IMD for Functionally Equivalent Discharges: Determining if a WPCF permit should be a NPDES permit under the Maui Supreme Court Decision

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1. Overview – the Maui Decision

On April 23, 2020, the Supreme Court ruled 6-3 in *County of Maui, Hawaii v. Hawaii Wildlife Fund et al.* (a.k.a the Maui Decision) that the Clean Water Act (CWA) requires an NPDES permit when a point source adds pollutants to navigable waters[1] through groundwater if this addition of pollutants is "the functional equivalent of a direct discharge" from the source into navigable waters. The *Maui* Decision applies to discharges that originate from point sources. This analysis is not intended to be used for pollution that originates from nonpoint sources.

2. Impact of the Maui Decision on Wastewater Permits in Oregon

Wastewater from facilities is regulated by National Pollutant Discharge Elimination System (NPDES), Water Pollution Control Facility (WPCF), or a Water Pollution Control Facility Onsite (WPCF-OS) permit (OAR 340-045 and OAR 340-071). Under federal law, facilities that discharge to waters of the United States from a point source require an NPDES permit. WPCF and WPCF-OS permits regulate wastewater disposal either to the ground or underground. Prior to the *Maui* Decision, DEQ's standard approach to permitting a facility that did not have a direct conveyance (e.g. outfall or drainage ditch) to a surface water was a WPCF permit. Following the *Maui* Decision, permittees must now be evaluated for possible functionally equivalent discharges. Permittees previously covered under a WPCF permit may need to apply for a NPDES permit if it is determined that there is a "functional equivalent of a direct discharge" from the permitted facility into navigable waters.

The "functional equivalent" trigger has two components. First, there must be a hydrologic connection that creates a discharge to a navigable water. Second, the character of the discharge to navigable waters must maintain enough similarity to the original effluent from the facility. The difficulty lies in determining whether the discharge is similar enough to the original effluent when it reaches the navigable water that it can be classified as a "functional equivalent of a direct discharge." It should be stressed that just because *any* discharge reaches a navigable waterway, it does not automatically mean that the discharge is a "functional equivalent of a direct discharge" such that NPDES permit coverage is required. The Supreme Court specifically rejected the Ninth Circuit Court of Appeals interpretation that any "fairly traceable" discharge should require an NPDES permit and set out the factors outlined in the next section for evaluating whether a functional equivalent of a direct discharge occurs and a NPDES permit is needed.

[1] The Maui Supreme Court Decision explicitly uses the term "navigable waters".

3. Analysis for Determining if a Discharge Requires a NPDES Permit

In the *Maui* Decision, the Supreme Court specifically acknowledged the difficulty of defining a "functional equivalent of a direct discharge" due to "too many potentially relevant factors applicable to factually different cases…" and therefore did not establish a bright-line test. However, the court's opinion did provide some guidance by outlining seven potential factors:

> "Consider, for example, just some of the factors that may prove relevant (depending upon the circumstances of a particular case): (1) transit time, (2) distance traveled, (3) the nature of the material through which the pollutant travels, (4) the extent to which the pollutant is diluted or chemically changed as it travels, (5) the amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source, (6) the manner by or area in which the pollutant enters the navigable waters, (7) the degree to which the pollution (at that point) has maintained its specific identity. Time and distance will be the most important factors in most cases, but not necessarily every case."

While these factors are not inclusive of all factors that could be considered, they do provide a foundation upon which to base a determination. The following analysis outlines each factor and includes an additional framework which the permit writer can use to determine, on a case-by-case basis, whether a discharge is the functional equivalent of a direct discharge, and therefore must be permitted pursuant to an NPDES permit.

The following analysis is not meant to create a bright-line test. Instead, this analysis and accompanying worksheet (Appendix A) is intended to help DEQ staff (the permit writer and/or SME) organize information and determine whether the discharge from a specific facility is likely a "functional equivalent of a direct discharge." The determination of a functionally equivalent discharge will be made in coordination with the water quality permitting program development manager and the signing manager of the permit.

