State of Oregon Department of Environmental Quality

Written Comments

Lower Columbia-Sandy Subbasin TMDL

This document is a compilation of written and oral comments received during the public comment period for the Lower Columbia-Sandy Subbasin TMDL.

DEQ held one virtual public hearing on Feb. 16, 2024, at 1:30 p.m. DEQ received no comments at the hearing. Later sections of this document include a summary of the written comments received during the open public comment period, DEQ's responses, and a list of the commenters. Original comments are on file with DEQ.

Commenters

Translation or other formats

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Northwest Oregon District Office
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February 23, 2024

Michele Martin
Project Manager
Oregon Department of Environmental Quality
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Michelemartin@deq.state.or.us

Subject: Comments on Draft Water Quality Management Plan – Riparian Vegetation Management Strategies

Dear Michele,

The Bureau of Land Management (BLM) has thoroughly reviewed the draft requirements stipulated within the Lower Columbia Sandy Subbasin Draft Water Quality Management Plan, specifically those pertaining to riparian vegetation management strategies for streamside vegetation. While we appreciate DEQ's efforts to ensure the achievement of Total Maximum Daily Load (TMDL) load allocation and effective shade targets, we wish to address several points where our findings diverge, particularly concerning the management of intermittent, non-fish bearing streams (pg. 16 paragraph 2 & table 6).

1. Intermittent Streams and Temperature Contribution

   We argue that intermittent streams, by their very nature, do not contribute to increased temperature during periods of potential non-attainment. These streams flow only during certain times of the year, primarily in response to precipitation or snowmelt, and thus, during dry periods or drought conditions, they do not flow at all. The concern for stream warming is primarily associated with continuous water flow, where prolonged exposure to sunlight can significantly raise water temperatures. In the case of intermittent streams, the absence of flow during critical warm periods negates the risk of contributing to temperature non-attainment areas. Therefore, the management strategies for these streams should reflect their distinct hydrological characteristics, acknowledging that their impact on overall water temperature and quality is significantly different from that of perennial streams.

2. Analogous Streams in Roon et al. (2021) Study

   Secondly, the streams studied in Roon et al. (2021), which DEQ cites to support the management strategies, are not analogous to the headwater intermittent streams managed by BLM. The referenced study focuses on larger, fish-bearing perennial streams, which fundamentally differ in both ecological function and hydrological dynamics from intermittent streams. Perennial streams have continuous flow and support aquatic life year-round, which necessitates different management approaches to maintain temperature and habitat quality. The application of findings from perennial stream studies to intermittent stream management overlooks critical differences in stream ecology and hydrology, potentially leading to ineffective or inappropriate management prescriptions for intermittent streams.

   Furthermore, it's crucial to note that the temperature signal measured in the Roon et al. (2021) study dissipated downstream within 75-200m. (fig. 5) This dissipation suggests that even if temperature increases were to occur due to thinning practices, their impact would be localized and transient, not affecting the broader stream ecosystem or the achievement of TMDL load allocation and effective shade targets over a significant distance.

3. Silvicultural Prescription and No-Cut Buffers

   Lastly, the silvicultural prescription used in the study cited (Roon et al., 2021) is not directly transferable to the context of BLM's management practices, particularly due to our implementation of no-cut buffers along streams. The study's approach involved thinning vegetation up to the stream bank, a practice not permitted under BLM's management policies for streams within our jurisdiction. BLM maintains no-cut buffers (50 feet for intermittent, non fish-bearing), a critical measure to protect water quality and streamside habitat by preserving canopy cover and minimizing direct human impact to the riparian zone. This distinction is crucial as it underscores the differing potential for shade reduction and temperature increase. BLM's management practices are designed to maintain, if not enhance, effective shade and reduce the risk of stream warming, contrary to the implications of applying the study’s findings to our context.

In light of these points, we respectfully request that DEQ reconsider the applicability of the draft requirements to intermittent, non-fish bearing streams managed by BLM. We believe that a nuanced understanding of the hydrological and ecological characteristics of these streams, along with a careful consideration of BLM's existing management practices, will lead to more effective and appropriate water quality management strategies.

BLM is committed to working collaboratively with DEQ to protect and improve water quality while ensuring that management strategies are based on sound science and reflect the specific conditions of the streams under our management. We are prepared to provide further information and engage in discussions to help ODEQ move forward towards a final Water Quality Management Plan that accurately addresses the unique aspects of intermittent stream management. The BLM is committed to protecting the water quality within the Lower Columbia

Sandy Subbasin and ensuring adherence to water quality standards. The BLM will continue our work to educate the public about the vital significance of these lands and the critical need to preserve their environmental integrity. We look forward to your response and the opportunity to continue our collaborative efforts towards sustainable water quality management and the BLM requests the opportunity to work with ODEQ staff to resolve this issue.

Dennis C. Teitzel,
District Manager, Northwest Oregon District,
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February 26, 2024

Michele Mar?n
DEQ Water Quality Division
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Sent via email to: Sandy.SubbasinTMDL@DEQ.oregon.gov and
Willamete.TemperatureTMDL@DEQ.oregon.gov

Subject: City of Gresham Comments on the Draft Lower Columbia-Sandy and Willamette Subbasins Temperature TMDL

Dear Michele Martin,

Gresham appreciates the opportunity to comment on the Lower Columbia-Sandy Subbasin and the Willamette Subbasin Total Maximum Daily Load (TMDL) updates. As a lower-income municipality with 68 miles of stream resources within portions of both the Sandy and Willamette subbasins, over the last 20 years, Gresham has endeavored to efficiently invest public resources in stream temperature improvements within the Johnson/Kelley Creek; Fairview Creek/Columbia Slough; and Kelly/Burlingame/Beaver Creek watersheds. The City has integrated Temperature TMDL commitments into our land use code, stormwater monitoring, maintenance programming, and stormwater and natural resource master planning. Gresham echoes the comments made by the Oregon Association of Clean Water Agencies in response to the proposed Temperature TMDL updates for both subbasins, and in the interest of wanting to assist DEQ with developing realistic and achievable plans to improve stream temperatures in both basins, we're offering the following comments from the perspective of implementation practitioners.

Fiscal Analysis

While recognizing the court-mandated deadlines for these updates lead to DEQ relying on pre-existing data sources where possible for these updates, it should be noted that the Fiscal Analysis completed for both subbasins depended on quite out-dated project cost data, as compiled in "DEQ's Cost Estimate to Restore Riparian Forest Buffers and Improve Stream Habitat in the Willamette Basin, Oregon (2010)." That document presents riparian and in-stream project costs that are 15-18 years old, and which are based on project areas typically outside confined urban areas. Projects in urban areas typically have to meet multiple objectives to fit into the constrained landscape, and incur additional project costs. Gresham has an extensive list of recognized riparian and in-stream restoration needs that far exceed our ability to take on even low interest debt of the type outlined in the DEQ fiscal analyses. The degree of staff time and matching resources needed for pursuing grant options impact progress via those routes as well. The fiscal analysis states rate payers may incur costs, but at least in Gresham, it's a certainty that these natural resource investments will impact stormwater rate payers. The statements in the fiscal analysis about the income generated by Portland area tourism should not be portrayed as a relevant compensating variable for low-income suburbs that are rarely tourist destination hot spots. In short, the fiscal analysis as currently written doesn't speak to implementation feasibility or inform implementation rate projections for at least one low-income suburb. DEQ staff reviewing annual and 5-year reporting requirements during the 2/16/24 webinar enumerated reporting requirements for DMAs, and notably, actual project costs were not mentioned, despite the importance of fiscal resources in making forward progress. To better inform future DEQ decisions on adequacy of adaptive management proposed by DMAs, future Temperature TMDL updates, or

state funding decisions to support DMA progress, we recommend DEQ begins requesting basic, standard reporting metrics on actual incurred costs for riparian and in-stream restoration costs when either annual or 5-year progress reports are submitted by DMAs. DMAs could submit project-specific costs on a $X/acre for 5-year riparian restoration projects, and $X/linear ft of in-stream restoration.

Strategies Beyond Shade Needed

The predominant focus on shade may be insufficient for some subbasins, per the information provided by Appendix A of the Willamette TMDL. DEQ's Effective Shade Model on Johnson Creek is presented in Figure 3-22 of Appendix A in conjunction with actual field measurements of existing shade (pasted below). The model appears to be a poor fit when with the recent field observations presented by DEQ. In a quick comparison, the average modelled shade at the validation points was ~35%, while the real observations at those same points averaged ~79%--more than twice as much real shade as in the model DEQ is using.

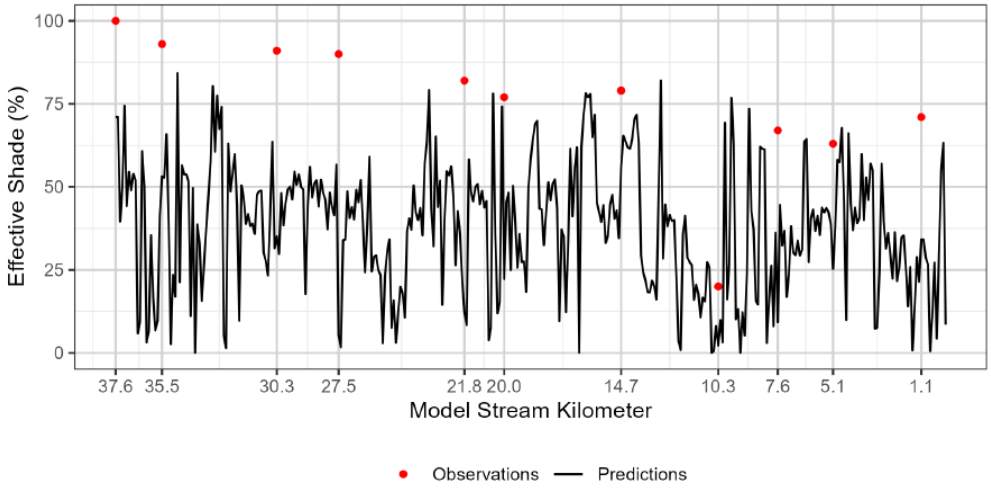

Figure 3-22: Johnson Creek field observed and predicted effective shade.

A main conclusion from the WQMP documents is that to meet the Water Quality Temperature Standard, DMAs need to increase shade, and that if we increased shade to its potential, we would generally stay below the Standard (see Fig 4-1 in the same Appendix document). However, if Johnson Creek already has more than twice the shade that the model suggests and yet that subwatershed is still routinely exceeding the temperature standard, will this predominant focus on stream shade result in temperature improvements as assumed by the DEQ modeling? These data sources suggest Gresham would be expected to increase shade where it is already at or near full potential. And, while the conflict between the Effective Shade model and actual conditions sets the jurisdiction up to easily demonstrate improved stream shade conditions when comparing current conditions against the 2002 baseline (as established by the Effective Shade Model), Gresham is motivated to invest efforts where public resource investment will contribute to real temperature improvements when combined with the investment of other Johnson Creek stakeholders.

Recent water quality monitoring on Johnson Creek has resulted in DEQ expanding the critical period window for Johnson Creek to February 15 through November 15, newly reflecting heat exceedances during the time of year that we have leaf-off conditions. It is unlikely that direct solar radiation is the source of heat loading in the late fall and late winter months that have been added to the critical period, thus strategies other than shade are especially important to explore. In Gresham's experience the Water Quality Management Plans strategies, as listed in Table 2 of the Willamette Subbasin WQMP should include the following.

1) The impacts of private reservoirs/in-channel impoundments

We recommend adding language that requires all in-channel ponds over an acre to be addressed, instead of focusing only on those located on publicly owned land. Both DEQ and Gresham are aware of the sometimes substantial heat loadings from both public and private in-channel ponds in these subbasins. Gresham has tried multiple strategies over the last 20 years to incentivize stream restoration and/or riparian improvements in areas where historic stream impoundments were created as a centerpiece aesthetic feature for a subdivision, or as recreational features for golf courses. Despite numerous long-standing efforts, only negligible changes have resulted with no discernable reduction in heat loading. The City lacks authority to require private in-channel impoundments be retrofit to address heat loading without TMDL language necessitating these areas be addressed, yet it may be private impoundments that are the larger heat source in some systems. The current focus on public reservoirs may miss significant heat sinks. For instance, Gresham will be required to report on continued efforts to improve a 1.5-acre publicly owned pond surrounded by trees on Butler Creek (tributary to Johnson Creek), while immediately upstream, an entirely unshaded 1.3-acre private pond will remain unaddressed, under the current draft of the Willamette Subbasin WQMP. On another Johnson Creek tributary (Hogan Creek) a private golf course system of in-line ponds and a Homeowner Association-maintained in-channel impoundment contribute over 5 acres of privately owned, unshaded reservoirs and those will continue to contribute substantial heat loading to designated critical habitat. Kelly Creek (a tributary to the Sandy River) has summer flows that are largely groundwater-fed and often attain the temperature standard until the creek passes through a golf course and then heats up further in the 1.7-acre private pond on Mt. Hood Community College campus. Fairview Creek is also largely groundwater-fed and generally attains the temperature standard throughout the summer except where large in-channel ponds are present. Publicly owned Fujitsu Ponds (~20-acres) are a high priority for Gresham to retrofit, and opportunities are being pursued. Downstream of these ponds, Fairview Creek empties into a >100-acre private reservoir from which the Columbia Slough emerges, and no amount of shade can offset that impact. Tree shade may help prevent heat loading from direct sun, but shade can't be assumed to offset heat loading upstream. By not including privately held in-channel impoundments in these Temperature TMDL updates, at least a portion of public investment in downstream shade improvements are negated.

2) Protection of shallow subsurface groundwater.

Gresham has documented reaches of sub-surface cold water inputs in both the Sandy subbasin (Kelly Creek) and the Lower Willamette subbasin (Johnson/Kelley Creeks). These inputs are found to create cool areas in these streams, even in areas without the benefit of riparian shade. Protection of "groundwater inflows" and correspondingly, "stream volume" are mentioned specifically in OAR 340-041-0028(11) yet aren't part of the criterion or considerations presented in either the Willamette or Lower Columbia-Sandy Subbasin WQMPs. Disruption or exposures of shallow groundwater and related reduction of bank storage and decreased support of hyporheic flow are anthropogenic sources of warming, thus we recommend that Department of State Lands (DSL) and Oregon Department of Geology and Mineral Industries (DOGAMI) have more explicit requirements for managing temperature than what is currently indicated in both the Sandy and Willamette Subbasin WQMPs. While DSL and DOGAMI are listed as DMAs under the Temperature TMDL updates, both are currently exempted from having any type of implementation plan responsibility due to their limited ownership of streamside property that could be shaded. However, their jurisdictional decisions have significant impacts on preservation of groundwater inflows, stream volume, and cold water refuge support throughout many watersheds in the state, including those relevant to the Temperature TMDL updates discussed here.

While the full Temperature Management Implementation Plans required of most DMAs may not be appropriate for these agencies given their state-wide activities, Gresham would recommend to DEQ that these DMAs are expected to consider their mitigation decisions in the context of the 5th and 6th field HUC

scales at which DEQ regulates other DMA activity. Even the minimal degree of reporting expected of reservoir operators to demonstrate their management activities aren't resulting in heat loading of a given stream seems a reasonable minimum to expect of these state agencies so that their management decisions are not made without considering temperature impacts to TMDL streams. An equivalent expectation could be to report on impacts permitted and mitigation required within the relevant 5th or 6th field HUC. Future riparian tree planting efforts cannot offset current heat exceedances as well as offset future decreases in infiltration, groundwater flow, bank storage, and hyporheic flow support that occurs when nearby wetlands are filled and then mitigated for elsewhere in the state (via in lieu fee payments) or mitigated at a 3rd or 4th field HUC scale.

Similarly, no amount of stream shading can offset the changing hydrology conditions that come from industrial mining sites where industrial discharges start and stop to accommodate extraction activities. Groundwater monitoring near Fairview Creek (in the Lower Willamette) demonstrates that the groundwater gradient is reversed during certain mining activities, and stream flows are significantly altered as mining activities evolve at a site, affecting the survival of riparian vegetation—even negating all past public investment in riparian conditions.

These actions are the largest impacts on bank storage and stream volume Gresham has noticed to date, yet are not addressed in the current Temperature TMDL updates.

Locally Significant Wetlands

Gresham requests that DEQ incorporate into their Temperature TMDL update process a review and collaborative revision of OAR 141-086-0350 (2)(b), in conjunction with the relevant state agencies. The existing language was developed by a technical advisory committee in the late 1990s in association with DSL, DLCD, and DEQ staff, prior to any TMDL approvals in Oregon. The language is the primary directive used by local jurisdictions to require buffer protections of wetlands meeting local significance criteria. Recent challenges to Gresham's legal ability to consider a wetland "locally significant" due to proximity of a 303(d)-listed waterway have highlighted the need for this language to be reviewed and updated at such times that DEQ alters their assessment of streams for inclusion on the 303(d) list and for TMDL listing. If that language does not reflect current DEQ practices, local jurisdictions may lose justification for local wetland protections, and therefore lose the ability to protect these areas on the landscape that are critical for infiltration, groundwater flow, bank storage, and hyporheic flow support.

Please contact me if Gresham's Natural Resources or Water Quality Program can provide any additional information on the comments provided here.

Sincerely,

Kathy Majidi
Natural Resources Program Manager

SANDY
WHERE INNOVATION MEETS ELEVATION

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February 23, 2024

Michele Martin, Project Manager
DEQ Water Quality Division
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232-4100

Sent via email to: Sandy.SubbasinTMDL@DEQ.oregon.gov

Subject: Comments on the Draft Lower Columbia-Sandy River Temperature TMDL

Dear Michele Martin:

Thank you for the opportunity to provide comments on the draft Lower Columbia-Sandy River Temperature TMDL. The City of Sandy is the commercial center of eastern Clackamas County and serves a population of nearly 13,000 people. The City is undertaking major infrastructure investments to protect the environment and plan for Sandy's future, including rehabilitating the aging sewer system and upgrading the existing wastewater treatment plant (WWTP).

The Oregon Association of Clean Water Agencies (ACWA) is providing detailed comments on the draft Lower Columbia-Sandy River Temperature TMDL. We support ACWA's comments on the draft TMDL. The City also has specific comments related to its proposed discharge to the Sandy River, which are presented below.

NPDES Permit
The current NPDES permit for the City's WWTP authorizes discharge to Tickle Creek in the Clackamas River Basin from November 1 to April 30. From May 1 to October 31, the WWTF produces recycled water for use at a local nursery.

As a result of limitations for new or increased discharges in the Clackamas River Basin, the City has submitted an NPDES permit application for a discharge to the Sandy River. Note that the City would continue to discharge to Tickle Creek from November to April and continue to provide recycled water for use at the nursery in accordance with NPDES permit requirements. Wet season flows in excess of what can be discharged to Tickle Creek and meet NPDES permit requirements would be discharged to the Sandy River. Additionally, dry season flows in excess of what can be land applied would also be discharged to the Sandy River. Accordingly, the draft Lower Columbia-Sandy River Temperature TMDL includes a wasteload allocation for the City's proposed discharge to the Sandy River.

Section 9.1 of the TMDL states that the "human use allowance at OAR 340-041-0028(12)(b)(B) identifies the allowed temperature increase reserved for human uses. The rule requires that wasteload and load allocations restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.30°C (0.5°F) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact." A series of tables are included that define the source category allocations in various watersheds in the Lower Columbia-Sandy River Temperature TMDL. Table 9-3 defines the human use allowance allocations that would apply to the City's WWTP proposed discharge to the Sandy River.

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Table 9-3: Human use allowance allocations on the Sandy River from the headwaters to the Bull Run River.

Portion of Human Use Allowance (°C)	Source or source category
0.08*	NPDES point sources
0.21	Warming from tributaries
0.01	Water management activities and water withdrawals
0.00	Solar loading from existing transportation corridors, existing buildings, and existing utility infrastructure
0.00	Solar loading from other NPS sectors
0.00	Reserve capacity
0.30	**Total**

Note: * NPDES permitted point sources are allowed up to 0.08°C cumulatively at the point of maximum impact on the Sandy River from the headwaters to the Bull Run River. The portion of the human use allowance allocated to each point source at the point of discharge is identified in Table 9-7.

This table shows that 0.08°C has been allocated to NPDES point sources, which include Water Environment Services' (WES) Hoodland facility and the proposed discharge from the City's WWTP to the Sandy River. There is no allocation for reserve capacity in this segment of the Sandy River. A significant portion of the human use allowance (0.21°C) is allocated to "warming from tributaries".

The discussion of background sources states that changes to channel morphology, tributary inflows, groundwater inputs, and other anthropogenic changes that are not specifically addressed in the TMDL are included as background. From the discussion in Section 7.3 of the TMDL, it would appear that "warming from tributaries" should be categorized as a background source. Categorizing "warming from tributaries" as background will enable DEQ to include an allocation for reserve capacity. This will provide the communities served by the City of Sandy and Hoodland treatment facilities to potentially utilize a portion of the reserve capacity for future growth and development.

Thank you for your consideration of the City's comments. If you have any questions, please do not hesitate to contact me.

Sincerely,

Jennifer Coker, P.E.
Public Works Director

CITY OF TROUTDALE
ENGINEERING DIVISION

Sent via Email

February 26, 2024

Michele Martin
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Sandy.subbasinTMDL@DEQ.oregon.gov

Dear Michele Martin,

Thank you for the opportunity to provide comments on the draft Lower Columbia-Sandy River Temperature TMDL.

General Comment

- The City agrees with Clackamas Water Environment Services (WES) stance that Oregon's Water Resources Department should be identified as a Designated Management Agency (DMA).
- The City supports comments listed in ACWA's comment letter for the Draft Lower Columbia-Sandy River Temperature TMDL and WQMP that are not referenced in this letter.

Draft TMDL for the Lower Columbia-Sandy Subbasin

Section 7. Pollutant sources or source categories

- In Table 7-1, the City's WPCF is listed under the River Mile column at 1.3 (2.15 km), but the City's NPDES Waste Discharge Permit lists the outfall at river mile 2.3 (3.70 km).
- DEQ should modify its statement about insufficient evidence of stormwater discharges not contributing to temperature standard exceedances to reflect a more affirmative position as proposed by ACWA:
  "Based on a review of published literature and other studies related to stormwater runoff and stream temperature in Oregon, DEQ concludes that stormwater discharges authorized under the set of general (MS4 Phase II, Construction 1200-C), and Industrial (1200-A and 1200-Z) permits do not contribute to temperature standard exceedances in the Lower Columbia-Sandy River Temperature TMDL."
- With the affirmative position, the City also supports WES's request to include a modest temperature WLA for MS4s, such as the City, covered by this TMDL to avoid an unintended compliance issue.

Section 9. Allocation, reserve capacity, and margin of safety

- DEQ allocates a portion of the human use allowance to "warming from tributaries" in Table 9-1 and Table 9-3, but zero allocation from upstream of the Troutdale WPCF to the Bull Run River. The City agrees with ACWA's assertion: "The discussion of background sources states that changes to channel morphology, tributary inflows, groundwater inputs, and other anthropogenic changes that are not specifically addressed in the TMDL are included as background. From the discussion in Section 7.3 of the TMDL, it would appear that "warming from tributaries" should be categorized as a background source. Categorizing "warming from tributaries" as a background will enable DEQ to include an allocation for reserve capacity." This would better serve communities serviced by the City, City of Sandy, and WES included in this TMDL that may need reserve capacity for future growth and development.
- The City of Troutdale is unsure if the reserve capacity listed in Table 9-1 will be enough in the future based on a preliminary data review to meet the 13-degree Celsius criterion during the shoulder seasons.
- Was the Mt. Hood Community College reservoir contribution considered in Table 9-7 and the zero human use allowance allocation for dam and reservoir operations?
- Why is there not a separate WLA for salmon and steelhead spawning and salmon and trout rearing and migration in Table 9.6 as there is in Table 4.15 of the Willamette Basin TMDL of 2006?
- The City agrees with ACWA's statement and would also like to know the answer: "Please explain why the sector-specific allocations do not include an allocation for solar loading from non-point sources (other than existing transportation and utility infrastructure). There is no justification provided in the documents. If there is no allocation for non-point sources, that would mean that achieving the TMDL target requires fully vegetated stream corridors at maximum effective shade."
    - Cities and counties are limited in their scope of control over private property in their jurisdictions and they cannot legally compel private property owners to plant and retain trees absent a proposed land use action. Local governments implement riparian buffer protection and restoration requirements through development codes and ordinances in a manner consistent with Statewide Land Use Goal 5—Natural Resources. The Oregon Administrative Rules (OAR) governing inventorying and protection of riparian corridors are found in OAR 660-023-0090. These rules require that local jurisdictions inventory riparian corridors and either adopt riparian buffer widths and protections based on "safe harbor" provisions or that they establish alternative buffers based on science-based evaluations. Riparian protection ordinances legally cannot, independent of a land use action, compel private property owners to plant and maintain trees or conduct water quality monitoring. These codes and ordinances are triggered when

development applications are submitted, and sometimes when building permit applications are submitted. In these cases, local jurisdictions can require riparian restoration activities within certain legal tests that require proportionality with the land use action.

