

Boyd, John

From: Williams, John
Sent: Wednesday, June 19, 2019 11:03 AM
To: 'Roberta Schwarz'; Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Boyd, John; Savanna Oaks Neighborhood Association
Subject: RE: June 19th PC Meeting on Storm Water-Please include as part of Public Record

Roberta,

Tonight's [PC meeting](#) is discussing the Sanitary Sewer Master Plan, not the Surface Water Plan. As far as I know, the Sanitary System Plan is unrelated to the Bernert Basin issue, so there is more time to work all this out.

With that clarification, please let me know if you would still like to have any information provided to the Planning Commission this evening.

Thank you,
 John

From: Roberta Schwarz [mailto:roberta.schwarz@comcast.net]
Sent: Wednesday, June 19, 2019 10:57 AM
To: Planning Commission (Public) ; Axelrod, Russell ; Cummings, Teri ; Sakelik, Richard ; Relyea, William ; Walters, Julianna
Cc: Williams, John ; Boyd, John ; Savanna Oaks Neighborhood Association
Subject: June 19th PC Meeting on Storm Water-Please include as part of Public Record

Hello City Council, City Planning Commission, John Williams, and John Boyd,

We would like to have standing in the Planning Commission's meeting tonight on the Storm Water Master Plan. Daylighting Bernert Creek is a park project and not a storm water project. It should be done with half of the funds from the Natural Play Area \$600,000 SDC funds. Please include the documents that we are going to send you today (including this email) in to the Public Record for this meeting and for the June 17th Work Session of the City Council on Bernert Creek Daylighting as well. There will be several documents sent to you today in three additional emails regarding Daylighting Bernert Creek. Please read each of them. The first will be the Hydrology Report by Jon J Rhodes. The second will be the Feasibility Study and Cost estimate, and the third will be the Testimony and Goal 5 attachments of Savanna Oaks Neighborhood Association President Edward Schwarz submitted on June 17th at the CC Work Session. We request that all of these documents be submitted to the Planning Commission tonight along with this email. This is the time to correct a serious mistake that was made in August of 2017.

Please note that when the Planning Commission heard the **application submitted by the City of West Linn Park Department for the City of West Linn** on the Natural Play Area in the White Oak Savanna in August of 2017, it should have considered CDC 32.020 and 32.060 as listed

below and highlighted. There is a piped stream in the White Oak Savanna. It is called Bernert Creek. This part of the CDC was not considered even though it is applicable. Documents we have recently reviewed that are part of the public record show that these Chapters were not included in the final application. The application did not consider this Chapter and that was not in keeping with our CDC code. We did not know this at the time because we are citizens and not professional land use planners.

Chapter 32 of the West Linn Community Development Code supports Bernert Creek being daylighted as part of the play area being constructed and it should have been included in that application. It states the following:

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

H. Daylighting Piped Streams.

1. As part of any application, covered or piped stream sections shown on the WRA Map are encouraged to be "daylighted" or opened. Once it is daylighted, the WRA will be limited to 15 feet on either side of the stream. Within that WRA, water quality measures are required which may include a storm water treatment system (e.g., vegetated bioswales), continuous vegetative ground cover (e.g., native grasses) at least 15 feet in width that provides year-round efficacy, or a combination thereof.
2. The re-opened stream does not have to align with the original piped route but may take a different route on the subject property so long as it makes the appropriate upstream and downstream connections and meet the standards of subsections (H)(3) and (4) of this section.

We ask that you correct this serious error and insure that the Daylighting Bernert Creek project is done as part of the Natural Play Area **park project**. It should have been done this way from the very beginning and would have been if the CDC above had been properly included as per the code. We further ask that the Natural Play Area project play structures be completely reviewed by you as it has been found that more than half of them are not compatible in the White Oak Savanna. There are grossly inappropriate items included in the current list and we request that these items all be reconsidered. A few examples include a xylophone, drums, an outdoor shower, a fort, water play (when extra water is very bad for oak trees), a full restroom (when an ADA porta toilet which does not require extra water is all that is necessary). These among other items do not belong in a Significant Natural Habitat.

The Savanna and Bernert Creek are both listed in West Linn's Goal 5 Inventory-Wetland, Riparian, and Wildlife Habitat Inventory. This was approved by the Oregon Department of

State Lands in 2005. This is a Significant Natural Habitat. The Inventory lists Bernert Creek as a Wetland. Upper Bernert Creek was given an Enhanced Score of 58 on the Habitat Assessment Summary. Bernert Creek is listed on the National Wetlands Inventory and on the Clackamas County Surveyor's map as well.

Please look for the final three emails. This is important to the citizens. You have the ability to right a wrong.

Thank you,
Ed and Roberta Schwarz
President and Secretary
Savanna Oaks Neighborhood Association

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:30 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Hydrology Report by Jon J Rhodes and his C.V.
Attachments: WOS-Final3-18-19 Bernert Creek Jonathan Rhodes 2019 Update.pdf; NWI West Linn OR Bernert Creek 1 to 9K.pdf

Hello PC, CC, and Mr. Williams and Mr. Boyd,

Here is the Hydrology Report by Jon J Rhodes and his CV. This is the second of a total of four emails we will be sending today.

Ed and Roberta Schwarz
President and Secretary
Savanna Oaks Neighborhood Association

An evaluation of the benefits of daylighting Bernert Creek in the White Oak Savanna Park, West Linn, OR

By: Jonathan J. Rhodes, Hydrologist

Introduction

This report updates my previous written evaluation of hydrologic values in the White Oak Savanna Park,¹ dated Aug. 8, 2007, based on my field evaluation of July 31, 2007. This update provides an evaluation of the benefits of daylighting a section of Bernert Creek in the Park, based on my second field review of the area on March 9, 2019 and review of additional information. This evaluation only assesses the hydrologic effects and some environmental effects of daylighting Bernert Creek. The logistics, design, implementation, feasibility, and/or costs of daylighting are outside of the scope of this evaluation.

My evaluation is also based on my education and experience. The latter includes more than 35 years of professional experience, with about 25 of those years in the Pacific Northwest. Most of my work has focused on how land use and stream conditions affect water quality and quantity. My curriculum vitae, attached to this report, provides additional detail on my professional experience.

Existing and historic stream conditions

Prior to development, a segment of Bernert Creek, a tributary to the Willamette River, historically existed in the area now occupied by the stretch of Tannler Drive that runs along the westerly boundary of the Park, as other assessments have noted (Harris Stream Services, 2013; Herrera, 2017). This historic natural reach of Bernert Creek and associated floodplain were eliminated as part of the construction of Tannler Drive. As part of development, runoff from the watershed upstream of this segment of Bernert Creek is now routed into piped drainage buried underneath an existing vestigial stream channel in the Park, which runs easterly along Tannler Drive in the Park downstream towards Blankenship Road. The runoff is piped into lower Bernert Creek and discharges into the Willamette River. Photo 1 shows the existing alignment of Bernert Creek in the Park.

¹ At the time of my 2007 report, the area that is now the White Oak Savanna Park (hereinafter: "Park") was an undeveloped area that had not been established as a park.



Photo 1. 2005 aerial photo from Clackamas County Surveyor's Office, showing the current alignment of Bernert Creek (delineated by the blue line in photo), now in underground conveyance structures, in the Park along Tannler Drive. I added the red arrow and "Bernert Creek" text in red font for identification purposes.

As discussed in my previous 2007 evaluation, local topography and vegetation indicate that the existing stream channel in the Park is a vestige of a natural stream segment. The shunting of runoff, including stormwater, from the upper part of the watershed to the buried drainage infrastructure has disconnected the vestigial segment of Bernert Creek and remaining riparian area in the Park from runoff from the upper watershed. This diversion of runoff to piped drainage has greatly reduced the frequency and duration of streamflow in the existing remnant stream segment of Bernert Creek along Tannler Drive in the Park. It has also likely contributed to drying out riparian area soils along the vestigial channel in the Park, relative to historic conditions. This, in turn, has likely contributed to reducing and/or thwarting the development of riparian vegetation, which requires moist soils, in the area along the existing channel remnant of Bernert Creek in the Park.

The soils along the remnant Bernert Creek stream channel and the slopes flanking it in the Park still store, transmit, and release water to the vestigial channel in the Park, despite the diminution of runoff and the contributing watershed area. During my field review on March 9, 2019, I observed that subsurface water was percolating through the soil and seeping out of shallow excavation at the downstream end of the existing stream channel near the junction of Tannler Drive and Blankenship Road (Photo 2).



Photo 2. Water seeping from soil in the existing channel into a shallow excavation (bottom center of photo) near the junction of Tannler Drive and Blankenship Road on March 9, 2019. Photo taken looking upstream from near the road junction along the channel axis. The seepage indicates that the channel continues to transmit subsurface water despite the disconnection of the channel from upstream runoff.

Benefits of daylighting the Bernert Creek in the Park and reconnecting it to runoff from the upstream watershed

Daylighting Bernert Creek in the Park, including reconnecting it to runoff from its watershed, would have several environmental benefits. Very importantly, these benefits would be self-sustaining and perennial with daylighting.

First, it would help reduce the volume of discharge of urban runoff to the downstream reaches of Bernert Creek and Willamette River. This would occur because some of the water flowing in the stream will infiltrate into the channel beds, banks, and soils flanking the channel. While some of the infiltrated water may ultimately be transmitted back to stream, some of it would be taken up by riparian vegetation, particularly during the warmer growing season. Research has documented that riparian vegetation takes up a sizable fraction of the water delivered to riparian soils (Rhodes and Frissell, 2015). The reduction of urban runoff volume via uptake by vegetation is likely to increase for a period of time after daylighting because the vigor and density of riparian vegetation is likely to increase after daylighting.

