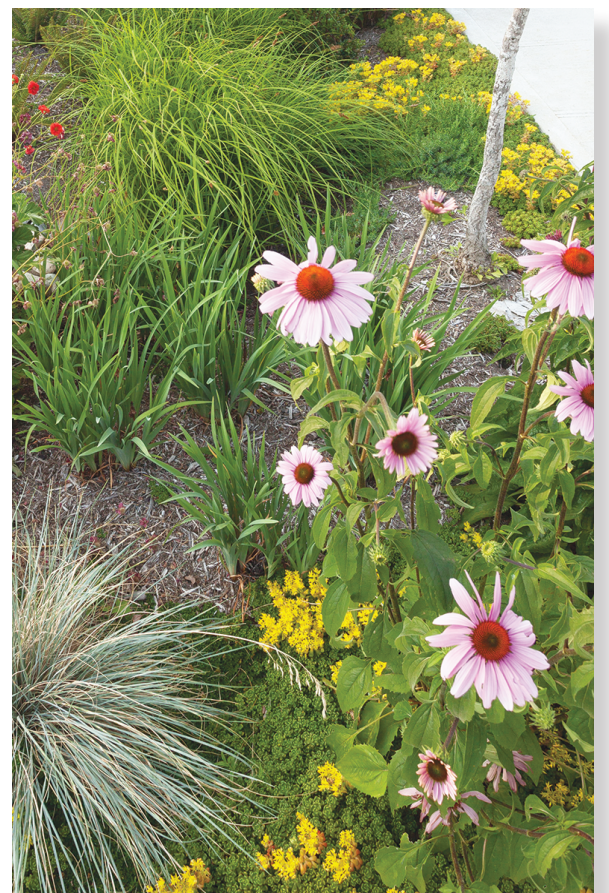


ENVIRONMENTAL OUTLOOK



WORKING AROUND AN UNWORKABLE VOLUNTARY CLEANUP PROGRAM

Budget cuts are slowing approval of VCP sites, threatening development projects and real estate transactions.

In 1997, the Washington Department of Ecology rolled out its Voluntary Cleanup Program, which allows individuals who conduct independent cleanups to request informal advice



BY CONNIE SUE MARTIN SCHWABE, WILLIAMSON & WYATT

and assistance from Ecology and receive a written opinion on the sufficiency of completed cleanups under the Model Toxics Control Act.

An NFA letter — an opinion from Ecology that “no further action” will be required at the site — often provides enough assurance for a lending institution to finance real property sales and development, or for potential buyers to enter into real estate transactions.

By all accounts, Ecology’s VCP has been wildly popular in Western Washington. Over 5,000 applications were submitted for VCP enrollment between 1997 and 2015. As of December 2015, 56 percent of the VCP cleanups were in the Northwest Region (which includes King County), 35 percent were in the Southwest Region (includes Pierce County), 5 percent were in the Central Region and 4 percent were in the Eastern Region.

Participation in the VCP is driven by redevelopment: The number of new VCP applications fluctuates with real estate demands, redevelopment needs and construction season.

Unfortunately, the popularity of the program has also been its Achilles’ heel. At the same time as participation is increasing, Ecology staff numbers are down and the agency has a limited ability to rehire because of revenue constraints. As a result, VCP sites are not moving through

the program, threatening development projects and real estate transactions.

Ecology has tried to address the problem in several ways:

- In June 2016 it required that plans and reports submitted to Ecology for review include information specified in checklists, or they would be returned without processing.

- In August 2016 Ecology announced that new complex sites would not be eligible for the VCP, and complex sites already in the program would be handled on a case-by-case basis, with some participants with complex sites being encouraged to leave the VCP program and enter into the formal cleanup program.

- In December 2016 Ecology instituted two different wait lists, one for existing VCP projects where no site manager is assigned, and a second for new VCP applications. It is not possible to “get in line” and reserve a slot on the wait list for when

a project is ready for an opinion — Ecology will not accept applications if written opinions or technical assistance are not requested at the time of application.

Existing VCP participants with complex sites will be urged (and perhaps required) to leave the program and proceed under a formal cleanup. Sites where there has been no action for an extended period of time may be required to take action, submit a plan for action, or risk being kicked out of the program until a written opinion or technical assistance is requested.

Environmental consultants, real estate developers and construction contractors most impacted by the VCP backlog have asked why Ecology cannot simply employ a pay-to-play model that allows developers to expedite VCP review by paying increased fees, as municipalities do.

For example, Pierce County provides for expedited project review performed by Planning and Land Services staff, third-party consultants and extra hires paid for by the applicant under an expedited review agreement. King County has a similar program, which funds the expedited

review through expedited review fees of 150 percent of the regular review fee.

Contractors have also inquired about Ecology using qualified outside consultants to review VCP projects. Outside consultants have been used successfully in the water rights arena to clear the backlog of pending applications and speed up the decision-making process.

Quicker decisions result under the program because the resources of a consulting firm are dedicated to the investigation of a particular application, and can return a decision within a matter of months rather than a matter of years. This model may be the solution for the VCP, but it will require legislative action to amend MTCA.

So, what is a developer or seller of contaminated property to do? Neither Ecology nor state law prohibits the transfer of contaminated property. Rather, banks, transaction financiers and buyers require assurance regarding liability stemming from contamination as a condition of lending or acquisition, and many believe that the absence of an NFA letter is a deal killer.

With the current condition of



CLEANUP — PAGE 8

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30 YEARS AND BEYOND: CARING FOR LANDFILLS POST CLOSURE

For landfill owners and operators, an ounce of prevention can be worth hundreds of thousands of dollars of cure.

Landfills have a finite operational and economic life. When waste can no longer be accepted and the facility closes, it transitions from an income source to a financial and environmental liability.



BY CHRISTOPHER AUGUSTINE
ASPECT CONSULTING

Recognizing this, EPA's Resource Conservation and Recovery Act (RCRA) outlines requirements for post-closure care (PCC) and long-term management for landfills. For landfill owners, strategic end-use planning for the facility, early data collection, and predictive modeling of landfill changes will reduce near- and long-term costs.

Based on experience with active and closed landfills throughout the Pacific Northwest, let's take a look at regulatory requirements and owner strategies for planning long-term management of permitted waste facilities and ways to reduce the PCC period.

Closure without 'closure'

Closure of a facility ends its operational life accepting waste and marks the transition to the PCC period.

PCC can be defined as the time after closure when the owners actively monitor and maintain

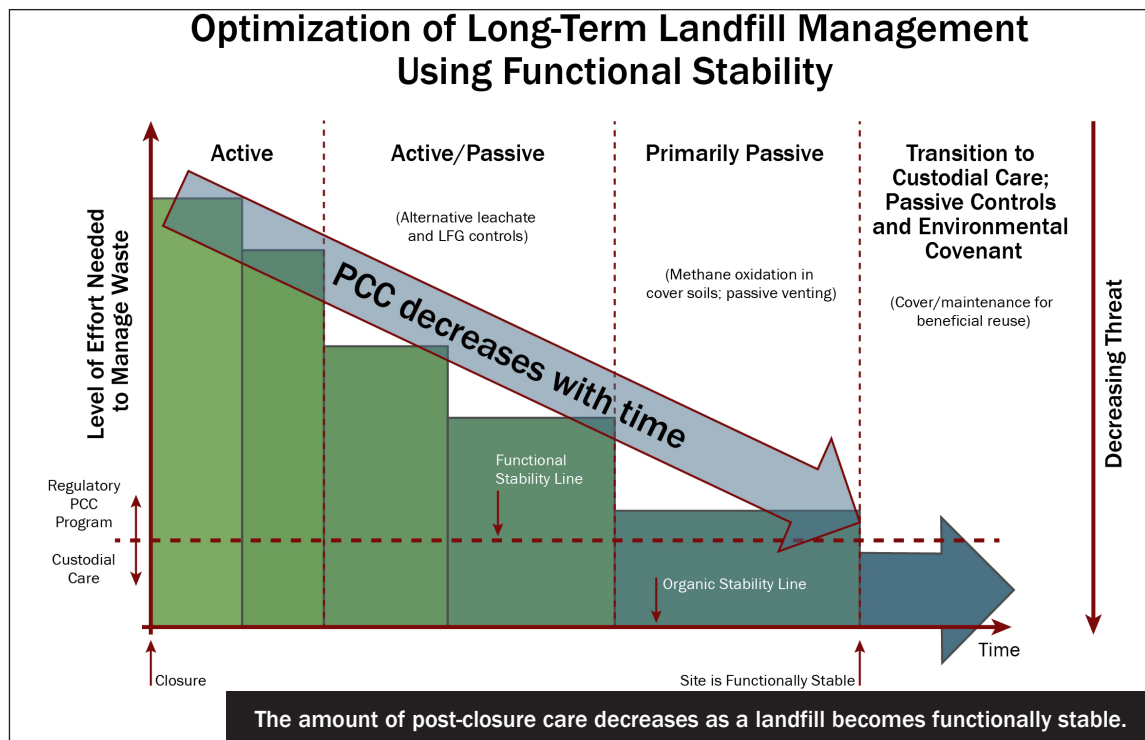
systems designed to prevent releases of contaminants to the environment (e.g., landfill cover, landfill gas extraction system and leachate collection system).

RCRA established that PCC should be conducted for a presumptive period of 30 years by the owner or operator of a waste facility. The PCC period is generally considered complete when the landfill no longer presents a threat to human health or the environment. However, in practice, the PCC period is typically much longer than 30 years, especially for legacy facilities (i.e., unlined "sanitary landfill" facilities or open dumps) developed prior to advances in landfill design and operation requirements.

Newer landfills were designed to more effectively manage risk, reduce threats to human health and environment, and stabilize the waste more efficiently.

The owner is financially responsible for any contaminant release that poses a threat to human health and environment until the PCC period ends. And this is true even when the facility is transitioned to reuse (i.e., custodial care). RCRA requires owners of waste facilities to demonstrate "financial assurance" for the required maintenance and monitoring activities during the PCC period, and any corrective action needed to control releases of contaminants into the environment.

