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# Invenenergy

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## Grays Harbor Energy Center

Water Panel Discussion  
July 2010

# Water Panel Presentation Overview

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Panel Discussion of the Following Topics:

- ❑ Water Quantities
- ❑ Water Quality
- ❑ Chehalis River Fish
- ❑ Questions?

# Water Panel Presentation Applicant Participants

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- Cameron Ochiltree, PE, Senior Civil Engineer, URS
- Kevin Warner, PE, Plant Engineer, Grays Harbor Energy Center
- Brad Rawls, Senior Biologist, URS

# Grays Harbor Energy Center – Proposed

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- ❑ 1,300 MW facility (total with expansion)
- ❑ Two 2x1 Combined Cycle Natural Gas Facilities Consisting of:
  - 4 Combustion Turbines
  - 2 Steam Turbines



# Water Quantities

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- How much water does the facility use?
- Where does the facility get its water?
- How much water does the facility discharge?

# Grays Harbor Energy Center – Water Use

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**Water is used to generate steam to drive the steam turbines, and to cool the steam after it passes through the turbines.**

## **□ Existing Water Use**

- Current use is a maximum of 9.2 cfs

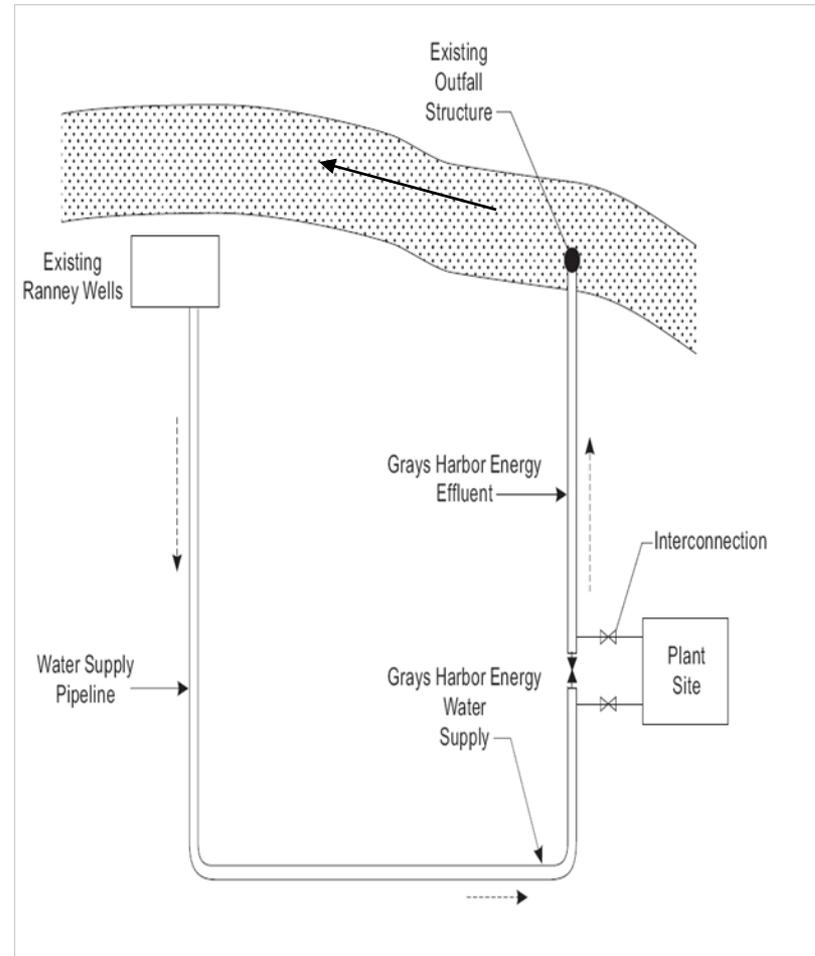
## **□ Proposed Water Use**

- An additional 6.8 cfs of water, for a total of 16 cfs

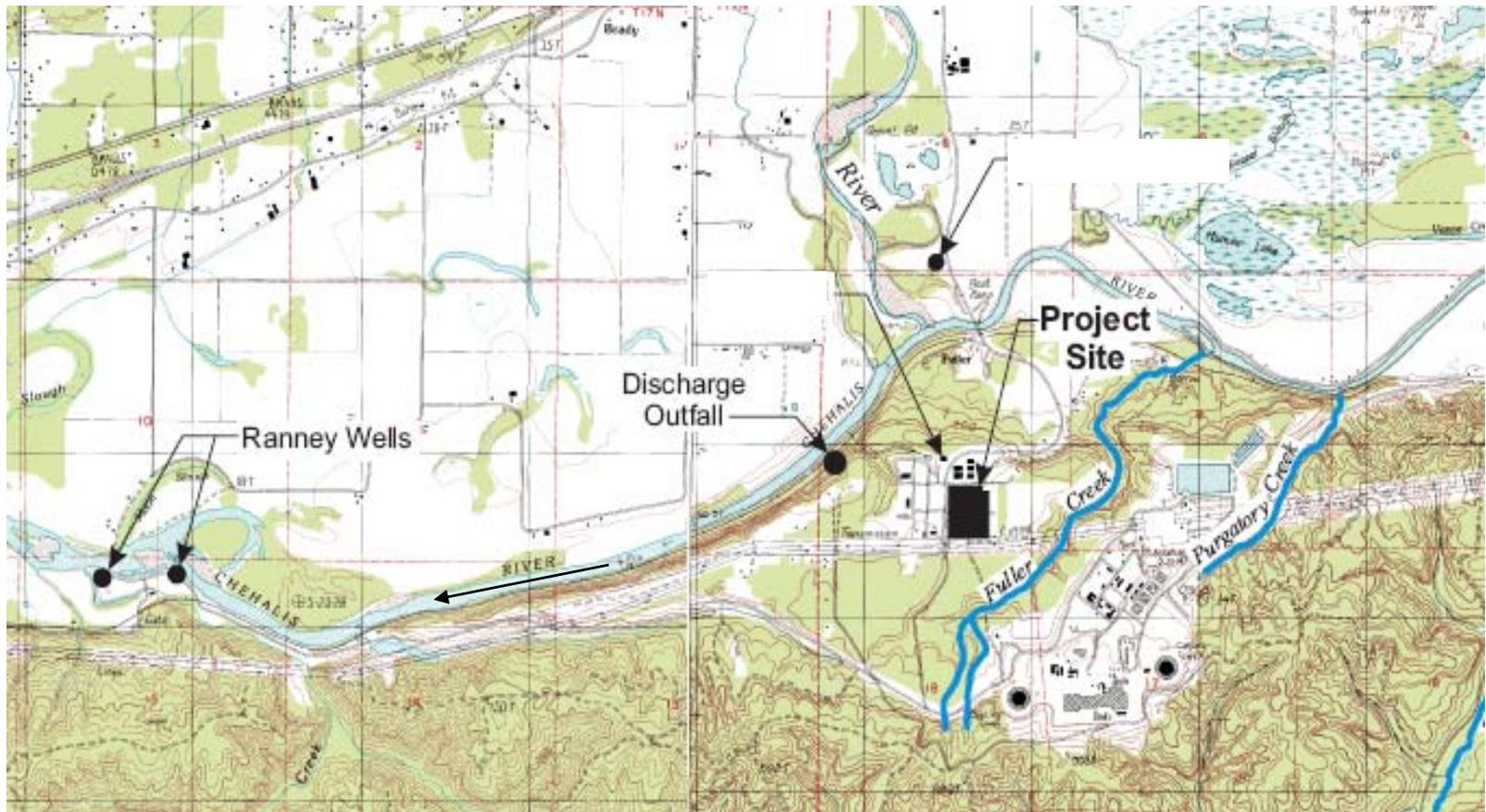
# Grays Harbor Energy Center – Water Source

Where does the water supply come from?

- Water comes from two Ranney wells located next to the Chehalis River, about 4 miles downstream
- The Ranney wells have adequate capacity for the expanded facility and require no new construction.
- The Ranney wells pump water from an aquifer approximately 120 feet below ground.
  - 88% from the Chehalis River
  - 12% groundwater.



# Location of Ranney Wells



# Grays Harbor Energy Center – Water Supply

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- Grays Harbor Energy has a water authorization of 9.2 cfs from EFSEC. This water authorization is subject to a base flow restriction.
- That means if the flow in the Chehalis River falls below the base flow levels, set by the Department of Ecology, Grays Harbor Energy must purchase water from the Grays Harbor PDA, which holds a water right which is not subject to base flow restrictions.