In contrast to this benefit of daylighting the stream, the current situation precludes significant attenuation of urban runoff transmitted into the buried drainage pipes and then to the Willamette River. The water flowing in the pipes is not subject to significant soil infiltration, storage, and uptake by riparian vegetation.

The reduction in runoff volumes from daylighting would benefit conditions downstream. Urban runoff impacts are already a well-documented problem in the Willamette River. Reducing the volume of urban runoff would help ameliorate the downstream water quality impacts on the Willamette River.

This is a significant benefit because efforts to reduce urban runoff volumes have considerable fiscal costs. For instance, large sums are spent annually in nearby Portland on efforts to reduce the volume of urban runoff delivered to the Willamette River and its tributaries. The benefits from storm runoff volume reduction would be self-sustaining and continual after daylighting Bernert Creek in the Park and reconnecting it with its upstream watershed.

Second, restoring watershed connectivity and daylighting Bernert Creek in the Park would likely improve water quality and help reduce pollutant loads delivered to downstream reaches of Bernert Creek and the Willamette River. Infiltration of streamflow and flow through bank and riparian soils typically reduces pollutant loads. Bank vegetation helps remove particulates in streamflow, including constituents attached to the particulates.

Therefore, daylighting the stream would likely improve downstream water quality, providing benefits to the Willamette River. Other independent assessments (Herrera, 2013; Harris, 2017) also concluded that the daylighting of Bernert Creek would improve downstream water quality. This is an important benefit, because urban runoff contributes to existing, well-documented water quality problems in the Willamette River.

The current situation has little or no water quality benefits, because piped flow effectively precludes the interaction of runoff with soil and riparian vegetation. Therefore, daylighting the stream would likely convey significant water quality benefits relative to current conditions.

Third, daylighting the stream channel would likely benefit biodiversity because it would likely contribute to the re-establishment of riparian vegetation, as Harris (2013) and Herrera (2017) also noted. It is well-documented that riparian zones are critically important for biodiversity (Beschta et al. 2013). Healthy riparian areas provide a variety of functions and habitats that benefit a wide

array of species, including birds, amphibians, other vertebrates, and invertebrates, such as insects. Notably, invertebrates are important components of foodwebs for many species, including amphibians and birds. Thus, the riparian zone restoration that is likely to occur with stream daylighting would likely benefit the biodiversity of Park and surrounding areas.

Fourth, daylighting the stream would likely reduce the long-term costs of maintaining the drainage infrastructure that now conveys runoff from Bernert Creek's upper watershed. Nothing lasts forever. Drainage infrastructure eventually requires periodic replacement, which involves not only the direct costs of the infrastructure, but also the costs associated with excavation and reburial. Daylighting the stream would obviate these long-term recurring costs associated with maintaining the drainage infrastructure that currently routes runoff downstream.

In aggregate, daylighting Bernert Creek would provide several long-term, self-sustaining benefits to the environment.

Literature Cited

Beschta, R.L., Donahue, D.L., DellaSala, D.A., Rhodes, J.J., et al., 2013. Adapting to climate change on western public lands: Addressing the ecological effects of domestic, wild, and feral ungulates. *Env. Manage.*, 51: 474-491 DOI 10.1007/s00267-012-9964-9

Herrera, 2017. Technical Memorandum: Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis, from A. Rhode, PE to R. Schwarz. Herrera, Portland, OR.

Harris Stream Services, 2013. Report to Nature in Neighborhoods Grant Committee from A. Harris. Harris Stream Services, LLC, West Linn, OR

Rhodes, J.J., and C.A. Frissell. 2015. The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada. 108 pp. *Environment Now*, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025.

Curriculum Vitae: Jonathan J. Rhodes
Hydrologist

EDUCATION

1989: Doctoral candidacy degree in forest hydrology at the Univ. of Wash. Completed all requirements but dissertation.

1985: M.S. in Hydrology and Hydrogeology at the Univ. of Nev.-Reno. Thesis topic: The influence of seasonal stream runoff patterns on water quality.

1981: B.S. in Hydrology and Water Resources at the Univ. of Ariz.

PROFESSIONAL HISTORY

Sept. 2001 -- present. Principal Hydrologist, Planeto Azul Hydrology. Main duties: Analysis of water and land use effects on streams and aquatic resources, including native salmonids and their habitats; diagnosis of watershed and stream conditions; stream monitoring; development of programmatic and site-specific watershed and stream protection measures; project management. Some recent projects (and clients): Analysis of potential effects of groundwater pumping on streamflow (Conf. Tribes of the Umatilla Indian Reservation, OR); diagnosis of watershed and stream conditions in an urbanized watershed (West Multnomah Soil and Water Conservation District, OR); analysis of data on sediment effects on ESA-listed salmon in the South Fork Stillaguamish River, WA (Snohomish County, WA).

Aug. 1990 -- Sept. 2001. Consulting hydrologist for non-profit organizations. Past projects (and clients) include: hydrologic characterization of remnant marsh proposed as urban wildlife refuge/greenspace (Multnomah Co. Parks Dept, OR); review of aquatic effects of: quarry expansion (Friends of Forest Park, OR), urban construction (homeowners consortium, W. Linn, OR); forest manipulations on streamflow (Pacific Rivers Council).

Apr. 1989 -- Sept. 2001. Senior Fishery Scientist-Hydrologist, Columbia River Inter-Tribal Fish Commission. Main duties: Administration and implementation of projects monitoring channel change from land use; development of programmatic and site-specific land management plans to ensure protection of watershed integrity, water quality and aquatic resources; development of restoration plans for watersheds degraded by grazing, roads, logging, and mining; design of plans for monitoring watershed and stream erosion, sedimentation, water quality, and habitat conditions; review of land management plans for adequacy of protection of aquatic resources; field evaluation of watershed and channel conditions throughout the Columbia Basin; expert witness testimony; development of technical recommendations for policy staff for protection of natal habitat for anadromous fish; review of state and federal aquatic resource monitoring plans; report and proposal writing; and, participation in various state and federal technical work groups.

Aug. '84 -- Apr. '89. Research assistant, College of Forestry, Univ. of Wash. Main duties: analysis and interpretation of water quality-quantity data; technical report writing; design and maintenance of water chemistry and quantity monitoring network in a coastal forested watershed; training in data acquisition techniques; public presentation of findings.

July -- Oct. 1987 and May -- Oct. 1988. Consulting hydrologist, Tahoe Regional Planning Association, CA and NV. Main duties: field delineation and mapping of riparian zones, wetlands, and erosion-prone areas.

June -- Sept. 1985 and July 1986. Research assistant, Dept. of Geophysics, Univ of Wash. Main duties: operation of field station for glacier research on Mt. Olympus, Wash.; measurement of snow and glacier melt rates; mapping of supra- and extra- glacial streams contributing to basal sub-glacial flow rates on surging and non-surging glaciers in the Alaska Range, Alaska.

Jan. 1984. Consultant with C.M. Skau, Reno, NV. Main duties: field evaluation of logging roads for erosion potential and sedimentation risk; recommendations for placement of future roads to minimize erosion and sediment delivery to fish-bearing streams in coastal Northern California.

Oct. 1983 -- June 1984. Hydrologic Tech., USGS, Carson City, NV. Main duties: aid in development and calibration of predictive water quality model for the Truckee River; statistical analysis of water quality data; identification and quantification of non-point sources of nutrients to Truckee River, NV.

Aug. 1981 -- Sept. 1983. Research Assistant, Univ. of Nev.-Reno. Main duties: design and installation of instrument network to monitor water chemistry and quantity in a small, forested alpine watershed in the Sierra Nevada; water quality sampling; data interpretation and management; preparation of reports, grant proposals, and publications, computer programming for data reduction and storage; mapping of geology, soils and runoff-producing areas; and, training of field technicians.

Feb. -- May 1981. Water Quality Intern, Pima Assoc. of Gov'ts., Tucson, AZ. Main duties: water quality sampling of agricultural production wells; mapping of groundwater levels; and, coordination of sampling efforts.

PROFESSIONAL SERVICE

May 2009 – present. Peer Reviewer for the scholarly journal, Open Forest Science Journal, for papers related to hydrology and forest and watershed responses to disturbance.

Feb. 2010. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Feb. 2009. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Feb. 2008. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "PACFISH and INFISH and Imperiled Salmonids on Public Lands" Portland, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "Fuel Treatments & Thinning: Its Impacts and Low Priority Relative to Other Needed Restoration Measures," Univ. of OR, Eugene, OR.

Mar. 2007. Invited Panel Speaker, International Environmental Law Conference: "The Impacts of Livestock Grazing on Water Quality and Trout Habitats," Univ. of OR, Eugene, OR.

Feb. 2005. Invited Guest Lecturer, Lewis and Clark School of Law course on public lands law: "Postfire Watershed Management on Western Public Lands" Portland, OR.

Mar. 2004. Invited Panel Speaker, International Environmental Law Conference: "Postfire Watershed Restoration," Univ. of OR, Eugene, OR.

