to a diverse, native cover of vegetation are absent on the site. Other functions, such as hydrologic and water quality

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improvement functions, are affected somewhat. The site is likely providing important base flow support to Johnson Creek, in addition to moderating peak flows. Many "prior converted cropland" wetlands provide important overwintering habitat for migratory waterfowl. Case in point: Many of the overwintering grounds for trumpeter swans in the Skagit Valley likely meet the "prior converted cropland" exclusion. When flooded, these wetlands improve water quality through biogeochemical processes in the soil profile. The absence of a complex overstory of wetland vegetation does not preclude these functions from being provided. Their degraded condition also “masks” their restoration potential.

Mitigation

Q: When wetland impacts are unavoidable, what is required of the impacting party?

A: When adverse wetland impacts are truly "unavoidable," an applicant is required to develop a compensatory mitigation plan. This can include: 1) **creation** of a new wetland; 2) **restoration** of a former wetland; 3) **enhancement** of a degraded wetland; or 4) some combination of the three. In some instances, preservation of high quality wetlands and/or adjacent high quality uplands may be acceptable as part of an overall mitigation "package."

Historically, creation of new wetlands in upland sites has been problematic, primarily due to the difficulty in establishing an adequate water regime to sustain wetland conditions. Ecology emphasizes restoration of former wetlands or enhancement of significantly degraded wetlands as the preferred methods of compensation. With these methods, establishing an adequate water regime is usually more certain.

The primary questions we ask in determining the adequacy of a compensatory mitigation method, location or plan are:

(1) What are the type and extent of functions being impacted by the project?

(2) How will the proposed mitigation replace these functions?

(3) Will the proposed mitigation be successful and sustainable?

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Thus, the appropriate type of compensatory mitigation will depend on the individual circumstances of the project. It will also depend on the opportunities for mitigation in the area of the project since we usually require that the replacement wetland be located in the same drainage basin. It is difficult to replace hydrologic and fish habitat functions in a different drainage basin and impossible to replace them in a different watershed. However, the old notion that compensatory mitigation must be "on-site" is now seldom required since adequate opportunities are rarely available on a given project site.

Also, in the past we typically required "in-kind" compensatory mitigation, usually meaning that the replacement wetland must be the same type of wetland as the one being impacted (e.g., a cattail marsh for a cattail marsh). This is still often a requirement since it is difficult to replace lost functions with a different type of wetland. However, Ecology makes an individual assessment in each case and has occasionally decided to accept, or even encourage, out-of-kind replacement. This is usually due to one or more of several factors. Sometimes the wetland being impacted is of low value such as a depression dominated by exotic invasive plants such as reed-canary grass.

In some cases there may not be adequate opportunities to recreate or restore the same type of wetland in the area and there may be an excellent opportunity to create a different, usually higher-value wetland in the area. In other cases we have judged that a different type of resource restoration makes more ecological sense in a particular situation. For example, we have allowed the restoration of stream and riparian corridors in exchange for a minimal loss of wetlands in areas where stream resources have been significantly degraded, particularly in eastern Washington.

Another mitigation concept is the use of replacement ratios. A replacement ratio is the amount of wetland area created, restored or enhanced in relation to the amount of wetland area impacted. For example, historically a replacement ratio of 1:1 was common. This means for every acre of wetland impacted, an acre of wetland would be created. In recent years the ratio

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has increased and seldom is a 1:1 ratio acceptable to any regulatory agency. This increase is due primarily to two factors: 1) the likelihood of success of the compensatory mitigation and 2) the length of time it takes to successfully create or restore a wetland.

Compensatory wetland mitigation projects have historically been less than 100% successful. Different studies have determined that roughly half of the attempts to create wetlands have failed. Given this poor track record, and the fact that it takes anywhere from several years to several decades to create a fully functioning wetland, replacement ratios greater than 1:1 are used as a means of equalizing the tradeoff. In order to replace the lost functions at a 1:1 ratio, it is necessary to increase the replacement acreage at most sites.

At present Ecology recommends replacement ratios based on the rating of the wetland and/or the type of wetland.

