



NORTH MERCER ISLAND/ENATAI Sewer Upgrade Project

BRIEFING: HOLLY TREE LANE HOMEOWNERS ASSOCIATION

Date: May 10, 2016

Time: 7-8:30 p.m.

Location: Private residence

Purpose of the meeting

King County's North Mercer Island/Enatai Sewer Upgrade Project team met with interested members of the Holly Tree Lane Homeowners Association. The HOA is located where the recommended alternative requires a new sewer pipeline to be installed up to 160 feet below ground. This meeting was intended to provide an overview of the project, answer questions, and begin a dialogue with residents who may not have attended recent community meetings.

Introductions

Monica Van der Vieren, King County Community Relations lead for this project, thanked everyone for attending and everyone introduced themselves. The purpose of the briefing was to review the project and upcoming activities, and answer attendees' questions and hear their concerns. Monica indicated that technical experts on the team were in attendance to explain the project and answer questions, but that not all subject matter experts (such as environmental and permitting) were present. She noted that the project team would follow up on any questions that could not be answered at the meeting.

Project overview

Sibel Yildiz, King County Project Manager, provided an overview of the project scope, purpose, and schedule. To maintain safe, reliable service, King County needs to replace aging sewer lines serving Mercer Island, the southwest portion of Bellevue near Enatai Beach, and the town of Beaux Arts Village. The pipes were built in the 1970s and are nearing the end of their service life.

Project background

The team started the alternatives analysis process about two years ago. A single feasible alternative was identified for the East Channel crossing and Bellevue. Physical constraints ruled out trenchless installation (drilling or tunneling) under the East Channel, and technical issues prevented hanging the pipe from the I-90 bridge. In Enatai, the project team faced constraints due to:

- Topography (waterways and hills)
- Sewer connections to homes and other City of Bellevue pipelines, and
- Sensitive environmental areas such as Lake Washington and Mercer Slough



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The recommended alternative for Bellevue is trenchless installation of a new pipeline deep under the hill from Enatai Beach Park to the County's Sweyolocken Pump Station by Mercer Slough. After this new pipeline is connected, the project will rehabilitate the existing Enatai Interceptor to continue providing service to waterfront homeowners and areas north of Enatai including the Town of Beaux Arts.

Project schedule

The project is currently in the early design phase. During this phase, the team will look at soil and groundwater conditions, map utilities, and survey the project area. . By this fall, the project team will recommend the final alignment. We will begin final design in 2017. Construction is projected for 2019 to 2022.

Project Design and Construction- Bellevue

James Chae, the project's Design Manager, shared his experience working on projects like this for 23 years. James described a similar King County project that was constructed in Bellevue, the Bellevue Force Main Project. James led the project to install a new pipeline extending a total of 5,300 feet using the same method proposed for Enatai, Horizontal Directional Drilling, or HDD. James described one 3,800 foot segment extending from Bellevue Pump Station at 595 102nd Avenue SE to Bellevue Club. The contractor drilled the pipeline under Bellevue High School, the King County Courthouse, homes, and condominiums with no impacts to the surface.

Recommended alternative for this project

On Mercer Island and Bellevue, the project team's recommendations considered environmental permitting constraints for work in the water. The existing pipeline is mostly constructed in the water from Luther Burbank Park on Mercer Island, across the East Channel, along the Enatai shoreline, and in Mercer Slough. Permitting agencies now require project teams to consider locations out of the waterway if they are feasible. On Mercer Island, the recommended option follows a corridor including the I90 Trail and North Mercer Way rather than in the water along the shoreline.

The team's only feasible option to cross the East Channel is in a trench. Drilling or tunneling the pipeline below the East Channel was not acceptable due to the proximity of the I-90 bridge and hydraulic constraints.

In Enatai, there is a feasible option to keep the pipe out of the water by drilling the pipeline under the hill from Enatai Beach Park to Sweyolocken. The project includes rehabilitation of the existing Enatai Interceptor to maintain residential and city connections. However, there wasn't a feasible option that could be permitted to put a bigger pipeline along the Enatai shoreline and Mercer Slough.



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Construction method

James described the Horizontal Directional Drilling method and explained what people in Enatai could expect during construction. HDD starts when the contractor drills a pilot bore, to establish a path for the new pipeline. After the pilot bore, the contractor widens the borehole so that the pipe will fit in. The contractor keeps the borehole open using drilling mud. In the final step, the pipeline is pulled through the prepared borehole.