Curriculum Vitae: J.J. Rhodes

page 3 Professional Service (cont'd)

April 2002. Invited Speaker, Restoring Public Lands Conference: Reclaiming the Concept of Forest Restoration, "Watersheds and Fisheries: Restoration Needs for Trout Habitats," Univ. of CO, Boulder, CO

Mar 2002. Invited Panel Speaker, International Environmental Law Conference: "Soils, Impacts and Effects on Trout Habitat," Univ. of OR, Eugene, OR

Mar. 2001. Invited Panel Speaker, International Environmental Law Conference: "NFMA and Salmon Habitat Protection," Univ. of OR, Eugene, OR.

May 2000. Invited speaker, 5th National Tribal Conf. on Environmental Management: "Federal Land Management's Effects on Critical Habitat for Endangered Salmon," Lincoln City, OR

July 1998-2000. Peer Reviewer for the scholarly journal, N. Amer. J. Fish, for papers related to the sedimentation of fish habitat in response to erosion from land uses and fire.

Feb. 1998. Invited Speaker, Oregon AFS Annual meeting: "Adaptive management: Is it really adaptive?" Sunriver, OR

May 1996-2000. Guest lecturer, Oregon State Univ. graduate course on riparian and wetland ecology, Corvallis, OR

Apr.-May 1996. Peer-reviewer for Proceedings of Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems. Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta, Canada. Nat. Resour. Can., Can. For. Serv. Nort. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-356.

Apr. 1995. Invited speaker, Pacific Rivers Council Workshop on Watershed Analysis and Salvage Logging, Wenatchee, Wash.

Apr. 1995. Invited speaker, Oregon State Univ. Dept of Fisheries and Wildlife Seminar, Corvallis, OR

Apr. 1995. Invited speaker, American Fisheries Society North Pacific International Chapter, Annual Meeting, Vancouver B.C., Can.

Mar. 1995. Invited speaker, American Fisheries Society Idaho Chapter Annual Meeting, Boise, ID.

Nov. 1994. Invited speaker, President's Council on Sustainable Development Workshop, Yakima, WA.

Sept. 1994. Invited speaker, Oregon Water Resources Research Institute Streambank Restoration Conference: "Biological Methods to Stabilize Streambanks--From Theory to Practice," Portland, OR.

Mar.-April, 1994. Peer-reviewer for Henjum et al., 1994. Interim Protection for Late Successional Forests, Fisheries, and Watersheds: National Forests East of The Cascade Crest, Oregon and Washington. The Wildlife Soc., Bethesda, MD.

Jan. 1993-Sept. 1995. Member, Oregon Department of Environmental Quality's (ODEQ) Technical Advisory Committee for Triennial Review of the State Water Temperature Standard.

Mar. 1993. Invited speaker, Northwest Scientific Association Symposium: "Cumulative Effects of Land Management Practices on Anadromous Salmonids," La Grande, OR.

Curriculum Vitae: J.J. Rhodes
page 4 Professional Service (cont'd)

Aug. 1992 - Sept. 1992. Member, Ad Hoc Consultant Selection Committee for Portland Water Bureau Study of Future Water Supply Needs.

May 1992. Invited Speaker, US Forest Service, Pacific Northwest Region, Regional Workshop on Monitoring Soil and Water Resources, Bend, OR.

May 1992. Invited Speaker, Northern Arizona University, School of Forestry, Graduate Seminar Series, Flagstaff, AZ.

Jan. 1991 - Mar. 1995. Member, Technical Work Group: Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan.

Aug. 1989 - Feb. 1990. Member, Technical Advisory Committee to ODEQ for development of definitions for level of beneficial use impairment by nonpoint sources.

May 1989 - Jan. 1991. Member, Nonpoint Source Technical Advisory Committee to Idaho Department of Environmental Quality: Coordinated Nonpoint Source Monitoring Program For Idaho.

PUBLICATIONS

Peer-Reviewed:

Rhodes, J.J., C.M. Skau, and W.M. Melgin, 1984. Nitrate-nitrogen flux in a forested watershed -- Lake Tahoe, USA. In: Recent Investigations in the Zone of Aeration, Proc. of Inter. Symp., Munich, West Germany, 1984, P. Udluft, B. Merkel, and K. Prosl (Eds), pp. 671-680.

Rhodes, J.J., 1985. A Reconnaissance of Hydrologic Transport of Nitrate in An Undisturbed Forested Watershed Near Lake Tahoe. M.S. thesis, Univ. of Nev. Reno, 254 pp.

Rhodes, J.J., C.M. Skau, and J.C. Brown, 1985. An areally intensive approach to hydrologic nutrient transport in forested watersheds. In: The Forest-Atmosphere Interaction, B.A. Hutchison and B.B. Hicks (Eds), pp. 255-270.

Rhodes, J.J., C.M. Skau, D. Greenlee, and D.L. Brown, 1985. Quantification of nitrate uptake by riparian forests and wetlands in an undisturbed headwaters watershed. US Forest Service Gen. Tech. Rept. RM-120.

Rhodes, J.J., C.M. Skau, and D. Greenlee, 1986. The role of snowcover on diurnal nitrate concentration patterns in streamflow from a forested watershed in the Sierra Nevada, Nevada, USA. In: Proc. of AWRA Symposium: Cold Regions Hydrology, Fairbanks Alaska, 1986, D.L. Kane (Editor), pp. 157-166.

Rhodes, J.J., R.L. Armstrong, and S.G. Warren, 1987. Mode of formation of "ablation hollows" controlled by dirt content of snow. J. Glaciology, 33: 135-139.

Edmonds, R.L., T.B. Thomas, and J.J. Rhodes, 1991. Canopy and soil modification of precipitation chemistry in a temperate rain forest. Soil Soc. of Amer. J., **55**: 1685-1693.

Rhodes, J.J., McCullough, D.A., and Espinosa Jr., F.A., 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. CRITFC Tech. Rept. 94-4, Portland, OR <http://www.critfc.org/tech/94-4report.htm>

Curriculum Vitae: **J.J. Rhodes**
page 5 **Publications** (cont'd)

Rhodes, J.J. 1995. A Comparison and Evaluation of Existing Land Management Plans Affecting Spawning and Rearing Habitat of Snake River Basin Salmon Species Listed Under the Endangered Species Act. CRITFC Tech. Rept. 95-4, Portland, OR <http://www.critfc.org/tech/95-4report.htm>

Rhodes, J.J. 1996. Description and Evaluation of Some Available Models for Estimating the Effects of Land Management Plans on Sediment Delivery, Channel Substrate, and Water Temperature, CRITFC, Portland, OR

Espinosa, F.A., Rhodes, J.J., and McCullough, D. A. 1997. The failure of existing plans to protect salmon habitat on the Clearwater National Forest in Idaho. J. Env. Management **49**: 205-230.

Rhodes, J.J., and Purser, M.D., 1998. Overwinter sedimentation of clean gravels in simulated redds in the upper Grande Ronde River and nearby streams in northeastern Oregon, USA: Implications for the survival of threatened spring chinook salmon, Forest-Fish Conference: Land Management Affecting Aquatic Ecosystems, Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta, Canada. Nat. Resour. Can., Can. For. Serv. Nort. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-356, pp: 403-412.

Beschta, R.L., Rhodes, J.J., Kauffman, J.B., Gresswell, R.E, Minshall, G.W., Karr, J.R, Perry, D.A., Hauer, F.R., and Frissell, C.A., 2004. Postfire Management on Forested Public Lands of the Western USA. Cons. Bio., **18**: 957-967. <http://pacificrivers.org/files/post-fire-management-and-sound-science/Beschta-et-al2004.pdf>

Karr, J.R., Rhodes, J.J., Minshall, G.W., Hauer, F.R., Beschta, R.L., Frissell, C.A. Perry, D.A, 2004. Postfire Salvage Logging's Effects on Aquatic Ecosystems in the American West. BioScience, **54**: 1029-1033. <http://www.earthjustice.org/library/reports/the-effects-of-positive-salvage-logging.pdf>

Rhodes, J.J. and Odion, D.C., 2004. Comment Letter: Evaluation of the Efficacy of Forest Manipulations Still Needed. BioScience, **54**: 980.

Rhodes, J.J., 2005. Comment on "Modeling of the interactions between forest vegetation, disturbances, and sediment yields" by Erkan Istanbulluoglu et al. J. Geophys. Res. Earth Surf., Vol. 110, No. F1, F01012 10.1029/2004JF000240

Rhodes, J.J., 2007. The Watershed Impacts of Forest Treatments to Reduce Fuels and Modify Fire Behavior. Pacific Rivers Council, Eugene, OR <http://pacificrivers.org/science-research/resources-publications/the-watershed-impacts-of-forest-treatments-to-reduce-fuels-and-modify-fire-behavior>

Rhodes, J.J. and Baker, W.L., 2008. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. Open Forest Science Journal, 1: 1-7. <http://www.bentham.org/open/tofscij/openaccess2.htm>

Lewis, J., Rhodes, J.J., and Bradley, C. 2018. Turbidity responses from timber harvesting, wildfire, and post-fire logging in the Battle Creek watershed, Northern California. *Env. Mgmt*, 1-17.

Technical Reports:

1986. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1987. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

Curriculum Vitae: J.J. Rhodes

page 6 Publications (cont'd)

1988. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1989. Annual Report on Watershed Studies at Olympic National Park. College of Forestry, Univ. of Wash., Seattle, Wash. (Co-authors: R.L. Edmonds, T.B. Thomas, T.W. Cundy)

1990. Coordinated Nonpoint Source Monitoring Program For Idaho. Idaho Dept. of Environmental Quality, Boise, Idaho. (Co-authors: B. Clark, D. McGreer, W. Reid, T. Burton, W. Low, I. Urnovitz, D. McCullough, T. Litke)

1992. The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan. Wallowa-Whitman National Forest, Baker, OR (Co-authors: M. Purser, P. Boehne, R.E. Gill, R.L. Beschta, J.R. Sedell, B. McIntosh, J. Zakel, J.W. Anderson, D. Bryson, S. Howes, R. George).

