



Annual Report Template
Naval Base Kitsap
Municipal Separate Storm Sewer System (MS4)
Permit WAS026646



Reporting Period

- Year 1 Reporting Period: effective date of the permit – January 31, 2022
- Year 2 Reporting Period: February 1, 2022 – January 31, 2023
- Year 3 Reporting Period: February 1, 2023 – January 31, 2024
- Year 4 Reporting Period: February 1, 2024 – January 31, 2025
- Year 5 Reporting Period: February 1, 2025 – January 31, 2026
- Other _____

General Information

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Stormwater Website URL: <https://pacific.navfac.navy.mil/Facilities-Engineering-Commands/NAVFAC-Northwest/About-Us/Environmental-Stewardship/Water-Quality/>

Signature and Certification

Certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: EISELE.RORY.S. [Redacted] Digitally signed by EISELE.RORY.S. Date: 2023.03.30 12:45:38 -07'00' Date: March 30, 2023

Printed Name: Rory Eisele

Signatory Title: Naval Base Kitsap Environmental Planning and Engineering Manager

Section I. Permittee Responsibility (Part 1):

If you answer "NO" to any of these questions, please explain in the Comments section.

Year 1 Annual Report		
1.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Has the Permittee submitted to EPA for consideration any documents, plans, programs or program summaries that the Permittee believes to be equivalent to a required control measure or control measure? <i>If the answer is "YES", use the Comments section to briefly list the one or more documents, plans or programs you have requested be considered as an Equivalent Document, Plan or Program. Cite the relevant Permit provision for each. (Part 1.5)</i>
All Reporting Years		
2.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Do you, the Permittee, share Permit implementation responsibility with one or more Outside Entity for compliance with the Permit? <i>If yes, please explain in the Comments section. (Part 1.4.1)</i>
3.	YES <input type="checkbox"/> NO <input type="checkbox"/>	If yes, is the agreement with Outside Entity(s) formalized in a written and binding agreement between parties? (Part 1.4.1)
4.	YES <input type="checkbox"/> NO <input type="checkbox"/>	If yes, is the agreement with Outside Entity(s) described/cited in the Stormwater Management Program (SWMP) Document? (Part 1.4.1)
5.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you established and maintained relevant enforceable mechanisms, to control pollutant discharges into and from the MS4 and to meet the requirements of this Permit? (Part 1.4.2)
6.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are you maintaining system(s) to track SWMP data and information? (Part 1.4.4)

Permittee Responsibility and Equivalent Documents, Plans or Programs Comments:

5. Please refer to the answer to #18 below for details.

Section II. Stormwater Management Program (SWMP) Control Measures (Part 2)

Please answer all questions.

Education and Outreach on Stormwater Impacts (Part 2.1)

If you answer “NO” to any of these questions, please explain in the Comments section.

7.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you listed and publicized means for the public and Permittee personnel to report spills and other illicit discharges? (Part 2.1.1.1)
8.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you informed target audiences of the environmental impacts associated with illegal discharges and improper disposal of waste and how to report them? (Part 2.1.1.2)
9.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you selected specific education and outreach topics to build general awareness and effect behavior change? <i>Please list these topics in the Comments section.</i> (Part 2.1.1.3)
10.	Narrative	<i>In the Comments section, please summarize your activities and accomplishments as part of the Southern Resident Killer Whale Outreach and Education efforts.</i> (Part 2.1.2)
11.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you conducted public education and outreach behaviors specifically on bacterial pollution problems? (Part 2.1.3)
12.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you assessed, or participated in efforts to assess, the understanding and adoption of intended behaviors by the target audiences for at least one of the topics? <i>In the Comments section, please summarize your efforts to assess the education and outreach activities conducted during the reporting period, and how this information is being utilized to improve the public education and outreach program efforts.</i> (Part 2.1.4) <i>Please also include one or more example of successful education/outreach.</i> (Part 2.1.4)

Education and Outreach Comments:

7. Infographics have been prepared and have been distributed periodically across the installation in the form of posters, flyers, and magnets (Attachment 1). A new spill reporting mailbox has been established to enhance reporting of non-emergency illicit discharges.

8. Information regarding the effects of illicit discharges and the improper disposal of waste has been added to the Environmental Awareness Training plan for all personnel. Personnel tasked with direct maintenance of the storm water system received training to identify illicit discharges on 30 November 2021. Base housing management personnel and residents of base housing received virtual training (due to Navy COVID restrictions), on 13 January 2022 and 26 January 2022. A spill awareness and reporting display was sponsored by the Navy Exchange in February 2022. Spill awareness and reporting posters were placed in high-traffic public and industrial areas throughout the year. Also see #9 below.

9. Education and outreach on appropriate spill prevention practices conducted during the first year of the permit was extended into the second year. During the first year, an agreement with the grounds maintenance contractor to provide video training (due to Navy COVID restrictions) to workers on best management practices for avoiding illicit discharges was reached on 4 October 2021. The grounds maintenance contractor reported 17 workers were trained. Training was also provided to base housing management and base housing residents, as part of the training described in #8 above. Educational refrigerator magnets, instructing and reminding unaccompanied housing residents that vehicle maintenance in installation parking lots was not

permitted, were also distributed to minimize vehicle fluids from leaking or spilling (Attachment 2).

The Environmental Awareness Training plan for Naval Base Kitsap was updated during the first year to include best management practices to prevent spills and illicit discharges. This training was again updated during the second year based on successful feedback from stakeholders,

Due to the easing of COVID restrictions on in-person training, the Installation Environmental Office was able to reestablish in-person Environmental Training outreach efforts for installation personnel. During the second year of the permit, the installation was able to train 350 personnel in-person regarding best management and reporting practices to prevent and minimize the impact of spills and illicit discharges, and an additional 400 personnel through NBK's online Environmental training platform.

Additionally, during the second year of the permit Naval Base Kitsap completed a significant update of our Oil and Hazardous Substance, Spill Response training program for Persons-In-Charge of transfers of petroleum products. Through collaboration with on-base stakeholders and tenants to identify areas for training improvement, the updated training program was established and provided to over 200 facility personnel involved in petroleum transfers at Naval Base Kitsap.

For the second year of the permit, educational outreach on proper pet waste management was added as a second topic of emphasis. Outreach methods included informational pamphlets distributed to housing residents (Attachment 3), educational signage on pet waste environmental impact posted on pet waste stations (Attachment 4) and face to face engagement. Additional pet waste stations and signage for recreational areas have been procured and are awaiting installation to further enhance awareness and compliance with proper pet waste management. During the second year of the permit, the Installation Environmental Office replaced 1000 pet waste bags at the three stations being directly managed.

The Installation Environmental office engaged the public face to face at the following events on (1) the environmental impacts associated with illegal discharges, spills, and improper disposal of waste and how to report them, and (2) pet waste management for bacterial control of pollutants during 2022:

- Monthly Environmental Awareness Training for industrial workers
- Annual recreational fishing derby at Trident Lakes, June 11, about 450 attendees
- Spoil Your Dog Day, August 10
- Ready Navy Block Party, September 29, about 2500 attendees

Examples of educational materials distributed are Attachment 5 to this report.

10. Naval Facilities Engineering Systems Command Northwest (NAVFAC NW) worked with National Marine Fisheries Service (NMFS) to develop and deliver a training program regarding stormwater threats to Southern Resident Killer Whales for target audiences. Discussions with NMFS started in July 2020 and notes were provided to NMFS detailing the permit requirements. After months of coordination with NMFS, training for Navy MS4 and natural resources program personnel in the Northwest Region was accomplished on 26 January 2022 through a virtual platform. The training covered SRKW monitoring and mitigation strategies, their status under the Endangered Species Act, habitat, prey, chemical threats such as PCP, PCB, DDT, PBDEs,

persistent organic pollutants, bioaccumulation of chemicals, and the decline of chinook and Coho salmon due to poor stormwater quality. Information from the training will continue to be used to enhance public education efforts. In 2020, prior to the MS4 permit being issued to NBK, four personnel within the region attended orca-specific training at Sound Waters University. Information on the effects of pollution on killer whales was provided at the events listed in #9 above. The effect of pollution on killer whales was included in educational materials (attachment 5) distributed at the events listed in #9 above and general awareness of the effects of stormwater pollution on orcas was incorporated into installation Environmental Awareness Training.

11. Pet waste was selected as an educational and outreach topic to build general awareness and effect behavior change. Please see the details in #9 and #10 above. Hunt Military Communities, the Navy's Public Private Venture housing service provider, engaged with base housing residents on pet waste management throughout the year. The Installation Environmental Office conducted surveys of base housing to evaluate resident and housing management compliance with pet waste management policy. Survey feedback was provided to Hunt Military Communities for their action. Surveys of base recreational areas were also conducted, with no problem areas identified, and overall less than one pile per acre observed.

12. Education regarding proper spill reporting on base to prevent stormwater pollution has resulted in an increase in the number of reported spill notifications and cleanup responses relative to pre-permit baseline information (2019-2020). Therefore, a behavioral change has occurred. OHS Spill data collection, used by the Oil and Hazardous Substance program were expanded in 2021 to record additional information to improve program metrics to help improve prevention and response efforts. NBK will continue to measure and document the understanding and adoption of spill prevention practices during the second and follow-on years of the permit. Surveys of public areas for pet waste are ongoing to assess behavioral change.

Public Involvement/Participation (Part 2.2)

If you answer “NO” to any of these questions, please explain in the Comments section.

13.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Have you complied with applicable federal notice requirements, as relevant? (Part 2.2.1)
14.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you conducted one or more meetings to coordinate among appropriate staff, managers and others who play a role in Permit implementation? <i>Briefly describe meeting(s), participants and topics in the Comments section.</i> (Part 2.2.2)
15.	Narrative	<i>In the Comments section, please describe any engagement with affected entities in setting priorities for the storm water program.</i> (Part 2.2.2)
16.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you sponsored at least twice during the Permit term volunteer activities designed to actively engage residents and/or employees to better understand stormwater pollution? <i>Please describe these events and activities in the Comments section.</i> (Part 2.2.4)

Public Involvement/Participation Comments:

14. Following permit issuance, relevant Navy stakeholders met in order to introduce permit requirements and to coordinate implementation actions. Stakeholders included environmental compliance staff, base housing management, public works, and utilities. During the Navy's annual Construction Day on 12 April, Environmental personnel conducted training with NAVFAC NW Construction & Design Division, and Naval Base Kitsap (NBK) Facilities Engineering & Acquisition Division. These personnel responsible for the management, design, and construction of facility projects on base were educated on the requirements of the permit. Engagement with those groups, as well as the groups managing facility planning and maintenance continued during the development of the SWMP. Beginning 28 October 2021, additional meetings were held regarding improvement of future Navy stormwater management corporate business practices and funding roles and responsibilities.

Coordination with the contractors tasked with maintenance of stormwater structures at NBK has been ongoing, in order to ensure implementation of the maintenance standards and reporting requirements of the permit.

The NBK commanding officer was briefed on the installation stormwater program 25 January 2022, and delivered talking points to commanding officers of tenant commands 23 February 2022. Public Works Department leadership were briefed on the stormwater program, first year MS4 report, and the SWMP in March 2022, followed by briefs to the installation leadership.

Monthly meetings between the Integrated Solid Waste Program and the Installation Environmental Office to address environmental issues, including the elimination of illicit discharges, have been held since 17 February 2022. See #32 for details.

NBK coordinates with the West Sound Stormwater Outreach Group for the development of education and public involvement initiatives. NBK's storm drain art contest, co-sponsored by Hunt Military Communities, was lauded by the group for eliminating substantial organization and preparation time and cost associated with their past efforts to do public stormwater art, while at the same time increasing public involvement by asking the base residents to create their own art

using sidewalk chalk. Samples of the art created are in attachment 6.

Monthly stormwater meetings are held with key stormwater management personnel at Naval Station Everett, Naval Air Station Whidbey Island, and Naval Base Kitsap. Consistent monthly meetings were started in February 2020, and have continued since. These monthly meetings are used to discuss any topic related to stormwater, and to share best practices and lessons learned regarding stormwater management and implementation of the MS4 permit, MSGP, and CGP. The meetings provide a collaborative approach to stormwater management in the NW Region. Below is a summary of meetings held during the second year of the MS4 permit:

Year	Month	Short summary of meeting topics
2022	February	SWMPs, annual reports, EAP, SRKW training
	March	Education, IDDE, pet waste materials, EAP sampling
	April	IDDE, educational materials, SWMPs, annual reports
	May	BMPs, SRKW, construction training, education and outreach materials, future funding discussions
	June	Funding discussions, BMPs
	July	6PPD, contract language, sampling, mapping, IDDE, outreach, training
	August	No meeting held due to scheduling conflicts
	September	Meeting not held, combined with October meeting instead
	October	Outreach events, SWMPs, stormwater inventory, contracting specifications
	November	SWMP reviews, annual reports, sampling, mapping, BMP evaluation
	December	New technology, funding update, annual reports, maintenance, MSGP annual report
2023	January	BMPs, sampling, budget, education and outreach materials

The Installation Environmental Office has also engaged with Joint Base Lewis-McChord to share information and ideas for developing a robust MS4 program.

15. NBK actively engages with the Native American tribes regarding environmental issues and to ensure that tribal treaty rights are maintained within the Puget Sound and Hood Canal. In order to protect water quality, NBK routinely monitors stormwater and conducts dry weather surveys to detect illicit discharges. Implementation of additional education, additional construction runoff controls, and additional maintenance requirements as part of the MS4 permit, should further protect and enhance local water quality. During 2022, NBK executed two construction projects to repair and modernize portions of the sanitary sewer system at NBK Bangor and the Jackson Park Housing complex. These projects represent major investments on the Navy’s part to minimize overflow and leaks from the sanitary sewer system and improve local water quality. NBK’s participation in the Stormwater Action Monitoring Program provides coordination with other entities and allows NBK resources to be applied to the highest priorities across the region.

16. NBK stormwater program managers are engaged with NBK Public Affairs, the installation volunteer coordinator and Morale Welfare and Recreation event planners to develop ongoing volunteer activities to educate residents and improve water quality. Group volunteer activities were limited to an extent during 2021 and 2022 due to COVID safety restrictions. Despite these restrictions, NBK personnel provided over 200 work-hours of volunteer labor at community base clean-up events in 2021. In 2022 stormwater education was added to some of these ongoing events, regarding how the cleanup of trash and debris helps to lessen stormwater pollution and

improve water quality. The first of these was an Earth day cleanup at Trident Lakes by 14 Seabees from Construction Battalion Maintenance Unit 303. The Seabees were also engaged 20 September 2022 to replace nets containing oyster shells in stormwater catch basins, which have successfully reduced levels of copper and zinc in stormwater discharges. The Naval Undersea Warfare Center collaborated with the Installation Environmental Office and the Integrated Solid Waste Program to execute a beach cleanup at Keyport 25 August 2022, coupled with stormwater education.

Illicit Discharge Detection and Elimination (Part 2.3)

If you answer "NO" to any of these questions, please explain in the Comments section.

