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Re: Petition Under MCA § 75-5-702 and 33 U.S.C. § 1313(d)(1) to Assess the Middle Segment of the Gallatin River and Determine Recurrent Nuisance Algal Blooms Require Listing As An Impaired Water on Montana's 303(d) List

Dear DEQ:

The undersigned organizations submit this petition and supporting documentation under MCA § 75-5-702(3) and DEQ's delegated authority administering the CWA, 33 U.S.C. § 1313(d)(1), to request that the Department of Environmental Quality (hereinafter 'DEQ') formally assess beneficial use attainment on the middle segment Gallatin River, make a determination that recurrent, nuisance level algal blooms have degraded uses of this waterway and constitute overwhelming evidence of impairment, list this segment on the 303(d) List of impaired waters, and find that development of Total Maximum Daily Loads for nitrogen and phosphorus pollutants are necessary pursuant to requirements of the Montana Water Quality Act MCA § 75-5-101 *et seq*, federal Clean Water Act 33 U.S.C. § 1313 *et seq*, and implementing regulations and guidance of the Environmental Protection Agency (hereinafter 'EPA').

About Us

Upper Missouri Waterkeeper is a Montana not-for-profit membership organization that defends fishable, swimmable, drinkable water throughout the 25,000 sq. miles of southwest and west-central Montana's Upper Missouri River Basin. We use a combination of strong science, citizen action, and the law to champion the importance of lawful governance and clean water protections that provide critical defense against threats to healthy rivers and water resources. Waterkeeper has engaged in nutrient pollution and water quality issues affecting the Gallatin River since 2015, including as a stakeholder in the Big Sky Sustainable Water Solutions Forum from 2018-2020, and as a boots-on-the-ground advocate documenting water degradation and nuisance algal blooms in the mainstem Gallatin since 2018. Waterkeeper's members fish, swim, recreate, and own businesses that depend on cool, clean flows of the Gallatin River. All of these interests are negatively impacted by recurrent, seasonal nuisance algal blooms.

Gallatin River Task Force has been working to protect and preserve the Gallatin River for over twenty years. We do this work through a watershed approach that considers stakeholder

involvement, community collaboration, and a platform of science-based information that allows us to focus projects around conservation and restoration. As the local organization coordinating the TMDL assessments for the West Fork, a tributary of the Upper Gallatin, addressing nutrient pollution in the Big Sky area has long been a priority for our organization. With the recent noxious algae blooms on the mainstem Gallatin, we are anxious to formulate a plan to mitigate and manage nutrient loading to the Gallatin to protect this treasured resource.

Montana Trout Unlimited has pursued its mission to conserve, protect and restore coldwater fisheries and their habitats across the state, including in the Gallatin River watershed for decades. That includes the clean water advocacy and project work of the Madison-Gallatin chapter, one of our largest and most active of the 13 chapters in Montana. MTU's efforts include regular participation on the DEQ's Statewide TMDL Advisory Group and attention to TMDL designations throughout the area.

American Rivers was founded in 1973 to protect wild rivers, restore damaged rivers ,and conserve clean water for people and nature. Preserving the Gallatin River's clean water and thriving coldwater fishery has been a high priority of American Rivers' Northern Rockies office for over a decade. We look forward to documenting the sources and extent of nutrient pollution in the Gallatin River so we can begin the process of reversing it and restoring the river back to health.

Greater Yellowstone Coalition is a regional conservation organization based in Bozeman, Montana with offices in Idaho and Wyoming and over 90,000 supporters from across the country. Our mission is to work with people to protect the lands, waters, and wildlife of the Greater Yellowstone Ecosystem now and for future generations. Greater Yellowstone's streams are the fountainhead of the west. As such, we have direct interest in the health of all the Greater Yellowstone's waters, including the Gallatin River. GYC's supporters include people who care sincerely about the health of the Gallatin River. GYC works with diverse stakeholders to ensure the ecological function of rivers are protected and water quality is maintained or enhanced.

I. Legal Framework

Montana DEQ is the state agency with delegated authority to implement requirements of the federal Clean Water Act (hereinafter 'CWA') in Montana. In addition to its CWA duties, DEQ implements requirements of the Montana Water Quality Act (hereinafter 'MWQA') and the environmental protection imperatives guaranteed citizens under Article II, section 3 and Article IX, section 1 of the Montana constitution. Below in Part I petitioners summarize these complementary frameworks, then discuss their application to the Gallatin River in Part II.