1992. Salmon Recovery Program for the Columbia River Basin: An Advisory Report for the US Congress. Col. Riv. Inter-Tribal Fish Comm., Portland, OR (Co-authors: P.R. Mundy, D.A. McCullough, M.L. Cuenco, T.W. Backman, D. Dompier, P. O'Toole, S. Whitman, E. Larson, B. Watson, G. James).

1993. A comprehensive approach to restoring habitat conditions needed to protect threatened salmon species in a severely degraded river--The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan. USFS Gen. Tech. Rept RM-226, pp. 175-179. (Co-authors: J.W. Anderson, R.L. Beschta, P. Boehne, D. Bryson, R.E. Gill, S. Howes, B. McIntosh, M.D. Purser and J. Zakel).

1993. Dante's Video Guide to Habitat Conditions for Wild Spring Chinook Salmon, Steelhead and Bull Trout in the John Day Basin, Oregon. (Video) Presented at AFS National Meeting, Portland, Or, Aug. 29-31. (Co-authors: R. Taylor and M. Purser).

1995. Wildfire and Salvage Logging: Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments on Federal Lands in the West. Pacific Rivers Council, Portland, OR (Co-authors: R. Beschta, C. Frissell, R. Gresswell, R. Hauer, J. Karr, G. Minshall, D. Perry).

1998. Adaptive management: Is it really adaptive? Abstracts: Oregon AFS Annual Meeting, Feb. 11-13, 1998, p. 31.

1998. Thinning For Increased Water Yield in the Sierra Nevada: Free Lunch or Pie in the Sky? Pacific Rivers Council, Eugene, OR. (Co-author: M. Purser)

1999. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Bonneville Power Administration (BPA), Portland, OR. (Co-author: C. Huntington)

1999. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR (Co-author: M. Purser)

2000. Annual Project Report: Watershed Evaluation and Aquatic Habitat Response to Recent Storms. BPA, Portland, OR. (Co-author: C. Huntington)

2000. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. (Co-author: M. J. Greene)

Curriculum Vitae: J.J. Rhodes
page 7 Publications (cont'd)

2001. Annual Project Report: Monitoring Fine Sediment in Salmon Habitat in John Day and Grande Ronde Rivers. BPA, Portland, OR. (Co-author: M. J. Greene)

2001. Imperiled Western Trout and the Importance of Roadless Areas. Western Native Trout Campaign, Center for Biological Diversity, Tucson, Az. (Co-authors: J. Kessler, C. Bradley, and J. Wood)

2002. Tryon Creek Watershed: Overview of Existing Conditions, Data Gaps, and Recommendations for the Protection and Restoration of Aquatic Resources. West Multnomah Soil and Water Conservation District, Portland, OR

2002. An Analysis of Trout and Salmon Status and Conservation Values of Potential Wilderness Candidates in Idaho and Eastern Washington. Western Native Trout Campaign, Center for Biological Diversity, Tucson, AZ. (Co-authors: C. Bradley, J. Kessler, C. Frissell)

2003. Stream and Fish Habitat Conditions in Tryon Creek: Their Likely Causes and Ramifications for Salmonids. Proceedings of Urban Ecology and Conservation Symposium, January 24, 2003, Portland, OR. Portland State University, Environmental Sciences and Resources, Portland, OR

2008. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Interim progress report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis, S. Britton, T. Coburn, and M. Rustay)

2009. Primary Sources of Fine Sediment in the South Fork Stillaguamish River. Project completion report for Washington State Salmon Recovery Funding Board, Olympia, WA. Snohomish County Public Works Surface Water Management, Everett, WA. (Co-authors: M. Purser, B. Gaddis)

2015. The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada. 108 pp. Environment Now, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025. (Co-author: CA. Frissell)

Semi-Technical Publications:

1993. Dam the analysis--heal streams instead. The Assoc. of Forest Service Employees for Env. Ethics Inner Voice, 5(6): 1, 4-5.

1994. Invited Preface to Northwest Science Special Issue--Environmental History of River Basins in Eastern Oregon and Washington. Northwest Sci., 68.

PROJECT MANAGEMENT

1993-1996. Technical Assistance Contract with NMFS to produce technical guidance for ESA consultations for effects of land management on critical habitat for Columbia basin salmon. Main duties: Primary Investigator; primary author of peer-reviewed reports including proposed guidelines for salmon habitat effects assessment (Rhodes et al., 1994), evaluation of land management plans' protection of critical salmon habitat (Rhodes, 1995), and evaluation of models for estimating land management effects on salmon habitat (Rhodes, 1996); available scientific literature review; budget tracking; project coordination. Total budget: \$230,000.

Curriculum Vitae: J.J. Rhodes
page 8 Proj. Management (cont'd)

1998-2000. Watershed Evaluation and Aquatic Habitat Response to Recent Storms. Main duties: Primary Investigator; design and implementation of monitoring methods, coordination of technical staff in 10 watersheds with differing levels of grazing and logging in 3 subbasins in Idaho, Washington, and Oregon; technical training; data analysis; contract administration; proposal development; report preparation; budget development and tracking; coordination with grantor representatives. Total budget: \$164,000.

1998-2000. Evaluation of Effects of Grazing on Rate of Salmon Habitat Recovery. Main duties: Primary Investigator; design and implementation of monitoring methods, training of field technician; data analysis and synthesis; proposal development; preparation of progress reports; budget development and tracking; coordination with grantor representatives. Total budget: \$73,000.

1998-2001. Monitoring Fine Sediment Levels in Salmon Habitat in Grande Ronde and John Day Rivers. Main duties: Primary Investigator; design and implementation of methods for monitoring fine sediment levels in four rivers; field technician training; data analysis and synthesis; subcontract administration; proposal development; progress and technical report preparation; budget development and tracking; coordination with grantor representatives. Total budget: \$128,000.

2001-2002. Western Native Trout Campaign, Aquatic Scientist and Coordinator. Main duties: Oversight and assurance of scientific integrity of all reports and work products; coordinate conservation efforts among campaign member organizations and other groups working to protect and restore trout habitats and populations; budget tracking; technical and progress report preparation.

HONORS AND AWARDS

1996. Leadership and Excellence. Col. River Inter-Tribal Fish Comm., Portland, OR

1991. Employee of the Year. Col. River Inter-Tribal Fish Comm., Portland, OR

1984. Academic Recruitment Scholarship for Outstanding Graduate Prospect. Univ. of Wash, Seattle, Wash.

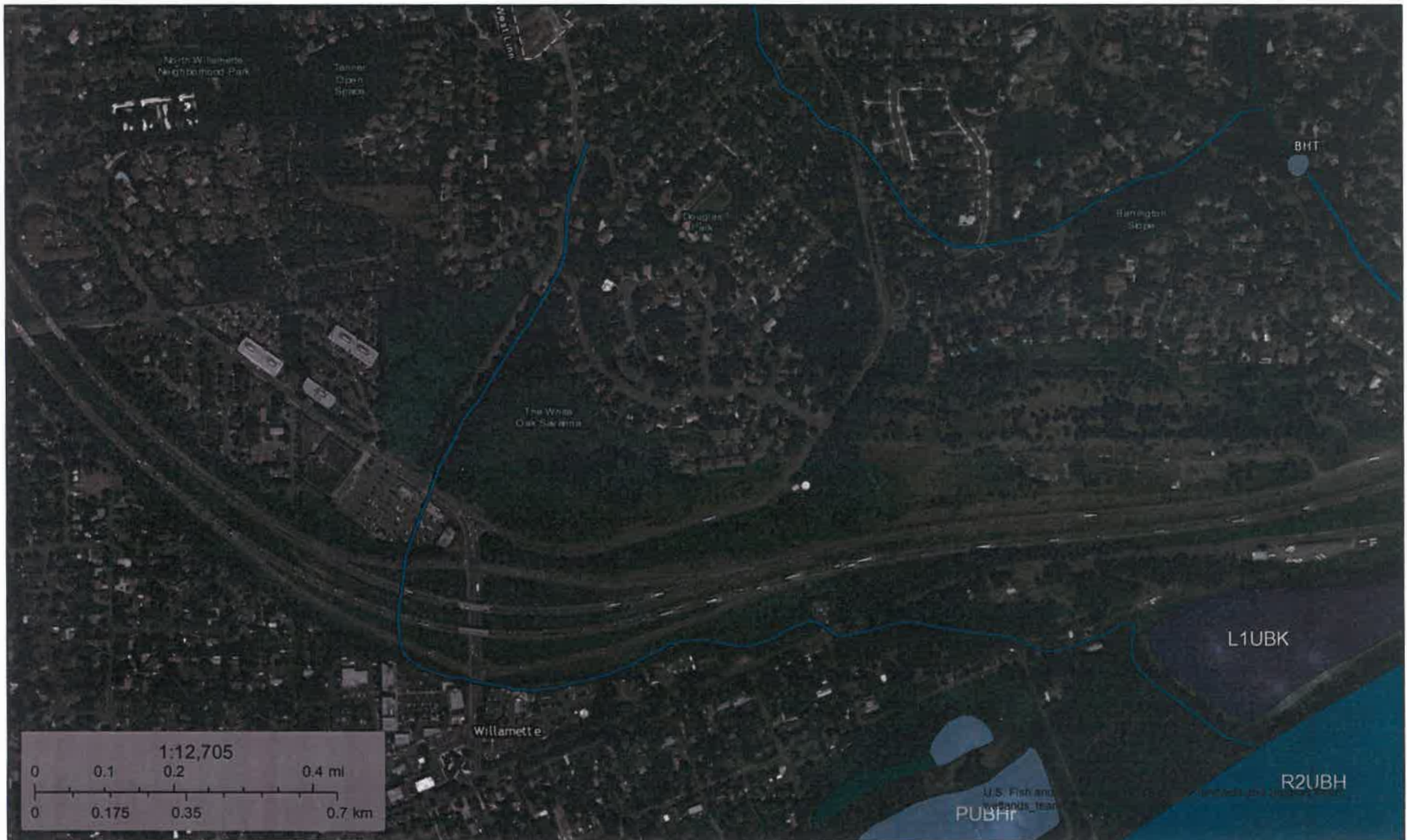
1982. Maxey Award -- Outstanding Graduate Student Paper in Hydrology. Univ. of Nev.-Reno.

