

# Charleston Advisory Committee Meeting

Wednesday, January 17, 2018, 12:00pm

Charleston Marina RV Park  
63402 Kingfisher Road, Charleston, OR 97420



M E M O R A N D U M

TO: Charleston Marina Advisory Committee  
And All Interested Parties

FROM: John Buckley, Harbormaster

DATE: January 8, 2018

SUBJECT: Charleston Marina Advisory Committee Meeting Notice

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A regular meeting of the Charleston Advisory Committee has been scheduled for:

**DATE: Wednesday, January 17, 2018**  
**TIME: 12:00 p.m. – 1:30 p.m.**  
**LOCATION: Charleston Marina RV Park  
Recreation Room  
63402 Kingfisher Road  
Charleston, OR 97420**

Lunch will be provided for the Charleston Marina Advisory Committee members.

Guests are encouraged to bring their own lunch. Many local businesses offer boxed and to-go lunches. Please feel free to contact any of them to purchase a meal to bring to the meeting, or feel free to bring your own.

JB/aw

**OREGON INTERNATIONAL PORT OF COOS BAY  
CHARLESTON MARINA ADVISORY COMMITTEE MEETING  
12:00 p.m., Wednesday, January 17, 2018  
Charleston Marina RV Park, Recreation Room**

**T E N T A T I V E   A G E N D A**

1. Call Meeting to Order
2. Introductions of Guest and Port Staff
3. Review and Approval of October 18, 2017 Meeting Minutes and November 17, 2017 Special Meeting Minutes
4. Financial Data Review
5. New Issues/Projects
6. Roundtable Discussion on Facilities Maintenance Needs from the Customers' and Staff Perspectives
7. Public Comment
8. Committee Comments
9. Next Meeting Date: Wednesday, April 18, 2018
10. Adjourn

# Review Meeting Minutes

Draft

**OREGON INTERNATIONAL PORT OF COOS BAY  
CHARLESTON MARINA ADVISORY COMMITTEE**

Wednesday, October 18, 2017

Noon – 1:30 p.m.

**Charleston Marina RV Park Recreation Room**

1. **Call to Order:** Nick Nylander called the meeting to order at 12:05pm.
2. **Introduction of Guests:**

**Committee Members:** Nick Nylander, Committee Chair; Mark Fleck, Committee Vice Chair; Lou Leberti, Ray Cox.

**Port Staff:** John Buckley, Harbormaster; John Burns, OIPCB CEO; Hans Gundersen, CFO; Mike Stonesifer, Maintenance Manager; Chris Cranford, Maint. Supervisor; Dan Crawford, Port Staff; Amhra Wimer, Port Staff; Fred Jacquot, Port Staff; Kay Knight, Port Staff.

**Guests:** Ed Fleming, marina customer; Steve Wilson, marina customer; Victoria Wilson, Cardinal Services; Jerry Hampel, Marina Customer; Nick Edwards, ODCC; Kathy Erickson, Rep. for Congressman DeFazio; Roy Metzger, Coos County Assessor's Office; Donna Nichols, Jordan Cove; Peter Schaedel, LNG, LLC; Rick Lilienthal, marina customer; Hugh Link, ODCC; George Tinker, marina customer; Fred Stanio, marina customer; Will Smith, Fishermen's Wharf; Kyle Cox, Tarheel Aluminum.
3. **Jordan Cove Presentation regarding LNG Ship Movement Impacts to the Fishing Community: Presented by Peter Schaedel:**

Pembina Pipeline Corp. acquired Veresen. Pembina leadership is fully engaged and supportive of the Jordan cove LNG Terminal and Pacific Connector Gas Pipeline. Mr. Schaedel went over the LNG Carrier Transit safety and security zone, the MOI-material offloading facility and the LNG Carrier Transit Boating Impact mitigation. Completion is scheduled for 2023. See Presentation Report attached.
4. **Review and Approval of the July 19, 2017 Minutes:**

Nick Nylander made a motion to approve the minutes and Lou Leberti seconded the motion. The motion was passed, and the minutes were approved.
5. **Financial Data Review:**

Han Gunderson, Port CFO, did an overview of the Charleston Operations Revenue. The Report shows first 3 months of 17/18 fiscal year, July - Sept. Port is over \$60K ahead of plan. RV Park made a large profit to give a cushion. More money was spent on personnel, \$11k in overtime, \$10k additional for temporary help to get projects done before dredging season. The Operating result of \$99k tells us the amount of money we need to fund the major projects that are planned or are in process. New phone system has been installed. Wifi in the RV Park and surveillance cameras are in the process of being installed. Report is attached.

Mr. Cox asked about repairing the Ways. Mr. Burns said he would like to set up a meeting with Mr. Cox to start the process of repairing the Ways. Mr. Cox said the condition of the Ways affects everyone in the marine community. It is only at 50% capacity. Mark Fleck,

manager of Englund Marina, also agrees that the condition of the Ways is having a huge affect on the community. A meeting was scheduled for Oct. 25 regarding the repairs needed for the Ways.

**6. New Issues/Projects:**

Regarding Member Vacancies on the Charleston Advisory Committee.

Mr. Ray Cox has missed more than 2 consecutive meetings. He is being asked to step down. Mr. Will Smith and Mr. Kyle Cox have asked to be added to the committee. Mr. Buckley will ask the commissioners approval to add the 2 new members and have Mr. Cox vacate his position on the committee.

Derelict vessels: Port has a contract to dispose of 3 commercial and 2 recreational vessels. The DEQ and Oregon State Marina Board will provide 45% of funds to dispose of the 2 recreational vessels.

On Oct. 20, piling and dock work will start on the damaged docks. This is all insurance work. New Wifi is being installed in the RV Park. If it works well it will be opened up to the rest of the marina. More Surveillance cameras in the shipyard installed.

Port is waiting on the contract for the repair of all the Dock Head Buildings.

A gate is being installed at Alaska Packers Rd. It will be locked. If needed security can unlock for customer use. Question from meeting guest: can hours be set for the gate to be unlocked? Mr. Buckley said that is something that can be discussed.

Mark Fleck brought up condition of Troller Road. Some repairs were done last year by Mr. Hampel and Mr. Cox. It still needs major repairs. Mr. Fleck hired C&C landscaping to dig out some of the sediment by the drain. He is worried that with another bad winter the road will become much worse. Mr. Burns will follow up with Commissioner Main regarding the condition of Alaska Packer Road and Troller Road.

Four of maintenance crew will be dredging in Garibaldi until January, 2018.

The Stormwater system is just an interim system at this time. Installation of the permanent system will start Oct. 23.

Mr. Buckley and his staff are looking at the option of a Live-Aboard Policy. Mr. Fleming said a letter needs to be sent out and have a meeting addressing that issue.

The dredging of the marina is on hold. Port has been working with Corp. of Engineers. They have said only 5K cubic yards of dredging material can be put in the flow lane. Barview is an option for dumping but it will cost quite a lot to get it ready. Corp of Engineers is limiting where we can put it. Other options are dumping off shore, or filling in problem areas in the shipyard or Barview Site G. Port is trying to keep the cost down.

**7. Roundtable Discussion of Facilities Maintenance Needs from Customer's and Staff's Perspective:**

Mr. Fleming asked if the damaged pilings on E dock are part of the repairs mentioned earlier? He also mentioned that D dock has some exposed wires on lamp post, there are broken pedestals on F dock that has exposed conductors, some of the rubber bumpers at end of docks are all torn up and need to be replaced.

Mr. Fleming also asked about a Tsunami warning alarm in the shipyard, RV Park and Marina. Mr. Cox and Mr. Fleck said there used to be a practice alarm that went off every day at noon. You could hear it clear over in the shipyard. Mr. Buckley said he would contact the Fire Dept. regarding this issue.

**8. Committee Comments:**

An extended Special Jordan Cove LNG meeting was discussed by the committee. There is a lot of questions and concerns by the fishing community. A bigger venue will be needed. Mr. Nylander suggested that the meeting be run as a Charleston Advisory Committee meeting. That will give more control for the committee. Mr. Burns will take the lead on scheduling and finding a larger venue.

Lou Leberti asked if Mr. Defazio would be able to help with the dredging material dumping problem with the Corp of Engineers. Mr. Burns informed the committee that Mr. Defazio is willing to help with that issue.

Hugh link asked if the scheduling for materials for the 2018 repair the North Jetty. Mr. Burns said the start of moving materials to start the project for the North Jetty might not be until 2019.

- 9. Next Meeting Date:** Special Meeting scheduled for November 17, 2017 and Regular Meeting scheduled for January 17, 2018.

- 10. Adjourn:** Nick Nylander adjourned the meeting at 1:30pm.