A. Requirements for 303(d) List Determinations and Associated Total Maximum Daily Loads Under the Clean Water Act

Congress enacted the CWA in 1972 to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). The goal of the CWA is to eliminate "the discharge of pollutants into navigable waters," and in the interim, to attain "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and

provides for recreation in and on the water." 33 U.S.C. § 1251(a)(1) and (2). To achieve these ends, Section 1313 of the Act requires each state to establish and implement water quality standards, subject to review and approval by EPA. 33 U.S.C. §§ 1313(a)-(c), 1362(3). Water quality standards consist of the "designated uses" of a state's waters (such as drinking water, swimming, and wildlife habitat) and "the water quality criteria for such waters based upon such uses," and "shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of [the CWA]." 33 U.S.C. § 1313(c)(2)(A); 40 C.F.R. § 130.2(d).

The CWA requires each State to "identify those waters within its boundaries for which the [technology-based] effluent limitations required by section 1311(b)(1)(A) and section 1311(b)(1)(B) of [the CWA] are not stringent enough to implement any water quality standard applicable to such waters." 33 U.S.C. § 1313(d)(1)(A). For the waters thus identified, "[e]ach State shall establish…the total maximum daily load, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation." 33 U.S.C. § 1313(d)(1)(C). Pursuant to Section 1314(a)(2), EPA has identified "[a]ll pollutants" as being suitable for TMDL calculation. 43 Fed.Reg. 60665 (Dec. 28, 1978).

The CWA requires that "TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards…" 40 C.F.R. § 130.7(c)(1)(ii); *see also* 33 U.S.C. § 1313(d)(1)(C). Section 1313(d) further provides that TMDLs "shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." 33 U.S.C. § 1313(d)(1)(C). EPA regulations likewise provide that "TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical [water quality standards] with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. Determinations of TMDLs shall take into account critical conditions for stream flow, loading, and water quality parameters." 40 C.F.R. ∞ 130.7(c)(1).

A given water body can be listed as impaired by multiple pollutants and therefore subject to multiple TMDLs simultaneously, one for each pollutant for which it is water-quality impaired. Likewise, a single pollutant may be a cause or contributing factor in the impairment of several designated uses and water quality standards. As a result, a single river segment may require multiple TMDLs to address each water body-designated use-pollutant combination for which the segment has been listed as impaired.

Under EPA's regulations, a TMDL is "[t]he sum of the individual [wasteload allocations] for point sources and [load allocations] for nonpoint sources and natural background." 40 C.F.R. § 130.2(i). A point source is a discharge through a discrete pipe or conveyance, such as from industrial or sewage facilities. Nonpoint source pollution generally results from diffuse sources like land runoff or drainage. A wasteload allocation is "[t]he portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. [Wasteload allocations] constitute a type of water quality-based effluent limitation." *Id.* § 130.2(h). A load allocation is "[t]he portion of a receiving water's loading capacity that is

attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources." *Id.* § 130.2(g).

States are required to submit biennially to EPA a report on surface water quality, including a list of impaired waters and TMDLs, often referred to respectively as the "Integrated Report" and "Section 303(d) List" or impaired waters list. 33 U.S.C. § 1313(d)(2), 40 C.F.R. §§ 130.0, 130.7(d)(1). Submission of an impaired waters list triggers EPA's duty to "either approve or disapprove such identification and load not later than thirty days after the date of submission." 33 U.S.C. § 1313(d)(2). "If the Administrator disapproves such identification and load, [he/she] shall not later than thirty days after the date of such disapproval identify such waters in such State and establish such loads for such waters as [he/she] determines necessary to implement the water quality standards applicable to such waters and upon such identification and establishment the State shall incorporate them into its current plan under subsection (e) of this section." *Id.*

TMDLs for 303d List waterways are implemented, *inter alia*, through incorporation into water quality management plans under Section 1313(e)(3)(C) of the CWA, and through point source discharge permits. TMDLs are a crucial component of the framework established by the CWA to protect local water quality. In waters with ongoing water quality impairments, TMDLs provide an important technical basis for determining that adequate effluent limits in CWA permits for point sources to ensure that discharges do not contribute to violation of water quality standards. In addition to the actual "total maximum daily loads," the TMDL development process generates crucial information about an impaired water body's baseline conditions including its particular local needs and challenges. TMDLs serve as an essential tool for coordinating state efforts to reduce pollution from non point sources, which also cause or contribute to violation of water quality standards. TMDLs also provide a tool for independent third parties to monitor the status of water quality restoration efforts and to check compliance with CWA-mandated water quality standards.