17.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Have you developed updated maps of the MS4 within the Permit Area that include all of the features listed in Part 2.3.1 of the Permit? <i>For Annual Reporting Years 1 through 4, you may check NA if these maps have not yet been completed. (Part 2.3.1)</i>
18.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Do you effectively prohibit non-storm water discharges into the MS4 (except those authorized in Part 1.3.4 of this Permit) through effectively robust policies and procedures? <i>For Annual Reporting Years 1 and 2, you may check NA if you have not yet implemented effective policies and procedures. (Part 2.3.2)</i>
19.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	For any discharges of potable water, have you dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4? (Part 2.3.2.2.1)
20.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Have discharges from lawn watering and other irrigation runoff been minimized through public education and water conservation efforts? (Part 2.3.2.2.2)
21.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	For any discharges of swimming pool, spa and hot tub waters, have you dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted and re-oxygenized if necessary, volumetrically and velocity controlled to prevent resuspension of sediments in the MS4, thermally controlled to prevent an increase in temperature of the receiving waters, and prohibited the discharge of pool cleaning wastewater and filter backwash? (Part 2.3.2.2.3)
22.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Have discharges from street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents been minimized through public education and water conservation efforts? (Part 2.3.2.2.4)
23.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	For any discharges of accumulated stormwater from utility vaults, have you conducted sampling to verify that no pollutants cause or contribute to water quality impairments, AND visually verified prior to any discharge, that there are no visible sheens or solids in the discharge? (Part 2.3.2.2.5)
24.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	For any discharges of accumulated stormwater from secondary containment structures, have you conducted sampling to verify that no pollutants cause or contribute to water quality impairments, AND visually verified prior to any discharge, that there are no visible sheens or solids in the discharge?? (Part 2.3.2.2.6)
25.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are you implementing a targeted IDDE program at Naval Base Kitsap-Keyport and Naval Base Kitsap-Bangor for fecal coliform source identification in sub-basins draining to Liberty Bay and Clear Creek, respectively? (Part 2.3.3)
26.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Does the program described in the SWMP document include procedures for locating priority areas likely to have illicit discharges, including areas where complaints have been recorded and areas with storage of large quantities of materials that could result in spills and areas where storage, usage, releases or contamination of any pollutant in Table 2.4.4 is or has occurred? (Part 2.3.4.1)

27.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Do you conduct a dry weather analytical and field screening monitoring program to identify non-stormwater flows from stormwater outfalls? <i>For Annual Reporting Years 1 and 2, you may check NA if you have not yet begun dry weather field screenings. (Part 2.3.4.2.1)</i>
28.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	For Annual Reporting Year 5 only, have you completed field screening of at least 75% of all MS4 outfalls located within the Permit Area? <i>For Annual Reporting Years 1 through, you may check NA unless you have completed screening of 75% of the MS4 outfalls in the Permit Area. (Part 2.3.4.2.2)</i>
29.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are your screening methods/protocols consistent with <i>Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments</i> , Center for Watershed Protection, October 2004, or another methodology of comparable effectiveness? (Part 2.3.4.2.3)
30.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do you have and implement procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges which are found by or reported to the Permittee? (Part 2.3.4.3)
31.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do these procedures include the evaluation of whether the discharge must be immediately contained and the steps to be taken for containment of the discharge per the stipulations in Part 2.3.4.3? (Part 2.3.4.3)
32.	Narrative	<i>In the Comments section, please summarize all illicit discharge responses, including responses to spills and recurring discharges. Also summarize any investigations and referrals as detailed in Part 2.3.4.3.2. (Parts 2.3.4.3.1, 2.3.4.3.2 and 2.3.4.3.3)</i>
33.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do you have and implement procedures for notification of affected parties, including immediate notification of the spills and illicit discharges and ongoing updates about abatement measures and possible impacts? (Part 2.3.4.4)
34.	Narrative	<i>In the Comments section, please summarize all notifications to downstream operators of MS4s, shellfish beds/fisheries, agricultural/livestock operations, drinking water systems (public or private) or other affected entity of spills or other non-stormwater discharges that may impact those systems. (Part 2.3.4.4.1) Please include in the description all outreach, discussions and/or information exchanges regarding the impacts of discharges and the status of illicit discharge elimination activities. (Part 2.3.4.4.2)</i>
35.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do you have and implement procedures for tracing sources of illicit discharges, including visual inspections, opening manholes, using mobile cameras, collecting and analyzing water samples, and other procedures, as appropriate? (Part 2.3.4.5)
36.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do you have procedures for eliminating illicit discharges, including scheduling and implementing remedial measures and other safeguards to ensure the discharge does not recur? (Part 2.3.4.6)
37.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do these procedures include initiation of an investigation within 21 days of a report or discovery of an illicit connection to determine the source, nature and volume, and responsible party? (Part 2.3.4.6.1)
38.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do these procedures include initiation of action to eliminate the illicit connection within 45 days of confirming the connection? (Part 2.3.4.6.1)

39.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have all staff responsible for investigating, identifying and eliminating illicit discharges, spills, and illicit connections into the MS4 received program-specific training? (Part 2.3.5)
40.	Narrative	<i>In the Comments section, please describe any training provided during this reporting period, including new employee training and follow-up training. (Part 2.3.5)</i>
41.	Narrative	<i>In the Comments section, please include a general summary of the results of dry weather screening program activities conducted over the preceding reporting period, including number and type of illicit connections identified, dry weather screening efforts, and location and efforts to correct identified illicit discharges. (Part 2.3.6)</i>

Illicit Discharge Detection and Elimination Comments:

17. NAVFAC NW awarded an 18-month contract in 2021 to update stormwater maps for all Navy installations across the NW region. Map data was provided by the contractor to NAVFAC NW for review on 27 February 2023.

18. NBK Instruction 5090.4C, Water Pollution Prevention Program, was published 13 July 2022 to revise policy and responsibilities for clean water and incorporated requirements included in the MS4 permit. This instruction prohibits non-stormwater discharges to the MS4 and formally adopts the SWMP for detailed procedures and responsibilities to comply with MS4 permit requirements. The SWMP was submitted to EPA simultaneously with the first year report on 31 March 2022.

20. Most of the existing irrigation systems at NBK have been turned off and these areas have been xeriscaped. Water consumption for NBK is well ahead of a goal of 36% reduction in water intensity (usage per square foot of buildings) from fiscal year 2007 to fiscal year 2025 (Attachment 7). Housing residents are provided information on water conservation when they move in. Environmental personnel provided training to housing residents on avoiding illicit discharges associated with lawn watering as part of the training described in #8 above.

22. An agreement with the grounds maintenance contractor to provide video training to workers on best management practices to avoid illicit discharges was reached on 4 October 2021. The contractor reported 17 workers were trained and no new workers requiring training have been hired since that date. Training was also provided to housing management and housing residents, as part of the training detailed in #8 above.

23. A comprehensive procedure for draining vaults is included in the SWMP and has been implemented. Current practice is for personnel to not discharge utility vaults directly to storm drains, but to infiltrate clean and clear accumulated stormwater to a vegetated area. If accumulated stormwater is not clean and clear, personnel are trained to contact Environmental for evaluation and appropriate disposal guidance.

24. A comprehensive procedure for draining secondary containment is included in the SWMP and has been implemented. Current practice is for personnel to not discharge secondary containment directly to storm drains, but to infiltrate clean and clear accumulated stormwater to a vegetated area. If accumulated stormwater is not clean and clear, personnel are trained to contact the Installation Environmental Office for evaluation and appropriate disposal guidance.

25. See attached Dry Weather Survey Summary (Attachment 8).

27. See attached Dry Weather Survey Summary (Attachment 8) and Dry Weather Analytical Summary (Attachment 9).

29-31. Please reference SWMP for methods, procedures and protocols.

32. On 25 August 2021, the Installation Environmental Office was informed of an ongoing potable water discharge from an air conditioning chiller discharging into the storm sewer. Environmental contacted Facilities Management and notified them of the MS4 permit requirement to initiate action within 45 days to eliminate the illicit connection. Action was formally initiated at the 16 September 2021 Work Induction Board where it was determined that this work was beyond in-house capabilities, so the repair would need to be contracted out. The contract was awarded 9 November 2021 and completed 25 March 2022.

A section of sanitary sewer piping downstream of the Industrial Waste Treatment Plant and Waterfront Security Forces Facility was the cause of sewage overflows on 22 May 2021 (to ground not to storm drains) and 21 September 2021. The overflow on 21 September 2021 reached the storm drain and resulted in a reportable sanitary sewer release in accordance with State Waste Discharge Permit (SWDP) ST-7363. It was determined that there is a discontinuity in this gravity flow line, which causes debris to catch and cause pipe blockages, resulting in overflows from the upstream manholes. As a temporary measure, the section of sewer line was cleaned monthly by water jet to remove obstructions and minimize the likelihood of additional overflows. Two projects were awarded 31 August 2021 to address portions of the degraded sanitary sewer infrastructure at NBK Bangor, Jackson Park Housing and Bremerton Naval Hospital. The projects scoped, inspected and cleaned all affected portions (pipes, manholes, and other components) and then repaired, lined or replaced those sections currently identified in the scope. The projects resulted in a more reliable and properly functioning sanitary sewer conveyance system, minimized deficiencies and failures and decreased the risk and frequency of sanitary sewer overflows and unintentional releases. The contractor broke ground on the NBK-Bangor project 31 January 2022 and the problematic piping described above was initially patched on 6 June 2022 and fully repaired by 3 August 2022.

On 6 June 2022, the contractor replacing sewer lines at Bangor damaged a pipe that services the Delta Pier Dry Dock floor drains which resulted in a reportable industrial wastewater release in accordance with State Waste Discharge Permit (SWDP) ST-7363. Discharges were secured, repairs to the pipe were made immediately, and the following day normal operations resumed. Ecology, WA State shellfish program, Brownsville POTW, Kitsap County Public Health & NRC were notified.

For incidental spills that tenants can cleanup with on-hand spill response supplies that do not enter surface waters or risk entry into the MS4, the spills are responded to, cleaned up, and notification is made to the Installation Environmental Office. For spills that tenants cannot cleanup themselves due to size/supplies/personnel/risk/etc the NBK Federal Fire Department (FFD) is notified to respond, once the FFD completes their initial assessment and ensures the scene is safe, notification is made to NBK's OHS Response cleanup crews for additional response and cleanup. Please see Appendix 10 for additional information. The processes for characterizing the nature of, and potential public or environmental threat posed by illicit discharges is included in the SWMM Plan.

33. Procedures for notification of spills and discharges of potentially environmentally hazardous substances are outlined in the NBK Oil Spill Prevention, Control, and Countermeasure (SPCC) Plan, the Navy Region Northwest Oil and Hazardous Substance Integrated Contingency Plan, and NBK Wastewater Release Response and Reporting Procedures.

34. Reportable spill notifications and any updates are made through the installation Oil and Hazardous Substance (OHS) spill program and OHS Program Manager. The spill notifications and updates are made depending upon the location and substance released as specified in the Navy Region Northwest Oil and Hazardous Substances Integrated Contingency Plan. Depending upon the type and nature of the release, notifications are made to appropriate agencies, which may include the National Response Center, Washington State Department of Ecology, Kitsap County Department of Emergency Management, Washington State Health Department, Kitsap County Department of Health, Puget Sound Clean Air Agency, Region 10 EPA office, Center for Disease Control, Department of Health and Human Services, US Coast Guard National Command Center and District 13, Northwest treaty tribes, and Washington State Emergency Management. See Attachment 10 for the list of reportable spills that required notification.

35-38. Reference SWMP for procedures.

39-40. Prior to MS4 permit issuance, NBK stormwater quality program managers received Certified Stormwater Inspector training, which includes illicit discharge, detection and elimination (IDDE) training. Key NBK personnel who received awareness training to detect and report illicit discharges includes grounds maintenance personnel (ongoing since 4 October 2021), stormwater maintenance personnel (30 November 2021), and housing management and maintenance personnel (13 January 2022). Training regarding illicit discharge detection and reporting procedures was included in the 25 January 2022 NBK town hall meeting for base residents. Illicit discharge detection and reporting training has also been added to the Environmental Awareness training for all personnel.

41. See attached Dry Weather Survey Summary 2022 (Attachment 8).

New Development, Redevelopment, and Construction Site Runoff Control (Part 2.4)

If you answer “NO” to any of these questions, please explain in the Comments section.

42.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Does the SWMP document describe, and are you implementing, a program to reduce pollutants in stormwater runoff to the MS4 from all construction, new development and redevelopment project site activities in the Permit Area, including roads? (Part 2.4)
43.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	During this reporting year have you provided adequate oversight to “regulated construction activities” and “regulated industrial activities” to ensure that all regulated activities obtained coverage under the appropriate stormwater permits? <i>Only choose NA if there were none of these activities in the Permit Area during this reporting year.</i> (Part 2.4.1)
44.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you implemented an enforceable mechanism to address runoff from new development, redevelopment and construction site projects to include the minimum requirements, thresholds and definitions? (Part 2.4.2.1)
45.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Does the enforceable mechanism include all of the criteria listed in Part 2.4.2.2 of the Permit? (Part 2.4.2.2)
46.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Have you had any equivalent criteria approved by EPA for use in stormwater controls from new development, redevelopment, and construction site runoff? <i>If so, in the Comments section please describe how these have been utilized during this reporting year.</i> (Part 2.4.2.4)
47.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you implemented policies and procedures, including contract mechanisms, to ensure review of all stormwater site plans for proposed development activities? (Part 2.4.3.1)
48.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Do you inspect, prior to clearing and construction, all development sites that have a high potential for sediment transport as determined through plan reviews based on definitions and requirements of Appendix C of the Permit? <i>Only choose NA if there were none of these activities in the Permit Area during this reporting year.</i> (Part 2.4.3.2)
49.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Do you inspect all development sites during construction to verify proper installation and maintenance of required erosion and sediment controls? <i>Only choose NA if there were none of these activities in the Permit Area during this reporting year.</i> (Part 2.4.3.3)
50.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	During this reporting year, did you take the necessary enforcement actions, as relevant, based on the results of these inspections? <i>If yes, please describe in the Comments section. Only choose NA if there were no construction activities in the Permit Area or you did not identify any failures to properly install or maintain the required controls.</i> (Part 2.4.3.3)
51.	Narrative	<i>In the Comments section please document what percentage of all permanent stormwater treatment and flow control BMPs/facilities and catch basins in new developments were inspected every six months prior to 90% of the common plan of development being constructed during this reporting year?</i> (Part 2.4.3.4)
52.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>	Do you inspect all development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater facilities? <i>Only choose NA if there were none of these activities in the Permit Area during</i>

		<i>this reporting year. (Part 2.4.3.5)</i>
53.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are all maintenance requirements assigned/entered into the electronic tracking system for stormwater treatment and flow control BMPs/facilities? (Part 2.4.3.5)
54.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Do you keep adequate records to document that all the requirements of Part 2.4.3 of the Permit have been fully implemented? (Part 2.4.3.6)
55.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Were at least 80% of scheduled inspections completed during this reporting year? (Part 2.4.3.6)
56.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you established and implemented an internal tracking system to respond to issues of non-compliance? (Part 2.4.3.7)
57.	Narrative	<i>Annual Reporting Year 1: In the Comments section, please describe the Early Action Projects (EAPs) you plan to implement during this permit term. Please also provide a summary of all EAP planning and implementation actions taken to date. (Part 2.4.4)</i>
58.	Narrative	<i>Annual Reporting Year 2-5: In the Comments section, please provide any updates to your Early Action Projects (EAPs) plan. Please also provide a summary of all EAP planning and implementation actions taken in this reporting year. (Part 2.4.4)</i>
59.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	<i>Annual Reporting Year 4: Have you submitted a written Stormwater Infrastructure Investment Plan to EPA that documents future investments and upgrades in Naval Base Kitsap's stormwater infrastructure designed to improve MS4 discharge quality, AND that meets all of the requirements of Part 2.4.4? (Part 2.4.4)</i>
60.	Narrative	<i>In the Comments section, please describe any training provided during this reporting period, including new employee training and follow-up training. (Part 2.4.5)</i>
61.	Narrative	<i>In the Comments section, please include a general summary any corrective actions taken at construction sites, number of site plans reviewed, site inspections, and one or more example of follow-up actions. (Part 2.4.6)</i>

New Development, Redevelopment, and Construction Site Runoff Control Comments:

44. Please refer to #18 above for details.

47. Please refer to #18 above for details.

48-49. See attached Inspection Tracker (Attachment 11). See #61 below.

50. All concerns identified during construction inspections are referred to the government project manager to address corrective actions with the contractor.

51-52. Due to the limited size of construction projects, it is practical and standard practice to review all permanent stormwater treatment and flow control BMPs/facilities and catch basins in new developments during recurring inspections.

53. As addressed in #18 above, procedures and responsibilities have been assigned for all MS4 requirements. Verification that maintenance requirements for stormwater structures in new construction are being tracked is still pending. The recent completion of the Uplands Parking Lot in Jan 2023 provides the first opportunity to add newly constructed stormwater structures to

the inventory and maintenance tracking system. An inventory of existing structures began in the previous year with the stormwater mapping contract (ref. #17 above) is ongoing.

54-55. See attached Inspection Tracker (Attachment 11).

58. Please see attached Early Action Projects Plan (Attachment 12), and MS4 Early Action Projects Sampling Results (Attachment 13).

60. In March 2021, NAVFAC NW conducted training with facility project planners, designers, and construction managers during a regional "Construction Day". Approximately 25 personnel attended the training in person, and an additional 50 personnel were provided the presentation for review after the training day was completed. The training topics presented included stormwater awareness, introduction to the MS4 permit, the SWMP, MS4 permit requirements, the Stormwater Management Manual for Western Washington, refresher information about the Construction General Permit, and construction BMPs. NAVFAC NW also trained PWD construction managers and lead engineering technicians on CGP and MS4 construction permitting requirements on 28 April 2022.

Installation stormwater quality program managers achieved Certified Erosion and Sediment Control Lead status 21 April 2022 and provided on-the-job training to PWD construction managers and engineering technicians during construction site inspections. PWD engineering technicians, who provide on-site surveillance of construction projects, were trained by the program managers on the SWPPP elements 23-24 August 2022.

61. During the second year of the MS4 permit, stormwater managers reviewed 18 site plans, 48 minor projects, and conducted 10 formal site inspections. Coordination with NBK project managers and contractor site managers occurred before and during initial inspections. Project construction sites were also reviewed during required quarterly MSGP site inspections.

Corrective actions identified during inspections were minor and included uncovered soil piles, cleanup of small amounts of spilled concrete washout and sawdust, and installing catch basin filters. All follow-ups were questions regarding design specifics, of which no concerns were identified.

Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance (Part 2.5)

If you answer "NO" to any of these questions, please explain in the Comments section.

