



NAVY PUGET SOUND
KINETIC HYDROPOWER SYSTEM
(NPS-KHPS)
Demonstration Project



**Prepared for the Puget Sound Harbor
Safety Committee**

September 22, 2009





NPS-KHPS Objectives

- ✦ **Adapt Verdant Power Generation 5 design/technology for NPS-KHPS installation (Status: work in progress)**
 - Finalize Generation 5 turbine design
 - Design seafloor mounting system
 - Select cable routing
 - Design interface connections
 - Process NEPA documentation
 - Develop environmental **monitoring** plan
 - Develop PATON plan

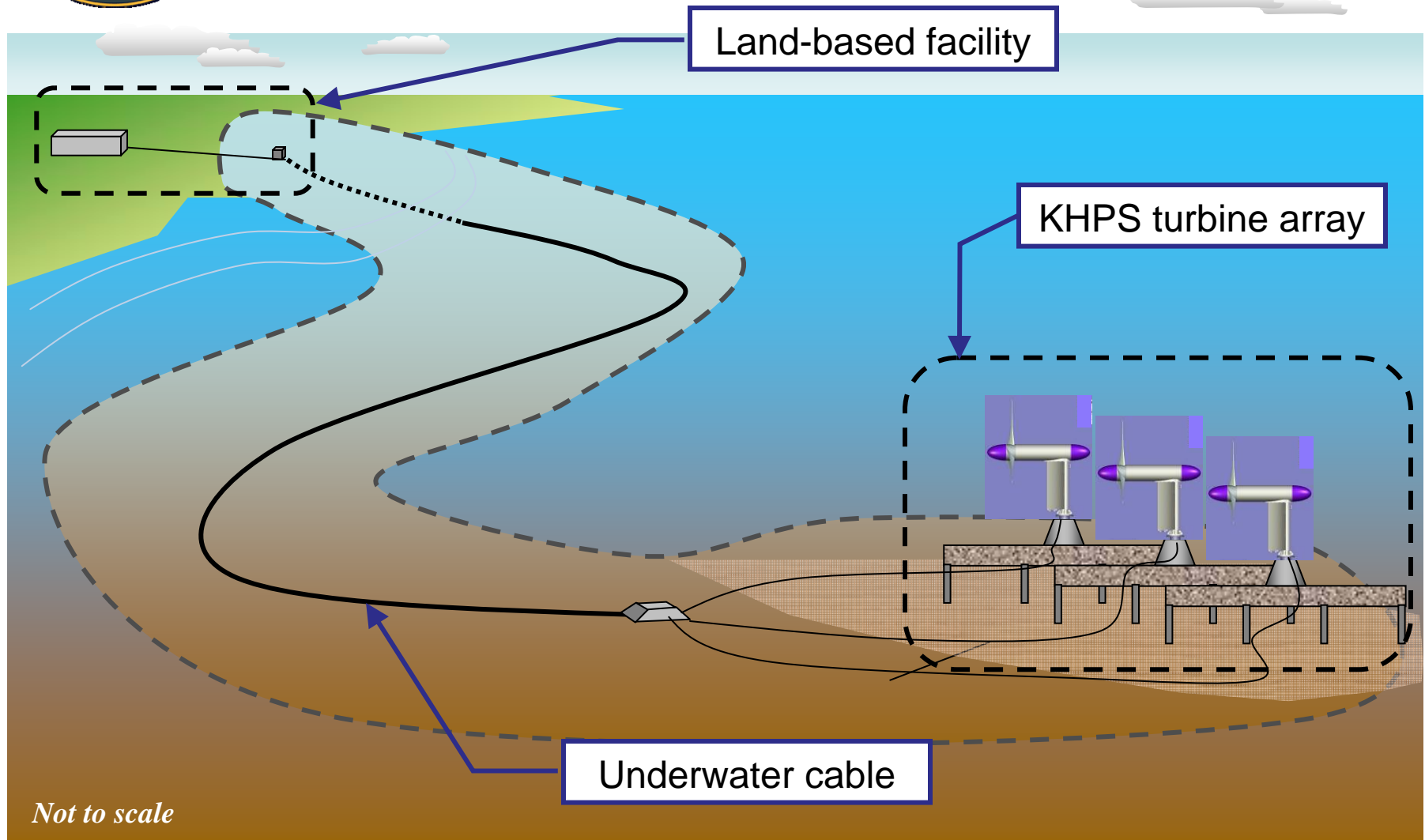
- ✦ **Demonstrate the KHPS in Puget Sound for 9-12 months**
 - Monitor operations
 - Monitor environmental effects