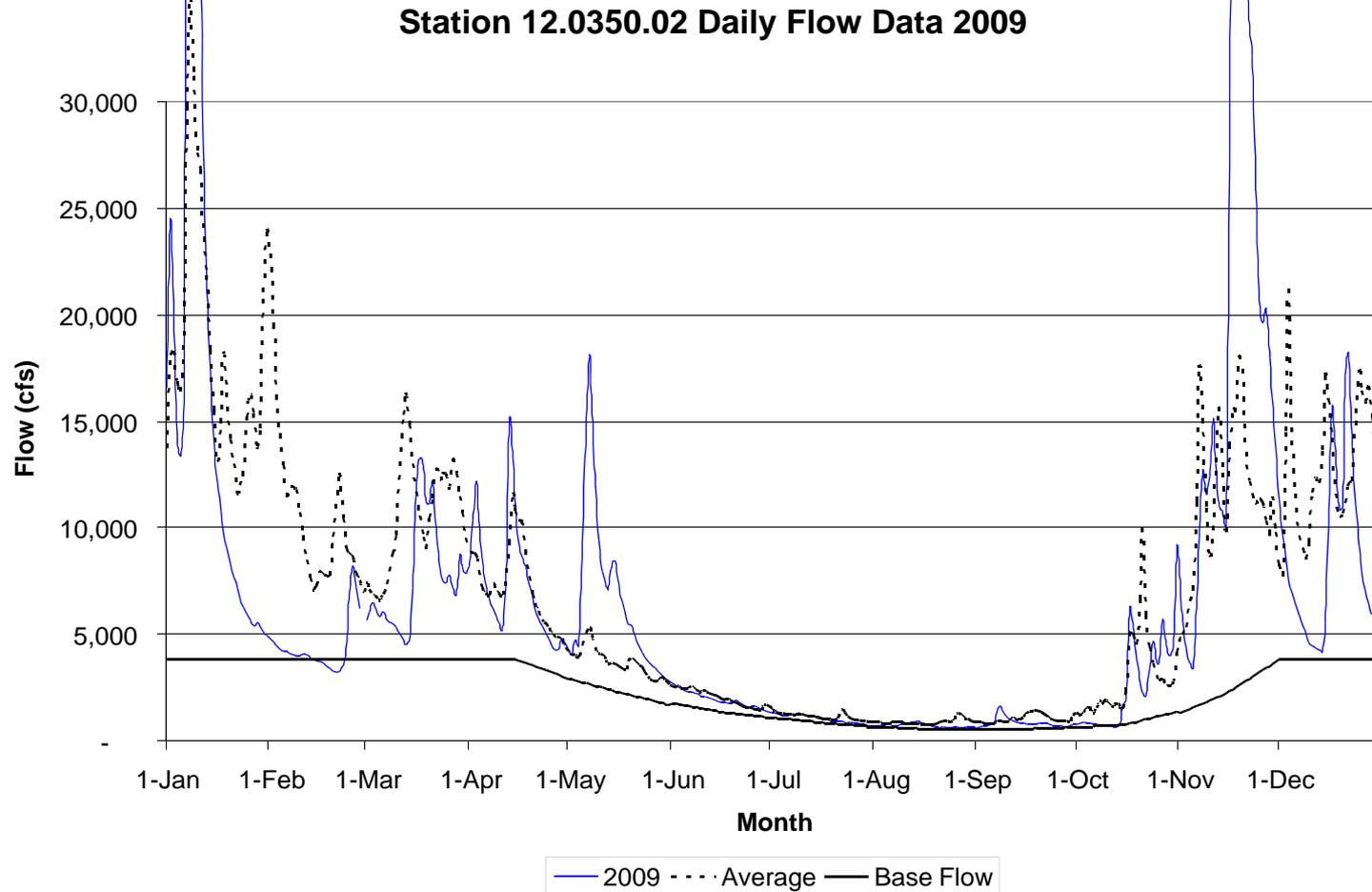
# Grays Harbor Energy Center – River Low Flow

- Base flows have been established by Ecology for monitoring station 12.0350.02 on the Chehalis River, a location just below the confluence with the Satsop River, approximately 4 miles upriver from the Ranney wells.
- Base flows are set for each month and range from 550 to 3,800 cfs.



