Scenario 1b

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303(d) listings:	Mercury and PCBs
TMDL status:	**Completed and loads allocated,** The water is no longer on the 303(d) list
Discharges:	POTW Stormwater 5 Industries Contaminated sites

Waterbody: This is a marine shoreline area with healthy shellfish beds located nearby and active sportfishing for both fish and shellfish in the area. Rainfall is heavy and generally confined to the fall/winter/spring months.

Human Development and Discharges: This is an urban area with one municipality (approximately 100,000 people) served by a secondary treatment plant (POTW) and several storm drains located along the shoreline. The sanitary and stormwater collection systems are largely separate. This is an older community, and has historically had industrial uses along some of the shoreline areas. Over time many of these industries have disappeared and other land uses have developed, such as commercial, open space, or currently undeveloped areas. There is one contaminated site located along the shoreline where clean-up levels are being developed to address historic contamination of PCBs and mercury. Three industries (Industries A-C) discharge directly to the water. Growth projections for this area indicate that populations will increase and there will be growth both within and outside the service area of the POTW. Two new industries (Industry D and Industry E) from outside the state are considering locating facilities in this city because of the proximity to ports, and the ability to hire and retain highly skilled employees (desirable environmental and recreational settings , high quality cultural resources, good schools, etc...). The POTW is running close to design capacity, and the city expects that it will need to expand the POTW in the near future to handle additional population growth. The natural landscape and climate preclude removal of the discharge from the water and movement to land discharge.

The three permitted industries all have NPDES permits:

- Industry A has recently expanded its markets and will be looking to expand its treatment system to handle increased wastewater resulting from the expected greater production.
- Industries B and C have stable production volumes and sales and anticipate no expansions in production or wastewater generation in the near future.

Industries D and E, which operate plants in different states, have both had talks with the city about opening facilities. Industry D and E would both need assurance that they could apply for and obtain NPDES permits for their facilities before committing to construction.

The contaminated site is an area where drums of waste were stored in the mid-1900s. The area was closed for storage in the late 1970's. Soils were contaminated in this area and subsequent stormwater runoff from the site resulted in contaminated sediments in an isolated near-shore area. Upland and in-water clean-up levels for mercury and PCBs are currently being developed for the site.

The POTW and the three industries have NPDES permits, including a stormwater permit for the city. All are in compliance with the current toxics limits in their NPDES permits.

303(d) Listing Information for Scenario 1b:

PCBs: Tissues from resident sport fish were used to determine that the fishable use of the waterbody was impaired for PCBs.

Mercury: Mercury was found in the water column at levels that exceed the aquatic life-based criteria.

The policy for how data are used to list waterbodies can be found at:
http://www.ecy.wa.gov/programs/wq/303d/policy1-11.html.

What if the waterbody is 303(d) listed but a TMDL has not been completed?

Please see the information in the Introduction and Context file to help support discussion of this situation

The following discussion follows a hypothetical TMDL process and the potential subsequent permitting decisions under current federal and state regulations and implementation policy.

Permitting Scenario:

- **TMDL completed and loads allocated.**
- **The water is no longer on the 303(d) list.**

TMDL-based information:

PCBs:

- Tissues from resident sportfish were used to determine that the fishable use of the waterbody was impaired for PCBs (based on use of NTR tissue equivalent levels). Fish showed high levels

of the contaminant, and water column data indicate that significant reductions in the PCBs to the system will need to be made in order for WQS to be met.

- The Department of Health is evaluating fish tissue information to see is a fish advisory is needed. PCBs are present in sediments, tissues, and also in sources as diverse as storm drains, treated municipal and industrial effluent streams, upland and in-water contaminated sites, and atmospheric deposition (from out-of-state sources).
- Modeling indicates that after the measured sources (apart from atmospheric deposition) are accounted for (and are significantly reduced) it will likely take approximately 20 additional years for natural attenuation to remove PCBs from the aquatic system or otherwise make them unavailable to the food web (e.g., burial). There is uncertainty about whether air sources will result in steady-state concentrations above the criteria in water and NTR-equivalent tissue levels.
- Allocations for PCBs have been made in the TMDL. Because there is no assimilative capacity and only reductions are required, wasteload allocations for point sources are set to meet the PCB criteria at the end of the pipe.