- ✦ **Remove KHPS upon completion**



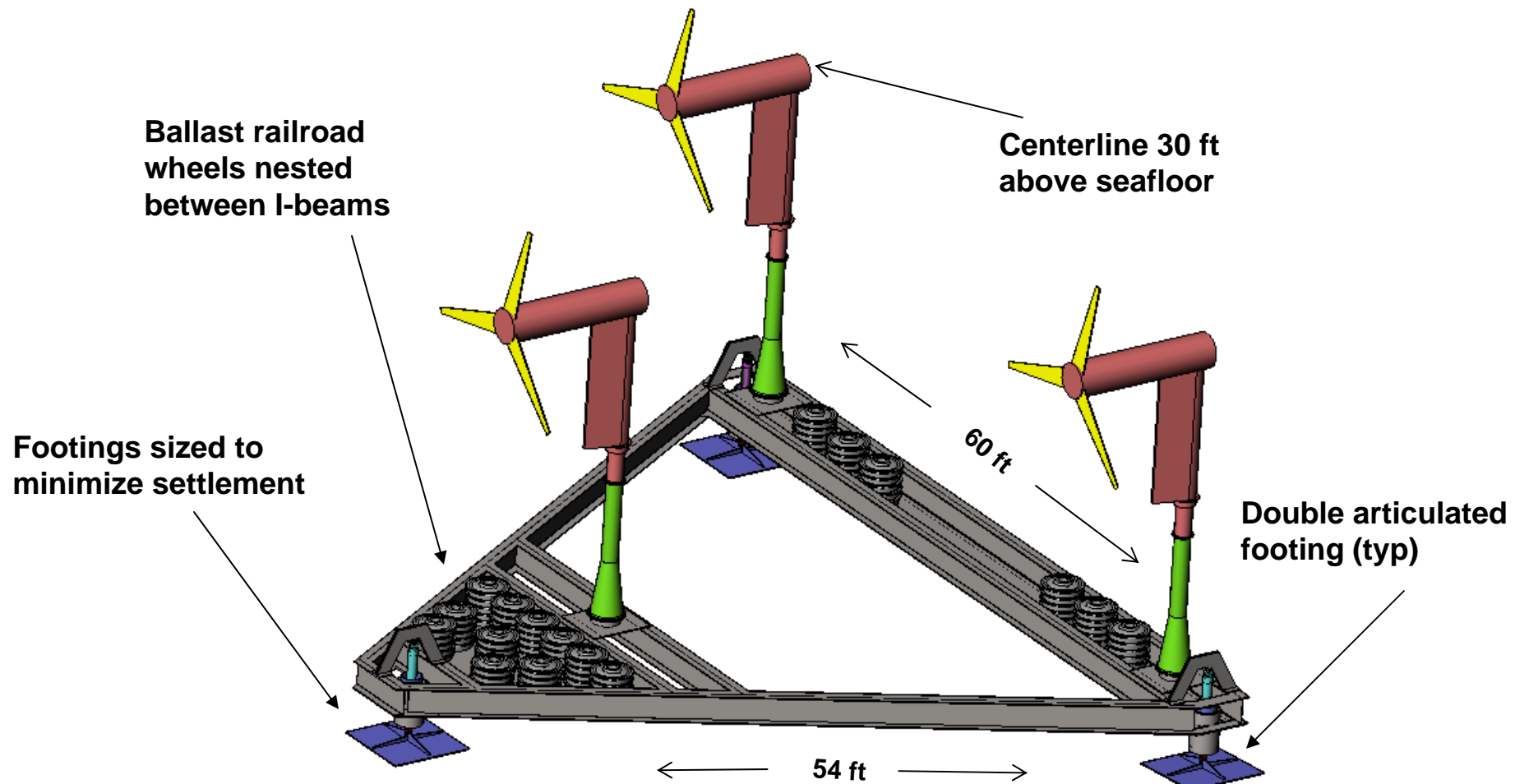


NPS-KHPS Components





3T Frame Assembly





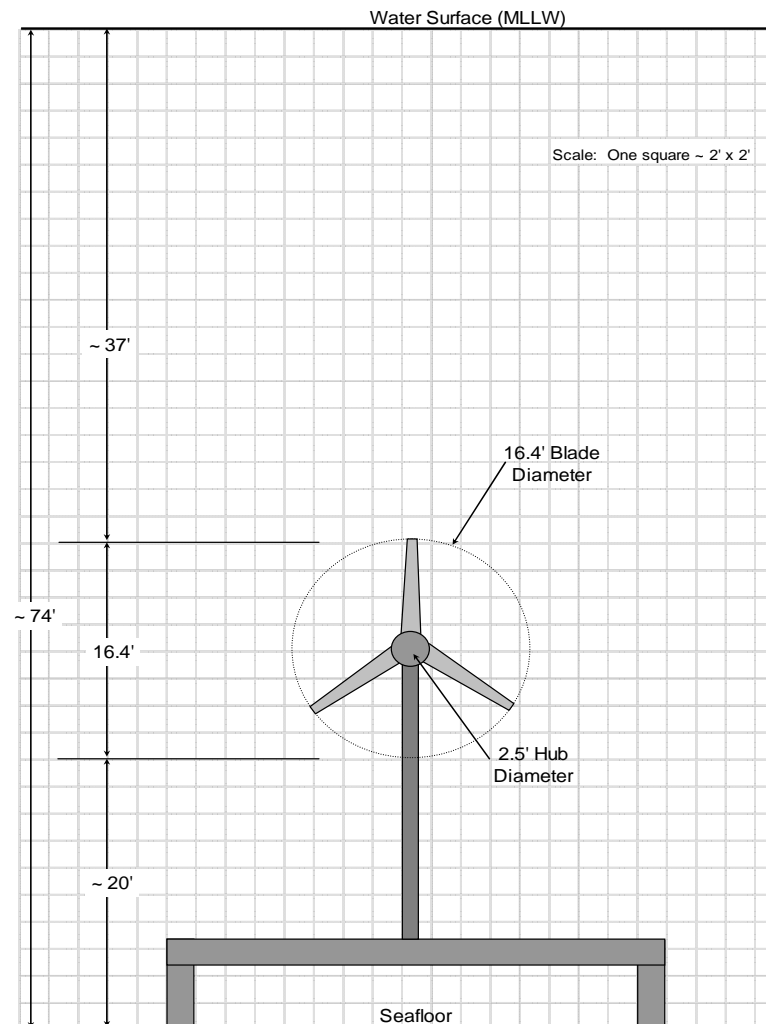
Turbine Scale Model

