Environmental Review of the Statewide General Permit for Biosolids Management

SEPA Environmental Checklist

Solid Waste Management Program
Washington State Department of Ecology
Olympia, WA

September 2024

DEPARTMENT OF
ECOLOGY
State of Washington

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SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

Reissue the Statewide General Permit for Biosolids Management (General Permit) with statewide applicability. A draft can be found on Ecology's biosolids web (Washington State Department of Ecology [DOE], n.d.-a)

2. Name of applicant:

Washington State Department of Ecology

3. Address and phone number of applicant and contact person:

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Solid Waste Management

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4. Date checklist prepared:

September 27, 2024

5. Agency requesting checklist:

Washington State Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable):

Ecology initially issued a SEPA checklist and determination for the General Permit in 2021 concurrent with public notice. Ecology then conducted public hearings and published a response to comments received on the General Permit, and incorporated changes based on comments appropriately. Ecology made the determination to issue the General Permit on June 15, 2022. It went into effect 30 days later on July 15, 2022, and was to remain in effect for 5 years. During the 30-day appeal period, Ecology received a citizen appeal of Ecology's issuance of the new General Permit. The new General Permit was not enjoined during appeal, so in the two years that it took for the appeal process to reach a final decision by the Pollution Control Hearings Board (PCHB or Board), Ecology implemented and enforced the General Permit.

On January 29, 2024, the PCHB issued a final order on summary judgment of the citizen appeal. (Nisqually Delta Association v. Washington State Department of Ecology, 2024) The Board determined that "Ecology's decision to issue the final General Permit following its DNS is void because the DNS was issued in violation of SEPA." (pp. 29) This invalidated the General Permit that had been in effect since July 15, 2022. The Board concluded that Ecology's

programmatic SEPA Checklist and Determination of Non-significance (DNS) failed to include sufficient information. Specifically, the Board's decision stated that:

> "The Board is aware that there is incomplete information on PFAS, PBDEs, and microplastics in biosolids. Kijowski Decl., ¶¶ 21-26; Washington State Department of Ecology, Per- and Polyfluoroalkyl Substances Chemical Action Plan (2022), p. 423 (Appendix 8 – Biosolids). But information gaps on the degree to which these pollutants are present in biosolids, including their exposure pathways and risk levels, should be discussed in the environmental checklist and DNS, along with forthcoming studies and screening tools. See, WAC 197-11-080(2)-(3) (requiring information gaps be identified, and describe how agencies may proceed in the face of lack of information); WAC 197-11-080(2) (when there are gaps in relevant information or scientific uncertainty concerning significant impacts, agencies shall make clear that such information is lacking or that substantial uncertainty exists). Here, neither the SEPA Checklist nor the DNS disclosed the uncertainty or lack of information except for a brief reference that Ecology will be monitoring EPA's current development of a new risk screening tool to further evaluate risks from pollutants in general, without specifying any particular pollutant. Kijowski Decl., Ex. D, p. 13." (Nisqually Delta Association v. Washington State Department of Ecology, 2024, pp. 26-27)

In response to the Board's directive, Ecology is clarifying and expanding upon the initial SEPA checklist in our review of the same General Permit to ensure that we document our analysis appropriately to address the deficiencies the Board identified.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Ecology could modify, revoke and reissue the General Permit during its five-year life if underlying rules change or new information requires changes that cannot be properly addressed by conditioning individual facility approvals.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

This SEPA checklist and accompanying Determination as well as the previous checklists and associated determinations prepared for previous iterations of the general permit.

Ecology uses numerous guidance documents and other authoritative sources as the basis for developing and implementing the general permit, including but not limited to:

Chapter 173-308 WAC (Department of Ecology [DOE], 2007) – These are the rules that govern implementation of the state biosolids program.

Biosolids Management Guidelines (DOE, 2000)– This guidance document is a compilation of research and real-world application and experience from agriculturally focused universities and Ecology that helps biosolids managers and agency staff make appropriate decisions when evaluating site and facility proposals.

Managing Nitrogen from Biosolids (DOE, 1999)– Nitrogen is a critical plant nutrient. This guidance document helps biosolids managers and staff understand how to evaluate nitrogen in biosolids.

Control of Pathogens and Vector Attraction Reduction in Sewage Sludge (Boczek et al., 2023)– This federal guidance document helps managers and staff understand the basis for pathogen reduction and controlling attraction to vectors in biosolids. This is the best guidance available for the purpose, and there is no state equivalent.

40 CFR Part 503 - Standards for the Use or Disposal of Sewage Sludge (U.S. Environmental Protection Agency [EPA], 1993) – the state program is based on this federal rule.

A Plain English Guide to the EPA Part 503 Biosolids Rule (EPA, 1994)– EPA developed this guidance document to help interested persons interpret requirements of the federal program. Washington's program is based on the federal program.

Fertilizing with Biosolids (Sullivan et al., 2022)– This document is a product of the joint efforts of Washington State and Oregon State Universities, by Oregon State Extension.

Other authoritative sources can inform decision-making. In particular, crop-specific nutrient management and soil sampling guidelines, typically produced by university cooperative extension services.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

NOTE: This proposal is not project specific. All facilities subject to the general permit are potentially subject to other rules or local ordinances, and must comply at the proper time.

All facilities subject the general permit are also subject to project-level SEPA review on their project specific actions as a part of the permit application process.

10. List any government approvals or permits that will be needed for your proposal, if known.

No other approvals are needed to issue this permit. Other approvals may be required for new facilities that apply for coverage, and for existing facilities with active management programs.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This proposal is to reissue the Statewide General Permit for Biosolids Management with a term of 5 years. If reissued, the General Permit, along with Chapter 173-308 of the Washington Administrative Code (WAC) will be used to facilitate Ecology's oversight of all forms of biosolids generated, treated, stored, transferred from one facility to another, sold or given away, applied to the land for beneficial use, and disposed through incineration or landfilling within the jurisdiction of the State of Washington. There are about 376 facilities subject to the General Permit currently who generate an estimated 110,000 dry tons of biosolids annually. There are industries in the state with their own independent wastewater treatment systems separate from municipal systems. This permit is not applicable to those independent industry wastewater treatment systems, nor are the solids produced from those systems considered biosolids or allowed for land application under this permit.