**Port of Coos Bay - Charleston Operations**

**3 Months Status**

Preliminary & Unaudited

	2017-18 Jul-Sep Actual	2017-18 Jul-Sep Budget	Variance	%	Adopted 2017-18 Fiscal Year Budget	Change from prior year actual
Total Operating Revenue	\$ 707,816	\$ 648,000	\$ 59,816	9.2%	\$ 2,164,500	+15.1%
Personnel Services	\$ 357,728	\$ 335,000	\$ (22,728)	-6.8%	\$ 1,328,000	+4.6%
Goods & Services	\$ 250,894	\$ 301,000	\$ 50,106	16.6%	\$ 831,000	-10.6%
Total Operating Expenses	\$ 608,622	\$ 636,000	\$ 27,378	4.3%	\$ 2,159,000	-1.9%
Operating Result	\$ 99,193	\$ 12,000	\$ 87,193	-726.6%	\$ 5,500	N/A
Debt Service	\$ 10,018	\$ 10,018	\$ 0	0.0%	\$ 168,000	N/A

Major Repairs & Replacements completed in 2016-17:

Emergency Marina Dredging	\$ 190,000
New TUFF boat	\$ 32,000

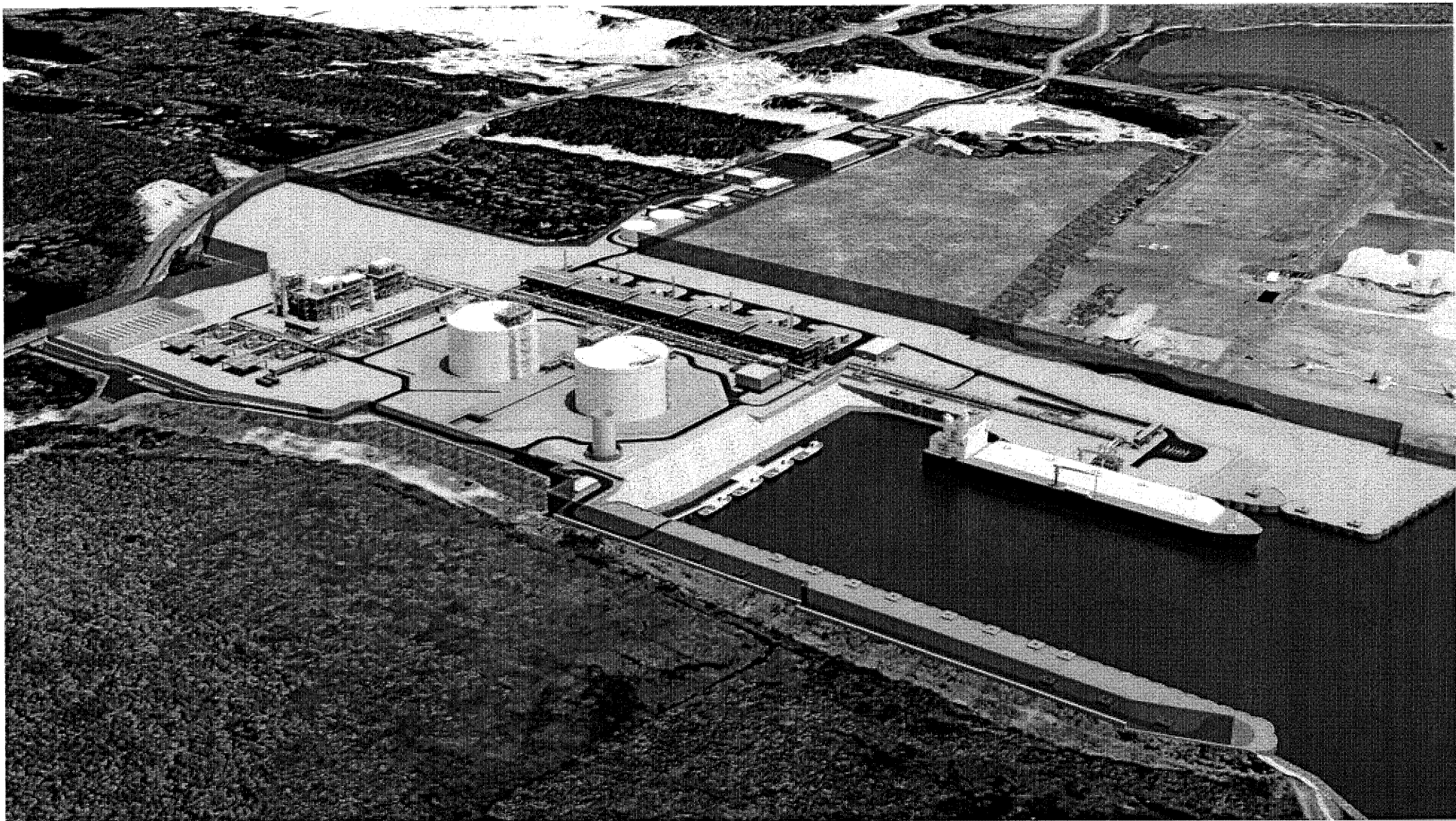
Major Projects Planned or in process in 2017-18:

Boat Travel Lift - Storage bldg remains	\$ 600,000	Loan obtained
Shipyards Stormwater	\$ 1,050,000	Loan obtained
Internet/WiFi/Surveillance cameras/Port Telephone System	\$ 125,000	Loan obtained
Ice Plant equipment & roof refurbishment	\$ 85,000	
Replace Ice Plant floating dock	\$ 40,000	
Heavy-duty truck for towing w/tail lift gate	\$ 30,000	Acquired
Rebuild all dock approach bldgs	\$ 40,000	
Dredge Marina - using State dredge equip	\$ 120,000	Postponed - USACE Permit issues

Dredge Activity in 2017-18:

Port of Garibaldi





# Jordan Cove LNG

Project update - Charleston Harbor Advisory Group

18 October 2017

# Agenda

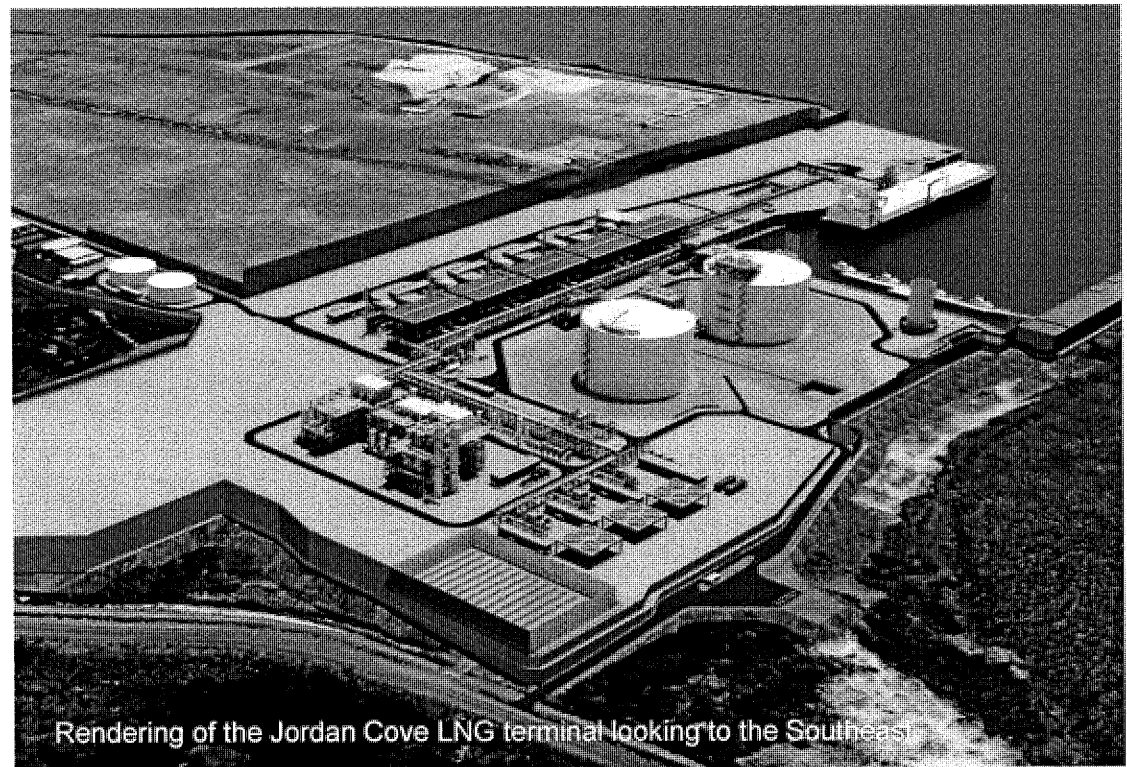
- JCLNG project update
- Introduction to Pembina Pipeline Corp
- Project overview
- Construction material deliveries by Ship and Barge
- LNG Carrier transits
- Project schedule