Mercury:

- Mercury was found in the water column at levels that exceed the aquatic life-based criteria. Mercury is present in sediments, tissues, and also in treated municipal and industrial effluent streams, upland and in-water contaminated sites, and atmospheric deposition (from out-of-state sources).
- Modeling indicates that after the measured sources (apart from atmospheric deposition) are accounted for, the waterbody will likely show compliance with water quality criteria levels. However, uncertainty in the mercury modeling could underestimate the reductions in mercury that are needed to meet criteria.
- Because there is no assimilative capacity and only reductions are required, wasteload allocations for point sources are set to meet the mercury criteria at the end of the pipe.

Municipal POTW – permitting under the current regulations:

Application for permit renewal at current design capacity: Ecology received the permit renewal application. Data on PCBs in effluent were collected during the TMDL source study using EPA Method 1668C which identifies PCB congeners – a very sensitive analytical method. These data indicate that the POTW does not meet PCB criteria at the end of the pipe. Compliance limits in permits are generally based on 40CFR 136 Methods and EPA Method 608 for Arachlors would normally be used to measure compliance. However, Method 608 is less sensitive than 1668C,

Note on Method 1668C: This analytical method is currently under USEPA review for approval under 40CFR136 for use in assessing compliance with NPDES effluent limits. For this scenario the choice was made to assume that Method 1668C will be approved (either nationally or for use in Washington) and used to measure compliance with effluent limits.

and effluent data indicate that PCBs will not be detected in the effluent using this method. Based on this circumstance Ecology prepares to place limits in the permit with effluent limit compliance monitoring using Method 1668C.

Can a Compliance Schedule for PCBs be used for this discharge?
"In order to grant a compliance schedule in an NPDES permit, the permitting authority has to make a reasonable finding, adequately supported by the administrative record, that the compliance schedule "will lead {} to compliance with an effluent limitation …" "to meet water quality standards" by the end of the compliance schedule as required by sections 301(b)(C) and 502(17) of the CWA. See also 40 CFR Section 122.2, 122.44(d)(1)(vii)(A) (see EPA May 10, 2007 memo from Hanlon to A.Strauss, Region 9 EPA at http://water.epa.gov/lawsregs/guidance/wetlands/upload/signed-hanlon-memo.pdf). Thus, if there is some reasonable assurance that effluent limits will be met at the end of a 5 or 10 year compliance schedule, Ecology could issue a compliance schedule for the discharge. If this were the case for this discharge, the permit limits with a 10-year compliance schedule would likely look like this:

> The interim limits in the first 5-year NPDES permit are based on taking actions to reduce PCBs. The final limits, based on the PCB criteria, are in the Fact Sheet that accompanies the first NPDES permit. In the second NPDES cycle of the 10-year compliance schedule both the interim and final limits will be placed in the NPDES permit. During the TMDL period the discharger evaluated effluent treatment options, and feasible methods to remove PCBs from final effluent are not readily available. Some reductions could be made by further reducing solids by adding tertiary treatment (coagulation and filtration), but the cost is very high and will still result in levels of PCBs that exceed criteria. As part of the compliance schedule the discharger will need to formally investigate available treatment methods to reduce PCBs and PCB sources upstream in the collection system as part of the compliance schedule. The collection system is old and contains old sediment deposits, which could be one source of the PCBs in the effluent. Under a compliance schedule the discharger would be expected to investigate and implement source control or pollutant removal on a schedule that would meet effluent limits at the end of the 10-year compliance period.