The greatest risk to incurring



N.J. DEPARTMENT OF ENVIRONMENTAL PROTECTION (MODIFIED AND USED WITH PERMISSION)

long-term financial obligations is generally a release to groundwater from leachate or landfill gas. Corrective action for a groundwater impact can be costly and

take years of additional effort and expenditures to characterize, investigate and clean up.

The monitoring and maintenance programs for the PCC

period need to be designed carefully during the closure process to be both protective of the envi-

LANDFILLS — PAGE 8

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GOING BELOW THE SURFACE FOR BETTER WATERSHED HEALTH

Amid record growth, Salmon-Safe development holds the key to improving fish habitat and water quality in Puget Sound.



BY LORI MASON CURRAN & ELLEN SOUTHARD
SPECIAL TO THE JOURNAL

Each spring and fall, onlookers gather at the Ballard Locks for a glimpse at a phenomenon thousands of years in the making: adult salmon migrating upstream to spawn, and smolts journeying into Puget Sound for the first time.

Only, the scene from behind the viewing windows stems from recent human activity, rather than Mother Nature's intent. A century ago, the completion of the Lake Washington Ship Canal connecting Lake Washington to Puget Sound disrupted the routes of coho, sockeye and Chinook salmon.

With the lowering of Lake Washington in 1916 as part of the ship canal project, the Black River — formerly the corridor for salmon heading into Puget Sound via the Duwamish River — dried up. Salmon eventually reoriented toward the northernmost part of Lake Washington, and then onto the ship canal and past Lake Union.

Today, factors like predation, water pollution, rising temperatures and shoreline development continue to pose other challenges. Yet nothing has so drastically imperiled salmon species as increased urbanization. And specifically: the loss of permeable soil to impervious roofs and roadways.

With each rain event, heavy metals and motor oil are swept into local receiving waters through stormwater runoff, rather than being filtered more gradually through natural soils. As the Puget Sound region continues to experience record-breaking development, the degree to which green stormwater infrastructure standards are implemented by mission-oriented developers and landowners will set the tone for how we protect watershed health during this time of unprecedented growth.

The origins of Salmon-Safe

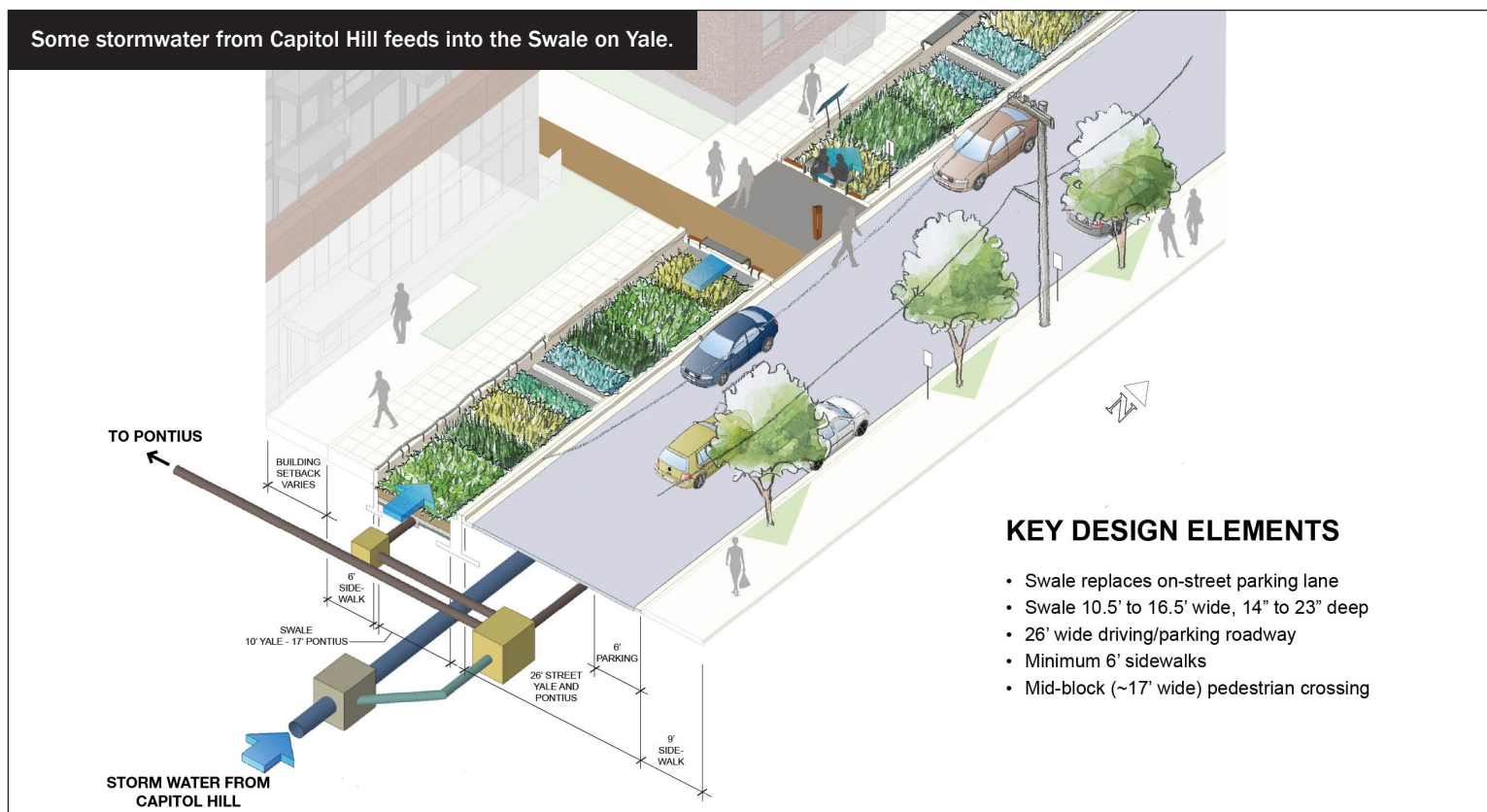
To passersby, the Salmon-Safe



Vulcan is in the latter stages of construction on Batik, a multifamily development in Yesler Terrace with bioretention planters, vegetated roofs and water-efficient irrigation.

IMAGE COURTESY OF VULCAN REAL ESTATE

Some stormwater from Capitol Hill feeds into the Swale on Yale.



KEY DESIGN ELEMENTS

- Swale replaces on-street parking lane
- Swale 10.5' to 16.5' wide, 14" to 23" deep
- 26' wide driving/parking roadway
- Minimum 6' sidewalks
- Mid-block (~17' wide) pedestrian crossing

IMAGE FROM SPU

educational signage surrounding Vulcan Real Estate's office and residential projects in South Lake Union stands as a reminder that this place was once a natural part of the watershed where salmon thrived.

Construction fence signage highlighting the Salmon-Safe commitment to water quality protection surround some of Vulcan's most high-profile projects,

including the new Google and Facebook campuses in South Lake Union. So far, Vulcan has finished or started eight Salmon-Safe-certified projects, and at least eight more are on the horizon.

Portland-based nonprofit Salmon-Safe has made headlines in recent years for certifying high-profile sites including Sea-Tac Airport as the first Salmon-Safe-

certified airport in the U.S. and Seattle Children's as the first hospital campus in the nation to earn the certification.

But its story began 15 years ago in the farms and vineyards of Washington, Oregon, California and British Columbia. Since then, Salmon-Safe has certified 95,000 acres of farm and urban lands that exhibit good land-use practices and a commitment to protecting salm-

on habitat and water quality.

In 2008, Turner Construction approached Salmon-Safe to explore recognition for its environmentally innovative work on Nintendo's sprawling campus in Redmond — a hub for salmon habitat. With that, a new standard for construction was implemented with the goal of achieving these high standards wherever Turner works in the

Puget Sound region.

In 2014, Salmon-Safe extended its oversight to real estate development with the aim of creating a certification that plays a complementary role to LEED, the U.S. Green Building Council's system for rating the environmental performance of a building.

This year, Vulcan Real Estate became the first Salmon-Safe accredited developer in the world. Its newest Seattle projects in South Lake Union and Yesler Terrace have gained Salmon-Safe certification — among the first in the city to do so — through the extensive use of bioretention planters, vegetated roofs and water-efficient irrigation.

Additionally, Vulcan now requires all of its general contractor partners to be accredited by Salmon-Safe for zero sediment runoff in construction. The group of accredited contractors includes Exxel Pacific, GLY, Lease Crutcher Lewis, Sellen, Turner and W.G. Clark. These firms make a practice-wide commitment to achieving Salmon-Safe's zero pollutant standard on every project, even on sites that aren't being considered for certification.

Among the responsibilities accompanying Vulcan's developer accreditation is to share key learnings both internally and with other developers, with the aim of moving the marketplace toward a higher development standard.

Sustainability on display

To qualify for Salmon-Safe certification, each project is required to meet the Salmon-Safe devel-

opment principles of protecting habitat and water quality during construction, incorporating strategies that treat stormwater and provide ecologically functioning habitat, as well as a commitment to water conservation methods.

An interdisciplinary team including scientists from local universities and private-sector partners is then called on to conduct each assessment on behalf of Salmon-Safe. This includes a visit to each project site before a certification is issued.

Vulcan's full-block residential development at 1255 Harrison St., called Sitka, is among the newly certified projects.

Slated for completion in 2018, Sitka includes the installation of the second half of the Swale on Yale joint-venture project with Seattle Public Utilities to treat stormwater before it reaches Lake Union — part of the region's new salmon migration corridor. The newest two-block-long swales will be situated on the eastern and western margins of the development, along Pontius and Yale avenues.

The first half of the Swale on Yale was completed in 2013 alongside Vulcan's Stack House and Supply Landry development, one block north of Sitka.

Together, the four swales will treat stormwater from 435 acres of Capitol Hill streets and sidewalks each year. At completion, about 190 million gallons of stormwater will be treated annually. This voluntary retrofit of a storm system in an urban setting is the first of its kind in the U.S.

Green roofs will also be installed atop Sitka and its ground-floor awnings. All other

roof drainage will be directed to one of five bioretention planters.