When to Use This Analysis

DEQ staff should use this analysis to guide review of any available information and indicators that a new or existing WPCF permittee may have a functional equivalent discharge to navigable waters as outlined in the *Maui* Decision. In addition, DEQ staff should use this information and procedures to determine if underground point source discharges of an NPDES permittee may constitute a functional equivalent discharge to navigable waters. Generally, DEQ staff should perform this analysis at the time of application for a new WPCF or NPDES permit or at permit renewal. However, if there is strong evidence that a permittee has a functional equivalent discharge and that permit conditions/permit type should change this analysis can be done outside of the permit renewal process.

4. Factor Overview

The permit writer or subject matter expert (SME) should read each factor and document the information relevant to each factor in the Functionally Equivalent Discharge Worksheet (Appendix A) based on the information available. Be specific as to where the information comes from and what methods were used. For initial determinations, or in the absence of detailed groundwater studies, the permit writer should fill out the worksheet with the available information. The SME will then review the "Next Steps" section. The "Next Steps" section advises the course of action to take depending on the number of factors that indicate the presence of a functional equivalent of a direct discharge and whether more information is needed.

Factor 1: Transit Time

What to Consider

Transit time is the amount of time a discharge takes to reach the navigable water from the point of discharge from the point source. Transit times from the source of the effluent to the navigable water measured in days or weeks are less likely to be diluted or transformed compared with transit times measured in months or years.

For the Lahaina Wastewater Reclamation Facility (LWRF) that was the subject of the *Maui* Decision the minimum transit time was 84 days and the average transit time was 14 to 16 months, which was cited as weighing in favor of requiring an NPDES permit. In the absence of other guidance from EPA, regulations or caselaw, permit writers should use the following times based on the transit time for the LWRF wastewater as a rough benchmark:

- A transit time of roughly 90 days or less (approximately 3 months) would strongly indicate that the discharge is a functional equivalent discharge.
- Transit times between roughly 3 months and 18 months (approximately 1.5 years) would indicate that the discharge is likely a functional equivalent discharge, but determination of an equivalent discharge will include other factors.
- Facilities with transit times greater than 18 months will rely more on other factors to determine whether a functional equivalent of a direct discharge is present.

Determining Transit Time

Transit time is largely contingent on groundwater velocity, which is dependent on the hydraulic conductivity of the aquifer, the hydraulic gradient of the aquifer, and the effective porosity of the sediments. Using the groundwater velocity, groundwater flow direction, and the distance from the discharge point to the receiving water the transit time can be estimated. A crude velocity can be calculated with literature values of hydrogeologic conditions; a more detailed velocity will need to be based on site specific hydrogeologic conditions from a robust hydrogeologic characterization provided by the permittee. **Consult with a DEQ hydrogeologist to determine transit time.**

Factor 2: Distance Traveled

What to Consider

In general, the closer a point source is to a navigable water, the more likely it is that discharges from that point source will be a functional equivalent of a direct discharge and thus facilities that are sited closer to a navigable water require closer scrutiny. While the *Maui* Decision did not provide a definitive estimate

for what distance would constitute a functional equivalent of direct discharge, the *Maui* Decision and Oregon rule can be used to help determine if a functional equivalent of a direct discharge is likely to be present.

The effluent from the LWRF was estimated to travel 0.5 miles from the facility to the Pacific Ocean. Furthermore, OAR 340-071-0220 Table 1 states that there must be a minimum separation distance of 50 to 100 ft between a surface water and a standard subsurface system for the system to be approved. In *Stone v High Mountain Mining Co., LLC*, a Colorado Federal District Court determined that a placer mine within 100 ft of the nearby navigable waterway was a functional equivalent of a direct discharge (2022). Based on this information, in examining travel distance, permit writers should consider the following:

- Facilities sited within 100 ft of a navigable water would strongly indicate the potential for a functional equivalent of a direct discharge.
- For facilities with point source discharges further than 100 ft away but within 0.5 miles distance may be a likely indicator that the discharge is a functional equivalent discharge, but other factors will also be necessary to show whether a discharge to navigable waters is a functional equivalent of a direct discharge.
- Facilities with point source discharges greater than 0.5 miles from a navigable water are less likely to be considered functionally equivalent discharges. However, determining whether a functional equivalent of a direct discharge is present will rely more on other factors.