The state biosolids program is based on the standards established by the U.S. Environmental Protection Agency (EPA) in 40 CFR Part 503. Development of the federal program was informed by a nationwide survey of biosolids quality, and by a comprehensive risk assessment using data and information available for pollutants that can occur in biosolids. EPA performs biennial reviews of the national biosolids program requirements and has published eight reports since 2005. Treatment works that generate biosolids are required to monitor for, and keep records of, regulated pollutants in the biosolids they produce. Approvals of individual facilities under the general permit can be modified to include additional pollutants if information specific to the generating facility or the site warrants.

Washington's biosolids program is authorized by state law in Chapter 70A.226 RCW. The law establishes biosolids as a valuable commodity and directs Ecology to maximize beneficial use while protecting human health and the environment. Ecology developed rules for the state biosolids program in Chapter 173-308 WAC, Biosolids Management. These state rules meet or exceed federal rules in 40 CFR 503 implemented by EPA. The beneficial use of biosolids is a long-standing practice in the US, regulated and supported by the EPA. The general permit is authorized by, and is Ecology's mechanism to implement the Biosolids Management Rule.

Ecology may include additional or more stringent requirements to each individual facility and land application site as necessary if requirements in rule or the general permit are not specific enough to effectively protect human health and the environment. These additional requirements can be described as further efforts to mitigate impacts to human health or the environment. They are prescribed based on site-specific characteristics using guidance, like the *Biosolids Management Guidelines*, derived from research and real-world application; and experience from universities and regulatory entities.

The proposed General Permit differs structurally from the previous iteration of the General Permit issued in 2015. The new General Permit categorizes facilities into two primary groups covering three distinct permit sections: those *without* active management programs (Baseline section), and those *with* active management programs (Active Septage Management and Active Biosolids Management sections). The new structure reduces the administrative burden for some facilities that do not have active management programs.

Regardless of the permit sections a facility is subject to, all facilities subject the General Permit are also subject to project-level SEPA review on their project specific actions as a part of the permit application process.

Baseline Requirements

The Baseline section of the permit establishes requirements that apply to all facilities. Facilities without active management programs are subject only to the Baseline section of the general permit. These facilities do not engage in beneficial use. This group includes facilities where biosolids are treated in surface impoundments with no expectation of removal during the life of the general permit, and facilities where biosolids are removed and sent only to another permitted facility for further treatment, or disposal.

Existing Baseline facilities have previously submitted applications for coverage under a General Permit, undergone project-level SEPA review appropriately, applicable public notification and comment procedures, and submitted Notices of Intent to continue coverage all in a timely manner. These facilities are also subject to additional or more stringent requirements as Ecology deems necessary and will receive final coverage when the General Permit becomes effective.

Existing Baseline facilities that propose major changes in operations must submit an active management permit application prior to beginning active management operations as outlined

below under the Active Management heading. At this time, they will also be subject to additional review, additional project-level SEPA review where appropriate, applicable public notification and comment procedures, and may be subject to additional or more stringent requirements as a condition of final approval of coverage.

New facilities subject only to the Baseline section of the permit must submit a complete permit application. They are subject to project-level SEPA review, applicable public notification and comment procedures. Ecology may require additional or more stringent requirements as a condition of final approval of coverage.

Active Management Requirements

The Active Septage Management and Active Biosolids Management sections of the General Permit cover facilities with active management programs that engage in beneficial use of biosolids, including treatment to biosolids standards and land application. These new and existing facilities must submit complete permit application packages with plans that include specific information about biosolids treatment, analysis, and uses, including detailed information about proposed land application sites or programs that will sell or give biosolids away without further regulation (if applicable). Facilities subject to the Active Management sections of the General Permit must have conducted project-level SEPA review appropriately, conduct public notice and hold a public comment period all in a timely manner. These facilities are subject to further review that may include additional public notice, and incorporation of additional or more stringent requirements as a condition of final approval of coverage.

Ecology makes decisions about the need for additional requirements based on a review of existing operations where applicable, the content of an application, a review of proposed facility operations, site-specific characteristics, and public input, as applicable.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The General Permit will be applicable within the boundaries of the State of Washington for all facilities and lands under the jurisdiction of the State of Washington. The permit will not apply to federal lands, lands within the boundaries of Washington Tribal Reservations, or lands outside of Washington Tribal Reservations that are held in trust by the federal government for a Tribe. Certain conditions of state program rules and the General Permit may apply when biosolids are imported into the jurisdiction of the state.

B. Environmental Elements [HELP]

Note: This is **not** a site-specific project proposal. A programmatic review has been prepared for this proposal. The agency responses are found in Part D of the checklist. The General Permit is the mechanism by which Ecology implements the Biosolids Management Rule (Chapter 173-308 WAC). Information has been included under section B of the checklist where applicable. Questions 1-16 in this section asking for information too specific for this nonproject proposal are left blank. All facilities subject the general permit are also subject to project-level SEPA review on their project specific actions as a part of the permit application process. As such environmental elements

specific to each facility will be provided in their project proposals and receive further environmental review as required.

1. *Earth* [help]

a. General description of the site:

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other

b. What is the steepest slope on the site (approximate percent slope)?

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Not all land is appropriate for biosolids land application practices. Soil characteristics and slopes vary across Washington state and are taken into consideration when reviewing and determining if a site is appropriate to receive biosolids for land application. Where runoff potential is likely Ecology requires best management practices including those in the *Biosolids Management Guidelines*, that reduce the risk of runoff, mitigating offsite effects. Each land application site is assessed individually to determine if additional or more stringent requirements outside of those imposed by rule and permit are necessary to mitigate offsite effects. These include but are not limited to increased buffers to surface water and limited seasonal timing for land application.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Biosolids must be treated to meet pathogen reduction (PR) and vector attraction reduction (VAR) standards for land application. Processes designed to meet PR and VAR inherently work to mitigate odor generation as well. Ecology refers to the federal guidance document *Biosolids Management Guidelines Control of Pathogens and Vector Attraction Reduction in Sewage Sludge* to guide biosolids facilities in effectively managing pathogens and vectors as required by the regulatory process.

Where odor potential is likely Ecology requires best management practices including those in the above guidance and *Biosolids Management Guidelines*, that reduce the likelihood of odors, mitigating offsite effects. Each land application site is assessed individually to determine if additional or more stringent requirements outside of those imposed by rule and permit are necessary to mitigate offsite effects. These include but are not limited to increased buffers to neighboring properties and incorporation or injection of odorous biosolids that have met PR and VAR requirements.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

2) Could waste materials enter ground or surface waters? If so, generally describe.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Groundwater levels and surface water locations vary across Washington state and are taken into consideration when reviewing and determining if a site is appropriate to receive biosolids for land application. Where runoff potential is likely Ecology requires best management practices including those in the *Biosolids Management Guidelines*, that reduce the risk of runoff, mitigating offsite effects. Each land application site is assessed individually to determine if additional or more stringent requirements outside of those imposed by rule and permit are necessary to mitigate offsite effects. These include but are not limited to restricting land application to times when groundwater is at least 3 feet from the ground's surface, increasing buffers to surface waters, limiting temporary storage, assigning larger buffer zones where appropriate, approving specific land application windows based on annual weather patterns, and land applying at Ecology approved agronomic rates.