1980. Winslow and Myron Reuben Scholarship for Outstanding Undergraduate in the Earth Sciences. Univ. of Ariz., Tucson, Az.

ADDITIONAL TRAINING

1993. USFWS Water Temperature Modeling via SNTMP

1991. USFWS Introduction to IFIM Investigations



March 18, 2019

Wetlands

-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland

-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond

-  Lake
-  Other
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:36 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Bernert Creek Daylighting Project - Updated Cost Estimates and Feasibility Assessment
Attachments: BernertCreekDaylighting_FeasibilityMemo_Final-signed.pdf

Hello again all,

This is the third of four emails that will come to you from us today.
Attached you will find the Feasibility Study and Cost Estimates of daylighting Bernert Creek.

Thank you,
Ed and Roberta Schwarz
President and Secretary Savanna Oaks Neighborhood Association



Roberta Schwarz
Neighbors for a Livable West Linn
2206 Tannler Drive
West Linn, Oregon 97068

RE: Feasibility Assessment and Conceptual Cost Estimate of Bernert Creek Daylighting Project

Dear Ms. Schwarz:

Please find attached the 2017 Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis Technical Memorandum and an updated cost estimate. The feasibility assessment is supplemented with the information in this letter that provides additional detail on project permitting requirements and depth of the existing pipe. We have also prepared an updated cost estimate that includes geotechnical investigation and survey services, adjustments to the unit costs of the some of the construction line items in the estimate, a reduced contingency (from 50% to 25%), and updated earthwork and imported material quantities based on additional information reviewed and gathered since 2017. Our current cost estimate is \$320,000 for the entire project as conceived, accounting for survey and geotechnical services, design, permitting, construction oversight, and construction contracting. This exceeds the approximately \$250,000 that you have indicated is available for design and construction. We have also provided a second budget estimate for a reduced project scale, which indicates what we think is attainable within the available budget but eliminates some of the project scope. Assumptions include:

- The length of daylighted stream channel is assumed to be reduced to 600 feet, which would reduce stream channel excavation, reduce the volume of excavated soil to be reused and require lesser amounts of imported materials (streambed aggregate, boulders and logs).
- The assumed cost for a stream crossing (pedestrian bridge) is reduced from \$40,000 to \$5,000, assuming a single prefabricated bridge with handrails is installed, with materials and labor donated. The \$5,000 cost of this item covers coordination, permitting, and procurement.

The updated cost estimates for the larger project as conceived, and for a reduced project scale, do not currently include any assumptions regarding donated time by either engineers or contractors, since per our discussion you anticipate that the design work and thereafter the construction work will be competitively bid by the City of West Linn. We do not advise proceeding with the project assuming that the selected design and permitting consultant or the selected construction contractor will be able or willing to donate some of their time to the project. There may be opportunities through the procurement process to achieve cost savings, and to make it clear to bidders what the available budget is to see if that encourages lower cost bids, but that would be at the City's discretion.



Permitting

To refine our estimate of permitting costs, our land use planner, Kristina Gifford, did a preliminary review of zoning. Daylighting Bernert Creek within the White Oak Savanna site will likely need design review and approval and permits from the City of West Linn. Because the creek is within a stormwater pipe, it may not be considered a wetland or water of the US or Oregon; therefore, wetland removal/fill permits may not be required, but that would need to be confirmed through consultation with regulatory agencies. If there are wetlands along the project alignment that would be affected, state and federal permits would be necessary. According to the City’s zoning map, the site is zoned Office Business Center (OBC) and most of the site is designated as Parks. The existing storm drain pipe and proposed daylighted creek also cross a property that is not within the Parks designation. Based on a review of the City’s community development code (CDC), we believe the project is likely subject to design review (CDC Chapter 55) and Parks and Natural Area design review (CDC Chapter 56). It is unclear how the City would define the proposed land use: it could be a minor utility, major utility, or special use area (defined in CDC Chapter 56). Special use areas and minor utilities are allowed outright in the OBC zone; a major utility may be allowed as a conditional use.

Our updated cost estimate assumes the permit application and coordination effort will cost \$40,000, which may be high given the likely absence of wetlands. However, the budget and schedule for permitting will depend on information from the project pre-application conference with the City. At the conference, the City would confirm a definition of the proposed site use, whether it would be allowed in the OBC zone, whether the proposed development would require Class I or Class II design review, and the materials required for submittal to the City.

Existing Pipe Condition and Depth

To confirm the feasibility of daylighting the existing pipe and to update quantities of excavation for cost estimating purposes, Alex Svendsen, a Herrera scientist, inspected the existing pipe by accessing four manholes along the alignment. At manhole BEJ7 (upstream). The pipe is approximately 6.5 feet deep (ground surface to pipe invert). Baseflow was observed in the pipe during the visit, which occurred on May 10, 2019. The pipe appears to be made of corrugated metal.



MH BEJ7, Upstream MH along Proposed Daylight Section

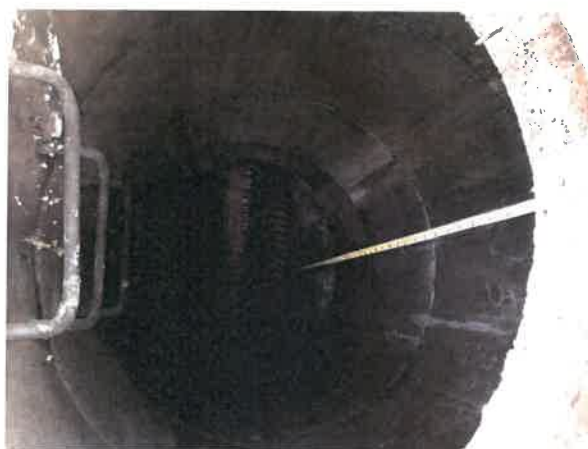
There is a live sewer line approximately 50 feet southeast of Manhole BEJ7 near the base of the adjacent hillside. It appears to be a 12-inch diameter pipe approximately 15 feet below the ground surface; discharge in the pipe was flowing north.

Approximately 200 feet downgradient from MH BEJ7, the pipe was observed approximately 4.5 feet below ground surface. A tree root has grown around the manhole lid at that location.



MH Approximately 200 feet Downgradient from MH BEJ7

Approximately 60 feet downgradient from the main trail, the pipe is at a depth of approximately 10.5 feet below ground surface.



MH Approximately 60 feet Downgradient from main trail

At MH BEJ6, the pipe is at a depth of approximately 5.5 feet below ground surface.



MH BEJ6, Downstream Structure Along Proposed Daylight Alignment

The observed depths of the existing storm drain line are consistent with the concept proposed in the 2017 technical memorandum. Given that the pipe starts in Manhole BEJ7 at a depth of approximately 6.5 feet, constructing a culvert at a slope of approximately 2 percent from this structure that extends approximately 90 feet would allow the culvert to outfall to a splash pad that starts the daylighted stream channel as described in the technical memorandum. Flows from the daylighted stream channel could re-enter the storm drain system via a ditch inlet constructed upstream of Structure MH BEJ6, as described in the technical memorandum.

Thank you for the opportunity to assist you in advancing the conceptual planning for this project. Please feel free to contact us if you have additional questions.

A handwritten signature in black ink that reads "Kate Forester".

Kate Forester, PLA, Project Manager

971.200.8876

A handwritten signature in blue ink that reads "Mary Larkin".