62.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Have you established maintenance standards that are protective of facility function for all permanent stormwater facilities used for onsite management, flow control and treatment? (Part 2.5.1.1)
63.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Were all required maintenance activities, as relevant, undertaken per the schedules in Part 2.5.1.2? (Part 2.5.1.2)
64.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Does your operation and maintenance program include an enforceable mechanism that clearly identifies the party/parties responsible for maintenance? (Part 2.5.1.3)
65.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	During this reporting year have you conducted inspections of all stormwater treatment and flow control BMPS/facilities that discharge to the MS4 at least annually or per an alternative schedule as established in the SWMP based on maintenance records or other documented information? (Part 2.5.2)
66.	Narrative	<i>In the Comments section, please specify the number of inspections of permanent stormwater facilities conducted pursuant to Parts 2.5.2. Please also indicate what percentage of the overall number of permanent stormwater facilities these numbers represent. (Part 2.5.2)</i>
67.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	During this reporting year, have you conducted spot checks of all permanent stormwater facilities, per the requirements of Part 2.5.3 after all major storm events? (Part 2.5.3)
68.	Narrative	<i>In the Comments section, please specify the number of catch basins and inlets that were inspected during this reporting year. Please also indicate what percentage of the overall number of catch basins and inlets, this represents. (Part 2.5.4)</i>
69.	Narrative	<i>In the Comments section, please specify the number of catch basins cleaned during this reporting year. (Part 2.5.4)</i>
70.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	During this reporting year, did you undertake and complete all the necessary maintenance, as required by Part 2.5.6 of the Permit, and as described in the SWMP document? (Part 2.5.6) <i>Please briefly describe in the Comments section.</i>
71.	Narrative	<i>In the Comments section, please briefly describe the animal waste management activities at Naval Base Kitsap-Keyport and Naval Base Kitsap-Bangor, during this reporting year. (Part 2.5.7)</i>
72.	Narrative	<i>In the Comments section, please describe any training provided during this reporting period, including new employee training and follow-up training. (Part 2.5.8)</i>
73.	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Have you developed and implemented SWPPPs for all heavy equipment maintenance and storage yards and all material storage facilities within the MS4 area that are not already regulated under the MSGP? <i>Only choose NA if there were none of these facilities in the Permit Area OR if this is the Annual Report for Year 1. (Part 2.5.9)</i>
74.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	During this reporting year, have you kept records of all inspections, findings of inspections, follow up actions to correct problems, and all maintenance? (Part 2.5.10)

Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance Comments:

62. Maintenance standards developed and adopted under the first year of the MS4 permit were provided to the contractor, along with employee training, on 29 November 2021.

63. Improvements in stormwater maintenance are being addressed on several levels. A project is currently in progress to identify and map all stormwater facilities at Navy facilities within the Northwest Region. To date, the stormwater infrastructure audit has identified 17 flow control devices, 15 oil/water separators, 29 bioswales, 4 filter strips, 13 stormwater vaults, 27 detention/retention ponds, 47 pump stations, 21 Filterra® bioretention systems, and 28 media filter cartridge vaults for recurring inspection and maintenance. Once complete, inventory information will be updated in the real property database to provide adequate funding for all maintenance activities. Similarly, stormwater structures and required activities are already being added to the maintenance database for tracking. Once all structures have been identified, maintenance can then be accurately tracked for completion as required. NBK continues to work with its maintenance contractors to implement the maintenance standards developed and adopted under the first year of the MS4 permit to ensure complete and thorough maintenance. The contractors' maintenance programs have been assessed, and gaps within the programs have been identified and brought to contract management for resolution. Expectations for improvement in contractor maintenance execution and reporting have been established and are expected to continue in 2023.

64. See #18 above for details.

65-66. See #63 above for details.

67. No major storm event as defined in part 2.5.3 occurred during the second permit year.

68-69. NBK has an estimated 3252 stormwater catch basins located at properties covered under the permit, of which 747 (23%) were inspected in the second half of 2021. For 2022, stormwater catch basin maintenance was tracked by the contractor in groups. The number of catch basins in each group was not identified, so the number of catch basins inspected and cleaned cannot be determined. Discussion regarding maintenance tracking with the contractor is ongoing.

70. Maintenance required by part 2.5.6 was conducted by contractor. QC of the maintenance reported by the contractor identified discrepancies with performance standards and established requirements for execution. Contractor performance is currently under management review. Improvements were made by the contractor in street sweeping completion. In particular, most major parking lots received a one-time cleaning. See also #63 above for details on stormwater maintenance improvement efforts.

71. A survey of pet waste management needs at recreation areas and housing common areas was performed. NBK housing areas have 26 pet waste stations for use by residents located at properties covered under the permit. This includes two new stations installed at Keyport in October 2021. During the first permit year, approximately 14,400 bags were distributed to these stations. Six additional stations were procured, to be placed in recreational areas, which are expected to be installed in 2023.

Please refer to answers provided to #40, #60 and #62 above for complete training information

for personnel regarding pet waste management.

74. See answer to #63 above.

Section III. Monitoring, Recordkeeping and Reporting Requirements (Part 3)

If you answer “NO” to any of these questions, please explain in the Comments section.

75.	Narrative	<i>In the Comments section, please provide an evaluation of your compliance with the Permit conditions and progress towards achieving the control measures, during this reporting year. (Part 3.1)</i>
76.	<input type="checkbox"/> Option 1 <input checked="" type="checkbox"/> Option 2	For Annual Reporting Year 1: Did you select monitoring Option 1 (Monitoring/Assessment Plan) or monitoring Option 2 (participation in the Stormwater Action Monitoring Program)? <i>For all reporting years: If you selected Option 1, please answer questions 77, 78 and 79. If you selected Option 2, please answer question 80.</i>
77.		<i>In the Comments section, please summarize the results of all monitoring and evaluation undertaken during this reporting year. Discuss results of all types of assessments per the monitoring plan approved by EPA pursuant to Parts 3.3.1 through 3.3.10 of the Permit. Provide your interpretation of these data and how you are using them to inform your stormwater management program. (Part 3.3)</i>
78.	YES <input type="checkbox"/> NO <input type="checkbox"/>	During this reporting year, was all sample collection, preservation and analysis conducted according to test procedures approved under 40 CFR Part 136, or another method approved by EPA? (Part 3.3.4)
79.	YES <input type="checkbox"/> NO <input type="checkbox"/>	During this reporting year, have you complied with all elements of your Quality Assurance Program Plan (QAPP) developed pursuant to the requirements of part 3.3.9 of the Permit? (Part 3.3.9)
80.	Narrative	<i>In the Comments section, please summarize your activities as a participant with the Stormwater Action Monitoring Program.</i>
81.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are you complying with the record-keeping requirements of Part 3.6 of the Permit? (Part 3.6)
82.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	During this reporting year have you ensured that an updated SWMP and all SWMP records are available to the public? (Part 3.7.2.2) <i>In the Comments section please discuss what records are available on your website, any requests you have received for records and your responses.</i>
83.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	During this reporting year, have any boundary changes to your facilities resulted in either an increase or a decrease in the Permit Area? <i>If yes, please describe in the Comments section. (Part 3.7.2.2.4)</i>
84.	Narrative	<i>In the Comments section please provide an annotated list of any attachments to this Annual Report. (Part 3.7.2.2.1)</i>
85.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Are all monitoring data collected during this reporting year, as applicable, attached to this Annual Report? (Part 3.7.3)

Monitoring, Recordkeeping and Reporting Comments:

75. Minimum Control Measure (MCM) #1 – Education and Outreach

NBK is fully compliant with education and outreach requirements in the MS4 permit. Implementation efforts and accomplishments during the second permit year include:

- Initiated pet waste management as a second educational focus
 - o Distributed pamphlets on pet waste environmental impact to housing residents
 - o Posted educational signage on pet waste environmental impact at pet waste stations
 - o Procured additional pet waste stations and signage for recreational areas

- Conducted pet waste surveys of base housing to evaluate resident and housing management compliance with policy
- Hunt Military Communities engaged with base housing residents on pet waste management throughout the year
- Continued focused education on spill awareness and reporting
 - Production and distribution of flyers, posters and magnets containing information for reporting spills and illicit discharges
 - Spill awareness and reporting display sponsored by the Navy Exchange
 - Initiated environmental awareness training, to include BMPs to prevent spills and illicit discharges, for all installation personnel
 - Emphasized installation policy against vehicle maintenance being performed in parking lots via a graphical magnet distributed to all unaccompanied housing residents
- The Installation Environmental Office engaged the public face to face at the following events on (1) the environmental impacts associated with illegal discharges, spills, and improper disposal of waste and how to report them, and (2) pet waste management for bacterial control of pollutants at the following events in 2022:
 - Initiated monthly face-to-face environmental awareness training for industrial workers according to the plan updated during the first year.
 - Annual recreational fishing derby at Trident Lakes, June 11, about 450 attendees
 - Spoil Your Dog Day, August 10 Ready
 - Ready Navy Block Party, September 29

MCM #2 – Public Involvement and Participation

NBK is fully compliant with public involvement and participation requirements in the MS4 permit. Implementation efforts and accomplishments during the second permit year include:

- Internal meetings with engineering design and construction staff for awareness and implementation of specific permit requirements for construction
- Monthly stormwater meetings with stormwater management personnel at Navy installations across the region
- Engagement with Joint Base Lewis-McChord to share information and ideas
- Continued engagement with Native American tribes regarding environmental issues
- Participation in the Washington Dept. of Ecology's Stormwater Action Monitoring Program
- Engagement with NBK Public Affairs, volunteer coordinators and Morale Welfare and Recreation event planners to develop volunteer activities designed to actively engage residents and/or employees to better understand stormwater pollution
 - Earth day cleanup at Trident Lakes
 - Replacement of oyster shells in stormwater catch basins to reduce levels of copper and zinc in stormwater discharges
 - Keyport beach cleanup and education
- Coordination with the contractors tasked with maintenance of stormwater structures
- Education for installation and tenant command leadership
- Coordination with Integrated Solid Waste Program to eliminate illicit discharges
- Coordination with the West Sound Stormwater Outreach Group for the development of education and public involvement initiatives.

- Initiated and co-sponsored storm drain chalk art contest conducted by Hunt Military Communities for housing residents

MCM #3 – Illicit Discharge Detection and Elimination

NBK is fully compliant with illicit discharge detection and elimination requirements in the MS4 permit. Implementation efforts and accomplishments during the second permit year include:

- Established written NBK instruction implementing clean water act requirements
- Established SWMP practices and procedures required by the MS4 permit.
 - o Procedures to minimize pollution due to discharges from utility vaults and secondary containments
 - o Procedures for evaluating discharges, investigating potentially illicit discharges, and implementing response and corrective actions to identified illicit discharges
- Ongoing contract to identify all stormwater structures and update all stormwater maps across the installation
- Training target audiences on BMPs to prevent illicit discharges
- Continuing facility water conservation programs to minimize discharges from lawn watering and irrigation
- Coordinated regional uniform policy among environmental and housing management staff at three Navy installations to prevent discharges from street and sidewalk wash water and routine external building wash down
- Continued dry weather screening program to identify illicit discharges, particularly targeting fecal coliform in discharges leading to Liberty Bay and Clear Creek.
 - o Years ahead of the permit-required implementation schedule
- Staff training beyond permit requirements for awareness in identifying and reporting illicit discharges through face-to-face environmental awareness training
- Eliminated one continuous potable water discharge and one occasional wastewater discharge through construction and repair projects

MCM #4 – New Development, Redevelopment, and Construction Site Runoff Control and MCM #5 – Post-Construction Site Runoff Control

NBK is fully compliant with development, construction, and post-construction site runoff requirements in the MS4 permit. Implementation efforts and accomplishments during the second permit year include:

- The NBK clean water act instruction and SWMP were published to establish MS4 permit requirements for development and construction
 - o SWMP details practices and procedures, including runoff control
 - o Stakeholders were engaged to ensure adoption of requirements
- Review of 18 site plans, 48 minor projects for inclusion of MS4 requirements
- 10 formal inspections of temporary and permanent stormwater treatment and flow control BMPs/facilities and catch basins
 - o Numerous informal and drive-by inspections exceeded MS4 permit requirements
- Implementation and completion of corrective actions addressing inspection findings
- Stormwater quality managers trained as Certified Erosion and Sediment Control Leads
- Construction management personnel training
 - o CGP and MS4 construction permitting requirements
 - o SWPPP elements and BMPs

- EAP updated to identify and prioritize projects to execute during this permit term
 - o Detailed stormwater sampling and analysis to identify any contaminants of concern for priority action

MCM #6 – Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance

NBK continues to implement its operations and maintenance program for compliance with the requirements of the MS4 permit. The NBK Clean Water Act instruction established operational and maintenance responsibilities in accordance with the MS4 permit. Stakeholders have been engaged to ensure adoption of all requirements. The SWMP details practices and procedures, including operations and maintenance requirements. NBK continues to address stormwater infrastructure maintenance completion and tracking with the goal of establishing compliance with all requirements.

Implementation efforts and accomplishments during the second permit year include:

- Continuing assessment of existing contract maintenance and reporting requirements and identification of potential gaps
 - o Engagement with maintenance contractor toward MS4 and SWMP compliance
 - o QC and feedback on contractor-performed maintenance
- Ongoing development of stormwater maintenance tracking and reporting
- Continued stormwater structure audit to identify all required inspections
- Establishment of maintenance standards for stormwater structures
- Pet waste assessments in housing and recreation areas
- Installation of additional pet waste stations
- Procurement of additional pet waste stations for recreation areas
- Education and outreach to residents on pet waste environmental impact

77. Please refer to the attached Dry Weather Survey Summary and Dry Weather Analytical Summary (Attachments 8 and 9), Early Actions Project Plan, and MS4 Early Action Projects Sampling Results (Attachments 11 and 12).

80. Through negotiations with the Washington Dept. of Ecology Stormwater Action Monitoring (SAM) Network, the Navy is considered an active participant through annual payment. The regional MS4 manager participates in SAM Stormwater Work Group meetings, and while not currently voting on project proposals, the ability to do so in the future is available. The Navy's participation in SAM is outlined in the cover letter (Attachment 13) provided by the Washington Dept. of Ecology.

82. The SWMP was published to the public web site in accordance with MS4 permit requirements.

84. Attachment 1: Stormwater Spill Response Infographic
Attachment 2: No Vehicle Maintenance Magnet
Attachment 3: Pet Waste Pamphlet
Attachment 4: Educational Pet Waste Signage
Attachment 5: Educational Materials
Attachment 6: Stormwater Chalk Art
Attachment 7: NBK Water Conservation Progress

Attachment 8: Dry Weather Survey Summary 2022

Attachment 9: Dry Weather Analytical Summary 2022

Attachment 10: 2022 Spill Log

Attachment 11: Construction Inspection Tracker

Attachment 12: Early Actions Project Plan

Attachment 13: MS4 Early Actions Project Sampling Results

Attachment 14: Washington Dept. of Ecology letter, RE: Navy on joining Stormwater Action Monitoring Program, 15 June 2021

Section IV. Required Response to Exceedances of Water Quality Standards (Part 4)

86.	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	During this reporting year were any exceedances of water quality standards identified, per the terms of Part 4 of the Permit? (Part 4)
87.	Narrative	<i>If yes, please describe in the Comments section all measures that were taken to mitigate the water quality standards exceedance, including notifications, adaptive management measures undertaken, schedules for implementation, and a status of current conditions. Include details per the provisions in Part 4 of the Permit.</i>

Required Responses to Violations of Water Quality Standards Comments:

Prevent Water Pollution



Pouring, leaking or discarding any substance other than rainwater into stormwater system *degrades* our water resources.



Pollutants dumped onto our streets or in our storm drains do not go to a sewage treatment plant to be cleaned. Instead, these pollutants are discharged directly into the storm system which flows into our natural waterways.

If you witness a potential spill or an illegal dumping into a storm drain, the street, a ditch, or a water body, **REPORT IT!**

Naval Base Kitsap

To report emergency spills call
396-4444

To report non-emergency illicit discharges please email
navfac_nw_stormw.fct@navy.mil, and indicate the location of the concern.



ONLY RAIN DOWN THE DRAIN!



Tips

Picking up pet waste is no one's favorite job. Hopefully the tips below will make the job a little less icky.

- You can turn pet waste collection baggies inside out over your hand to use the bag as a glove when picking up the waste.
- Many pet owners prefer to double bag the collected pet waste.
- After collection, you can tie the baggies onto the leash so that you do not have to hold or put the full baggie in your pocket.
- Long handled pet waste scoopers are available at pet stores to assist with waste collection.
- Although you can purchase baggies specifically for pet waste at pet stores, you can also re-use other bags including newspaper bags, bread bags, or sandwich baggies.
- Pet waste digesters are available for purchase at pet stores.



Attachment 3

Additional Information

For more information, contact the Naval Base Kitsap Stormwater Manager at (360) 315-1992 for Keyport, Jackson Park, Bangor or the Naval Air Station Whidbey Island Stormwater Manager at (360) 257-5631. Residents please review pet waste management in you Community Handbook or contact your Neighborhood Management Office. Additional information is available at:

EPA Pet Waste Management:

<https://cfpub.epa.gov/npstbx/files/Pet%20Care%20Fact%20Sheet.pdf>

Washington Department of Ecology: <https://ecology.wa.gov/About-us/Get-involved/What-you-can-do/Washington-Waters-ours-to-protect/Manage-animal-manure>

Kitsap County Stormwater Management:

<https://www.kitsapgov.com/how-do-i/apply-for/pet-waste-bag-station>

Water Environment Federation Pet Waste Management (under Too Cute to Pollute?):

www.wef.org/resources/for-the-public/public-information/fact-sheets/

Pet waste is a health risk to people, other pets, and the environment. Bacteria in pet waste can make people sick. When not disposed of properly, pet waste is washed into storm drains and ends up in our local waterways.

Always bag the pet waste and dispose of it properly.



May 2020



WE ALL LIVE DOWNSTREAM



Preventing Pollution from Pet Waste



The Problem

Pet waste is not only smelly and unsightly, but also is a health risk to pets, people, and our local water bodies.