4. Plants [help]

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

c. List threatened and endangered species known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.

c. Is the site part of a migration route? If so, explain.

d. Proposed measures to preserve or enhance wildlife, if any:

e. List any invasive animal species known to be on or near the site.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Each year about 80% of biosolids generated in Washington state are land applied. A comprehensive GHG calculator tool, the Biosolids Emissions Assessment Model (BEAM), found that the end use of biosolids associated with the greatest GHG emissions reduction—land application--also had the lowest costs associated. (Brown et al., 2010) Biosolids land application practices can often lead to negative GHG emissions, otherwise referred to as carbon credits, by sequestering carbon and by avoiding the use of chemical fertilizers. This work suggests that land application of biosolids is a cost-effective means of lowering a wastewater treatment plant's carbon footprint.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

4) Describe special emergency services that might be required.

Proposed measures to reduce or control environmental health hazards, if any:
In Washington state, biosolids are not considered a solid waste when managed appropriately. Biosolids are a valuable commodity per RCW 70A.226.005. All transporters of biosolids must have an approved spill prevention and response plan. This plan includes spill prevention measures, spill clean-up measures, and spill response (who to contact). In the case of a spill Ecology will be contacted as soon as possible, but at least within 24 hours. Others that may be contacted include Washington Department of Fish and Wildlife, Washinton Department of Transportation, and local health jurisdiction.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

2) What types and levels of noise would be created by or associated with the project on a
short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

3) Proposed measures to reduce or control noise impacts, if any:

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

c. Describe any structures on the site.

d. Will any structures be demolished? If so, what?

e. What is the current zoning classification of the site?

f. What is the current comprehensive plan designation of the site?

g. If applicable, what is the current shoreline master program designation of the site?

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

i. Approximately how many people would reside or work in the completed project?

j. Approximately how many people would the completed project displace?

k. Proposed measures to avoid or reduce displacement impacts, if any:

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Biosolids improve agricultural and forest lands by improving soil qualities/properties.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

c. Proposed measures to reduce or control housing impacts, if any:

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

b. What views in the immediate vicinity would be altered or obstructed?

c. Proposed measures to reduce or control aesthetic impacts, if any:

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly
occur?

b. Could light or glare from the finished project be a safety hazard or interfere with views?

c. What existing off-site sources of light or glare may affect your proposal?

d. Proposed measures to reduce or control light and glare impacts, if any:

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

b. Would the proposed project displace any existing recreational uses? If so, describe.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

h. Proposed measures to reduce or control transportation impacts, if any:

Individual facilities cover transportation impacts specific to their operations in their project-level SEPA. In some instances, Ecology includes additional or more stringent transportation requirements as a condition of final approval of coverage. This can include identifying the most appropriate routes and times of the day, week, and/or year where transportation is allowed or prohibited. In addition, all facilities subject to the General Permit must also abide by other laws, regulations, and ordinances including local transportation laws per WAC 173-308-030.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

b. Proposed measures to reduce or control direct impacts on public services, if any.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Name of signee Emily Kijowski

Position and Agency/Organization State Biosolids Program Coordinator; Ecology Solid Waste Management Program

Date Submitted: September 27, 2024

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Reissuing the General Permit is not likely to cause an increase in discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise due to the nature of biosolids operations as well as mitigation efforts built into the general permit.

Biosolids are an unavoidable byproduct of our municipal wastewater treatment facilities. As such they can contain contaminants from up stream, pre-wastewater treatment sources, including from products that we encounter on a regular basis.

Implementation of a permitting system for biosolids management is mandated RCW 70A.226. The general permit, and the process of requiring facilities to obtain coverage thereunder, is a mechanism to ensure appropriate handling, beneficial use, or disposal of biosolids. Implementation of the general permit is not the cause of biosolids generation; rather, it helps ensure appropriate handling of these materials. Without the general permit in effect, wastewater treatment will not halt, nor will the generation of biosolids.

Beneficial use of biosolids has been the *primary* method of sewage sludge management in Washington since at least 1992. This general permit will be the fifth since program inception. On average, each year about 65% of biosolids generated in Washington State are applied to the land directly, and 15% are sold or given away to individuals (including in the form of biosolids compost and soil products). About 20% of biosolids are disposed. These conditions have been consistent for many years.

Definitions

In this checklist, the following terms will be used:

Contaminant – is a substance that makes the biosolids impure. Generally, contaminants in biosolids occur in very low concentrations, below the level where an adverse effect is expected.

Pollutant – is a contaminant that is regulated in biosolids by EPA and Ecology.

Unregulated Pollutant – a contaminant that is not regulated in biosolids by EPA and Ecology. This term can be confused with Pollutant so it will not be used in this document.

Contaminant of Emerging Concern (CEC) – is a contaminant that is known or probable to occur in biosolids but not enough information is available to determine if levels in biosolids pose significant risks to human health or the environment.

Regulated Pollutants

Biosolids contain pollutants that are subject to regulation under the federal and state biosolids programs. Ecology has relied on the EPA's federal authority and expertise to

determine whether regulation of new contaminants in biosolids is necessary. When it initially established the federal biosolids regulations in 40 CFR 503, EPA conducted a robust risk assessment that described different pathways of exposure to contaminants in biosolids and described maximum risk to different populations. The result was a decision to regulate nine specific pollutants that EPA knew occurred in biosolids and were potentially found in concentrations that could cause problems with either human or environmental health. (EPA, 1995, pp. 98-107) Those pollutants are arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. Some of those are also essential nutrients for plants and animals. In that sense, the permit will authorize the release of pollutants, but within the limits of established regulations.

Since establishing the federal biosolids program, the EPA regularly conducts literature reviews of contaminants that may be present in biosolids for the purpose of identifying additional contaminants to review and monitor. If new contaminants are identified, the EPA conducts a robust risk analysis to determine if regulation is necessary to protect human health and the environment. This process is mandated and outlined by the Clean Water Act. It is important to note that the identification of a contaminant does not automatically result in regulatory action, because the mere presence of a contaminant does not mean that the contaminant is present in amounts that are harmful to human health and the environment.