Verdant Power Turbine at Operating Depth Near Nodule Point (Figure to scale)

Blade diameter – 16.4 ft

Hub height off bottom – 28.2 ft

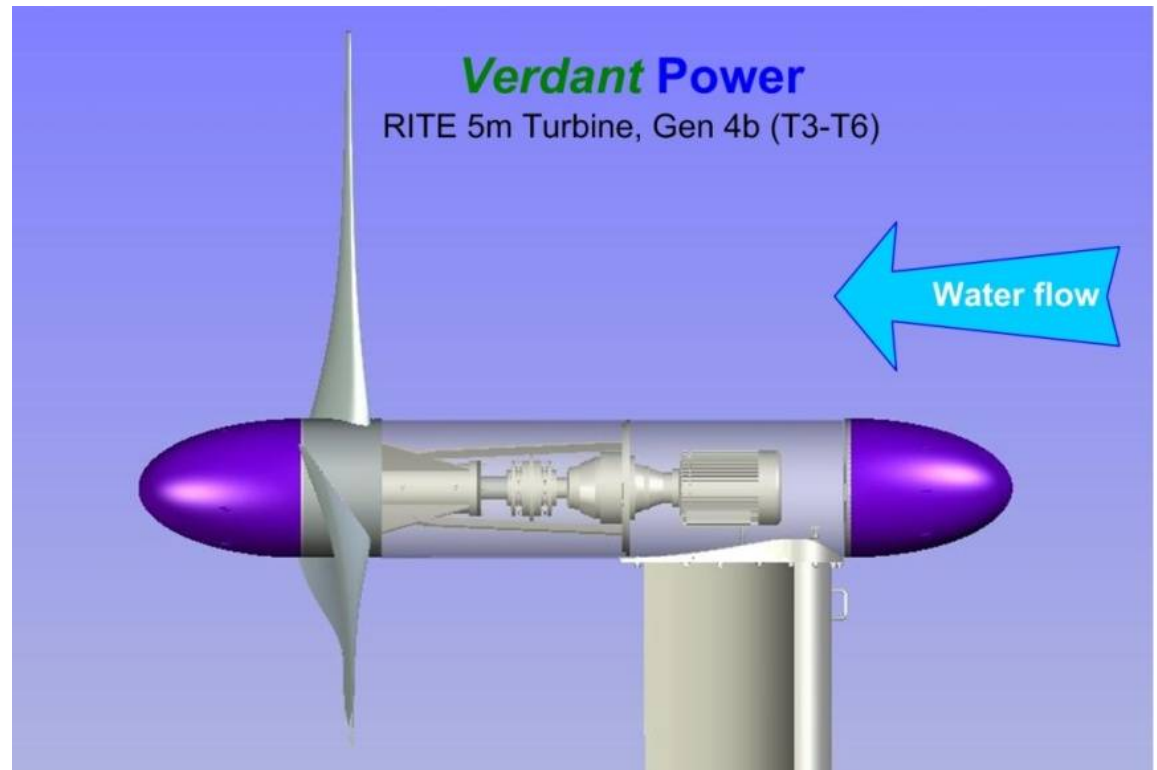
Depth to top of blade in ~73.5 ft
(at MLLW) of water – 37 ft