Determining Distance

In the absence of a groundwater study, distance traveled can be estimated by determining the distance between the land application site, well injection, or storage location and the closest point of the navigable water. This can be done using mapping software or online tools (for example: DEQ WQ Standards and Assessment Tool (https://hdcgcx2.deq.state.or.us/Html5Viewer211/?viewer=wqsa)) and will provide a conservative estimate in the absence of knowledge of groundwater flow paths. If a groundwater study is available, **consult with a DEQ hydrogeologist to determine distance traveled**.

Factor 3: The nature of the material through which the pollutant travels

What to Consider

The substrate (either soil or bedrock) through which the pollutant travels can significantly affect the transit time, the amount of pollutant entering navigable waters, the characteristics of the pollutant (dilution, interactions, or chemical transformations), and the manner which the pollutant enters the navigable water. Substrates that are denser and that have lower porosity or poorly connected pores will likely result in much slower transit times and a more diffuse entry into the navigable water. Substrates that have different temperature, pH, or chemical profiles can have effects on the final pollutant mix that enters the navigable waterway.

In *Stone v. High Mountain*, the material through which the pollutants traveled had an extremely high percolation rate, but the court gave the factor little weight due to the "limited evidence presented about the composition of the soil below the Settling Ponds". The US District Court for the District of Hawaii found that the nature of the material through which the pollutant traveled did not weigh in favor of requiring an NPDES permit for the LWRF though overall evidence eventually determined that an NPDES permit would be required.

In the absence of additional guidance from EPA, regulation or caselaw on this factor, the permit writer, in consult with a DEQ hydrogeologist, should consider the nature of the material through which the pollutants travel.

Determining Nature of the Material

The nature of the material through which the pollutant travels can be determined by geologic surveys and/or soil surveys (depending on whether the pollutant travels through bedrock, soil, or both). In the absence of detailed surveys done in the location of the pollutant plume, local geology and soils can be determined by examining USGS National Geologic Map Database (https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html),USDA's Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm), or DOGAMI's Geologic Map (https://gis.dogami.oregon.gov/maps/geologicmap/). DEQ hydrogeologists may suggest additional regional tools or studies. Note that these tools are not substitutes for a local survey done for the discharge in question and should only be used for initial approximations. **Consult with a DEQ hydrogeologist to determine the effect of nature of the material.**

Factor 4: The extent to which the pollutant is diluted or chemically changed as it travels

What to Consider

Once the effluent reaches groundwater, it can be diluted or chemically changed by the groundwater, aquifer material, or aquifer sediments. Chemical changes to the pollutant will also be mediated by chemical differences between the effluent and the groundwater. The amount of dilution will depend on the amount of effluent relative to the groundwater, the amount of mixing of the effluent and the groundwater, and the flow path of the effluent through the groundwater. For example, if an effluent stream has a direct flow path through large soil pores or bedrock cracks to a navigable water that limits the time for interaction with the groundwater, it is less likely to be diluted or chemically changed. The more the effluent interacts with the groundwater, the more likely it is to be diluted or chemically changed by the time it reaches the navigable water. Court cases to date have either not considered this factor or have given it less weight than the other factors.

In the absence of clear guidance from EPA, regulation or caselaw on this factor, the permit writer, in consult with a DEQ hydrogeologist, should consider the extent to which the pollutants in question are diluted or chemically changed as they travel, however this factor will not, on its own, support a finding of a functional equivalent of a direct discharge.

Determining Extent of Dilution or Chemical Change

Determining the extent of dilution or chemical change will require groundwater studies and will vary depending on the nature of the pollutant. **Consult with a DEQ hydrogeologist to determine the extent of dilution or chemical change of the effluent.**

Factor 5: The amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source

What to Consider

The amount of pollutant entering navigable waters will be determined by multiple factors, including direction and velocity of groundwater flow. Factor 5 is distinct from factor 4 (dilution of the pollutant) in that it deals with the percentage of the pollutant that arrives at the navigable water, regardless of whether it is diluted and/or chemically changed. If the groundwater plume carrying the effluent is disperse and travels in multiple directions, it is possible that very little of the effluent will eventually reach the navigable water, whereas if the groundwater plume carrying the effluent has a direct and swift flow path to the navigable water a large proportion of the effluent may reach the navigable water, even if it has been diluted by the groundwater. For this factor the LWRF and the *Maui* Decision does not provide a helpful benchmark, as it was determined that 100% of the wastewater entered the ocean.