# Pembina Pipeline Corporation

- Pembina Pipeline Corporation acquired Veresen with the transaction closing on October 2, 2017
- Jordan Cove LNG (JCLNG) and the Pacific Connector Gas Pipeline (PCGP) continue to advance the project as wholly owned subsidiaries of Pembina Pipeline Corporation
- Pembina leadership is fully engaged and supportive of the Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline
- The combined entity will have a market cap of approximately \$33 billion Canadian, which means the project now has a much larger company backing it to a successful implementation

## Project overview – LNG terminal

- Natural gas liquefaction and export terminal in Coos County, Oregon to serve overseas markets around the Pacific Rim
- Natural gas will be delivered to the terminal by pipeline from the Malin hub located in southern Oregon.
- Liquefaction and export facility with an LNG production capacity of 7.8 million tons per annum (mtpa)
- Located on same site reviewed in the prior FEIS



Rendering of the Jordan Cove LNG terminal looking to the Southeast

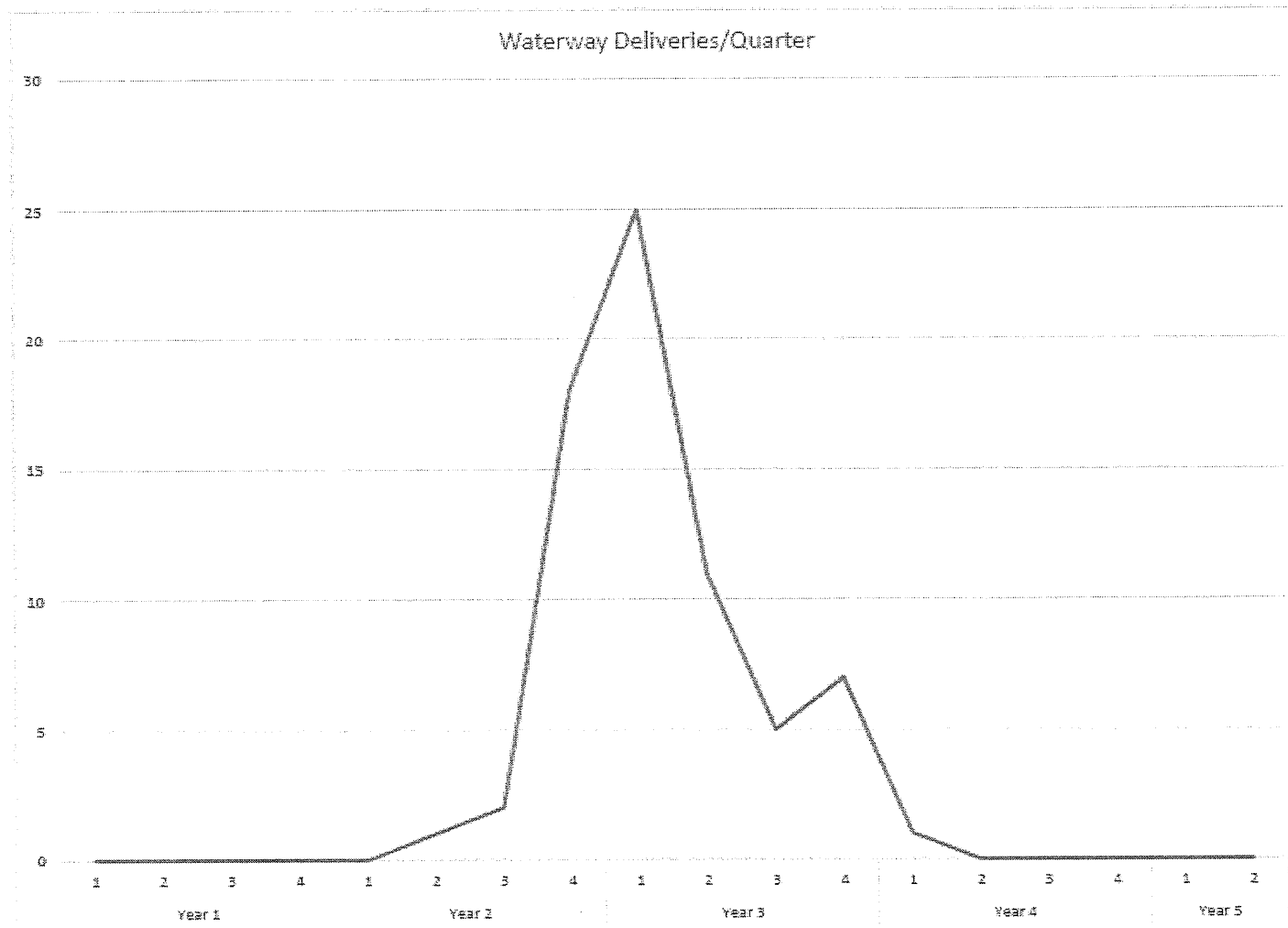
# Waterway Deliveries to the MOF

During construction, it is necessary to create a location for offloading equipment for the facility. This is called a material offloading facility (MOF).

- The MOF will be located on the south side of the project site with direct access to the Coos Bay shipping channel
- The MOF will be the single point for unloading of equipment & materials that come directly to site via the waterway
- Items delivered to site via waterway to the MOF:
  - Modules (LNG trains, Gas conditioning units, pipe racks)
  - LNG tank plates
  - Mechanical equipment (turbines, compressors, generators)
  - Large pressure vessels (dehydrators, amine contactor)
- Transits will be scheduled with the Pilots to minimize impact to the local boating community
- Number of transits is relatively low and below normal operational transits

# Marine Module and Material Delivery during construction

- KBJ High Level Schedule and Plan

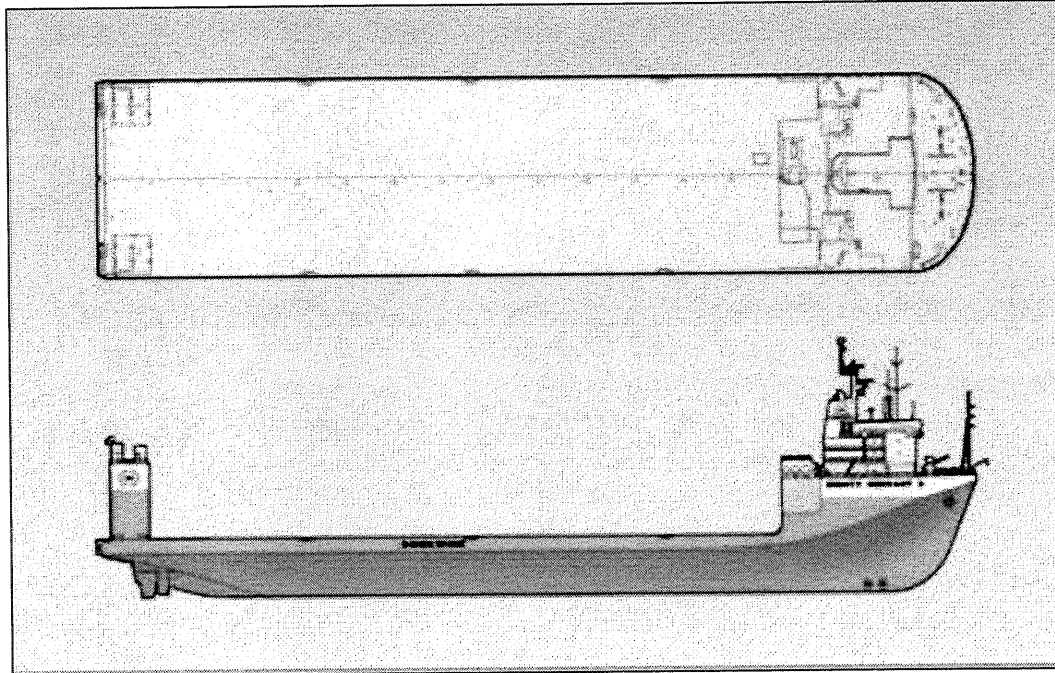


# RoRo vessel and Combi-Lift / LoLo vessel

## MIGHTY SERVANT 3

LENGTH O.A. (meter)	180.50
LENGTH B.P. (meter)	165.72
BREADTH MOULDED / MAX. (meter)	40.00
DECK SPACE [L X B]* (meter)	140.00 x 40.00
DEPTH (meter)	12.00
DRAFT SUBMERGED AT FPP / APP (meter)	22.00
MAXIMUM DRAFT (meter)	9.51
WATER-DEPTH ABOVE MAIN DECK FPP / APP (meter)	10.00
DEADWEIGHT (metric tons)	27,720
SPEED (knots)	15.0