Contaminants of Emerging Concern

A constant topic of discussion related to biosolids and land application is contaminants of emerging concern (CEC). This is looked at closely by the public, researchers, and regulators. These CECs originate from the activities of businesses and individuals and, as a result, end up in our wastewater treatment systems and potentially biosolids. As the name implies, CECs are the focus of substantial, ongoing research to increase our understanding of them. Often there is incomplete or unavailable information to determine if regulatory action is necessary, and what that action needs to look like. This research is necessary to inform regulatory decisions. Adoption of extremely low regulatory limits for contaminants before we understand if they pose a risk could have adverse consequences for biosolids recycling. Such limits could interfere with established goals and benefits of recycling programs and may not provide demonstrated risk-reduction for human health and the environment.

The EPA awarded grant funding to a group of researchers well-versed in biosolids in 2021 with the goal of furthering our knowledge of these contaminants. This group of researchers started with 910 biosolids-borne contaminants derived from EPA lists and has narrowed this list to 44 unregulated organic chemicals (UOCs) classified as high-priority based on mobility, persistence, bioaccumulation, and toxicity. (EPA, 2023-a) The results of this work are intended to “support states, municipalities, and utilities in determining potential risk from contaminants found in biosolids and developing standards and policies for biosolids management.” (EPA, 2020-b, pp. 2) The EPA continues to support the beneficial use of biosolids while it makes efforts toward determining whether regulation is needed with respect to CECs.

Among the CECs being discussed today are PBDEs, PFAS and microplastics. Research has found PFAS and PBDEs in biosolids at differing levels around the US, including Washington State. The research around microplastics in biosolids is still young. There is still no standardized methodology for identification and quantification of microplastics, but there is ongoing investigation into their presence in biosolids and their effect on human health and the environment. These three contaminants and the associated research conducted on each are representative of three different stages of the analysis process EPA conducts when

determining whether regulation in biosolids is necessary. One commonality with these different stages is that research is always ongoing. Should new research identify a contaminant as a risk and the EPA identify appropriate risk based, regulatory limits, Ecology will implement those limits in state rules as well.

There has been significant research conducted on PBDEs in biosolids which is the basis for there not being a federal regulation implemented with respect to PBDEs and biosolids. We have seen this same conclusion reached for many CECs in the past including, Cadmium, Mercury and pharmaceuticals like Tylenol.

Our understanding of PFAS in biosolids is less developed and still evolving. We have a method for detection of this contaminant in biosolids, and there have been many studies conducted on this topic so our understanding is more complete in comparison to microplastics in biosolids. However, a risk-based assessment has still not been conducted for PFAS in biosolids. The EPA is currently working on this effort specifically for PFOS and PFOA (two types of PFAS chemicals) in biosolids that will help it determine if management of these contaminants in biosolids is necessary. (EPA, 2020-a, pp. 1)

Finally, our understanding of microplastics is limited as this is a contaminant that we have only become aware of fairly recently. Most notably, there is still no standardized methodology for identification and quantification of microplastics (EPA, n.d.-a, para. 3; Christian & Koper, 2023) As such, there isn't yet a standardized methodology to identify and measure microplastics in biosolids. The EPA is working to characterize and assess microplastics and other entities have begun to conduct much needed research on this contaminant, but it is still very much in the beginning stages.

PBDEs

Our understanding of PBDEs in biosolids is well developed and has not resulted in regulatory action in biosolids by the EPA. PBDEs can be found in our environment today due to their widespread historic use as flame retardants in the manufacturing of textiles, electronics, and construction materials. PBDEs are not chemically bound to the products in which they are used, which makes it easier for them to migrate and enter the environment. (Environmental Protection Agency [EPA], n.d.-b, para. 1, 3) The three most common commercial mixtures produced and used, c-pentaBDE, c-octaBDE, and c-decaBDE, were phased out of use in the US by 2012. (EPA, 2009, pp. 1, 10; Washington State Department of Ecology [DOE], n.d.-b)

Harrad & Hunter (2006) conducted a study in and around Birmingham, the second largest city in England, and found urban areas act as sources of PBDEs to the wider environment around them. They found high concentrations of PBDEs in the city center and lowering concentrations further out, and found that volatilization from environmental surfaces (soils) is not a significant source. Rather they hypothesize indoor environments contaminated with PBDEs from consumer goods in urban areas results in significant emissions to the atmosphere. (Harrad & Hunter, 2006, pp. 4551).

Hale et al. (2012, pp. 1) looked at presence, persistence and plant uptake of PBDEs, in which no measurable uptake into corn plants was found from biosolids amended soils due to the biosolids ability to tightly bind these compounds. This work also referenced other studies showing plant uptake when PBDEs are highly elevated from soils contaminated with electronic recycling waste, spiked with PBDEs, or grown in undiluted biosolids. Here they found decreasing PBDE levels from roots to stems and leaves. These practices are not representative of Washington state biosolids application practices, nor would they be allowed under our rule or permit. They are also problematic as they tend to exaggerate

bioavailability of contaminants. Studies like these can be helpful in showing potential outcomes in extreme or opportune conditions, but they are not indicative of real-world application, nor should regulatory decisions be made based on their conclusions.

Ecology developed a Chemical Action Plan (CAP) for PBDEs in 2006. The PBDE CAP acknowledges the presence of PBDEs in biosolids but did not classify biosolids as a significant source of release of PBDEs to the environment. Instead, Washington state and EPA efforts on reducing human and environmental exposure to PBDEs have focused on source reduction via banning or phasing out of the compounds in manufacture, sale, and import as well as identifying safe alternatives. (DOE & Washington State Department of Health [DOH], 2006, pp. x-xi; EPA, 2009, pp. 13-14) Restricting the manufacture of these chemicals has been shown to reduce some PBDEs in foodstuffs (Ma et al., 2023) and biosolids, (Andrade et al., 2015). Meng et al. (2023) found no substantial decline in certain PBDEs in blood and breast milk on a global scale and suggest this may be due to legacy PBDEs in products still in use that may continue to release into the environment. Regulatory limits for PBDEs in biosolids have never been implemented because biosolids have not been found to constitute a significant pathway for release of PBDEs to the environment.