In general, the higher the percentage of pollutants entering the navigable water the more support there is for finding a functional equivalent of a direct discharge.

Determining Amount of Pollutant Entering Navigable Waters

Determining the amount of pollutant entering the navigable waters will require knowledge of how much effluent is leaving the facility and how much pollutant is entering the navigable waters, as well as knowledge of whether the navigable water is a losing or gaining reach. Groundwater, surface water, and effluent studies will be needed with data provided by the permittee. Approximations may be done using groundwater studies and estimates provided by the permittee. **Consult with a DEQ hydrogeologist to determine the amount of pollutant entering navigable waters.**

Factor 6: The manner by or area in which the pollutant enters the navigable waters

What to Consider

The more discrete an area in which the pollutant enters a navigable water, the more likely it is to be a functional equivalent of a direct discharge. For example, if an effluent plume entered the navigable waterway through a naturally made crack or tunnel it would be more likely to be a functional equivalent of a direct discharge than if it entered the navigable waterway through a diffuse groundwater plume.

Determining Manner/Area in which pollutant enters navigable waters

The manner or area in which a pollutant enters the navigable water would be determined by developing a conceptual model of the site's hydrogeology and site-specific groundwater investigations. **Consult with a DEQ hydrogeologist to determine the manner/area in which a pollutant enters the navigable waters.**

Factor 7: The degree to which the pollution (at that point) has maintained its specific identity

What to Consider

Factor 7 considers all the pollutants from the effluent in aggregate and requires a determination of how close the discharge into the navigable water is in composition to the original effluent from the point source. As the effluent interacts with the groundwater, it will be changed in varying ways based on the pollutant, amount of time, dilution, and chemical interaction. Some pollutants, such as temperature, will in most cases be mitigated in short order when interacting with groundwater before reaching a navigable waterway. Other pollutants such as ammonia or nitrate may be transformed, while pollutants such as DDT will remain relatively inert while travelling to a navigable water. The groundwater itself, or other nonpoint sources, may add chemicals not originally from the facility. The permit writer should be careful to focus on pollutants that are from the facility in question and not pollutants that are from other sources (such as iron or other metals from groundwater or nitrogen compounds from non-point sources).

In the *Maui* case, the water near the seeps from which LWRF facility's effluent was emerging had elevated levels of inorganic nitrogen and phosphorus, low salinity, low pH, and high temperature and therefore the degree to which the pollution maintained its specific identity weighed in favor of requiring an NPDES permit. The court in *Stone v. High Mountain Mining Co., LLC* made a determination that a permittee should get an NPDES permit without consideration of this factor.

Determining Degree of Identity Maintenance

The permit writer will want to consider all the relevant pollutants that are part of the effluent and therefore will want data fully characterizing the effluent, groundwater, discharge at the navigable water, and ambient for those pollutants. Once this data is in hand then the permit writer can determine which pollutants are found in the discharge to the navigable water and how much they have changed using a Piper Diagram or other graphing technique. **Consult with a DEQ hydrologist to determine the degree to which a pollutant maintains its identity.**

5. Interpreting the Worksheet Scores

Once the worksheet in Appendix A is complete, the next steps will be determined by which category received the highest number of marks (with 7 being the highest score possible). Note that this process can be iterative; if more information is received about the facility's discharge the worksheet should be re-assessed. Additionally, DEQ's case-by-case determination of a functionally equivalent discharge is not limited to these factors and this analysis. The director may deviate from this process in writing and make a determination on behalf of the agency.