In Bellevue, entry and exit pits would be at Enatai Beach Park and King County's Sweyolocken Pump Station in Bellevue. Work would occur under I-90 by Enatai Beach Park. The contractor will install a pipeline across the park to connect the new pipeline and the existing Enatai Interceptor. This connection is needed to get enough flow through the Enatai Interceptor to keep solids in the wastewater moving. At Sweyolocken, the contractor would use the boat launch parking area to build a drilling pit. The pipeline would probably be assembled offsite and floated in on Lake Washington to pullback through the borehole. This work has to occur continuously during the pullback, and should last approximately 2 – 3 days.

James explained why the team recommends HDD as a trenchless method for installing the pipeline under Enatai Hill. Open trench installation in the streets wasn't feasible because the trenches would be too deep. Tunneling machines have some of the same impacts as HDD, with added risk if they encounter a boulder deep underground. With HDD, the contractor can typically steer the drill around underground obstacles, if encountered.

HDD was identified as a recommended construction method from Enatai Beach Park to Sweyolocken Pump Station. James referred to the HDD fact sheet to explain the three steps involved in HDD construction. This method minimizes risk since crews use guidance wires to steer the pilot hole, and to change the direction of the drill bit to avoid boulders if needed. While doing this work, we will likely have a few monitoring points installed along the HDD route so that we can survey any ground movement during construction to protect both homeowners and the county. The team does not anticipate any movement since HDD will be used 50-160 feet below the surface. The shallowest, 50-foot-deep HDD bores would be at either end of the staging areas under the I-90 bridge near Enatai Beach Park and next to Sweyolocken Pump Station. The new pipeline will be approximately 30 inches in diameter.

Some project team members recently completed another HDD project called the South Magnolia CSO control project. Our team has experience working closely with individual property owners throughout projects.

Field investigations and geotechnical information



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Mike Kucker is a geotechnical engineer from Shannon and Wilson, a consultant firm with decades of experience working on major projects in the Puget Sound region. Mike has worked on many King County projects, including the Bellevue Force Main Project described earlier and the County's South Magnolia CSO Control Project, which included 3000 feet of pipeline installed under Magnolia bluff using HDD. Mike described the history of the soils in the area in the context of trenchless construction methods. He described the upper layer of soil on Enatai Hill, as a till layer compressed by thick glacial ice in the past so that it seems hard as concrete. Neighbors said it seems like rock when they dig in their yards. Mike said the soils below are sands, silts and some clay. These soils and the 20-30 foot thick glacial till layer on top, are favorable for drilling. Mike said that this area does not have a lot of large boulders in the soil, but if an HDD drill encounters a boulder, it can steer around it. The team will need to get more information about soils and groundwater in order to finalize the alignment, and will drill four additional boring holes to fill in the soil profile along the alignment. Borings are typically done by, but not in, the alignment to avoid problems during drilling.

The Holly Tree Lane neighborhood will have one boring in the street by the cul-de-sac. It typically takes about three or four days to drill and collect a soil sample core from a boring that is about 6 inches in diameter. The work will be similar to what people saw on 34th ST last summer. The boring contractor will install a monitoring well and cap it with a lid. Engineers will periodically visit to check groundwater levels.

Our contractor will eventually remove monitoring wells and fill boreholes with bentonite natural clay) chips that solidifies. They will also restore the pavement on top of the boring.

Questions and Discussion

Project Coordination

Can you explain the responsibilities of the City of Bellevue and King County for the sewer system?

The City of Bellevue receives sewer flows from private properties, and King County receives sewer flows from the local sewer districts. King County provides wastewater treatment for the region. Wastewater in this area flows to South Treatment Plant in Renton.

Is King County working with the City of Bellevue? Why isn't a representative from the City of Bellevue at this meeting? Can they be invited to these meetings?

We have had meetings with City of Bellevue staff and have provided briefing materials for Bellevue City Council. Cities usually work closely with us but let us conduct our outreach directly with their communities. They are kept up to date on our community outreach activities and what we are hearing from the community. Bellevue has been very engaged with how we're



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working with the community and what we're hearing. We will let them know the community is interested in having them be present and invite them to our meetings as we go forward.

There is a lot of construction going on now. Could you have scheduled this project to wait until the other projects are done?

We know the Mercer Island and Bellevue communities are facing a lot of transportation and utility improvement projects at the same time. King County's sewer upgrade needs to occur now to continue providing safe, reliable service to North Mercer Island and Southwest Bellevue. The Wastewater Treatment Division (WTD) monitors our whole system, looking at both the amount of flow coming into the pipes, pipe condition and age of the pipelines. We start to track systems that are nearing capacity, showing wear, or nearing the end of their service life. WTD is committed to planning and carrying out projects before there are problems- we don't plan to wait until a break or overflows occur. The pipes in this area will be half a century old by the time they are replaced, and we have already experienced overflows from manholes on Mercer Island in two very large storms (December 2007 and 2010).