You may think that pet waste left on a lawn or sidewalk fertilizes the soil. However, in most cases the waste is washed into storm drains that lead directly into nearby waterways **without** being treated first.

The problem is that pet waste contains harmful bacteria such as E. coli and fecal coliform, and parasites. This can make the water unfit for recreation such as swimming, fishing, or tubing and can spread gastrointestinal illnesses in humans such as Giardia and Salmonella.



These pollutants are harmful to the thousands of species of plants and animals (including fish, crabs and shellfish, birds, grasses, mammals, reptiles, and amphibians). **People who eat food from contaminated water can get very sick.**

Additionally, pet waste decays very slowly and the pollutants in pet waste can travel several miles in the water, contaminating the water as it travels.



The Facts

Some of the harmful effects of pet waste include:

- When pet waste decays, it uses up dissolved oxygen and releases compounds that are harmful to fish, shellfish and other aquatic life.
- Each dog produces approximately 0.42 pounds of fecal waste per day, or about 150 pounds per year. Just think how much waste is produced by the pets in your neighborhood!
- A *single gram* of pet waste contains an average of 23 million fecal coliform bacteria that can cause disease in humans.
- A single day's waste from one large dog can contain 7.8 billion fecal coliform bacteria - **enough to close 15 acres of shellfish beds.**
- EPA estimates that 2 to 3 days of pet waste from a population of 100 dogs would contribute enough bacteria and nutrients to temporarily **close** an entire bay for swimming and shellfishing. *Source: EPA 1993*



The Solution

Be responsible and clean up after your pets. It is as easy as 1-2-3:

1. Bring a bag.



2. Use the bag to pick up the pet waste.



3. Dispose of the bag properly in the trash...



**and not down
the storm drain!**



HELP SPOT PROTECT THE ENVIRONMENT

Pet waste isn't just unsightly and smelly, it is also harmful to the environment.



150 LBS

One pet can contribute 150 lbs of waste every year! When you don't pick up your pet's waste it can be carried by stormwater runoff into nearby waterways.



PET WASTE IN STORMWATER

Pet waste contains harmful bacteria such as E. coli and fecal coliform, and parasites.

STORMWATER PERMITS

The National Pollutant Discharge Elimination System (NPDES), Municipal Separate Storm Sewer System Permit identifies pet waste as a concern to water quality.



IT ALL LIES IN NATURE

A single day's waste from one large dog can contain 7.8 billion fecal coliform bacteria – enough to close 15 acres of shellfish beds! Pollutants in pet waste can make the water unfit for recreation and spread gastrointestinal illnesses in humans.

NEGATIVE EFFECTS OF PET WASTE ON LOCAL WATERS



As pet waste decomposes it demands high levels of oxygen from the water. This demand can suffocate fish and plant life by reducing the amount of oxygen available.

The solution

Be responsible and clean up after your pets.

It is as easy as 1-2-3:

1. Bring a bag
2. Use the bag to pick up the pet waste
3. Dispose of the bag properly in the trash

HELP SPOT PROTECT THE ENVIRONMENT

Pet waste isn't just unsightly and smelly, it is also harmful to the environment.

150 LBS

One pet can contribute 150 lbs of waste every year! When you don't pick up your pet's waste it can be carried by stormwater runoff into nearby waterways.

STORMWATER PERMITS

The National Pollution Discharge Elimination System (NPDES) requires separate storm sewer basins to capture pet waste as a concern to water quality.

PET WASTE IN STORMWATER

Pet waste contains harmful bacteria such as E. coli and fecal coliform, and parasites.

IT ALL LIES IN NATURE

A single dog's waste from one large dog can contain 1.8 billion fecal coliform bacteria - enough to close 10 acres of shallow water. Pathogens in pet waste can make the water unsafe for recreation and spread zoonotic diseases to humans.

NEGATIVE EFFECTS OF PET WASTE ON LOCAL WATERS

As pet waste decomposes it demands high levels of oxygen from the water. This demand can suffocate fish and plant life by reducing the amount of oxygen available.

The solution

Be responsible and clean up after your pet. It is as easy as 1-2-3:

1. Bring a bag
2. Use the bag to pick up the pet waste
3. Dispose of the bag properly in the trash

PLEASE CLEAN UP AFTER YOUR DOG





Dog Waste Bags

INSTRUCTIONS FOR USE

- 1. PLACE BAGS INTO BAG
- 2. PICK UP WASTE
- 3. TIE A KNOT AND DISPOSE



EPA Issues Naval Base New Stormwater Regulation



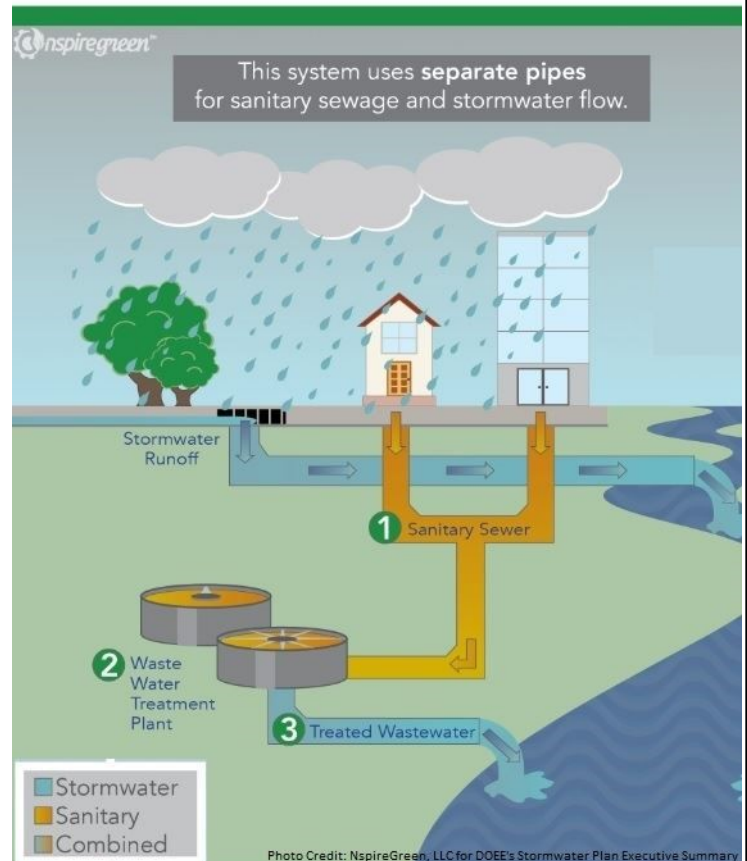
Understanding the MS4 Permit

Just to start with the basics, MS4 stands for Municipal Separate Storm Sewer System (MS4). A separate storm sewer system is a collection of structures, including retention basins, ditches, roadside inlets and underground pipes, designed to gather stormwater from built-up areas and discharge it, without treatment, into local streams and rivers. It's called a separate system because it's not connected to the sanitary sewer system which drains waste water from inside a home to a sewage treatment facility or a private septic system. An MS4 permit is required based on the criteria established by the Clean Water Act and Environmental Protection Agency (EPA), including being defined as an "urbanized area" by the Census Bureau.

The MS4 permit allows the Navy to discharge stormwater from our facilities, provided the requirements within the permit are met. Specific non-stormwater discharges, if allowed, are stated in the permit, along with some conditionally allowed non-stormwater discharges. For conditionally allowable non-stormwater discharges contact your installation stormwater manager, as certain conditions must be met.

Stormwater management will be defined by the Stormwater Management Program (SWMP) Plan, currently in development by Environmental staff. The plan will focus on six areas or minimum control measures for managing stormwater as required by the permit. The controls include: Education and

MS4 MUNICIPAL SEPARATE STORM SEWER SYSTEM



Outreach, Public Involvement, Illicit Detection and Discharge Elimination, New Development, Redevelopment and Construction Site Runoff Control, and Pollution Prevention and Operations and Maintenance.

Stormwater awareness and education is a large part of the permit because everyone plays a role in stormwater management and pollution prevention. You will see some changes made to the education and outreach program, be prepared!

Naval Base Kitsap Municipal Separate Storm Sewer System (MS4) Permit

The EPA issued an MS4 permit to Naval Base Kitsap. It took effect Feb 1, 2021 and applies to all of Naval Base Kitsap excepting NBK Bremerton. Highlights from the 50-page MS4 permit are below and will assist you in understanding our new requirements. Significant language from the permit is included below.

Compliance with Water Quality Standards

*If the Permittee complies with all the terms and conditions of this Permit, it is presumed that the Permittee is not causing or contributing to an exceedance above the State of Washington's water quality standards. **This Permit does not authorize discharges that will cause, or have the reasonable potential to cause or contribute to, an exceedance above the applicable State surface water quality standards (Chapter 173-201A WAC), groundwater standards (Chapter 173-200 WAC), sediment quality standards (Chapter 173-204 WAC), standards in EPA's revision of certain Federal water quality criteria applicable to Washington (40 CFR 131.45), and other appropriate requirements of State law.** If the Permittee finds that there has been a discharge that causes, or has the reasonable potential to cause or contribute to, an exceedance above the State of Washington water quality standards, the Permittee is required to notify EPA.*

Twenty-Four Hour Notice of Noncompliance Reporting

The Permittee must report the following occurrences of noncompliance by telephone at within 24 hours from the time the Permittee becomes aware of the circumstances:

- *Any discharge to or from the MS4 which could result in noncompliance that may endanger health or the environment;*
- *Any unanticipated bypass or upset that results in or contributes to an exceedance of any effluent limitation in this Permit. See Part 6.10 (Bypass of Treatment Facilities);*
- *Any upset that results in or contributes to an exceedance of any effluent limitation in this Permit. See Part 5.11 (Upset Conditions).*
- *Any discharge that may cause bacterial contamination of marine waters, such as discharges resulting from broken sewer lines and failing on-site septic systems.*
- *Any spills or discharges of oil and hazardous materials.*

*******Please make all notifications to the NBK environmental office.**

The environmental office will notify the required parties upon investigation. ****

Naval Base Kitsap Municipal Separate Storm Sewer System (MS4) Permit

Non-Stormwater Discharges. *The Permittee is not authorized to discharge non-stormwater from the MS4, unless such discharges satisfy one of the following conditions:*

The non-stormwater discharges comply with a separate NPDES permit;

The discharges originate from emergency firefighting activities during the emergency firefighting activities, not after the emergency has ceased. Determination of cessation of the emergency is at the discretion of the emergency on-scene coordinator. During cleanup, non-stormwater discharges to the MS4 are prohibited;

The non-stormwater discharges result from a spill and are the result of an unusual and severe weather event where reasonable and prudent measures have been taken to minimize the impact of such discharge; or

The non-stormwater discharges result from a spill and consist of emergency discharges required to prevent imminent threat to human health or severe property damage, provided that reasonable and prudent measures have been taken to minimize the impact of such discharges; or

*The **non-stormwater** discharges consist of one or more flows listed below, and such flows are managed by the Permittee in accordance with Parts 2.3 and 2.5 of this Permit:*

- *Potable water sources, including but not limited to, water line flushing, hyperchlorinated water line flushing, fire hydrant flushing, and pipeline hydrostatic test water;*
- *Landscape watering and other irrigation runoff;*
- *Dechlorinated swimming pool, spa, and hot tub discharges;*
- *Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents;*
- *Diverted stream flows;*
- *Rising ground waters;*
- *Uncontaminated ground water infiltration (as defined at 40 CFR §35.2005(20));*
- *Uncontaminated pumped ground water;*
- *Foundation drains;*
- *Air conditioning condensation; Irrigation water from agricultural sources that is*
 - *commingled with urban stormwater;*
 - *Footing drains; and/or*
 - *Flows from riparian habitats and wetlands.*



Penalties for Violating Permit Conditions. *There are monetary penalties for Civil and Administrative Violations of sections 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pre-treatment program approved under sections 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed the maximum amounts authorized in the United States Code (USC) by section 309(d) of the CWA and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently \$52,414 per day for each violation).*

Naval Base Kitsap Municipal Separate Storm Sewer System (MS4) Permit

Educational Requirements

This permit requires the engagement of appropriate audiences to address and evaluate targeted behaviors. Our annual report to the EPA must summarize our education and outreach activities during the reporting period and provide one or more examples of successful education/outreach activity. Public engagement from tenant commands, contractors, and residents will be key to meeting the requirements of this permit.

The Permittee must conduct and/or participate in public education and outreach activities designed to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts and encourage the public to participate in stewardship activities. The education and outreach activities must be designed to educate target audiences about the stormwater problem and provide specific actions they can follow to minimize the problem.

The Permittee must describe the specific education program goals in the Stormwater Management Plan. The Permitted must track and maintain records of public education and outreach activities and outcomes. The Permittee must target its education and outreach program activities to reach a combination of the following audienc-es that is appropriate for each facility or operation. Examples are Project managers Contractors, Tenants, Residents and Environmental staff.

The Permittee must select from the following topics to build general awareness and effect behavior change through its education and outreach activities:

- Proper use, storage and disposal of household hazardous waste;
- Proper recycling;
- Appropriate stormwater management practices for commercial, food service, and automotive activities, including carpet cleaners, home-based or mobile businesses;
- Appropriate yard care techniques for protecting water quality, including proper timing and use of fertilizers and pesticides;
- Proper pet waste management;
- Appropriate spill prevention practices;
- Proper management of street, parking lot, sidewalk, and building wash water;
- Proper methods for using water for dust control; and
- Proper design and use of Low Impact Development (LID) techniques;
- Impacts of stormwater on endangered species in Puget Sound, in particular on Southern Resident Killer Whales;
- Other topic(s) that focus(es) on facility-specific source(s) or cause(s) of water quality degradation.



What is Stormwater Pollution?



Impacts of Stormwater on the Environment

Stormwater picks up and carries numerous pollutants into our waterways. Many of these pollutants can cause problems in very small amounts. The cumulative effects of stormwater runoff on water bodies are evident in Puget Sound. The nearby water bodies that regularly receive untreated stormwater, now suffer from poor water quality. Pollutants in stormwater may include antifreeze, grease, oil, and heavy metals from cars; fertilizers, pesticides and other chemicals from gardens, homes and businesses; bacteria from pet wastes and failing septic systems; and sediment from poor construction site practices.

What are the impacts?

- **Sediment** - Sediment enters stormwater when rainwater flows across bare soil. Soil particles become entrained in the runoff and are carried to streams. Sediment reduces water clarity, impedes aquatic plant growth and destroys aquatic habitat.
- **Nutrients** - In urban environments the two largest contributors to nutrients in stormwater runoff are pet waste and fertilizer. Excess nutrients cause algae overgrowths or algal blooms which may be toxic to humans and pets and reduce water oxygen levels for fish and other aquatic organisms.
- **Bacteria and pathogens** - Human and animal waste (pets and wildlife) contribute bacteria and pathogens to stormwater. Animal waste is carried to the storm sewer system by surface runoff. Human waste may enter the storm sewer system due to aging and failing infrastructure, sanitary sewer overflows, and inappropriately maintained septic systems. In excess, these bacteria and pathogens cause illness and result in closing of swimming areas and impairment of streams that limits other recreational use.
- **Trash and debris** - Stormwater runoff picks up trash and pollutants from streets and parking lots. These are carried through the storm sewer system and into our waterways. Trash may choke or suffocate wildlife and is unsightly.
- **Oils, chemicals, and other pollutants** - From leaking automotive fluids to paint brushes rinsed out in the driveway, any chemical that is not properly stored, used, or disposed of has the potential to end up in the storm drain. Pollutants and chemicals alter water chemistry, diminishing water quality that supports many aquatic organisms.



If not properly managed, the volume of stormwater can flood and damage homes and businesses, flood septic system drainfields, erode stream channels, and damage or destroy fish and wildlife habitat. As you enjoy the warm summer months, be sure to leave no trace! Clean up your trash, pick up your pet's waste and make sure you maintain your vehicle to prevent leaks.

Only rain down the drain.

What is an Illicit Discharge?



Illicit Discharge Warning Signs

It is illegal to dump (discharge) anything other than stormwater into a storm discharge system (illicit discharge) or to connect any unauthorized pipe, ditch, or other manmade structure to a storm drainage system (illicit connection) per Section 2.3 of the MS4 permit. Indications of an illicit discharge can include, staining, residues, oily substances, abnormal flow during dry weather, murky water, or suds.



Suds

Dry weather flows may be observed after prolonged periods without rain and there may be staining. Annually the Base Environmental Stormwater Program manager will check stormwater outfalls for dry weather flows and if present, complete field testing to determine the source.

Suds often enter storm water systems as a result of improperly connected car washes or washing machines. Suds can also be the result of vehicle washing practices.



Oily Sheen

Oil/gas is recognized as a sheen on the water. Natural sheens may be differentiated from oil/gas sheen by breaking up the sheen with a stick. Natural sheens will remain separated and have sharp edges while oil/gas sheens will reattach and form a solid sheet. Oil/gas can enter water bodies via storm water runoff (spills at gas stations, oil leaks on pavement and illegal dumping).

Sanitary sewage may be present if there is black staining inside the drainage pipe; visible evidence of sanitary waste (such as toilet paper); or opaque or gray water.



Sewage flow

Report stormwater pollution immediately!

Any pollution entering the storm drain must be stopped to prevent harm to the environment. Contact 396-4444 immediately if you see this happening.