In Yesler Terrace, Vulcan is in the latter stages of construction on Batik, a multifamily development at 123 Broadway. It has bioretention planters, vegetated roofs and water-efficient irrigation. Its stormwater management features will be particularly evident along both sides of Fir Street, where rain collected from the roof will empty into street-side planters.

Stormwater from approximately 80 percent of the project's surface area will be treated on-site through the use of vegetated bioretention structures.

Overcoming obstacles

A 2015 report published by the National Oceanic and Atmospheric Administration captured the startling impact of stormwater pollution on our urban watershed. Researchers found that adult coho salmon died in less than three hours after direct exposure to road runoff.

The silver lining: The study found that running the same toxic cocktail through layers of compost, soil and gravel — mimicking pre-development conditions by using conventional stormwater management practices — led to zero salmon deaths.

Researchers then offered readers an important takeaway: Green stormwater infrastructure

should be incorporated as much as possible to preserve and protect watershed health.

Yet for land owners and developers, a key barrier to adoption remains: a lack of expedited permitting and financial incentives that prioritize green site development are otherwise available

for high-performance buildings.

Until that changes, mission-oriented developers, land owners, contractors and others will need to recognize their role in protecting our urban watershed. The stakes have never been higher.

Lori Mason Curran is Vulcan



IMAGE FROM SPU

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WATER FOR RURAL DEVELOPMENT: TAPPING THE HIRST RULING

Counties must determine whether water is legally available when issuing building permits that rely on permit-exempt wells.



BY CHRIS PITRE & SHARON HAENSLY
SPECIAL TO THE JOURNAL

Background

Water in Washington is a public resource allocated on a “first-come, first-served” basis, meaning that new water uses cannot impair older senior water rights. Most water in Washington is already fully committed to meeting the needs of senior rights issued for drinking water, agriculture, industry and instream flows.

Instream flows are water rights that specify a quantity of water that must remain in the stream for salmon habitat. Water shortages are occurring with greater frequency and climate change will make it worse.

While these wells are exempt from Ecology’s permitting process, they remain subject to the law against impairing senior rights. Groundwater pumping by permit-exempt wells in a basin can decrease water needed for older water rights.

Counties have historically only asked whether a well could physically provide the required quantity and quality of water. Hirst now clarifies that counties must also determine whether water is



Rural developments, like this home under construction in Selah, often rely on permit-exempt wells for drinking water.

PHOTO FROM COPPER HILLS CONSTRUCTION

Rural development relies largely on permit-exempt wells to provide drinking water to private residences, small water systems and other uses. In October 2016, the Washington Supreme Court’s Hirst decision confirmed that counties must determine whether water is legally available when approving development that relies on permit-exempt wells.

This decision presents a challenge for counties, developers and the Washington Department of Ecology. This article offers some solutions to meet Hirst’s requirements.

legally available before approving buildings and subdivisions that will use permit-exempt wells. Ecology has been largely passive here.

The legal availability of water varies statewide with the biggest variable being whether Ecology has adopted instream flow regulations that now cover about half

of the 62 basins in Washington. Groundwater is not legally available if pumping reduces stream-flows that are not being met unless the use is mitigated.

Hirst concerns

Landowners and developers are concerned about financial

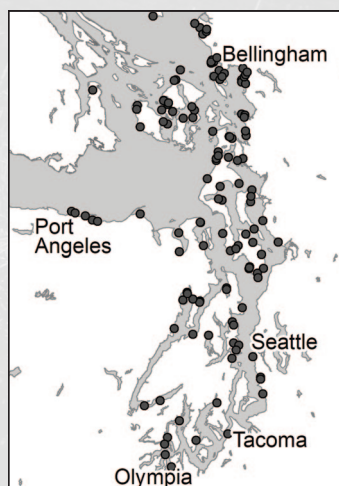
losses if the water supply they assumed would be available from permit-exempt wells is in fact not available. They include individuals who bought undeveloped property as part of their retirement plans and were uninformed about water availability constraints.

Counties are concerned about

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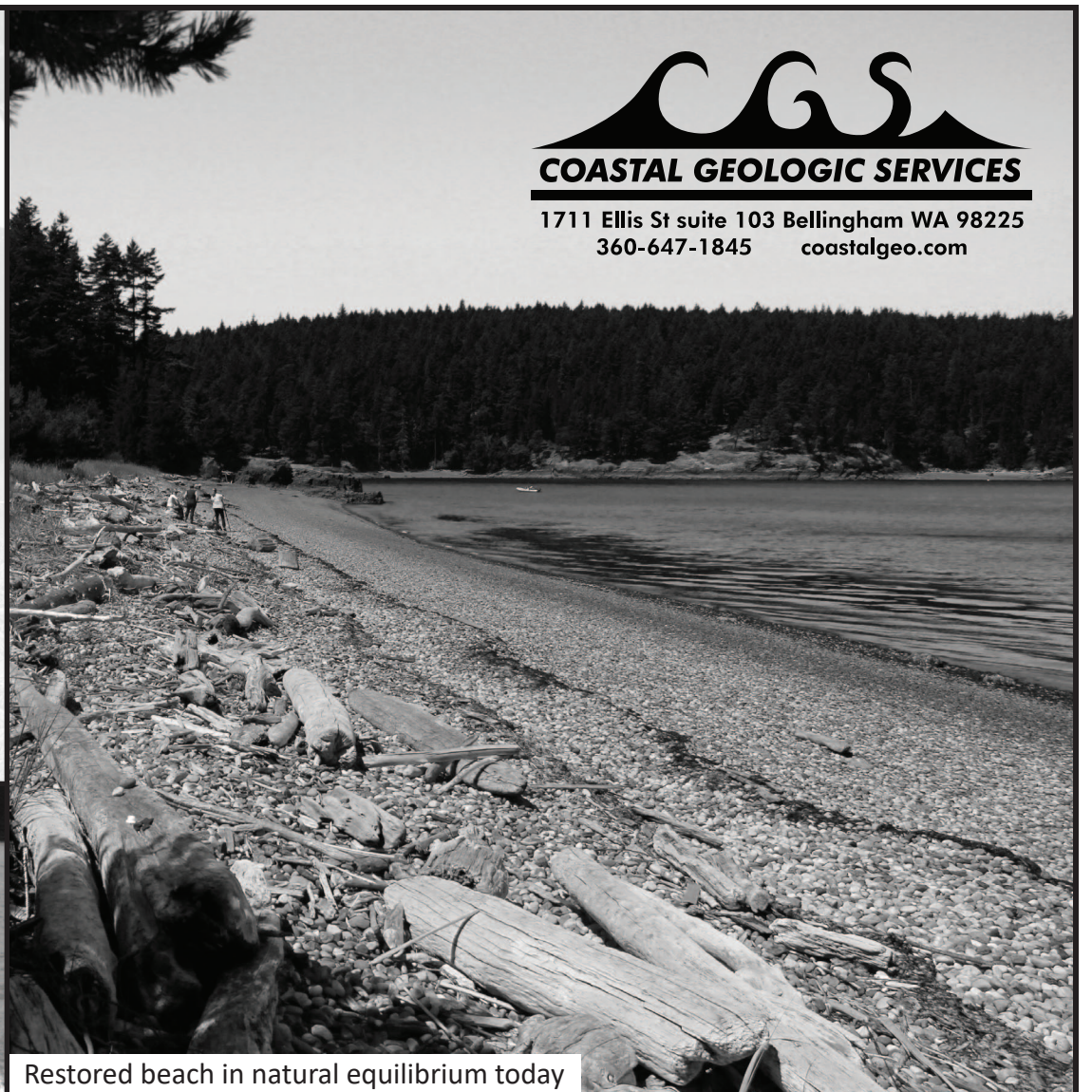


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the administrative burden. They typically lack technical staff to assess water availability. They are also uneasy about liability when approving development reliant on permit-exempt wells whose use might be curtailed during a water shortage.

Varying responses

The counties' reactions to the Hirst decision have included:

- Requiring applicants to obtain professional opinions (Pierce and Spokane counties)
- Issuing building permits with disclaimers to "proceed at your own risk" (King and Snohomish counties)
- "Wait-and-see" approaches (Thurston and Lewis counties)
- Building moratoria (portions of Skagit and Kittitas counties)
- Offering water banking institutions (portions of Clallam and Walla Walla counties)

Dealing with Hirst

The Hirst decision is likely to remain in one form or another. Therefore, how will counties implement it? Counties may consider site-specific and regional approaches to mitigate impacts from permit-exempt wells and to avoid further disturbing natural hydrologic systems. While no one size fits all, tools exist and it is doable.

Site-specific approaches that help sustain the natural hydrologic system include stormwater management. Development can increase stormwater runoff to harmful levels — causing flooding, high stream flows that wash out salmon redds (egg nests) and erosion. Stormwater can be managed to avoid short-circuiting natural hydrologic systems, and can be done at the scale of homes (e.g., rain gardens), housing developments and the region (e.g., runoff from transportation corridors).

Septic systems and rain harvesting may provide a degree of impact mitigation but their benefits are often overstated.

Permit-exempt well use is split between interior use that returns to the groundwater system through septic systems, and outdoor landscape irrigation that evaporates and is lost. Giving up the green lawn is an obvious mitigation measure with 100 percent payback in reducing impacts.

Septic system return flows are about 90 percent of interior water use, and some claim that all of this should be applied as a mitigation credit. This may be true in certain settings, but may also be significantly less — possibly even zero — depending on the geology. Furthermore, septic return flow has water quality concerns.

Rain may be harvested in lieu of a permit-exempt well, or for later controlled release to mitigate permit-exempt well use. Rain ends up in evaporation, runoff and groundwater recharge.

Rain harvesting of the evapora-

tion portion is a no-harm proposition with respect to watershed health. Harvesting the runoff portion may actually provide benefit by reducing harmful high stormwater runoff. However, harvesting the groundwater recharge portion impacts groundwater, though to a much smaller degree than permit-exempt well groundwater withdrawals (maybe two thirds less, depending on the geology).