It takes years to plan, design, permit, and build sewer projects like this one, so we plan far ahead to carry out these projects in enough time to continue safe, reliable service. Other projects are planned all the time, and long-term planning, contracts, and funding issues do not always allow a range of agencies to coordinate projects.

We are working closely with Sound Transit and the City of Bellevue to identify ways to reduce community impacts as we move forward. King County's team will be with the community every step of the way.

Recommended alternative

Can't you use the pipeline that we have instead of drilling a new pipeline? Is there another pump station you can send flows?

The project team looked at an alternative to increase the size of the existing Enatai Interceptor, but rapidly encountered insurmountable obstacles:

- The pipeline is located under docks. We looked at building a new pipeline away from docks, but the lake bottom drops quickly. We would have to support a new pipeline on piles installed in the lake, which would probably not get permitted. If we tried to bury the pipeline, it would mean filling the lake bottom, which also would not get permitted. We already know that agencies that oversee our waters will not permit an in-water option if there is a feasible option upland, which we have identified in this case.
- Since the Enatai Interceptor was built, the I-90 bridge has expanded. While we can maintain the existing pipeline, replacement work would require significant- and likely unacceptable- construction near the bridge piers.



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Why doesn't the alignment follow I-90 along 34th and then turn north to Sweyolocken Pump Station?

There are two reasons. First, the turn from 34th ST up Mercer Slough is too tight for HDD so another drill pit would be required at that location. This creates more impact and there isn't a suitable location for staging. Second, WSDOT discourages pipelines that run parallel to freeways if there is an option to avoid that. When crossing freeways, they encourage a perpendicular crossing in as short a distance as possible.

Growth happening other places in Bellevue, not here in Enatai. Why can't the project happen where the growth is occurring?

There are two reasons for this. First, the system isn't configured in a way that makes that approach possible. It is a regional, interconnected system designed around the lay of the land and wastewater, like water, flows to a downstream point, in this case, treatment plants.

Bellevue upgrades pipes in areas where there is growth. King County takes wastewater from the City of Bellevue's system, and this area is downstream, and part of a regional system. Your flows continue downstream to King County's South Treatment Plant in Renton.

Second, upgrades are based not only on growth, but on an effect called *infiltration and inflow*. King County's planning process to maintain safe, reliable sewer service includes a calculation for groundwater that infiltrates into old, leaky sewers outside our system. As your side sewer that goes to the City's sewer gets older, it can develop small cracks that let groundwater into the sewer system. If you don't regularly inspect your sewer, you may not know it is leaking until there is a sewer backup into your home. As people build more surfaces that don't absorb rainwater- larger houses, additions, paved driveways and paths- runoff during storms adds more groundwater. More groundwater means more water in the sewer system during storms, and less capacity for wastewater.

So your sewer system may need more capacity over time even if there is zero growth in your area because sewers are not maintained to keep groundwater out of the system. We are planning this system to serve you for 50 years or more, and we're taking more infiltration and inflow into account over that time.

How can you build under the I-90 bridge if WSDOT doesn't like construction and pipelines near freeways and bridges?

The recommended alternative limits work near the I-90 bridge and roadway, but some work near these structures is required to ensure continued service of the regional wastewater system in this area. The project team will work closely with WSDOT and perform any required studies to inform project design that protects the bridge and freeway. WSDOT will carefully evaluate all work to protect their infrastructure.



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You're proposing to build the pipe along I-90 on Mercer Island. Didn't you say that WSDOT doesn't like pipelines parallel to the freeway?

We did not identify a feasible option on Mercer Island that avoids a route parallel to I-90. We looked at trenchless crossings from the North Mercer Pump Station to Bellevue, but these are considered very high risk. We also looked at an in-water alternative but this wouldn't be permitted since we have a feasible upland option that reduces in water work. It is also unlikely that WSDOT will add more lanes to I-90 in this right-of-way since the I-90 bike trail is much higher in elevation than I-90.

Will there be manholes in people's yards?

No, there will be no structures on private property. Access points will be established at Enatai Beach Park, where there are already access manholes for the existing Enatai Interceptor, and at the Sweyolocken site. The exact location of access points will be determined during design.

What determines the depth of the pipeline? Can you put it deeper underground?