The CWA also mandates that "[p]ublic participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this chapter" – such as programs and plans to develop and employ TMDLs – "shall be provided for, encouraged, and assisted by the Administrator and the States." 33 U.S.C. § 1251(e); 40 C.F.R. §§ 25.3-25.4. To this end, EPA's longstanding policy requires that states allow for "full and meaningful public participation in the [impaired waters] development process." *See Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992*, at 5 (May 20, 2002). The TMDL development process enables members of the public to contribute relevant information to ensure that local conditions are accurately characterized and accounted for in calculating the final TMDLs.

B. Waterway Impairment Listing by Petition Under the Montana Water Quality Act

Montana law provides specific authority for any person to petition the DEQ to "add or remove a water body…on [the impaired waters list] by providing the data or information necessary to support the request." MCA § 75-5-702(3). "In revising the [impaired waters] list…the department shall use all currently available data, including information or data obtained

from federal, state, and local agencies, private entities, or individuals with an interest in water quality protection." *Id*. § 75-5-702(2).

DEQ relies on an internal data verification process entitled "sufficient credible data" to inform its decisionmaking to add a waterway to the impaired waters list. *See* MCA §§ 75-5-702(2), 75-5-103(13). "'Sufficient Credible Data' means chemical, physical, or biological monitoring data, alone or in combination with narrative information, that supports a finding as to whether a water body is achieving compliance with applicable water quality standards." MCA § 75-5-103(33).

Since 2011, DEQ has used a data quality assessment (DQA) process to determine if available data is of sufficient quality for making parameter-specific impairment determinations. This process entails examination of the technical soundness of methodology, spatial and temporal coverage, data quality, and data currency. Under this policy DEQ's 'Beneficial Use Assessment Method' guide states that if a single indicator is not met, the DQA fails for that parameter group. An assessor may override or pass or override fail a DQA but they must accompany such override with adequate justification based on best professional judgment. For use in assessment decisionmaking such as that requested under this petition, data must represent ambient conditions of the waterbody being assessed and therefore must be collected directly from the assessment unit itself. Universal data requirements include that data be current, linked to a documented location, written documentation of monitoring approach, objectives, quality control and assurances, and study design, and applicable narratives that indicate any deviations from protocols and explain potential impacts on data quality and objective outcome. *See* Beneficial Use Assessment Method for Montana's Surface Waters, 2020 Final, WQPBWQM-001, V 4.0.

According to DEQ "[b]ecause each beneficial use may be affected by various types of pollution, determining whether a waterbody is fully supporting its beneficial uses is reliant upon the outcomes of multiple-parameter specific impairment assessments. Impairment assessments are performed for individual waterbody-parameter combinations and these decisions are guided by parameter-specific assessment methods. When a waterbody is found to be impaired by a parameter, that parameter is listed as a cause of impairment and an assessor can affirm that the associated use (or uses) is not fully supported. However, an assessor can only affirm a use if fully supported if a cumulative evaluation of impairment assessment outcomes for multiple parameters associated with the use, especially the core parameters most likely to affect use support, are assessed and found to be not impaired." *Id.*, Section 7.0 Assessment Method, 7.1 Beneficial Use Assessment.

Whenever possible, assessment of core parameters for each beneficial use of a waterbody should be required when performing a comprehensive beneficial use assessment, especially if attempting to affirm that a use is fully supported. When credible data exists that provides compelling evidence that parameters are limiting beneficial use support, they may be identified as causes of impairment and the waterbody determination for that use is deemed not fully supported. *Id.,* Section 7.1.1

Table 2. Core and secondary assessment parameters for beneficial use assessment.