PFAS

Per- and polyfluoroalkyl substances are a group of chemicals that are resistant to natural decomposition and sometimes referred to as “forever chemicals”. Because of their mass production and use they are ubiquitous in our environment today, both indoors and out. PFAS make their way into wastewaters from both residential and industrial discharges. PFAS compounds have been identified in influent, effluent, and sewage sludge or biosolids across the US, including Washington state, due to their persistence and extensive use. Although our understanding of PFAS has improved, uncertainty still exists with respect to human and environmental impacts from biosolids contaminated with PFAS. A better understanding of its bioavailability, accurate modeling of how PFAS moves between biosolids, soil, ground water, surface water, and crops, and a robust risk assessment is necessary.

When researching such technically complex topics like biosolids and PFAS, work from reputable sources is of most value. Researchers that have spent a considerable amount of their careers working on both biosolids and PFAS have produced some compelling work and continue to do so as this is an evolving science. We spoke at length about what experienced researchers have found so far in our PFAS Chemical Action Plan, initially published in 2021.

The PFAS CAP biosolids section included discussion about data and modeling uncertainties which can inhibit accurate assessment of risk to human health and the environment from biosolids-sourced PFAS land applied at agronomic rates in Washington. (DOE & DOH, 2022, pp. 432-433) The sorption of PFAS to soil influences their fate and distribution in the environment. Carbon-chain length seems to impact their persistence in soils. Longer carbon-chains are less mobile. (Venkatesan & Halden, 2013) Organic-carbon partitioning coefficients (KOC) are used to predict mobility of organic contaminants in the environment and vary based on the methodology used for calculating. (Snyder, O’Connor, & McAvoy, 2010) Determining appropriate KOC values reflective of biosolids-sourced PFAS compounds has proven difficult and may indicate we don’t have the necessary information yet to adequately model their movement in a soil system.

PFAS with lower sorption are likely to leave wastewater treatment in the effluent. This may reduce overall PFAS amounts and provide an inherent bias for higher sorption congeners (higher KOC) to remain in biosolids. Which may result in reduced mobility of biosolids-

sourced PFAS relative to the suite of PFAS congeners found in the WWTP influent. Thus, field-scale studies investigating the transfer or leaching of biosolids-sourced PFAS in natural soil systems are important to evaluate actual mobility and risk from biosolids land application.

Leaching models take many characteristics into consideration including KOC and the Fraction of Organic Carbon (FOC). Small changes in these characteristics directly affect model outcomes. If unrealistic characteristics are used in models, the results produced are not valuable or appropriate. For example, Alaska Department of Environmental Conservation (ADEC) evaluated soil standards based on a leaching model using an unrealistic FOC and an FOC that was not field verified. ADEC's online calculator run with more realistic inputs for organic content and partitioning coefficients resulted in significantly higher calculated soil PFAS limits (Lono-Batura et al., 2018, pp. 8-9). Similarly, the State of Maine ended up with unrealistic PFAS screening limits for biosolids based on fate and transport models, rather than real-world research. (Maine Department of Environmental Protection, 2018, Appendix A)

The research above continues to prove true as we see additional studies conducted on PFAS and biosolids. Pepper et. al. (2021) looked at long term land application of biosolids and PFAS loading implications and found irrigation water added similar levels of PFAS to the soils when compared to biosolids. They also observed about 73% attenuation of PFAS occurred in the top 183 cm of the soil surface suggesting potential for ground water contamination is relatively low. Wen et al. (2014) looked at uptake of PFAS into wheat roots, straws, husks, and grains, and found the concentration of PFAS decreased as you move up the plant with minimal uptake into the grain or edible portion of the crop. Research also shows PFAS crop uptake from soils contaminated with PFAS is highly dependent on many factors like crop species and plant part, chain length, functional group, and soil organic matter. and it is generally limited to the non-food parts of the crop. We also see that PFAS crop uptake from biosolids contaminated with PFAS into the edible portions of the plant can occur, predominately by the short chain PFAS. (Ghisi et al., 2019) (Wen et al., 2014) (Yang et al., 2024) (Brusseau, 2023)

Recent Food and Drug Administration (FDA) sampling of US grocery store produce did not detect PFAS in any fruit or vegetable items. (Food and Drug Administration [FDA], 2021) In this same body of work, the FDA noted that PFAS being taken up by crops is dependent on many things, so contamination of the environment where food is grown is not indicative of dietary exposure to PFAS. (FDA, n.d., para. 17)

We also understand researchers familiar with both biosolids and PFAS are currently conducting many additional studies on this topic that are yet to be published that bolster this work. The continued and evolving work being conducted on PFAS and biosolids is evidence that we don't have all the necessary information yet to determine whether regulatory action is necessary. A better understanding of PFAS bioavailability, accurate modeling of how PFAS moves between biosolids, soil, ground water, surface water, and crops, in different climates and geographic locations and a robust risk assessment is necessary.

Exaggerated Data

In addition to work conducted by reputable sources well-versed in both biosolids and PFAS, many studies have been conducted on the impacts of CEC contaminated biosolids being land applied that exaggerate or misconstrue the data. Common examples include studies that use pots, containers or greenhouses rather than using field conditions, or application rates much higher than what would be allowed in Washington state. Such studies can be helpful in showing potential outcomes in extreme or opportune conditions, but they are not

indicative of real-world application. Blaine et al (2013) articulates the issues with, and inaccuracies of these types of studies and compares crop uptake of PFAS from industrially impacted biosolids, municipally impacted biosolids and a control in both greenhouse and field conditions. Through this and other similar work, Blaine et al. (2014) found crops grown on soils amended with municipal biosolids (not impacted by PFAS industries) are unlikely to be a primary source of PFAS exposure. This work also highlighted what many other studies have found, that plant uptake of PFAS from biosolids varies with soil properties, crop type, and biosolids application rate, and more work is needed to verify trends.

It is important to note that exaggerated data is the result of the study parameters and can occur with any contaminant or pollutant, not only PFAS.

EPA Efforts on PFAS

The EPA is also undertaking significant work to evaluate the risk of PFAS present in biosolids, as addressed in its PFAS Strategic Roadmap (2021, pp. 15-16). It is conducting a risk assessment on PFOS and PFOA in biosolids that will serve as the basis for determining how to manage these contaminants in biosolids, and if regulation is necessary. (EPA, 2021, pp.16) It is also working on a risk screening tool specific to biosolids that streamlines and improves upon the robust risk assessment process conducted when the EPA first developed the federal rules applicable to biosolids under 40 CFR Part 503. The Biosolids Screening Tool is a model that is intended to be used to assess the risk of contaminants in biosolids following different pathway and exposure scenarios. The tool's framework was recently reviewed by a science advisory board made up of experts with demonstrated expertise in biosolids management, risk assessment, exposure assessment, probabilistic modeling, and deterministic modeling. While the science advisory board commended the EPA on their work, they also highlighted some potential pitfalls and limitations in the framework, which may be an indication of additional work needed prior to making the tool available. (EPA, 2023-b, pp.1-2). The EPA is currently working to respond.