- Even when riparian buffers are established and trees can be required on private properties, regulatory buffer widths are subject to site constraints, existing structures, established land use laws and regulations, and property owner rights to develop their sites consistent with zoning and land use designations. For reference, OAR 0660-023-0090 sets safe harbor riparian protection areas at 75' from top of bank for streams larger than 1,000 cfs, and at 50' from top of bank for streams smaller than 1,000 cfs. It should be anticipated that in most cases local jurisdictions have very limited ability to require or incentivize private property owners to provide a 120' tree planted buffer. It should also be noted that local jurisdictions do not have legal authority to access private property for the purposes of conducting a shade assessment, which the draft WQMP document requires.
- Certain riparian areas have inventoried significant natural resources, including wetlands and sensitive/endangered/threatened species of plants and animals that require retention of sunlight to maintain habitat conditions and ecological regimes necessary to sustain plant species. For example, areas that are protected for Western Pond turtle habitat, which exist within DMA jurisdictional boundaries must be exposed to the sun. The Temperature TMDL cannot override the need to maintain these types of areas for multi-objective environmental benefits, including natural and constructed wetlands and other protected habitat areas, for Endangered Species Act considerations. In some of these cases, planting trees is inconsistent with maintaining habitat conditions.
- Some DMAs have overlapping jurisdiction with other local government entities and cannot compel tree planting in areas that impact other jurisdictions' functions. For example, some cities have drainage districts established within their jurisdictional boundaries. Like power utilities (that are given an HUA greater than zero in the draft TMDL), drainage districts must restrict tree planting in certain areas, and in some cases remove trees to maintain their facilities. The cities (or counties) cannot be obligated to achieve effective shade where drainage districts or other similar special districts operate drainage and flood control facilities that must be free and clear of vegetation.
- Other state agency objectives, such as those implemented through measures that compel cities to allow increased urban density (which have been enacted to increase affordable housing) or that compel tree removal

in certain areas (to protect certain areas against wildfire risk), also constrain cities abilities to achieve effective shade targets.
    - Existing structures, and the development of new water related and/or water dependent uses are allowed by state land use laws, including rules that implement Statewide Land Use Goal 5, subject to reasonable approval processes. Local governments cannot place a blanket ban on these uses for the purposes of increasing effective shade.

Draft Water Quality Management Plan

- Why is solar radiation listed as a pollutant instead of temperature in Table 1?
- How much bacteria source tracking is required? How will the results be used to reduce bacteria input by a DMA if the bacteria sources are upstream of the DMA jurisdiction? Are construction sites contributing enough bacteria to warrant a management strategy as listed in Table 1?
- The City agrees with ACWA's comment:
  "Reliance on instream water rights as the vehicle to implement this management strategy will not tap its full potential. This management strategy needs to be more fully developed as there is significant untapped potential to leave cool water instream and offset its consumption with recycled water. Recycled water from municipal wastewater treatment facilities is a viable alternate source of water for many consumptive uses and using it in-lieu-of river water has the double temperature benefit of eliminating a discharge of warmer water to the stream and leaving cooler water in the stream. DEQ should take necessary steps to facilitate expansion of the permitted use of recycled water which would allow entities to transfer water rights for in-stream use. For the purposes of this WQMP, DEQ should incorporate the framework for additional means (other than water rights transfers or leases) for achieving temperature compliance through recycled water offsets to withdrawals, such as contracts."
- In reference to ACWA's comment on Section 2.4, the City agrees that the NPDES permit for its WPCF "…cannot implement the priority management strategies without viable permitting pathways." The WQMP should outline the full range of permitting pathways available to achieve compliance for temperature limits.
- Why are many Section 5 requirements treated as a "one size fits all" for DMAs if the approximate percentage of total subbasin area and approximate percentage of acreage within 150' of stream as shown in Table 4 differ by a significant margin and some entities are exempt?
- Measuring effective shade, conducting temperature modeling, and reporting on monitoring performance is impractical and potentially costly for DMAs such as the City of Troutdale. The City does not have authority to access private properties to conduct shade assessments or to confirm that any width of buffer zone from the stream bank is protected. Therefore, DEQ's expressed desire to have local DMAs

conduct “boots on the ground” assessments is not practicable. Small DMAs do not have resources to conduct complex analyses through LiDAR, solar pathfinder or other means. Rather than have individual agencies conduct a shade assessment, this is an action that should be taken on by DEQ at defined intervals to assess shade with the implementation of the TMDL management practices. DEQ has the necessary tools and expertise to conduct this assessment and should take on this responsibility to define the effectiveness of the TMDL management practices.

- Due to the TMDL and the WQMP eventually becoming law, the City strongly encourages DEQ to give DMAs flexibility in the manner it can meet requirements and update its Implementation Plan. There are potentially many unknown costs associated with the new requirements that ultimately would be passed down to sanitary sewer rate payers. Grants are administratively burdensome to DMAs such as the City and should not be considered the primary method of payment.

Thank you for consideration of the City’s comments.

Please contact me if you have any questions regarding this matter.

Sincerely,

Ryan Largura

Ryan Largura
Environmental Specialist

CLACKAMAS
WATER ENVIRONMENT SERVICES

GREGORY L. GEIST | DIRECTOR

Water Quality Protection
Surface Water Management
Wastewater Collection & Treatment

February 20, 2024

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Sent via email to: Willamette.TemperatureTMDL@DEQ.oregon.gov and Sandy.SubbasinTMDL@DEQ.oregon.gov

Subject: Comments on the Draft Willamette and Sandy River Watershed Temperature TMDLs

Dear Michele Martin,

Thank you for the opportunity to provide comments about the January 2024 draft temperature TMDLFs for the Willamette and Sandy River watersheds.

Clackamas Water Environment Services (WES) produces clean water, protects water quality and recovers renewable resources. We do this by providing wastewater services, stormwater management, and environmental education. It's our job to protect public health and support the vitality of our communities, natural environment, and economy. We do that as a collaborative partner in building a resilient clean water future where all people benefit and rivers thrive.

WES maintains and operates:

- The Boring Sewage Treatment Plant (STP), which discharges into the North Fork of Deep Creek in the Willamette River watershed in Boring.
- The Hoodland STP, which discharges into the Sandy River in Welches.
- The public storm sewer system in portions of northwest Clackamas County in partnership with Clackamas County and the Cities of Happy Valley and Rivergrove.

WES has reviewed these two draft TMDLs and has the following comments:

Boring STP:
The January 2024 draft Willamette River TMDL includes a wasteload allocation (WLA) of 0.125 million kcal/day for the Boring STP. This draft allocation is substantially lower than the current NPDES permit limits which are based on the 2006 Willamette River TMDL. The current 2016-2021 NPDES permit for the Boring STP specifies wasteload allocations of 0.333 million kcal/day from June 16th to October 14th based on the core cold water criteria (16 C), and 0.357 million kcal/day from October 15th to June 15th based on fish spawning use (13 C). **An assessment of recent thermal loads in the STP's effluent shows that the facility would be in immediate non-compliance with the proposed WLA in the Jan. 2024 draft TMDL.** Please see the

attached Excel file with Excess Thermal Load data from the Boring STP from April 2020 through October 2023. In many instances, the 7-day average excess thermal load (ETL) discharged during this recent time period exceeds the 0.125 million kcal/day which was allocated to the Boring STP in the Jan. 2024 draft TMDL. Because this is a wastewater treatment plant which serves a community, WES does not have any available options for reducing the temperature or volume of the Boring STP's effluent. Because there is a significant amount (0.155 C) of reserve capacity available in this section of the North Fork of Deep Creek (see Table 9-10), we urge DEQ to distribute some of this reserve capacity to the Boring STP's WLA to provide an achievable WLA for the Boring STP.

In the Jan. 2024 draft Willamette TMDL's Water Quality Management Plan, it says this about WLAs for point sources: "*The allocation was increased above 0.075 when analysis indicated that 0.075 would result in immediate noncompliance. DEQ only increased the allocation if there was sufficient loading capacity available. An assessment of current thermal loading was not possible for all point sources due to project time constraints or lack of data."* It appears that DEQ hasn't yet conducted this assessment of thermal loading for the Boring STP and we urge DEQ to do this prior to finalizing the TMDL.

Also prior to finalizing the TMDL, we also encourage DEQ to establish two WLAs for the Boring STP, as was done in the 2006 Willamette TMDL. One WLA would be for the period from June 16th to October 14th and the other would be from October 15th to June 15th.

Finally, the Jan. 2024 draft Willamette TMDL says the North Fork of Deep Creek's 7Q10 flow at the Boring STP is 0.65 CFS, but WES' 2009 mixing zone study for the Boring STP says the 7Q10 flow there is 0.24 CFS, and this is the 7Q10 flow which DEQ relied upon to write portions of the Boring STP's current (2016-2021) NPDES Permit. Please evaluate this situation to be sure that DEQ is using the most appropriate 7Q10 flow in the new TMDL.

<u>Hoodland STP:</u>
The January 2024 draft Sandy River TMDL includes a wasteload allocation (WLA) of 23.4 million kcal/day for the Hoodland STP. This draft allocation is substantially lower than the current NPDES permit limits which are based on the 2005 Sandy River TMDL. The current 2022-2027 NPDES permit for the Hoodland STP specifies a WLA of 29.9 million kcal/day, which raises the question of why is the Hoodland STP's WLA proposed to be reduced by 6.5 million kcal/day? Is this portion of the Hoodland STP's load proposed to be given to the City of Sandy's proposed new wastewater treatment plant discharge into the Sandy River?

Please see the attached Excel file with Excess Thermal Load data from the Hoodland STP from May 2020 through October 2023. Within this set of data, the highest 7-day average ETL discharged was 7.2
million kcal/day, so a 23.4 million kcal/day allocation to the Hoodland STP in the new TMDL should be satisfactory, because it will allow for some increase in its ETL over time (due to population growth, for example) without causing noncompliance.

And finally, we're concerned about Table 9-3, which contains the Human Use Allowance for the section of the Sandy River where the Hoodland STP is located. "Warming from tributaries" is proposed to receive 0.21 C of the 0.3 C Human Use Allowance and there isn't any allocation for

Reserve Capacity. Please explain why Reserve Capacity receives no allocation. If DEQ is able to do so, we recommend that some of the very large allocation for "warming from tributaries" be re-distributed to Reserve Capacity to ensure that additional loading is available for distribution to sources in the future – potentially including the Hoodland STP if needed – in this reach of the river.

Oregon's Water Resources Department:
Oregon's Water Resources Department should be identified as a DMA (Designated Management Agency) in the Sandy River and Willamette River Watershed Temperature TMDLs. In Appendix A on Page #54 of #83 in the Jan. 2024 draft Willamette River TMDL's Water Quality Management Plan, in rows #126 to #133 in the table, Oregon's Dept. of Forestry (ODF), Oregon's Department of Agriculture (ODA), and several other state agencies are identified as DMAs. Why was WRD omitted from this draft list?

On page #7 of #83 in the Jan. 2024 draft Willamette River TMDL's Water Quality Management Plan, water rights and the benefit of enhancing instream flows are addressed: "*Water conservation is a best management practice that directly links the relationship between water quantity and water quality. Leaving water instream functions as a method to protect water quality from flow-related parameters of concern, such as temperature. Under state law, the first person to file for and obtain a water right on a stream is the last person to be denied water in times of low stream flows. Therefore, restoration of stream flows may require establishing instream water rights. One way this can be accomplished is by donating or purchasing out-of-stream rights and converting these rights to instream uses."* To support attainment of the allocations in these water temperature TMDLs, the WRD could communicate with senior water rights holders, for example, to verify that they aren't taking more water for consumptive purposes (ie. irrigating crops) than is allowed by their water right in order to maintain higher instream flows and lower instream temperatures.

Clackamas WES is a DMA:
On Page #54 of #83 in the Jan. 2024 draft Willamette River TMDL's Water Quality Management Plan, in row #125 in the table found in Appendix A, WES' name isn't spelled correctly. It says *"Water and Environment Services".* The correct name to use here is Water Environment Services.

MS4 Permits in the Jan. 2024 draft Willamette River TMDL:

- Please re-name Table 9-11, which begins on page #40. It current title is "Point Sources" but MS4 Permits, which are point sources, have been excluded. MS4 Permits were included in Table 7-2.
- Section 9.1.2 says "*The wasteload allocation for registrants under the general stormwater permits (MS4, 1200-A, 1200-C and 1200-Z) and general permit registrants not identified in Table 9-11 is equal to any existing thermal load authorized under the current permit."* This is problematic because we're unsure what the existing thermal load is that was authorized by the Phase II General MS4 Permit, and a NPDES permit cannot authorize a MS4 to discharge an excess thermal load if the load isn't first properly authorized by the temperature TMDL. Note that this phrase says only "general" MS4 permits are included. Please remember to also consider Phase I individual MS4 Permits

when addressing this subject (Clackamas WES' Phase I MS4 Permit is an individual MS4 permit).

- On page #23, the draft TMDL says "*Based on a review of published literature and other studies related to stormwater runoff and stream temperature in Oregon (see TSD section 7.1.2), DEQ found there is not sufficient evidence to demonstrate that stormwater discharges authorized under the current municipal (MS4s) permits or the construction (1200-C) and industrial (1200-A and 1200-Z) general stormwater permits contribute to exceedances of the temperature standard."* The TMDL also says "*Waste load allocations were not assigned to storm water sources such as municipal separate storm sewer systems (MS4s) and combined sewer overflows because they have been determined not to be significant contributors to heat over a seven day period as specified in the temperature standard."* We encourage DEQ to provide a modest temperature WLA to all MS4s in this TMDL – and also in the Sandy River TMDL – to avoid unintended compliance problems if it turns out that one or more MS4s are someday found to be a significant contributor of heat. An example could be a storm sewer system with a large stormwater treatment & detention pond near the outfall with a constant source of spring-fed flow (24-7) during the hot Summer months. In this instance, this spring water could be warmed somewhat on its way through the pond before being discharged into the creek, wetland or river.

Please do not hesitate to call me at (503) 742-4581 if you have any questions, concerns or comments.

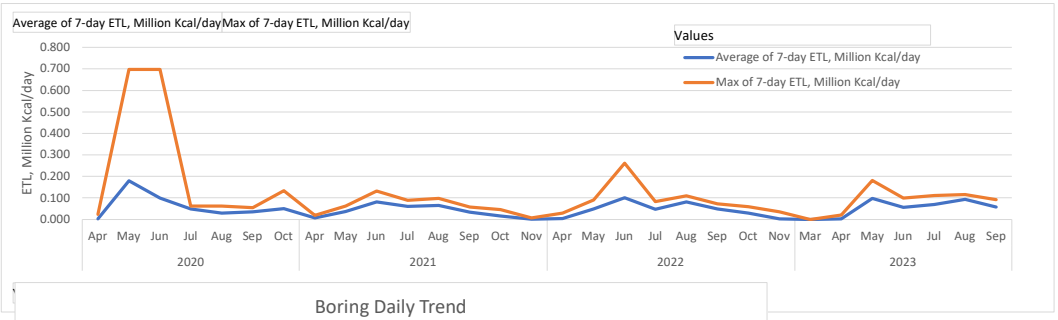
Sincerely,

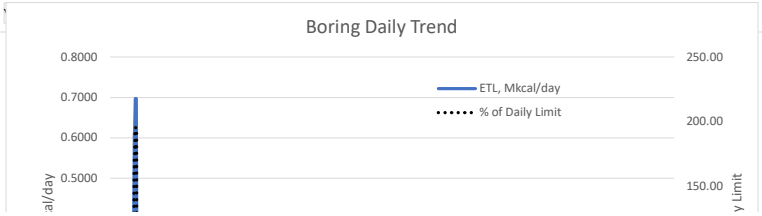
Ronald Wierenga
Deputy Director

cc Andrew Swanson (WES)

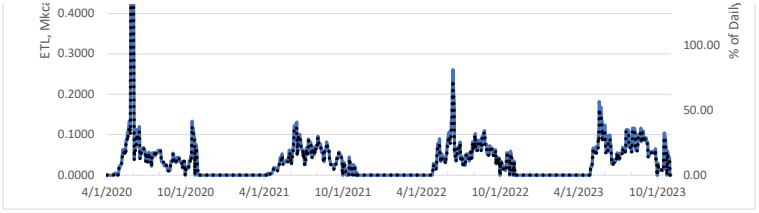
Date	7-day ETL, Million Kcal/day	ETL Limit	Over Limit?	% of Limit
4/1/2020	0.0000	0.357	N	0.00
4/2/2020	0.0000	0.357	N	0.00
4/3/2020	0.0000	0.357	N	0.00
4/4/2020	0.0000	0.357	N	0.00
4/5/2020	0.0000	0.357	N	0.00
4/6/2020	0.0000	0.357	N	0.00
4/7/2020	0.0000	0.357	N	0.00
4/8/2020	0.0000	0.357	N	0.00
4/9/2020	0.0000	0.357	N	0.00
4/10/2020	0.0000	0.357	N	0.00
4/11/2020	0.0000	0.357	N	0.00
4/12/2020	0.0000	0.357	N	0.00
4/13/2020	0.0000	0.357	N	0.00
4/14/2020	0.0000	0.357	N	0.00
4/15/2020	0.0000	0.357	N	0.00
4/16/2020	0.0000	0.357	N	0.00
4/17/2020	0.0026	0.357	N	0.73
4/18/2020	0.0026	0.357	N	0.73
4/19/2020	0.0026	0.357	N	0.73
4/20/2020	0.0054	0.357	N	1.50
4/21/2020	0.0046	0.357	N	1.29
4/22/2020	0.0024	0.357	N	0.68
4/23/2020	0.0018	0.357	N	0.50
4/24/2020	0.0000	0.357	N	0.00
4/25/2020	0.0000	0.357	N	0.00
4/26/2020	0.0000	0.357	N	0.00
4/27/2020	0.0013	0.357	N	0.35
4/28/2020	0.0115	0.357	N	3.21
4/29/2020	0.0222	0.357	N	6.21
4/30/2020	0.0232	0.357	N	6.49
5/1/2020	0.0231	0.357	N	6.46
5/2/2020	0.0231	0.357	N	6.46
5/3/2020	0.0231	0.357	N	6.46
5/4/2020	0.0275	0.357	N	7.72
5/5/2020	0.0333	0.357	N	9.34
5/6/2020	0.0432	0.357	N	12.09
5/7/2020	0.0631	0.357	N	17.68
5/8/2020	0.0631	0.357	N	17.68
5/9/2020	0.0631	0.357	N	17.68
5/10/2020	0.0631	0.357	N	17.68
5/11/2020	0.0530	0.357	N	14.85
5/12/2020	0.0620	0.357	N	17.36
5/13/2020	0.0613	0.357	N	17.18
5/14/2020	0.0547	0.357	N	15.32
5/15/2020	0.0845	0.357	N	23.67
5/16/2020	0.0845	0.357	N	23.67
5/17/2020	0.0845	0.357	N	23.67
5/18/2020	0.1055	0.357	N	29.55
5/19/2020	0.0999	0.357	N	27.98
5/20/2020	0.1057	0.357	N	29.61
5/21/2020	0.1197	0.357	N	33.52
5/22/2020	0.1327	0.357	N	37.18
5/23/2020	0.1327	0.357	N	37.18
5/24/2020	0.1327	0.357	N	37.18
5/25/2020	0.1109	0.357	N	31.06
5/26/2020	0.4012	0.357	Y	112.39
5/27/2020	0.6076	0.357	Y	170.19
5/28/2020	0.6203	0.357	Y	173.76
5/29/2020	0.6975	0.357	Y	195.39
5/30/2020	0.6975	0.357	Y	195.39
5/31/2020	0.6975	0.357	Y	195.39

Row Labels	Average of 7-day ETL, Million Kcal/day	Max of 7-day ETL, Million Kcal/day
2020	**0.063**	**0.698**
Apr	0.003	0.023
May	0.180	0.698
Jun	0.099	0.698
Jul	0.048	0.062
Aug	0.029	0.062
Sep	0.034	0.054
Oct	0.049	0.133
2021	**0.038**	**0.131**
Apr	0.007	0.019
May	0.037	0.061
Jun	0.081	0.131
Jul	0.060	0.089
Aug	0.064	0.097
Sep	0.033	0.057
Oct	0.016	0.045
Nov	0.000	0.007
2022	**0.045**	**0.261**
Apr	0.003	0.029
May	0.049	0.090
Jun	0.100	0.261
Jul	0.047	0.082
Aug	0.081	0.110
Sep	0.048	0.072
Oct	0.030	0.059
Nov	0.002	0.034
2023	**0.061**	**0.182**
Mar	0.000	0.000
Apr	0.002	0.020
May	0.098	0.182
Jun	0.056	0.099
Jul	0.070	0.112
Aug	0.093	0.116
Sep	0.057	0.092





6/1/2020	0.6975	0.357	Y	195.39
6/2/2020	0.2706	0.357	N	75.80
6/3/2020	0.0417	0.357	N	11.67
6/4/2020	0.0719	0.357	N	20.13
6/5/2020	0.0682	0.357	N	19.09
6/6/2020	0.0682	0.357	N	19.09
6/7/2020	0.0682	0.357	N	19.09
6/8/2020	0.0906	0.357	N	25.38
6/9/2020	0.1119	0.357	N	31.34
6/10/2020	0.0984	0.357	N	27.57
6/11/2020	0.0945	0.357	N	26.48
6/12/2020	0.1120	0.357	N	31.38
6/13/2020	0.1120	0.357	N	31.38
6/14/2020	0.1120	0.357	N	31.38
6/15/2020	0.1197	0.357	N	33.52
6/16/2020	0.0422	0.333	N	12.68
6/17/2020	0.0521	0.333	N	15.63
6/18/2020	0.0512	0.333	N	15.37
6/19/2020	0.0568	0.333	N	17.05
6/20/2020	0.0568	0.333	N	17.05
6/21/2020	0.0568	0.333	N	17.05
6/22/2020	0.0627	0.333	N	18.82
6/23/2020	0.0628	0.333	N	18.87
6/24/2020	0.0680	0.333	N	20.41
6/25/2020	0.0675	0.333	N	20.28
6/26/2020	0.0596	0.333	N	17.90
6/27/2020	0.0596	0.333	N	17.90
6/28/2020	0.0596	0.333	N	17.90
6/29/2020	0.0490	0.333	N	14.73
6/30/2020	0.0346	0.333	N	10.40
7/1/2020	0.0472	0.333	N	14.19
7/2/2020	0.0489	0.333	N	14.68
7/3/2020	0.0334	0.333	N	10.02
7/4/2020	0.0334	0.333	N	10.02
7/5/2020	0.0334	0.333	N	10.02
7/6/2020	0.0454	0.333	N	13.64
7/7/2020	0.0569	0.333	N	17.09
7/8/2020	0.0496	0.333	N	14.89
7/9/2020	0.0344	0.333	N	10.34
7/10/2020	0.0344	0.333	N	10.34
7/11/2020	0.0344	0.333	N	10.34
7/12/2020	0.0344	0.333	N	10.34
7/13/2020	0.0219	0.333	N	6.58
7/14/2020	0.0383	0.333	N	11.51
7/15/2020	0.0554	0.333	N	16.65
7/16/2020	0.0554	0.333	N	16.65
7/17/2020	0.0554	0.333	N	16.65
7/18/2020	0.0554	0.333	N	16.65
7/19/2020	0.0554	0.333	N	16.65
7/20/2020	0.0554	0.333	N	16.65
7/21/2020	0.0470	0.333	N	14.12
7/22/2020	0.0549	0.333	N	16.48
7/23/2020	0.0549	0.333	N	16.48
7/24/2020	0.0549	0.333	N	16.48
7/25/2020	0.0549	0.333	N	16.48
7/26/2020	0.0549	0.333	N	16.48
7/27/2020	0.0549	0.333	N	16.48
7/28/2020	0.0609	0.333	N	18.29
7/29/2020	0.0616	0.333	N	18.50
7/30/2020	0.0616	0.333	N	18.50
7/31/2020	0.0616	0.333	N	18.50
8/1/2020	0.0616	0.333	N	18.50