Beneficial Use	Suggested Assessment Parameters		Limitations/Considerations/Guidance
Aquatic Life and Fish	Core Parameters	Nutrients	Assessment method for wadeable streams (Suplee and Sada, 2016).
		Parameters with numeric aquatic life standards (e.g., metals)	Assessment method for metals (Drygas, 2012)
		Sediment	Assessment method for wadeble streams in mountain/transitional areas (Kusnierz, et al., 2013)
		Temperature	No assessment method
		Dissolved oxygen (DO)	No assessment method
		Biological communities	Biological metrics apply for some pollutant specific assessment methods
	Supplemental Parameters	Habitat	No assessment method
		Electrical conductivity (EC)	No assessment method
		Sulfate	No assessment method
		Turbidity/TSS	No assessment method
		pH	No assessment method
		Flow alterations	No assessment method
Recreation	Core Parameters	*Escherichia coli* (*E. coli*)	E. coli assessment method (Makarowski, 2020)
		Nutrients (mountain/transitional streams only)	Assessment method for wadeable streams (Suplee and Sada, 2016)
	Supplemental Parameters	Harmful algal blooms (HABs)	No assessment method; no numeric standards
		Oil & Grease	No assessment method
		Aesthetics/Odor	No assessment method

Table 2, Section 7.1., DEQ Assessment Manual.

DEQ makes beneficial use support decisions for each use independent from other uses and a waterbody may support some uses while not supporting others. Drinking water, aquatic life, and contact recreation uses are typically more sensitive to pollution impacts than agriculture and industrial uses. Beneficial use support determinations fall into one of the following categories:

- Not Fully Supporting: A waterbody is not fully supporting a beneficial use if any one or more parameter (pollutant and/or non-pollutant) associated with that use is not attaining water quality standards and is therefore listed as a cause of impairment.

- Fully Supporting: A waterbody is fully supporting a beneficial use if all core parameters associated with the use are attaining applicable water quality standards, and if there are no supplemental parameters associated with the use that indicate non-support.

- Threatened: Threatened waters are AUs for which sufficient data and information exists to determine that designated uses are being attained but that non-attainment is predicted within the next two Integrated Report cycles (approximately four years). These AUs are included, like Not Fully Supporting determinations, in Category 5 on the 303d List of Impaired Waters. Waterbody pollutant combinations that are threatened are reported as causes of impairment, they appear on the 303(d) list of pollutant impaired waters in need of a TML and the associated use is not fully supported.

- Insufficient information: This determination is used when core parameters have been assessed and found to be not impaired, but there is not sufficient credible data to assess all core parameters associated with the use. Even if one or more core parameters was assessed and found to be not impaired, the assessor cannot confidently say the use is fully supported if there are core parameters that have not been assessed. For example, a nutrient assessment may indicate that nutrients are not impairing an AU, but an assessor cannot assert that the aquatic life use is fully supported until assessment indicates that the waterbody is not impaired due to the other core parameters associated with the aquatic life use.

- Not Assessed: If there are no causes of impairment already linked to a use and if none of the core parameters associated with the use have been assessed, the use is not assessed.

Although core and secondary indicators are often interpreted together using a weight of evidence approach when making assessment decisions, the policy of independent applicability applies to DEQ's assessment of beneficial use support. For assessment purposes, independent applicability says that when evaluating multiple types of data and any one type of data indicates an element of a water quality standard is not attained (e.g. chemical concentrations exceed a numeric criterion), the waterbody should most likely be identified as impaired. The intent of independent applicability is to protect against dismissing exceedances of a water quality standards through a weight of evidence approach, though EPA recognizes that there are circumstances when conflicting results should be investigated further before an attainment or nonattainment decision is made. Section 7, DEQ Assessment Manual

When assessment confirms that a waterbody is not attaining water quality standards for a pollutant or non-pollutant cause of impairment, the assessment decision is either to "list" the waterbody-cause combination if it is a newly discovered impairment, or to "keep listed" if the waterbody-cause combination is already listed.

Conversely, if minimum data quality requirements are not met to pass the DQA for a parameter, and if there is no acceptable rationale for overriding the DQA failure, there is insufficient information to make an impairment listing decision. Because people can implement water quality protection and improvement activities to abate human impacts, DEQ prioritizes water quality assessment where human sources of impairment are most likely and does not consider it a priority to identify new impairment conditions when human sources are absent. Section 7, DEQ Assessment Manual. For assessments considering potential nutrient-based impairment decisions DEQ utilizes Table C-1 in its Assessment Manual to qualify and quantify its decisionmaking. This table is provided below.