Only rain down the drain.

How Pollution Affects Killer Whales



Impacts of Stormwater runoff on Southern Resident Killer Whales

Stormwater runoff from industrial and municipal areas can carry pollutants to surface water, like the Puget Sound, that are harmful to killer whales. The Southern Resident killer whale (SRWK) resides in the Puget Sound and are a listed Endangered Species. These whales are protected by the Endangered Species Act and the Marine Mammal Protection Act, and have a Recovery Plan established by the National Marine Fisheries Service.

Impacts to SRKW from stormwater can result from biomagnification and bioaccumulation of pollutants. Persistent Organic Pollutants, called POPs, are synthetic man-made chemicals that are particularly concerning in bioaccumulation and biomagnification. To better understand bioaccumulation, it is important to look at the start of the food web. Smaller organisms absorb POPs over time and the POPs accumulate within the organism's tissue. As larger organisms consume the smaller ones, the concentration of POPs increases in each organism as it moves up the trophic food levels from zooplankton to fish to apex predators. This is called biomagnification.

Since SRKWs are an apex predator at the top of the food chain, they are heavily impacted by these two processes. Research has identified high levels of PCBs in the blubber of orcas and evidence of mothers passing contaminants to their young through the mother's milk. PCBs can impair reproduction, and the endocrine and immune systems, making SRKWs more susceptible to disease or infection from injuries (Desforges et al., 2018; NMFS 2016).

By following MSGP and MS4 permit requirements and properly maintaining stormwater BMPs we can work together to help protect these beautiful whales.

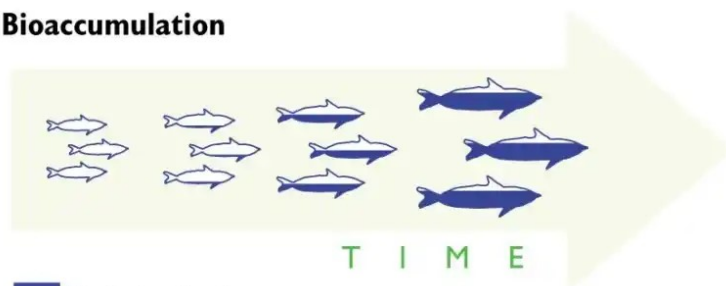
References

Desforges, J.P., A. Hall, B. McConnell, A. Rosing-Asvid, J.L. Barber, A. Brownlow, S. De Guise, I. Eulaers, P.I.D. Jepson, R.J. Letcher, R.J. Letcher, M. Levin, P.S. Ross, F. Samarra, G. Vikingson, C. Sonne, and R. Dietz. 2018. Predicting global killer whale population collapse from PCB pollution. *Science*. 361, 6409.1373-1376.

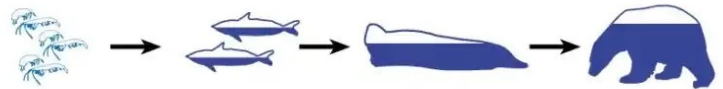
National Marine Fisheries Service. 2016. Exposure to a Mixture of Toxic Chemicals: Implications for the Health of Endangered Southern Resident Killer Whales. NOAA Technical Memorandum NMFS-NWFSC-135. 118 pp.

<https://cimioutdoored.org/bioaccumulation-and-biomagnification-increasingly-concentrated-problems/>

Bioaccumulation



Contaminant levels



Contaminant levels

Biomagnification

Photo credit and reference: <https://cimioutdoored.org/bioaccumulation-and-biomagnification-increasingly-concentrated-problems/>



August 8 – August 31

Only Rain Down the Drain Contest

Show us your best Sidewalk Art for Stormwater Awareness!

EPA prohibits any pollutants from going into the storm drain. This not only includes oil, detergents and chemicals, but also grass, leaves, and even dirt.

“Nothing but clean rain down the storm drain.”

Sidewalks in the community are your canvas! Send us your best depiction for Stormwater Awareness. Take photos of your creations and send them in for a chance to win a prize!

Submissions can be sent to
WestSoundRSO@HuntCompanies.com

Attachment 6

STORMWATER

What is Stormwater Pollution?

When rain hits concrete and asphalt, it cannot absorb and filter through the ecosystem as nature intended. Instead, it runs along these impervious surfaces and flows into drains and creeks, picking up any contaminants along the way. This pollutes waterways, damages vegetation and wildlife, and even contaminate drinking water.

NBK housing and municipal areas are all subject to the Clean Water Act. Together, we can help keep the Puget Sound Clean.

Ensure trash and recycling receptacles are under cover or covered with a lid. This prevents rainwater from mixing with trash and carrying bacteria, metals, and toxins into the waterways.



A Washington State University study showed that salmon die within hours of exposure to stormwater pollution. This is the cause for up to a third of salmon deaths in the Puget Sound.

What causes it?



SPILLAGE OF OIL, FUEL, AND ANTIFREEZE. Residents are NOT permitted to conduct vehicle maintenance on NBK property since it generates hazardous waste and pollution hazards that the base is liable for. To conduct maintenance on your vehicles, please contact commercial garages in town.



CIGARETTE BUTTS AND TRASH. Rain picks up harmful bacteria and toxic metals from trash. Especially harmful to the environment are cigarette butts, which contain metals toxic to aquatic organisms.



PET WASTE. Poop left outside takes a very long time to decompose. It spreads parasites and bacteria that are not only harmful to the ecosystem, but also to humans and other pets. Always pick up after your dog.



PESTICIDES AND FERTILIZERS. Due to their toxicity, the use of these substances on military bases are highly regulated, and therefore are not permitted for use by NBK housing residents.



SEDIMENT AND EROSION. Excess sediment harms aquatic organisms and reduces oxygen levels in the water. Cover dirt piles with a tarp. Never hose off any impervious surfaces without permission from NBK Public Works.



Please do not wash your cars in your driveway! Take your car to a commercial carwash. This way the sediment, oil, and metals on your vehicle wash into a filtered recycled system.



The local orca pods thrive off salmon as their primary food source. If salmon populations do not improve, the Puget Sound orcas will go extinct.

Attachment 6



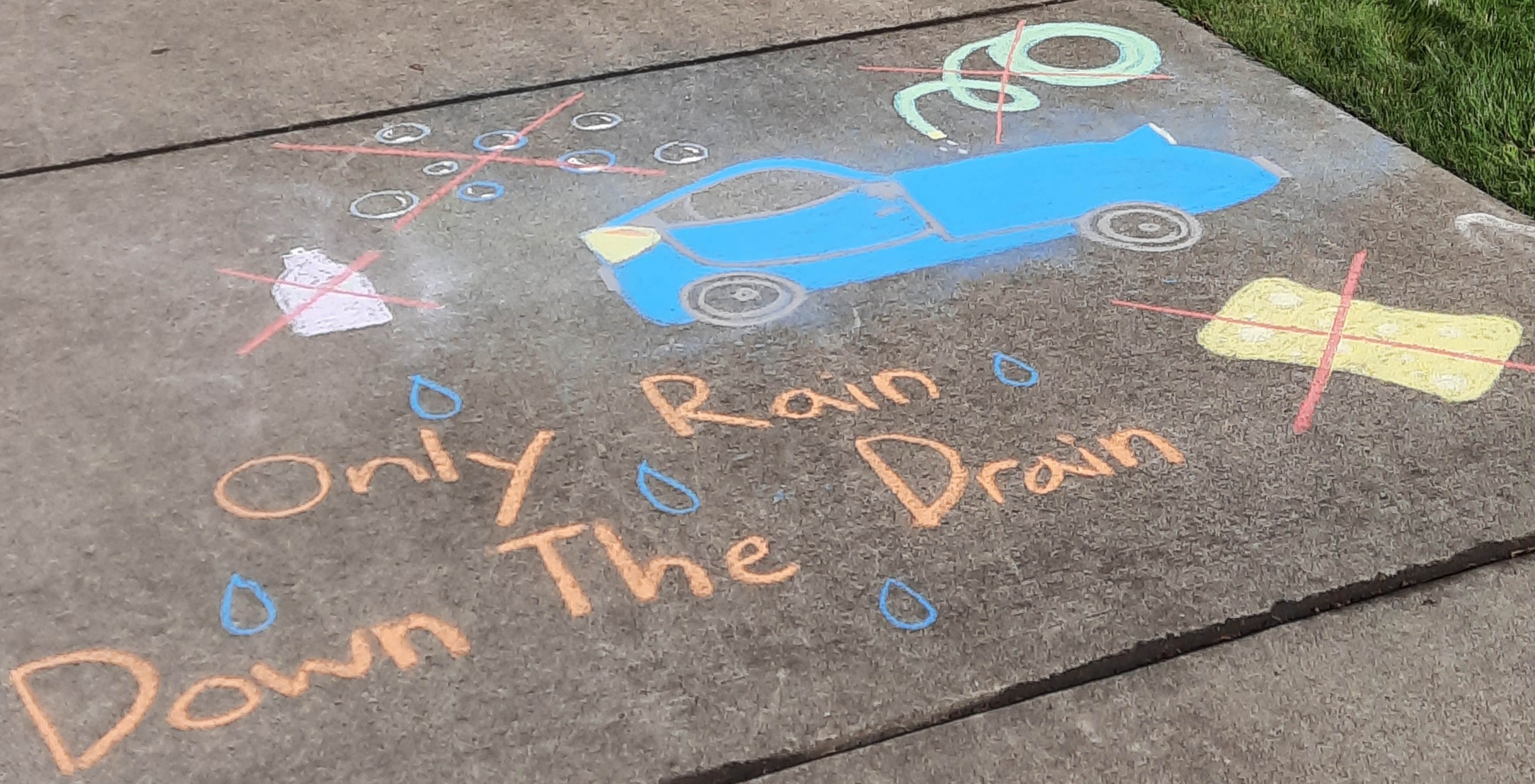
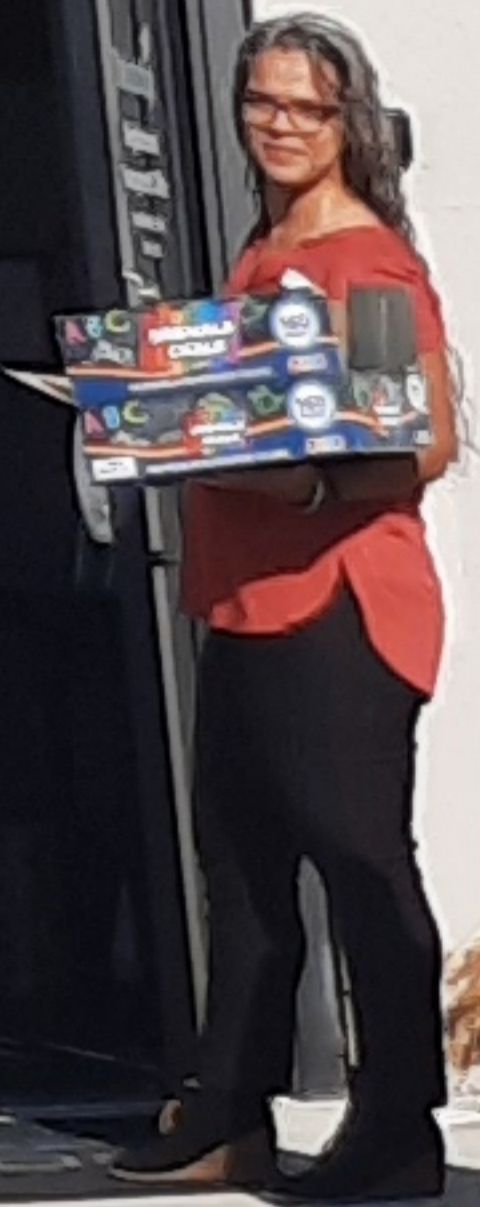
CLEON

CHZO



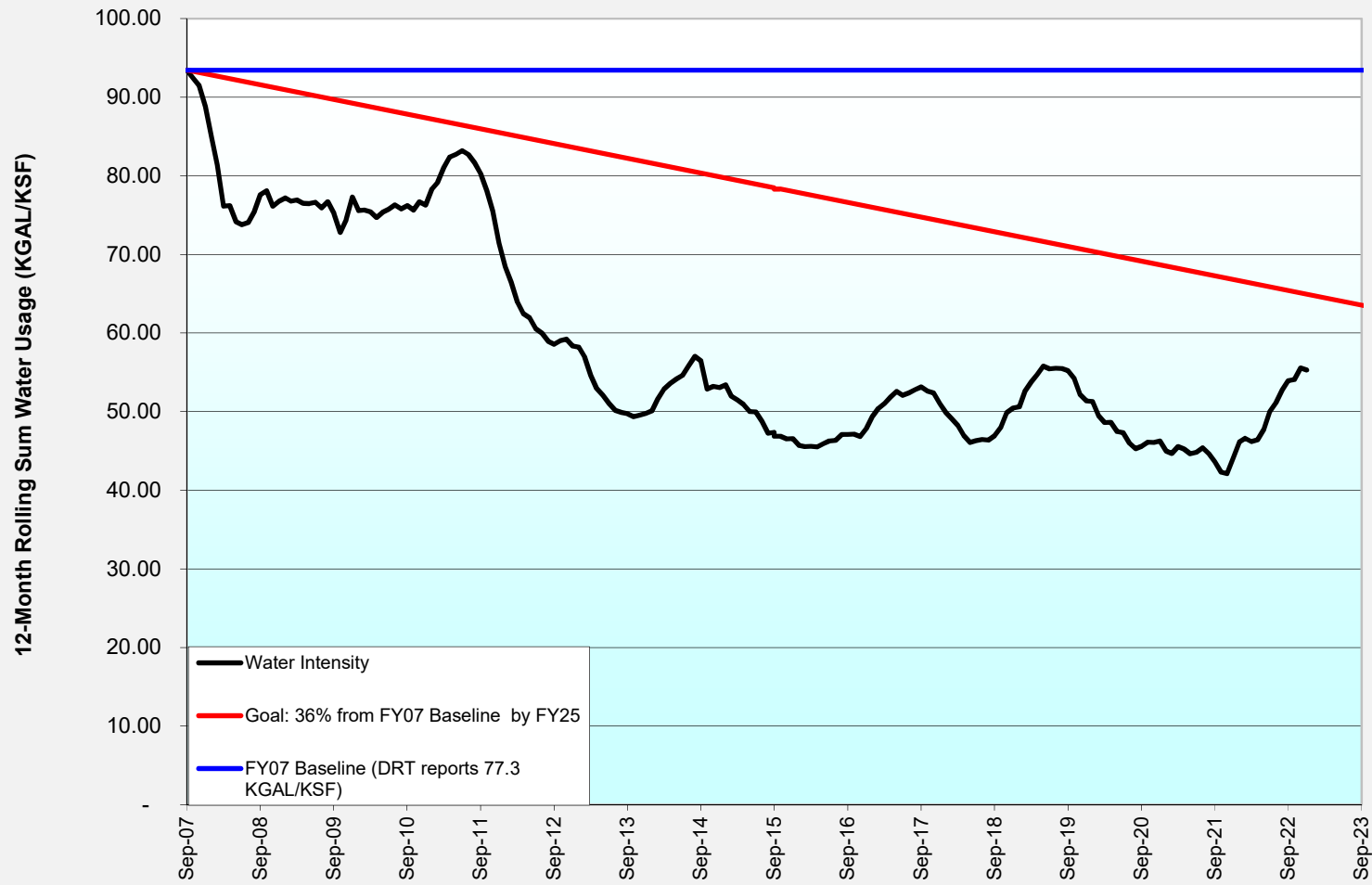


2785





Navy Base Kitsap Water Reduction Progress (all sites)



Dry Weather Survey Summary 2022

Naval Base Kitsap (NBK) is required by its MS4 permit to conduct field assessments for illicit discharges, including visual inspection of outfalls during dry weather. NBK has maintained a robust dry weather survey program for many years to detect and investigate illicit discharges. During 2022, dry weather surveys were conducted for all areas of NBK listed in the MS4 permit, which are described below. It is estimated that NBK has met the requirement to complete field screening of 75% of all MS4 outfalls during the 5-year permit term. Surveys were conducted according to permit-prescribed procedures in *Illicit Connection and Illicit Discharge Field Screening and Source Tracking Guidance Manual*, Herrera Environmental Consultants, Inc, May 2013.

A comprehensive survey of the shoreline of Jackson Park was accomplished. All water found flowing from an identified MS4 outfall during this survey was characterized. Supporting the Sinclair and Dyes Inlets TMDL, a total of six fecal coliform samples/backup samples were taken. None of the fecal coliform sample results nor indicator measurements indicated illicit discharges were present. All flows were determined to be upstream natural creek flows or groundwater intrusion.

At Keyport, a comprehensive shoreline survey of stormwater outfalls was conducted from the northern boundary around to the Radio Hill/lagoon area. A total of eight fecal coliform samples/backup samples were collected, regardless whether the characterization suggested a likelihood of fecal coliform being present or not. This was done according to the MS4 permit requirement to focus on fecal coliform identification and elimination for drainage to Liberty Bay, as well as requirements from the Liberty Bay TMDL implementation plan. Only one of the sample fecal coliform results was high enough to warrant further investigation per the permit-prescribed guidance, but the follow up fecal coliform sample results and indicator measurements were low enough to rule out an illicit discharge. This outfall will continue to be monitored for any changes in flow and water quality. None of the other fecal coliform sample results nor indicator measurements indicated illicit discharges were present.