8/2/2020	0.0616	0.333	N	18.50
8/3/2020	0.0616	0.333	N	18.50
8/4/2020	0.0481	0.333	N	14.46
8/5/2020	0.0329	0.333	N	9.88
8/6/2020	0.0329	0.333	N	9.88
8/7/2020	0.0329	0.333	N	9.88
8/8/2020	0.0329	0.333	N	9.88
8/9/2020	0.0329	0.333	N	9.88
8/10/2020	0.0329	0.333	N	9.88
8/11/2020	0.0242	0.333	N	7.26
8/12/2020	0.0224	0.333	N	6.74
8/13/2020	0.0247	0.333	N	7.42
8/14/2020	0.0247	0.333	N	7.42
8/15/2020	0.0247	0.333	N	7.42
8/16/2020	0.0247	0.333	N	7.42
8/17/2020	0.0247	0.333	N	7.42
8/18/2020	0.0203	0.333	N	6.09
8/19/2020	0.0128	0.333	N	3.84
8/20/2020	0.0103	0.333	N	3.11
8/21/2020	0.0103	0.333	N	3.11
8/22/2020	0.0103	0.333	N	3.11
8/23/2020	0.0103	0.333	N	3.11
8/24/2020	0.0103	0.333	N	3.11
8/25/2020	0.0114	0.333	N	3.44
8/26/2020	0.0201	0.333	N	6.03
8/27/2020	0.0353	0.333	N	10.61
8/28/2020	0.0353	0.333	N	10.61
8/29/2020	0.0353	0.333	N	10.61
8/30/2020	0.0353	0.333	N	10.61
8/31/2020	0.0353	0.333	N	10.61
9/1/2020	0.0545	0.333	N	16.35
9/2/2020	0.0522	0.333	N	15.67
9/3/2020	0.0357	0.333	N	10.73
9/4/2020	0.0357	0.333	N	10.73
9/5/2020	0.0357	0.333	N	10.73
9/6/2020	0.0357	0.333	N	10.73
9/7/2020	0.0357	0.333	N	10.73
9/8/2020	0.0310	0.333	N	9.32
9/9/2020	0.0436	0.333	N	13.09
9/10/2020	0.0436	0.333	N	13.09
9/11/2020	0.0436	0.333	N	13.09
9/12/2020	0.0436	0.333	N	13.09
9/13/2020	0.0436	0.333	N	13.09
9/14/2020	0.0436	0.333	N	13.09
9/15/2020	0.0444	0.333	N	13.34
9/16/2020	0.0325	0.333	N	9.77
9/17/2020	0.0325	0.333	N	9.77
9/18/2020	0.0325	0.333	N	9.77
9/19/2020	0.0325	0.333	N	9.77
9/20/2020	0.0325	0.333	N	9.77
9/21/2020	0.0325	0.333	N	9.77
9/22/2020	0.0252	0.333	N	7.56
9/23/2020	0.0171	0.333	N	5.14
9/24/2020	0.0348	0.333	N	10.45
9/25/2020	0.0348	0.333	N	10.45
9/26/2020	0.0348	0.333	N	10.45
9/27/2020	0.0348	0.333	N	10.45
9/28/2020	0.0348	0.333	N	10.45
9/29/2020	0.0000	0.333	N	0.00
9/30/2020	0.0000	0.333	N	0.00
10/1/2020	0.0190	0.333	N	5.71
10/2/2020	0.0190	0.333	N	5.71

10/3/2020	0.0190	0.333	N	5.71
10/4/2020	0.0190	0.333	N	5.71
10/5/2020	0.0190	0.333	N	5.71
10/6/2020	0.0169	0.333	N	5.09
10/7/2020	0.0169	0.333	N	5.09
10/8/2020	0.0262	0.333	N	7.87
10/9/2020	0.0359	0.333	N	10.78
10/10/2020	0.0359	0.333	N	10.78
10/11/2020	0.0359	0.333	N	10.78
10/12/2020	0.0478	0.333	N	14.35
10/13/2020	0.0477	0.333	N	14.31
10/14/2020	0.0425	0.333	N	12.77
10/15/2020	0.1331	0.357	N	37.29
10/16/2020	0.1171	0.357	N	32.79
10/17/2020	0.1171	0.357	N	32.79
10/18/2020	0.1171	0.357	N	32.79
10/19/2020	0.1018	0.357	N	28.52
10/20/2020	0.0987	0.357	N	27.66
10/21/2020	0.0911	0.357	N	25.51
10/22/2020	0.0000	0.357	N	0.00
10/23/2020	0.0752	0.357	N	21.07
10/24/2020	0.0752	0.357	N	21.07
10/25/2020	0.0752	0.357	N	21.07
10/26/2020	0.0638	0.357	N	17.86
10/27/2020	0.0377	0.357	N	10.55
10/28/2020	0.0182	0.357	N	5.11
10/29/2020	0.0000	0.357	N	0.00
10/30/2020	0.0000	0.357	N	0.00
10/31/2020	0.0000	0.357	N	0.00
4/1/2021	0.0000	0.357	N	0.00
4/2/2021	0.0000	0.357	N	0.00
4/3/2021	0.0000	0.357	N	0.00
4/4/2021	0.0000	0.357	N	0.00
4/5/2021	0.0000	0.357	N	0.00
4/6/2021	0.0000	0.357	N	0.00
4/7/2021	0.0000	0.357	N	0.00
4/8/2021	0.0044	0.357	N	1.22
4/9/2021	0.0044	0.357	N	1.22
4/10/2021	0.0044	0.357	N	1.22
4/11/2021	0.0044	0.357	N	1.22
4/12/2021	0.0003	0.357	N	0.07
4/13/2021	0.0030	0.357	N	0.84
4/14/2021	0.0029	0.357	N	0.82
4/15/2021	0.0038	0.357	N	1.07
4/16/2021	0.0038	0.357	N	1.07
4/17/2021	0.0038	0.357	N	1.07
4/18/2021	0.0038	0.357	N	1.07
4/19/2021	0.0059	0.357	N	1.64
4/20/2021	0.0079	0.357	N	2.20
4/21/2021	0.0102	0.357	N	2.86
4/22/2021	0.0172	0.357	N	4.82
4/23/2021	0.0188	0.357	N	5.28
4/24/2021	0.0188	0.357	N	5.28
4/25/2021	0.0188	0.357	N	5.28
4/26/2021	0.0177	0.357	N	4.96
4/27/2021	0.0138	0.357	N	3.88
4/28/2021	0.0147	0.357	N	4.12
4/29/2021	0.0137	0.357	N	3.85
4/30/2021	0.0119	0.357	N	3.34
5/1/2021	0.012	0.357	N	3.34
5/2/2021	0.012	0.357	N	3.34
5/3/2021	0.020	0.357	N	5.54

5/4/2021	0.023	0.357	N	6.40
5/5/2021	0.027	0.357	N	7.48
5/6/2021	0.030	0.357	N	8.48
5/7/2021	0.043	0.357	N	12.18
5/8/2021	0.043	0.357	N	12.18
5/9/2021	0.043	0.357	N	12.18
5/10/2021	0.041	0.357	N	11.57
5/11/2021	0.048	0.357	N	13.56
5/12/2021	0.053	0.357	N	14.80
5/13/2021	0.043	0.357	N	11.96
5/14/2021	0.030	0.357	N	8.33
5/15/2021	0.030	0.357	N	8.33
5/16/2021	0.030	0.357	N	8.33
5/17/2021	0.030	0.357	N	8.51
5/18/2021	0.034	0.357	N	9.50
5/19/2021	0.036	0.357	N	10.05
5/20/2021	0.036	0.357	N	10.05
5/21/2021	0.036	0.357	N	10.05
5/22/2021	0.036	0.357	N	10.05
5/23/2021	0.036	0.357	N	10.05
5/24/2021	0.038	0.357	N	10.58
5/25/2021	0.035	0.357	N	9.93
5/26/2021	0.034	0.357	N	9.41
5/27/2021	0.047	0.357	N	13.05
5/28/2021	0.061	0.357	N	17.19
5/29/2021	0.061	0.357	N	17.19
5/30/2021	0.061	0.357	N	17.19
5/31/2021	0.044	0.357	N	12.25
6/1/2021	0.0430	0.357	N	12.03
6/2/2021	0.0278	0.357	N	7.78
6/3/2021	0.0314	0.357	N	8.80
6/4/2021	0.0432	0.357	N	12.11
6/5/2021	0.0643	0.357	N	18.00
6/6/2021	0.0643	0.357	N	18.00
6/7/2021	0.0643	0.357	N	18.00
6/8/2021	0.0911	0.357	N	25.51
6/9/2021	0.1216	0.357	N	34.06
6/10/2021	0.1195	0.357	N	33.46
6/11/2021	0.1181	0.357	N	33.09
6/12/2021	0.1257	0.357	N	35.20
6/13/2021	0.1257	0.357	N	35.20
6/14/2021	0.1257	0.357	N	35.20
6/15/2021	0.1313	0.357	N	36.79
6/16/2021	0.0506	0.333	N	15.19
6/17/2021	0.0588	0.333	N	17.65
6/18/2021	0.0766	0.333	N	23.01
6/19/2021	0.0982	0.333	N	29.50
6/20/2021	0.0982	0.333	N	29.50
6/21/2021	0.0982	0.333	N	29.50
6/22/2021	0.1012	0.333	N	30.39
6/23/2021	0.0903	0.333	N	27.12
6/24/2021	0.0860	0.333	N	25.83
6/25/2021	0.0714	0.333	N	21.45
6/26/2021	0.0628	0.333	N	18.87
6/27/2021	0.0628	0.333	N	18.87
6/28/2021	0.0628	0.333	N	18.87
6/29/2021	0.0620	0.333	N	18.61
6/30/2021	0.0472	0.333	N	14.16
7/1/2021	0.0567	0.333	N	17.03
7/2/2021	0.0435	0.333	N	13.07
7/3/2021	0.0261	0.333	N	7.84
7/4/2021	0.0261	0.333	N	7.84

7/5/2021	0.0261	0.333	N	7.84
7/6/2021	0.0453	0.333	N	13.61
7/7/2021	0.0669	0.333	N	20.10
7/8/2021	0.0515	0.333	N	15.46
7/9/2021	0.0515	0.333	N	15.46
7/10/2021	0.0515	0.333	N	15.46
7/11/2021	0.0515	0.333	N	15.46
7/12/2021	0.0887	0.333	N	26.64
7/13/2021	0.0869	0.333	N	26.08
7/14/2021	0.0800	0.333	N	24.02
7/15/2021	0.0800	0.333	N	24.02
7/16/2021	0.0800	0.333	N	24.02
7/17/2021	0.0800	0.333	N	24.02
7/18/2021	0.0800	0.333	N	24.02
7/19/2021	0.0595	0.333	N	17.88
7/20/2021	0.0441	0.333	N	13.24
7/21/2021	0.0449	0.333	N	13.49
7/22/2021	0.0672	0.333	N	20.19
7/23/2021	0.0672	0.333	N	20.19
7/24/2021	0.0672	0.333	N	20.19
7/25/2021	0.0672	0.333	N	20.19
7/26/2021	0.0502	0.333	N	15.09
7/27/2021	0.0569	0.333	N	17.08
7/28/2021	0.0714	0.333	N	21.45
7/29/2021	0.0652	0.333	N	19.58
7/30/2021	0.0652	0.333	N	19.58
7/31/2021	0.0652	0.333	N	19.58
8/1/2021	0.0652	0.333	N	19.58
8/2/2021	0.0877	0.333	N	26.32
8/3/2021	0.0968	0.333	N	29.06
8/4/2021	0.0928	0.333	N	27.86
8/5/2021	0.0784	0.333	N	23.54
8/6/2021	0.0784	0.333	N	23.54
8/7/2021	0.0784	0.333	N	23.54
8/8/2021	0.0784	0.333	N	23.54
8/9/2021	0.0766	0.333	N	23.01
8/10/2021	0.0721	0.333	N	21.65
8/11/2021	0.0570	0.333	N	17.11
8/12/2021	0.0570	0.333	N	17.11
8/13/2021	0.0570	0.333	N	17.11
8/14/2021	0.0570	0.333	N	17.11
8/15/2021	0.0570	0.333	N	17.11
8/16/2021	0.0360	0.333	N	10.80
8/17/2021	0.0332	0.333	N	9.96
8/18/2021	0.0347	0.333	N	10.43
8/19/2021	0.0617	0.333	N	18.53
8/20/2021	0.0617	0.333	N	18.53
8/21/2021	0.0617	0.333	N	18.53
8/22/2021	0.0617	0.333	N	18.53
8/23/2021	0.0819	0.333	N	24.59
8/24/2021	0.0783	0.333	N	23.52
8/25/2021	0.0743	0.333	N	22.33
8/26/2021	0.0607	0.333	N	18.22
8/27/2021	0.0607	0.333	N	18.22
8/28/2021	0.0607	0.333	N	18.22
8/29/2021	0.0607	0.333	N	18.22
8/30/2021	0.0411	0.333	N	12.33
8/31/2021	0.0359	0.333	N	10.77
9/1/2021	0.0308	0.333	N	9.26
9/2/2021	0.0258	0.333	N	7.75
9/3/2021	0.0258	0.333	N	7.75
9/4/2021	0.0258	0.333	N	7.75

9/5/2021	0.0258	0.333	N	7.75
9/6/2021	0.0258	0.333	N	7.75
9/7/2021	0.0235	0.333	N	7.05
9/8/2021	0.0216	0.333	N	6.49
9/9/2021	0.0148	0.333	N	4.45
9/10/2021	0.0261	0.333	N	7.85
9/11/2021	0.0261	0.333	N	7.85
9/12/2021	0.0261	0.333	N	7.85
9/13/2021	0.0261	0.333	N	7.85
9/14/2021	0.0279	0.333	N	8.37
9/15/2021	0.0313	0.333	N	9.39
9/16/2021	0.0435	0.333	N	13.06
9/17/2021	0.0416	0.333	N	12.49
9/18/2021	0.0416	0.333	N	12.49
9/19/2021	0.0416	0.333	N	12.49
9/20/2021	0.0564	0.333	N	16.93
9/21/2021	0.0573	0.333	N	17.20
9/22/2021	0.0561	0.333	N	16.83
9/23/2021	0.0515	0.333	N	15.47
9/24/2021	0.0490	0.333	N	14.71
9/25/2021	0.0490	0.333	N	14.71
9/26/2021	0.0490	0.333	N	14.71
9/27/2021	0.0424	0.333	N	12.73
9/28/2021	0.0405	0.333	N	12.16
9/29/2021	0.0000	0.333	N	0.00
9/30/2021	0.0000	0.333	N	0.00
10/1/2021	0.0314	0.333	N	9.43
10/2/2021	0.0314	0.333	N	9.43
10/3/2021	0.0314	0.333	N	9.43
10/4/2021	0.0267	0.333	N	8.02
10/5/2021	0.0178	0.333	N	5.35
10/6/2021	0.0139	0.333	N	4.17
10/7/2021	0.0088	0.333	N	2.66
10/8/2021	0.0000	0.333	N	0.00
10/9/2021	0.0000	0.333	N	0.00
10/10/2021	0.0000	0.333	N	0.00
10/11/2021	0.0000	0.333	N	0.00
10/12/2021	0.0000	0.333	N	0.00
10/13/2021	0.0000	0.333	N	0.00
10/14/2021	0.0000	0.333	N	0.00
10/15/2021	0.0449	0.357	N	12.59
10/16/2021	0.0333	0.357	N	9.32
10/17/2021	0.0333	0.357	N	9.32
10/18/2021	0.0263	0.357	N	7.37
10/19/2021	0.0206	0.357	N	5.78
10/20/2021	0.0163	0.357	N	4.56
10/21/2021	0.0161	0.357	N	4.50
10/22/2021	0.0000	0.357	N	0.00
10/23/2021	0.0221	0.357	N	6.20
10/24/2021	0.0262	0.357	N	7.34
10/25/2021	0.0255	0.357	N	7.14
10/26/2021	0.0237	0.357	N	6.63
10/27/2021	0.0227	0.357	N	6.36
10/28/2021	0.0210	0.357	N	5.88
10/29/2021	0.0000	0.357	N	0.00
10/30/2021	0.0000	0.357	N	0.00
10/31/2021	0.0000	0.357	N	0.00
11/1/2021	0.0069	0.357	N	1.92
11/2/2021	0.0032	0.357	N	0.89
11/3/2021	0.0000	0.357	N	0.00
11/4/2021	0.0000	0.357	N	0.00
11/5/2021	0.0000	0.357	N	0.00

11/6/2021	0.0000	0.357	N	0.00
11/7/2021	0.0000	0.357	N	0.00
11/8/2021	0.0000	0.357	N	0.00
11/9/2021	0.0000	0.357	N	0.00
11/10/2021	0.0000	0.357	N	0.00
11/11/2021	0.0000	0.357	N	0.00
11/12/2021	0.0000	0.357	N	0.00
11/13/2021	0.0000	0.357	N	0.00
11/14/2021	0.0000	0.357	N	0.00
11/15/2021	0.0000	0.357	N	0.00
11/16/2021	0.0000	0.357	N	0.00
11/17/2021	0.0000	0.357	N	0.00
11/18/2021	0.0000	0.357	N	0.00
11/19/2021	0.0000	0.357	N	0.00
11/20/2021	0.0000	0.357	N	0.00
11/21/2021	0.0000	0.357	N	0.00
11/22/2021	0.0000	0.357	N	0.00
11/23/2021	0.0000	0.357	N	0.00
11/24/2021	0.0000	0.357	N	0.00
11/25/2021	0.0000	0.357	N	0.00
11/26/2021	0.0000	0.357	N	0.00
11/27/2021	0.0000	0.357	N	0.00
11/28/2021	0.0000	0.357	N	0.00
11/29/2021	0.0000	0.357	N	0.00
11/30/2021	0.0000	0.357	N	0.00
4/1/2022	0.0000	0.357	N	0.00
4/2/2022	0.0000	0.357	N	0.00
4/3/2022	0.0000	0.357	N	0.00
4/4/2022	0.0000	0.357	N	0.00
4/5/2022	0.0000	0.357	N	0.00
4/6/2022	0.0000	0.357	N	0.00
4/7/2022	0.0000	0.357	N	0.00
4/8/2022	0.0000	0.357	N	0.00
4/9/2022	0.0000	0.357	N	0.00
4/10/2022	0.0000	0.357	N	0.00
4/11/2022	0.0000	0.357	N	0.00
4/12/2022	0.0000	0.357	N	0.00
4/13/2022	0.0000	0.357	N	0.00
4/14/2022	0.0000	0.357	N	0.00
4/15/2022	0.0000	0.357	N	0.00
4/16/2022	0.0000	0.357	N	0.00
4/17/2022	0.0000	0.357	N	0.00
4/18/2022	0.0000	0.357	N	0.00
4/19/2022	0.0000	0.357	N	0.00
4/20/2022	0.0000	0.357	N	0.00
4/21/2022	0.0000	0.357	N	0.00
4/22/2022	0.0000	0.357	N	0.00
4/23/2022	0.0000	0.357	N	0.00
4/24/2022	0.0000	0.357	N	0.00
4/25/2022	0.0000	0.357	N	0.00
4/26/2022	0.0038	0.357	N	1.07
4/27/2022	0.0144	0.357	N	4.04
4/28/2022	0.0287	0.357	N	8.03
4/29/2022	0.0251	0.357	N	7.03
4/30/2022	0.0251	0.357	N	7.03
5/1/2022	0.0251	0.357	N	7.03
5/2/2022	0.0251	0.357	N	7.03
5/3/2022	0.0144	0.357	N	4.02
5/4/2022	0.0154	0.357	N	4.32
5/5/2022	0.0201	0.357	N	5.63
5/6/2022	0.0468	0.357	N	13.10
5/7/2022	0.0640	0.357	N	17.94

5/8/2022	0.0769	0.357	N	21.53
5/9/2022	0.0745	0.357	N	20.86
5/10/2022	0.0766	0.357	N	21.46
5/11/2022	0.0754	0.357	N	21.13
5/12/2022	0.0900	0.357	N	25.20
5/13/2022	0.0619	0.357	N	17.34
5/14/2022	0.0455	0.357	N	12.73
5/15/2022	0.0338	0.357	N	9.47
5/16/2022	0.0444	0.357	N	12.43
5/17/2022	0.0526	0.357	N	14.73
5/18/2022	0.0520	0.357	N	14.56
5/19/2022	0.0415	0.357	N	11.62
5/20/2022	0.0433	0.357	N	12.12
5/21/2022	0.0433	0.357	N	12.12
5/22/2022	0.0433	0.357	N	12.12
5/23/2022	0.0407	0.357	N	11.39
5/24/2022	0.0357	0.357	N	10.01
5/25/2022	0.0360	0.357	N	10.07
5/26/2022	0.0305	0.357	N	8.53
5/27/2022	0.0399	0.357	N	11.18
5/28/2022	0.0513	0.357	N	14.38
5/29/2022	0.0513	0.357	N	14.38
5/30/2022	0.0769	0.357	N	21.55
5/31/2022	0.0803	0.357	N	22.49
6/1/2022	0.0963	0.357	N	26.97
6/2/2022	0.0963	0.357	N	26.97
6/3/2022	0.1067	0.357	N	29.90
6/4/2022	0.0973	0.357	N	27.25
6/5/2022	0.0973	0.357	N	27.25
6/6/2022	0.0849	0.357	N	23.79
6/7/2022	0.0941	0.357	N	26.35
6/8/2022	0.1078	0.357	N	30.20
6/9/2022	0.1334	0.357	N	37.35
6/10/2022	0.1450	0.357	N	40.61
6/11/2022	0.2064	0.357	N	57.81
6/12/2022	0.2607	0.357	N	73.02
6/13/2022	0.2339	0.357	N	65.51
6/14/2022	0.2069	0.357	N	57.96
6/15/2022	0.1788	0.357	N	50.08
6/16/2022	0.0577	0.333	N	17.32
6/17/2022	0.0660	0.333	N	19.81
6/18/2022	0.0481	0.333	N	14.44
6/19/2022	0.0349	0.333	N	10.47
6/20/2022	0.0372	0.333	N	11.17
6/21/2022	0.0415	0.333	N	12.47
6/22/2022	0.0541	0.333	N	16.24
6/23/2022	0.0618	0.333	N	18.57
6/24/2022	0.0697	0.333	N	20.94
6/25/2022	0.0644	0.333	N	19.34
6/26/2022	0.0644	0.333	N	19.34
6/27/2022	0.0615	0.333	N	18.46
6/28/2022	0.0762	0.333	N	22.88
6/29/2022	0.0819	0.333	N	24.60
6/30/2022	0.0389	0.333	N	11.68
7/1/2022	0.0452	0.333	N	13.57
7/2/2022	0.0452	0.333	N	13.57
7/3/2022	0.0452	0.333	N	13.57
7/4/2022	0.0452	0.333	N	13.57
7/5/2022	0.0257	0.333	N	7.73
7/6/2022	0.0276	0.333	N	8.28
7/7/2022	0.0357	0.333	N	10.71
7/8/2022	0.0240	0.333	N	7.22