Table C-1. Nutrients (Mountain and Transitional Streams)

Pollutant Group	Determining Assessment Reaches
NUTRIENTS	The assessor uses best professional judgment to determine when stratification of the assessment unit into assessment reaches is warranted (e.g., stratify when one reach of the total segment can be isolated and its condition is substantially different from other parts of the segment).
Beneficial Uses	
Aquatic Life and Fishes; Primary Contact Recreation	
Applicability	**Overwhelming Evidence of impairment**
Wadeable streams in mountainous and transitional ecoregions (perennial or intermittent; Strahler Order ≤ 6)	Rigorous data collection is unnecessary if the following are evident: (1) fish kills involving massive growths of senescent algae mats that are attached to the bottom or floating (with DO at dawn likely < 1 mg/L); **or** (2) filamentous algal growth covers the entire bottom from bank to bank and extends continuously for a substantial longitudinal distance (> 150m).
Computations Using Non-Detect Data	
Convert non-detects to 50% of reported detection limit; if >> 15% of dataset is non-detect, consult WQPB Standards Section.	

Assessment Method Overview: Using Core Indicators	Very Large Datasets	
Method considers nutrient concentration data and biological indicator data to determine attainment of ecoregion-specific nutrient criteria using a two-level process. Level I assessment considers the results from two nutrient statistical tests and benthic algal chlorophyll *a* (Chl *a*) or ash-free dry weight (AFDW) and diatom metric results (if available) compared to thresholds. Level II assessment requires diatom metric results (except in the Middle Rockies ecoregion where validated diatom increaser metrics have not been developed) ***and*** macroinvertebrate metric results. Perform Level II assessment only when Level I assessment conclusions are "unclear." When Level II is "unclear," consult management to determine final outcome. Excel spreadsheet "NtrntAssessFramework.xlsx" contains the decision matrix for attainment determinations.	Assess using nutrient concentrations alone if a very large nutrient dataset exists n ≥ 90 (listed streams); n ≥ 50 (unlisted streams)	
	Statistical Analyses for Nutrient Concentration Data	
	Methods	**Limits on Decision Errors**
	Exact Binomial Test	α = 0.25 (25%); β = 0.14 - 0.35 (14% - 35%) critical exceedance rate (p) = 0.2 (20%); effect size (p2) = 0.15 (15%)
	One-Sample Student's t-test for the Mean	α = 0.25 (25%); critical exceedance rate (p) = 0.2 (20%)

	Indicators	Analysis	Index Period	Minimum Sample Size	Data Independence
Level I	Nutrient Concentration (TN, TP)	Data (mg/L) are evaluated against nutrient criteria using two statistical tests. Either Excel spreadsheet "MT-NoncomplianceTool.xls" or "MT-ComplianceTool.xls" is used, depending on 303(d) listing status.	Ecoregion-Specific Growing Season (DEQ, 2014)	n ≥ 13 (listed); n ≥ 12 (unlisted); n = 7 (with ≥ 4 exceedances)	≥ 14 days; ≥ 1 stream mile
	Benthic Algal Chlorophyll *a*/Ash-Free Dry Weight (AFDW)	Data are evaluated against recommended criteria (threshold values: 120 mg Chl *a*/m^2 or 35 g AFDW/m^2).		n ≥ 3	
	Diatoms	Data are evaluated using an "increaser taxa probability of impairment" metric value (threshold value: 51%). Diatoms are optional during Level I but must be included if data exists.		n ≥ 2 (n = 0 in Middle Rockies ecoregion)	
Level II	Nutrient Concentration (TN, TP)	If additional data are collected, re-evaluate using analyses described in Level I prior to incorporating diatoms and macroinvertebrates.		n ≥ 13 (listed); n ≥ 12 (unlisted); n = 7 (with ≥ 4 exceedances)	
	Benthic Algae Chlorophyll *a*/Ash-Free Dry Weight (AFDW)			n ≥ 3	
	Diatoms	Data are evaluated using an "increaser taxa probability of impairment" metric value (threshold value: 51%). Diatoms are required for Level II assessment.		n ≥ 2 (n = 0 in Middle Rockies ecoregion)	
	Macroinvertebrates	Data are evaluated using the Hilsenhoff Biotic Index (HBI) score (threshold value: 4).		n ≥ 2 (n ≥ 3 in Middle Rockies ecoregion)	

C. DEQ's Decisionmaking on an Impairment Listing Petition Must Reflect an Anticipatory and Preventative Approach to Controlling Water Pollution