Ecology's policy on rain harvesting is similar to that for permit-exempt wells in that: it is "not subject to the permit process"; and Ecology may curtail future rain harvesting if "rain harvesting systems are likely to negatively affect instream flow values or existing water rights."

Also, the reliability of water supply from rain harvesting will be quite variable year to year. Therefore, rain harvesting is likely only feasible as a source supplemental to another supply.

Metering well use will lead to conservation and efficiency, raise awareness and provide critical data to inform sustainable rural development. You have to know what you have in order to manage it.

Water banking is a regional solution that involves obtaining

large water rights and distributing small portions to many users who then exercise their portion by installing a well. It is a purely administrative function with no physical transfer of water.

Water banks can be operated privately, publicly and by non-profit non-governmental organizations such as the Washington Water Trust. They can only serve downstream areas; upstream sites have to rely upon site-specific mitigation measures.

Water banking transaction fees offset program costs. Yakima County is considering a form of water banking whereby the county retains ownership of the water right and charges homeowners a connection fee to install a well, plus a metered water use bill. This encourages conservation and provides a steady revenue stream to the county to administer the program.

Overcoming complexities

Any one of the above measures does not ensure a statewide — or even countywide — solution. Effective approaches will depend upon site-specific conditions such as geology and cli-



This West Seattle rain garden helps sustain natural hydrologic systems.

PHOTO FROM KING COUNTY

WATER — PAGE 8



Nick Hall



Bristol Bay Needs You.

The EPA has proposed to erase the protections for Bristol Bay's wild salmon and fish-based jobs, that over 1 million Americans have supported. We need to tell the EPA that weakening protections for Bristol Bay is unacceptable. Take action before October 17th.

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WATER

CONTINUED FROM PAGE 7

mate. Stormwater management in places with high precipitation may more than compensate for the impacts of permit-exempt wells, whereas rain harvesting may not be an option in dry areas.

Geology determines the timing and magnitude of impacts from permit-exempt wells on streams and the effectiveness of mitigation measures.

Therefore, a county's first task in responding to Hirst is understanding key countywide variables. Counties can develop a checklist to guide development by using GIS tools to overlay water systems, instream flow regulations and geology. They can identify areas where water is available, where simple mitigation measures will work, and where more work is needed to find workable solutions.

This approach will allow development to proceed in some areas and direct attention to areas that require more detailed management. This analysis can largely be completed with existing information.

The Foster decision

A 2015 court ruling known

as the Foster decision requires drop-for-drop mitigation in the exact location and time that impacts occur. This standard rejects alternative mitigation measures such as conservation easements, restoration of streamside riparian vegetation, and creation/restoration of wetlands that may provide greater benefits than the impacts they are mitigating.

Opinions on this topic vary, with some desiring flexibility that will result in greater improvements for salmon habitat, while others are concerned that flexibility will allow misuse at the expense of salmon habitat.

Support for counties

Counties should not face this challenge alone. Ecology should provide information and technical assistance to help guide sustainable rural development.

Initial funding of Ecology's and the counties' efforts should come from the Legislature. A coordinated effort led by counties, with Ecology's assistance, is far more financially efficient and fair than requiring each landowner to conduct their own

water availability analysis, and will result in better stewardship of our water and salmon resources.

Finally, developing county policy and administering permit-exempt wells requires community support. This includes developers, real estate agents, landowners and tribes.

Tribes can help counties obtain the needed technical, policy and financial resources to succeed. Outreach and education are critical to soliciting this support. After all, most of us care deeply about maintaining rural development, healthy economies and thriving fish populations for the long haul.

Chris Pitre of Coho Water Resources consults in water resource management with specialties in watershed management, groundwater, water rights, water supply well installation, and aquifer storage and recovery. Sharon Haensly, attorney in the Squaxin Island Legal Department, focuses on natural resources issues, and has represented tribes for nearly 25 years. Her views are not necessarily those of the Squaxin Island Tribe.

LANDFILLS

CONTINUED FROM PAGE 3

ronment but also cost efficient based on the potential long-term financial obligations of a closed facility.

Functional stability

Determining how long to continue PCC monitoring and when a landfill no longer poses a threat to human health and environment is challenging for both owners and regulators. Also daunting is successfully planning for the post-PCC finish line — i.e., the sustainable transfer of a facility back to beneficial reuse — while trying to avoid threats to landfill health over the next 30 years.

In Washington, the Department of Ecology adopted a "functional stability" model to clarify the more arbitrary 30-year presumptive PCC period for permitted municipal landfills. These standards allow owners to determine the time needed for a permitted landfill to become "functionally stable" and update financial assurance estimates. Threats are evaluated based on leachate quality and quantity, landfill gas production, cover system integrity and groundwater quality.

The criteria for demonstrating functional stability are not specifically stated in Ecology guidance because the ability to demonstrate functional stability is site-specific and dependent on several factors. Landfill design, waste type and age, local geology, hydrogeology, nearby land use and other considerations such as potential long-term beneficial reuse of the facility all affect the evaluation of the potential impacts or threats.

A case for less monitoring

Methodical data collection is key to set the stage for regulatory compliance in both new and legacy landfills.

For newer landfill facilities, leachate characteristics, landfill gas characteristics, background water quality and, in some instances, potential contamination to groundwater should be adequately characterized. Unfortunately, this may not always be possible for legacy facilities that are already in post closure.

In either case, steps to take early in the post-closure planning process include:

- Evaluating the groundwater monitoring program design
- Defining leachate, landfill gas and groundwater sampling methods
- Evaluating the waste management area point of compliance boundaries
- Confirming performance of control systems
- Performing statistical and trend analysis of historical leachate, gas and water quality data trends

As an example, an owner of a currently active regional facility evaluated how to significantly reduce the monitoring frequency and number of locations by reducing the number of deep wells monitored. They demonstrated that hydrogeologic conditions didn't support a threat to deeper groundwater. This reduction in monitoring requirements will carry over during PCC.

Performance-driven reductions and long-term monitoring program optimization (such as decreasing monitoring frequency from quarterly to bi-annual or decreasing the number of locations in the monitoring program) can only be done when supported by sufficient data to show reduced threat due to progress towards functional stability.

Invest now to save later

For landfill owners and operators, an ounce of prevention can be worth hundreds of thousands of dollars of cure. Data to evaluate functional stability indicators is critical to assess time frames and predict measures of functional stability like leachate quality and landfill gas emissions, which pose the greatest threats to human health and environment.

Adequate data collection and characterization will allow development of predictive modeling of a potential release.

Predictive modeling that demonstrates progress towards functional stability can persuasively support the case made to regulatory agencies for reducing the PCC period from the presumptive 30 years — thus reducing the owner's financial obligations.

Additionally, the ability to periodically evaluate and verify functional stability of the landfill will allow optimization of the post-closure monitoring program and more rapid transition from costly active controls to passive controls, reduce monitoring and decrease the PCC period based on performance-driven evaluation of cover integrity, leachate, landfill gas and groundwater quality.

Christopher Augustine is a senior hydrogeologist in Aspect Consulting's Portland office. Augustine has performed hydrogeologic investigations and supported operations, groundwater monitoring programs, regulatory compliance, permitting, and remedial investigations at municipal and hazardous waste landfills for over 16 years throughout Washington and Oregon.

CLEANUP

CONTINUED FROM PAGE 2

the VCP, an NFA letter may be three years out. Fixes for the VCP may be in the works, but waiting for the Legislature to act will likely not meet acquisition or construction timelines.

The simple answer is to be creative. Here are some tips:

- Educate your lenders or deal partners. Many lenders are under the false impression that an NFA letter means a site is "clean" and subsequent owners have no risk of having to deal with potential environmental liabilities. That simply is not true. An NFA letter, even one that says that no further action will be required to satisfy MTCA cleanup requirements, does not fully absolve a person of liability to the state or third parties. Ecology

does not have the authority to settle with any person potentially liable under MTCA except under a consent decree.

- Consider specialized environmental insurance such as pollution legal liability, remediation cost cap, blended finite risk and secured creditor policies to allocate environmental risks in transactions and provide certainty for lenders or purchasers.
- Assemble an experienced team to help you. An environmental consultant can advise what would need to be done to meet MTCA cleanup regulations and obtain approval from Ecology if and when the cleanup is submitted to Ecology for review. An environmental lawyer can draft contractual provisions

such as environmental disclosures or indemnity provisions as stand-alones or on concert with specialized insurance policies.

- Don't be afraid to go it alone (i.e., perform an independent cleanup without any Ecology oversight). A cleanup conducted by an experienced consultant, in compliance with MTCA, can be submitted to Ecology for approval under the VCP after it is completed.

Connie Sue Martin is an environmental lawyer in Schwabe, Williamson & Wyatt's Seattle office. She helps ports, companies and individuals address environmental contamination and redevelopment of impacted properties.

LEASES & TENANTS

We're always seeking information on leases and property sales. Send yours to Phil Brown at phil.brown@djc.com

KALAMA METHANOL PLANT WILL FIGHT CLIMATE CHANGE

Northwest Innovation Works is using ultra-low emissions technology to reduce global greenhouse gas emissions by up to 90 percent compared to most other methanol facilities.

Climate change is arguably the most serious existential threat of the 21st century. To address this crisis in ways that will matter, we need to evolve our thinking to develop stringent standards enabling a responsible global view of the way we do business today.



BY SIMON ZHANG
NORTHWEST INNOVATION WORKS

In Washington state, we are fortunate to have some of the best minds in the world focused on this problem. Our culture has always understood the importance of the environment, and we have some of the best regulations in the world to ensure that we live by our values.

People here take responsibility — not just for what happens inside our state's borders, but for our global environment. Gov. Jay Inslee has been one of the most progressive leaders in the country when it comes to confronting climate change. His leadership has spurred our universities, nonprofits and industry to push the boundaries of innovation to change their practices to minimize our collective impact on the environment, including greenhouse gas emissions.

In this way, we all share the same goal: protecting our environment for generations to come. To deny climate change, or to oppose responsible evolving business practices, is akin to hitting the fast-forward button on diminishing our planet's ability to sustain life.