Depth is based on requirements to keep wastewater flowing and the pipeline installation method. Designers' first priority is to keep wastewater moving through the system at a rate that prevents solids buildup. In this area, the flows are very complex. In the recommended alternative, the North Mercer Pump Station pushes wastewater up a hill to a point along the upland corridor. Then the pipe travels downhill and the wastewater flows by gravity. Once it reaches Enatai, the flows travel through a siphon, where the downstream end is lower than the upstream, but there is an even lower part in the middle. Having a lower downstream end keeps the flows moving through that "dip" in the middle by gravity. Designers have to put these pipes at a depth that will maintain flows in these types of systems.

The installation method also dictates how deep the pipe can be. HDD "dives downward" but can't do so at a very steep downward angle from the entry and exit points. To get deeper, the entry and exit points have to be farther apart, which isn't feasible in this case.

Property

What kind of property do you need for this project?

To build this project, we will need temporary and permanent easements. We will be working with agencies like Washington Department of Transportation, the Cities of Mercer Island and Bellevue, state agencies like the Department of Natural Resources, and federal agencies like the Army Corps of Engineers. We will work one on one with private property owners on Mercer Island and Bellevue.

If King County has an easement under my property, would you dig through my yard to get to the pipe if there is an issue with the pipeline in the future?



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No. First, we would access the pipeline from existing shafts and manholes to address any issues in a pipeline that deep. It is not feasible to excavate 160 feet below the surface to address a problem. Most importantly, we would have no surface rights on your property. Because the pipeline- and our easement area- is so deep, you can develop and use the surface without considering our below ground easement.

Do homeowners have to hire an expert if King County contacts them for an easement?

When King County requests a temporary or permanent easement, the County will acquire an appraisal to provide homeowners fair value for the easement. If a homeowner wishes to obtain an independent verification of the appraisal, King County will contribute a set sum to support that effort.

What happens if homeowners don't want to grant easements?

King County understands that homeowners have concerns when they first hear that we are requesting an easement on their property. Our property team works supportively with homeowners to understand the easement process, and we help homeowners through the process. We work through issues and concerns with each homeowner, starting early as we are now. The County has successfully worked with homeowners to ensure that we can obtain property rights to build infrastructure that we all need to maintain healthy communities. Our project team is made up of people who are residents in the area, and all of us face the same need for projects to support our region.

In the Magnolia project, did you work with homeowners associations or individuals on the alignment?

On the South Magnolia CSO Control Project, we considered two pipeline alignments, one of which involved almost two dozen homeowners. We began the process of engaging individual homeowners for easements along that alignment, but discontinued the process when we discovered landslide risk close to a bridge was too great to consider that route. People were still concerned about the potential for landslide or other problems along the route so the whole team worked with them to understand the drilling process, geotechnical evaluations, and how we avoid problems like that. We have successfully finished that project with no problems.

Can you tell us which properties will have drilling below them?

Not at this time, since the project team needs to acquire more soil and groundwater information before finalizing the alignment.

Why not go under the street instead of private properties?

The project team looks at this option first, and the team is still looking at minimizing the number of private properties along the alignment. However, technical limitations and permitting don't



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always allow us to avoid private properties. Drilling methods limit most construction impacts to the entry and exit points, but they have constraints such as how much the pipe can turn or bend before another drill shaft is needed to completely change direction. Carefully designed drilling deep below private properties often causes less impact than building additional shafts that follow public right-of-way.

Is there some protection for homeowners if construction causes a problem or something happens in the future? What if something happens long after the contractor is gone?

With all the tunneling news in our area, we know people will have questions and concerns about trenchless technology. King County hasn't experienced problems during construction, and the team expects that people on the hill, well over 100 feet above the drilling, will not know that work is occurring. The County also has no reports of issues developing over time.

One way we avoid problems is research. Our team's geotechnical and trenchless technology engineers evaluate soils to see whether they are conducive for the proposed method. We look at historic data on soils in the area. We have taken one soil boring on 34th ST and will take more borings this summer along the alignment. We'll measure groundwater over time.

We add protections in the contract and require the contractor to measure vibration at key locations and check for settlement along the route. We have never had reported problems using careful research and these measures.

If someone does feel that King County's project has caused a problem, there is a process to report this to the County. First, you need to contact us as quickly as possible, especially during construction, so we can investigate and respond. We have had instances where people who live far above a drilling operation report vibration, and upon investigation, it turns out the vibration is from another local (non-King County) construction project. We investigate that sort of report even on weekends, and we follow up with you to tell you what we have found.

Even after the project is over, King County and the Wastewater Treatment Division will be here to take your call. It's different from some construction projects where a developer may live outside the area and sell the built project later. We will continue to be here providing services, and you can reach us long into the future.