At Bangor, a comprehensive survey of stormwater outfalls was conducted along the base boundary and shoreline clockwise from the veterinary clinic on Tautog Circle around to outfall #12 by the Explosives Handling Wharf. No dry weather flows to tributaries of Clear Creek were identified other than from outfall 01, which is already sampled quarterly for fecal coliform in compliance with the EPA MSGP permit sampling requirements for impaired waters. This supports the MS4 permit focus on fecal coliform identification and elimination for drainage to tributaries of Clear Creek as well as the Sinclair and Dyes Inlets TMDL. Flows occurring along the West Boundary Road/shoreline toward Hood Canal were characterized and fecal coliform samples taken. A total of 25 fecal coliform samples, including repeat samples, were taken. None of the fecal coliform results nor indicator measurements indicated that any illicit discharges were present.

At Camp Wesley Harris, no water was flowing, so there was nothing to indicate that any illicit discharges were occurring.

At Camp McKean, samples collected upstream of the facility in 2021 identified high levels of fecal coliform in the surface water entering the Camp McKean MS4, indicating that the fecal coliform level in the upstream water flows are responsible for the fecal coliform level at the outfall. The source of flow at the outfall is from water flow out of forested areas on the north and south side of the west parking lot. This flow enters the piping on the west side of Kitsap Lake Road NW and then travels underground to the outfall with no other stormwater inputs. Supporting the Sinclair and Dyes Inlets TMDL and investigation of the fecal coliform level in the outfall, additional fecal coliform samples were taken in Sep 2022 at these two upstream flows. The only Camp McKean stormwater that enters the piping leading to the outfall is runoff from the west parking lot, which was dry at the time these samples were collected.

Site	Outfall	Description	Date	Time	Sample Collected By	Fecal Coliform, Method SM 9222 D	
Bangor	OF1		9/6/2022	1130	Chris Jorgensen	14	CFU/100 ml
Bangor	OF1C	Creek at fenceline at Trigger gate	9/6/2022	1116	Chris Jorgensen	21	CFU/100 ml
Bangor	OF3		9/6/2022	1255	Chris Jorgensen	4	CFU/100 ml
Bangor	OF3A		9/7/2022	1210	Chris Jorgensen	9	CFU/100 ml
Bangor	OF3B		9/15/2022	830	Chris Jorgensen	10	CFU/100 ml
Bangor	OF4		7/22/2022	1135	Chris Jorgensen	50	CFU/100 ml
Bangor	OF6		9/7/2022	1107	Chris Jorgensen	81	CFU/100 ml
Bangor	OF6		9/15/2022	945	Chris Jorgensen	120	CFU/100 ml
Bangor	OF6		9/22/2022	1000	Chris Jorgensen	50	CFU/100 ml
Bangor	OF11BE	East outfall inlet pipe	9/7/2022	1145	Chris Jorgensen	41	CFU/100 ml
Bangor	OF11BS	South outfall inlet pipe	9/7/2022	1149	Chris Jorgensen	7	CFU/100 ml
Bangor	OF11C		9/7/2022	1135	Chris Jorgensen	30	CFU/100 ml
Bangor	OF11F		9/7/2022	1125	Chris Jorgensen	>200	CFU/100 ml
Bangor	OF11F		9/16/2022	758	Chris Jorgensen	20	CFU/100 ml
Bangor	OF11F		9/22/2022	1012	Chris Jorgensen	30	CFU/100 ml
Bangor	OF12A		7/22/2022	1120	Chris Jorgensen	<10	CFU/100 ml
Bangor	OF13		9/7/2022	1115	Chris Jorgensen	152	CFU/100 ml
Bangor	OF13		9/15/2022	950	Chris Jorgensen	10	CFU/100 ml
Bangor	OF13		9/22/2022	1005	Chris Jorgensen	70	CFU/100 ml
Bangor	OF-19A		9/6/2022	1052	Chris Jorgensen	25	CFU/100 ml
Bangor	WBRFS		9/6/2022	1105	Chris Jorgensen	7	CFU/100 ml
Bangor	WBRBH		9/6/2022	1230	Chris Jorgensen	31	CFU/100 ml
Bangor	WBRER		9/6/2022	1220	Chris Jorgensen	100	CFU/100 ml
Bangor	WBRER		9/15/2022	835	Chris Jorgensen	40	CFU/100 ml
Bangor	WBRER		9/22/2022	1040	Chris Jorgensen	<10	CFU/100 ml
Camp Wesley		Ditch on east side of road that flows under the road to the north of shoot house					
Harris	Ditch		8/13/2022	830	Chris Jorgensen	10	CFU/100 ml
Keyport	01-733		9/8/2022	1010	Chris Jorgensen	4	CFU/100 ml
Keyport	02-702		5/12/2022	935	Chris Jorgensen	<10	CFU/100 ml
Keyport	02-702		9/8/2022	1030	Chris Jorgensen	4	CFU/100 ml
Keyport	02-726		9/8/2022	1055	Chris Jorgensen	20	CFU/100 ml
Keyport	02-733		9/8/2022	1110	Chris Jorgensen	<1	CFU/100 ml
Keyport	03-719		9/8/2022	1130	Chris Jorgensen	>200	CFU/100 ml
Keyport	03-719		9/16/2022	705	Chris Jorgensen	13	CFU/100 ml
Keyport	04-703		9/8/2022	1145	Chris Jorgensen	5	CFU/100 ml
Jackson Park	SD209 (705)		2/14/2022	1034	Chris Jorgensen	10	CFU/100 ml
Jackson Park	SD209 (705)		8/23/2022	1000	Chris Jorgensen	46	CFU/100 ml
Jackson Park	SD212	Sample during small sewer leak	2/11/2022	845	Chris Jorgensen	<10	CFU/100 ml
Jackson Park	SD212		8/23/2022	1010	Chris Jorgensen	1	CFU/100 ml
Jackson Park	SD224 (716)		8/23/2022	1025	Chris Jorgensen	<1	CFU/100 ml
Jackson Park	SD227		8/23/2022	1035	Chris Jorgensen	45	CFU/100 ml
Camp McKean	CMUS		9/12/2022	12:20	Chris Jorgensen	40	CFU/100 ml
Camp McKean	CMUSN		9/12/2022	12:25	Chris Jorgensen	870	CFU/100 ml
Camp McKean	CMUSN		9/22/2022	11:40	Chris Jorgensen	240	CFU/100 ml

Spill Reports from February 1, 2022 to January 31, 2023

Site	Product	Quantity	Reportable	Date	Cause
Bangor	Form Release Agent (refined mineral oil)	0.0147 Gallon	Yes	3-Mar-22	Personnel error
Bangor	Hydraulic Fluid	0.0196 Gallon	Yes	18-Mar-22	Equipment leak
Bangor	Motor Oil	0.5 Gallon	No	22-Mar-22	Vehicle leak
Bangor	Canola Oil	0.5 Gallon	No	22-Mar-22	Operator error, improperly stored container
Jackson Park	Transmission Fluid	0.25 Gallon	No	23-May-22	Unathorized Vehicle Maintenance
Bangor	Industrial Waste Water	19,500 Gallons	Yes	6-Jun-22	Contractor struck pipe during excavation work
Bangor	Hydraulic Fluid	2 Ounces	Yes	22-Jun-22	Equipment leak
Bangor	Hydraulic Fluid	1 Gallon	Yes	28-Jun-22	Equipment leak
Jackson Park	Hydraulic Fluid	1 Gallon	No	21-Jul-22	Vac truck hydraulic line failure
Bangor	Used Cooking Oil	1 Gallon	No	27-Jul-22	Personnel error
Bangor	Diesel Fuel	0.25 Gallon	No	29-Jul-22	Vehicle leak
Bangor	Diesel Fuel	139 Gallons	Yes	29-Jul-22	Vehicle contacted and broke fuel line on pier
Bangor	Sanitary Sewer	2500 Gallons	Yes	12-Aug-22	Lift station control system failure
Bangor	Antifreeze	0.5 Gallon	No	15-Aug-22	Vehicle leak
Bangor	Gear Oil	1 Gallon	No	1-Sep-22	Vehicle leak
Bangor	Hydraulic Fluid	0.25 Gallon	No	27-Sep-22	Equipment leak
Bangor	Hydraulic Fluid	0.25 Gallon	No	20-Oct-22	Equipment leak
Keyport	Roof Coating	0.25 Gallon	No	26-Oct-22	Personnel error
Bangor	Hydraulic Fluid	0.1 Gallon	No	25-Nov-22	Uncovered metals recycling bin
Keyport	Concrete Washout Water	0.5 Gallon	No	16-Dec-22	Personnel error
Bangor	Hydraulic Fluid	0.5 Gallons	No	4-Jan-23	Vehicle leak
Bangor	Hydraulic Fluid	<15 gallons	Yes	6-Jan-23	Equipment leak
Bangor	Diesel Fuel	0.5 Gallon	No	6-Jan-23	Vehicle leak
Bangor	Motor Oil	5 Gallons	No	11-Jan-23	Vehicle leak

Summary of Findings:

Spilled concrete washwater on ground

Sawdust on ground/pier

New SW structure covered but dirt on top of cover

Small amount of dirt on street near covered pile

Catch basin filter installed on the spot at time of inspection

Catch basin filters missing from new construction and one catch basin of unusual design

Silt fence damaged, with gaps

Stabilized slopes eroding and sloughing

Bioswale sloping opposite direction of overflow and flowing over the side into SW vault manhole

Contractor dumping concrete-contaminated stormwater from dewatering pan

Drains needing cleaning before acceptance

Catch basin filter damaged

Naval Base Kitsap Early Action Projects Plan February 2022



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Naval Base Kitsap Early Action Projects Plan March 2023



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Executive Summary

In 2021, the Environmental Protection Agency (EPA) issued a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit to Naval Base Kitsap (NBK). The MS4 permit covers NBK– Bangor and Keyport, Camp Wesley Harris, Camp McKean, and Naval Hospital Bremerton/Jackson Park Housing Complex. Section 2.4.4 of the MS4 permit requires a list of Early Action Projects (EAPs) to be identified no later than the reporting deadline for year one of the permit, no later than March 31, 2022. This document lists the EAPs to be implemented within the permit term, by February 1, 2026.

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List of Acronyms

BMP.....	Best Management Practices
DMR.....	Discharge Monitoring Report
DO.....	Dissolved Oxygen
EAP.....	Early Action Project
EPA.....	Environmental Protection Agency
MS4.....	Municipal Separate Storm Sewer System
MSGP.....	Multi-Sector General Permit
NBK.....	Naval Base Kitsap
NPDES.....	National Pollutant Discharge Elimination System
OWS.....	Oil/water interceptors
PAH.....	Polycyclic Aromatic Hydrocarbon
SAM.....	Stormwater Action Monitoring
SIIP.....	Stormwater Infrastructure Investment Plan
WAC.....	Washington Administrative Code
WLA.....	Wasteload Allocation

1 Introduction

This plan serves as the list of EAPs required by section 2.4.4 of the MS4 Permit and submitted with the first annual report for NBK. The EAPs are required to be completed within the permit term, by February 1, 2026.

2 Regulatory Authority

The MS4 permit section 2.4.4 requires a list of Early Action Projects to be identified no later than the reporting deadline for year one of the permit, no later than March 31, 2022. Within section 2.4.4 requirements are established for EAPs and the Stormwater Infrastructure Investment Plan (SIIP) which is referred to as the plan and written plan.

Permittee must implement the identified EAPs during the permit term. The Permittee may satisfy this requirement in connection with corrective action project(s) required by compliance with the Multi-Sector General Permit (MSGP), if appropriate. Due to a shortened timeframe of implementation for EAPs, the balance of EAPs may consist of operational or maintenance activities rather than projects that require design and construction stages or major capital improvements.

3 Data Evaluation

The goal of the EAPs is to prioritize reduction and elimination of pollutants of concern listed in Table 2.4.4 of the MS4 permit. Table 3.1 below, lists these pollutants of concern and a summary of their possible sources.

A data review was completed to determine the potential for the pollutants of concern to be present and to identify any other potential pollutants to include in the EAP sampling effort, which was completed in September 2021. Following the EAP sampling effort, a report of the findings was completed and is included in Appendix A of this report.

Pollutants of Concern	
Parameter	Possible Sources
Magnesium	Magnesium salts and compounds and natural sources. (Teravskis, 2017)
Zinc	Moss control products, building siding, parking lots, vehicle tire wear, chain-link fence, roofing material, vehicle brake wear (WDOE, 2017), galvanized metals, wood preservatives (City of Pacific Grove, n.d) and industrial sources.
Copper	Vehicle brake wear, roofing materials, parking lots, treatment lumber, building siding, vehicle exhaust (WDOE, 2017) and industrial sources.
Lead	Lead-based paints, leaded gasoline, mining, and soils contaminated with lead (Jones-Lee & Lee, 2000)
Pyrene	Polycyclic Aromatic Hydrocarbon (PAH) –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Bis(2-ethylhexyl) phthalate	Production of PVC and vinyl chloride resins (added to plastics to make them flexible) (EPA, 2000)

Pollutants of Concern	
Parameter	Possible Sources
Fluoranthene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Cadmium	Vehicle use and wear, brake wear (McKenzie et al., 2009) and industrial sources.
Butyl benzyl phthalate	Commonly used plasticizer found in a variety of consumer products (Carlson, 2010), plasticized PVC, motor vehicle components, paints or other coatings, caulks and sealants (Dale & Trim, 2017).
Benzo(b,k)fluoranthene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Chrysene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Phenanthrene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Dichlobenil	Used as an herbicide. (NCAP, 1997)
Benzo(g,h,i)perylene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Benzo(b)fluoranthene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Benzo(k)fluoranthene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Naphthalene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Benz(a)anthracene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Diethyl phthalate	Commonly used plasticizer found in a variety of consumer products (Carlson, 2010), plasticized PVC, motor vehicle components, paints or other coatings, caulks and sealants (Dale & Trim, 2017)
Pentachlorophenol	Used as an insecticide, fungicide, and slimicide (Pohanish, 2015) and in wood preservation (Cheremisinoff & Rosenfield, 2010).

Pollutants of Concern	
Parameter	Possible Sources
Benzo(a)pyrene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Indeno(1,2,3-cd)pyrene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
2-Methylnaphthalene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Fluorene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Acenaphthene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Mercury	Atmospheric deposition (City of Pacific Grove, n.d)
Dibenzo(a,h)anthracene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
1-Methylnaphthalene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Anthracene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Acenaphthylene	PAH –non-point sources including leaking motor oil, tire particles, incomplete combustion of fuel within engines – especially diesel-based, and crumbling asphalt. Natural sources include forest fires. (Crane et al., 2010)
Di-N-Octyl Phthalate	Commonly used plasticizer found in a variety of consumer products (Carlson, 2010), plasticized PVC, motor vehicle components, paints or other coatings, caulks and sealants (Dale & Trim, 2017)
Dibenzofuran	Combustion process (EPA, 2016)

Table 3.1 Pollutants of concern as listed in MS4 permit Table 2.4.4 and potential sources.

3.1 Relevant Monitoring data

Table 3.2 below summarizes sources of data reviewed to gather information regarding the pollutants of concern specified in the MS4 permit, and to identify any other contaminants to include in the sampling effort.

Source	Plan/Report Title	Link to site
Stormwater Action Monitoring	Effectiveness Studies	https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring/SAM-effectiveness-studies
Stormwater Action Monitoring	Status and Trends	https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring/SAM-status-and-trends
US Geological Survey	Puget Sound National Water Quality Assessment Program	https://www.usgs.gov/centers/wa-water/science/puget-sound-basin-nawqa?qt-science_center_objects=0#qt-science_center_objects
Kitsap County	Kitsap County Stormwater Comprehensive Plan	https://www.kitsapgov.com/pw/Documents/Kitsap%20Stormwater%20Comp%20Plan%20FINAL.pdf
Puget Sound Partnership	Watershed Recovery Chapter	https://www.psp.wa.gov/salmon-recovery-watersheds.php
Washington Department of Ecology	Western Washington NPDES Phase I Stormwater permit	https://apps.ecology.wa.gov/publications/documents/1503001.pdf

Table 3.2 Sources of data

3.2 Land Use and Activity Data

Bangor is the largest of the sites covered under the NBK MS4 permit and is 7,200 acres of mostly forested area, with residential and industrial spaces intermixed. Stormwater flowing eastward either infiltrates into the soil or flows into Clear Creek, while westward flows infiltrate or flow into the Hood Canal. Industrial areas at Bangor are covered by the MSGP.

At Keyport, several upland areas discharge stormwater onto Navy property, potentially containing contaminants of concern. The base lies at the bottom of a natural drainage basin for the Keyport area and receives run-on from the south, north, and west. Stormwater from agricultural, livestock, and residential areas flows onto Navy property. Also upgradient from Keyport are several Kitsap County sewage lift stations, that in the event of overflow could ultimately discharge onto Navy property. Keyport can be divided into seven distinct drainage areas that feed wetlands, salt marshes and tide flats, the shallow lagoon, and Liberty Bay.