\* Equipped with movable casings



# LNG Carrier Transit

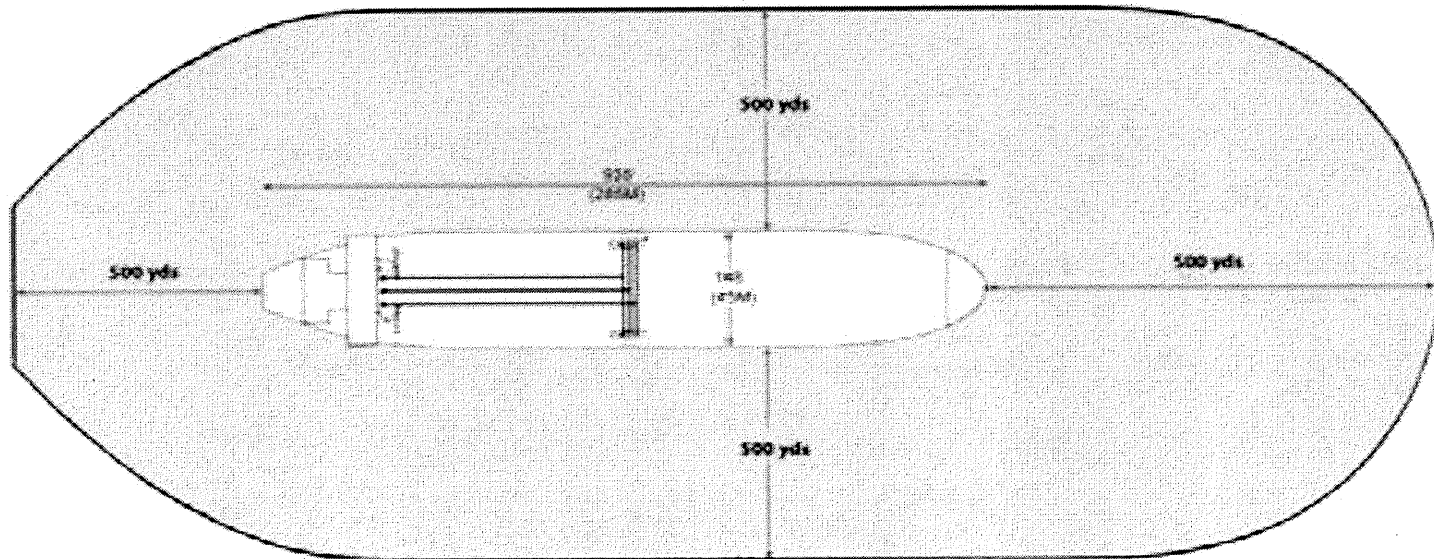
Approximately one LNG ship will visit the facility every three days once the terminal is operational, up to 120 calls per year

- Frequency will not impact traffic congestion in the port – as recently as the 1980's the Port routinely handled 350 ships per year. Today it handles about 50 ships per year
- Each LNG Carrier will be scheduled to minimize impacts to recreational boating and fishing in the Bay
- The USCG will oversee and control the safe movement of all LNG Carriers in the port
- All LNG Carriers will be piloted by a state licensed pilot and actively escorted throughout the transit by at least three tractor tugs purposely built for this task
- LNGC transits will apply all risk mitigation measures for safe & secure transits developed in conjunction with and approved by the USCG

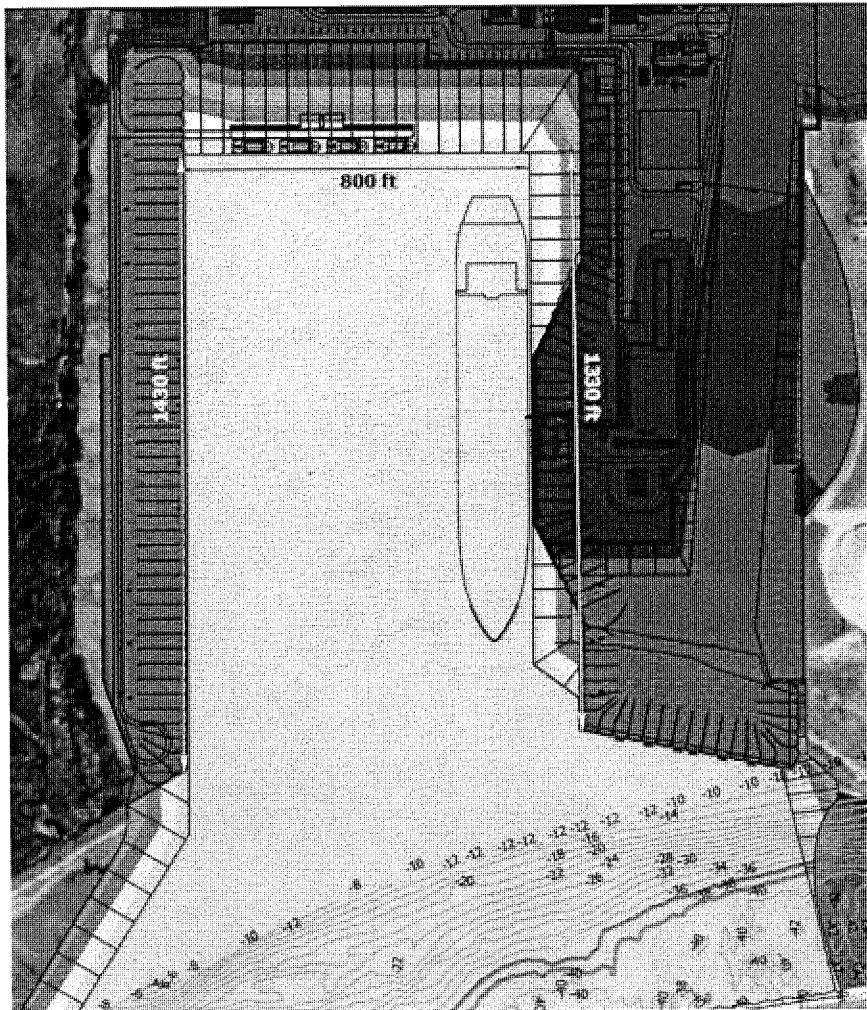


# LNG Carrier Transit safety & security zone

- There will be a moving security zone around the LNGC during transit for a distance of 500 yards
- This is not a moving exclusion zone – It is a zone that the USCG will regulate and determine permission to be in, enter, and/or pass through
- As with the bulk and log carriers transiting the channel today, all smaller recreational and commercial boaters will be guided away to avoid impeding the safe transit of the larger LNG vessels in the channel



## Security zone around LNGC at terminal berth



Marine terminal loading berth will be in a protected slip that is a security zone regulated by the USCG

The security zone will extend south out into the Bay by 75 feet from the end of the slip at all times

The security zone may be extended to a distance of about 250 feet from the end of the slip when a LNGC is present

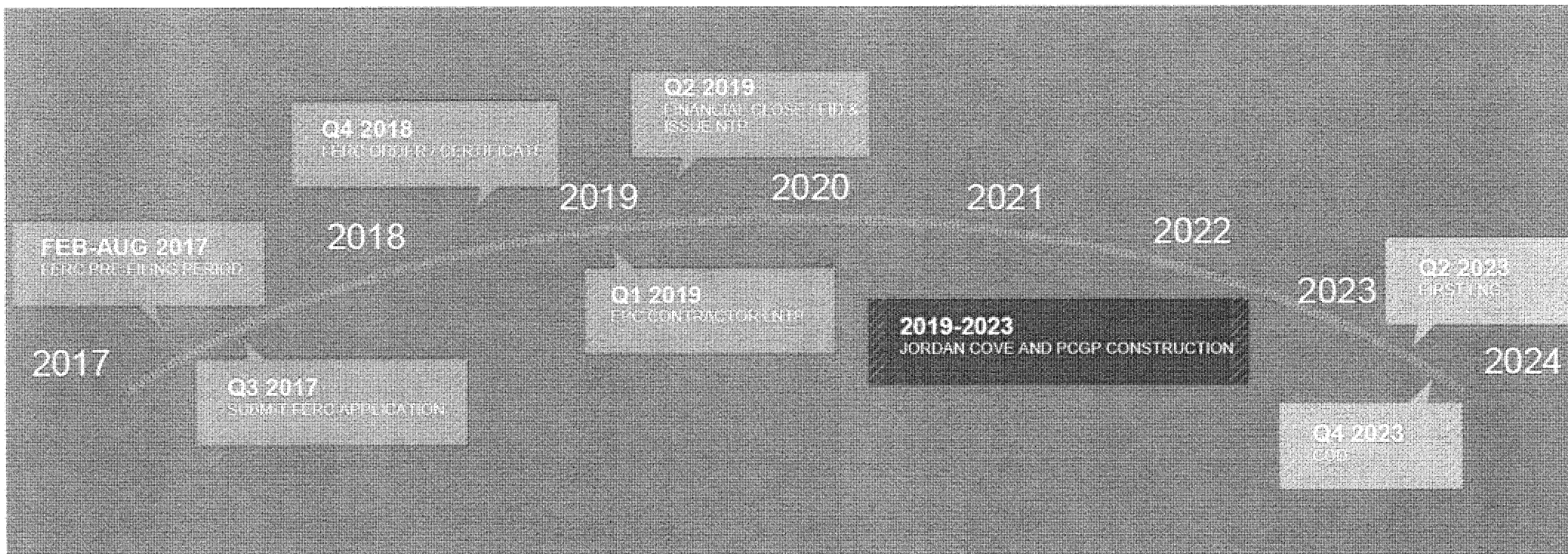
This security zone will not impede the safe transit of any watercraft via the existing Federal Channel