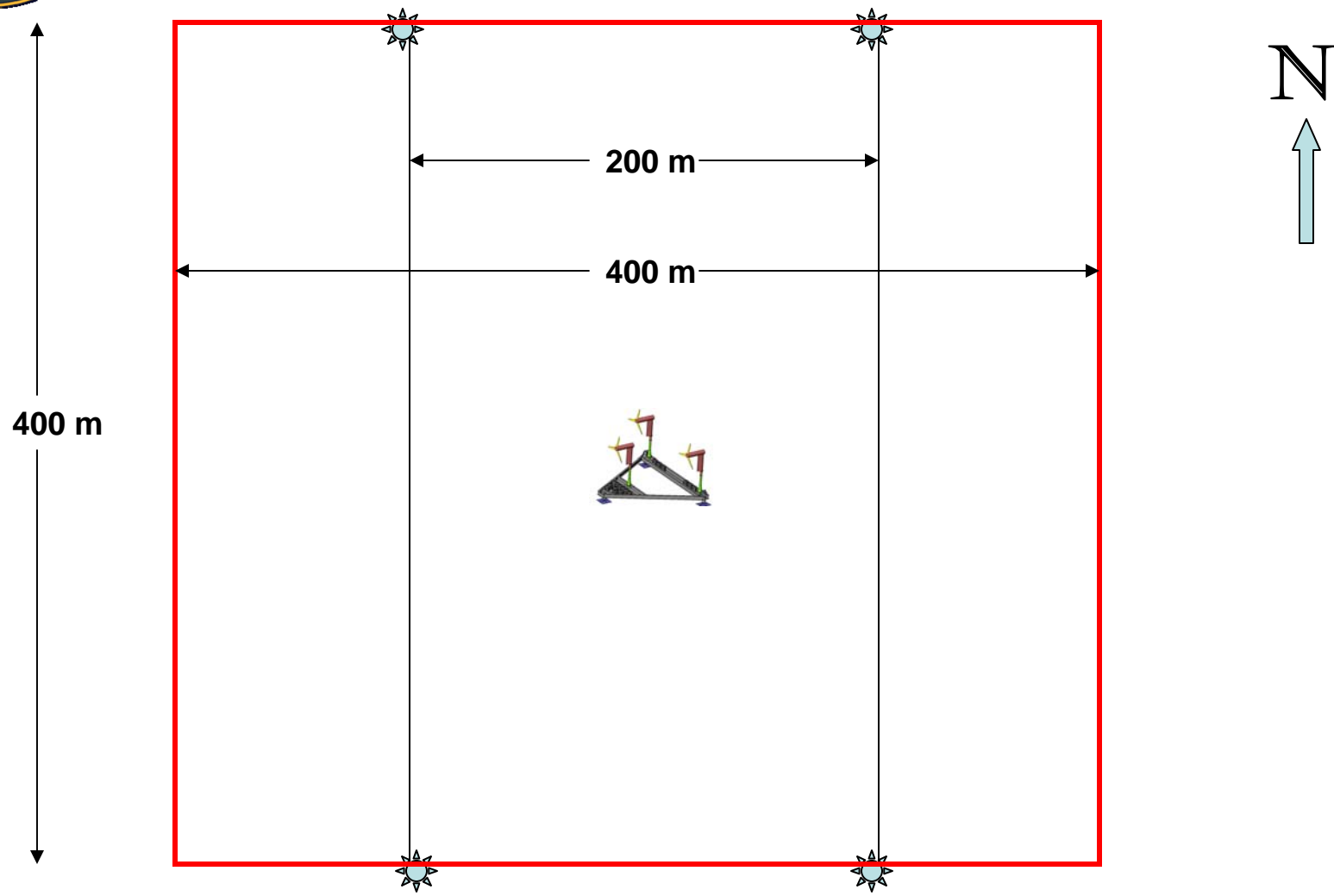
Verdant Power Turbine

- ✦ Open rotor
- ✦ Fixed pitch
- ✦ 3 blades
- ✦ 5 meter diameter
- ✦ Turbine yaws with current direction
- ✦ Braking system for marine mammal safety