Can a Variance for PCBs be used for this discharge?
A variance is probably a more appropriate regulatory tool for this type of discharge, but a state does not have authority to waive a federal regulation. Washington's human health-based criteria (which contain the PCB criterion at issue) are contained in federal regulation - the National Toxics Rule (NTR). Submitting a variance to EPA for an NTR criterion would likely have a very low probability of resulting in federal rule-making to approve the variance via modification of the NTR. See Introduction and Context file for more complete information.

Permitting for Mercury:
Mercury was identified in the effluent at levels above aquatic life-based criteria. The permit will contain a compliance schedule to meet the mercury limit in 10-years, with source investigation and reporting

requirements included as interim limits. Subsequent permits for the POTW would be issued to meet WQS.

Main concerns with the POTW discharge:
Discharger does not have apparent methods to comply with a final PCB limit by the end of a 5-10-year compliance schedule. Identifying the PCB sources will be expensive because sensitive analytical methods will be needed. Discharger will be out of compliance with water quality-based effluent limits. Identification of mercury sources is less difficult than PCBs, and the discharger expects to make significant progress reducing mercury during the compliance schedule.

Future expansion – The municipality is planning for a facility expansion to add additional capacity that would come on-line in approximately 10 years:
The waterbody has no additional assimilative capacity at present for mercury and PCBs. *This is an expansion of an existing facility, not a new discharge.* The discharge would come on-line in 10- years. The facility could expect to get a permit with limits to meet PCB criteria at the end of the pipe if criteria are not met in the waterbody.

From a practical perspective, the POTW must remain in place. In this example the natural landscape and climate preclude removal of the discharge from the water and movement to land discharge. If a permit cannot be issued because the discharger cannot meet the limits, the choices are to plan for the following: develop site-specific criteria for PCBs (possible after adoption of human health-based criteria into Washington Surface Water Quality Standards), change the designated use (very difficult), or develop a variance (maximum 5-year variance might be approvable after adoption of human health-based criteria into Washington Surface Water Quality Standards). Under current regulations, Ecology would need to renew a variance through rule-making and seek EPA approval every 5 years.

Municipal Stormwater – permitting under the current regulations:
The municipality is currently under the Phase 1 Municipal Stormwater general permit (http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/phipermit.html). The permit does not have limits for PCBs. PCBs were found in stormwater discharges, and concentrations and loads varied among the drains that were sampled. Because of the historic light industrial use of the shoreline and subsequent building demolition and redevelopment of the area, people suspect that areas where PCB-containing equipment was historically used could be contributing PCBs to stormwater.

The Municipal Stormwater Phase 1 general permit does not contain limits for PCBs. With the identification of PCBs in the stormwater at levels that cause or contribute to an exceedance of a criterion, the municipality would follow permit requirements to address PCBs. The alternative approaches under the current permit include:

- **S.4, pages 4-6 of 73:** Adaptive management approach,
- **S.7, page 43 of 73:** Reopen and modify permit to add effluent limit
- **Other approaches:** Issue an order or no additional requirements

Industry A – expanding discharge under current regulation:

Ecology received the permit renewal application and a request for approval of a facility expansion for an existing discharge. *This is an expanding discharge, not a new discharge.* Effluent data and information about the expansion indicate that the discharger will meet effluent limits for mercury (meet criteria at the end of the pipe), with or without the expansion. Data on PCBs in effluent were collected during the TMDL source study using EPA Method 1668C which identifies PCB congeners – a very sensitive analytical method. These data indicate that the discharger does not meet PCB criteria at the end of the pipe. Compliance limits in permits are generally based on 40CFR 136 Methods, and EPA Method 608 for Arachlors would normally be used to measure compliance. Method 608 is less sensitive than 1668C, and effluent data indicate that PCBs will not be detected in the effluent using this method. Based on this circumstance Ecology prepares to place a water quality-based limit in the permit, for the current capacity of the plant, with effluent limit compliance monitoring using Method 1668C. The permit will might contain a compliance schedule to meet the WQ-based limit for PCBs in 10-years, with source investigation and reporting requirements included as interim limits. During the TMDL period the discharger evaluated effluent treatment options, and feasible methods to remove PCBs from internal waste streams or final effluent are not readily available for short-term implementation. In addition, source control options at the facility are not apparent. The compliance schedule, if allowable, will give the discharger the opportunity to more vigorously investigate source control and pollution prevention.