In the debate on solutions for fighting climate change, we accept that some people believe the best course of action is to immediately end our reliance on all fossil fuels. If that were achievable today, it might represent a perfect solution. However, at a global level, it would impose profound impacts today that are difficult to imagine: no more computer screens or smartphones; the loss of countless medical devices; no more cars; and no more internet.

The list goes on and on. And, ironically, the quest for perfection stands to block the realization of the good — or the great.

Fighting climate change through activism and engagement must be respected and encouraged. It defies complacency and motivates creativity. But this approach may cause more harm to the environment

when conflict overcomes conversation and subsequent industry inaction forestalls solutions.

It's clear that if human consumption continues, then the solutions must come from motivated innovation, the environmental community and the marketplace insisting on new technologies and standards that prioritize and respond to the impacts of climate change. We must have both the wisdom and the courage to enable us to accomplish the good — or the great.

Not just another plant

Over three years ago, Northwest Innovation Works signed a lease with the Port of Kalama to build a methanol plant on a long-standing industrial site. In so doing, we set out to do much more than just build another plant or create jobs. Our mission is to dramatically change an industry through innovation and, as a result, positively and meaningfully impact our global environment.

Washington state's innovative spirit and support for taking bold steps that change the world are several of the reasons Northwest Innovation Works chose to locate here.

Methanol is not overly complex or dangerous, but it is necessary. It's a naturally occurring, biodegradable and noncarcinogenic alcohol that is present throughout our environment. In fact, methanol is ubiquitous in today's society and is used as a building block in virtually every consumer product today.

Methanol is even used in wastewater treatment plants in Washington and across the globe to reduce environmentally damaging effluent. It falls into that category of things that you don't even realize you need, but without it, you'd notice a significant change in your daily life.

Most of the methanol produced in the world today comes from China, where many use coal and outdated manufacturing techniques. This dirty and antiquated combination has contributed to both an air quality crisis that is impacting the globe at an alarming rate and significant global greenhouse gas emissions.

In China, air pollution from the use of coal for industrial purposes results in 1.6 million people dying prematurely every year — that's more than 4,000 people every day. And as you would expect, this is not a problem that respects borders. National Public Radio reported recently that air pollution from

Northwest Innovation Works will build its clean-tech facility at this site along the Columbia River at the Port of Kalama.



PHOTO FROM NORTHWEST INNOVATION WORKS

Asia had increased harmful surface-level smog in the western United States by nearly 65 percent in recent years. This is on top of significant greenhouse gas

emissions that impact the global atmosphere.

We set out to create a pathway to correct these trends. Internally, our goal was to leapfrog

the existing industry best practices. We did so by adopting the world's first-ever large-scale

METHANOL PLANT — PAGE 12



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IS SEATTLE'S LIVING BUILDING PILOT PROGRAM READY TO TAKE OFF?

A recent study found that the program is achievable for many sites if developers pursue "best-in-class" water and energy efficiency levels.



BY ANDREW LEE & MYER HARRELL
SPECIAL TO THE JOURNAL

In October 2016, the Seattle City Council approved an update to the Living Building Pilot Program (LBPP) — an ordinance and land use code provision which offers height and floor area ratio incentives in exchange for meeting the world's most stringent green building standard, the Living Building Challenge.

Despite the value of these unique zoning incentives, only two projects have completed the program since its inception in 2009. Through this latest iteration, the city intends to increase participation in the program, and the surging market in Seattle has led to additional inquiries about the program from developers.

However, many questions

remain for program administrators and the local real estate community as to how achievable the LBPP is across the city, and what key factors impact its feasibility.

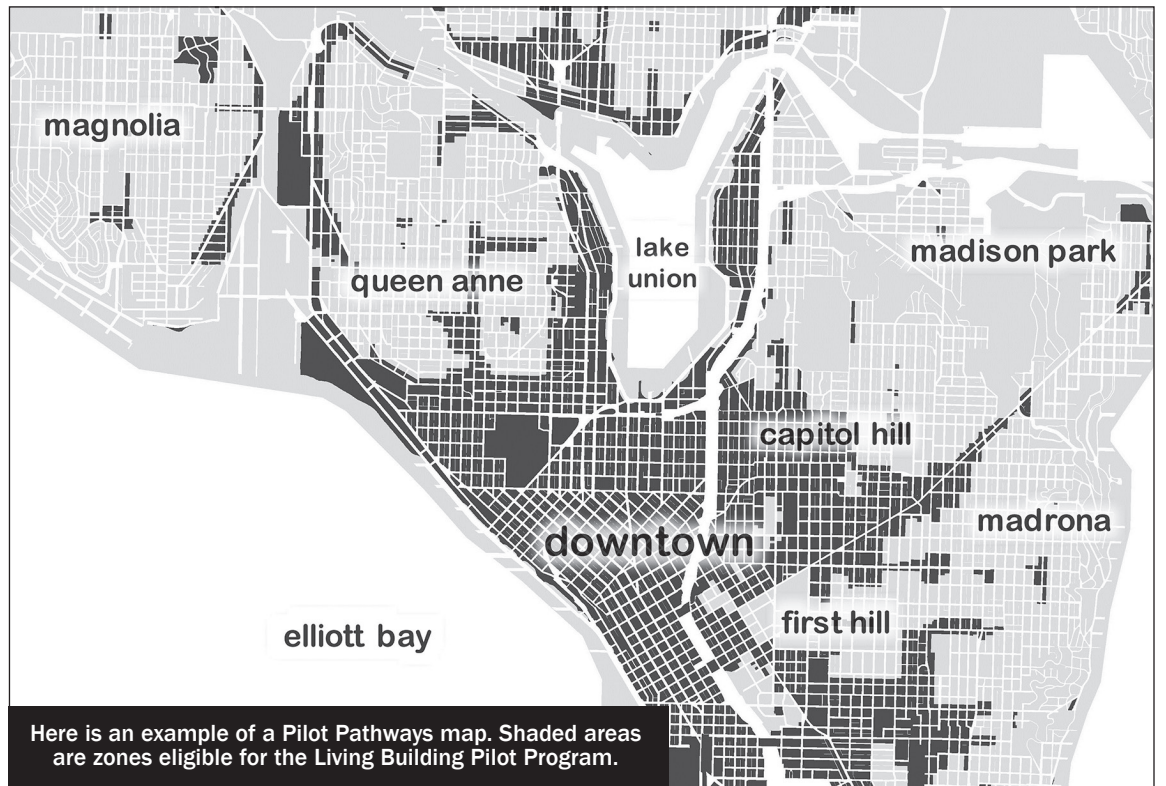
The creation of Pilot Pathways

In April, Andrew Lee published a study that aimed to answer the question: What is the current and future potential for the LBPP?

"Pilot Pathways: A Technical Feasibility Study of the Living Building Pilot Program" evaluates the program at the city scale to identify the potential reach of the LBPP and the patterns of its anticipated outcomes. Results of the study are presented as a series of maps and tables that are available online, intended to help bridge conversations between LBPP applicants and the city.

The Pilot Pathways study was prepared using city zoning and parcel GIS data, establishing a series of criteria to filter for the sites with the highest potential to meet the LBPP.

Sites that are not eligible for the program are excluded from the analyses, which includes parcels in shoreline zones or zones that do not qualify for design



Here is an example of a Pilot Pathways map. Shaded areas are zones eligible for the Living Building Pilot Program.

GRAPHICS FROM ANDREW LEE

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review. The remaining parcels are then tested for feasibility to meet each of the LBPP pathways, which are those based on certification programs from the International Living Future Institute: achieve one of three Petal certifications (Energy, Water or Materials) or achieve full Living Building Challenge certification.

Whereas LBPP applicants must satisfy a wide range of design requirements for each pathway, the analyses in this study focus solely on site-dependent criteria, evaluating whether parcels have the ability to generate their energy and water needs on site.

The study provides a method for calculating typical solar energy and water harvesting potential per site area, compared to the anticipated future project's energy and water consumption, relying on zone-based floor area ratio assumptions. Additional requirements specified by the

city — that all LBPP projects use no potable water for non-potable demands, and must beat the Seattle Energy Code by at least 25 percent — are considered in each analysis as well.

Results are presented for both commercial and multifamily projects, assumed to be the two most prominent building types pursuing the LBPP.

Achievable for many sites

The study reveals intriguing outcomes. LBPP eligibility is limited by city zoning patterns, with only 20.3 percent of the city's parcels (representing 45 percent of the total land area) able to pursue the LBPP. Of these 39,000 parcels, the feasibility of each pathway varies by whether a project is commercial office or multifamily, though certain trends emerge in performance thresholds as well.

PILOT PATHWAYS
Learn more at seattlepilotstudy.com

While the study breaks down three performance levels, the "best in class" level represents a route to LBPP assuming energy and water efficiency levels in the new development comparable to the two completed pilot projects: the Bullitt Center and Stone34.

At this level, the following is found:

- The city's non-potable water requirements pose little restriction on commercial projects. It is a different story for multifamily projects, where about a third of eligible parcels are restricted by water requirements.

LIVING BUILDING — PAGE 16

		PARCEL COVERAGE	X	SOLAR CAPACITY	X	SOLAR OUTPUT
ENERGY USE INTENSITY TARGET	=	—————				
		F.A.R.	X	DENSITY BONUS	X	ENERGY BALANCE RATIO

This formula is used to compute the energy use intensity target required to achieve Energy Petal certification.

FISH BARRIER FIX: TAKE A CUE FROM HENRY FORD

Simple fish passage barriers could be removed using mass production; complicated ones would need more engineering.



BY JOSEPH
RICHARDS

& COLIN
THORNE

ENVIRONMENTAL SCIENCE ASSOCIATES

River restoration in the Pacific Northwest is a \$300 million a year business that leads the world in terms of both restoration science and practice. Despite this, barriers to fish passage continue to be a problem.

Road crossings at rivers or streams are known to create barriers to fish movement when they are improperly designed or constructed. When fish movement is limited by barriers within river systems, species are no longer able to migrate and are vulnerable to climate change and other issues.