## LNG Carrier Transit – Boating impact mitigation

- Pilot's preference to schedule LNGC transits at night to reduce impacts to boating and fishing community
- Implementing channel Navigation Reliability Improvements
- Private Vessel Traffic Information System (VTIS) installed in the port to assist in traffic management
- NOAA PORTS system data collection buoys installed providing real time tidal condition and channel currents
- Introduction of three dedicated tractor tugs with enhanced fire fighting and offshore ship assist capability into Coos Bay
- Upgraded Portable Pilot Units (PPU) for the Pilots Association linked to a local DGPS transponder system to allow position accuracy to better than +/- 6 inches

# On schedule to deliver LNG by 2023

Jordan Cove anticipates commencing construction in the first half of 2019 and target in-service date is the end of 2023.



# Questions

**THANK YOU**

**DRAFT**  
**OREGON INTERNATIONAL PORT OF COOS BAY**  
**CHARLESTON MARINA ADVISORY COMMITTEE SPECIAL MEETING**

**12:00 p.m., Friday, November 17, 2017**  
**Charleston Fire District**

**ATTENDANCE**

**Committee Members:**

Mark Fleck, Englund Marine; Lou Leberti, Marina customer; Michael Armstrong, Marina customer.

**Media & Guests:**

Amrha Wimer, Port of Coos Bay; Mike Dunning, Port of Coos Bay; Wes Hill, Jordan Cove LNG; Donna Nichols, Jordan Cove LNG; Peter Schaedel, Jordan Cove LNG; Kerry Ground, Jordan Cove LNG; Chuck Deister, Jordan Cove LNG; Tom Burdett, BACC; Steve Jansen, Coos County Assessor; Captain Kirk Bonnin, Harley Marine – Olympic Tug & Barge; LT. Alex Drake, USCG; George Tinker; Coast Guard Auxiliary; Kathleen Hornstuen, Charleston Community Enhancement Committee; Barry Winters, BBSI; Todd Goergen Coos Bay Chamber; Dick Goergen, retired R.E.; Alan Tayler, Charleston Fire; Dana Gaab, local resident; Ed Fleming, Marina customer; Rick Skinner, Boost Southern Oregon; Sage Coleman, Pacific Properties; Daryl Kemmerle, Charleston Fire; Ben Crowell, USCG; Sam Baugh, SCDC, Jody McCaffree, CALNG; Deborah Steenbock, local resident; John Neikirk, CALNG; George Wales, Coos Bay Pilots; Chris Press, local resident; Cindy Laudel, local resident.

**1. CALL MEETING TO ORDER – INTRODUCTION BY MIKE DUNNING**

Meeting called to order at 12:00 p.m.

**2. INTRODUCTIONS**

**3. PRESENTATION BY PETER SCHAEDEL FROM JORDAN COVE**

Peter Schaedel presented on Jordan Cove LNG Project Update.

**4. QUESTIONS FROM AUDIENCE**

**Question:** Are the resource reports mentioned in the presentation public information?

**Answer:** The air emission reports are in the public resource reports. They are available on the Jordan Cove LNG website along with the local libraries.

**Question:** Does the Kentuck mitigation site cover the entire pipeline?

**Answer:** Yes, it captures the mitigation requirements. There is also an eelgrass mitigation site off the end of the runway in North Bend.

**Question:** How will the mitigation impact the people who live upstream from flooding?

**Answer:** Flooding has been a design criteria and additional flood storage capacity has been added. The intent is for less flooding than now.

**Question:** Does the mitigation exceed the requirements?

**Answer:** Yes, it does.

**Question:** How do fishing vessels access the ship schedule?

**Answer:** There will be two signs in both directions on Route 101 and when exiting Charleston harbor there will be an electronic sign. Jordan Cove is happy to work with recreational and commercial boating associations to figure out the best means of communication.

**Question:** Are the ships flagged by the United States, so they have safety standards?

**Answer:** There are no U.S. flagged LNG ships left in the world fleet. All the ships in the global fleet are designed and constructed to high standards. There are international regulatory standards through the International Maritime Organization (IMO) which the Coast Guard directly participates in. The Society of International Gas Tanker and Terminal Operators (SIGTTO) has requirements specific for officer and crew qualifications and training. Every LNG carrier that comes into the United States has to go through a certificate of compliance inspection by the Coast Guard each year. Before the ship can come into U.S. waters it has to go through the inspection. Even with the certificate of compliance, the Coast Guard has the option to do a port state inspection. LNG ships cost around 220 – 250 million each so the owners want to ensure they are well maintained and kept to standards. Jordan Cove wants to protect their investment in the terminal as well.

**Question:** Will this project change the current spill response?

**Answer:** Each LNG ship will sign up with the oil spill cooperative. Based on 110-120 ships a year, according to Richard Dybevik, it should lower the fee all ships pay to cover the expense of maintaining the emergency response capability. The only fuel oil onboard is what is used for operations.

**Question:** Will there be a chance for fishermen to give input on where the data collecting buoys are placed?

**Answer:** There is an opportunity for input from the fishing community. Mr. Schaedel asked for contact information. Jordan Cove is working with George Wales, Coos Bay Pilots Association and NOAA on recommendations of placement.

**Question:** What is the draft depth in front of the terminal and what is the draft needs of the tanker?

**Answer:** The navigation reliability improvements refer to the four corners of the existing federal channel where the channel turns. The pilots have requested this to soften the turns. The depth of the areas will be the same as the existing federal channel. The berth area will be 45 ft. deep to handle the potential tsunami impact. The ballast draft and loaded draft are typically within 2-2.5 ft. which is about 37 ft.

**Question:** How soon after a ship leaves will one be coming back in?

**Answer:** It might be the next day after an LNG ship leaves.

**Question:** How long is an LNG ship?

**Answer:** Between 900 – 950 ft.

**Question:** In the last EIS, the Coast Guard approved ships carrying 148,000 cubic meters. The facility is being built for 217,000 cubic meters.

**Answer:** The berth is being designed for up to a max of 217,000 cubic meter carrier which is not the largest that exist in the world today. The largest LNG carrier is 266,000 cubic meters. There are different cargo tank designs that are approved by the Coast Guard and International Maritime Organization for LNG carriers. Based on the selection of approved cargo containment system, the ship owner decides to build or design a ship. There is no direct correlation between ship dimension and capacity. Jordan Cove has been working with the pilots and Coast Guard and should focus on the dimension of the ship and not the capacity of the vessel.

**Question:** If they wanted to bring bigger ships, will there be more dredging than proposed?

**Answer:** The project is not based on the capability of bringing in bigger ships in the future but are pre-designing the berth to take advantage of it now. The 110 - 120 ships per year is based on the 950 ft. by 150 ft. ships the Coast Guard has approved to be suitable to bring into the channel as it is today.

**Question:** If there are 120 ship calls does that mean 240 bar crossings and are they high tide only?

**Answer:** One ship call is one inbound transit plus one outbound transit so 120 ship calls per year would be 240 bar crossings. The limit for the bar crossing is the current and not tide because the water depth at the bar is plenty deep enough at high or low tide.

**Question:** How long of a wait will there be from the tug boats and LNG ship?

**Answer:** The wait will be quite low because the LNG ship transit speed will be between 4 and 5 knots. The tugs will be along side the ship at the same speed during the whole transit. The tug return speed will be about 10 knots depending on the circumstances.

**Question:** Will there be any underwater blasting during the dredging of the terminal?

**Answer:** There has not been any hard material discovered that will require any type of underwater blasting.

**Question:** Will there be a turbidity problem from the dredging?

**Answer:** There are very strict turbidity requirements the dredging contractor has to meet and there is a variety of mitigation measures they can use to meet the requirements including stopping dredging for a period of time. To minimize turbidity impacts on the bay, the slip will be dredged prior to the berm being removed. 95% of the slip dredging will be done behind a land base barrier and there will be zero impact to the bay during that time.