Construction

Do you hire the contractor with the lowest bid?

King County must follow state law, which requires acceptance of the lowest *qualified* bidder. On a complex project like this, our team will write qualifications to ensure that contractors with appropriate skills and experience bid on the project. Then there is an evaluation process using a range of criteria to make sure the contractor is qualified to perform the work. King County has disqualified contractors in the past if they are not qualified.



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A project like this is likely to attract only the most experienced drilling firms. The County's Bellevue Force Main project attracted one of the two best drilling firms in the nation, and the Magnolia project was built by the other firm.

This technology seems very new, without a lot of evidence that problems at the surface won't happen years after the project. Are there long-term studies? How many wastewater projects have used HDD technology and how long have they been in place?

HDD is not a new technology; it been in use since the 1970s, almost half a century. The Bellevue Force Main project was completed 8 years ago and no issues have been reported. We don't expect surface issues on projects like this, even years later, because we are so deep below the surface, the pipeline is relatively small diameter, and the soils are good for drilling. We know that the type of soils we see in this year are good drilling soils because they have been compressed by glaciers over half a mile thick. Soils like that expand to fill any space that may be created around the pipe. We also support the borehole with drilling mud, a clay-based substance that firms up quickly and fills space around the pipe.

How will the project affect Enatai Beach Park?

The recommended alternative calls for a drilling pit to be located under the I-90 bridge in the undeveloped gravel area. Staging will also be needed for other equipment. Once the pipeline is built we will need to connect the new pipe to the old pipe, which involves trenching, or digging a pipeline across the park. We will work with WSDOT, the City of Bellevue and the community on what construction and restoration of the park look like.

I have a swimming pool on my property. Could the drilling work affect my swimming pool?

It would be unprecedented from our experience on similar King County projects to have effects at the surface from drilling in good soils that far below the surface. The Bellevue Force Main Project is a good local example of how drilling can be carried out below buildings and roads without impacts at the surface. We successfully completed installation of a pipeline by HDD in Magnolia, closer to the surface by a historic building with no effects on the structure or driveways.

If you feel there are any impacts during construction, which we don't expect, you will be able to contact Community Relations staff at any time on the 24/7 construction hotline to report a concern. Our staff will contact King County's construction management team to investigate the report as quickly as possible.

Who do I contact about noise and other impacts during field work?



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During construction, we will maintain a 24-hour hotline, but during this field work, Monica will provide the community with her contact information including a cell phone number to report any concerns or complaints. The County's project teams work with communities and crews to find reasonable solutions to problems on the ground.

Does Mercer Island have impacts from this project like Bellevue does?

Mercer Island will benefit from this project and also experience impacts, and not just from pipeline construction. We will need to upgrade King County's North Mercer Pump Station because building a new pipeline uphill out of the water means that we need more pumping power to move wastewater. We also need to upgrade the City's Lift Station 11 to make this alternative work.

As in Bellevue, we don't have a final alignment yet on Mercer Island. We show the pipeline running in an upland corridor on the map. We are looking at the feasibility of installing the pipeline on the I-90 trail, but we need to do field work and coordinate with WSDOT. There is a lot we need to find out about the utilities and retaining walls along I-90, there are some very narrow areas that may affect constructability, and WSDOT has to approve the alignment. We may find that sections of the pipeline have to be built on North Mercer Way, which will cause traffic impacts. We will also affect the Mercer Island Boat Launch for the East Channel crossing.

What happens if the pipeline gets blocked?

Our designers and operations staff work together to build systems that keep the solids in wastewater flowing at all times. If any solids do build up in low parts of the pipes, the system is designed to flush them out during high flows. There are daily peaks and storm peaks that help to keep wastewater moving. We have addressed rare blockages caused by unexpected events, such as a sudden rag and grease blockage that occurred, probably due to disallowed disposal by a restaurant. This is an isolated problem that we can address from existing access points in the system.

Next steps

Attendees and community members may think of questions they forgot to ask after this meeting. If people have additional questions or concerns, they should contact Monica Van der Vieren at monica.vandervieren@kingcounty.gov or 206-477-5502. Monica will follow up with the community by providing a draft summary to make sure the team's notes are inclusive. Monica will add questions she receives after the meeting, and the summary will be posted on the project Web page.

During this phase, we will continue to do outreach. We will provide advance notice of surveys and geotechnical work, and Monica will be available to address questions and concerns during



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the geotechnical work. In the summer, the project team will host an event at Enatai Beach Park to help people learn about the wastewater system and the project in their area. In the fall, we'll host a meeting and information session so people can learn about our findings during field investigations and get an update on the alignment through the whole project.