DEQ's actions implementing the Montana Water Quality Act must be guided by Article II, Section 3 and Article IX, Section 1 of the Montana Constitution. Article II, Section 3 guarantees Montanans "the right to a clean and healthful environment." Mont. Const. Art. II, sec. 3. Article IX, Section 1 provides that "[t]he State and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." *Id.*, Art. IX, sec. 1. These constitutional provisions are intended to not "merely prohibit that degree of environmental degradation which can be conclusively linked to ill health or physical endangerment." Rather, read together, they provide environmental "protections which are both anticipatory and preventative." *MEIC v. DEQ*, 1999 MT 248, 296 Mont. 207, 988 P.2d 1236 (1999)

The MWQA was enacted in light of these constitutional obligations. MCA § 75-5-102(1). Indeed, the explicit purpose of the state of Montana in implementing the MWQA is to conserve water by protecting, maintaining, and improving quality and potability, provide a comprehensive system for preventing, abating, and controlling water pollution, and balancing use of land with the public's right and governmental interest in preventing, abating, and controlling water pollution. MCA § 75-5-101. Beneficial use assessments and any necessary development of Total Maximum Daily Loads pursuant to MCA § 75-5-702 are part of the state's "comprehensive system" for preventing, abating, and controlling water pollution and as such, must reflect not only best professional judgments based on science, but so too an anticipatory

and preventative modality emphasizing the precautionary approach in waterway protection and restoration.

DEQ must view petitions, like the one at-hand, that seek to address ongoing evidence of waterway degradation, in a manner that prioritizes the public trust, advances the precautionary approach, and reflects conservative assumptions favoring conservation in its decisionmaking. As detailed below water quality data for the middle segment Gallatin indicates overwhelming evidence of impairment from nuisance algal blooms. DEQ should embrace the precautionary approach embodied in the Montana Constitution and codified within the Montana Water Quality Act to find that the middle segment Gallatin River is not fully attaining its designated uses and list this section on its 303(d) List as impaired for nutrients.

II. The Middle Segment Gallatin River Has Experienced Recurrent, Nuisance Level Algal Blooms Which Have Degraded Beneficial Uses of the Waterway

A. Evidence of Widespread and Recurrent Nuisance Algal Blooms within the Middle Segment Gallatin River During Calendar Years 2018 and 2020 Constitute Overwhelming Evidence of Impairment for Primary Contact Recreation and/or Aquatic Life and Fisheries Beneficial Uses

a. The middle segment Gallatin River is a B-1 Water and blue-ribbon trout fishery

The middle segment Gallatin River is a B-1 waterway. ARM 17.30.610(1)(a). Waters classified as B-1 are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply. ARM 17.30.623(1). Montana's longstanding narrative water quality standard prohibits substances in waters that "create conditions which produce undesirable aquatic life." ARM 17.30.637(1)(e). The most sensitive beneficial uses of a B-1 waterway, including the middle segment Gallatin, are the recreational fishing use and the aquatic life use.

As recognized by the extensive body of scientific evidence surrounding the state's promulgation of DEQ's Numeric Nutrient Criteria, nuisance level algal growth can constitute degraded waterway conditions that harm the recreational fishing use. In western Montana's wadeable streams the fish and aquatic life use and the recreation use have broadly similar sensitivities to nitrogen and phosphorus pollution and the causal effect of algal blooms. As discussed herein the widespread occurence of bottom-attached algae growth in a waterway represent nuisance level algal blooms, and nuisance level algal blooms violate ARM 17.30.637(1)(e) and likely violate a waterway's recreational and/or aquatic life uses. *See also generally* MAR Notice No. 17-356, Technical Basis for Montana's Numeric Nutrient Criteria.

b. Summer Season 2018 Algal Blooms Constitute Overwhelming Evidence of Impairment

The Gallatin River downstream of the West Fork Gallatin confluence experienced a sustained and pervasive algal bloom during the months of July and August 2018. Waterkeeper first became aware of the algal bloom during the fourth week of July 2018 when members provided photographic evidence of a neon-green filamentous algal bloom, attached to the entire river substrate at well-known fishing access sites in the Canyon stretch of the Gallatin River downstream of Big Sky. Investigation by Waterkeeper and others showed an algal bloom originating in the stretch of the middle segment Gallatin adjacent to Big Sky's Canyon community and reaching several miles downstream to approximately the Portal Creek confluence.