The EPA continues to support the beneficial use of biosolids while they make efforts toward determining whether regulation is needed with respect to PFAS. The EPA has summarized the benefits of biosolids land application on their webpages as follows:

"When applied to land at the appropriate agronomic rate, biosolids provide a number of benefits including nutrient addition, improved soil structure, and water reuse. Land application of biosolids also can have economic and waste management benefits (e.g., conservation of landfill space; reduced demand on non-renewable resources like phosphorus; and a reduced demand for synthetic fertilizers)." (EPA, n.d.-d, para. 2)

Ecology Studies on PFAS

Ecology's Water Quality program conducted a small study on the presence of PFAS in influent, effluent and biosolids or sewage sludge at three facilities in 2022 with known industrial inputs and impacts from historical AFFF contamination in the area. (Bothfeld & Mathieu, 2022) The PFOA and PFOS results were an order of magnitude lower than those concentrations that Thompson et al. (2022) calculated for a national non-industrial biosolids and sludge mean for PFOA and PFOS. The results from the WA study were also very similar to Michigan's average PFOS concentration in non-industrially impacted biosolids (18 ng/g). The results for all participating facilities were well below Michigan's initial industrial threshold (Michigan Department of Environment, Great Lakes, and Energy [EGLE], 2021, pp. 11) and current PFOS industrial threshold of 100 ng/g. (EGLE, 2024) Although the 2022 Washington state study was small, the results support the conclusion that finding highly elevated PFAS levels in WA generated biosolids is unlikely.

The Ecology biosolids program is also currently conducting a small biosolids PFAS study, sampling biosolids or sewage sludge for PFAS at 44 different wastewater treatment plants across the state. Although the results from this work are not robust enough to directly inform regulatory decisions, it is an important step in characterizing PFAS levels in WA generated biosolids.

Source Reduction

Regulated pollutants and other contaminants contained in biosolids will decrease as the use of toxic chemicals in manufacturing is reduced. The most relevant example of source reduction is PFOS and PFOA, two long-chain PFAS compounds that have had their uses extremely reduced over the past two decades. Since this occurred, the levels of PFOS and PFOA have dropped significantly in both human blood. (Agency for Toxic Substances and Disease Registry, n.d.)

Ecology's Water Quality Program has a pretreatment program in place that aims to remove contaminants from industrial dischargers before they make it to municipal wastewater treatment plants. "Because PFAS is persistent, highly resistant to treatment, and nearly ubiquitous in our environment, preventing contamination of municipal wastewaters in the first place is the most effective way to protect water quality" (DOE, n.d.-c, para. 1). They are implementing monitoring and source-reduction efforts in National Pollutant Discharge Elimination System (NPDES) permits on a case-by-case basis as appropriate per EPA Guidance on water quality permitting. (EPA, 2022, pp. 2-4)

As noted above, source reduction is an effective management practice for any contaminant or pollutant, not only PFAS.

Case Studies: PFAS

Other states that have seen issues with elevated levels of PFAS in biosolids or soils have also noted that these levels are a result of historical direct PFAS manufacturer impacts or industry that uses PFAS in their operations and discharges directly to municipal wastewater treatment plants.

One specific example we spoke to in the PFAS CAP (2022, pp. 427-428) is the instance in Decatur Alabama where industry direct discharge impacted biosolids PFAS levels. This WWTP's sewage sludge data is fragmentary but showed elevated levels of PFOA in 2005 and 2006, ranging from about 500ng/g to 1800ng/g. After significant reduction in industrial discharges to the treatment plant, the PFOS concentrations were reduced as well ranging from 50-128ng/g in 2007, and 27-32ng/g in 2008. These biosolids were land applied to agricultural fields for more than a decade at much higher agronomic rates than would be allowed in Washington state. Due to concerns of PFAS contamination the EPA conducted some soil sampling in 2007 and 2009. The highest PFOA concentrations from sludge-applied fields were less than or equal to 320 ng/g, and PFOS were less than or equal to 410 ng/g (Washington et al., 2010). From the perspective of an agronomic evaluation, application rates used for the Decatur biosolids would have likely resulted in excessive nitrogen accumulations and leaching of nitrate. Such rates would be unlikely to receive regulatory approval in Washington.

In response to a Sierra Club publication about PFAS and biosolids, the California Association of Sanitation Agencies (CASA) provides an in depth explanation of several incidences of elevated PFAS levels in Maine and Alabama soils, groundwater, and animal byproducts due to historical sludge and biosolids land application practices. (CASA, 2022, pp. 7-10) These incidences of contamination were caused by historical land application events of paper mill residuals, and biosolids generated at a wastewater treatment facility

that received high discharges from a PFAS manufacturer. These practices are not indicative of typical applications of municipal biosolids across the country including Washington state, and thus are not common occurrences.

We can reasonably assess that the worst-case scenarios other states have seen are not likely to result from current land application practices in Washington state. The incidences where high levels of PFAS were identified and impacts from them realized, were a result of historical practices conducted in ways that are not representative of current Washington state practices regulated and authorized under the general permit. Washington state has no known manufacturers of PFAS, and so does not expect biosolids generated in Washington state to contain high levels of PFAS. In addition, in Washington some industries operate their own wastewater treatment systems, the residuals or industrial sludges generated at these facilities are not considered biosolids and are not permitted for land application under the biosolids program. Only sludges generated by municipal wastewater treatment plants treated to the biosolids standards for beneficial use are allowed for application to the land and must be done so at an appropriate agronomic rate and in keeping with all other state and federal rules and permit requirements.