Approximate location of  
Monitoring Station 12.0350.02

# Grays Harbor Energy Center – River Low Flow



# Grays Harbor Energy Center – River Low Flow

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- How often is the river below base flows?
  - 13-44 days per year for the years 2005 through 2009.
- Were these days during the summer when river flow is at its lowest?
  - No, many of these low flow days were at times of the year when the base flow was in the higher ranges.
  - There were no recorded flows below the base flow of 550 cfs established for August and September in any of the recent five years.

# Grays Harbor Energy Center – PDA Water Supply

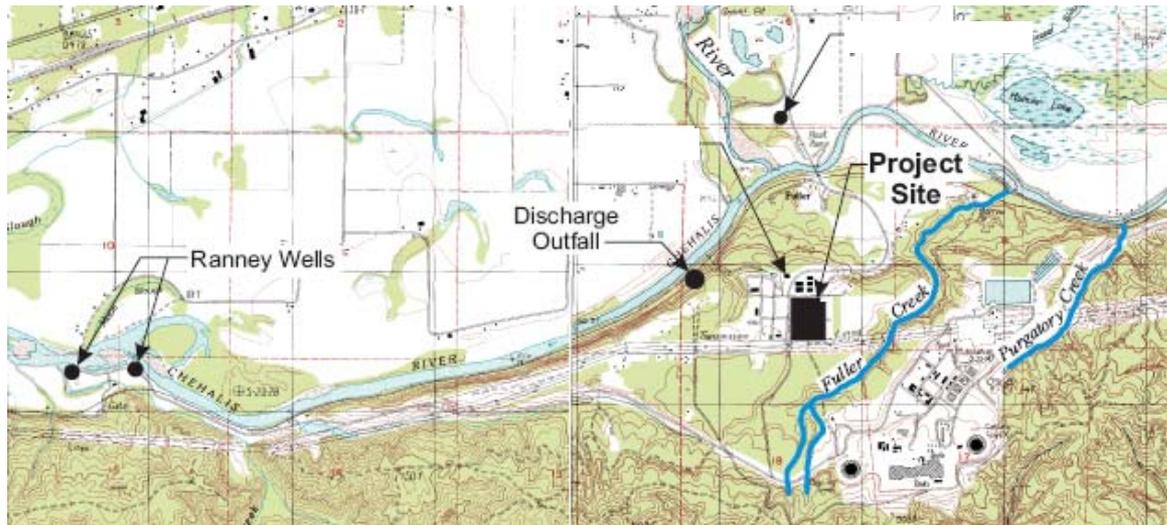
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- The Grays Harbor PDA has a water right of 20 cfs that is not subject to base flow restrictions.
- Grays Harbor Energy is proposing to purchase the additional 6.8 cfs of water it needs for the expanded facility from the PDA.

# Grays Harbor Energy Center – Discharge

- The discharge from the existing facility varies between approximately 1 and 1.5 cfs.
- The expanded Grays Harbor Energy Center discharge would increase by up to 1.5 cfs, for a total of approximately 3.0 cfs.



# Grays Harbor Energy Center – Effect on Chehalis River Flows

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- How much would the withdrawal for the project decrease the flow of the river?
  - The net additional withdrawal of water from the Chehalis River would be about 4.5 cfs

6.8 cfs from Ranney wells
<u>x 88% from Chehalis river</u>
~6 cfs from Chehalis river
<u>- 1.5 cfs discharge (upstream)</u>
<b>~4.5 cfs net withdrawal from river</b>

- How much of a percentage decrease is this in river flow?
  - Even at the times of the lowest flow of 550 cfs, the 4.5 cfs only represents approximately 1 percent in the flow which is within the accuracy of the river gage.
  - At the annual average flow of 7,100 cfs, the withdrawal would be a fraction of one percent.

# Water Quality

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- Is the discharged water treated?
- How is the discharge regulated?
- Does the discharged water meet water quality requirements?

# Grays Harbor Energy Center – Water Quality

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- The discharged water comes primarily from the cooling tower system
- This water is both treated and cooled to meet the quality and temperature limits of the NPDES Permit.
- A limit on maximum temperature (16° Celsius) is designed to protect fish.