The recommended ratios are as follows:

Wetland category[1]	**Creation and Restoration**	**Enhancement***
Category 1 (all types)	6:1	12:1
Category 2 or 3 Forested Scrub/shrub Emergent	Forested - 3:1 Scrub/Shrub - 2:1 Emergent - 2:1	6:1 4:1 4:1
Category 4	1.25:1	2.5:1

** The mitigation ratios are doubled for wetland enhancement. Enhancement as compensation for wetland losses results in a net loss of wetland area. The net gain in wetland function from enhancement is usually less than from creation or restoration.*

These ratios are general guidelines that are adjusted up or down based on the likelihood of success of the proposed mitigation and the expected length of time it will take to reach maturity. Good hydrologic information on the proposed mitigation site is necessary to establish a likelihood of success. In addition, the track record of the type of proposed compensatory mitigation is an important factor.

[1] Wetlands are placed in one of four categories based upon the wetlands quality and the functions it provides. Category 1 wetlands are of the highest quality, while Category 4 wetlands are the lowest.

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Q: Given the target mitigation ratios listed above, has Sumas 2 provided sufficient mitigation for wetland impacts?

A: The current wetland mitigation proposal is inadequate to compensate for the presently identified wetland impacts. Nor is it sufficient to compensate for the additional wetland impacts that most likely will be disclosed after an acceptable delineation is conducted.

Q: Why is the mitigation plan inadequate?

A: First, the mitigation is segregated into the corner of the project site and involves the excavation of an area adjacent to an existing high quality wetland. This is likely to result in degradation of the existing wetland and may not result in a net increase in wetland functions.

Second, the combined wetland mitigation ratio is overstated, as less credit is given for wetland enhancement than wetland creation and restoration. Typically, half the credit is given. The actual amount of proposed mitigation is 1.5 acres of creation and 0.28 acres of enhancement (half of 0.56) for a total of 1.78 acres of mitigation for impacts to 1.9 acres of wetlands. (This does not include the additional wetland impacts created by the revised stormwater detention system discussed in Mr. Wong's testimony as complete data on the new stormwater design was not available for review.) Given the currently identified wetland impacts, the proposed mitigation is less than one to one. Ecology does not grant mitigation credit for avoiding wetlands.

Finally, the mitigation proposal does not contain several necessary elements:

(1) an accurate estimate of site features, including: hydroperiod, water depth, water supply, substrate, and water quality;

(2) clear, detailed technical design narrative;

(3) clear and detailed construction narrative;

(4) clear, measurable performance standards;

(5) a monitoring plan;

(6) a maintenance plan;

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(7) a contingency plan that outlines steps to be taken when performance standards are not met, including:

- non-native invasive plant species control (primarily reed canarygrass);
- grazing of plantings by cattle;
- catastrophic events (floods, storms, and droughts); and
- human impacts (mowing, ditching, off-road vehicles, dumping, etc.).

Q: How can Sumas 2 remedy the flaws in its wetland mitigation plan?

A: Sumas 2 must first conduct an adequate wetland delineation to accurately determine the acres of wetlands being impacted by construction of the energy plant. It should then craft a new plan containing the elements set forth above and follow the Ecology guidance documents: *"How Ecology Regulates Wetlands"* (publication no. 97-112, and *"Wetland Mitigation Replacement Ratios: Defining Equivalency"* (publication no. 92-08). Sumas 2 should also identify alternative mitigation sites near the project site that include the restoration of degraded and/or drained wetlands, and develop a mitigation plan based on a landscape profile of the Sumas area wetlands (following recommendations of Kentula et al. 1999). Many agricultural sites exist in the area that could be restored and may be more likely to replace the lost hydrologic functions of the wetlands on the project site.

In addition, Sumas 2 should create a dedicated bank account containing 125% of the anticipated costs for maintenance, monitoring and contingency plan compliance.

Buffers

Q: You mentioned that inadequate wetland buffers are proposed. Can you explain?