Microplastics

Microplastics (MPs) are ubiquitous in our environment today due to the increasingly high use and production of plastics around the world. (EPA, n.d.-a, para. 1,3; Zalasiewicza et al., 2016) Plastics have been in production since the mid-20th century, and our use of this easily disposable but indispensable material has increased dramatically since then. In 1950, globally we made about 2 million tons of plastic and by 2015 we were making 300 million tons annually. It has been estimated based on current trends that global plastic production will reach 40 billion tons by 2050. (Zalasiewicza et al., 2016, pp. 5) As plastics age they breakdown at differing rates becoming MPs and are difficult to remove from the environment. They have been found in many foods, table salt, drinking water, and air. (Zhang et al., 2020)

Our understanding of MPs and the risks they pose to human health is limited. Studies conducted on the impacts of land application of biosolids contaminated with MPs present conflicting evidence on the negative impacts. Many studies on MPs make mention of our still minimal understanding of these compounds, including most notably our lack of standardized methodology for identification and quantification of MPs, which produces incomparable data. (EPA, n.d.-a, para. 3; Christian & Koper, 2023, pp. 1-5) The EPA defines MPs as plastic particles ranging in size from 5mm to 1nm, whereas other studies include plastic particles with a diameter under 1mm, or 100nm to 5mm, etc. The EPA supports the need to establish standardized collection, extraction, quantification and identification methodology to improve our understanding of MPS and enable for comparison across studies. They are working to characterize and assess MPs as they do with all CECs that may be present in biosolids, but are not as far along in this work compared to PFAS and biosolids. (EPA, n.d.-a) Additional peer-reviewed work that is replicable and representative of real-life biosolids land application is needed to better understand MPs levels in biosolids and their fate and transport in the environment from land application of biosolids.

Summary

Research is ongoing on these three contaminants as well as others the EPA has identified for further scrutiny. The practice of gathering risk-based information about a contaminant before taking regulatory action is integral to ensuring appropriate protection of human health and the environment. Adoption of extremely low regulatory limits for contaminants before we understand if they pose a risk could have adverse consequences for biosolids recycling.

Such limits could interfere with established goals and benefits of recycling programs and may not provide demonstrated risk-reduction for human health and the environment. Should new research identify a contaminant as a risk and the EPA identify appropriate regulatory limits, Ecology will implement those limits in our state rules as well.

Proposed measures to avoid or reduce such increases are:

Even though this proposal is not expected to result in increased release of pollutants, beneficial use activities of individual facilities subject to the General Permit are evaluated and regulated based on specific proposals in permit applications required under the general permit. The proposed permit is written to ensure protection of human health and the environment while beneficially using biosolids to the greatest extent possible as mandated in chapter 70A.226 RCW.

The Biosolids Management Rule incorporates mitigation efforts throughout that are protective of human health and the environment, and further ensure adherence with other applicable regulations such as RCW 90.48, RCW 70A.226, WAC 173-200-030, WAC 173-201A-010. Some of these mitigation efforts are directly outlined in rule language and implemented via the General Permit some examples include:

- WAC 173-308-170 and -180 requires biosolids to meet pathogen reduction and vector attraction reduction requirements to greatly reduce the volatile organic solids and presence of organisms that cause human disease, thus mitigating the potential for biosolids to result in spreading disease or causing noxious odors.
- WAC 173-308-190 requires application of biosolids to the land at an approved agronomic rate based on nitrogen needs. Agronomic rates are designed to protect groundwater from excess nitrate, and soils are monitored to validate application rates. Ecology must approve agronomic rates prior to land application activities beginning.
- WAC 173-308-191 prohibits the land application of biosolids when they are likely to adversely affect threatened or endangered species or critical habitats under Title 232 WAC or section 4 of the Endangered Species Act.
- WAC 173-308-280(3) prohibits storage of biosolids in a manner that would be likely to result in the contamination of groundwater, surface water, air, or land under current conditions or in the case of fire or flood.
- WAC 173-308-210(5) and 270(4) establish minimum buffer requirements from wells and surface waters.

All facilities subject to the general permit are also subject to project-level SEPA review on their project specific actions where these topics are also covered.

The flexible nature of the General Permit enables Ecology to include additional or more stringent requirements to each individual facility and land application site as necessary if requirements in rule or permit are not stringent enough to effectively protect human health and the environment. These additional requirements can be described as further efforts to mitigate impacts to human health or the environment. They are prescribed based on site characteristics; guidance, like the *Biosolids Management Guidelines*, derived from research and real-world application; and experience from universities and regulatory entities. Some examples of such mitigation efforts include:

- Assessing site characteristics like slope, crop type, soil type and public or livestock access in determining if it's appropriate to receive biosolids.
- Buffer zones between biosolids application sites and neighboring properties or waters of the state. Varying buffers to property boundaries and sensitive areas (such as surface waters and wetlands) are required at land application sites. The minimum buffer to surface water is ten meters under federal and state rules (WAC 173-308-210(b)). In practice, actual buffers are typically wider. Ecology's *Biosolids Management Guidelines* address agricultural site suitability in chapter 4. Depending on slope, soil type, amount cover, and method of application, buffer widths range up to 200 feet and could be increased if appropriate. (DOE,2000)
- Restrictions on land application during rain and snowfall or based on depth to groundwater. Seasonality of application may also be restricted to avoid high rainfall or flood events, and some sites require checking for the presence of shallow groundwater prior to beginning application. If groundwater is less than three feet from the surface of the land at any time, a groundwater protection plan is required per WAC 173-308-90003.

Ecology's Water Quality program also implements a pretreatment program that reduces or alters discharges of pollutants and contaminants from significant industrial dischargers to municipal wastewater treatment plants. In some cases, program authority is delegated to local government. When pollutants and contaminants are reduced before they enter the sewer system, water quality and biosolids quality are protected.

EPA has been working on a risk assessment specifically for PFOS and PFOA in biosolids, as well as a sampling methodology for PFAS in biosolids that is near final in 2024. Their current top priority for the national biosolids program is development of a new risk-screening tool that can be used to further evaluate risks from contaminants. The screening tool will help EPA determine whether additional research or regulatory standards are needed to be adequately protective. The screening tool is still in the design phase. In 2023 a Science Advisory Board (SAB) composed of nationally and internationally recognized scientists and experts in the biosolids field convened to provide scientific and technical review and recommendations on the draft tool. The EPA is currently working to respond to the SAB comments and recommendations. Ecology is monitoring these activities and expects to continue participating with EPA in national program development.

2.How would the proposal be likely to affect plants, animals, fish, or marine life?