Mary Larkin, PE, Engineer

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

Project: Bernert Creek Daylighting
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Medium

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by:

M. Larkin

5/10/2019

Checked/Revised by:

M. Ewbank

5/14/2019

NO.	ITEMS OF WORK AND MATERIALS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	NOTES
1	Mobilization	1	LS	10%	\$7,190.80	Assumed 10% total construction cost
2	Traffic Control, Temporary	1	LS	\$5,000.00	\$5,000.00	Temporary single-lane traffic
3	Erosion and Sediment Control and Tree Protection	1	LS	\$5,000.00	\$5,000.00	
4	Clearing and Grubbing	1	LS	\$5,000.00	\$5,000.00	Minimal clearing and grubbing - preserve habitat
5	Temporary Flow Bypass During Construction	1	LS	\$3,000.00	\$3,000.00	Minimal pumping - diversion will use gravity
6	Boulders 24"-36" (nominal diameter)	100	EA	\$150.00	\$15,000.00	To be placed along alignment /provide grade control
7	Streambed aggregate	482	CY	\$60.00	\$28,908.00	To be placed along alignment - cobble assumed
8	Log Without Rootwad - 15' length	10	EA	\$500.00	\$5,000.00	Includes procurement and and surface installation
9	Salvaged Woody Debris	1	LS	\$5,000.00	\$5,000.00	Salvage any downed trees or pruned branches for use in channel
10	Stream Channel Excavation and Reuse	1,170	CY	\$25.00	\$29,250.00	Assumes soil reuse on site to reduce costs
11	Decommission Existing Pipe in Place	1	LS	\$5,000.00	\$5,000.00	Fill with CDF (115 CY)
12	New Pipe Outfall	1	LS	\$1,500.00	\$1,500.00	Connect to BEJ7 manhole
13	New Ditch Inlet	1	LS	\$2,500.00	\$2,500.00	Connect to BEJ6 manhole
14	Driveway Culvert and Gravel Bedding	1	LS	\$25,000.00	\$25,000.00	Arch Culvert - 12' span with compacted gravel bedding
15	Pedestrian Crossing	1	LS	\$15,000.00	\$15,000.00	Assume a simple prefab bridge with handrails
16	Interpretive Signage	2	EA	\$500.00	\$1,000.00	Installation only; estimate assumes that signs are donated.
17	Seeding/Planting	1	LS	\$1,000.00	\$1,000.00	Cost is for contractor effort associated with coordination/inspection only. Seeding is to be done by others.
	Construction Subtotal				\$160,000.00	
	Construction Contingency			25%	\$40,000.00	
	Survey and basemapping	1	LS	\$10,000.00	\$10,000.00	
	Geotechnical Investigation	1	LS	\$15,000.00	\$15,000.00	Assumes shallow hand auger borings to characterize soils and assess groundwater elevations.
	Modeling and Design	1	LS	\$50,000.00	\$50,000.00	
	Permitting	1	LS	\$40,000.00	\$40,000.00	
	Construction Oversight	1	LS	\$15,000.00	\$15,000.00	Engineering oversight
	Total				\$320,000.00	

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

**Project: Bernert Creek Daylighting - Reduced Stream Length and Eliminated Services and Bid Items
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Medium**

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by: M. Larkin 5/10/2019
Checked/Revised by: M. Ewbank 5/14/2019

NO.	ITEMS OF WORK AND MATERIALS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	NOTES
1	Mobilization	1	LS	10%	\$5,082.20	Assumed 10% total construction cost
2	Traffic Control, Temporary	1	LS	\$5,000.00	\$5,000.00	Temporary single-lane traffic
3	Erosion and Sediment Control and Tree Protection	1	LS	\$5,000.00	\$5,000.00	
4	Clearing and Grubbing	1	LS	\$5,000.00	\$0.00	Minimal clearing and grubbing - preserve habitat
5	Temporary Flow Bypass During Construction	1	LS	\$3,000.00	\$3,000.00	Minimal pumping - diversion will use gravity
6	Boulders 24"-36" (nominal diameter)	67	EA	\$150.00	\$10,050.00	To be placed along alignment /provide grade control Assumed quantity reduced by 30% due to reduced daylight channel length
7	Streambed aggregate	321	CY	\$60.00	\$19,272.00	To be placed along alignment - cobble assumed Assumed quantity reduced by 30% due to reduced daylight channel length
8	Log Without Rootwad - 15' length	7	EA	\$500.00	\$3,500.00	Includes procurement and and surface installation. Assumed quantity reduced by 30% due to reduced daylight channel length
9	Salvaged Woody Debris	1	LS	\$5,000.00	\$5,000.00	Salvage any downed trees or pruned branches for use in channel
10	Stream Channel Excavation and Reuse	780	CY	\$25.00	\$19,500.00	Assumes soil reuse on site to reduce costs. Assumed quantity reduced by 30% due to reduced daylight channel length.
11	Decommission Existing Pipe In Place	1	LS	\$5,000.00	\$5,000.00	Fill with CDF (115 CY)
12	New Pipe Outfall	1	LS	\$1,500.00	\$1,500.00	Connect to BEJ7 manhole
13	New Ditch Inlet	1	LS	\$2,500.00	\$2,500.00	Connect to BEJ6 manhole
14	Driveway Culvert and Gravel Bedding	0	LS	\$25,000.00	\$0.00	Eliminated and assumed to be constructed as future contract.
15	Pedestrian Crossing	1	LS	\$5,000.00	\$5,000.00	Assume a simple prefab bridge with handrails. Assume that labor and materials are donated.
16	Interpretive Signage	2	EA	\$500.00	\$1,000.00	Installation only; estimate assumes that signs are donated.
17	Seeding/Planting	1	LS	\$1,000.00	\$1,000.00	Cost is for contractor effort associated with coordination/inspection only. Seeding is to be done by others.
	Construction Subtotal				\$92,000.00	
	Construction Contingency			25%	\$23,000.00	
	Survey and basemapping	1	LS	\$10,000.00	\$10,000.00	
	Geotechnical Investigation	1	LS	\$15,000.00	\$15,000.00	Assumes shallow hand auger borings to characterize soils and assess groundwater elevations.
	Modeling and Design	1	LS	\$50,000.00	\$50,000.00	
	Permitting	1	LS	\$40,000.00	\$40,000.00	
	Construction Oversight	1	LS	\$15,000.00	\$15,000.00	Engineering oversight
	Total				\$250,000.00	

TECHNICAL MEMORANDUM

Date: March 27, 2017
To: Roberta Schwartz
From: Abbey Rhode, PE
Subject: Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis

BACKGROUND

Bernert Creek is a tributary to the Willamette River that historically flowed southward along what is now Tannler Drive and then east to the river. Around 1977, the creek was piped as part of a stormwater drainage network to support development. Neighbors for a Livable West Linn (NLWL) and the Trust for Public Land partnered together for over 12 years to raise \$3.5 million and acquire 20 acres of property along and adjacent to the historical creek to preserve ecologically important oak savanna. The park is now a public West Linn Park, owned by the City of West Linn, and officially called The White Oak Savanna. Thousands of volunteer hours, including many classes of students, have volunteered to help restore the site. There is now an opportunity to “daylight” the segment of Bernert Creek that runs along the preserved oak savanna to further enhance the ecological and educational benefits of this important park.

As shown in Figure 1, the existing pipe alignment along the proposed stream channel daylighting corridor consists of a 24-inch concrete pipe (BER6-7) that connects an upstream manhole structure (BEJ7) to a downstream manhole structure (BEJ6). The pipe is approximately 900 feet long with a slope of 0.128 feet/foot (West Linn Public Works 2006).

PROPOSED STREAM CHANNEL DAYLIGHTING

Description

A proposed conceptual alignment for the daylighted stream channel is shown in Figure 1. The upstream end of the new/restored channel would be near structure BEJ7 via a new outfall that discharges piped flow to the channel. The channel would extend southward along the forested area east of Tannler Drive, and at its downstream end would convey flow into a pipe coincident with the existing pipe alignment at or near structure BEJ6 via a new ditch inlet structure. One pedestrian bridge and one drivable culvert crossing would provide public access to the West Linn Oak Savanna along the length of the channel. These crossings would encourage access to the stream to serve as a public demonstration of ecological restoration, and could readily



include interpretive signage to educate visitors on the benefits of stream habitat on water quality and fish.

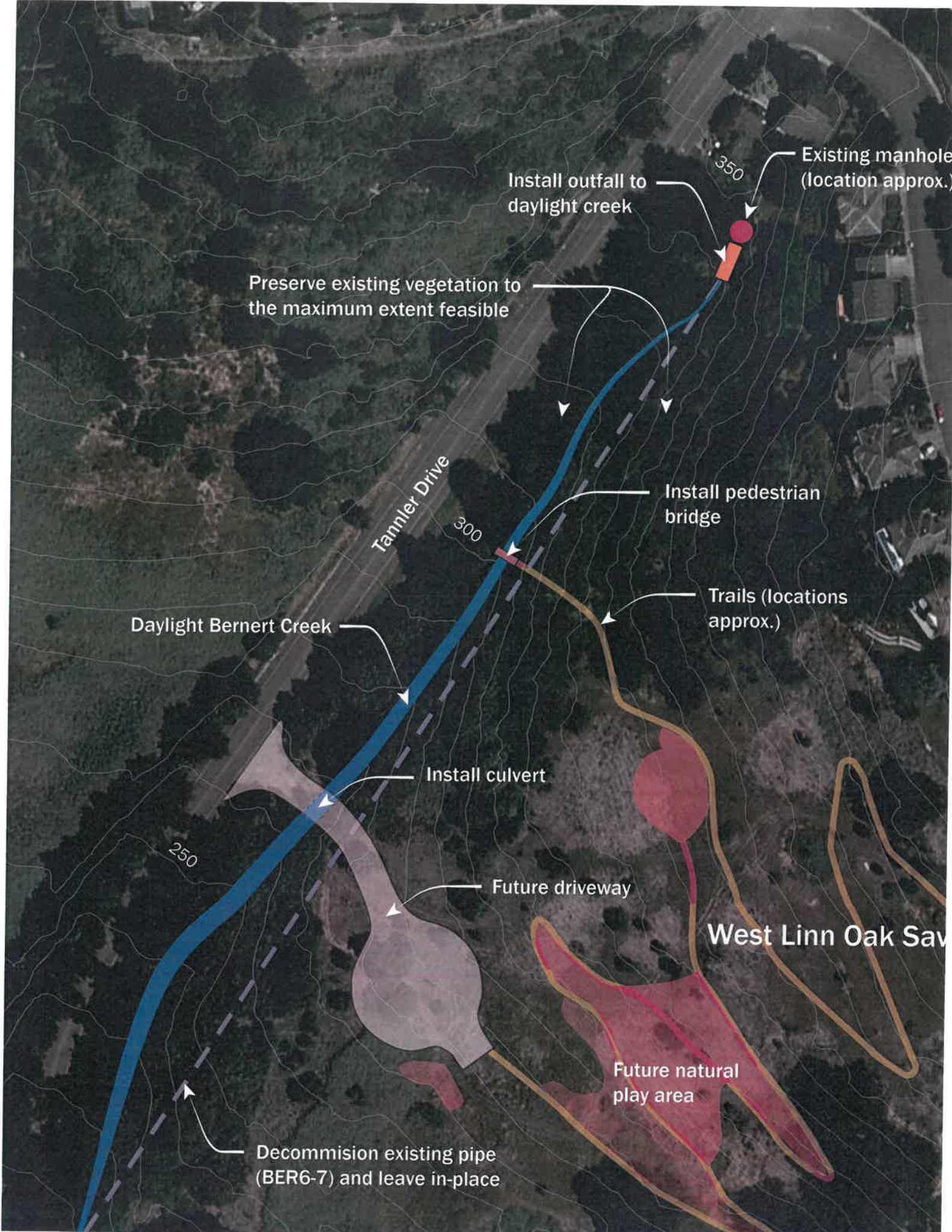
Provided that adequate freeboard is achievable (i.e., additional channel depth above estimated peak flow levels), the proposed concept would decommission the existing BER6-7 pipe and leave it buried in place to reduce cost. One possible design alternative would be to instead retain the pipe for functional flow conveyance, with a new overflow structure or a flow splitter installed in structure BEJ7 that would direct flow into the pipe during high storm flows. Diverting higher flows into the existing pipe could help to minimize the potential for an extreme storm event causing damage to the new/restored channel habitat, though the overflow structure or flow splitter included in this alternative would require an added level of inspection and maintenance attention for the long term to be sure it continues to function as intended.