Highest Score: "Unable to Assess"

If the highest score is "Unable to Assess" then proceed with the "Next Steps" for the second highest score. This is because not all factors need to be assessed for a functional equivalent of a direct discharge to be determined. For example, there may be clear evidence that a discharge from a facility is entering a navigable water at a discrete location and that the discharge carries a distinct signature from the facility (factors 6 and 7), but other factors (transit time, distance traveled, nature of the material, extent of dilution, amount of pollutant) were not assessed.

Highest Score: "Unlikely Factor"

If the highest score is "Unlikely Factor" then the point source discharge does not likely need to be permitted as a functional equivalent of a direct discharge and further investigation is likely not warranted. However, there may be exceptions for this if one or two factors are "likely factors" (especially Factors 1 and 2 – Transit time and Distance). In that case, DEQ should include conditions in the renewed permit (or as part of a permit modification or separate department order) requiring the permittee to perform studies to address any factors that were unable to be assessed (consult with the regional hydrogeologist to determine appropriate studies).

Highest Score: "Ambiguous Factor"

If the highest score is "Ambiguous Factor" then DEQ should place conditions in the renewed permit (or require conditions in a separate department order) requiring the permittee to perform studies to address the ambiguous factor or factors that were unable to be assessed. Consult with the regional hydrogeologist to determine the appropriate studies and timelines for permit requirements. It should be noted that the Supreme Court placed heavy emphasis on Factors 1 and 2 in *Maui*, and that these factors also factored heavily in *Stone v High Mountain Mining Co., LLC*. Therefore, while it is not necessary for prescribed studies to answer each of the seven factors it is expected at a minimum that transit time and distance would be addressed by any required studies.

Highest Score: "Likely Factor"

If the highest score is "Likely Factor" the next step is to discuss the results with the Functional Equivalent Discharge SME and DEQ management to determine the most appropriate pathway for permitting.

The main exception to this is if the “Likely Factor” score is 2 or less. In this case the permit writer should follow the “Next Steps” for “Ambiguous Factor”. This situation could occur if only one or two factors have been evaluated and the rest are unable to be assessed.

6. Relevant Guidance

This section outlines other relevant DEQ documents and guidelines that can be of use when trying to determine whether a discharge is a functional equivalent of a direct discharge.

Preliminary Groundwater Assessment Guidelines, DEQ Eastern Region Office, 1995
This document reviews information that should be included in preliminary groundwater assessments.

Hydrogeologic Characterization Part B: Guidelines, DEQ Eastern Region Office, 1994 This document reviews information that should be included in hydrogeologic characterizations, which are more technical and complex than preliminary groundwater assessments.

OAR Chapter 340 Division 52 Guidelines for Estimating Leakage from Existing Sewage Lagoons
This document describes how to test for lagoon leakage. This test can be used to help determine if a functional equivalent discharge may be occurring from a pond or lagoon.

7. References

Stone v. High Mountain Mining Co., LLC, 627 F Supp 3d 1211, 1229 (D Colo 2022)

Hawai'i Wildlife Fund et al v. County of Maui. Order Granting Plaintiffs' Motions for Summary Judgment; Order Denying Defendant's Motion for Summary Judgment. U.S. District Court for the District of Hawaii. July 15, 2021. Civ. No. 12-00198.

Cnty. of Maui v. Haw. Wildlife Fund, 140 S.Ct. 1462 (2020).

8. Appendix A: Functional Equivalent Worksheet

For each factor below document the known information. Once the data has been evaluated for each factor place a checkmark under the appropriate box (Unable to Assess, Unlikely Factor, Ambiguous Factor, or Likely Factor) using this IMD to help inform the decision.

Factor 1: Transit Time

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 2: Distance Traveled

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 3: The nature of the material through which the pollutant travels

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 4: The extent to which the pollutant is diluted or chemically changed as it travels

Information:

Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 5: The amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 6: The manner by or area in which the pollutant enters the navigable waters

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Factor 7: The degree to which the pollution (at that point) has maintained its specific identity

Information:			
Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

Results:

Tally the number of marks from each category below. Refer to this IMD for next steps.

Unable to Assess (no info)	Unlikely Factor	Ambiguous Factor	Likely Factor

9. Record of Revisions to IMD

Revision	Date	Changes	Editor
1.0	05/08/2024	Creation of IMD	Aliana Britson