2 Suggested PATON Configurations



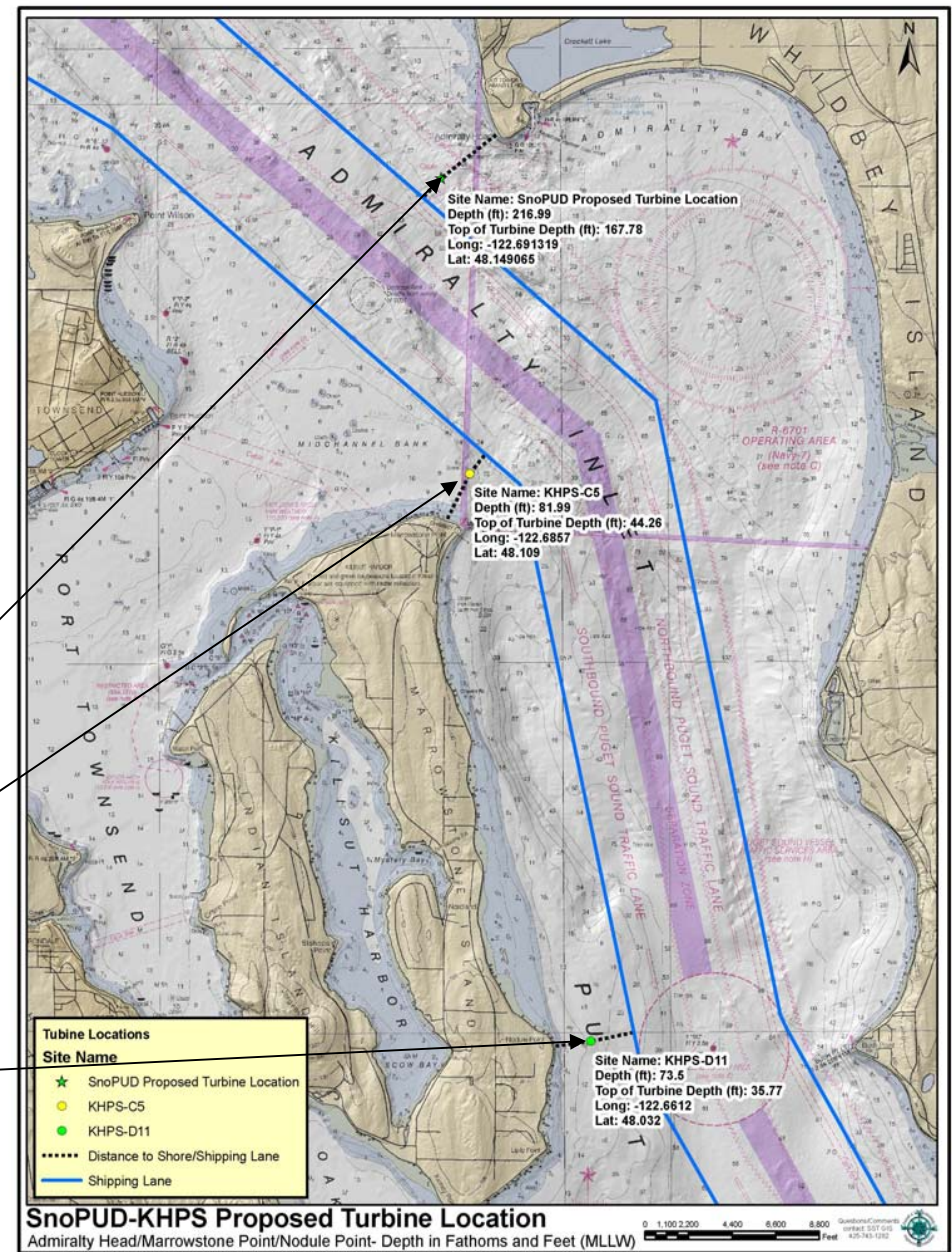


NPS-KHPS and SNOPOD Candidate Areas in Consideration