**Question:** When the Jordan Cove vessel is in the channel is it shut off to all other boats?

**Answer:** It is a moving zone not an exclusion zone.

**Question:** A lot of crabbers use night time for crossing. How long is the wait?

**Answer:** The calculated wait time for the LNG vessel to go by is 6 minutes through the jetty and inside the channel would be 8.8 minutes. The ship is always moving, and the zone is moving with the ship.

**Question:** Are there sections in certain bar conditions where commercial vessels can get within the 500-yard zone for safety?



**Answer:** It would be up to the Coast Guard on-scene Commander who would assess the risk and threat.

**Question:** Will the Coast Guard be present for all crossings?

**Answer:** The Coast Guard on-scene Commander could be sitting in the Source Building, bridge of the ship, or in a security vessel in the zone. It is up to the Coast Guard where they want to be.

**Question:** What do the commercial fishermen do now for a chip ship?

**Answer:** George Wales stated it will be pretty much the same thing for a chip ship as an LNG ship. If there are any issues it is normally with out of town boats.

**Question:** What is security going to look like?

**Answer:** The Coast Guard is providing security assets for each LNG vessel transit. Along with the Coast Guard assets, Jordan Cove is providing security assets to support the Coast Guard. There is also an agreement between Coos County Sheriff office and the U.S. Coast Guard where the Coos County Sheriff office deputies will be marine police and used to support the Coast Guard enforcement of the safety and security zone. In addition to water based assets, there are also going to be land based assets from Coos County Sheriff department. A lot of the detail is security sensitive and not provided to the public. There will be plenty of assets available based on the threat level and risk and all controlled by the Coast Guard.

**Question:** What is being done regarding safety on land?

**Answer:** The Coast Guard assets do not just cover the water but also address potential threats to people standing on the land. The coordinated arrangements in place between all the required federal, state and local agencies including the shipping companies and Jordan Cove cover not just the waterway but land as well. From a safety standpoint, all local fire departments with jurisdiction on the waterway have been part of an emergency response plan development group for years. Mr. Schaedel stated he has been in the LNG business for 40 years and there has never been a breach of a cargo tank of an LNG carrier anywhere in the world in that time. Jordan Cove is following all the regulatory requirements of the Coast Guard and other U.S. agencies as well as SIGTTO recommendations and following all the regulations and industry standards.

**Question:** There seems to be a lot of SIGTTO guidelines Jordan Cove is not following.

**Answer:** SIGTTO guidelines is a risk based approach and each location is different and the approach is flexible based on a risk mitigation strategy. The risk mitigation strategy has been vetted and endorsed by the Coast Guard and will be endorsed by FERC and state and local agencies.

**Question:** If there is an accident, what is the protection for the citizens?

**Answer:** The protection is the emergency response plan. The main local agencies are the local fire departments and fire chiefs and they have the responsibility of protecting the public in the event of an incident. Jordan Cove, at the request of the local fire departments, Coast Guard and other federal agencies, is putting a full camera system and a gas detection system in the bay and around the shoreline. The information will be directly available to the fire chiefs.

**Question:** The security zone is a security bumper zone and boats will not be excluded from navigating within or without.

**Answer:** The on-scene Coast Guard Commander will make the decision which vessels need to move and what vessels can stay in place. The LNG ship will go by in about 8.8 minutes.

**Question:** How many LNG terminals and transits have been within 20-50 mins of the cascadia subduction zone.

**Answer:** There is a LNG terminal in Quintero, Chile that is less than 90 miles from their earthquake zone. There have been two major earthquakes since completion with zero issues. Jordan Cove is working with state and federal government to design the facility to the absolute latest technology available for earthquake impact or systemic events including tsunami events.

**Question:** If there is a tsunami and a ship in transit within the channel, is there a plan in place?

**Answer:** There is about 27-28 minutes before the first wave will come across the spit depending on the size of the event. The biggest risk that is mitigated against is a cascadia subduction zone 90 miles off the coast. There is a plan being developed modeled after a cascadia subduction zone event and tsunami.

**Question:** What measures are in place on land for a tsunami?

**Answer:** The location of the facility is being raised above plus 60 ft. in elevation. It will be the highest location on the North Spit and above the tsunami zone. The Coos County Emergency Management will be headquartered in the building. The 911 call center for the entire Coos County will be in the building along with other critical emergency response agencies for the county. Jordan Cove is working with the state experts who are modeling this type of event in the location specific areas and mitigating what the models show will happen.

**Question:** Would it be safe to say when construction starts it will be built to withstand a magnitude 9 earthquake?

**Answer:** The facility is being designed to the magnitude earthquake FERC and the state of Oregon requires.

**Question:** Will you explain how Jordan Cove changed the way electricity is going to be generated?

**Answer:** The original design on the facility was to have an electric power plant with electric drive compressors for the liquefaction process. In 2015 the design was optimized to reduce overall unit omissions by removing the electric power plant and going to direct gas turbine drive compressors for the liquefaction process.

**Question:** If the pipeline got shut down, is there a mitigation program to generate electricity?

**Answer:** The gas turbine will consume natural gas as fuel to power the gas turbine and it will be the same natural gas that is coming through the pipeline. If the gas source gets shut down, there will be no gas to make LNG and everything will shut down. There will be enough demand for electricity to run the facility to consume enough of the boil off to keep the LNG in the storage tanks at the right temperature.

## **5. ADJOURN**

Meeting adjourned at 2:14 p.m.



# Jordan Cove LNG

Project update - Charleston Harbor Advisory Group

17 November 2017

# Agenda

- JCLNG project update
- Introduction to Pembina Pipeline Corp
- Project overview
- Construction material deliveries by Ship and Barge
- LNG Carrier transits
- Project schedule

# Pembina Pipeline Corporation

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- Jordan Cove LNG (JCLNG) and the Pacific Connector Gas Pipeline (PCGP) continue to advance the project as wholly owned subsidiaries of Pembina Pipeline Corporation
- Pembina leadership is fully engaged and supportive of the Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline
- The combined entity will have a market cap of approximately \$33 billion Canadian, which means the project now has a much larger company backing it to a successful implementation

# Project overview – LNG terminal

- Natural gas liquefaction and export terminal in Coos County, Oregon to serve overseas markets around the Pacific Rim
- Natural gas will be delivered to the terminal by pipeline from the Malin hub located in southern Oregon.
- Liquefaction and export facility with an LNG production capacity of 7.8 million tons per annum (mtpa)
- Located on same site reviewed in the prior FEIS