Current ranges of salmonid species are much lower than their historic ranges, and climate change impacts on peak stormflows, summer low flows and water temperatures threaten to further reduce salmon ranges and populations. In this article we explain why it is time to rethink our approach to barrier removal.

In 2013 the U.S. District Court for Western Washington issued an injunction directing the state to correct fish passage issues on road culverts because they violate the 1854-1855 Stevens Treaties, which guarantee tribal rights to off-reservation fishing. The court directed that all high-priority barriers (those that block access to more than 200 lineal meters of upstream habitat) shall be replaced by 2030, although the state may defer up to 10 percent of these high-priority replacements based on cost and complexity.

While the court's ruling establishes the seriousness and urgency of barrier removal, it does not indicate how the state can achieve compliance.

A mammoth problem

Washington State Department of Transportation estimates there are no less than 1,989 barriers to fish passage in the state road system, that 978 of these culverts are covered by the 2013 injunction and that, of those, 806 are high-priority culverts that must be replaced by 2030.



This culvert on Wolfe Creek near its confluence with the Nestucca River in Oregon simulates a natural stream.

PHOTO FROM ESA

That is a lot of culverts. It would be a monumental task to complete the necessary work within the 13 years allowed by the court.

But the culverts covered by the 2013 injunction actually represent only the tip of a passage barrier iceberg. According to the Washington Department of Fish and Wildlife, there are around 35,000 passage barriers in the state and the number is growing because new barriers are being discovered faster than known barriers are being removed.

Attempts to fix barriers

Since 2013, WSDOT has corrected 44 (just 4 percent) of the barriers covered by the injunction and a total of 61 (3 percent) of known barriers statewide. WSDOT's six-year culvert replacement plan (2015-21) schedules another 48 culverts for replacement. However, the estimated cost of meeting the terms of the injunction stands at \$2.4 billion and only \$640 million has been allocated through the end of 2031.

But the wider problem is not limited to culverts owned by WSDOT or even the state. Federal agencies (U.S. Forest Service and Bureau of Land Management) report that over half of the estimated 10,215 culverts that exist on fish-bearing streams within federal lands in Washington and Oregon may also be fish

passage barriers.

If access to historical habitat is to be recovered, tens of thousands of culverts will have to be replaced. Using current methods, the cost of achieving this could be in the range of \$60 billion to \$86 billion and that simply is not feasible.

A risk-based approach

In the world of fish passage barrier removal, owners, regulatory agencies and design professionals all try to limit their liability; a behavior that is driving up project costs and reducing the speed that barriers can be remedied.

A prudent way to view the barrier problem is to assess barriers based on risk and complexity, categorizing them according to the risks they pose to people, property and fish, and the technical challenges posed by redesigning them to eliminate the risk to fish without increasing the risk to people and property. Then the level of effort in design and permitting, as well as the priority in terms of habitat access, can be tailored to the associated levels of risk.

Risk-based design, construction

By design we are referring to the process through which engineers and other design professionals create solutions for a specific site to achieve

desired outcomes. In the case of simple barrier removals, we must streamline our processes and move towards a production-based methodology by leveraging scientific approaches and

innovative engineering to craft solutions that can be rapidly implemented at a fraction of the cost and time required for

FISH BARRIER — PAGE 12

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METHANOL PLANT

CONTINUED FROM PAGE 9

implementation of ultra-low emissions technology at our facility. Through the use of this innovative clean technology, we will reduce global greenhouse gas emissions by up to 90 percent compared to most other methanol facilities in production today.

By replacing China coal with clean ultra-low emissions methanol made in Kalama, annual net greenhouse gas reduction totals more than 10 million tons, which is equivalent to removing more than 2 million cars off the road. That represents a significant and much-needed step in the right direction.

We are also the first large

manufacturing facility on the Columbia River to employ a zero-liquid-discharge system, which keeps wastewater out of the river.

Imagine what that means to the Columbia River and its wildlife should more industrial facilities along the river adopt the same approach. Protecting our local waterways and the aquatic life that depends on it is, quite simply, a moral imperative.

But we didn't stop there.

We are the first large industrial facility to voluntarily support the state's efforts to impose new "clean air rule" standards that will require us to reduce

greenhouse gas emissions from our facility on an annual basis. Just doing better today is not enough, however. We strive to drive improvement every year that we're in operation.

In addition to protecting our environment, it is essential we help our local, state and national economies thrive. Along with enhancing our local communities' economy through job creation, taxes and local spending, we are helping local citizens with barriers to employment to gain the skills necessary to improve their quality of life.

We are partnering with former Washington Gov. Gary Locke

(who chairs our Global Advisory Board), Lower Columbia College and Workforce Southwest Washington to create a training program for employees who would otherwise fall short of such opportunities. Under this program, we will select 20 individuals to receive scholarships to Lower Columbia College.

The education program will provide scholarship recipients with the skills necessary to work in our facility. Additionally, they will receive minimum wage pay while they are attending college in preparation for family-wage employment at Northwest Innovation Works.

Taking care of our environment and helping our economy to thrive is not an either-or proposition. These fundamental goals must be integrated to ensure healthy communities and a healthy planet for current and future generations. Through the spirit of innovation and responsibility that Washington is known for, together we will help our state, nation and world to thrive now and well into the future.

Simon Zhang is CEO at Northwest Innovation Works. He has over 20 years of experience managing complex energy and industrial projects around the world.

FISH BARRIER

CONTINUED FROM PAGE 11

unique solutions.

On the other hand, complicated sites require unique approaches to achieve favorable outcomes and these sites must be addressed differently than the straight-forward crossings.

Barrier removal production line

Henry Ford was a pioneer in automobile manufacturing because he perfected mass production; simple fish passage barriers could be removed following this example. We could move away from designing and permitting based on unique site char-

acteristics for straight-forward projects. This approach would involve segregating barrier sites into a straight-forward category and a more complex category based on risk.

Straight-forward barriers could be pre-engineered based on stream channel size, watershed and roadway characteristics, and other physical indicators. Standardization of culvert dimensions to improve efficiency and reduce manufacturing cost is also essential and the environmental permitting process — which involves local, state and federal agencies — could

be streamlined to support this vision.

Only through cooperation and agreement at all stages of the design, permitting and construction life-cycle can we begin to address the magnitude of this issue. The good news is an effort is underway that is a step in the right direction to address this massive issue.

Environmental Science Associates and its partners are working with the state Department of Fish and Wildlife to refine the department's approach to modeling water flow and sediment movement at culverts. The goal is to enhance planning, design and implementation of successful, sustainable fish passage at culverts throughout the Chehalis Basin. The project focuses on simple culverts and the assessment tools that can be applied broadly throughout the state to

address engineering in a cost-effective manner.

High risk, complex culverts

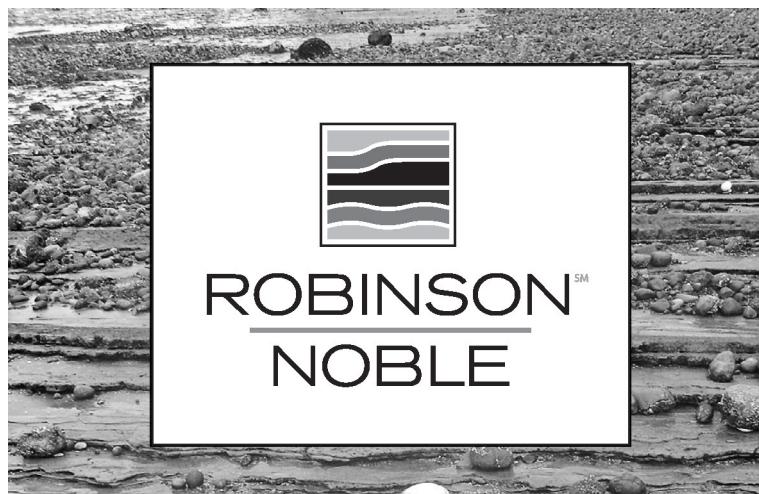
Complex crossings — which represent a small minority of cases where failure would have unacceptable consequences for people, property and fish — must continue to be designed on an individual basis. These projects will continue to follow the implementation approach that all barrier removals are currently corrected through today. In this category unique investigation, analysis and design are required but it is essential that we distinguish this complex category from straight-forward projects where a production-based approach could work efficiently.

Collaboration

The path forward to address this issue is collaboration and recon-

ciliation among all stakeholders at the local, state, federal and sovereign nation/tribal levels. We must distinguish between complex and simple projects based on risk, pre-engineer projects in the simple or straight-forward category, and streamline manufacturing and environmental permitting to foster a barrier removal production line that could increase the rate of barrier correction while reducing project costs.

Joseph Richards is a director at ESA and a senior civil and water resources engineer. He has over 25 years of experience working on projects that solve natural resource and infrastructure conflict issues. Colin Thorne, senior river scientist at ESA, is internationally recognized for his expertise in flood control, fluvial geomorphology and sediment management.



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SURVEYS

ASPECT CONSULTING

Specialty: Environmental engineering, water resources, stormwater monitoring and planning, geotechnical engineering, information technology

Management: Tim Flynn, president and managing member

Founded: 2001

Headquarters: Bainbridge Island

2016 revenues: \$15 million

Projected 2017 revenues: \$17 million

Projects: Environmental cleanup, geotechnical engineering and public involvement for Mt. Baker Housing Association's Gateway affordable housing redevelopment in Seattle; Icicle Creek integrated basin plan in Chelan County; 520 Bridge stormwater quality monitoring for WSDOT

President Tim Flynn and principals Doug Hillman and Dave Cook shared their thoughts on the state of their firm.

Q: What are a few of the chief

challenges you're facing?

A: We've had challenges getting regulatory concurrence on environmental issues to assist brownfield projects on fast-track redevelopment schedules. This is likely because both state and federal government resources to provide environmental consultation and oversight are severely strapped. New federal policy directives have altered project courses under EPA oversight; though, they also potentially provide new opportunities for progress.