SNOPOD

Navy North Marrowstone (C5)

Navy South Marrowstone (D11)

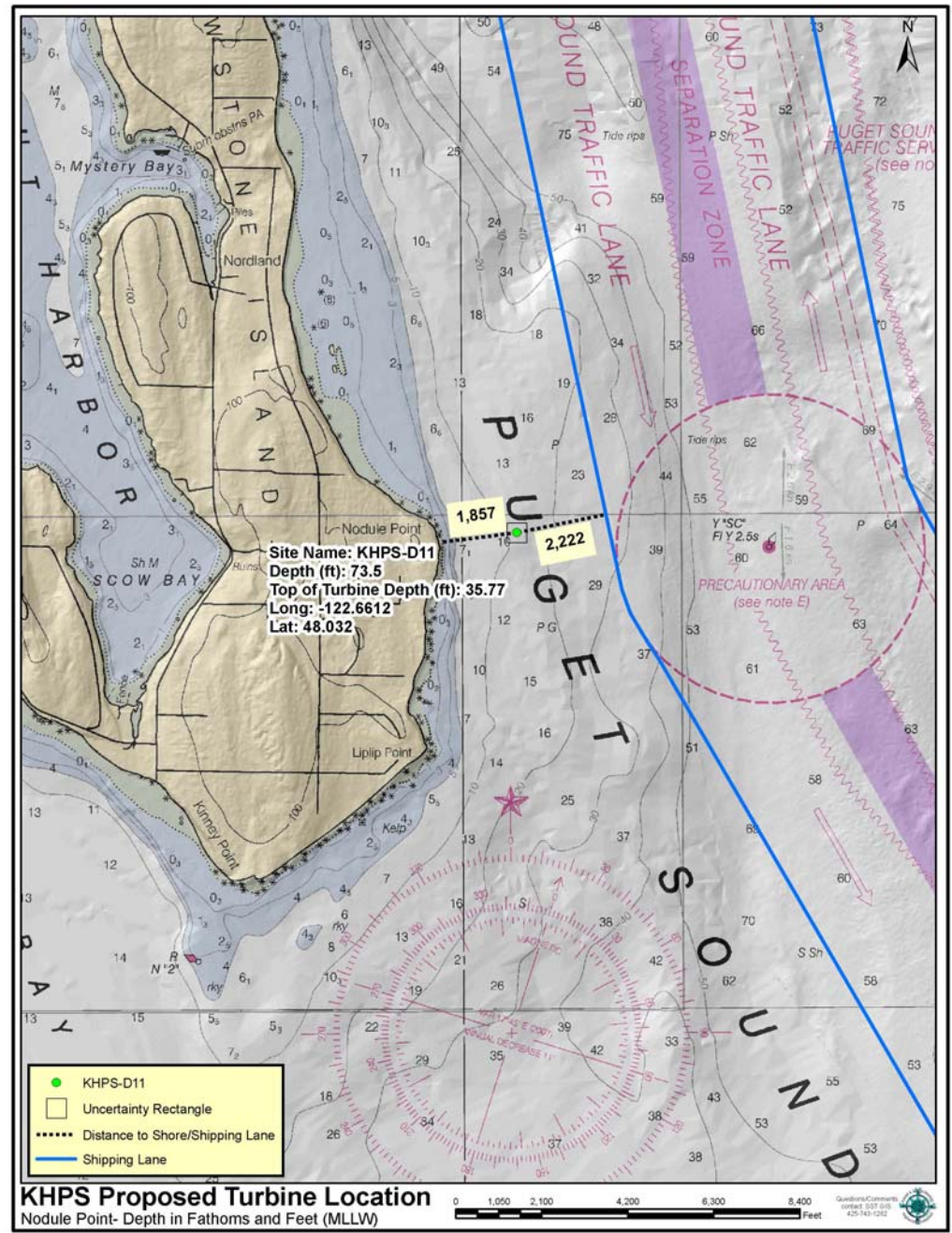




(D-11)