Jackson Park Housing Complex and Naval Hospital Bremerton were constructed in the 1970s and 1980s. Before then, the property was used as an ammunition depot where personnel made, cleaned, and destroyed military weapons, ammunition, and maintenance

equipment. Waste products from these operations have left behind contaminants on Navy owned property. These areas have been addressed by the Navy's Installation Restoration Program and continue to be monitored.

Camp Wesley Harris is approximately 388 acres of forested area with five structures. The surrounding areas is rural/residential. In 1998, two areas at Camp Wesley Harris were remediated to stabilize lead and other metals in the soil.

Camp McKean is a small recreational facility located on Kitsap Lake open during the summer months. Pets are not allowed on the premises. The surrounding area is residential and forest areas.

3.3 Designated Uses and Impairments

3.3.1 Fresh Waters

3.3.1.1 Clear Creek

The State of Washington has established designated uses for Clear Creek and its tributaries as follows: core spawning habitat (aquatic life uses); primary contact (recreation); domestic, industrial, agricultural, and stock water (water supply uses); and wildlife habitat, harvesting, commerce/navigation, boating, and aesthetics (miscellaneous uses) (WAC 173-201A-602).

Two tributaries to Clear Creek, originating on Naval Base Kitsap (NBK), join outside the southeast corner of the installation. The western tributary is fed by overflow from Trident Lakes and is classified as Category 1 (clean) for bacteria by the Washington Department of Ecology. The eastern tributary is classified 4A (Sinclair/Dyes Inlet TMDL) for fecal coliform. Once they come together there is a length that is classified Category 5 (polluted waters needing a TMDL) by the Washington Department of Ecology for dissolved oxygen, Category 2 (waters of concern) for temperature, and Category 1 (clean) for bacteria (Washington Department of Ecology, 2012).

3.3.1.2 Wildcat Creek

Camp Wesley Harris discharges to Wildcat Creek through an unnamed tributary.

Wildcat Creek is protected for core summer salmonid habitat; primary contact recreation; water supply uses (domestic, industrial, agricultural, stock); and miscellaneous uses (wildlife habitat, harvesting, commerce/navigation, boating and aesthetics). Wildcat Creek is located in Kitsap County and is a tributary to Chico Creek. The creek receives possible discharge from Camp Wesley Harris via intermittent streams.

The Washington Department of Ecology has not identified any impairment for Wildcat Creek.

3.3.1.3 Kitsap Lake

Kitsap Lake is protected for core summer salmonid habitat; extraordinary primary contact recreation; water supply uses (domestic, industrial, agricultural, stock); and miscellaneous uses (wildlife habitat, harvesting, commerce/navigation, boating and aesthetics). Kitsap Lake is located in Kitsap County, west of Dyes Inlet and three miles from the city of Bremerton. Kitsap Lake is a recreational lake and is stocked with

rainbow trout for year-round sport fishing. The surrounding area is residential. Recreational motor boat use is allowed on Kitsap Lake.

The waters of Kitsap Lake are classified as Category 4A (Sinclair/Dyes Inlet TMDL) for fecal coliform and Category 2 (waters of concern) for phosphorus by Washington Department of Ecology (2012).

3.3.2 Marine Waters

3.3.2.1 Ostrich Bay Watershed

Ostrich Bay is a small embayment on the south end of Dyes Inlet. The bay is relatively shallow with an average water depth of 35 feet. Tidal current and winds are the main sources of water circulation in Dyes Inlet. Tidal current in Dyes Inlet is influenced primarily by flow out of Port Washington Narrows. The water exchange rate in Ostrich Bay is estimated to be an average of 20 to 50% per day, depending on tidal conditions, with an average residence time of 1 to 5 days. Approximately 17 small tributary streams drain into Dyes Inlet. The three largest streams are Chico Creek, Clear Creek, and Barker Creek.

The State of Washington has established designated uses for Dyes Inlet, including Ostrich Bay, as follows: excellent (aquatic life uses); primary contact (recreation); shellfish harvesting; and wildlife habitat, commerce and navigation, boating, and aesthetics (miscellaneous uses) (WAC 173-201A-612). While there is a Dyes Inlet fecal coliform TMDL, NBK MS4 discharges to the adjacent waters of Ostrich Bay, which are listed as Category 1 (meets tested standards for clean water) for bacteria and Category 5 (polluted waters needing a TMDL) for mercury and sediment.

3.3.2.2 Hood Canal Watershed

Hood Canal is a long, deep fjord-like waterbody in Puget Sound with relatively low human development in the surrounding watershed. The tidal exchange between Hood Canal and Admiralty Inlet is small relative to the overall depth and volume of the canal, and a sill at the north end of Hood Canal restricts circulation. Because of these characteristics, low dissolved oxygen (DO), or hypoxia, is a natural condition in the deep waters of Hood Canal.

NBK-Bangor is located in the northern portion of the Hood Canal. The State of Washington has established designated uses for Hood Canal as follows: extraordinary (aquatic life uses); primary contact (recreation); shellfish harvesting; and wildlife habitat, commerce/navigation, boating, and aesthetics (miscellaneous uses) (WAC 173-201A-612).

The current 303(d) list includes two grid segments along the Bangor Waterfront impaired by low DO levels. One is adjacent to Marginal Wharf and Delta Pier; the other is to the south of Service Pier (Washington Department of Ecology, 2012). There are also two Category 4b (pollution control program) sediment impairment grids nearby. No total maximum daily load (TMDL) has been developed by Ecology for this area. Areas of Hood Canal near the base have also been listed as Category 2, waters of concern, for isolated exceedances of bacteria (fecal coliform) and pH.

NBK has sampled the Hood Canal waters off NBK-Bangor numerous times for water quality parameters (temperature, salinity, DO, and turbidity). This sampling has shown that these waters are consistently within the Washington State standards for extraordinary water quality for each of these parameters. An exception to these findings was temperature, which typically met extraordinary water quality levels in the winter months and excellent water quality standards in the summer months. NBK performs required monitoring for stormwater entering Hood Canal in support of the dissolved oxygen and sediment impairments. Sampling data is routinely provided to regulatory authorities for review.

3.3.2.3 Liberty Bay Watershed

Liberty Bay is a branch of the Puget Sound. The mouth of Liberty Bay is located off Port Orchard Bay, which flows through the narrow Agate Passage to the north and Port Orchard Narrows to the south. Liberty Bay and waters adjacent to Keyport are relatively shallow with water depths no greater than 100 feet. Keyport contains approximately 5,000 feet of shoreline, the majority of which is riprap or bulkhead.

The State of Washington has established designated uses for Liberty Bay as follows: extraordinary (aquatic life uses); primary contact (recreation); shellfish harvesting; and wildlife habitat, commerce and navigation, boating, and aesthetics (miscellaneous uses) (WAC 173-201A-612). The waters of Liberty Bay and east of the installation are classified as Category 2 (Waters of Concern) by Ecology for temperature (Washington Department of Ecology, 2012) and pH. The waters in Liberty Bay west of the pier are classified as Category 4A (has a TMDL) for fecal coliform and Category 2 for DO and temperature. Sediments in the cleanup areas surrounding Keyport have been assessed and are listed as Category 4A and 5.

NBK performs required monitoring of stormwater entering Liberty Bay in support of sediment and fecal coliform impairments.

3.3.2.4 Dyes Inlet

Clear Creek discharges to Dyes Inlet, and a TMDL has been established for the Sinclair/Dyes watershed. Kitsap County has been assigned a wasteload allocation (WLA) of a 95% reduction in the discharge of fecal coliform at the head of Dyes Inlet below Clear Creek. NBK-Bangor is assigned secondary responsibility for a freshwater WLA of a 45% reduction. The WLA is equivalent to the percent reduction for either the geometric mean or the 90th percentile, whichever is greater.

3.4 Monitoring Data

Historical monitoring data from the MSGP and Installation Restoration Program efforts was evaluated to determine potential pollutants for analysis during the EAP sampling effort in September 2021.

Another source of information used to evaluate stormwater quality was the historic Discharge Monitoring Reports (DMRs) and monitoring efforts completed through the MSGP. Further identification of potential pollutants of concern were evaluated with input from the Navy's Installation Restoration Program, which is the program responsible for management of Comprehensive Environmental Response, Cleanup, Compensation,

and Liability Act (CERCLA) site management and cleanup at NBK properties, before determining the final list of analytes.

4 Early Action Projects

The projects listed in the following sections are anticipated actions to occur over the MS4 permit term, which expires at midnight, January 31, 2026. Mission and funding changes within the Department of the Navy could alter the timeframe, scope, and viability of any project listed below to occur.

4.1 Sampling Summary

In 2021, a regional sampling effort was executed to address the potential pollutants of concern identified in the MS4 permit (reference Table 3.2 in Section 3 of this report), as well as others identified in the review of historical and current activities and land use data. This large sampling undertaking is one of the first EAPs and will help determine the need for future projects and focus efforts for the SIIP.

The purpose of sampling was to identify and evaluate the risk of potential pollutants at NBK-Keyport, and Bangor, Jackson Park Housing Complex, Camp McKean, and Camp Wesley Harris. Pollutants exceeding benchmark levels will be further investigated.

Sampling points were identified to provide best representative sampling information. The sampling occurred in September 2021 during the first rain event after a dry period lasting through the entire summer. Under typical flow conditions, rainfall provides a dilution for pollutants. The lack of prior rainfall for this sampling concentrated pollutants and created data that is representative of the worst case. Follow-up samples were collected for contaminants detected above their benchmark levels. Appendix A contains the *Early Action Project Sampling Results Report* for full results from this sampling effort.

4.2 MSGP Corrective Actions

Corrective actions resulting from requirements of the MSGP are reported in the MSGP Annual Report due in January each year. These actions may include operational, maintenance, or structural changes and should be considered as EAPs required by the MS4 permit. Examples of MSGP corrective actions include more robust inspections to address housekeeping concerns, covering materials to protect them from weathering, and addressing maintenance on stormwater infrastructure. Corrective actions completed will be documented in the Annual MSGP Report.

4.3 Operational Projects

A general operational change currently underway is the enhanced review of construction project designs for stormwater management. Previously, designs would be reviewed by stormwater managers following various stages of their completion, and all plans would be reviewed by the environmental office before construction started. The enhanced process requires stormwater managers to be more involved in the process at the start and should allow for more robust stormwater management to be developed during the design process and the implementation of treatment and flow control long term. This change requires many internal agencies' cooperation, continuous revisions to the current process, and robust training efforts.

Currently, an 18-month contract project is being executed to survey and map permanent stormwater infrastructure and stormwater facilities at all MS4 covered properties. This project will ensure an accurate and complete inventory of stormwater infrastructure and facilities. An accurate inventory will aid condition assessment of existing infrastructure and help ensure all existing structures are identified and included in the Navy’s inspection and maintenance program. It will also enhance efforts to track any illicit contaminants back to their sources, should any be identified during recurring surveillance efforts.

At Bangor, Keyport, and Jackson Park, operational improvements in pet waste management have been implemented. An outreach program has been implemented to ensure personnel on station are aware of the importance of pet waste management. Additional signage and waste stations have been placed throughout the installations to encourage pet owners to be more responsible in cleaning up after their pets. In partnership with Navy Morale, Welfare, and Recreation (MWR), an educational campaign will be completed to encourage park users to help keep the parks clean and pick up after their pets. Surveillance of these areas prior to implementing this program already shows a high level of compliance.

The Navy Lodge at Bangor allows pets and has a pet waste bag station for patrons with pets. To further enhance the pet waste management program pet owners will be asked to sign acknowledging the requirement and understanding why pet waste management is an important part of pollution prevention.

The existing Naval Base Kitsap Water Pollution Prevention instruction, NAVBASEKITSAPINST 5090.4B - Water Pollution Prevention Program, was updated to further emphasize and enforce water pollution prevention efforts at NBK, including MS4 permit requirements. The updated instruction will improve operational guidance to tenant commands and personnel working on base, and strengthen internal water pollution prevention procedures in areas covered by the MS4 permit.

<u>Location</u>	<u>Project Description</u>	<u>Impact</u>
All MS4 Properties	Survey and Mapping of Storm Water Infrastructure	Significant. Project will ensure accurate equipment inventories, which will improve condition assessment, inspection, and maintenance program for stormwater infrastructure
All MS4 Properties	Pet Waste Management Program	Project will enhance existing pet waste management control measures implemented at properties covered by the permit.
All MS4 Properties	NBK Water Pollution Prevention Instruction	The updated instruction will improve operational guidance to tenant commands and personnel working on base, and strengthen internal water pollution prevention procedures in areas covered by the MS4 permit.

Table 4.1 Summary of Operational Projects

4.4 Maintenance Projects

Using the information gained within the Survey and Mapping project listed in the Operational Projects section, NBK will be conducting a gap analysis of the structures identified with existing stormwater structure maintenance contracts and initiating actions to update existing facility maintenance projects based on those results. This project will result in improvements to the overall funding and execution of the Navy’s maintenance program for stormwater structures. Individual projects to address any identified gaps and deficiencies will be programmed and executed during the MS4 permit term.

In 2019, a pond maintenance study was conducted to identify deficiencies in permanent stormwater facilities including detention ponds, retention ponds, and bioswales. The report identifies practices recommended to enhance the current stormwater structures. Individual projects to address identified gaps and deficiencies will be programmed and executed during the MS4 permit term.

A study to further assess the detention pond receiving stormwater from the vast majority of ship maintenance operations was conducted in 2022. The study assessed the physical condition of the pond and conducted water and soil sampling. The study report provided multiple recommendations for improving the pond, which can be used to program projects.

<u>Location</u>	<u>Project Description</u>	<u>Impact</u>
All MS4 Properties	Stormwater maintenance program gap analysis	Project will improve condition assessment, inspection, and maintenance program for stormwater infrastructure
All MS4 Properties	Pond maintenance Improvements	Implementation of projects will improve pond infrastructure. Individual projects to address identified deficiencies will be programmed and executed during the MS4 permit term

Table 4.2 Summary of Maintenance Projects

4.5 Structural Projects

NBK has programmed a number of structural projects over the MS4 term which should result in significant positive water quality impacts.

Two projects were completed to address portions of degraded sanitary sewer infrastructure at NBK Bangor, Jackson Park Housing and Bremerton Naval Hospital. The projects initially scoped, inspected and cleaned all affected portions of the sanitary sewer (pipes, manholes, and other components) and then repaired, lined or replaced those sections identified as needing replacement or repair. The projects will

result in more reliable and properly functioning sanitary sewer systems and and also correct known chronic deficiencies and failures which have caused sanitary sewer system overflows and upsets in the past. This will greatly decrease the risk for sanitary sewer overflows and unintentional releases, thereby reducing the negative impacts on the surrounding environment and water resources.

Structural projects to mitigate measured zinc benchmark exceedances at NBK Keyport are being pursued. the galvanized surfaces at NBK-Keyport and treatment methods for minimizing zinc runoff are being pursued. Treatment methods being implemented include oyster shell media placed in catch basins, which have successfully reduced zinc and copper in stormwater discharges, as verified by sampling and analysis. The oyster shell media was refreshed in September 2022. Research into different media to reduce metals in stormwater discharges is also being pursued. An industrial ventilation system project in building 514 replaced a large galvanized exhaust duct with several smaller ones composed of welded carbon black steel with epoxy coating, eliminating this zinc-leaching source. Additional projects are being reviewed individually to address identified zinc benchmark exceedances at NBK Keyport through the elimination of exterior galvanized materials.

NBK Integrated Solid Waste Management (ISWM) runs the Qualified Recycling Program which markets scrap metal collected from base. To avoid non-point source pollution run-off from the metals in the work area, a Stormwater Rx water filtration system was purchased and installation began in March 2022. The system consists of the Clara media filter, which is an underground concrete vault designed for primary settling and removal of solids. The second part of the system is the Aquip; an above ground media filtration system that has the ability to remove TSS, heavy metals, organics, and nutrients. During installation, work crews discovered a corrugated drain line that was at capacity with media and removed it. Now every lateral and main line is tied into the system. The project is planned to be completed and fully commissioned by December 2023, although other emergency projects have recently taken priority, which could extend the timeline.

The ISWM also picks up solid waste from seven installations. In order to mitigate carbon emissions, a waste transfer station is used in operations to compact and create more head space in roll-off boxes and the walking floor trailer; which is permanently stationed to be filled and transport refuse. In order to prevent non-point source pollution from the trailer leaking intermittently, PWD is working to provide funding in FY2025 to build a curb around the first floor area where the walking floor trailer sits to divert leachate to sanitary sewer. Until funding is provided, ISWM Operations staff has pivoted use of this trailer by only accepting industrial waste. Refuse containing food waste and other organics is delivered directly to Olympic View Transfer Station. This change in operations has eliminated leakage from the trailer.

Additional projects to improve water quality within the MS4 will be implemented on a case by case basis based on risk assessment and available funding.