7/9/2022	0.0240	0.333	N	7.22
7/10/2022	0.0240	0.333	N	7.22
7/11/2022	0.0240	0.333	N	7.22
7/12/2022	0.0478	0.333	N	14.35
7/13/2022	0.0516	0.333	N	15.51
7/14/2022	0.0524	0.333	N	15.74
7/15/2022	0.0524	0.333	N	15.74
7/16/2022	0.0524	0.333	N	15.74
7/17/2022	0.0524	0.333	N	15.74
7/18/2022	0.0524	0.333	N	15.74
7/19/2022	0.0428	0.333	N	12.85
7/20/2022	0.0344	0.333	N	10.34
7/21/2022	0.0362	0.333	N	10.86
7/22/2022	0.0584	0.333	N	17.54
7/23/2022	0.0584	0.333	N	17.54
7/24/2022	0.0584	0.333	N	17.54
7/25/2022	0.0584	0.333	N	17.54
7/26/2022	0.0435	0.333	N	13.05
7/27/2022	0.0583	0.333	N	17.50
7/28/2022	0.0820	0.333	N	24.61
7/29/2022	0.0680	0.333	N	20.41
7/30/2022	0.0680	0.333	N	20.41
7/31/2022	0.0680	0.333	N	20.41
8/1/2022	0.0680	0.333	N	20.41
8/2/2022	0.0979	0.333	N	29.40
8/3/2022	0.1022	0.333	N	30.70
8/4/2022	0.0706	0.333	N	21.21
8/5/2022	0.0618	0.333	N	18.57
8/6/2022	0.0618	0.333	N	18.57
8/7/2022	0.0618	0.333	N	18.57
8/8/2022	0.0618	0.333	N	18.57
8/9/2022	0.0778	0.333	N	23.36
8/10/2022	0.0859	0.333	N	25.79
8/11/2022	0.0859	0.333	N	25.79
8/12/2022	0.0859	0.333	N	25.79
8/13/2022	0.0859	0.333	N	25.79
8/14/2022	0.0859	0.333	N	25.79
8/15/2022	0.0859	0.333	N	25.79
8/16/2022	0.0677	0.333	N	20.32
8/17/2022	0.0626	0.333	N	18.81
8/18/2022	0.0626	0.333	N	18.81
8/19/2022	0.0959	0.333	N	28.80
8/20/2022	0.0959	0.333	N	28.80
8/21/2022	0.0959	0.333	N	28.80
8/22/2022	0.0959	0.333	N	28.80
8/23/2022	0.1046	0.333	N	31.40
8/24/2022	0.1099	0.333	N	33.00
8/25/2022	0.1099	0.333	N	33.00
8/26/2022	0.0767	0.333	N	23.04
8/27/2022	0.0767	0.333	N	23.04
8/28/2022	0.0767	0.333	N	23.04
8/29/2022	0.0767	0.333	N	23.04
8/30/2022	0.0579	0.333	N	17.38
8/31/2022	0.0514	0.333	N	15.42
9/1/2022	0.0514	0.333	N	15.42
9/2/2022	0.0514	0.333	N	15.42
9/3/2022	0.0514	0.333	N	15.42
9/4/2022	0.0514	0.333	N	15.42
9/5/2022	0.0514	0.333	N	15.42
9/6/2022	0.0724	0.333	N	21.74
9/7/2022	0.0665	0.333	N	19.98
9/8/2022	0.0665	0.333	N	19.98

9/9/2022	0.0665	0.333	N	19.98
9/10/2022	0.0665	0.333	N	19.98
9/11/2022	0.0665	0.333	N	19.98
9/12/2022	0.0665	0.333	N	19.98
9/13/2022	0.0603	0.333	N	18.09
9/14/2022	0.0493	0.333	N	14.79
9/15/2022	0.0493	0.333	N	14.79
9/16/2022	0.0493	0.333	N	14.79
9/17/2022	0.0493	0.333	N	14.79
9/18/2022	0.0493	0.333	N	14.79
9/19/2022	0.0628	0.333	N	18.86
9/20/2022	0.0319	0.333	N	9.57
9/21/2022	0.0274	0.333	N	8.21
9/22/2022	0.0426	0.333	N	12.80
9/23/2022	0.0426	0.333	N	12.80
9/24/2022	0.0426	0.333	N	12.80
9/25/2022	0.0426	0.333	N	12.80
9/26/2022	0.0280	0.333	N	8.41
9/27/2022	0.0420	0.333	N	12.63
9/28/2022	0.0420	0.333	N	12.60
9/29/2022	0.0000	0.333	N	0.00
9/30/2022	0.0000	0.333	N	0.00
10/1/2022	0.0339	0.333	N	10.20
10/2/2022	0.0339	0.333	N	10.20
10/3/2022	0.0339	0.333	N	10.20
10/4/2022	0.0281	0.333	N	8.44
10/5/2022	0.0235	0.333	N	7.06
10/6/2022	0.0235	0.333	N	7.06
10/7/2022	0.0157	0.333	N	4.72
10/8/2022	0.0157	0.333	N	4.72
10/9/2022	0.0157	0.333	N	4.72
10/10/2022	0.0157	0.333	N	4.72
10/11/2022	0.0132	0.333	N	3.96
10/12/2022	0.0107	0.333	N	3.21
10/13/2022	0.0160	0.333	N	4.80
10/14/2022	0.0160	0.333	N	4.80
10/15/2022	0.0549	0.357	N	15.38
10/16/2022	0.0549	0.357	N	15.38
10/17/2022	0.0549	0.357	N	15.38
10/18/2022	0.0523	0.357	N	14.66
10/19/2022	0.0500	0.357	N	14.00
10/20/2022	0.0425	0.357	N	11.90
10/21/2022	0.0425	0.357	N	11.90
10/22/2022	0.0000	0.357	N	0.00
10/23/2022	0.0425	0.357	N	11.90
10/24/2022	0.0590	0.357	N	16.52
10/25/2022	0.0551	0.357	N	15.43
10/26/2022	0.0474	0.357	N	13.27
10/27/2022	0.0372	0.357	N	10.43
10/28/2022	0.0381	0.357	N	10.68
10/29/2022	0.0000	0.357	N	0.00
10/30/2022	0.0000	0.357	N	0.00
10/31/2022	0.0000	0.357	N	0.00
11/1/2022	0.0345	0.357	N	9.66
11/2/2022	0.0334	0.357	N	9.35
11/3/2022	0.0000	0.357	N	0.00
11/4/2022	0.0000	0.357	N	0.00
11/5/2022	0.0000	0.357	N	0.00
11/6/2022	0.0000	0.357	N	0.00
11/7/2022	0.0000	0.357	N	0.00
11/8/2022	0.0000	0.357	N	0.00
11/9/2022	0.0000	0.357	N	0.00

11/10/2022	0.0000	0.357	N	0.00
11/11/2022	0.0000	0.357	N	0.00
11/12/2022	0.0000	0.357	N	0.00
11/13/2022	0.0000	0.357	N	0.00
11/14/2022	0.0000	0.357	N	0.00
11/15/2022	0.0000	0.357	N	0.00
11/16/2022	0.0000	0.357	N	0.00
11/17/2022	0.0000	0.357	N	0.00
11/18/2022	0.0000	0.357	N	0.00
11/19/2022	0.0000	0.357	N	0.00
11/20/2022	0.0000	0.357	N	0.00
11/21/2022	0.0000	0.357	N	0.00
11/22/2022	0.0000	0.357	N	0.00
11/23/2022	0.0000	0.357	N	0.00
11/24/2022	0.0000	0.357	N	0.00
11/25/2022	0.0000	0.357	N	0.00
11/26/2022	0.0000	0.357	N	0.00
11/27/2022	0.0000	0.357	N	0.00
11/28/2022	0.0000	0.357	N	0.00
11/29/2022	0.0000	0.357	N	0.00
11/30/2022	0.0000	0.357	N	0.00
3/26/2023	0.0000	0.357	N	0.00
3/27/2023	0.0000	0.357	N	0.00
3/28/2023	0.0000	0.357	N	0.00
3/29/2023	0.0000	0.357	N	0.00
3/30/2023	0.0000	0.357	N	0.00
3/31/2023	0.0000	0.357	N	0.00
4/1/2023	0.0000	0.357	N	0.00
4/2/2023	0.0000	0.357	N	0.00
4/3/2023	0.0000	0.357	N	0.00
4/4/2023	0.0000	0.357	N	0.00
4/5/2023	0.0000	0.357	N	0.00
4/6/2023	0.0000	0.357	N	0.00
4/7/2023	0.0000	0.357	N	0.00
4/8/2023	0.0000	0.357	N	0.00
4/9/2023	0.0000	0.357	N	0.00
4/10/2023	0.0000	0.357	N	0.00
4/11/2023	0.0000	0.357	N	0.00
4/12/2023	0.0000	0.357	N	0.00
4/13/2023	0.0000	0.357	N	0.00
4/14/2023	0.0000	0.357	N	0.00
4/15/2023	0.0000	0.357	N	0.00
4/16/2023	0.0000	0.357	N	0.00
4/17/2023	0.0000	0.357	N	0.00
4/18/2023	0.0000	0.357	N	0.00
4/19/2023	0.0000	0.357	N	0.00
4/20/2023	0.0000	0.357	N	0.00
4/21/2023	0.0000	0.357	N	0.00
4/22/2023	0.0000	0.357	N	0.00
4/23/2023	0.0000	0.357	N	0.00
4/24/2023	0.0000	0.357	N	0.00
4/25/2023	0.0000	0.357	N	0.00
4/26/2023	0.0000	0.357	N	0.00
4/27/2023	0.0000	0.357	N	0.00
4/28/2023	0.0204	0.357	N	5.72
4/29/2023	0.0194	0.357	N	5.44
4/30/2023	0.0194	0.357	N	5.44
5/1/2023	0.0254	0.357	N	7.10
5/2/2023	0.0396	0.357	N	11.09
5/3/2023	0.0642	0.357	N	17.97
5/4/2023	0.0671	0.357	N	18.80
5/5/2023	0.0582	0.357	N	16.30

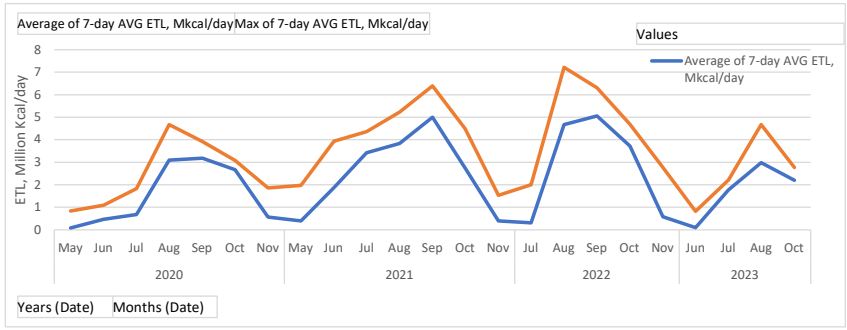
5/6/2023	0.0582	0.357	N	16.30
5/7/2023	0.0582	0.357	N	16.30
5/8/2023	0.0582	0.357	N	16.30
5/9/2023	0.0612	0.357	N	17.15
5/10/2023	0.0705	0.357	N	19.75
5/11/2023	0.0604	0.357	N	16.92
5/12/2023	0.0688	0.357	N	19.27
5/13/2023	0.0688	0.357	N	19.27
5/14/2023	0.0688	0.357	N	19.27
5/15/2023	0.0688	0.357	N	19.27
5/16/2023	0.1051	0.357	N	29.43
5/17/2023	0.0997	0.357	N	27.93
5/18/2023	0.1816	0.357	N	50.86
5/19/2023	0.1676	0.357	N	46.96
5/20/2023	0.1676	0.357	N	46.96
5/21/2023	0.1676	0.357	N	46.96
5/22/2023	0.1676	0.357	N	46.96
5/23/2023	0.1400	0.357	N	39.23
5/24/2023	0.1349	0.357	N	37.78
5/25/2023	0.0909	0.357	N	25.46
5/26/2023	0.1157	0.357	N	32.42
5/27/2023	0.1157	0.357	N	32.42
5/28/2023	0.1157	0.357	N	32.42
5/29/2023	0.1157	0.357	N	32.42
5/30/2023	0.1215	0.357	N	34.03
5/31/2023	0.1235	0.357	N	34.59
6/1/2023	0.0851	0.357	N	23.84
6/2/2023	0.0603	0.357	N	16.89
6/3/2023	0.0603	0.357	N	16.89
6/4/2023	0.0603	0.357	N	16.89
6/5/2023	0.0603	0.357	N	16.89
6/6/2023	0.0580	0.357	N	16.25
6/7/2023	0.0609	0.357	N	17.05
6/8/2023	0.0988	0.357	N	27.67
6/9/2023	0.0988	0.357	N	27.67
6/10/2023	0.0988	0.357	N	27.67
6/11/2023	0.0988	0.357	N	27.67
6/12/2023	0.0988	0.357	N	27.67
6/13/2023	0.0814	0.357	N	22.81
6/14/2023	0.0720	0.357	N	20.18
6/15/2023	0.0517	0.357	N	14.49
6/16/2023	0.0274	0.333	N	8.23
6/17/2023	0.0274	0.333	N	8.23
6/18/2023	0.0274	0.333	N	8.23
6/19/2023	0.0274	0.333	N	8.23
6/20/2023	0.0379	0.333	N	11.38
6/21/2023	0.0305	0.333	N	9.15
6/22/2023	0.0334	0.333	N	10.03
6/23/2023	0.0334	0.333	N	10.03
6/24/2023	0.0334	0.333	N	10.03
6/25/2023	0.0334	0.333	N	10.03
6/26/2023	0.0407	0.333	N	12.23
6/27/2023	0.0406	0.333	N	12.20
6/28/2023	0.0554	0.333	N	16.63
6/29/2023	0.0432	0.333	N	12.98
6/30/2023	0.0504	0.333	N	15.14
7/1/2023	0.0432	0.333	N	12.98
7/2/2023	0.0432	0.333	N	12.98
7/3/2023	0.0383	0.333	N	11.50
7/4/2023	0.0420	0.333	N	12.62
7/5/2023	0.0540	0.333	N	16.22
7/6/2023	0.0540	0.333	N	16.22

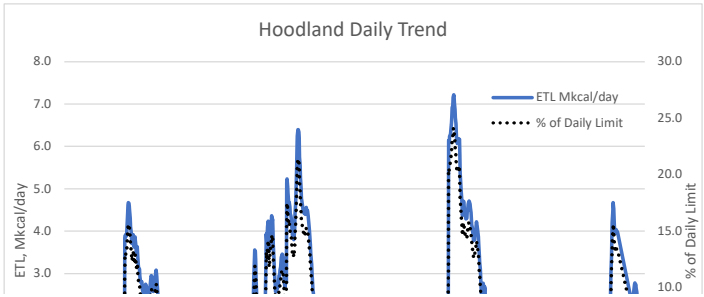
7/7/2023	0.0540	0.333	N	16.22
7/8/2023	0.0540	0.333	N	16.22
7/9/2023	0.0540	0.333	N	16.22
7/10/2023	0.0540	0.333	N	16.22
7/11/2023	0.0682	0.333	N	20.48
7/12/2023	0.0566	0.333	N	16.99
7/13/2023	0.0566	0.333	N	16.99
7/14/2023	0.0566	0.333	N	16.99
7/15/2023	0.0566	0.333	N	16.99
7/16/2023	0.0566	0.333	N	16.99
7/17/2023	0.0566	0.333	N	16.99
7/18/2023	0.0679	0.333	N	20.40
7/19/2023	0.1117	0.333	N	33.55
7/20/2023	0.1117	0.333	N	33.55
7/21/2023	0.1117	0.333	N	33.55
7/22/2023	0.1117	0.333	N	33.55
7/23/2023	0.1117	0.333	N	33.55
7/24/2023	0.1117	0.333	N	33.55
7/25/2023	0.1097	0.333	N	32.96
7/26/2023	0.0706	0.333	N	21.19
7/27/2023	0.0706	0.333	N	21.19
7/28/2023	0.0706	0.333	N	21.19
7/29/2023	0.0706	0.333	N	21.19
7/30/2023	0.0706	0.333	N	21.19
7/31/2023	0.0706	0.333	N	21.19
8/1/2023	0.0579	0.333	N	17.38
8/2/2023	0.0718	0.333	N	21.55
8/3/2023	0.1161	0.333	N	34.86
8/4/2023	0.1161	0.333	N	34.86
8/5/2023	0.1161	0.333	N	34.86
8/6/2023	0.1161	0.333	N	34.86
8/7/2023	0.1161	0.333	N	34.86
8/8/2023	0.1135	0.333	N	34.09
8/9/2023	0.1062	0.333	N	31.88
8/10/2023	0.0621	0.333	N	18.65
8/11/2023	0.0621	0.333	N	18.65
8/12/2023	0.0621	0.333	N	18.65
8/13/2023	0.0621	0.333	N	18.65
8/14/2023	0.0621	0.333	N	18.65
8/15/2023	0.0679	0.333	N	20.41
8/16/2023	0.1005	0.333	N	30.17
8/17/2023	0.1005	0.333	N	30.17
8/18/2023	0.1005	0.333	N	30.17
8/19/2023	0.1005	0.333	N	30.17
8/20/2023	0.1005	0.333	N	30.17
8/21/2023	0.1005	0.333	N	30.17
8/22/2023	0.1157	0.333	N	34.75
8/23/2023	0.0833	0.333	N	25.01
8/24/2023	0.0833	0.333	N	25.01
8/25/2023	0.1089	0.333	N	32.69
8/26/2023	0.1089	0.333	N	32.69
8/27/2023	0.1089	0.333	N	32.69
8/28/2023	0.1089	0.333	N	32.69
8/29/2023	0.0947	0.333	N	28.44
8/30/2023	0.0851	0.333	N	25.56
8/31/2023	0.0851	0.333	N	25.56
9/1/2023	0.0923	0.333	N	27.73
9/2/2023	0.0923	0.333	N	27.73
9/3/2023	0.0923	0.333	N	27.73
9/4/2023	0.0923	0.333	N	27.73
9/5/2023	0.0802	0.333	N	24.08
9/6/2023	0.0800	0.333	N	24.03

9/7/2023	0.0800	0.333	N	24.03
9/8/2023	0.0470	0.333	N	14.10
9/9/2023	0.0470	0.333	N	14.10
9/10/2023	0.0470	0.333	N	14.10
9/11/2023	0.0470	0.333	N	14.10
9/12/2023	0.0537	0.333	N	16.11
9/13/2023	0.0574	0.333	N	17.23
9/14/2023	0.0574	0.333	N	17.23
9/15/2023	0.0574	0.333	N	17.23
9/16/2023	0.0574	0.333	N	17.23
9/17/2023	0.0574	0.333	N	17.23
9/18/2023	0.0574	0.333	N	17.23
9/19/2023	0.0592	0.333	N	17.77
9/20/2023	0.0540	0.333	N	16.21
9/21/2023	0.0540	0.333	N	16.21
9/22/2023	0.0540	0.333	N	16.21
9/23/2023	0.0540	0.333	N	16.21
9/24/2023	0.0540	0.333	N	16.21
9/25/2023	0.0657	0.333	N	19.72
9/26/2023	0.0467	0.333	N	14.01
9/27/2023	0.0310	0.333	N	9.29
9/28/2023	0.0310	0.333	N	9.29
9/29/2023	0.0000	0.333	N	0.00
9/30/2023	0.0000	0.333	N	0.00
10/1/2023	0.0310	0.333	N	9.29
10/2/2023	0.0168	0.333	N	5.05
10/3/2023	0.0166	0.333	N	4.97
10/4/2023	0.0124	0.333	N	3.74
10/5/2023	0.0142	0.333	N	4.27
10/6/2023	0.0142	0.333	N	4.27
10/7/2023	0.0142	0.333	N	4.27
10/8/2023	0.0142	0.333	N	4.27
10/9/2023	0.0142	0.333	N	4.27
10/10/2023	0.0114	0.333	N	3.41
10/11/2023	0.0122	0.333	N	3.67
10/12/2023	0.0105	0.333	N	3.15
10/13/2023	0.0150	0.333	N	4.50
10/14/2023	0.0150	0.333	N	4.50
10/15/2023	0.1042	0.357	N	29.18
10/16/2023	0.1042	0.357	N	29.18
10/17/2023	0.0993	0.357	N	27.82
10/18/2023	0.0917	0.357	N	25.68
10/19/2023	0.0803	0.357	N	22.49
10/20/2023	0.0598	0.357	N	16.75
10/21/2023	0.0598	0.357	N	16.75
10/22/2023	0.0000	0.357	N	0.00
10/23/2023	0.0598	0.357	N	16.75
10/24/2023	0.0540	0.357	N	15.13
10/25/2023	0.0448	0.357	N	12.54
10/26/2023	0.0434	0.357	N	12.15
10/27/2023	0.0434	0.357	N	12.15
10/28/2023	0.0434	0.357	N	12.15
10/29/2023	0.0000	0.357	N	0.00
10/30/2023	0.0000	0.357	N	0.00
10/31/2023	0.0000	0.357	N	0.00

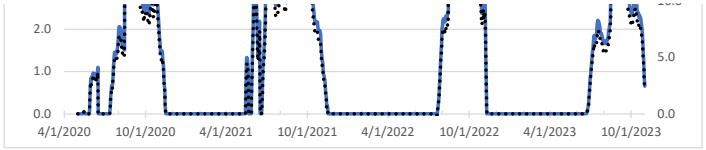
Date	ETL, Million Kcal/day	7-day AVG ETL, Mkcal/day	ETL Limit	Over Limit?	% of Limit
5/1/2020		0.0	29.9	N	0.0
5/2/2020		0.0	29.9	N	0.0
5/3/2020		0.0	29.9	N	0.0
5/4/2020		0.0	29.9	N	0.0
5/5/2020		0.0	29.9	N	0.0
5/6/2020		0.0	29.9	N	0.0
5/7/2020		0.0	29.9	N	0.0
5/8/2020		0.0	29.9	N	0.0
5/9/2020		0.0	29.9	N	0.0
5/10/2020		0.0	29.9	N	0.0
5/11/2020		0.0	29.9	N	0.0
5/12/2020		0.0	29.9	N	0.0
5/13/2020		0.0	29.9	N	0.1
5/14/2020		0.0	29.9	N	0.2
5/15/2020		0.1	29.9	N	0.2
5/16/2020		0.0	29.9	N	0.0
5/17/2020		0.0	29.9	N	0.0
5/18/2020		0.0	29.9	N	0.0
5/19/2020		0.0	29.9	N	0.0
5/20/2020		0.0	29.9	N	0.0
5/21/2020		0.0	29.9	N	0.0
5/22/2020		0.0	29.9	N	0.0
5/23/2020		0.0	29.9	N	0.0
5/24/2020		0.0	29.9	N	0.0
5/25/2020		0.0	29.9	N	0.0
5/26/2020		0.0	29.9	N	0.0
5/27/2020		0.1	29.9	N	0.3
5/28/2020		0.3	29.9	N	1.1
5/29/2020		0.6	29.9	N	2.1
5/30/2020		0.8	29.9	N	2.8
5/31/2020		0.8	29.9	N	2.5
6/1/2020		0.9	29.9	N	3.0
6/2/2020		0.9	29.9	N	3.0
6/3/2020		0.9	29.9	N	3.0
6/4/2020		1.0	29.9	N	3.2
6/5/2020		1.0	29.9	N	3.2
6/6/2020		0.9	29.9	N	2.9
6/7/2020		0.9	29.9	N	3.1
6/8/2020		0.9	29.9	N	2.9
6/9/2020		0.9	29.9	N	3.1
6/10/2020		0.9	29.9	N	3.2
6/11/2020		0.9	29.9	N	3.1
6/12/2020		0.9	29.9	N	3.0
6/13/2020		0.9	29.9	N	3.1
6/14/2020		1.0	29.9	N	3.4
6/15/2020		1.1	29.9	N	3.7
6/16/2020		0.0	29.9	N	0.0
6/17/2020		0.0	29.9	N	0.0
6/18/2020		0.0	29.9	N	0.0
6/19/2020		0.0	29.9	N	0.0
6/20/2020		0.0	29.9	N	0.0
6/21/2020		0.0	29.9	N	0.0
6/22/2020		0.0	29.9	N	0.0
6/23/2020		0.0	29.9	N	0.0
6/24/2020		0.0	29.9	N	0.0
6/25/2020		0.0	29.9	N	0.0
6/26/2020		0.0	29.9	N	0.0
6/27/2020		0.0	29.9	N	0.0