This petition contains documentation of the Gallatin mainstem middle segment's algal blooms and of their prevalence and severity through photographic and video evidence based on river surveys performed on the following dates:

- August 3, 2018
- August 4, 2018
- August 10, 2018
- August 21, 2018
- August 29, 2018
- September 12, 2018
- September 19, 2018

Demonstrative evidence and metadata during each of these river surveys demonstrates a sufficient evidentiary basis for the conclusion that summer 2018 algal blooms in the middle segment Gallatin constitute "overwhelming evidence of impairment" under DEQ's rules and guidance. Specifically, metadata shows that filamentous algal growth covered the entire river bottom from bank to bank and extended continuously downstream for a substantial longitudinal distance (>150m).

c. Summer Season 2020 Algal Blooms Constitute Overwhelming Evidence of Impairment

The Gallatin River adjacent to the community of Big Sky and downstream of the West Fork Gallatin confluence again experienced a sustained and pervasive algal bloom during the months of July and August 2020. River surveys of the Gallatin middle segment starting in the fourth week of July discovered a pervasive, continuous, filamentous algal bloom stretching from at minimum the West Fork Gallatin confluence downstream to the Portal Creek confluence.

Attached to this petition is metadata documenting the pervasive and continuous nature of summer 2020's algal bloom on the middle segment Gallatin. Demonstrative evidence here again demonstrates a clear and convincing evidentiary basis for the conclusion that summer 2020 algal blooms in the middle segment Gallatin constitute "overwhelming evidence of impairment" under DEQ's rules and guidance. Specifically, metadata shows that filamentous algal growth covered

the entire river bottom from bank to bank and extended continuously downstream for a substantial longitudinal distance (>150m).

d. Summer Seasons 2019 and 2021 Algal Blooms Are Also Probative of Continued Nutrient Pollution Challenges in the Middle Segment Gallatin River

Middle segment Gallatin River surveys from Big Sky's Canyon Area and the West Fork Gallatin confluence downstream to Portal Creek found recurrent algal blooms in the summer seasons of 2019 and 2021, although these algal blooms were not as persistent or far reaching as documented algal blooms during the summer seasons of 2018 and 2020. Specifically, Waterkeeper documented algal blooms covering > 50% of the river bottom including nearly always the thalweg and deeper channel segments, beginning adjacent to Big Sky's Canyon Area and the West Fork confluence and reaching downstream to approximately the Deer Creek confluence.

Attached to this petition is metadata demonstrating recurrent algal blooms covering significant portions of the Gallatin's substrate and reaching > 100' in both 2019 and 2020. The fact that portions of the middle segment Gallatin experienced continued algal blooms in 2019 and 2020, despite not reaching an "overwhelming evidence of impairment" prevalence, is probative of chronic nutrient pollution entering this section of the river and should inform DEQ's proactive decisionmaking in response to this petition.

e. Declarations from River-Based Businesses Characterizing Recurrent Gallatin River Algal Blooms Also Support a Finding of Overwhelming Evidence of Impairment

Attached to this petition are declarations from several Montana river-based businesses. These businesses each utilize the middle segment Gallatin for commercial purposes and have personally witnessed and characterized algal blooms in this river segment. Each declaration finds that recurrent, nuisance level filamentous algal blooms on the middle segment Gallatin diminishes the aesthetic and recreational value of the waterway as seen through client experiences and economic opportunities lost due to nuisance algal blooms.

Each declaration identifies and characterizes the scope of filamentous algal blooms in calendar years 2018 and 2020 each as qualifying as both full coverage of the river substrate and extending more than 150 m downstream. DEQ should use narrative declarations from Gallatin river-based businesses in conjunction with its own data and metadata presented under this petition to determine the middle segment Gallatin has experienced nuisance algal blooms within the last 5 years, and those pollution events constitute 'overwhelming evidence of impairment' and require an impairment designation on DEQ's 303d List.

III. DEQ Must Find the Middle Segment Gallatin Is Impaired By Nutrient Pollutants And List This Waterway Segment As A Category 5 Impaired Waterbody On its 303(d) List

A. Nutrient Pollutants Are Key Causal Agents Causing and/or Contributing to Nuisance Algal Blooms

DEQ has been studying and modeling the effects of nutrients on Montana state waters for decades – at least since the early 2000s. Over those years DEQ has determined that excessive nutrient loading to many Montana waterways is resulting in failures to fully attain beneficial uses, including recreational and aquatic life uses.[1] Specifically, DEQ and others have determined that eutrophication and algal blooms can create a host of negative ecological impacts ranging from aesthetics and nuisance to recreation, to food web changes, habitat degradation, and even toxic conditions.