The proposed general permit is not expected to have an adverse effect on plants, animals, fish, or marine wildlife. To the contrary, decades of scientific research have shown that biosolids provide needed nutrients and organic matter to soils for healthy crop and forest production. The use of biosolids reduces the need for synthetic fertilizer, increases soil organic matter content and water retention, and reduces erosion. Biosolids have been shown to improve habitat, which in turn has a positive impact on wildlife. In fact, biosolids are a proven component of successful land reclamation projects following major disturbances such as mining. These areas show more rapid establishment of native plants and migration of animals back into the area. (Brown & Henry, 2015)

Biosolids are not expected to affect fish or marine life. Mitigation measures in place in the General Permit are in place to minimize potential for biosolids or biosolids components from entering surface waters of the state.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Site-specific permit conditions include mitigation efforts including those outlined above in question D 1 like buffers to surface waters, restrictions on seasonality of application to avoid high rainfall and flood events and checking for the presence of shallow groundwater. Biosolids are applied to the land at an agronomic rate. Along with required buffers, this protects our ground and surface water resources and associated wildlife.

Biosolids application is mostly associated with conventional farming practices. Land application could affect plants on forested sites by favoring the growth of some species over others. Sites where Class B biosolids are applied to the land are subject to project-level SEPA review which facilitates identification of sensitive plant or animal populations and allows for the inclusion of additional or more stringent requirements as needed.

3.How would the proposal be likely to deplete energy or natural resources?

We do not expect the biosolids general permit to deplete energy or natural resources. In fact, biosolids land application practices can often lead to negative Green House Gas (GHG) emissions, otherwise referred to as carbon credits for municipalities. They also help build and replenish soils depleted by farming and other activities.

Proposed measures to protect or conserve energy and natural resources are:

Studies have shown biosolids to be an equal and sometimes superior substitute for commercial fertilizers, thus reducing the demand for synthetic fertilizer products.

Many facilities across Washington state use anaerobic digestion to treat biosolids, and capture the methane released as a source of energy. This process to treat biosolids followed by land application is proven to be one of the most effective ways to reduce GHG emissions. A comprehensive GHG calculator tool, the Biosolids Emissions Assessment Model (BEAM), was developed for Canadian municipalities to estimate their GHG emissions from the environment, which compares GHG emissions from the wastewater treatment process through generations of biosolids and end use (Brown et al., 2010).

The BEAM model found that minimizing landfilling of biosolids can significantly decrease the GHG emissions from biosolids management practices. In addition, the end use options associated with the greatest GHG emissions reduction (land application) also had the lowest costs associated. Biosolids land application practices can often lead to negative GHG emissions, otherwise referred to as carbon credits, by avoiding the use of chemical fertilizers and through sequestering carbon. This work suggests that land application of biosolids is a cost-effective means of lowering a wastewater treatment plant's carbon footprint.

4.How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

We do not expect any adverse effect. Parks, wilderness areas, and wild and scenic rivers are likely too remote to be desirable for the land application of non-EQ biosolids. It is possible that EQ biosolids might be used to develop a public site such as a park.

Proposed measures to protect such resources or to avoid or reduce impacts are:

The amount of biosolids generated is small in comparison to demand, and there is a large demand for application to agricultural and forested lands. Some sites may contain or be

adjacent to critical habitat, historic or cultural sites, wetlands, or floodplains. Wherever Class B (non-exceptional quality biosolids) are applied to the land, a project-level SEPA review is required on the specific site. Review of a permit application and associated SEPA checklist will identify these types of resources and Ecology can include additional or more stringent permit conditions to ensure protections are in place.

For some terrestrial animal and plant habitats, biosolids may benefit them. For aquatic animal and plant habitats we mitigate exposure to waterways to prevent materials from getting into waterways.

The use of non-exceptional quality biosolids is prohibited, generally, wherever it might adversely affect a threatened or endangered species or its critical habitat (WAC 173-308-191), identification of which is a required component of site-specific land application plans (WAC 173-308-90003).

WAC 173-308-210(b) prohibits application to wetlands unless authorized by permit. In practice, the agency does not allow application of biosolids to functioning wetlands. Some farmland contains areas of hydric soils – where the water table fluctuates. Even though crops are grown in those areas, when they are identified during permit review, application may be restricted or limited to times when groundwater is not near the surface.

5.How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

We do not anticipate conflicts with existing plans. All proposed Class B land application sites are all reviewed by Ecology to determine if it is appropriate to receive biosolids. When Class B (non EQ) biosolids are applied to the land, public access may be restricted for up to a year, and harvest of some crops may be restricted for up to thirty-eight months after application.

While exceptional quality biosolids (EQ) are not regulated once distributed, per WAC 173-308-260 they must be distributed with a label containing information about appropriate agronomic application rates or guidance on how to determine appropriate agronomic application rates which encourages proper use of the product and protection of public health and the environment. Less than 20% of biosolids meet EQ criteria. A primary use of EQ products is on lawns and home gardens, and as components of topsoil and compost products.

Proposed measures to avoid or reduce shoreline and land use impacts are:

Compatibility with project plans and land use would be addressed during the application process that includes site specific review, SEPA review, and public notice. The general permit requires mitigation efforts including those outlined above in question D 1 like buffers to protect surface waters. Any proposal for application of Class B biosolids in a shoreline area would require site evaluation, SEPA review, and public notice, and land application at an approved agronomic rate at a minimum. Ecology could include additional or more stringent requirements for each individual site as necessary to protect public health and the environment.

6.How would the proposal be likely to increase demands on transportation or public services and utilities?

The proposal is unlikely to increase demands on transportation or public services. Biosolids must be periodically removed from all facilities because they are an integral product of the wastewater treatment process. Consideration for any increases in the demands on

transportation or public services such as appropriate driving routes, traffic impacts or limitations will be addressed by each facility individually during their project-level SEPA review.

Proposed measures to reduce or respond to such demand(s) are:

Individual facilities cover transportation impacts specific to their operations in their project-level SEPA. In some instances, Ecology includes additional or more stringent transportation requirements as a condition of final approval of coverage. This can include things like identifying preferred routes for truck traffic based on traffic impacts, seasonal limitations related to freeze/thaw cycles, and times of the day, week, and/or year where transportation is allowed or prohibited. In addition, all facilities subject to the General Permit must also abide by other laws, regulations, and ordinances including local transportation laws per WAC 173-308-030.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

We do not anticipate conflicts with other laws. The general permit is written in accordance with chapter 173-308 WAC, as authorized by chapter 70A.226 RCW. The state program is designed to meet the standards of federal rules in 40 CFR 503, as authorized by the Clean Water Act. WAC 173-308-030 identifies compliance with other federal, state, and local laws.

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A full list of references is provided below. Reference documents not readily available online are identified with an asterisk (*) and are included in Appendices A, B, and C in the same order they appear in the list below. The reference documents were split into three Appendices to accommodate the SEPA Register upload size limit.

Ecology will also provide electronic copies of all references upon request.

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