Row Labels	Average of 7-day AVG ETL, Mkcal/day	Max of 7-day AVG ETL, Mkcal/day
2020	**1.540696979**	**4.670502558**
May	0.088975268	0.834475046
Jun	0.466050462	1.102824755
Jul	0.68703814	1.82853443
Aug	3.098665168	4.670502558
Sep	3.18690066	3.920394094
Oct	2.672914594	3.078723202
Nov	0.571507721	1.870309082
2021	**2.526252655**	**6.395662083**
May	0.39491843	1.970924794
Jun	1.877995875	3.937700409
Jul	3.428595621	4.362642381
Aug	3.8336644	5.230486187
Sep	5.001329445	6.395662083
Oct	2.746571441	4.487774221
Nov	0.390735398	1.528661066
2022	**2.869894927**	**7.21769514**
Jul	0.321403889	1.997751667
Aug	4.671335717	7.21769514
Sep	5.056250355	6.312203255
Oct	3.717729355	4.692126358
Nov	0.579395846	2.770019816
2023	**1.778944435**	**4.673458457**
Jun	0.095630386	0.825517692
Jul	1.775771577	2.215126911
Aug	2.982593623	4.673458457
Oct	2.2074817	2.776015788





6/28/2020	0.0	29.9 N	0.0
6/29/2020	0.0	29.9 N	0.0
6/30/2020	0.0	29.9 N	0.0
7/1/2020	0.0	29.9 N	0.0
7/2/2020	0.0	29.9 N	0.0
7/3/2020	0.0	29.9 N	0.0
7/4/2020	0.0	29.9 N	0.0
7/5/2020	0.0	29.9 N	0.0
7/6/2020	0.0	29.9 N	0.0
7/7/2020	0.0	29.9 N	0.0
7/8/2020	0.0	29.9 N	0.0
7/9/2020	0.0	29.9 N	0.0
7/10/2020	0.0	29.9 N	0.0
7/11/2020	0.0	29.9 N	0.0
7/12/2020	0.0	29.9 N	0.1
7/13/2020	0.2	29.9 N	0.7
7/14/2020	0.4	29.9 N	1.4
7/15/2020	0.5	29.9 N	1.7
7/16/2020	0.7	29.9 N	2.2
7/17/2020	0.6	29.9 N	2.1
7/18/2020	0.7	29.9 N	2.4
7/19/2020	0.9	29.9 N	2.8
7/20/2020	1.0	29.9 N	3.5
7/21/2020	1.3	29.9 N	4.2
7/22/2020	1.4	29.9 N	4.6
7/23/2020	1.5	29.9 N	4.9
7/24/2020	1.5	29.9 N	4.9
7/25/2020	1.4	29.9 N	4.7
7/26/2020	1.4	29.9 N	4.7
7/27/2020	1.4	29.9 N	4.7
7/28/2020	1.5	29.9 N	4.9
7/29/2020	1.5	29.9 N	5.2
7/30/2020	1.6	29.9 N	5.4
7/31/2020	1.8	29.9 N	6.1
8/1/2020	2.0	29.9 N	6.6
8/2/2020	2.1	29.9 N	6.9
8/3/2020	2.1	29.9 N	6.9
8/4/2020	2.0	29.9 N	6.8
8/5/2020	2.0	29.9 N	6.8
8/6/2020	2.0	29.9 N	6.6
8/7/2020	1.9	29.9 N	6.2
8/8/2020	1.7	29.9 N	5.6
8/9/2020	1.6	29.9 N	5.3
8/10/2020	1.6	29.9 N	5.4
8/11/2020	1.6	29.9 N	5.4
8/12/2020	1.6	29.9 N	5.2
8/13/2020	1.5	29.9 N	5.2
8/14/2020	1.5	29.9 N	5.0
8/15/2020	3.8	29.9 N	12.9
8/16/2020	3.9	29.9 N	13.1
8/17/2020	3.9	29.9 N	12.9
8/18/2020	3.9	29.9 N	13.0
8/19/2020	3.9	29.9 N	13.2
8/20/2020	4.1	29.9 N	13.8
8/21/2020	4.4	29.9 N	14.9
8/22/2020	4.6	29.9 N	15.5
8/23/2020	4.7	29.9 N	15.6
8/24/2020	4.7	29.9 N	15.6
8/25/2020	4.6	29.9 N	15.4



8/26/2020	4.5	29.9	N	15.0
8/27/2020	4.3	29.9	N	14.4
8/28/2020	4.1	29.9	N	13.7
8/29/2020	4.0	29.9	N	13.3
8/30/2020	3.8	29.9	N	12.8
8/31/2020	3.7	29.9	N	12.4
9/1/2020	3.8	29.9	N	12.8
9/2/2020	3.9	29.9	N	13.0
9/3/2020	3.9	29.9	N	13.1
9/4/2020	3.8	29.9	N	12.6
9/5/2020	3.6	29.9	N	12.1
9/6/2020	3.7	29.9	N	12.4
9/7/2020	3.9	29.9	N	12.9
9/8/2020	3.8	29.9	N	12.6
9/9/2020	3.6	29.9	N	12.2
9/10/2020	3.5	29.9	N	11.7
9/11/2020	3.6	29.9	N	11.9
9/12/2020	3.6	29.9	N	12.1
9/13/2020	3.5	29.9	N	11.6
9/14/2020	3.2	29.9	N	10.8
9/15/2020	3.1	29.9	N	10.5
9/16/2020	3.1	29.9	N	10.5
9/17/2020	3.1	29.9	N	10.4
9/18/2020	2.9	29.9	N	9.8
9/19/2020	2.8	29.9	N	9.4
9/20/2020	2.8	29.9	N	9.3
9/21/2020	2.8	29.9	N	9.3
9/22/2020	2.8	29.9	N	9.4
9/23/2020	2.7	29.9	N	9.2
9/24/2020	2.6	29.9	N	8.8
9/25/2020	2.6	29.9	N	8.6
9/26/2020	2.5	29.9	N	8.4
9/27/2020	2.4	29.9	N	8.2
9/28/2020	2.6	29.9	N	8.7
9/29/2020	2.6	29.9	N	8.6
9/30/2020	2.7	29.9	N	8.9
10/1/2020	2.8	29.9	N	9.2
10/2/2020	2.7	29.9	N	9.0
10/3/2020	2.7	29.9	N	9.0
10/4/2020	2.7	29.9	N	8.9
10/5/2020	2.5	29.9	N	8.4
10/6/2020	2.4	29.9	N	8.2
10/7/2020	2.4	29.9	N	7.9
10/8/2020	2.4	29.9	N	7.9
10/9/2020	2.4	29.9	N	8.0
10/10/2020	2.5	29.9	N	8.5
10/11/2020	2.7	29.9	N	9.0
10/12/2020	2.8	29.9	N	9.3
10/13/2020	2.9	29.9	N	9.8
10/14/2020	3.0	29.9	N	9.9
10/15/2020	2.9	29.9	N	9.7
10/16/2020	2.8	29.9	N	9.5
10/17/2020	2.7	29.9	N	9.0
10/18/2020	2.6	29.9	N	8.6
10/19/2020	2.6	29.9	N	8.9
10/20/2020	2.6	29.9	N	8.8
10/21/2020	2.8	29.9	N	9.3
10/22/2020	2.9	29.9	N	9.7
10/23/2020	3.0	29.9	N	9.9

10/24/2020	3.1	29.9	N	10.2
10/25/2020	3.1	29.9	N	10.3
10/26/2020	2.9	29.9	N	9.8
10/27/2020	2.8	29.9	N	9.3
10/28/2020	2.6	29.9	N	8.6
10/29/2020	2.4	29.9	N	8.1
10/30/2020	2.3	29.9	N	7.6
10/31/2020	2.0	29.9	N	6.8
11/1/2020	1.9	29.9	N	6.3
11/2/2020	1.7	29.9	N	5.7
11/3/2020	1.5	29.9	N	5.1
11/4/2020	1.5	29.9	N	4.9
11/5/2020	1.4	29.9	N	4.8
11/6/2020	1.5	29.9	N	4.9
11/7/2020	1.5	29.9	N	5.0
11/8/2020	1.4	29.9	N	4.7
11/9/2020	1.3	29.9	N	4.2
11/10/2020	1.1	29.9	N	3.8
11/11/2020	1.0	29.9	N	3.2
11/12/2020	0.7	29.9	N	2.4
11/13/2020	0.6	29.9	N	1.9
11/14/2020	0.2	29.9	N	0.6
11/15/2020	0.0	29.9	N	0.0
11/16/2020	0.0	29.9	N	0.0
11/17/2020	0.0	29.9	N	0.0
11/18/2020	0.0	29.9	N	0.0
11/19/2020	0.0	29.9	N	0.0
11/20/2020	0.0	29.9	N	0.0
11/21/2020	0.0	29.9	N	0.0
11/22/2020	0.0	29.9	N	0.0
11/23/2020	0.0	29.9	N	0.0
11/24/2020	0.0	29.9	N	0.0
11/25/2020	0.0	29.9	N	0.0
11/26/2020	0.0	29.9	N	0.0
11/27/2020	0.0	29.9	N	0.0
11/28/2020	0.0	29.9	N	0.0
11/29/2020	0.0	29.9	N	0.0
11/30/2020	0.0	29.9	N	0.0
5/1/2021	0.0	29.9	N	0.0
5/2/2021	0.0	29.9	N	0.0
5/3/2021	0.0	29.9	N	0.0
5/4/2021	0.0	29.9	N	0.0
5/5/2021	0.0	29.9	N	0.0
5/6/2021	0.0	29.9	N	0.0
5/7/2021	0.0	29.9	N	0.0
5/8/2021	0.0	29.9	N	0.0
5/9/2021	0.0	29.9	N	0.0
5/10/2021	0.0	29.9	N	0.0
5/11/2021	0.0	29.9	N	0.0
5/12/2021	0.0	29.9	N	0.0
5/13/2021	0.0	29.9	N	0.0
5/14/2021	0.0	29.9	N	0.0
5/15/2021	0.8	29.9	N	2.8
5/16/2021	1.2	29.9	N	4.0
5/17/2021	1.3	29.9	N	4.5
5/18/2021	1.3	29.9	N	4.4
5/19/2021	1.2	29.9	N	4.1
5/20/2021	1.0	29.9	N	3.2
5/21/2021	0.0	29.9	N	0.0

5/22/2021	0.0	29.9 N	0.0
5/23/2021	0.0	29.9 N	0.0
5/24/2021	0.0	29.9 N	0.0
5/25/2021	0.0	29.9 N	0.0
5/26/2021	0.0	29.9 N	0.0
5/27/2021	0.0	29.9 N	0.0
5/28/2021	0.8	29.9 N	2.5
5/29/2021	1.1	29.9 N	3.7
5/30/2021	1.5	29.9 N	5.1
5/31/2021	2.0	29.9 N	6.6
6/1/2021	2.5	29.9 N	8.5
6/2/2021	2.9	29.9 N	9.7
6/3/2021	3.3	29.9 N	11.1
6/4/2021	3.6	29.9 N	11.9
6/5/2021	3.5	29.9 N	11.8
6/6/2021	3.3	29.9 N	11.1
6/7/2021	2.9	29.9 N	9.7
6/8/2021	2.5	29.9 N	8.4
6/9/2021	2.1	29.9 N	7.2
6/10/2021	1.7	29.9 N	5.8
6/11/2021	1.4	29.9 N	4.7
6/12/2021	1.6	29.9 N	5.3
6/13/2021	1.8	29.9 N	5.9
6/14/2021	2.0	29.9 N	6.7
6/15/2021	2.2	29.9 N	7.3
6/16/2021	0.0	29.9 N	0.0
6/17/2021	0.0	29.9 N	0.0
6/18/2021	0.0	29.9 N	0.0
6/19/2021	0.0	29.9 N	0.0
6/20/2021	0.1	29.9 N	0.2
6/21/2021	0.6	29.9 N	1.9
6/22/2021	0.9	29.9 N	3.1
6/23/2021	1.2	29.9 N	4.0
6/24/2021	1.3	29.9 N	4.4
6/25/2021	1.5	29.9 N	5.1
6/26/2021	1.8	29.9 N	6.0
6/27/2021	2.1	29.9 N	7.0
6/28/2021	2.3	29.9 N	7.8
6/29/2021	3.2	29.9 N	10.8
6/30/2021	3.9	29.9 N	13.2
7/1/2021	3.7	29.9 N	12.4
7/2/2021	3.9	29.9 N	13.0
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7/4/2021	4.2	29.9 N	14.2
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7/6/2021	3.6	29.9 N	12.0
7/7/2021	3.5	29.9 N	11.8
7/8/2021	3.8	29.9 N	12.8
7/9/2021	4.0	29.9 N	13.4
7/10/2021	4.1	29.9 N	13.7
7/11/2021	4.2	29.9 N	13.9
7/12/2021	4.4	29.9 N	14.6
7/13/2021	4.2	29.9 N	14.1
7/14/2021	4.3	29.9 N	14.3
7/15/2021	4.0	29.9 N	13.5
7/16/2021	3.7	29.9 N	12.3
7/17/2021	3.4	29.9 N	11.3
7/18/2021	3.2	29.9 N	10.5
7/19/2021	2.9	29.9 N	9.6

7/20/2021	2.8	29.9 N	9.2
7/21/2021	2.6	29.9 N	8.6
7/22/2021	2.6	29.9 N	8.6
7/23/2021	2.6	29.9 N	8.7
7/24/2021	2.6	29.9 N	8.7
7/25/2021	2.6	29.9 N	8.9
7/26/2021	2.7	29.9 N	9.0
7/27/2021	2.7	29.9 N	9.0
7/28/2021	2.8	29.9 N	9.5
7/29/2021	3.0	29.9 N	9.9
7/30/2021	3.0	29.9 N	9.9
7/31/2021	3.1	29.9 N	10.3
8/1/2021	3.2	29.9 N	10.6
8/2/2021	3.3	29.9 N	10.9
8/3/2021	3.4	29.9 N	11.3
8/4/2021	3.4	29.9 N	11.5
8/5/2021	3.5	29.9 N	11.6
8/6/2021	3.4	29.9 N	11.4
8/7/2021	3.3	29.9 N	11.1
8/8/2021	3.1	29.9 N	10.4
8/9/2021	2.9	29.9 N	9.6
8/10/2021	2.8	29.9 N	9.2
8/11/2021	2.7	29.9 N	9.0
8/12/2021	2.8	29.9 N	9.2
8/13/2021	2.8	29.9 N	9.3
8/14/2021	2.8	29.9 N	9.4
8/15/2021	5.1	29.9 N	17.2
8/16/2021	5.2	29.9 N	17.5
8/17/2021	5.1	29.9 N	16.9
8/18/2021	4.9	29.9 N	16.4
8/19/2021	4.7	29.9 N	15.7
8/20/2021	4.6	29.9 N	15.5
8/21/2021	4.7	29.9 N	15.6
8/22/2021	4.6	29.9 N	15.3
8/23/2021	4.4	29.9 N	14.7
8/24/2021	4.4	29.9 N	14.6
8/25/2021	4.3	29.9 N	14.4
8/26/2021	4.2	29.9 N	14.0
8/27/2021	4.0	29.9 N	13.5
8/28/2021	3.9	29.9 N	13.0
8/29/2021	3.9	29.9 N	13.2
8/30/2021	3.9	29.9 N	12.9
8/31/2021	3.8	29.9 N	12.7
9/1/2021	3.9	29.9 N	13.2
9/2/2021	4.1	29.9 N	13.6
9/3/2021	4.4	29.9 N	14.8
9/4/2021	4.7	29.9 N	15.6
9/5/2021	4.9	29.9 N	16.5
9/6/2021	5.5	29.9 N	18.4
9/7/2021	5.9	29.9 N	19.8
9/8/2021	6.2	29.9 N	20.9
9/9/2021	6.4	29.9 N	21.4
9/10/2021	6.4	29.9 N	21.4
9/11/2021	6.3	29.9 N	21.2
9/12/2021	6.2	29.9 N	20.8
9/13/2021	5.7	29.9 N	19.2
9/14/2021	5.6	29.9 N	18.6
9/15/2021	5.3	29.9 N	17.6
9/16/2021	5.0	29.9 N	16.8

9/17/2021	4.8	29.9 N	16.0
9/18/2021	4.7	29.9 N	15.8
9/19/2021	4.6	29.9 N	15.5
9/20/2021	4.6	29.9 N	15.3
9/21/2021	4.5	29.9 N	15.0
9/22/2021	4.4	29.9 N	14.8
9/23/2021	4.5	29.9 N	15.0
9/24/2021	4.5	29.9 N	15.1
9/25/2021	4.4	29.9 N	14.8
9/26/2021	4.4	29.9 N	14.7
9/27/2021	4.5	29.9 N	15.1
9/28/2021	4.6	29.9 N	15.3
9/29/2021	4.5	29.9 N	15.0
9/30/2021	4.5	29.9 N	15.0
10/1/2021	4.5	29.9 N	15.0
10/2/2021	4.4	29.9 N	14.6
10/3/2021	4.3	29.9 N	14.3
10/4/2021	4.1	29.9 N	13.7
10/5/2021	4.0	29.9 N	13.4
10/6/2021	3.9	29.9 N	13.1
10/7/2021	3.7	29.9 N	12.3
10/8/2021	3.5	29.9 N	11.6
10/9/2021	3.3	29.9 N	11.1
10/10/2021	3.2	29.9 N	10.7
10/11/2021	3.0	29.9 N	10.1
10/12/2021	2.8	29.9 N	9.2
10/13/2021	2.6	29.9 N	8.7
10/14/2021	2.6	29.9 N	8.5
10/15/2021	2.4	29.9 N	8.0
10/16/2021	2.3	29.9 N	7.8
10/17/2021	2.2	29.9 N	7.3
10/18/2021	2.2	29.9 N	7.3
10/19/2021	2.2	29.9 N	7.3
10/20/2021	2.2	29.9 N	7.2
10/21/2021	2.1	29.9 N	7.1
10/22/2021	2.2	29.9 N	7.3
10/23/2021	2.2	29.9 N	7.3
10/24/2021	2.1	29.9 N	6.9
10/25/2021	2.0	29.9 N	6.6
10/26/2021	2.0	29.9 N	6.6
10/27/2021	2.0	29.9 N	6.5
10/28/2021	2.0	29.9 N	6.5
10/29/2021	2.0	29.9 N	6.6
10/30/2021	1.9	29.9 N	6.3
10/31/2021	1.7	29.9 N	5.6
11/1/2021	1.5	29.9 N	5.1
11/2/2021	1.3	29.9 N	4.5
11/3/2021	1.3	29.9 N	4.3
11/4/2021	1.2	29.9 N	4.0
11/5/2021	1.0	29.9 N	3.4
11/6/2021	0.9	29.9 N	3.1
11/7/2021	0.9	29.9 N	3.0
11/8/2021	0.8	29.9 N	2.8
11/9/2021	0.7	29.9 N	2.5
11/10/2021	0.6	29.9 N	2.0
11/11/2021	0.5	29.9 N	1.6
11/12/2021	0.4	29.9 N	1.2
11/13/2021	0.2	29.9 N	0.6
11/14/2021	0.2	29.9 N	0.6

11/15/2021	0.2	29.9	N	0.5
11/16/2021	0.0	29.9	N	0.0
11/17/2021	0.0	29.9	N	0.0
11/18/2021	0.0	29.9	N	0.0
11/19/2021	0.0	29.9	N	0.0
11/20/2021	0.0	29.9	N	0.0
11/21/2021	0.0	29.9	N	0.0
11/22/2021	0.0	29.9	N	0.0
11/23/2021	0.0	29.9	N	0.0
11/24/2021	0.0	29.9	N	0.0
11/25/2021	0.0	29.9	N	0.0
11/26/2021	0.0	29.9	N	0.0
11/27/2021	0.0	29.9	N	0.0
11/28/2021	0.0	29.9	N	0.0
11/29/2021	0.0	29.9	N	0.0
11/30/2021	0.0	29.9	N	0.0
7/1/2022	0.0	29.9	N	0.0
7/2/2022	0.0	29.9	N	0.0
7/3/2022	0.0	29.9	N	0.0
7/4/2022	0.0	29.9	N	0.0
7/5/2022	0.0	29.9	N	0.0
7/6/2022	0.0	29.9	N	0.0
7/7/2022	0.0	29.9	N	0.0
7/8/2022	0.0	29.9	N	0.0
7/9/2022	0.0	29.9	N	0.0
7/10/2022	0.0	29.9	N	0.0
7/11/2022	0.0	29.9	N	0.0
7/12/2022	0.0	29.9	N	0.0
7/13/2022	0.0	29.9	N	0.0
7/14/2022	0.0	29.9	N	0.0
7/15/2022	0.0	29.9	N	0.0
7/16/2022	0.0	29.9	N	0.0
7/17/2022	0.0	29.9	N	0.0
7/18/2022	0.0	29.9	N	0.0
7/19/2022	0.0	29.9	N	0.0
7/20/2022	0.0	29.9	N	-0.1
7/21/2022	0.1	29.9	N	0.4
7/22/2022	0.2	29.9	N	0.6
7/23/2022	0.3	29.9	N	0.8
7/24/2022	0.4	29.9	N	1.4
7/25/2022	0.6	29.9	N	2.1
7/26/2022	0.9	29.9	N	2.9
7/27/2022	1.1	29.9	N	3.6
7/28/2022	1.3	29.9	N	4.2
7/29/2022	1.6	29.9	N	5.2
7/30/2022	1.6	29.9	N	5.5
7/31/2022	2.0	29.9	N	6.7
8/1/2022	2.1	29.9	N	7.0
8/2/2022	2.2	29.9	N	7.4
8/3/2022	2.2	29.9	N	7.5
8/4/2022	2.2	29.9	N	7.4
8/5/2022	2.2	29.9	N	7.3
8/6/2022	2.2	29.9	N	7.3
8/7/2022	2.2	29.9	N	7.4
8/8/2022	2.3	29.9	N	7.7
8/9/2022	2.3	29.9	N	7.5
8/10/2022	2.2	29.9	N	7.4
8/11/2022	2.3	29.9	N	7.6
8/12/2022	2.3	29.9	N	7.8