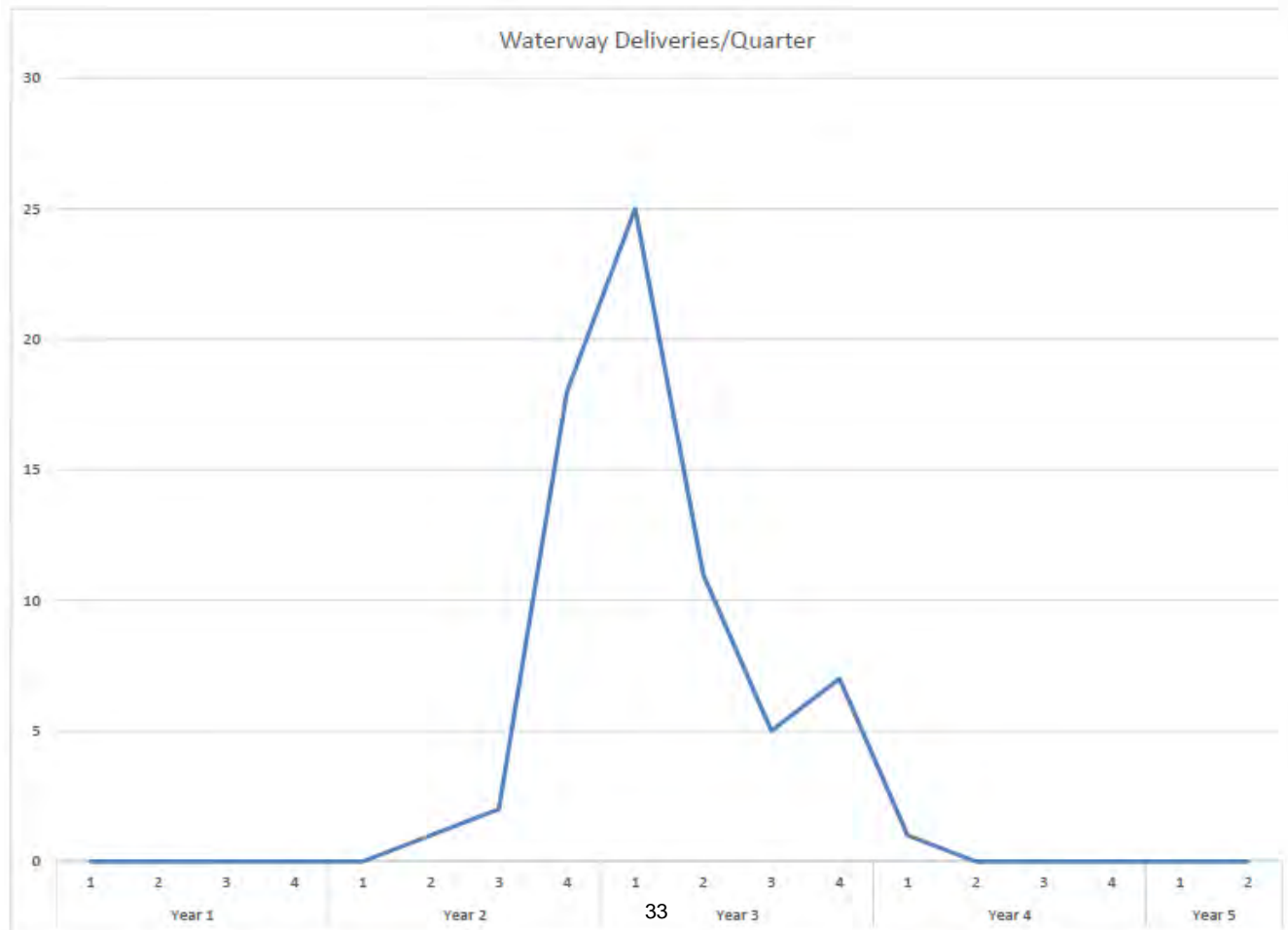
# Waterway Deliveries to the MOF

During construction, it is necessary to create a location for offloading equipment for the facility. This is called a material offloading facility (MOF).

- The MOF will be located on the south side of the project site with direct access to the Coos Bay shipping channel
- The MOF will be the single point for unloading of equipment & materials that come directly to site via the waterway
- Items delivered to site via waterway to the MOF:
  - Modules (LNG trains, Gas conditioning units, pipe racks)
  - LNG tank plates
  - Mechanical equipment (turbines, compressors, generators)
  - Large pressure vessels (dehydrators, amine contactor)
- Transits will be scheduled with the Pilots to minimize impact to the local boating community
- Number of transits is relatively low and below normal operational transits

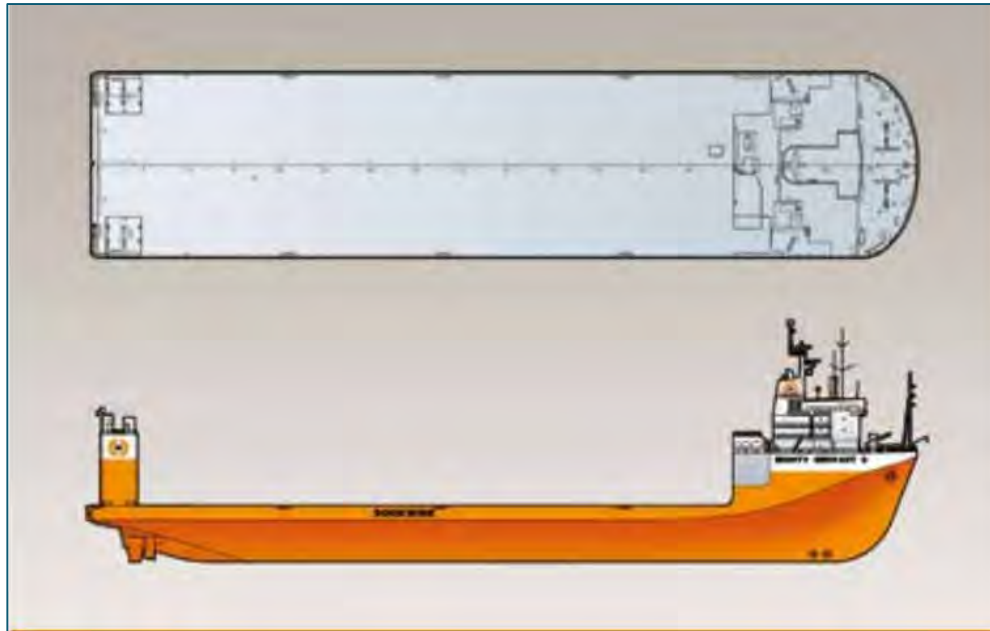
# Marine Module and Material Delivery during construction

- KBJ High Level Schedule and Plan





# RoRo vessel and Combi-Lift / LoLo vessel examples



LENGTH O.A. (meter)	180.50
LENGTH B.P. (meter)	165.72
BREADTH MOULDED / MAX. (meter)	40.00
DECK SPACE [L X B]* (meter)	140.00 x 40.00
DEPTH (meter)	12.00
DRAFT SUBMERGED AT FPP / APP (meter)	22.00
MAXIMUM DRAFT (meter)	9.51
WATER-DEPTH ABOVE MAIN DECK FPP / APP (meter)	10.00
DEADWEIGHT (metric tons)	27,720
SPEED (knots)	15.0