# Grays Harbor Energy Center – Water Quality

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- The discharged water has been sampled and analyzed to understand the quality. This information is used to evaluate conformance with water quality standards.
- Permit limits are set to insure that the discharge will meet State water quality standards.
- The water quality of the discharge will have the same limitations on temperature, metals and chemicals as applied to the existing facility.

# Grays Harbor Energy Center – NPDES Compliance

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- Does the current facility exceed any of the NPDES Permit standards?
  - The current facility initially had some exceedances of NPDES permit limits, but these have been addressed.
  - The NPDES Permit is being revised to address initial limits and a draft is available for public review.
  - An engineering study will be completed prior to the facility expansion to confirm compliance with water quality standards.

# NPDES Compliance – Exceedances

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<b>Exceedance Parameter</b>	<b>How are exceedances being addressed?</b>
Chloride	Limit in the current NPDES Permit was the result of a permit writing error, <b>zero effective exceedances</b>
Iron	Wrong monitoring location initially used; this has been corrected to immediately prior to the discharge, <b>zero effective exceedances</b>
pH	Original chemical feed control system was completely replaced, <b>zero subsequent exceedances</b>
Temperature	Control system interlocks added to prevent future exceedances, <b>zero subsequent exceedances</b>

# Grays Harbor Energy Center – Fish

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- ❑ What fish are found in the river?
- ❑ What is the fish habitat like?
- ❑ Does the facility have any impact on fish?

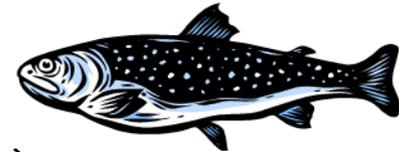
# Grays Harbor Energy Center – Fish

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- ❑ What species of fish are found in the Chehalis River near the project site?

Fish species are similar to those found in other vicinity rivers and include the following:

- Native resident fish
- Nine species of introduced fish, including carp
- Six species of anadromous salmonids, including:
  - Chinook (spring, summer & fall runs), Coho, and chum (fall run) salmon
  - Bull trout
  - Steelhead trout (summer & winter runs)
  - Resident and sea-run cutthroat trout



# Grays Harbor Energy Center – Fish

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- ❑ Does this stretch of the Chehalis River provide any exceptional fish habitat?
  - No, while the physical characteristics for fish (low gradient, graveled streambed, presence of deciduous vegetation, slow-moving pools) are good, there are times of high temperature (above 18 degrees C) and low dissolved oxygen levels which are detrimental to fish.
  
- ❑ When do the temperature and oxygen level problems occur?
  - Typically, during the summer months. The majority of fish that migrate through this area of the river do so during the spring and fall. The only exception is the summer run of Chinook salmon.

# Grays Harbor Energy Center – Fish

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- Are there any threatened or endangered species of fish in river near the project site?
  - Bull trout are federally listed as a threatened species.
  - It is possible that anadromous bull trout occasionally overwinter in the Chehalis River basin, but high summer water temperatures likely force foraging bull trout to leave the Chehalis River basin by late June and not return to the basin until the winter.
- Would bull trout be affected by the project?
  - No, bull trout would only be present in the Chehalis River basin outside of the low flow period when average river water temperature is at or below the 16°C thermal maximum (WAC 173-201A-200) for foraging adult and sub-adult bull trout.

# Grays Harbor Energy Center – Effect on Fish

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- Are impacts to fish anticipated to occur from the project?

No, for the following reasons:

- The project will use an existing in-stream outfall, so no dredging or other in-stream work will be required.
- Discharge water from the facility will be cooled to 16 degrees C or less, per NPDES requirements.
- Discharge water will comply with water quality standards and the limits set in the NPDES permit.
- Metal concentrations in the discharge water are within the normal ranges for the Chehalis river.

# Summary

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- Water Quantities:
  - The expanded facility will use an additional 6.8 cfs, which is available through existing water rights and authorizations
  - The proposed facility will discharge an additional 1.5 cfs
  - The net additional withdrawal will be less than one percent of the river flows under low flow conditions which will not create a measurable change in river flow or depth
- The facility expansion is being designed to comply with water quality requirements and the new NPDES permit
- Neither the water withdrawal nor the discharge of treated and cooled water is expected to adversely affect fish or fish habitat

# Questions?

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Source: 3D Scope

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