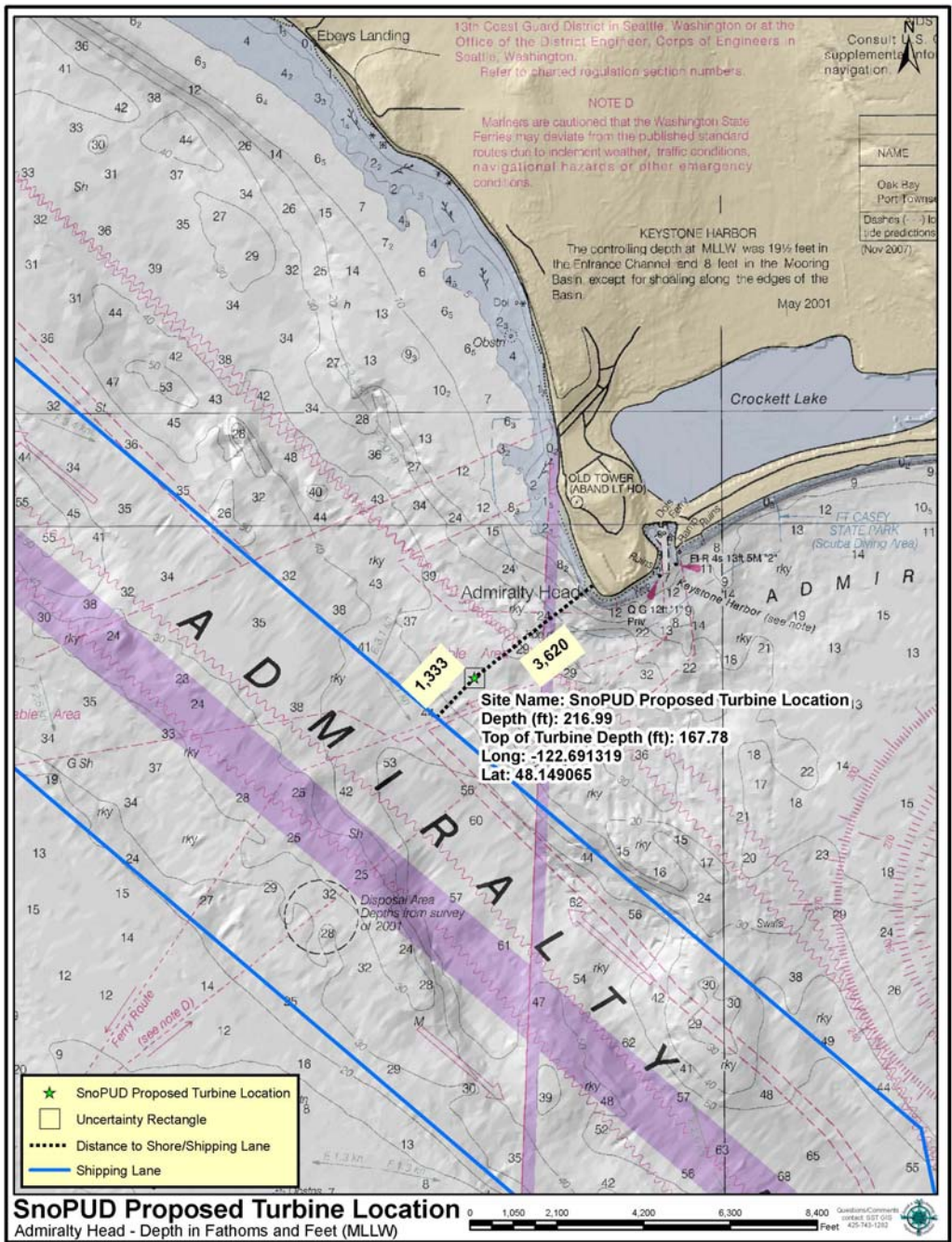
Preferred Navy Site:

D-11: South Marrowstone



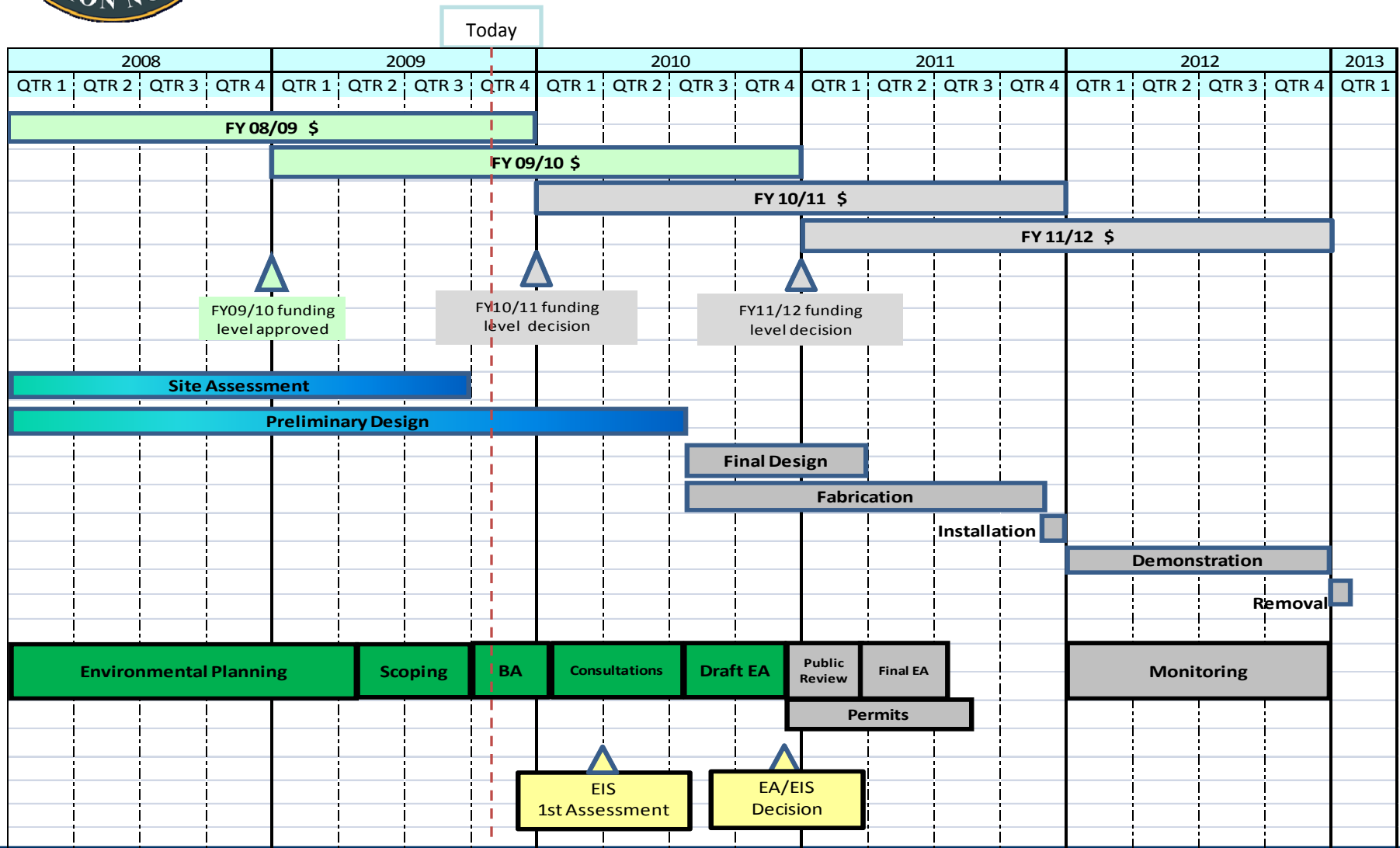


Snohomish PUD Site





Navy KHPS Timeline





Contacts

Captain J. P. Rios
Regional Engineer
Navy Region Northwest

Commander Mark Loose
Commanding Officer
Naval Magazine Indian Island

Ms Layna Goodman
Environmental Planning
(360) 396-0082
layna.goodman@navy.mil

Mr. Brian Cable
Project Manager
(805) 982-1207
brian.cable@navy.mil

Ms Sheila Murray
Public Affairs
(360) 396-4981
sheila.murray@navy.mil

Ms Cindy O'Hare
Tribal Coordination
(360) 396-0014
cindy.o'hare@navy.mil