8/13/2022	2.4	29.9 N	8.0
8/14/2022	2.4	29.9 N	8.0
8/15/2022	6.1	29.9 N	20.5
8/16/2022	6.1	29.9 N	20.4
8/17/2022	6.2	29.9 N	20.9
8/18/2022	6.3	29.9 N	20.9
8/19/2022	6.3	29.9 N	21.1
8/20/2022	6.4	29.9 N	21.4
8/21/2022	6.6	29.9 N	21.9
8/22/2022	6.7	29.9 N	22.5
8/23/2022	6.9	29.9 N	23.1
8/24/2022	7.0	29.9 N	23.3
8/25/2022	7.2	29.9 N	24.0
8/26/2022	7.2	29.9 N	24.1
8/27/2022	7.2	29.9 N	24.0
8/28/2022	7.0	29.9 N	23.5
8/29/2022	6.9	29.9 N	23.0
8/30/2022	6.7	29.9 N	22.3
8/31/2022	6.5	29.9 N	21.8
9/1/2022	6.3	29.9 N	21.1
9/2/2022	6.2	29.9 N	20.6
9/3/2022	6.1	29.9 N	20.3
9/4/2022	6.1	29.9 N	20.4
9/5/2022	6.1	29.9 N	20.3
9/6/2022	6.2	29.9 N	20.7
9/7/2022	6.1	29.9 N	20.5
9/8/2022	6.2	29.9 N	20.6
9/9/2022	5.8	29.9 N	19.5
9/10/2022	5.4	29.9 N	18.0
9/11/2022	5.1	29.9 N	17.1
9/12/2022	5.0	29.9 N	16.6
9/13/2022	4.7	29.9 N	15.9
9/14/2022	4.6	29.9 N	15.3
9/15/2022	4.4	29.9 N	14.6
9/16/2022	4.5	29.9 N	15.0
9/17/2022	4.7	29.9 N	15.6
9/18/2022	4.7	29.9 N	15.7
9/19/2022	4.6	29.9 N	15.2
9/20/2022	4.5	29.9 N	15.0
9/21/2022	4.4	29.9 N	14.7
9/22/2022	4.3	29.9 N	14.5
9/23/2022	4.3	29.9 N	14.3
9/24/2022	4.3	29.9 N	14.4
9/25/2022	4.3	29.9 N	14.4
9/26/2022	4.4	29.9 N	14.9
9/27/2022	4.5	29.9 N	15.2
9/28/2022	4.6	29.9 N	15.5
9/29/2022	4.7	29.9 N	15.7
9/30/2022	4.7	29.9 N	15.8
10/1/2022	4.7	29.9 N	15.7
10/2/2022	4.6	29.9 N	15.5
10/3/2022	4.5	29.9 N	15.2
10/4/2022	4.4	29.9 N	14.9
10/5/2022	4.3	29.9 N	14.4
10/6/2022	4.2	29.9 N	13.9
10/7/2022	4.1	29.9 N	13.7
10/8/2022	4.0	29.9 N	13.4
10/9/2022	3.9	29.9 N	13.1
10/10/2022	3.8	29.9 N	12.6

10/11/2022		3.8	29.9	N	12.7
10/12/2022		3.8	29.9	N	12.7
10/13/2022		3.9	29.9	N	13.0
10/14/2022		4.0	29.9	N	13.3
10/15/2022		4.0	29.9	N	13.5
10/16/2022		4.1	29.9	N	13.9
10/17/2022		4.2	29.9	N	14.1
10/18/2022		4.1	29.9	N	13.8
10/19/2022		4.1	29.9	N	13.6
10/20/2022		3.9	29.9	N	13.2
10/21/2022		3.9	29.9	N	12.9
10/22/2022		3.7	29.9	N	12.4
10/23/2022		3.4	29.9	N	11.5
10/24/2022		3.3	29.9	N	10.9
10/25/2022		3.1	29.9	N	10.4
10/26/2022		2.9	29.9	N	9.8
10/27/2022		2.7	29.9	N	9.1
10/28/2022		2.4	29.9	N	8.2
10/29/2022		2.4	29.9	N	7.9
10/30/2022		2.5	29.9	N	8.2
10/31/2022		2.4	29.9	N	8.2
11/1/2022		2.8	29.9	N	9.3
11/2/2022		2.7	29.9	N	8.9
11/3/2022		2.5	29.9	N	8.4
11/4/2022		2.7	29.9	N	9.0
11/5/2022		2.6	29.9	N	8.8
11/6/2022		2.1	29.9	N	7.2
11/7/2022		1.4	29.9	N	4.7
11/8/2022		0.6	29.9	N	1.9
11/9/2022		0.0	29.9	N	0.0
11/10/2022		0.0	29.9	N	0.0
11/11/2022		0.0	29.9	N	0.0
11/12/2022		0.0	29.9	N	0.0
11/13/2022		0.0	29.9	N	0.0
11/14/2022		0.0	29.9	N	0.0
11/15/2022		0.0	29.9	N	0.0
11/16/2022		0.0	29.9	N	0.0
11/17/2022		0.0	29.9	N	0.0
11/18/2022		0.0	29.9	N	0.0
11/19/2022		0.0	29.9	N	0.0
11/20/2022		0.0	29.9	N	0.0
11/21/2022		0.0	29.9	N	0.0
11/22/2022		0.0	29.9	N	0.0
11/23/2022		0.0	29.9	N	0.0
11/24/2022		0.0	29.9	N	0.0
11/25/2022		0.0	29.9	N	0.0
11/26/2022		0.0	29.9	N	0.0
11/27/2022		0.0	29.9	N	0.0
11/28/2022		0.0	29.9	N	0.0
11/29/2022		0.0	29.9	N	0.0
11/30/2022		0.0	29.9	N	0.0
6/1/2023	0.0	0.0	29.9	N	0.0
6/2/2023	0.0	0.0	29.9	N	0.0
6/3/2023	0.0	0.0	29.9	N	0.0
6/4/2023	0.0	0.0	29.9	N	0.0
6/5/2023	0.0	0.0	29.9	N	0.0
6/6/2023	0.0	0.0	29.9	N	0.0
6/7/2023	0.0	0.0	29.9	N	0.0
6/8/2023	0.0	0.0	29.9	N	0.0

6/9/2023	0.0	0.0	29.9	N	0.0
6/10/2023	0.0	0.0	29.9	N	0.0
6/11/2023	0.0	0.0	29.9	N	0.0
6/12/2023	0.0	0.0	29.9	N	0.0
6/13/2023	0.0	0.0	29.9	N	0.0
6/14/2023	0.0	0.0	29.9	N	0.0
6/15/2023	0.0	0.0	29.9	N	0.0
6/16/2023	0.0	0.0	29.9	N	0.0
6/17/2023	0.0	0.0	29.9	N	0.0
6/18/2023	0.0	0.0	29.9	N	0.0
6/19/2023	0.0	0.0	29.9	N	0.0
6/20/2023	0.0	0.0	29.9	N	0.0
6/21/2023	0.0	0.0	29.9	N	0.0
6/22/2023	0.1	0.0	29.9	N	0.1
6/23/2023	0.3	0.1	29.9	N	0.2
6/24/2023	0.2	0.1	29.9	N	0.3
6/25/2023	0.4	0.1	29.9	N	0.5
6/26/2023	0.5	0.2	29.9	N	0.7
6/27/2023	0.9	0.3	29.9	N	1.1
6/28/2023	1.3	0.5	29.9	N	1.8
6/29/2023	1.2	0.7	29.9	N	2.3
6/30/2023	1.3	0.8	29.9	N	2.8
7/1/2023	1.1	1.0	29.9	N	3.2
7/2/2023	1.2	1.1	29.9	N	3.6
7/3/2023	1.6	1.2	29.9	N	4.1
7/4/2023	1.6	1.3	29.9	N	4.5
7/5/2023	2.0	1.4	29.9	N	4.8
7/6/2023	2.0	1.5	29.9	N	5.2
7/7/2023	2.1	1.7	29.9	N	5.5
7/8/2023	1.8	1.8	29.9	N	5.9
7/9/2023	1.8	1.9	29.9	N	6.2
7/10/2023	1.0	1.8	29.9	N	5.9
7/11/2023	1.6	1.8	29.9	N	5.9
7/12/2023	1.9	1.8	29.9	N	5.9
7/13/2023	2.3	1.8	29.9	N	6.0
7/14/2023	2.4	1.8	29.9	N	6.2
7/15/2023	2.7	2.0	29.9	N	6.6
7/16/2023	2.8	2.1	29.9	N	7.1
7/17/2023	1.8	2.2	29.9	N	7.4
7/18/2023	1.6	2.2	29.9	N	7.4
7/19/2023	1.8	2.2	29.9	N	7.3
7/20/2023	2.0	2.2	29.9	N	7.2
7/21/2023	2.1	2.1	29.9	N	7.1
7/22/2023	2.1	2.0	29.9	N	6.8
7/23/2023	2.2	1.9	29.9	N	6.5
7/24/2023	1.4	1.9	29.9	N	6.3
7/25/2023	1.7	1.9	29.9	N	6.4
7/26/2023	1.6	1.9	29.9	N	6.3
7/27/2023	1.6	1.8	29.9	N	6.1
7/28/2023	1.7	1.8	29.9	N	5.9
7/29/2023	1.8	1.7	29.9	N	5.8
7/30/2023	1.7	1.7	29.9	N	5.6
7/31/2023	1.7	1.7	29.9	N	5.7
8/1/2023	1.7	1.7	29.9	N	5.7
8/2/2023	1.8	1.7	29.9	N	5.8
8/3/2023	1.5	1.7	29.9	N	5.7
8/4/2023	1.4	1.7	29.9	N	5.5
8/5/2023	1.9	1.7	29.9	N	5.6
8/6/2023	1.8	1.7	29.9	N	5.6

8/7/2023	2.1	1.7	29.9 N	5.8
8/8/2023	1.9	1.8	29.9 N	5.9
8/9/2023	1.8	1.8	29.9 N	5.9
8/10/2023	2.2	1.9	29.9 N	6.3
8/11/2023	2.1	2.0	29.9 N	6.6
8/12/2023	2.1	2.0	29.9 N	6.7
8/13/2023	2.4	2.1	29.9 N	7.0
8/14/2023	2.5	2.1	29.9 N	7.2
8/15/2023	4.7	2.5	29.9 N	8.5
8/16/2023	5.0	3.0	29.9 N	10.0
8/17/2023	5.1	3.4	29.9 N	11.4
8/18/2023	5.2	3.8	29.9 N	12.8
8/19/2023	4.7	4.2	29.9 N	14.1
8/20/2023	4.1	4.5	29.9 N	14.9
8/21/2023	4.0	4.7	29.9 N	15.6
8/22/2023	3.6	4.5	29.9 N	15.1
8/23/2023	3.5	4.3	29.9 N	14.4
8/24/2023	3.6	4.1	29.9 N	13.7
8/25/2023	4.1	4.0	29.9 N	13.2
8/26/2023	4.7	4.0	29.9 N	13.2
8/27/2023	4.6	4.0	29.9 N	13.4
8/28/2023	4.1	4.0	29.9 N	13.5
8/29/2023	3.3	4.0	29.9 N	13.3
8/30/2023	3.5	4.0	29.9 N	13.3
8/31/2023	3.5	4.0	29.9 N	13.3
10/1/2023	2.1	2.4	29.9 N	7.9
10/2/2023	2.3	2.3	29.9 N	7.8
10/3/2023	3.0	2.4	29.9 N	8.0
10/4/2023	2.5	2.4	29.9 N	8.1
10/5/2023	2.9	2.5	29.9 N	8.3
10/6/2023	2.6	2.5	29.9 N	8.5
10/7/2023	2.9	2.6	29.9 N	8.8
10/8/2023	3.0	2.7	29.9 N	9.2
10/9/2023	2.5	2.8	29.9 N	9.3
10/10/2023	2.5	2.7	29.9 N	9.1
10/11/2023	2.7	2.7	29.9 N	9.2
10/12/2023	2.2	2.6	29.9 N	8.9
10/13/2023	2.0	2.6	29.9 N	8.6
10/14/2023	2.2	2.5	29.9 N	8.3
10/15/2023	2.3	2.4	29.9 N	7.9
10/16/2023	2.7	2.4	29.9 N	8.0
10/17/2023	2.5	2.4	29.9 N	8.0
10/18/2023	2.0	2.3	29.9 N	7.6
10/19/2023	2.6	2.3	29.9 N	7.8
10/20/2023	1.9	2.3	29.9 N	7.7
10/21/2023	2.0	2.3	29.9 N	7.6
10/22/2023	2.2	2.3	29.9 N	7.5
10/23/2023	1.9	2.1	29.9 N	7.2
10/24/2023	2.1	2.1	29.9 N	7.0
10/25/2023	1.6	2.0	29.9 N	6.8
10/26/2023	1.2	1.8	29.9 N	6.1
10/27/2023	0.8	1.7	29.9 N	5.6
10/28/2023	0.5	1.5	29.9 N	4.9
10/29/2023	0.2	1.2	29.9 N	4.0
10/30/2023	0.0	0.9	29.9 N	3.0
10/31/2023	0.3	0.7	29.9 N	2.2

oregon association of CLEAN WATER agencies

Working with community wastewater treatment and stormwater management agencies across the state to protect Oregon's water quality since 1987.

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Eugene, Oregon 97401
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February 26, 2024

Michele Martin
DEQ Water Quality Division
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232-4100

Sent via email to: Sandy.SubbasinTMDL@DEQ.oregon.gov

Subject: Comments on the Draft Lower Columbia-Sandy River Temperature TMDL

Dear Michele Martin:

Thank you for the opportunity to provide comments on the draft Lower Columbia-Sandy River Temperature TMDL. These comments are provided on behalf of ACWA, which is a not-for-profit organization of Oregon's wastewater treatment and stormwater management utilities, along with associated professional consulting firms, which are dedicated to protecting and enhancing Oregon's water quality. Our members provide wastewater and stormwater services to over 3 million Oregonians, serving over 75% of Oregon's homes and businesses.

We fully recognize that DEQ is under a court ordered time schedule for the series of replacement TMDLs. However, we also recognize that the methods and approaches DEQ staff has applied to developing the draft Willamette Subbasins and the draft Lower Columbia-Sandy River TMDLs will likely be replicated elsewhere in the state, and that getting these TMDLs right is as important as getting them done on time. Recognizing the importance of these TMDLs, the ACWA TMDL Work Group, which is made up professionals from numerous wastewater and stormwater agencies in Oregon, have dedicated significant time and effort in reviewing, discussing, and providing their questions and concerns about the draft TMDL and WQMP documents. Comments are provided below and are organized by the sections of the Lower Columbia-Sandy River TMDL and Water Quality Management Plan.

DRAFT TOTAL MAXIMUM DAILY LOADS FOR THE LOWER COLUMBIA-SANDY RIVER

Section 7. Pollutant Sources or Source Categories

DEQ should make a clear, definitive statement regarding stormwater discharges, such as the following:

> *"Based on a review of published literature and other studies related to stormwater runoff and stream temperature in Oregon, DEQ ~~found there is not sufficient evidence to demonstrate~~ concluded that stormwater discharges authorized under the current*

municipal (MS4s) permits or the construction (1200-C) and industrial (1200-A and 1200-Z) general stormwater permits do not contribute to exceedances of the temperature standard. Therefore, wasteload allocations for these sources are not included in the TMDL."

Section 9. Allocations, Reserve Capacity, and Margin of Safety

Allocation of the Human Use Allowance

Section 9.1 of the TMDL states that the "human use allowance at OAR 340-041-0028(12)(b)(B) identifies the allowed temperature increase reserved for human uses. The rule requires that wasteload and load allocations restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.30°C (0.5°F) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact." A series of tables are included that define the source category allocations in various watersheds in the Lower Columbia-Sandy River Temperature TMDL. Table 9-3 defines the human use allowance allocations that would apply to the segment of the Sandy River from the headwaters to the Bull Run River.

Table 9-3: Human use allowance allocations on the Sandy River from the headwaters to the Bull Run River.

Portion of Human Use Allowance (°C)	Source or source category
0.08*	NPDES point sources
0.21	Warming from tributaries
0.01	Water management activities and water withdrawals
0.00	Solar loading from existing transportation corridors, existing buildings, and existing utility infrastructure
0.00	Solar loading from other NPS sectors
0.00	Reserve capacity
0.30	**Total**

Note: * NPDES permitted point sources are allowed up to 0.08°C cumulatively at the point of maximum impact on the Sandy River from the headwaters to the Bull Run River. The portion of the human use allowance allocated to each point source at the point of discharge is identified in Table 9-7.

This table shows that 0.08°C has been allocated to NPDES point sources, which include Water Environment Services' Hoodland facility and the proposed discharge from the City of Sandy's WWTP. A significant portion of the human use allowance (0.21°C) is allocated to "warming from tributaries". There is no allocation for reserve capacity in this segment of the Sandy River.

The discussion of background sources states that changes to channel morphology, tributary inflows, groundwater inputs, and other anthropogenic changes that are not specifically addressed in the TMDL are included as background. From the discussion in Section 7.3 of the TMDL, it would appear that "warming from tributaries" should be categorized as a background source. Categorizing "warming from tributaries" as background will enable DEQ to include an allocation for reserve capacity. This will provide the communities served by the City of Sandy and Hoodland treatment facilities to potentially utilize a portion of the reserve capacity for future growth and development.

The HUA allocation for non-point sources of 0.0º C is not defensible based on real world constraints.
Please explain why the sector-specific allocations do not include an allocation for solar loading from non-point sources (other than existing transportation and utility infrastructure). There is no justification provided in the documents. If there is no allocation for non-point sources, that would mean that achieving the TMDL target requires fully vegetated stream corridors at maximum effective shade. Factual, on-the-ground constraints, established laws, and competing environmental needs in some areas to retain solar access, make this aspirational goal unachievable. TMDL policy implications of a 0.0º C HUA for solar loading from other NPS sectors would set DMAs up for failure, because it would require implementation of shading activities that are beyond local governments' authorities. Moreover, setting an unachievable goal in a specific sector would mean that DEQ has not established an achievable path to meet its TMDL targets.

While there may well be significant additional potential for local governments to increase effective riparian shade, the measures they can take are limited, and the constraints to achieving DEQ's aspirational shade goal are very real. DEQ must include a reasonable non-point source HUA to recognize these constraints. We recommend that DEQ include a similar allowance for non-point sources as provided for the "transportation corridor, buildings and existing infrastructure" (0.02º C). Including an allocation for non-point sources recognizes both the dynamic nature of streamside vegetation and the limitations that Designated Management Agencies (DMAs) have in achieving TMDL goals.

Assigning a zero allocation for non-point sources may have unintended consequences related to point source discharges.
The zero allocation for non-point sources may mean that point sources will not be able to utilize water quality trading as a compliance strategy. That would negatively impact DEQ's ability to achieve the TMDL target over time and would likely lead to public expenditure of funds for unsustainable mechanical cooling infrastructure that provides little to no benefit to the river or fish habitat, and runs counter to the State's climate protection/carbon reduction goals. The permit compliance strategy implications for point sources need to be more fully evaluated, and the allocation should be not set such that it would eliminate opportunities for wastewater utilities to invest in riparian shade enhancement projects. As stated above, DEQ should adjust the sector-specific human use allocations to provide an allocation for solar loading from other non-point sources. A non-point source allocation as recommended above would enable point sources to pursue a water quality trading program as a compliance strategy. DEQ also should include a specific discussion of the water quality trading framework in the TMDL documents.

Thermal Wasteload Allocation for Point Sources

Section 9.1.2 says "The wasteload allocation for registrants under the general stormwater permits (MS4, 1200-A, 1200-C and 1200-Z) and general permit registrants not identified in Table 9-11 is equal to any existing thermal load authorized under the current permit." With regards to the general stormwater permits (MS4, 1200-A, 1200-C and 1200-Z), this statement conflicts with the findings in Section 7.1 of the TMDL, which states that "there is insufficient evidence to demonstrate that stormwater discharges authorized under this latter set of general permits (MS4 Phase II, Construction (1200-C), and Industrial (1200-A and 1200-Z)) contribute to temperature standard exceedances in the Lower Columbia-Sandy." The references to the general stormwater permits in Section 9.1.2 should be deleted.

Minimum Wasteload Allocations

Table 9-8 presents the thermal wasteload allocation for point sources. Multiple criteria (i.e., spawning, core cold water, rearing/migration) apply during the TMDL period for many streams in the Sandy River basin. For example, both the spawning and the core cold water criteria apply during the TMDL period in the segment of the Sandy River from the headwaters to the Bull Run River. The TMDL should specify wasteload allocations that would apply for each use period. This information is essential in assessing compliance strategies. A snip from the 2006 Willamette TMDL provided below is a good example.

Table 4.15 Individual waste load allocations for low streamflow conditions.

Receiving Stream	River Mile	Point Source	Summer 7Q10 WLA (Million Kcal/day)	Spawning 7Q10 WLA (Million Kcal/day)
Clackamas River	22.6	ODFW Clackamas River Hatchery	51	49
Coast Fork Willamette River	21.5	Cottage Grove WWTP	11	21
McKenzie River	1.0	Weyerhaeuser Springfield	1071	744
North Santiam River	14.9	Stayton WWTP	57	89
Santiam River	9.3	Jefferson WWTP	7	12
South Santiam River	15.9	Lebanon WWTP	65	111
South Santiam River	31.5	Sweet Home WWTP	31	55

The above table provides an example of wasteload allocations that would apply during the spawning and rearing periods. In situations where multiple criteria apply, DEQ should include wasteload allocations for each use period.

Thermal Load Allocation for Non-Point Sources

Table 9-13 presents the vegetation height, density, overhang and buffer width used to derive effective shade curve targets. A buffer width of 36.8 meters (120 feet) is used for deriving the effective shade curve targets for each mapping unit. As noted in the discussion regarding the allocation of the human use allowance, local jurisdictions have very limited ability to require or incentivize private property owners to provide a 120-foot buffer width. Additionally, site constraints often restrict the establishment of a 120-foot buffer width. Thus, the assumed buffer width used to derive the effective shade curve targets will likely not be achievable in many areas. We recommend that DEQ include discussion in Section 9.1.4.4 that the shade curves presented in Figures 9-5 to 9-8 and in the Appendix of Effective Shade Curve Tables are based on an assumed vegetation height, density, overhang, and buffer width; these are idealized conditions and not representative actual field conditions. Thus, the effective shade targets obtained from the shade curves do not reflect site potential conditions; the effective shade obtained from the shade curves should be used as a guide to evaluate progress and not as actual effective shade targets.

WATER QUALITY MANAGEMENT PLAN (WQMP):

Section 2. Proposed Management Strategies

Section 2 of the WQMP identifies proposed management strategies; these include streamside vegetation management, flow management strategies, and hydromodification strategies. The WQMP identifies specific management practices in each category.

Water Withdrawal Management Strategies

Section 2.2 discusses flow management strategies. This section notes that because “temperature is a flow-related parameter, water withdrawals can result in increased pollutant concentrations and warmer stream temperatures.” The WQMP recommends the pursuit of “out-of-stream rights and converting

these rights to instream uses". Reliance on instream water rights as the vehicle to implement this management strategy will not tap its full potential. This management strategy needs to be more fully developed as there is significant untapped potential to leave cool water instream and offset its consumption with recycled water. Recycled water from municipal wastewater treatment facilities is a viable alternate source of water for many consumptive uses and using it in-lieu-of river water has the double temperature benefit of eliminating a discharge of warmer water to the stream and leaving cooler water in the stream. DEQ should take necessary steps to facilitate expansion of the permitted use of recycled water which would allow entities to transfer water rights for in-stream use. For the purposes of this WQMP, DEQ should incorporate the framework for additional means (other than water rights transfers or leases) for achieving temperature compliance through recycled water offsets to withdrawals, such as contracts.

Additional strategies to address water withdrawals include expanding the use of Aquifer Storage and Recovery (ASR) systems for municipal use. These systems can be used to store water in the wet season and use the stored water in the dry season. This provides a viable method for communities to reduce surface water withdrawals during the dry season. These strategies also should be developed in the WQMP.

Point Source Priority Management Strategies

Section 2.4 discusses point source priority management strategies. The discussion of point source priority management strategies is inadequate. Point source dischargers cannot implement the priority management strategies without viable permitting pathways. The WQMP should include the range of permitting pathways that exist and that need to be developed in order to enable point source dischargers to have access to the priority management strategies as a means of permit compliance for temperature limits. Examples that need to be addressed in this section (or elsewhere in the WQMP as DEQ responsibilities) include, but are not limited to:

- Water quality trading: DEQ should provide a discussion for the framework for the water quality trading program in the WQMP.
- Mechanisms for pilot projects or a specific set of performance metrics that can constitute NPDES permit compliance for priority management strategies related to river system (channel morphology and hydromodification) improvement projects such as channel morphology improvements, floodplain function improvements, hyporheic flows through shallow gravels, etc.
- A broader set of mechanisms for crediting water left instream and offset by recycled water use.
- Pathways to site specific variances and implementation of pollution reduction plans in-lieu-of numeric temperature limits.