<u>Location</u>	<u>Project Description</u>	<u>Impact</u>
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NBK Bangor	NBK Bangor -Sanitary Sewer System improvements	The projects will result in more reliable and properly functioning sanitary sewer system and also aim to correct known chronic deficiencies and failures which have caused sanitary sewer system overflows and upsets in the past
Naval Hospital Bremerton and Jackson Park Housing Complex	Naval Hospital Bremerton and Jackson Park Housing Complex - Sanitary Sewer System improvements	The projects will result in more reliable and properly functioning sanitary sewer system and also aim to correct known chronic deficiencies and failures which have caused sanitary sewer system overflows and upsets in the past
NBK Bangor	Replace Building 7204 Sanitary Sewer Lift Station	The project will upgrade an existing aging sanitary sewer lift station and help to prevent sanitary sewer system overflows and upsets.
NBK Keyport	Replace Roof at Building 514 (includes replacement of galvanized roof section).	Project will help to mitigate a source of zinc, believed to be a significant contributor to MSGP zinc benchmark exceedances at NBK Keyport
NBK Bangor	Install Stormwater Treatment for Recycling Center	Removes metals and other pollutants from stormwater runoff from metals recycling area
NBK Bangor	Install curbing at solid waste compactor to divert leachate to sanitary sewer	Illicit discharge from solid waste leachate halted through interim process change until drainage is directed to sanitary sewer.

Table 4.3 Summary of Structural Projects

5 Conclusion

The EAP sampling effort that took place in September 2021, was the start of determining which potential pollutants of concern to address, if necessary. The results from the study will help drive structural projects in the future, and shape the SIIP. Sample results flagged as indicated in Appendix A will be further investigated. Results from the study may result in further EAPs. Additionally, corrective actions taken as a result of the MSGP should also be considered as EAPs and may be identified at a later date.

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7 Appendix A

**MS4 Early Action Projects
Sampling Results
March 2023**



Naval Base Kitsap

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List of Acronyms and Abbreviations

(A)	Acute
AOR	Area of Responsibility
COD	Chemical Oxygen Demand
EAP	Early Action Project
EPA	Environmental Protection Agency
(FW)	Freshwater
IC-ID	Illicit Connection and Illicit Discharge
ISGP	Industrial Sector General Permit
MSGP	Multi-Sector General Permit
MS4	Municipal Separate Storm Sewer Systems
N/A	Not Applicable
NAVFAC NW	Naval Facilities Engineering Command Northwest
NBK	Naval Base Kitsap
OFN	Outfall North
OFS	Outfall South
SAPP	Sample and Analysis Project Plan
(SW)	Saltwater
TKN	Total Kjeldahl Nitrogen
µg/L	Microgram per liter
WAC	Washington Administrative Code

**Key terms used in this report defined on next page.*

Key Term Definitions:

Acute Health Issue	Severe and sudden health issue in onset.
Analytes	A substance whose chemical constituents were identified and measured by a laboratory and referred to as contaminant of concern for parameters monitored under MS4 Clean Water Act (CWA) regulation or priority pollutant under EPA Water Quality Criteria.
Chronic Health Issue	Health issue develops and worsens over extended time.
Benchmark (MSGP)	Refers to benchmark thresholds issued under the MSGP.
Criteria (EPA)	Refers to EPA’s Water Quality Criteria – Aquatic Life Criteria Table. For this report, Washington State Freshwater and Marine Water “criteria” are referred to as “standards” (see below).
Outfall (EPA)	A point source as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the U.S. and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S..
MS4 (EPA)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the U.S. (ii) Designed or used for collecting or conveying stormwater; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works as defined at 40 CFR 122.2.
MSGP (EPA)	Authorizes the discharge of stormwater from industrial facilities.
Pollutant of Concern (EPA)	Any pollutant that has been identified as a cause of impairment in any waterbody to which the MS4 discharges as defined in the MS4 Permit Section 2.4, Table 2.4.4.
Standard (refers to WAC 173-201A water quality criteria)	WAC 173-201A, Washington State Water Quality “Standards” for Surface Water; refers to Freshwater and Marine Water criteria, which should not to be confused with EPA Water Quality “Criteria”. For freshwater water quality criteria broken down by type of habitats. For marine water quality criteria broken down into fair, good, excellent and extraordinary. Standards are the basis for protecting Washington state surface water quality. Pollution limits in water quality permits are based on these standards.

1 Introduction

The purpose of this report is to describe the Early Action Project (EAP) sample procedures and report the laboratory analytical results for Naval Base Kitsap (NBK). Nine Navy installations in the Pacific Northwest were included in this regional project. The purpose of the EAP sampling was to evaluate and identify the current state of stormwater discharges covered under the Municipal Separate Storm Sewer System (MS4) permit in order to identify and prioritize actions to promote storm water quality. Water quality results are compared to the 2021 Multi-Sector General Permit (MSGP) benchmarks, Washington Administrative Code (WAC) 173-201A Water Quality Standards for Surface Waters of the State of Washington, the Illicit Connection and Illicit Control (IC-ID) Field Screening and Source Tracing Guidance Manual (May 2020 Revision) recommended thresholds for further investigation, and Environmental Protection Agency (EPA) Recommended Water Quality Criteria. Once sample results were obtained from the respective labs, the data was analyzed in relationship to the Federal and State of Washington stormwater regulatory framework.

2 Sampling Procedure

This section lists sample locations and describes the sampling procedures for the EAP project. A list of downstream waterbodies is also included.

2.1 Sample Locations

The various Navy-owned installations in the area of responsibility of Naval Facilities Engineering Systems Command Northwest (NAVFAC NW) were sampled to obtain a perspective of stormwater discharges. Installations included in this report are located within Kitsap County and include NBK-Bangor, Camp McKean, Camp Wesley Harris, Jackson Park Housing Community/Naval Hospital Bremerton, and NBK-Keyport. Sample locations on each installation were specifically chosen to be representative of stormwater discharge quality. Table 2-1 is a lists of EAP sampling locations by installation.

Table 2-1. EAP Sampling Locations

	Site	Sample Location	Description
Naval Base Kitsap	Bangor	Outfall 01	
		Outfall 02	
	Camp McKean	CMP 01	In tree line catching North parking lot
	Camp Wesley Harris	Swamp Culvert	Culvert adjacent to the road
	Jackson Park Housing Community/Naval Hospital Bremerton	Outfall North (OFN)	
		Outfall South (OFS)	
		Helo Pad	Outfall near helicopter pad
	Keyport	Outfall 01-741	
		Outfall 03-717	Monitored under MSGP

2.2 Receiving Water Bodies

Stormwater benchmarks in the MSGP, surface water quality standards in WAC 173-201A, recommended thresholds from the IC-ID manual, and other documents were utilized for the analysis and are dependent upon the downstream waterbodies. Benchmarks and standards will vary significantly depending if the outfall flows into freshwater or saltwater. Table 2.2 below is a list of receiving waterbodies by installation. For those installations with outfalls that flow into both freshwater and saltwater bodies, both benchmarks were compared.

Table 2-2. Receiving Water Bodies

	Site	Water Body	Freshwater or Saltwater
Naval Base Kitsap	Bangor	Clear Creek & Hood Canal	Freshwater & Saltwater
	Camp McKean	Kitsap Lake	Freshwater
	Camp Wesley Harris	Wildcat Lake	Freshwater
	Jackson Park Housing Community/ Naval Hospital Bremerton	Ostrich Bay	Saltwater
	Keyport	Liberty Bay	Saltwater

2.3 Sample Procedure

Due to the extreme dry weather in the summer of 2021, samples had to be delayed until the first significant rainfall events near the summer’s end. The only exception was at Camp Wesley Harris, where sampling was conducted before significant rainfall occurred. Due to the extreme dryness proceeding the sampling, all analytes were expected to be above typical values. Additional samples were collected for any water quality results above Washington State surface water standards or the MSGP benchmarks.

The complete sampling procedure is defined in the Sampling and Analysis Project Plan (SAPP) for MS4 EAPs. Included in the SAPP is the Quality Assurance Project Plan as well as the Standard Operating Procedures. Sampling was conducted by NAVFAC NW employees in September 2021. Appendix A contains information regarding the date of sampling and who the samples were collected by. Samples were packaged and shipped via FedEx to Pace Analytical and Spectra Laboratories.

2.4 EPA Analytical Method

Samples were tested through EPA’s standard methods using Washington State certified labs under the Department of Ecology. EPA’s standard methods establish laboratory analytical methods for measuring and analyzing pollutants. Appendix A contains a list all the analytes tested and respective analytical method.

3 Results

This section defines the process of the data analysis and the findings from stormwater discharges for the various Navy installations. The findings mainly focus on any lab results that are above Washington State’s surface water standards and the MSGP benchmarks.

3.1 Data Analysis Procedure

3.2 Findings

This section provides a brief description of laboratory water quality results by analyte compared to MSGP benchmarks, Washington State’s surface water quality standards in WAC 173-201A, and the IC-ID recommended thresholds. Not all the sampling locations fall within MSGP coverage areas; however, the MSGP was used as a means to evaluate the results from this sampling effort. For a complete list of analytes tested during the initial sampling event in September 2022 and their standards and benchmark values, refer to Appendix A. It is important to note that some metals were tested in their dissolved state as well as their total amount which determines how they compare to the benchmarks or standards as displayed in Appendix A.

Initial sampling occurred in September 2021 during the first rain event after a dry period lasting through the entire summer. Under typical flow conditions, rainfall provides a dilution for pollutants. The lack of prior rainfall for this sampling concentrated pollutants and created data that is representative of the worst case. As a result, follow-up samples were collected under more typical conditions where the initial results caused concern. Results of concern and their follow-up samples are discussed in the paragraphs below. Additional follow-up sampling is planned for March and April 2023.

3.2.1 NBK-Bangor

NBK-Bangor has two outfalls, Outfall 01 and Outfall 02, that were sampled for stormwater pollutants. Both Outfall 01 and 02 flow into Clear Creek. All results at Outfall 01 and Outfall 02 were below the MSGP benchmarks and WAC 173-201A surface water quality standards, except Outfall 02 showed concentrations of dissolved and total copper above the MSGP benchmark value and the WAC 173-201A surface water quality standard as shown in Table 3-1. Follow-up samples collected after substantial rainfall were below the MSGP benchmark, and provide more typical concentrations. This outfall will continue to be monitored according to MSGP protocol.

Table 3-1. Pollutants of Concern – Bangor

Analyte	Date	Units	Lab Result	MSGP Benchmark	WAC 173-201A Standard
NBK – Bangor – Outfall 02					
Copper	9/19/2021	µg/L	10.8	5.19 (FW) 4.8 (SW)	N/A
Copper, Dissolved	9/19/2021	µg/L	9.31	N/A	4.8 (SW)
Copper	10/5/2021	µg/L	2.3	5.19 (FW) 4.8 (SW)	N/A
Copper	2/28/2022	µg/L	3.18	5.19 (FW)	N/A

				4.8 (SW)	
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3.2.2 Camp McKean

Analytes sampled at Camp McKean were below MSGP benchmarks and the WAC 173-201A surface water quality standards except for fecal coliform. Fecal coliform concentrations were above the WAC 173-201A surface water quality standards.

The vast majority of water flowing from the outfall at Camp McKean is not stormwater, but surface water from two small unnamed streams outside the camp. The water from these streams is collected by a roadside ditch which then drains into the storm sewer and eventually through the camp to the outfall. The northern stream is classified by the Washington Department of Ecology as impaired by bacteria (category 4A) as part of the Sinclair & Dyes Inlets Tributaries Fecal Coliform Bacteria Total Maximum Daily Load. Therefore, additional monitoring was performed where these two streams discharge into the drainage ditch to prove the high levels of fecal coliform originate upstream. As shown in Table 3-3, the water from these two creeks contained elevated concentrations of fecal coliform. The sample location CMUS refers to the creek to the south of the camp where it meets the drainage ditch. The sample location CMUSN refers to the creek north of the camp. As additional rain fell at the end of a historically dry summer, concentrations of fecal coliform decreased to concentration at the MSGP benchmark in 11 days. An additional sample was taken at Camp McKean a month after and showed concentrations of fecal coliform significantly below the WAC 173-201A surface water quality standard. Additional samples collected September 2022 show a continuing trend of high fecal coliform concentrations following dry weather.

Table 3-2. Pollutants of Concern – Camp McKean

Analyte	Date	Units	Lab Result
NBK – Camp McKean – CMP 01			
Fecal Coliform (Initial Sample)	09/27/2021	CFU/100 mL	600
Fecal Coliform	10/07/2021	CFU/100 mL	100
Fecal Coliform	10/27/2021	CFU/100 mL	40
NBK – Camp McKean - CMUS			
Fecal Coliform	10/04/2021	CFU/100 mL	360
Fecal Coliform	10/07/2021	CFU/100 mL	60
Fecal Coliform	10/27/2021	CFU/100 mL	50
Fecal Coliform	9/12/2022	CFU/100 mL	40
NBK – Camp McKean - CMUSN			
Fecal Coliform	10/07/2021	CFU/100 mL	90
Fecal Coliform	10/27/2021	CFU/100 mL	100
Fecal Coliform	9/12/2022	CFU/100 mL	870
Fecal Coliform	9/22/2022	CFU/100 mL	240

3.2.3 Camp Wesley Harris

Total copper and dissolved copper concentrations were above the MSGP benchmarks and WAC 173-201A surface water quality standards. The TKN concentration at Camp Wesley Harris was above the IC-ID Guidance Manual’s recommended threshold. Additionally, chemical oxygen demand (COD) was above the MSGP benchmark. As noted above, these samples were collected from stagnant water during dry weather, so the results were most likely higher than typical conditions. However, a follow-up sample showed copper concentrations to continue above the MSGP benchmark. Additional sampling for all pollutants of concern is scheduled for March and April 2023.

Table 3-3. Pollutants of Concern – Camp Wesley Harris

Analyte	Date	Units	Lab Result	MSGP Benchmark	WAC 173-201A Standard	IC-ID Recommended Threshold
NBK – Camp Wesley Harris – CWH Swamp Culvert						
Copper	8/13/2021	µg/L	16.9	5.19 (FW)	N/A	N/A
	2/14/2022	µg/L	8.48	5.19 (FW)	N/A	N/A
Copper, Dissolved	8/13/2021	µg/L	16.3	N/A	4.8 (SW)	N/A
Total Kjeldahl Nitrogen (TKN)	8/13/2021	µg/L	3,350	N/A	N/A	3,000
Chemical Oxygen Demand (COD)	8/13/2021	µg/L	200,000	120,000	N/A	N/A

3.2.4 Jackson Park Housing Community/Naval Hospital Bremerton

The Jackson Park Housing Community and Naval Hospital Bremerton were both sampled for stormwater pollutants. Extensive sampling was performed at the two main housing community outfalls, Outfall North and Outfall South, as well as the outfall at the helicopter pad by the hospital. Outfall North and Outfall South samples both contained concentrations of total copper and dissolved copper above MSGP benchmarks. At the north outfall, concentrations of other common pollutants of concern including total zinc, dissolved zinc, COD, and nitrate were above MSGP benchmarks and WAC 173-201A surface water quality standards. The TKN level recorded was above the IC-ID recommended threshold. For Outfall North and Outfall South, metals were tested utilizing both EPA standard method 200.8 and standard method 6020B. Results in Table 3-5 only show metal results from EPA standard method 200.8 because it is the MSGP-prescribed method. For results from standard method 6020B refer to Appendix A. At the helicopter pad, concentrations of fecal coliform were above WAC 173-201A surface water standards.

Table 3-4. Pollutants of Concern – Jackson Park/Naval Hospital Bremerton

Analyte	Date	Units	Lab Result	MSGP Benchmark (SW)	WAC 173-201A Standard (SW)	IC-ID Recommended Threshold
NBK – Jackson Park Housing Community – Outfall South						
Copper	9/17/2021	µg/L	44.1	4.8	N/A	N/A
	2/14/2022	µg/L	3.51			
Copper Dissolved	9/17/2021	µg/L	30.9	N/A	4.8	N/A
NBK – Jackson Park Housing Community– Outfall North						
Copper	9/17/2021	µg/L	182	4.8	N/A	N/A
	2/14/2022	µg/L	40.5			
Copper Dissolved	9/17/2021	µg/L	177	N/A	4.8	N/A
Zinc	9/17/2021	µg/L	524	90	N/A	N/A
	2/14/2022	µg/L	180			
Zinc, Dissolved	9/17/2021	µg/L	531	N/A	90	N/A
Total Kjeldahl Nitrogen (TKN)	9/17/2021	µg/L	4,850	N/A	N/A	3,000
Chemical Oxygen Demand (COD)	9/17/2021	µg/L	176,000	120,000	N/A	N/A
Nitrate	9/17/2021	µg/L	812	680	N/A	N/A
NBK –Naval Hospital Bremerton – Helo Pad						
Fecal Coliform	9/19/2021	CFU/100 mL	810	N/A	100	N/A
	2/14/2022		10			
	8/23/2022		46			

3.2.5 NBK-Keyport

NBK-Keyport was sampled at two locations, Outfall 01-741 and Outfall 03-717. Only Outfall 03-717 is covered under MSGP where approximately one-third of the area is categorized as industrial. Both outfalls had concentrations of total copper and dissolved copper above the MSGP benchmarks and WAC 173-201A surface water quality standards. All other analytes were below benchmarks and standards.

Table 3-5. Pollutants of Concern – Keyport

Analyte	Units	Lab Result	MSGP Benchmark	WAC 173-201A Standard
NBK – Keyport – Outfall 01-741				
Copper	µg/L	230	4.8	N/A
Copper, Dissolved	µg/L	203	N/A	4.8
NBK – Keyport – Outfall 03-717				
Copper	µg/L	13.4	4.8	N/A
Copper, Dissolved	µg/L	8.91	N/A	4.8

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APPENDIX A