The political fallout around the groundbreaking Washington state water rights case *Hirst v. Ecology* related to permit-exempt wells has halted work on a significant number of ours and other water resource-related projects throughout the state. The Legislature is, to date, stalled on passing a capital budget largely because of this case. An example is the temporary cessation of work with Ecology's Office

of Columbia River, which has the mission of developing new water supplies to address in-stream and out-of-stream needs throughout that basin.

Q: Which services are in highest demand? Has that changed in the last few years?

A: Right now, it's urban redevelopment, earth hazards, water supply and reuse. The incredibly strong growth our region is experiencing increases property values, which fuels a need for remediation and reuse. This creates a demand for properties that are environmentally and geologically challenged, and this often requires creative engineering solutions. Aspect excels in these situations, and our services and skills have had a much higher awareness as a result. It's a great time to be an earth consultant/engineer.

Q: Where are the best opportunities for future growth?

A: Our earth, water and land resources are being consumed at an ever-growing rate. Geologists, hydrogeologists, civil/

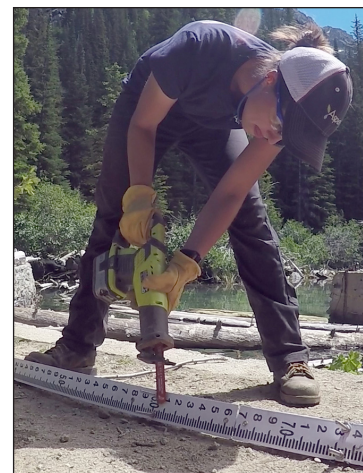
environmental/geotechnical engineers — we all have a big role to play in mitigating the risks involved with this consumption and keeping society working for everyone.

Q: What's a really interesting or vexing project you're working on?

A: We take pride in our contributions to the Mt. Baker Housing Association's Gateway affordable housing redevelopment project underway in South Seattle. Consider: a nonprofit purchasing five properties contaminated by a dry cleaner and gas station in a city where housing is limited and prices are skyrocketing. We are working to help Mt. Baker Housing envision a successful future where families live and thrive on these properties. This is an example of trust, vision and community helping to improve the environment while building critical new infrastructure.

Q: Any staffing changes? How does your work load compare with previous years?

A: Our work load is up. New



Taylor Dayton of Aspect builds and installs a lake staff gauge in the remote Icicle Creek Basin in Chelan County.

PHOTO FROM ASPECT CONSULTING

colleagues have joined us as we've significantly expanded our stormwater and environmental redevelopment practices over the past year. We've also opened an office in Portland to support our clients in that region. And we are having fun. Come join us!

HERRERA ENVIRONMENTAL CONSULTANTS

Specialty: Water resources, sustainable development, habitat restoration

Management: Mike Spillane, CEO; Carol Slaughterbeck, CFO; Phil Coughlan, COO

Founded: 1980

Headquarters: Seattle

2016 revenues: \$14.2 million

Projected 2017 revenues: \$14.9 million

Projects: Stormwater planning and design for cities in China as part of a national initiative to capture, treat and infiltrate or re-use stormwater; bringing SR 167 to the Port of Tacoma with stormwater management that is resilient to future climate change and benefits aquatic habitat; working on Stillaguamish Village near Arlington, a culturally and environmentally responsive new home for the Stillaguamish Tribe

The DJC asked Chris Webb, principal engineer with Herrera, about trends and issues in the industry. Here is what Webb said:

Q: How might a second Amazon headquarters affect the local design industry?

A: The choice to locate Headquarters 2 outside the Seattle area may slow the accelerated growth we've seen in the last several years. But I believe the region and our industry are still poised for good, healthy growth.

Q: What's the next frontier for sustainability?

A: Integrating sustainability principles with resiliency principles to create communities that are more ecologically responsive and more able to handle changing weather patterns and natural disasters. To function well and be cost effective long term, public and private projects must be designed based on the latest understanding of sea level rise, increased storm intensities, decreased summer rainfall, decreased snow pack, natural and human caused disaster risk and how green systems function.

Herrera is on a team that is updating the predicted rainfall patterns and volumes used by engineers locally to design drainage infrastructure in light of climate change, and is doing community planning that considers sea-level rise.

Q: What is the biggest environmental issue in real estate?

A: Climate change and increasing stress on infrastructure, particularly related to water and energy. Infrastructure designed and based on historic rainfall and tide conditions may be overwhelmed by intense storms and high tides, resulting in more flood risk for certain properties and infrastructure. Changes in the climate may also stress some habitats, so some development regulations may need to be changed.

Q: How has technology changed what you do?



Stillaguamish Village will include a mix of cultural, residential and community buildings, as well as a network of parks and trails.

IMAGE COURTESY OF 7DIRECTIONS ARCHITECTS/PLANNERS

A: It is reinventing our industry and how we connect people to their communities and environment. We use remote sensing instruments and drones to collect real-time data on a project's progress in ways not previously possible.

Developments in cloud computing allow us to design smart stormwater facilities with real-time controls to optimize system performance based on weather forecasts.

We use phone apps for residents to collect data in their neighborhoods so they can be part of the collaborative design and prioritization process on projects that affect them, such as new infrastructure or com-

munity amenities in the neighborhoods.

More advanced computer aided design and modeling lets us work in 3-D efficiently to better communicate designs to our clients and more clearly see how complex systems can be put together.

Q: Which services are most in demand and where do you see growth in the next five years?

A: Resilient infrastructure, integrating natural system principles in designs to create healthy, resilient communities and complete ecosystems. Resilient infrastructure and ecosystems have elasticity and redundancy to be able to meet

performance goals in light of disruptions such as natural disasters and gradual change such as increased storm intensities in winter, increased droughts in summer and rising sea levels.

Additionally, there must be a shift in planning and changes in how we approach design, including probability and risk and financial analyses, that lets public entities plan for impacts associated with a changing climate. Firms which can integrate information from many design and scientific disciplines will produce more robust solutions for the complex problems we will face.

SURVEYS

FARALLON CONSULTING

Specialty: Environmental consulting and engineering services

Management: Amy Essig Desai, CEO, principal scientist and member; Riley Conkin, principal geologist and member; Cliff Schmitt, principal hydrogeologist and co-founder

Founded: 1998

Headquarters: Issaquah

2016 revenues: \$15.4 million

Projected 2017 revenues: \$16.5 million

Projects: Remedial investigation and feasibility study for Prologis warehouse in Seattle; environmental due diligence during the land assemblage for development of an NBA and NHL arena in Seattle's Sodo neighborhood; characterization, remediation, and mediation and litigation support on redevelopment projects in Seattle's South Lake Union neighborhood



Farallon is doing a remedial investigation and feasibility study for Prologis' first multistory warehouse in the U.S. The building could be finished next year in Seattle's Georgetown neighborhood.

PHOTO FROM FARALLON CONSULTING

The DJC asked Cliff Schmitt, co-founder of Farallon Consulting, about trends and issues in the industry. Here is what he said:

Q: How might a second Amazon headquarters affect the local design industry?

A: Seattle was a hub for the computer, aerospace and biotechnology industries long before Amazon, and that won't be affected by an Amazon headquarters in another city. Amazon's success fueled local job growth and redevelopment at a

furious pace, but that rate isn't sustainable, and some slowdown is inevitable.

Since Amazon started expanding in the Lake Union area, the pool of properties available for redevelopment has been shrinking, and many of those remaining have significant environmental and engineering challenges, making them less economically viable for redevelopment. As Amazon's consumption rate of new space slows, we anticipate development in areas outside the Mercer Corridor, creating opportunities for strong but less

overheated growth in the architecture and engineering industries.

Q: What's the next frontier for sustainability?

A: Sustainability will move beyond efforts to reduce carbon emissions in homes and workplaces, to encompass climate mitigation and resilience. Environmental remediation cleanup plans will need to ensure properties are more resilient to climate change impacts, such as the recent storms and flooding in

Texas and Florida and wildfires in the West. Sustainability will expand to also include economic revitalization and other community improvements — returning contaminated areas to productive uses, creating jobs, and providing sustainable infrastructure such as offices, parks, housing and transit.

Q: What is the biggest environmental issue in real estate?

FARALLON — PAGE 15

GOLDER ASSOCIATES

Specialty: Geotechnical, environmental, water resources, cost-schedule risk assessment, seismic, geohazards

Management: Cathy Smith (PNW operations lead), Jim Kleppe (PNW infrastructure lead)

Founded: 1960

Headquarters: Palm Beach, Florida; Redmond (local office)

2016 revenues: \$960 million gross (global)

Projected 2017 revenues: \$980 million gross (global)

Projects: Sound Transit East Link light rail, Bellevue; WSF Colman Dock renovations, Seattle; Arrive 41-story high-rise, Seattle

Jim Kleppe, PNW infrastructure lead, answered questions about his firm and the design industry.

Q: What are the trends in your industry and your company locally?

A: Golder works in many sectors: development, transportation, water, manufacturing, mining, power, and oil and gas. Each sector has its ups and downs, but it's interesting to see the development and transportation sectors in the PNW being strong at the same time. Water, power and manufacturing seem steady

while mining and oil and gas seem poised to rebound from their downturns.

A consistent trend in each sector seems to be that many clients/owners are willing to tackle more difficult projects and sites — in part because of a need and in part because the location is more important than some of the existing characteristics of the sites/alignment.

Q: What is driving the local development sector's continuing expansion?

A: Clearly the increased employment in Seattle, notably the technology sector, is driving growth with significant ripples to other industries. Transit-oriented development is also a factor and will continue to be a factor as Sound Transit continues its expansion. WSDOT's program to improve its assets is also fueling employment and new development that can take advantage of improved highways.

Q: What challenges have you faced on recent projects?

A: This development cycle has included construction on sites with various challenges, and hence opportunities. For

Golder is the geotechnical engineer for the 195-unit Triangle apartment project in Redmond, opening next spring.



IMAGE FROM TISCARENO ASSOCIATES

example, the size of some sites has influenced the placement of tower cranes, such as at the Arrive high-rise in Seattle, when the crane was adjacent to the excavation and influenced shoring design. Also, due to unforeseen circumstances, that shoring design and excavation had to remain in place for many months longer than anticipated and performed exceedingly well.