What about the expansion?

This discussion is post-TMDL, with allocations made and the water subsequently removed from the 303(d) list. However, criteria are not yet met in the waterbody. The expansion would not receive a compliance schedule for discharge to the waterbody, and the final effluent limit would need to be met at criteria levels at the point of discharge.

Concerns:

Discharger might not meet effluent limits for PCBs by the end of the 10-year compliance schedule. Expansion might not be a viable option. Identifying the current sources will be expensive because sensitive analytical methods will be needed.

The natural landscape and climate preclude removal of the discharge from the water and movement to land discharge. If the discharger cannot meet the final permit limit by the end of the compliance schedule the following alternatives are available: develop site-specific criteria for PCBs (possible after adoption of human health-based criteria into Washington Surface Water Quality Standards – includes SWQS rule-making and EPA CWA approval), change the designated use (very difficult), or develop a variance (maximum 5-year variance might be approvable after adoption of human health-based criteria into Washington Surface Water Quality Standards Under current regulations, Ecology would need to renew a variance through rule-making and seek EPA approval every 5 years. The discharger can also evaluate the “no discharge” option or direct discharge to the POTW collection system.

Industry B – permitting under the current regulations:

Ecology received the permit renewal application. Industry B uses city drinking water in its processes and does not add PCBs. PCBs are not detected in effluent using sensitive analytical methods, so no effluent limit for PCBs is necessary. Industry B does generate mercury in its processes, and at current levels would exceed its mercury limits. A 10-year compliance schedule and final and interim effluent limits based on the mercury criteria are placed in the permit. The discharger expects to be able to meet the limit at the end of 10 years.

Concern:

A 10-year compliance schedule and final and interim effluent limits for mercury are placed in the permit. Discharger will need to address source control for mercury.

Industry C - permitting under the current regulations:

Ecology received permit renewal application. Industry C uses city drinking water in its processes and does not add PCBs or mercury. No effluent limits for PCBs or mercury are necessary.

Concern:

None at present. Discharger will continue to provide pollutant scan data to Ecology at NPDES re-application in order to confirm that limits are or are not needed for PCBs and mercury.

Industry D - new discharger under the current regulations:

See text box below. Industry D is negotiating with the city to build a manufacturing facility. The facility will generate mercury in its processes. PCBs at detectable concentrations exceeding criteria are likely to be in the discharge from the facility because of various materials used in the manufacturing process. The industry does not see a way to eliminate PCBs from its manufacturing process and treated effluent. Because the waterbody was on the 303(d) list for PCBs and mercury, a TMDL has been completed with loads allocated, ,and the water is no longer on the 303(d) list, the discharger could be issued a permit. The discharger would need to meet PCB and mercury criteria at the end of the pipe in order to not add to criteria exceedances in the waterbody. Because the industry is a new discharge, compliance schedules are not allowed. Other options for the industry are to: discharge to ground, discharge to the POTW, or locate in another area.

Industry E - new discharger under the current regulations:

See text box below. Industry D is negotiating with the city to build a manufacturing facility. The facility will generate mercury in its processes. PCBs are not expected to be present in the discharge. Because the waterbody was listed for mercury and, a TMDL has been completed with loads allocated, and the water is no longer on the 303(d) list, the new discharger could be issued a permit. The discharger would need to meet mercury criteria at the end of the pipe in order to not add to criteria exceedances in the waterbody. Because this is a new facility compliance schedules are not allowed. The industry can obtain an NPDES permit but will have to show prior to permit issuance that it can meet mercury criteria at the end of the pipe at start-up. Other options include: discharge to ground, discharge to the POTW, or locate in another area.

Contaminated sites:

The clean-up levels for upland and in-water sites are under development according to MTCA and NPDES regulations.