Benefits

Land development in the Bernert Creek watershed impacts fish habitat downstream by increasing water temperatures and increasing peak storm flows that can erode and otherwise adversely affect fish habitat. Daylighting and enhancing the creek channel would provide shade and increase hyporheic interaction with the soil to decrease water temperatures. While it is assumed that the creek historically provided habitat for salmonid fish species, existing downstream barriers to fish passage are likely preventing access for these species in the oak Savanna site area. In addition, a well-designed channel would provide much more hydraulic roughness than the existing concrete pipe in which Bernert Creek flows, which would slow down flow velocities and provide a modest amount of peak flow attenuation, thereby providing a minor benefit for downstream portions of the creek system.

The proposed channel alignment currently provides a valuable habitat corridor for a wide range of wildlife species. Over 100 vertebrate species have been identified on the property (Mishaga 2014) and it has been estimated that daylighting of the creek would substantially increase the species diversity even further (Mishaga 2013), providing a unique opportunity for residents and visitors to encounter these rarer species in their community setting. As development in the Portland Metro Area continues at a rapid pace to meet the demands of an increasing population, preserved habitats such as the West Linn Oak Savanna are increasingly important to provide vital habitat, and the refuge it provides, for local wildlife.

West Linn Oak Savanna is a preeminent example of how the community can be involved to increase education and awareness of local habitat. One goal for this stream channel daylighting project would be to serve as an accessible demonstration site to educate the community on the importance of healthy streams and the many important functions of riparian corridors. Most visitors to the oak Savanna would enter and/or exit via a route over the creek, where interpretive signage could be placed for their benefit. In addition, many classes of children participate in volunteer efforts at the park and this would be an opportunity for children to learn about the stream in a safe, easily accessible environment.



Existing manhole (location approx.)

Install outfall to daylight creek

Preserve existing vegetation to the maximum extent feasible

Install pedestrian bridge

Trails (locations approx.)

Daylight Bernert Creek

Install culvert

Future driveway

West Linn Oak Sav

Future natural play area

Decommission existing pipe (BER6-7) and leave in-place

Tannler Drive

350

300

250

Feasibility and Design Recommendations

Feasibility considerations for daylighting Bernert Creek amid the oak Savanna area include conveyance capacity for flood prevention and site constraints. This memo is intended to provide an overview of feasibility considerations. Further analysis is recommended to inform design.

The hydraulic feasibility analysis for this memo is based on hydrologic modeling completed by the City of West Linn in 2006 (West Linn Public Works 2006), which included analysis of hydraulic capacity needs for watershed “build-out” conditions. The City’s report calculated peak storm flow rates at the upstream and downstream drainage structures shown on Figure 1. Table 1 lists the results. However, it should be noted that when this analysis was conducted, West Linn Oak Savanna was zoned for development, and so the calculated build-out flows were likely based on the assumption that many of the preserved areas in the Savanna would have included more impervious area than will now be the case. Thus, the City’s peak flow estimates are slightly higher than they would have been if their modeling work accounted for the site as a park space instead of another form of land development.

Storm Frequency	BEJ7 (upstream structure)		BEJ6 (downstream structure)	
	2006	Build-out	2006	Build-out
2-Year	7.45	7.93	18.48	18.89
5-Year	8.82	11.13	22.97	23.43
10-Year	9.49	13.98	25.16	25.68
25-Year	15.15	23.67	31.64	33.62
50-Year	17.42	26.00	33.36	37.90
100-Year	20.59	29.57	35.88	44.19
500-Year	25.55	34.04	40.04	54.58

^a Hydrologic modeling performed with HEC-HMS with detention facilities (West Linn Public Works 2006).

Topographic survey was not available for this area, but the information on the existing pipe alignment enables a good estimate of the overall slope of the stream. Due to the steep slopes in the area, it is estimated that an approximate channel cross section area would need to be a minimum of 7.5 square feet to meet conveyance requirements and provide freeboard to prevent flooding of adjacent ground. For the purpose of developing a planning-level cost estimate, a simplified trapezoidal cross section was assumed with a base width of 2 feet, a depth of 1.5 feet, and a bank full width of 8 feet. However, it is recommended that the channel design not be a uniformly simple trapezoidal geometry, incorporating lateral and vertical (deeper than 1.5 feet) variation and complexity as space allows for increased habitat value. Where feasible, the channel should be allowed to spread as much as possible within a floodplain to distribute energy. The potential stream corridor width is estimated to range between 30 and 50 feet, which should be more than adequate for peak flow conveyance purposes, however, it would result in a narrow riparian corridor between the creek and the road in some places. It is recommended that the

riparian understory be actively maintained to supplement solar shading in areas where the canopy is narrow.

The primary constraints for this project are the steepness of the site and construction access due to the existing native vegetation on the site, which should be preserved to the maximum extent feasible. The overall daylighted channel slope would be approximately 12% on average, which is steep relative to most other stream channels in the region. Due to the steepness, it is recommended that the stream design incorporate grade control elements to prevent large scale erosion and channel bed incision. However, the steepness of the channel would be consistent with the historical channel character. The soils along the proposed daylighting alignment are mapped as part of the Witzel series, which are characterized by slopes up to 40 percent and have a depth to bedrock of 12 to 20 inches (NRCS 2017). This soil type is resistant to long-term erosion. However, grade control may be required in areas where native bedrock was excavated and disturbed during the installation of the pipe alignment, in the form of large boulder weirs, log weirs, and/or placing larger boulders and cobbles throughout the length of the channel, to prevent incision. Depending on the way in which grade control is accomplished, this could greatly impact the overall cost of construction, as well as increase the overall construction impact. Hydraulic modeling of the corridor should be conducted to determine the extent of grade control required, and to aid in sizing grade control components. Furthermore, hydraulic roughness (via cobbles and boulders and/or large woody debris) and vegetation will be important for minimizing erosion at the site following construction. As mentioned previously, if high flows are diverted into the existing pipe then the need for grade control and hydraulic roughness would be somewhat lessened.

Construction access to the site would occur via Tannler Road, which runs alongside the proposed creek corridor. The planning-level cost estimate prepared to accompany this memo includes costs for traffic control. Project construction may require temporary closures of one lane of traffic on Tannler Road. Most of the proposed stream corridor contains mature, native vegetation. Both the design and construction of the creek should be targeted to minimize impacts to established native vegetation along the creek corridor. Significant trees and vegetation should be surveyed along the full width of the future riparian corridor to inform design and identify high priority preservation areas. Construction techniques should include use of low ground pressure equipment and fencing of protected root zones.

Cost

Appendix A contains a planning-level cost estimate for stream daylighting is attached. This estimate includes costs for design, including further analysis such as modeling and surveying to support design, and construction. Due to the limited available information, this estimate includes a 100% contingency for construction, to account for unknown and unforeseen issues that could complicate construction.

Figure 2 shows a rendering of the potential future of daylighting Bernert Creek.



Figure 2. Daylighted Bernert Creek.

References

- Mishaga, Richard. 2013. Support for the Acquisition and Restoration of Additional Lands in the White Oak Savanna Area. Letter to Nature in Neighborhoods Grant Committee. January 28, 2013.
- Mishaga, Richard. 2014. Vertebrate Wildlife Observed on the ODOT-Administered Oak Savanna Habitat 1995 - 2009. Prepared by Richard Mishaga, Ph.D., Retired Wildlife Ecologist. February 24, 2014.
- Natural Resources Conservation Service (NRCS), United States Department of Agriculture. 2017. Web Soil Survey. Available online at <https://websoilsurvey.sc.egov.usda.gov/>. Accessed January 25, 2017.
- West Linn Public Works. 2006. West Linn Surface Water Management Plan. City of West Linn. West Linn, Oregon. December 11, 2006.