We also had a mixed-use site outside the major urban areas where the owner chose to build over a former quarry that had

been infilled with thick and soft/loose soils, resulting in the need for a ground improvement strategy. And more buildings are going below the water table, which can offer challenges to waterproofing, water control, and in some municipalities, water quality.

Q: Which sectors will drive your business?

A: We'll be active in all the sectors listed above in our PNW operation — though we expect the development sector to be peaking. Most folks in the devel-

opment sector I've spoken to expect development to peak in the next 12-18 months. Thankfully, WSDOT and Sound Transit work will be strong for the foreseeable future.

Q: What do you enjoy most about coming to work?

A: We are in the people business — people helping people solve problems and create opportunity. I love the opportunity each day to work with a variety of people to make things happen.

SURVEYS

ENVIRONMENTAL SCIENCE ASSOCIATES

Specialty: SEPA and NEPA compliance; natural resources; water resource management; restoration planning and design; parks, trails and open space; cultural resources; environmental permitting and policy

Management (local): Margaret Clancy, Pacific Northwest regional director; Molly Adolfson, Pacific Northwest water leader; Teresa Vanderburg, Pacific Northwest biological resources and land management leader

Founded: 1969

Headquarters: San Francisco; Northwest offices in Seattle, Portland and Bend

2016 revenues (Northwest): \$14 million

Projected 2017 revenues (Northwest): \$15 million

Projects: Burke-Gilman Trail "missing link" EIS for Seattle Department of Transportation; Mill Pond Dam removal on Sullivan Creek in Pend Oreille County for Seattle City Light; Seattle Center Arena renovation EIS

Margaret Clancy, vice president and Northwest regional director, answered questions about her firm.

Q: What sectors are most active? Has the nature of your work changed?

A: We have been working on a number of multi-disciplinary projects involving water, energy and transportation infrastructure. We supported the NEPA review and permitting processes for the Seattle Multimodal Terminal at Colman Dock project and prepared the EIS for the Energize Eastside project, which would provide 18 miles of high-capacity electric transmission lines from Redmond to Renton. We are also working with Seattle Public

Utilities and King County on the Ship Canal Water Quality Project, which is implementing parts of SPU's long-term control strategy for managing combined sewer overflows.

The nature of our work has not changed dramatically in recent years, but we seem to be doing more work in the built environment these days; a few years ago we were doing loads of natural resources-related work in the Puget Sound nearshore environment for example.

Q: Where do you see room for growth?

A: The transportation sector is strong right now, especially with the passage of Sound Transit 3. There is also going to be quite a bit of work associated with WSDOT's fish barrier removal program. We are involved in a number of floodplain management projects and expect to see quite a bit more of this work as local governments try to address flood risks, habitat restoration and farmland preservation. Our airports group is also very busy with air, noise, stormwater, habitat management and NEPA studies at both regional airports and major hubs.

Q: Will regulatory changes affect your work or your clients following the election of the new president?

A: Yes, the new administration has proffered some fairly significant changes to regulatory programs that are fundamental to our business — the Clean Water Act, the Endangered Species Act and NEPA to name a few. Viewed in a positive light, these changes might reduce regulatory complexity and help streamline the permitting process for important infrastructure projects,



ESA is helping Seattle City Light plan the removal of Mill Pond Dam in northeast Washington. After the dam is removed, the natural stream channel will be restored.

PHOTO BY JIM KEANY/ESA

which would benefit many of our clients. It's not clear though whether such benefits would outweigh the risks to water quality, air quality, species, habitats and other things our employees and clients care deeply about.

Funding cuts to regulatory agencies and key environmental programs such as the National Estuary Program will undoubtedly hurt our business and the administration's reluctance to acknowledge or address climate change is going to hold our industry back instead of pushing us forward to tackle the unprecedented challenges that climate change presents.

Q: ESA just opened an office in Bend. What kind of growth

are you seeing in that region?

A: We are very excited about the new Bend office. We recently completed a master plan for the Riley Ranch Nature Reserve, a new 180-acre regional park on the Deschutes River (under construction now) and we are getting underway on another master plan for the Bend Parks and Recreation Department at Alpenglow Park. Having an office in Bend will enable us to better serve clients in central and southern Oregon; that's our main focus right now in terms of regional expansion.

Q: What are you working on that's interesting or challenging?

A: Well, the Seattle Center Are-

na renovation project certainly falls into this category, especially considering its high profile. We are also working with the PCC Farmland Trust on the Farming in the Floodplains project, which is funded through the Floodplains by Design initiative. Our work involves analyzing the effects of proposed changes to flood and hydrology systems on agricultural viability in the Clear Creek area of the Puyallup River Basin. It is interesting because it requires working collaboratively with agricultural landowners and trying to advance progress toward a collectively agreed upon plan for the Clear Creek area that supports a thriving agricultural community, while also meeting fish and flood interests.

FARALLON

CONTINUED FROM PAGE 14

A: Developers have already acquired most properties with low to moderate environmental contamination. Many of those remaining have significant environmental issues that make them challenging to redevelop. Obtaining financing for those properties is impeded by the need to obtain regulatory closure within a reasonable time frame and within a reasonable budget.

There currently is no viable pathway for regulatory closure of complex contaminated prop-

erties based on risk-based cleanup standards, and the staffing resources at the state Department of Ecology are overwhelmed. It can take years to review and process cleanup documentation, so some developers and lenders are not seeking Ecology's opinion on the sufficiency of cleanups, but are relying on environmental consultants and their counsel to make that determination.

Q: How has technology

changed what you do?

A: Advancements in technology let us organize and evaluate ever-increasing volumes of environmental data more quickly even as environmental regulations become more complex.

Database management systems such as EarthSoft's Environmental Quality Information System can manage and store lab and field data electronically. This system allows us to export environmental data to regulatory databases, and integrate the

data with geographic information systems so we can model the data such as groundwater flow directions and contaminant plumes and view it in 2-D and 3-D. This streamlines evaluation of site conditions and communication of that data to clients and regulatory agencies.

Q: Do you expect your industry to be hurt by federal cutbacks?

A: Environmental consulting firms that target large-scale federal contracts will be stressed by

rollbacks in environmental regulations and severe reductions in federal funding. However, the future growth of most small- to medium-sized environmental consulting firms specializing in private-sector projects or local public-sector work is more tied to Washington state-specific environmental regulations. Although they likely will be affected by a decline in the frenzied pace of redevelopment near-term, they are unlikely to be significantly affected by changes in federal regulations.

LIVING BUILDING

CONTINUED FROM PAGE 10

- Commercial projects are more likely to achieve the Water Petal, while multifamily projects are more likely to achieve the Energy Petal; in both cases they are feasible in over 60 percent of eligible parcels.

- Conditional zoning departures offered by the LBPP can significantly improve the feasibility of more stringent pathways. Departures for higher parcel coverage for solar energy and allowance of solid waste storage for ultra-efficient water systems can increase the feasibility of Water Petal, Energy Petal and Living Building Challenge pathways to over 80 percent of eligible parcels.

Overall, the study finds that the LBPP is very achievable for many sites throughout the city if a developer pursues industry-leading, “best-in-class” water and energy efficiency levels.

The study presents a case for the most stringent pathway option — Living Building Challenge — for over 80 percent of eligible parcels for commercial office and 60 percent of eligible parcels for multifamily; those

generally located in low- and mid-rise zones along major corridors and throughout the city’s urban villages.

Only the densest zones in downtown and adjacent South Lake Union present challenges for LBPP pursuit, while in all other zones the LBPP is found to be feasible under at least one pathway.

Since its release, the study is being used as a reference tool by several local design firms to support their clients’ due diligence process when considering the LBPP. While the incentives are enticing (a 15 percent bonus in floor area ratio and 10- to 20-foot increase in allowable structure height, plus access to additional land use departures), participants are often challenged to weigh the incentive value against the costs of multiple system upgrades and soft costs (particularly if more than one pathway is under consideration).

It is in a project team’s best interest to carefully select a single pathway (energy, water, materials or Living Building Challenge) best suited to the

site before the building owner commits to the program in the entitlement process. To date, the value of the Pilot Pathways research has been to inform or validate these assumptions and give project teams greater confidence in their choice.

Next for Pilot Pathways

Going forward, this study has the potential to be used much more broadly by the city of Seattle to streamline communication between the program administrators and project team applicants.

Land use planners can use the study to quickly back-check new LBPP participant proposals and flag potential risks early in the process. By avoiding costly and politically undesirable misses in performance targets, this could ensure public and developer confidence in the program.

Findings from the study could also help the city focus its support, whether it be guiding project teams through specific aspects of the design review and entitlement process or offering more targeted assis-

tance from the program’s Technical Advisory Group.

Information from the study can also help shape the city’s outreach for LBPP or even evolve the ordinance itself. Using this data, city planners can proactively seek and prioritize applicants within zones that have the highest potential for LBPP or offer opportunities to test the full range of pathways and new building types.

Additionally, the city can use data from the study to inform changes to the pilot that address eligibility barriers or performance limitations that have prevented certain building or tenant types from entering the LBPP. At an even higher level, the city could use the study’s methodology to analyze the impact of future zoning changes to LBPP applicability, to inform the conversation about how future growth planning intersects with the city’s green building development goals or climate action planning.

The city of Seattle established itself as a leader by creating the LBPP, and will continue to lead through its iterative develop-

ment. As other jurisdictions look to this program as an example of progressive building incentive policy worth emulating, it will be all the more critical to ensure that the program succeeds.

Pilot Pathways provides a timely tool to inform the program, giving project teams and administrators better information to drive more effective communication, transparency and ultimately greater impact for the LBPP.

Where will the next Living Building be in Seattle? We may not know, but we now have a better tool to find the answer.

Andrew Lee, a project manager for Architecture 2030, is a green building practitioner with over 15 years of work in research, technical consulting and policy development related to net zero and carbon neutral buildings. Myer Harrell, director of sustainability and a principal at Weber Thompson, is an architect focused on boutique, high-performance commercial offices, including a project in Fremont pursuing the LBPP.

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