A: An inadequate buffer width is proposed around the wetland slated for preservation. The EIS states that a 25-foot buffer is proposed for this 8.8 acre scrub-shrub and forested wetland. It is unclear how this wetland was rated. What can be said with certainty is that the scientific literature clearly indicates that a 25-foot buffer on scrub-shrub and forested wetlands, adjacent to an industrial facility, is clearly inadequate. Attached is a published paper by

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Castelle et al. titled "Wetland and Stream Buffer Size Requirements – A Review." Exhibit ____ (ECS-4). This paper provides a good summary of the current body of "best available science" on wetland and stream buffer determinations and requirements.

It appears that Sumas 2 is relying on the City of Sumas Shoreline Master Program regulations to establish the requisite buffer. Such reliance is misplaced as most buffer standards in shoreline master programs across the state do not meet current "best available science" buffer requirements. Ecology's publications provide specific guidance on buffer standards. This literature is readily available and should be consulted to prescribe a protective buffer on the wetland.

Ecology recommends the following wetland buffer widths, according to wetland rating:

Wetland Rating	**Buffer Width**
Category I	200 - 300 feet
Category II	100 - 200 feet
Category III	50 - 100 feet
Category IV	25 - 50 feet

In addition, the deed restrictions should be drafted for the buffer area providing that the buffer is a no-entry, no-cut and no-activity area.

If the project proponent continues to propose a 25-foot buffer, then mitigation for this impact needs to be provided.

Utility Corridors

Q: Have the wetlands in the utility corridors been adequately delineated?

A: I am not sure. I have not walked the corridors. The errors in the delineation report for the facility site, however, do not give me reasonable assurance that the corridor delineations were conducted accurately.

Q: Are Sumas 2's proposed construction methods for the utility corridors designed to be protective of wetlands ?

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A: The wetland impacts for the natural gas pipeline route are estimated at 0.6 acres. This is based on a 10-foot wide corridor crossing through the wetlands. (See top of page 3.4-15 of Draft EIS). While Ecology prefers to see narrow construction corridors through wetlands, I have never seen impacts limited to a 10-foot wide corridor with a linear utility project. I question how realistic this impact estimate is.

Q: If wetlands are impacted in the construction of the utility corridor, what would be required of Sumas 2?

A: Ecology would require more mitigation than the current proposal. Presently, that proposal provides no mitigation.

Conclusions

Q: Will the project result in "no net loss" of wetland functions and values?

A:. No. The project will result in a significant loss of wetland acreage. We measure "no net loss" in terms of functions as well as acreage. Many wetland functions are directly linked to the size of a wetland. The base flow support function of a wetland, for example, is related to the amount of water that is stored in the soil during the winter, then re-released to a stream during the dry season. Think of this as a sponge. Larger sponges hold more water than smaller sponges. If the remaining wetland resource base continues to be fragmented and diminished in total acreage, we will continue to on a net loss trajectory. For that reason alone, a minimum 1:1 mitigation ratio should be targeted for the project for impacts to the agricultural wetlands. Mitigation for impacts to the higher quality wetland that is being nibbled away (the 9 acre forested/scrub shrub wetland), will require the use of a higher ratio .

Q: Do you think wetland impacts have been characterized properly?

A: No. The wetlands first need to be delineated properly, then rated using the Western Washington Rating System. Because the proposed wetland mitigation plan does not include prior converted wetlands it does not account for all wetlands impacts caused by construction of the project and is therefore flawed. The State of Washington retains a strong interest in

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regulating the important functions these areas provide. The wetland delineation needs to be re-done, using the 1996 Washington State Wetlands Identification and Delineation Manual, in order for a proper wetland mitigation plan to be considered adequate. Until an adequate delineation is conducted, a defensible wetland mitigation strategy cannot be formulated. If a proper delineation is not conducted, impacts from the project are likely to result in significant adverse impacts to state water quality, in violation of Chapter 90.48 RCW.

END OF TESTIMONY

I declare under penalty of perjury that the above testimony is true and correct to the best of my knowledge.

DATED this _____ day of June 26, 2000.

_____
ERIK C. STOCKDALE

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