Section 5. Implementation Responsibilities and Schedule

Since flow management strategies are an essential component of the proposed management strategies in the WQMP, the Oregon Water Resources Department (OWRD) has an important role in achieving TMDL objectives. OWRD's mission statement notes that its role is "to restore and protect stream flows and watersheds in order to ensure the long-term sustainability of Oregon's ecosystems, economy, and quality of life". OWRD's role in ensuring sustainable stream flows is essential in meeting temperatures targets. Therefore, we recommend that OWRD be listed as a DMA in the WQMP.

Thank you for your consideration of ACWA's comments. If you have any questions, please do not hesitate to contact me.

Sincerely,

Jerry

Jerry Linder
Executive Director

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February 23, 2024

Department of Environmental Quality
Attention: Michele Martin
Lower Columbia-Sandy Temperature TMDL Replacement
700 NE Multnomah Street, Suite 600
Portland, OR 97232

RE: Comments on the Temperature TMDL Replacement: Lower Columbia-Sandy Subbasin TMDL

Dear Ms. Martin,

The Oregon Department of Fish and Wildlife (ODFW) appreciates the opportunity to provide comments on the Draft Temperature Total Maximum Daily Loads for the Lower Columbia-Sandy Subbasin and Draft Water Quality Management Plan for the Willamette Subbasin Temperature TMDL.

DMA Status

OAR 340-042-0030(2) defines Designated Management Agency as a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants and is identified as such by DEQ in a TMDL, while "responsible person" is defined as any entity responsible for any source of pollution addressed by the TMDL. The draft TMDL identifies those entities responsible for temperature TMDL implementation (designated management agencies (DMAs) and responsible persons) through their jurisdiction and land ownership in the watershed. ODFW was identified as a DMA in the draft TMDL and maintains approximately 0.06% of total subbasin area and 0.11% of acreage within 150 feet of streams within the Sandy River subbasin. As a DMA, ODFW is required to develop a TMDL implementation plan. ODFW feels this is a substantial amount of agency resources directed at an insignificant contribution of heat relative to other sources in the basin.

The draft TMDL identified dam owners and operators responsible for implementation based on the definition of large dams, "Large dams are defined by a dam height >= 10 feet and storage of >= 9.2 acre- feet." DEQ did not focus implementation requirements on dams owned and operated by individuals or businesses, or those operated to manage seasonal flow to sustain ecological benefits associated with wetlands or manage stormwater, but instead identified large dam owners and operators. According to the draft TMDL, in these cases, large dam owners that are a public utility or a government agency are required to monitor and potentially develop TMDL implementation plans that include reservoir-specific management strategies to mitigate temperature increases that happen between the inflow and outlet of the dam.

Currently, the draft TMDL Water Quality Management Plan states that "*…. DMAs must identify specific measurable objectives with milestones and associated implementation timelines for implementing these strategies. …. Table 7 includes a list of dams and dam owners that are*

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responsible for developing a monitoring plan and may be required to develop a TMDL implementation plan" (Table 1).

Table 7: Large dam owners responsible for monitoring and that may be required to submit an implementation plan that includes reservoir management strategies.

Dam Name	Owner	Reservoir Storage (acre-ft)
Bull Run Lake Dam	City of Portland	14500
Trillium Lake	Oregon Dept. of Fish and Wildlife	380
Wahkeena Rearing Reservoir	Oregon Dept. of Fish and Wildlife	180
Development No. 1 Dam	City of Portland	33760
Spillway Dam	City of Portland	25000
Development No. 2 Dam	City of Portland	25000

Table 1. Table 7 of draft Water Quality Management Plan. Large dam owners responsible for monitoring and that may be required to submit an implementation plan that includes reservoir management strategies.

The WQMP goes on to say that "*Dam owners in Table 7 will collect temperature data and potentially assess temperature dynamics associated with their dam and reservoir operations using a mechanistic model, empirical model, and/or analysis of continuous temperature data collected upstream, downstream, and in the reservoir. The assessment shall include: (1) Collection of continuous temperature data to characterize reservoir inflow and outflow temperatures; (2) Reservoir temperature profiles to characterize timing and extent of thermal stratification, and (3) Collection of reservoir water level fluctuations and outflow rates*." The largest of these reservoirs that ODFW is responsible for, Trillium Lake, is approximately 380 acre-feet which is approximately 3% of the capacity of the next smallest reservoir, Bull Run Reservoir, which is 14,500 acre-feet. Trillium Lake was created in 1960 at the headwaters of Mud Creek in the Mount Hood Wilderness area (Figure 1). As a small headwater lake and tributary with a well vegetated riparian shade canopy, ODFW does not believe the operation of Trillium Lake poses a significant threat to increased downstream temperatures. Data from the 2022 Integrated Report from Site MHNF-062 on Mud Creek below Trillium Lake (Figure 1) demonstrate attainment of temperature criteria. Maximum summer temperatures peaked at 12.93 ºC at the end of July, which is approximately 3 degrees below the criterion of 16ºC. Temperatures below the Trillium Lake outfall currently attain Core Cold Water criteria.

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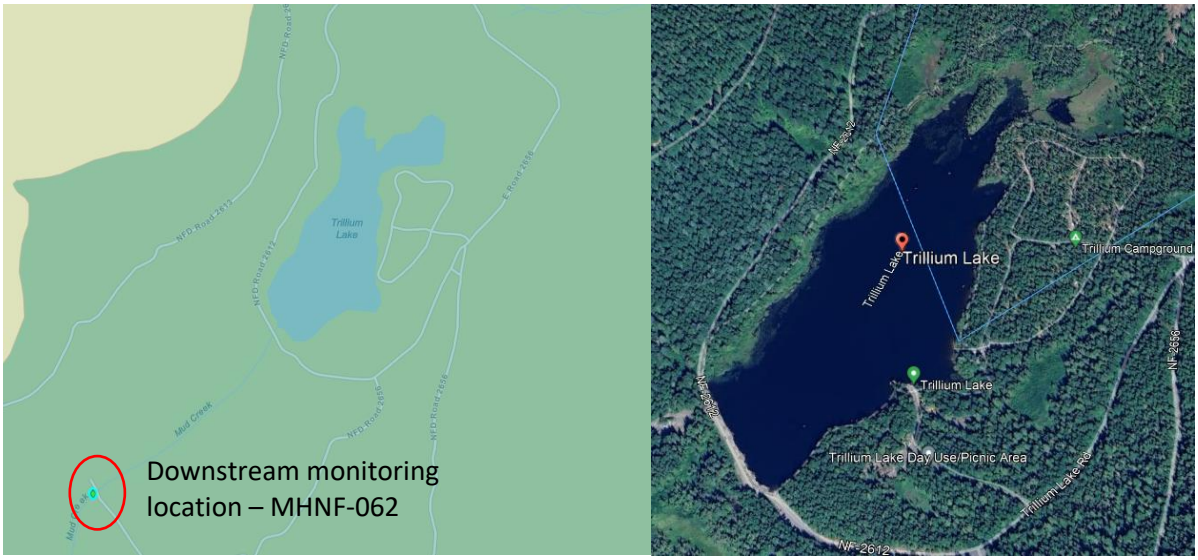

Figure 1. Trillium Lake and downstream monitoring location

Additionally, Wahkeena Rearing Reservoir (i.e. Hartman Pond) (Figure 2), also identified in the TMDL, was originally used as a rearing pond for an ODFW hatchery. The pond drains directly to the mainstem Columbia River and not to the Sandy River basin. Both Hartman Pond and Benson Lake were created during the construction of I-84 in the 1950s. During the construction of Interstate 84, two large gravel pits were excavated to generate fill material. All of Multnomah Creek was diverted through the larger gravel pit to form 22-acre Benson Lake, and a portion of Wahkeena Creek's flow was diverted through the smaller gravel pit to form 20-acre Hartman Pond[1].

The pond is currently dewatered and ODFW is exploring options to repair and maintain the water control structure. The Lower Columbia Estuary Partnership is currently undertaking a restoration project which replaces the current diversion structure in Wahkeena Creek to increase the flow of the creek and decrease the amount of water diverted to Hartman Pond, while maintaining a flow necessary to maintain the pond for recreational use throughout the year[1]. Like Trillium Lake, capacity at Hartman Pond is approximately 1% that of Bull Run Reservoir, the next smallest "large" reservoir. Average flow at the mouth of the Columbia River is approximately 265,000 cubic feet per second while flow at Hartman Pond, approximates 90 cubic feet per second when flowing (approximately 0.03% of Columbia River flow) and likely undetectable were the pond to completely empty all at once. Benson Pond, part of Benson Lake

[1] https://www.estuarypartnership.org/multnomah-and-wahkeena-creeks-restoration

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State Recreation Area, immediately east of Hartman Pond was excluded from the TMDL although it is also a manmade reservoir that is approximately the same size.

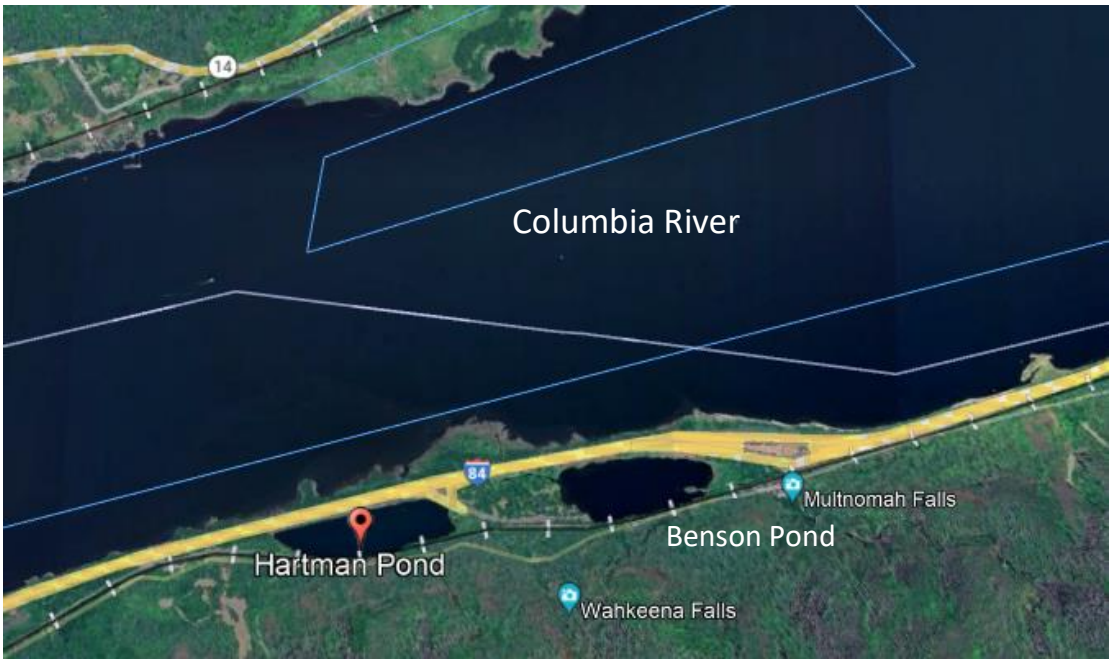

Figure 2. Google Earth image of Hartman Pond adjacent to mainstem Columbia River

ODFW is concerned that the implementation requirements associated with these small reservoirs will require a substantial amount of agency resources be directed toward an insignificant contribution of heat relative to other sources in the basin and on balance would provide little to no added benefit given the significant dedication of public resources associated with implementation. That said, ODFW is deeply committed to furthering actions to ensure resilient habitat conditions, including sufficient water quantity and quality conditions, for Oregon's fish and wildlife. Given the magnitude of challenges and limited resources, ODFW must prioritize actions likely to yield the most benefit to species. For example, changing climate conditions are undermining the ability of lands and waters to support Oregon's native fish and wildlife, and the cultural and economic benefits they provide. Climate change is a serious and immediate threat to ODFW's ability to achieve its mission and meet its statutory mandates to manage the public trust resources in its care, and ODFW continues to address these issues head-on through implementation of its Climate and Ocean Change Policy and prioritized, efficient use of state resources.

In conclusion, ODFW continues to be a state leader in understanding and addressing the impacts of climate change on Oregon's natural resources. ODFW supports a continued collaborative approach to protecting Oregon's aquatic resources and looks forward to working with DEQ to

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continue to protect Oregon's valuable natural resources using state resources as efficiently and effectively as possible.

Sincerely,

Rebecca Anthony

Rebecca Anthony
Water Quality Specialist
Oregon Department of Fish and Wildlife

cc: Chandra Ferrari, ODFW

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February 20, 2024

Oregon DEQ
Attn: Michele Martin
Water Quality
700 NE Multnomah Street Suite 600
Portland, Oregon 97232-4100

RE: Lower Columbia-Sandy Subbasin TMDL Rulemaking

The Oregon Department of Forestry (ODF) is providing the following comments in response to the Oregon Department of Environmental Quality's (DEQ) January 2024 draft Water Quality Management Plan (WQMP) for the Lower Columbia-Sandy Subbasin Temperature Total Maximum Daily Load (TMDL) and associated supporting documents.

The draft WQMP should allow for flexibility for implementation on forestland.
With the Board of Forestry adopting new and revised Forest Practices Act rules in the fall of 2022 (effective January 2024), ODF staff are fully engaged in forestland owner outreach, internal and external training, and on the ground rule implementation assistance and enforcement. ODF encourages the ability to evaluate how these new rules are protective of water quality. Additionally, to ensure successful implementation of FPA rules and associated programs, ODF does not have additional capacity or resources to devote to the shade gap analysis and streamside evaluations prescribed in the draft Lower Columbia-Sandy Subbasin Temperature TMDL WQMP, and certainly not in the proposed required timeframe. Having a prioritized implementation strategy and appropriate timeline would allow ODF to fully engage in this work.

In section *2.1 Streamside vegetation management strategies* of the draft Lower Columbia-Sandy Subbasin Temperature TMDL WQMP, DEQ identifies the necessary strategies to meet the water quality standards in the temperature impaired waterbodies in the Lower Columbia-Sandy Subbasin. Table 1 below lists specific ODF Rule Divisions and rules that, when implemented, will ensure ODF is meeting the strategies to attain the water quality standards.

Table 1. DEQ Streamside Vegetation Management Strategies and Correlating ODF's FPA Rules

DEQ Strategies	ODF Forest Practices Act Rules/ Best Management Practices
DEQ Strategy 1. Riparian Vegetation Planting and Establishment	ODF Rule Division 610 Reforestation Rules - (Associated Processes: Notifications, Guidance, Inspections, Enforcement, Compliance Monitoring, Enforcement, Adaptive Management)
DEQ Strategy 2. Riparian Vegetation Protection	ODF Rule Divisions for Water Protection: 635, 643, 645,650, 655, 660 - (Associated Processes: Notifications, Guidance, Inspections, Enforcement, Compliance Monitoring, Adaptive Management)
DEQ Strategy 3. Riparian Vegetation Thinning and Management	ODF Rule 629-605-0173 – Planning for Forest Operations: Plan for Alternative Practices - (Associated Processes: Notifications, Inspections, Enforcement, Compliance Monitoring, Adaptive Management), OAR 629-643-0400, Plan for Alternative Practice (PFAP)

ODF implements rules and programs that employ best management practices, targeting DEQ's identified WQMP strategies: riparian vegetation planting and plant establishment, riparian vegetation protection and riparian vegetation thinning and management. ODF is actively engaged in working with landowners to ensure proper riparian protection, management, and compliance.
ODF desires to be successful as a Designated Management Agency (DMA) in helping Oregon private forestland owners meet the Willamette temperature TMDL non-point source load allocation targets. We will do this by working collaboratively with DEQ staff to adopt language in the WQMP that allows for flexibility in implementation approach and effectively uses the resources and authorities under ODF's existing framework. ODF also recommends that DEQ assist ODF in obtaining additional resources before "requiring" ODF to carry out such prescriptive and time intensive activities (i.e. shade gap analysis and streamside evaluations) for the Lower Columbia-Sandy subbasin.

Requested Corrections in the published draft TMDL documents.
Correction 1: The statement "*These rules are not expected to result in after-the-fact restoration of riparian areas*" on page 14 of the draft WQMP is inaccurate for the following reasons: if a forest harvest operation occurred, forest practice rules require reforestation when stocking level fall below established thresholds. (OAR 629-610-0020 & -643-0500).

Landowners/operators conducting harvest operations under the FPA rules any time prior to January 1, 2024, are required to replant any harvested areas that fall below stocking standards due to tree harvest including areas within the wider no-touch Riparian Management Area's (RMAs) effective January 2024. *After-the-fact* restoration would have already occurred. Under the new buffer rules those areas planted that now fall within the wider required RMA buffers are not allowed to be harvested. **ODF requests DEQ remove this sentence from the draft WQMP.**

Correction 2: The following statement in draft WQMP is misleading: *"effective shade is likely to be deficient for those riparian areas adjacent to small and medium salmon, steelhead and bull trout streams that were harvested prior to implementation of the new rules."* Page 14. This statement suggests increased streamside vegetation regulatory improvements were not made until 2022. The Oregon Board of Forestry adopted new rules in July of 2017 for streams that are identified as having salmon, steelhead, and bull trout (SSBT) distribution. The SSBT rules resulted in wider RMA's and increased tree retention along such streams. ODF implemented wider stream buffer rules on small and medium salmon, steelhead, and bull trout streams seven years earlier than this sentence suggests. **ODF requests this sentence be revised or removed from the draft WQMP.**

Sincerely,

Cal Mukumoto
Oregon State Forester

OREGON FOREST
INDUSTRIES COUNCIL
SUSTAINABILITY. SCIENCE. INNOVATION. GROWTH.

PO Box 12826, Salem, OR 97309

February 26, 2024

Oregon DEQ
Attn: Michele Martin
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100

Via Email: Sandy.SubbasinTMDL@DEQ.oregon.gov

RE: Oregon DEQ Proposed Lower Columbia-Sandy Subbasin Temperature TMDL

Dear Ms. Martin:

Thank you for the opportunity to provide comment on the Department of Environmental Quality's (DEQ) proposed Lower Columbia-Sandy Subbasin Temperature TMDL rulemaking (the "rulemaking"). These comments are being submitted on behalf of Oregon Forest & Industries Council (OFIC), which represents forestland owners and forest products manufacturers from across the state of Oregon. Together, our members provide for themselves, their families and nearly 60,000 other households via direct employment from our lands and manufacturing facilities.

OFIC has been engaged in the current rulemaking as a member of the Rulemaking Advisory Committee (RAC) where we were represented by Rich Wildman from Geosyntec. We have also had opportunities to address questions and concerns directly to the DEQ rulemaking team outside of RAC meetings, and we appreciate the open-door policy that you have maintained throughout this process. We understand that DEQ has been working on something of an expedited schedule in an effort to meet court-mandated deadlines for completion of this revised TMDL, yet notwithstanding these real time constraints, your team has been communicative and has clearly made an effort to address concerns whenever possible. For that we thank you.

It is also with respect for the tight schedule that DEQ is working on that we wish to be as direct as possible with these comments. We recognize the importance at this stage of development for offering proposed solutions to identified problems rather than just pointing out the problems themselves. To that end, we would like to raise a number of issues of concern that we have with the draft TMDL and propose tangible ways that these concerns could be addressed by the agency in the final rule. After DEQ has had an opportunity to review and digest these suggestions, we are happy to answer any clarifying questions that your team might have.

1.) The Numeric Shade Targets Should Be Removed from the Final Rule

For the first time that we are aware of, DEQ has set numerical shade targets for each jurisdiction (by Designated Management Agency) across the subject area. These targets are based on DEQ modeling that attempts to recreate what "restored" vegetative conditions would look like and therefore what degree of shading the basin-wide river and stream network would receive absent human impacts. Table 9-12 in the proposed rule reflects these effective shade surrogate measure targets and – of immediate relevance for OFIC's private forest landowner members – assigns a numeric shade target of 24% effective shade for private forests regulated by the Oregon Department of Forestry (ODF) along the Sandy River, and higher targets for private forests regulated by ODF along the Little Sandy (74%), Zigzag (37%), and Salmon (40%) Rivers.

We are concerned about the inclusion of these numeric targets for three reasons.

a. Numeric Shade Targets Effectively Treat Nonpoint Sources as Point Sources

The Clean Water Act (CWA) maintains a clear distinction between the regulation of point sources and nonpoint sources for purposes of allocating loading for waters that are impaired as to a given water quality criteria. Point sources that are required to operate under NPDES permits (whether individual or general) are subject to mandatory, enforceable effluent limitations that are meant to ensure that these sources do not exceed the wasteload allocations assigned to them by the DEQ. For point sources, the analysis is simple: discharges must meet numeric effluent limits in order to be in compliance with the Act. For nonpoint sources, on the other hand, a considerable amount of flexibility is provided by the Act for demonstrating compliance and achieving the load allocations written into a TMDL. However, by assigning a an effective shade target to each DMA authorized by DEQ to implement the TMDL, DEQ is essentially treating each nonpoint source category as a single point source, merely swapping in a numeric shade measurement for the numeric effluent limits that would be imposed on a permitted point source.

There is a clear reason that the CWA distinguishes between point and nonpoint sources: the principles that apply to one simply do not fit the other. This is especially true when dealing with a water quality standard such as temperature. There are myriad factors that impact the temperature of water on the landscape (a fact reflected by the complexity built into the Heat Source model used by DEQ), and that complexity means that a single surrogate measure, such as shade, effects different waterbodies in different ways depending on a host of attendant factors. The draft rule ignores this, and essentially treats shade the same way as it treats effluent from a single, discreet conveyance.

b. Numeric Shade Targets Treat Temperature Impacts from Solar Radiation Flux as Uniform and Non-Attenuating

This raises a second issue with DEQ's numeric shade targets. Even assuming that the amount of effective shade is in all instances directly correlated to the temperature of a waterbody (which may not be the case), DEQ ignores evidence suggesting that the *magnitude* of the impact of solar radiation flux is different for different waterbodies (e.g. Vannote et al. (1980); Poole and Burman (2001)) and that such impacts have been shown not to be persistent, but to attenuate over space

and time (Bladon et al. (2018)). That is to say, there is abundant evidence suggesting that uncovering a portion of a stream does not result in a persistent increase in stream temperature, but that downstream shading will attenuate upstream impacts. This casts doubt on DEQ's reliance on basin-wide shade targets as necessary and sufficient for meeting nonpoint source load allocations and calls for a more circumspect approach when it comes to addressing landscape-level loading from nonpoint sources.

c. Unrealistic Restored Vegetation Scenarios in DEQ Modeling Calls for Removal of Prescriptive Shade Targets

We observed that, for the restored vegetation scenario in the Sandy River models, all pastures and cultivated fields are assumed to be restored to high density mixed conifer/hardwood forests. This assumption is unrealistic and problematic for nonpoint source sectors and casts doubt on the accuracy of the "restored vegetation scenario" used by DEQ to establish shade targets for various land classes.

If, notwithstanding our request that DEQ remove prescriptive targets for effective shade, DEQ opts to follow this course, we ask DEQ to leave these land uses as they are in the restored vegetation models. Further, we ask DEQ to use Restored Vegetation scenario B, instead of Restored Vegetation scenario A (from the technical support document), in the development of shade targets for the Sandy River and Salmon River basins. It is unrealistic to expect anthropogenic structures to be restored to high density forests.

2.) DEQ Should Provide More Flexibility for DMAs to Demonstrate Progress Toward Attainment of Water Quality Standards in Implementation Plans

Once the TMDL is finalized and has been approved by the Environmental Quality Commission, DEQ will require DMAs to craft and submit implementation plans for how DMAs will prioritize projects and demonstrate progress toward attainment of water quality standards. OFIC is concerned, insofar as ODF is the DMA with authority to implement the TMDL on private forestland, that DEQ is unnecessarily boxing in the agency, and not leaving flexibility for ODF to deploy the new Forest Practice Act (FPA) rules and the Adaptive Management process that was established as part of the updates that were made to the FPA in 2022.

As DEQ is no doubt aware, the FPA was recently amended to, among other things, materially increase riparian management restrictions (including expanded no-harvest buffers and equipment limitation zones) in an effort to better protect aquatic species habitat on private forestland. ODF is presently in the process of implementing the new forest practice standards established pursuant to the FPA.