APPENDIX A

Cost Estimate

**WEST LINN OAK SAVANNAH
WEST LINN, OR**

Project: Bernert Creek Daylighting
Construction Cost Estimate: Conceptual Planning Level
Level of Confidence: Low

Description: Daylight Bernert Creek segment along historic alignment and decommission existing pipe

Prepared by: A.Rhode 3/27/2017
Checked/Revised by: M. Ewbank 3/27/2017

NO.	ITEMS OF WORK AND MATERIALS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	NOTES
1	Mobilization	1	LS	10%	\$5,740.00	Assumed 10% total construction cost
2	Traffic Control, Temporary	1	LS	\$10,000.00	\$10,000.00	Temporary single-lane traffic
3	Erosion and Sediment Control	1	LS	\$3,000.00	\$3,000.00	Engineer's estimate
5	Tree Protection	1	LS	\$5,000.00	\$5,000.00	Many trees to be preserved
6	Clearing and Grubbing	1	LS	\$5,000.00	\$1,000.00	Minimal clearing and grubbing - preserve habitat
7	Temporary Flow Bypass During Construction	1	LS	\$3,000.00	\$3,000.00	Minimal pumping - diversion will use gravity
8	Boulders 24"-36" (nominal diameter)	100	TN	\$150.00	\$15,000.00	To be placed along alignment /provide grade control
9	Cobbles	130	TN	\$80.00	\$10,400.00	To be placed along alignment - large cobble assumed
10	Log Without Rootwad - 15' length	10	EA	\$500.00	\$5,000.00	Includes procurement and surface installation
11	Salvaged Woody Debris	1	LS	\$5,000.00	\$5,000.00	Salvage any downed trees or pruned branches for use in channel
12	Stream Channel Excavation and Offsite Haul	450	CY	\$50.00	\$22,500.00	High unit cost to account for low-impact excavation. Look into soil reuse on site to reduce costs
13	Decommission Existing Pipe in Place	1	LS	\$5,000.00	\$5,000.00	Fill with CDF (115 CY)
14	New Pipe Outfall	1	LS	\$3,000.00	\$3,000.00	Connect to BEJ7 manhole
15	New Ditch Inlet	1	LS	\$4,000.00	\$4,000.00	Connect to BEJ6 manhole
16	Driveway Culvert and Gravel Bedding	1	LS	\$25,000.00	\$25,000.00	Arch Culvert - 12' span with compacted gravel bedding
17	Pedestrian Crossing	1	LS	\$15,000.00	\$15,000.00	Assume a simple prefab bridge with handrails
18	Interpretive Signage	2	EA	\$2,500.00	\$5,000.00	
19	Seeding/Planting	0	LS	\$0.00	\$0.00	Not included in estimate - to be done by NLWL
20	Construction Oversight	1	LS	\$15,000.00	\$15,000.00	Engineering oversight
	Construction Subtotal				\$143,000.00	
	Construction Contingency			100%	\$143,000.00	
	Modeling and Design	1	LS	\$50,000.00	\$50,000.00	
	Permitting	1	LS	\$40,000.00	\$40,000.00	
	Total				\$380,000.00	

Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, June 19, 2019 11:53 AM
To: Planning Commission (Public); Axelrod, Russell; Cummings, Teri; Sakelik, Richard; Relyea, William; Walters, Julianna
Cc: Williams, John; Boyd, John; Savanna Oaks Neighborhood Association
Subject: Testimony for June 17th CC Work Session and reason for urgency
Attachments: Testimony for June 17th CC Work Session.pdf

Hello again,

This is the fourth and final of four emails for you today. In his testimony Ed makes reference to a US Fish and Wildlife Service National Wetlands Inventory map which you have already received with the Hydrology report. He also makes reference to several pages from the Goal 5 Inventory and a photo of the Bernert family. We do not have access to those today but will send them later if anyone would like to see them. They are also a part of the Public Record from Ed's testimony submitted at the CC meeting on June 17th.

Mr. Williams let us know that this PC meeting tonight is the Sanitary Sewer Master Plan, not the Surface Water Plan. It was suggested to us to submit information today and we have done so.

Like the testimony that Roberta submitted on June 17th about the lack of fire protection in the White Oak Savanna and the subsequent site tour and written information she obtained from Lt Raeburn of the TVFR, we consider this mistake made in the Planning process of the City of West Linn, to be an issue which must be corrected as soon as possible.

Thank you,
Ed and Roberta Schwarz
President and Secretary
Savanna Oaks N.A.

June 17, 2019

My name is Ed Schwarz and I am President of the Savanna Oaks Neighborhood Association. I am a resident of West Linn. Thank you for placing on the agenda tonight the “daylighting” or redirecting of Bernert Creek to flow above ground once again as it did before being put in a culvert in the 1970s when Tannler Drive was constructed. We have included in your packet tonight 12 relevant pages from West Linn’s Goal 5 Wetland, Riparian, and Wildlife Habitat Inventory completed in 2003 by Winterbrook Planning and paid for by the City of West Linn. This was approved by the Oregon Department of State Lands in 2005. We have also included Community Development Code information.

The White Oak Savanna is a Significant Natural Habitat. The Inventory lists Bernert Creek as a Wetland. Upper Bernert Creek was given an Enhanced Score of 58 on the Habitat Assessment Summary.

This area is listed as a Significant Natural Resource on West Linn’s Goal 5. Bernert Creek is listed on the US Fish and Wildlife Service National Wetlands Inventory map (included in your packet) and on the Clackamas County Surveyor’s map as well.

Hydrologist Jon Rhodes wrote a report which you have been sent previously and which lists the numerous benefits of daylighting Bernert Creek. They include:

1. Helping to reduce the volume of discharge of urban runoff to the downstream reaches of Bernert Creek and the Willamette River.
2. Likely improving water quality and reducing pollutant loads delivered to Bernert Creek and the Willamette River.
3. Likely benefiting biodiversity because it would contribute to the re-establishment of riparian vegetation. Riparian zones are critically important for biodiversity. Healthy riparian areas benefit a wide array of species including birds, amphibians, other vertebrates, and invertebrates including insects.
4. Likely reduce the long-term costs of maintaining the drainage infrastructure that now conveys runoff from Bernert Creek’s upper watershed. Daylighting the stream would obviate the long-term recurring costs associated with maintaining the drainage infrastructure that currently routes runoff downstream. West Linn’s Engineer estimated that the work needed on the pipe would cost approximately \$160,000. That is in the public record for tonight’s meeting.

Chapter 32 of the CDC supports Bernert Creek being daylighted:

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

32.060 APPROVAL CRITERIA (STANDARD PROCESS)

H. Daylighting Piped Streams.

1. As part of any application, covered or piped stream sections shown on the WRA Map are encouraged to be “daylighted” or opened.

When we last presented to the City Council on daylighting Bernert Creek we were asked for a Feasibility Study and Cost Estimate. We have had both completed by Herrera and have emailed them to you within the past week. The cost is approximately \$320,000 and includes design, further analysis such as modeling and surveying to support design, permitting and approval, and construction.

The benefits listed in the Feasibility Study include providing shade and increasing hyporheic interaction with the soil to decrease water temperatures. Also, species diversity would increase, thereby providing a unique opportunity for visitors to encounter rarer species in this setting. As development in the Portland Metro Area continues at a rapid pace, preserved habitats like the White Oak Savanna are increasingly important to provide vital habitat. And the refuge it provides for local wildlife.

One goal for this stream channel daylighting project would be to serve as an accessible demonstration site to educate the community on the importance of healthy streams and the many important functions of riparian corridors. Most visitors to the Savanna would enter and/or exit via a route over the creek, where interpretive signage could be placed for their benefit. Many classes of children participate in volunteer efforts at the park and this would be an opportunity for children to learn about the stream in a safe, easily accessible environment. We were also asked to make a presentation about this project to the residents of a local Assisted Living Facility and they were very happy to hear that a place so close would be available to them as a spot to sit and listen to birds and hear the creek flowing. The nearby VA Clinic will have patients and staff who will be able to come and enjoy this daylighted stream as well.

We have included Letters of Support from five different Conservation groups who endorse this daylighting of Bernert Creek.

Six hundred thousand dollars (\$600,000) has already been budgeted and approved for a natural play area in the White Oak Savanna. The design of the natural play area could have been handled better by the Park Department. No members of the NA were invited to any design meetings. We were only provided finished maps with small print. We feel that several of the proposed features are not compatible with the White Oak Savanna's habitat. Therefore, we respectfully ask that approximately half of the budgeted amount instead be used to daylight Bernert Creek and the other half be used for construction of a scaled-down Natural Play Area.

This is something that the community has been requesting for many years. Jon Rhodes did his first report on Bernert Creek for us in 2007. The Girl Scouts made this model as part of the 2013 celebration when we acquired the first 14 acres of the park. Look how they have Bernert Creek daylighted. Please do this for the community. The community did the heavy lifting and raised the \$3.5 million and have volunteered over 16,167 hours so far in restoration. You can support them by leaving this Bernert Creek legacy. The Bernert family has said they will donate the riparian plants for the banks of the Creek. This is local history coming back to life. The last page of your packet is a photo of the Bernert family.

Thank you for the opportunity to present this information.

Respectfully submitted,

Ed Schwarz, President
Savanna Oaks Neighborhood Association