\* Equipped with movable casings

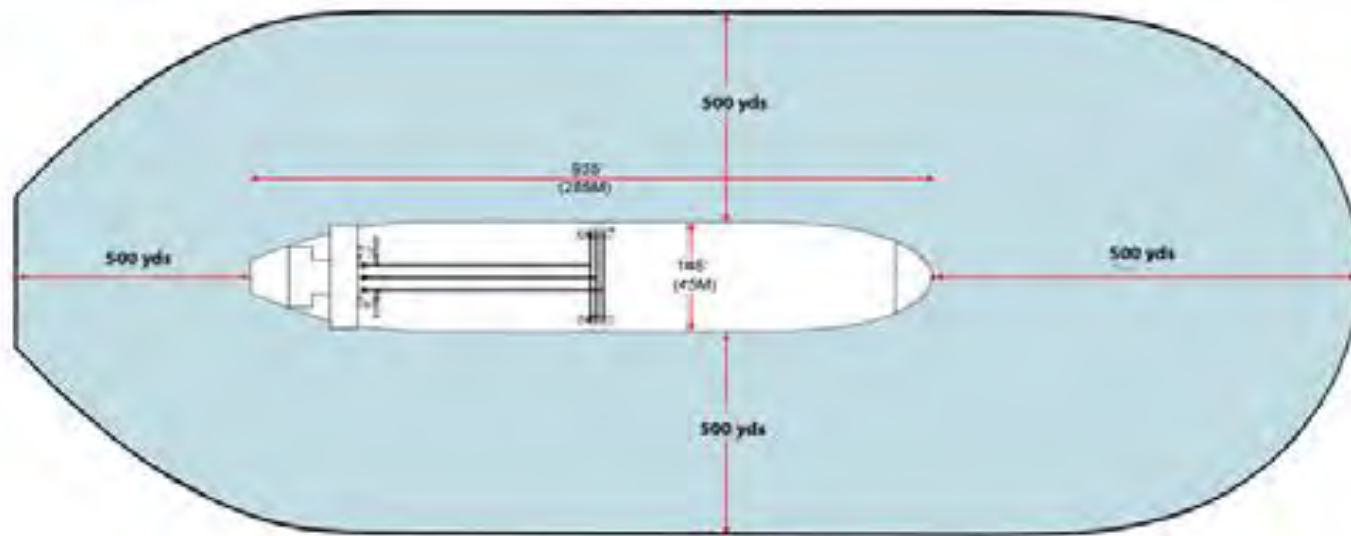


# LNG Carrier Transit

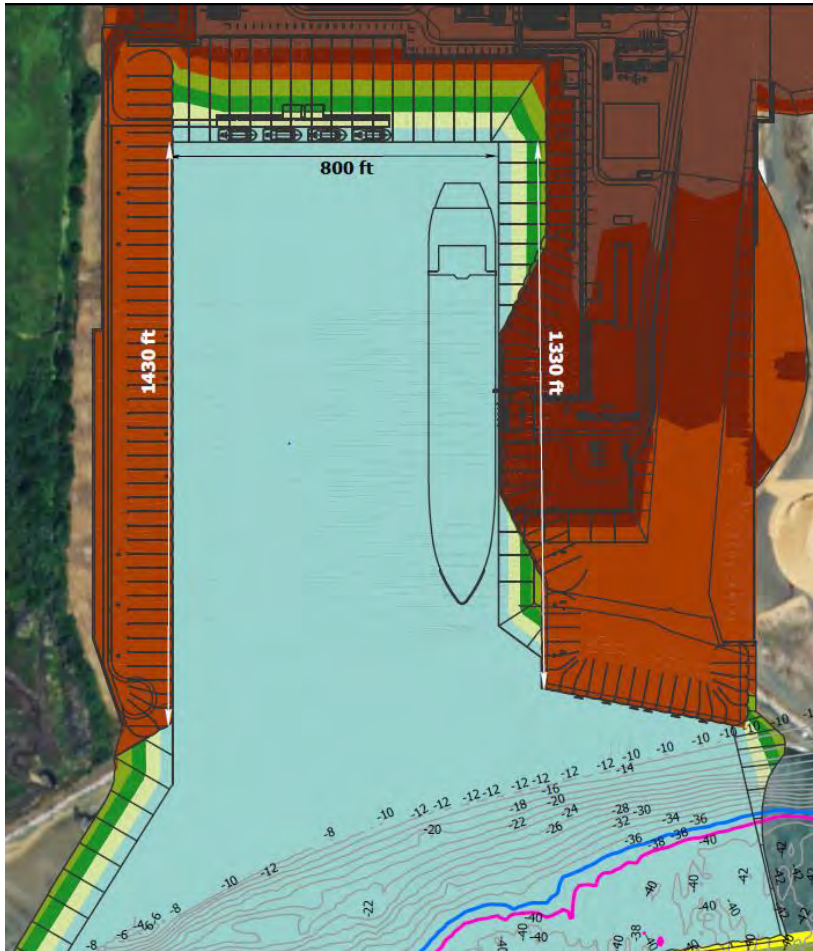
- Approximately one LNG ship will visit the facility every three days once the terminal is operational, up to 120 calls per year
- Frequency will not impact traffic congestion in the port – as recently as the 1980's the Port routinely handled 350 ships per year. Today it handles about 50 ships per year
- Each LNG Carrier will be scheduled to minimize impacts to recreational boating and fishing in the Bay
- The USCG will oversee and control the safe movement of all LNG Carriers in the port
- All LNG Carriers will be piloted by a state licensed pilot and actively escorted throughout the transit by at least three tractor tugs purposely built for this task
- LNGC transits will apply all risk mitigation measures for safe & secure transits developed in conjunction with and approved by the USCG

# LNG Carrier Transit safety & security zone

- There will be a moving security zone around the LNGC during transit for a distance of 500 yards
- This is not a moving exclusion zone – It is a zone that the USCG will regulate and determine permission to be in, enter, and/or pass through
- As with the bulk and log carriers transiting the channel today, all smaller recreational and commercial boaters will be guided away to avoid impeding the safe transit of the larger LNG vessels in the channel



# Security zone around LNGC at terminal berth



Marine terminal loading berth will be in a protected slip that is a security zone regulated by the USCG

The security zone will extend south out into the Bay by 75 feet from the end of the slip at all times

The security zone may be extended to a distance of about 250 feet from the end of the slip when a LNGC is present

This security zone will not impede the safe transit of any watercraft via the existing Federal Channel

## LNG Carrier Transit – Boating impact mitigation

- Pilot's preference to schedule LNGC transits at night to reduce impacts to boating and fishing community
- Implementing channel Navigation Reliability Improvements
- Private Vessel Traffic Information System (VTIS) installed in the port to assist in traffic management
- NOAA PORTS system data collection buoys installed providing real time tidal condition and channel currents
- Introduction of three dedicated tractor tugs with enhanced fire fighting and offshore ship assist capability into Coos Bay
- Upgraded Portable Pilot Units (PPU) for the Pilots Association linked to a local DGPS transponder system to allow position accuracy to better than +/- 6 inches

# Breaking bar



Modeling conducted in association with the Pilot's Association confirms an LNG carrier will be able to safely transit the bar channel area.

## Bar channel

- Bar channel has historically been dredged deeper by USACE to accommodate the safe transit of larger vessels
- The Pilots have confirmed that the number of days per year on average when the bar entrance channel is closed to ocean shipping is between 3 and 10 days
- Current deep draft ships use the channel with minimal delays
- The USCG establishes control of smaller vessels using the Coos Bay waterway during periods of hazardous sea conditions
- The USCG estimates that restrictions for transit of the bar channel are put in place during about 50 days per year (primarily during Oct-March) for small vessels due to breaking bar conditions for at least part of the day

# LNG Carrier & Tug emissions during a port call

- Each LNG Carrier port call will be approximately 29 hours per visit
- The LNGC call activities and operating periods per visit are as follows:

LNG Vessel Activities and Operating Periods per Visit		
Category	Activity	Time (hours)
Transit	Arrival to Berth (4-5 Knots)	2
	Berth to Pilot station (4-5 Knots)	2
Hoteling	Berthing Vessel	1
	Berthed, Not Carrying Out Cargo Transfer	6
	Vessel warm up of Main Engine & Departure Preparations	2
	Unberthing Time	1
Loading	Berthed, Carrying out Cargo Transfer	15



# LNG Carrier & Tug emissions during a port call

- The worst-case\* potential emissions, assuming 120 calls per year for each type of LNG carrier are:

Source	Emissions (tons/year)			
	NOx	PM	SO2	GHG (as CO2e)
Steam Turbine Vessels – Natural Gas	14.90	0.60	0.11	10,394
DFDE Vessels	48.68	2.06	3.57	8,756
Tugboats*	9.51	0.32	2.6	3,736

# LNG Carrier & Tug emissions during a port call

- Approximately 110 -120 LNG Carriers/year are expected to call
- Of these 60% are expected to be DFDE and 40% Steam Turbine
- There will be total 4 Tugs available and 3 will be used per transit and for berthing (and un-berthing) of the LNG Carriers
- Emissions include the inbound and outbound transit, berthing and unberthing operations, LNG loading, and hoteling of LNG carrier

# On schedule to deliver LNG by 2023

Jordan Cove anticipates commencing construction in the first half of 2019 and target in-service date is the end of 2023.



# Kentuck restoration and mitigation: Conceptual plan



# Kentuck restoration and mitigation

Design of the expansion of Kentuck Wetland Mitigation Site to 100 acres in consultation with NOAA Fisheries:

- Expands on the required mitigation area from 33 acres to include wide-ranging habitat of mudflats, salt marsh, willowed scrub/shrubs and fish structures
- Addresses stakeholders concerns such as saltwater intrusion; flood control especially in heavy winter rain; mosquito intensity and suppression.

# Coos County Direct Benefits

- Community Enhancement Plan
  - Estimated \$500 million in community fund to support education, waterfront development and county taxing districts
  
- Significant tax revenue for Coos County
  - Estimated average of \$40 million in tax revenue from LNG facility per year for the the project
  - Estimated average of \$5 million in tax revenue from natural gas pipeline for the life of the project
  
- Construction jobs for Oregon tradespeople
  - Estimated 2,500 – 3,500 construction jobs for Coos County
  - Commitment to using local southern Oregon workforce first and then cast a wider Oregon net to minimize out-of-state workers
  - Jordan Cove-Pacific Connector bi-annual grant program

# Questions

**THANK YOU**

# Financial Data Review



## Port of Coos Bay - Charleston Operations

### 3 Months Status

**Preliminary & Unaudited**

	2017-18 Oct-Dec Actual	2017-18 Jul-Sep Budget	Variance	%	Adopted 2017-18 Fiscal Year Budget	Change from prior year actual
Total Operating Revenue	\$ 459,543	\$ 455,153	\$ 4,390	1.0%	\$ 2,164,500	+15.1%
Personnel Services	\$ 358,133	\$ 298,561	\$ (59,572)	-20.0%	\$ 1,328,000	+4.6%
Goods & Services	\$ 296,384	\$ 172,580	\$ (123,804)	-71.7%	\$ 831,000	-10.6%
Total Operating Expenses	\$ 654,516	\$ 471,141	\$ (183,375)	-38.9%	\$ 2,159,000	-1.9%
Operating Result	\$ (194,973)	\$ (15,988)	\$ (178,985)	-1119.5%	\$ 5,500	N/A
Debt Service	\$ 64,366	\$ 143,605	\$ (79,240)	55.2%	\$ 168,000	N/A

#### Major Repairs & Replacements completed in 2016-17:

Emergency Marina Dredging	\$ 190,000	
New TUFF boat	\$ 32,000	

#### Major Projects Planned or in process in 2017-18:

Boat Travel Lift - Weight test remains	\$ 600,000	Loan obtained
Shipyard Stormwater - estimated project end date 1/31/18	\$ 1,050,000	Loan obtained
Internet/WiFi/Port Telephone System	\$ 125,000	Loan obtained
Ice Dock roof refurbishment /Ice Plant Equipment	\$ 85,000	Complete/ Postponed to 18/19
Replace Ice Plant floating dock	\$ 40,000	In process
Heavy-duty truck for towing w/tail lift gate	\$ 30,000	Acquired
Rebuild all dock approach bldgs	\$ 40,000	Complete
Dredge Marina - using State dredge equip	\$ 120,000	Postponed to 2018/19- USACE Permit issues

#### Dredge Activity in 2017-18:

Port of Garibaldi