The new FPA rules also include a process by which any future changes to the forest practice rules would be effected through rule review by an Adaptive Management Policy Committee (AMPC), which works in conjunction with an Independent Research and Science Team (IRST) to establish

studies and review scientific literature in order to assess the effectiveness of the rules in meeting environmental goals and objectives. DEQ is represented on the AMPC.

We believe that the revised forest practice rules abrogate any perceived shortcomings in Oregon's riparian protections on private forestland and are sufficient to address both aquatic species habitat concerns as well as water quality concerns, and that the Adaptive Management process will ensure that any shortcomings or changes in our understanding of the science will be timely addressed.

However, we fear that the draft TMDL and the accompanying draft Water Quality Management Plan (WQMP) do not give ODF the operational flexibility to let the new rules take effect and for the Adaptive Management process to be put into practice to address any remaining water quality concerns or questions. This lack of flexibility is demonstrated in at least two ways (aside from the prescriptive numeric shade targets that we address, above).

a. DEQ Assumes FPA Inadequacy in Contravention of Legal Standard in State Statute

In Section 5.2 of the draft WQMP, DEQ addresses existing implementation plans and, in subsection 5.2.1, specifically addresses ODF and the adequacy of the FPA to meet TMDL load allocations. In particular DEQ states that "forest operations conducted in accordance with the Forest Practices Act and other voluntary measures are *generally considered* to be in compliance with water quality standards," and that implementation of the revised FPA rules "*may* be effective at meeting shade allocations," but that "[t]hese rules are *not expected* to result in after-the-fact restoration of riparian areas harvested under previous rules," and "effective shade is *likely to be deficient* for those…areas adjacent to small and medium [SSBT] streams harvested prior to implementation of the new rules" (emphasis added).

This language is problematic in two regards. First, it directly contravenes the standard established by statute in ORS 527.770. That section states, without qualification, that "[a] forest operator conducting, or in good faith proposing to conduct, operations in accordance with best management practices currently in effect shall *not be considered in violation of any water quality standards*" (emphasis added). It is true that OAR 240-042-0080(2) contains a provision allowing the EQC to petition the Board of Forestry for a review of all or part of the FPA rules implementing a TMDL if a deficiency is suspected, but this qualified exception must not be allowed to swallow the default rule, which is that the FPA is deemed adequate to meet water quality standards.

Second, the language implying a presumed inadequacy – right out the gate – of the revised FPA rules to *restore* areas harvested under the old forest practice rules is a premature conclusion that completely ignores the fact that, even under the old rules, landowners were required to replant harvested acres (including riparian areas) and that any uncovering of stream segments resulting from harvest was therefore mitigated over time as those harvested areas regrew. The new FPA rules do not change that mandatory regeneration paradigm. In other words, not only are previously harvested areas *guaranteed* to be restored, but the new rules impose even greater restrictions on harvesting in riparian areas, thereby guaranteeing that the impacts of *future*

harvests will be greatly reduced. Even if, as DEQ states in the first paragraph under 5.2.1, the pre-2022 FPA rules were deemed inadequate to meet the temperature criterion for protecting cold water (a finding that was never tested through petition to the Board of Forestry, we might add), to imply that the same would be true of the revised rules that are just now in the process of being implemented is completely unfounded.

We would therefore request that DEQ amend the language in 5.2.1 of the WQMP as follows (removed language indicated by strikethrough and new language indicated in bold):

> With the publication of the Private Forest Accord Report and subsequent passage of Senate Bill 1501, 1502 and HB 4055, Forest Practices Act rule revisions were adopted by the Board of Forestry in October 2022 and additional amendments are anticipated through 2025. Implementation of these rules, which include increased riparian widths and additional tree retention, ~~may be~~ **shall be deemed** effective at meeting shade allocations **pursuant to ORS 527.770**. ~~In addition, as revised rules become effective, implementation of more stringent measures to protect water quality on private forestlands are anticipated to be applied, including in the Sandy River Subbasin. These rules are not expected to result in after-the-fact restoration of riparian areas harvested under previous rules. Therefore, effective shade is likely to be deficient for those riparian areas adjacent to small and medium salmon, steelhead and bull trout streams that were harvested prior to implementation of the new rules. The trajectory for providing future riparian shade on these streams is highly variable because it is based on the rules in effect at the time of harvest and the date of replanting.~~ **The effects of the revised rules on riparian areas and on water quality will be assessed over** ~~M~~multiple years **as previously harvested areas are regrown and new harvests are conducted in accordance with revised restrictions on harvest activities in riparian areas.** ~~will be needed for potential water quality improvements to be realized so that~~ DEQ **will work with ODF to develop a TMDL implementation plan focused on** ~~can~~ evaluat**eing the** adequacy of the revised rules **over time** in meeting the load allocations and surrogate measures required by the Sandy River Subbasin Temperature TMDL.

b. DEQ Does Not Provide the Adequate Flexibility for DMAs to Achieve Load Allocations and Meet Temperature Standards

In response to a concern that we raised in a meeting with DEQ staff on 5 February 2024 regarding what we perceived as a lack of flexibility in the TMDL and WQMP for DMAs to develop IPs that achieve the load allocations in the TMDL in a way that minimizes adverse impacts to affected landowners, DEQ asserted that the streamside evaluation language in 5.3.2 of the WQMP provides adequate flexibility and outlines a process for demonstrating progress toward the ultimate water quality objective other than through strict compliance with an effective shading requirement. Though this could be true were DEQ to remove the prescriptive shade targets as we have requested, above, if a numeric shade target is included in the TMDL, we simply do not see how the streamside evaluation process in 5.3.2 provides any alternative path for compliance to DMAs and the landowners that they regulate.

We understand that, in this TMDL, the target shade values developed under the shade surrogate concept become the de facto regulatory targets that DMAs must meet. We ask DEQ to clarify whether and how DMAs can receive credit for stream restoration work that cools waterways absent increases in effective shade when stream temperature is not the regulatory target that DMAs must meet. DEQ explained in an e-mail communication that "Basin Coordinators have understood these types of restoration activities (stream channel work, etc.) as making progress in DMA implementation plans." (Martin, 2023). While we agree that stream restoration projects by land managers are desirable, we ask DEQ to include explicit language in the TMDL and WQMP that allows DMAs to outline a process by which DMAs define the relationship between restoration activities, shade, and desired stream cooling.

In particular, we would ask DEQ to include clear language in 5.3.2 of the WQMP indicating that implementation of best management practices (including, but not limited to those outlined in subsection f. of 5.3.2) may serve as an alternative strategy to increasing effective shading to meet a prescriptive shade target in areas where such alternatives can be shown to be adequate to protect water quality or where it can be demonstrated that hitting a shade target is not determinative of achieving water quality standards in impaired waters.

Such flexibility will, we believe, be essential for ODF to implement the revised FPA and to utilize its new Adaptive Management process to address areas of ongoing concern.

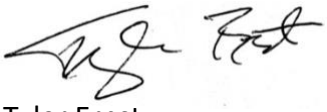
Conclusion

Again, we would like to clearly state our appreciation for the willingness of DEQ staff to answer questions and provide clarification throughout this rulemaking process. We recognize the magnitude of this process and the fact that there are many constituencies beyond the forestry sector that have no doubt likewise been engaged in this rulemaking that DEQ has had to respond to. Though we had hoped that some of the concerns that we have raised in this letter would be addressed in the draft rule, we appreciate DEQ's openness to ongoing dialogue and hope that the concerns we have raised here will be addressed by the agency in the final rule that is submitted to the EQC for approval.

The forestry sector in Oregon is doggedly committed to demonstrating that the work that we are engaged with is being carried in a manner that is responsible, sustainable, and protective of the environment. This is why we were willing to engage in a multiple-year process to revise the rules governing the harvest of timber on privately-owned forestland, and it is why we are willing, through ongoing research and processes like the Adaptive Management process with ODF, to consider how we might further improve our practices going forward.

It is our hope that DEQ will recognize the good work that is being done and give space for the process that has been established to work itself out. We have no doubt that, in time, it will become clear that Oregon's forest practices are unparalleled when it comes to protecting our state's water resources.

Sincerely,



Tyler Ernst
General Counsel and Director of Regulatory Affairs
Oregon Forest Industries Council

Appendix A: References

Bladon et al. 2018. A multicatchment analysis of headwater and downstream temperature effects from contemporary forest harvesting.

Martin, M. RE: Willamette Subbasins and Sandy Temperature TMDL Questions. E-mail message to Rich Wildman, 12 June 2023.

Poole & Burman 2001. An ecological perspective on in-stream temperature: natural heat dynamics and mechanisms of human-caused thermal degradation.

Vanotte et at. 1980. The River Continuum Concept.

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Mingus Mapps, Commissioner
Gabriel Solmer, Director

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Portland, Oregon 97204-1926
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Portland.gov/water

Michele Martin
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Portland, Oregon 97232-4100

Sent via email to: Sandy.SubbasinTMDL@DEQ.oregon.gov

Subject: Comments on the Draft Lower Columbia-Sandy Subbasin TMDL for Temperature

Date: February 26, 2024

Dear Michele Martin and ODEQ Sandy Subbasin TMDL staff:

Thank you for the opportunity to review and comment on the draft Sandy Subbasin TMDL and associated documents. These comments are provided on behalf of the City of Portland Water Bureau ("City"), which manages temperature and flows in the lower Bull Run River as part of the Bull Run Water Supply Habitat Conservation Plan (HCP). The City currently operates under a Temperature Management Plan that accompanies the HCP to achieve compliance with the Sandy TMDL and Clean Water Act requirements. Thus, replacement of the Sandy Subbasin TMDL is of high interest and importance to the City.

General Comments

- There are several errors throughout the TMDL, Technical Support Document, and Water Quality Management Plan where figures, tables, and equations are inaccurately referenced, labeled, or do not exist at all. A few examples are provided below. These errors create confusion and could compromise the integrity of the TMDL. The City requests that ODEQ thoroughly review documents to resolve errors of this nature.
    - In the TMDL (pg 24), the surrogate measure is calculated using Equation 9-4, not 9-3. There are several more incorrect references throughout this section.
    - In the TMDL there is a Table 9-9 and a Table 9-12, but there is not a Table 9-10 nor a Table 9-11.
    - In the Technical Support Document, Table 10-6 is referred to as 10-7 in the text.
    - In the Technical Support Document, it appears that the vertical axis label for Figure 10-6 should be "Surrogate-NoDam".
    - The City can provide a pdf that identifies more (likely not all) errors to ODEQ upon request.

- In 2021, the Environmental Protection Agency (EPA) published the Columbia River Cold Water Refuge Plan (U.S. EPA, January 2021). In the plan, EPA identifies the Sandy River as a cold water refuge (CWR) for migrating salmon and steelhead on the Columbia River. The Sandy is located in a critical location on the Columbia River due to the lack of

other CWRs in close proximity upstream or downstream. The Sandy is also already considered a 'marginal' CWR due to temperatures that are near 18º C during the critical summer period of late July through August. ODEQ does not mention EPA's Columbia River CWR Plan in the Sandy Subbasin TMDL, nor associated documents, including the Water Quality Management Plan. ODEQ also does not identify strategies, such as water quality trading, that could be used throughout the Sandy Subbasin by DMAs to protect and maintain the Sandy River CWR during the critical summer period. The City is not aware of any other place outside of a TMDL (and associated documents) where ODEQ could integrate EPA's Columbia River CWR Plan and strategies for protection of the Sandy River CWR. Given the potential for new heat sources in the Sandy Subbasin (e.g., City of Sandy WWTP and ODFW Sandy River Hatchery outfall) and the fact that it may take several decades for 'background' temperatures to decrease as shade slowly develops, it is important that ODEQ explicitly integrate EPA's CWR Plan into the Sandy Subbasin TMDL and identify near-term (0-20 years) strategies to protect and maintain the Sandy River CWR during the critical summer period of July and August.

- The City noted several places throughout the TMDL, and associated documents, where no HUA allocation is assigned to nonpoint sources. The City requests that ODEQ clarify in the documents if such a lack of a HUA allocation may affect the ability for DMAs to use water quality trading or other strategies to protect water temperatures.

Lower Columbia-Sandy Subbasin Draft Total Maximum Daily Loads for Temperature, and Appendices

TMDL – Section 9.1.4.2 (pg 24-25) *and* Technical Support Document – Section 9.3.2 (pg 69-70)

- The City requests that ODEQ clarify that the restored conditions model results were what was used to set background conditions and the surrogate measure target. The City's understanding is that the restored conditions model was used as an additional level of conservatism.

TMDL - Appendix A, Section 4.5.1 (pg 69)

- Please add text in red to the following section for clarification: "Results of the CCC model and the No Dams scenario, both using the contributing flow boundary conditions consistent with observed dam releases in 2016, were compared to determine the effect of existing dams and reservoirs on the Bull Run in terms of maximum 7DADM change. The results indicated a maximum 7DADM change of 0.87°C at the POMI (model segment 99 (the mouth) on 2016-09-07 due to the presence of existing dams and reservoirs (Table 4-16, Figure 4-25)."

TMDL – Appendix A, Section 4.5.2 (pg 70)

- Please add text in red to the following section for clarification: "Results of the RV and CCC models, both using the contributing flow boundary conditions consistent with observed dam releases in 2016, were compared to determine the maximum 7DADM effect of existing vegetative shading that is under human control. Further details on the Bull Run River setup for this scenario are provided in TSD Appendix D."

Lower Columbia-Sandy Subbasin Draft TMDL Technical Support Document

Technical Support Document - Figure 2.7 (pg 14) *and* Water Quality Management Plan - Figure 2 (pg 13)

- The map is inaccurate. The City and the U.S. Forest Service completed a land exchange in the Bull Run Watershed in 2022. The map has not been updated to show the new land ownership configuration. The City now owns 5497.6 acres; previously, the City owned 4819.9 acres. The City provided ODEQ with GIS data to update the map on April 21, 2023.

Technical Support Document – Section 9.3.1.1 (pg 69)

- In 2020, ODEQ issued a Clean Water Act 401 Certification to the City of Portland for the continued use of Bull Run Lake as a water supply source. In the Evaluations and Findings Report (June 2020), ODEQ stated that "the 'protecting cold water' rule does not apply" to Bull Run Lake (pg 19-20). This seems to contradict text in the Technical Support Document, Section 9.3.1.1, stating that "the protecting cold water criterion likely applies" to Bull Run Lake dam. The City requests that ODEQ consider its prior analysis and findings in the 401 Certification regarding the applicability of the PCW criterion to Bull Run Lake dam and then revise Table 9.3 and Section 9.3.1.1 accordingly to either exclude Bull Run Lake dam or clarify why these findings differ from previous findings.
    - The City acknowledges that the hydrology of Bull Run Lake is very complex and has extensive data to share with ODEQ if additional information is needed.
    - If ODEQ determines that no changes to the Technical Support Document are warranted regarding the Bull Run Lake dam, the City requests further discussion with ODEQ to better understand the rationale and any requirements that may differ from the 2020 401 Certification.

Lower Columbia-Sandy Subbasin Water Quality Management Plan

Water Quality Management Plan - Table 1. (pg 3)

- Add "protect and enhance cold water refuges" to management strategies for 'Water Withdrawals and Flow Alteration'.
- Add "flow augmentation and reservoir operations" to management strategies for 'Channel Modification and Hydromodification'. This is consistent with strategies listed for hydromodification management strategies in Section 2.3.

Water Quality Management Plan - Figure 2 (pg 13)

- The map is inaccurate. See previous comment for Technical Support Document – Figure 2.7.

Water Quality Management Plan – Section 5.3.2 (pg 18-19)

- The City requests that ODEQ provide the City with site-specific shade results and shade gap analysis pertaining to the City of Portland.

Water Quality Management Plan – Section 5.3.7 (pg 23)

- It is not clear why the schedule for implementation of the Sandy Subbasin TMDL is tied to the Willamette Mainstem TMDL. Please include information explaining the rationale for this and expectations for how implementation of the Sandy Subbasin TMDL will occur if EQC adoption of the Willamette Mainstem TMDL is significantly delayed. This has important staffing and funding resource planning implications for the City.

Water Quality Management Plan – Table 7 and Section 5.3.6.1 (pg 21-22)

- Bull Run Lake is included as a dam that would require monitoring outlined in section 5.3.6.1. Depending on ODEQ's response to the City's previous comment on the Technical Support Document, Section 9.3.1.1 (pg 69), the City requests that ODEQ edit this section accordingly and remove Bull Run Lake dam if applicable.
- "Spillway Dam" is included in Table 7 with a reservoir storage capacity listed as 25,000 acre feet. This is redundant with the inclusion of the Development No. 2 dam. The City is not sure if ODEQ is referring to the actual spillway of Dam 2 or the 'diversion dam', which impounds the diversion pool for the water supply system and is immediately downstream of Dam 2. Regardless, both the spillway and the diversion dam are integrated into Development No 2. The City requests that ODEQ remove the "Spillway Dam" from Table 7 due to its redundancy with Development No 2.
    - Monitoring of the type described in Section 5.3.6.1 is not possible for the "spillway dam", regardless of if it is referring to the spillway or the diversion dam, as it is impossible to separate these out from Development No. 2 dam. It would also be redundant with monitoring already occurring for the Development No. 2 dam. The City requests that ODEQ remove discussion of "spillway dam" from this section.

Water Quality Management Plan – Section 6.1 (pg 30)

- The gages used by the City for monitoring are USGS gages with a defined QA/QC protocol. The City requests that ODEQ allow the USGS QA/QC protocol to suffice for the QAPP; if this is not accepted, the City requests additional detail from ODEQ on QAPP requirements.

Thank you for your time and consideration of these comments. City staff are available for any clarification or to provide additional information as needed.

Sincerely,

Liane Davis

Liane Davis
Environmental Compliance Division Manager (*Bull Run Water Supply HCP Manager*)
Portland Water Bureau

Forest Service **Mt. Hood National Forest** **16400 Champion Way Sandy, OR 97055-7248**

Memo

To: Michele Martin, Project Manager, ODEQ

From: Todd Reinwald, soil and water program manager, Mt. Hood NF

Date: February 23, 2024

RE: Lower Columbia - Sandy River Subbasin TMDL Rulemaking Comment Period

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This memo is in response to a request for comment by DEQ on the TMDL rulemaking process for the Lower Columbia - Sandy River Subbasin. These comments reflect the long-standing commitment practiced on the Mt Hood Nat. Forest to protect and conserve water resources on the public lands it manages in trust.

Going back to the origin of the Forest Service, water has been an important issue. The Organic Act of 1897 established the care and management of national forests to secure "favorable conditions of water flow" as a principle purpose of the Forest Service. The Mt Hood Nat. Forest encompasses about 1.1 million acres including thousands of miles of streams. Since its inception in 1908, water resources have long been recognized as highly valued endowments, which is reflected in the legacy of protection afforded to them to assure their conservation for future generations.

Conservation and protection of water resources on the Mt Hood Nat. Forest are directed specifically by standards and guidelines contained in the Land and Resource Management Plan of 1990 and the Northwest Forest Plan of 1994. These plans incorporate strategies and practices to achieve consistency with the myriad of federal and state policy such as the Clean Water Act that dictate the conservation of water resources on National Forest System lands. Or the Wilderness Act of 1964, which strictly limits forest management and land use to preserve the natural character of certain designated areas.

In the Upper Sandy basin there are two notable designated wilderness areas on the Mt Hood Nat. Forest where natural, unmanaged conditions prevail. The Mt Hood and Salmon-Huckleberry wilderness areas comprise about 40 percent of the upper Sandy River basin. These include the headwater glaciers that source the Sandy, Zigzag, and Salmon Rivers, and where the character of streamside environments such as overstory shade serve as examples of undisturbed reference conditions.

Additional regionwide agreements to protect water resources have also been enacted in partnership with state agencies and municipalities for safeguarding these mutually beneficial values, such as the 2019 Memorandum of Understanding between the Forest Service and ODEQ that outlines a strategy for controlling point- and non-point source pollution. Or the Bull Run Watershed Management Act of 2003, which stipulates co-management between the City of Portland and the Mt Hood Nat. Forest of the 64,000-acre watershed to protect its source waters for municipal uses. Other National programs are also at play, such as the Watershed Condition Framework, which in recent years identified Still Creek and the Headwaters of the Sandy River as priority tributaries for watershed restoration.

These layers of policy and direction have resulted in concerted management efforts and the implementation of projects and monitoring to maintain, restore, and enhance water resources in the Sandy Basin for many decades. Dozens of miles of instream restoration projects have been completed to increase habitat complexity, reconnect floodplains, restore side channel function, reduce road-related sediment and runoff, decrease barriers to aquatic organism passage, support instream water rights, protect and enhance streamside vegetation, minimize effects of recreation, monitor water quality, and maintain water quantity.

The culmination of management strategies, protections, monitoring, and project objectives serve as the cornerstone of water resource conservation undertaken by the Mt Hood Nat. Forest. This legacy is evident in the ubiquitous forest cover across those public lands, with some of the most intact riparian corridors in the entire Sandy River basin. Being the largest ownership in the basin, the Forest Service has remained a leader in water resource and riparian management, contributing to their protection and conservation.

We appreciate the opportunity to comment on DEQ's TMDL rulemaking process for the Lower Columbia - Sandy River Subbasin. As a Designated Management Agency, we appreciated the invite to participate on its Rule Advisory Committee. The Mt Hood Nat. Forest is committed in supporting DEQ's efforts to improve stream temperature in the subbasin and welcomes the partnership to achieve mutually beneficial objectives. We look forward to this continued partnership and working toward the development of an implementation plan that advances water quality restoration in the basin.

/s/ Todd Reinwald
Soil & Water Program Manager
Mt Hood Nat. Forest

From: Brian Posewitz
To: SUBBASINTMDL Sandy * DEQ
Subject: Comments of WaterWatch of Oregon on proposed TMDL and WQMP for Lower Columbia-Sandy Subbasin
Date: Monday, February 26, 2024 3:53:41 PM

Greetings,

Thank you for the chance to comment on the proposed TMDL and WQMP for the Lower Columbia-Sandy Subbasin. WaterWatch of Oregon submits the following comments:

1. We appreciate express recognition of water management activities and water withdrawals as nonpoint sources of heat pollution, including the specific load allocations for the basin (0.05, 0.01 and 0.00 depending on the location and tributary).

2. Given the express recognition of water management and water withdrawals as a source of heat pollution, the Oregon Water Resources Department (OWRD) should be a Designated Management Agency (DMA) required to prepare an implementation plan. OWRD has "legal authority" over water management and water withdrawals in the basin. (See WQMP at 11 (defining DMA).) OWRD can influence water management and withdrawals in many ways, including by adequately conditioning or not issuing permits for new withdrawals, requiring measurement and reporting of water withdrawals to ensure withdrawals are within legal limits, enforcing laws against withdrawing water without a permit and withdrawing more water than legally allowed under a water right, enforcing instream water rights, and ensuring forfeiture of unused water rights to prevent resumption of withdrawals at a future date.

3. Management strategies for limiting the impact of water management and water withdrawals should including more than conservation and transfers of existing water rights to instream rights. See previous comment. In addition, the WMCP should discuss whether any new/additional instream water rights (which could be sought to ODEQ as well as ODFW) would be beneficial.

4. We appreciate the "surrogate measure" for the load limit from water withdrawals (consumptive use of 1.9 percent of monthly median natural flow). However, we question whether consumptive use, instead of water withdrawals, is the appropriate measure given lack of information regarding the location and quality of return flows and the potential for reuse that reduces return flows. Moreover, Technical Appendix C, Section 9, indicates that the surrogate measure was calculated only for the 0.05 load allocation at one location on the Sandy River that is not the point of maximum impact. Absent additional explanation, we suggest basing the surrogate measure on the impact at the point of maximum impact and surrogate measures for Camp Creek, other tributaries with a load allocation, and the portion of the river where the load allocation is 0.01 (assuming zero load allocation means zero consumptive use without offsets on tributaries).

Thank you for considering our comments.

Regards,

Brian Posewitz, Staff Attorney
WaterWatch of Oregon
213 SW Ash St.
Portland, OR 97204
(503) 432-8249
Email: brian@waterwatch.org