Over ten years ago DEQ assessed the West Fork Gallatin watershed, which feeds the middle segment Gallatin, finding many segments of that watershed impaired for excessive nutrient pollution, and ultimately listed those segments as Category 5 waters on its 303d List and prepared TMDLs, which EPA later approved. Now and as detailed herein, the mainstem Gallatin middle segment is experiencing recurrent, seasonal algal blooms at nuisance levels that require the same thoughtful, science-based approach to protect beneficial uses.

B. DEQ's Assessment Must Utilize the Best Available Data Provided in this Petition and That Already Within DEQ's Control to Find the Middle Segment Gallatin River is Not Fully Attaining All Its Beneficial Uses and Therefore Requires An Impairment Determination and Listing on DEQ's 303d List as a Category 5 Waterway

DEQ is obligated by statute to use monitoring data to revise the list of water bodies that are identified as threatened or impaired and to establish a priority ranking for TMDL development. MCA 75-5-702(1). Specifically, DEQ must use all currently available data, including information or data obtained from federal, state, and local agencies, private entities, or individuals with an interest in water quality protection. MCA 75-5-702(2). DEQ must update its list when there is sufficient credible data to support the modification. *Id.* After receiving a petition under this section, DEQ has 60 days to issue a preliminary finding, and then must provide a 60 day public comment period on its preliminary decision. MCA 75-5-702(2)-(3). Any revision to the state's 303(d) list must be submitted to EPA for approval.

It is persuasive authority in support of this petition that the EPA has made addressing excess nutrient pollution a high priority under section 303(d) of the CWA. Since 2013, EPA has told states that identifying nutrient-impaired waters on their 303(d) lists of impaired waters was a priority. *See* Memorandum from Denise Keehner, EPA, to Water Division Directors Regions 1-

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[1] Scientific and Technical Basis of the Numeric Nutrient Criteria for Montana's Wadeable Streams and Rivers, (2008), *available online:* https://documents.deq.utah.gov/legacy/pollutants/n/nutrients/docs/2011/11Nov/Montana_Scientific_Basis_for_Nutrient_Criteria_Nov12-08.pdf (last accessed March 28, 2022); *Id. 'Update 1', available online: https://deq.mt.gov/files/water/wqpb/standards/pdf/sciencetech2013fnlcom.pdf*

10, *Re: Information Concerning 2014 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions* (Sept. 3, 2013).[2] In this guidance, nutrients are the only pollutants on which EPA focused, stating:

> Addressing nutrient pollution in our nation's waters is one of EPA's top priorities. Over the past decade EPA has called upon the States and others to increase their efforts to address nutrient pollution. In a March 2011 memorandum to the States, tribes and territories, EPA reiterated the need for action by stating, "*States, EPA, and stakeholders, working in partnership, must make greater progress in accelerating the reduction of nitrogen and phosphorus loadings to our nation's waters."*

Id. at 6 (emphasis in original). Citing federal regulations, the agency EPA pointed out that:

> Applicable water quality standards include designated uses and the criteria that must be met to support the uses as well as antidegradation requirements. Furthermore, if a designated use is not supported and the segment currently fails to meet an applicable water quality standard or is "threatened," it must be included on the State's Section 303(d) list even if the specific pollutant causing the water quality standard exceedance is not known at the time.

Id. at 7 (footnote omitted). In light of this, the memorandum went on to list numerous methods of identifying nutrient-impaired waters including: visual assessments of excessive algal growth, macrophyte proliferation, adverse impacts on native vegetation (e.g., eelgrass), presence or duration of harmful algal blooms, unsightly green slimes or water column color, and/or objectionable odors; documentation of fish kills, beach closures or outbreaks of waterborne illness among swimmers, including from blooms of toxic blue-green algae, public photographs or testimonials of abundant algal mats that impede recreation or create unsightly aesthetics in the waterbody; numeric water quality targets or thresholds for nitrogen and/or phosphorus that are used as quantitative "translations" of states' narrative criteria; multiple lines of evidence, including information on the causal variables (e.g., total nitrogen or total phosphorus) and response indicators (e.g., chlorophyll-a, dissolved oxygen, pH, macroinvertebrates, periphyton); and data on macrophyte cover, chlorophyll-a, algae assemblages, including diatoms, are used to gauge the biological condition of the water. *Id*. at 6 – 12.

For the states' 2016 lists, and many others thereafter, EPA reiterated its emphasis on nutrients as "one of EPA's top priorities," stating that listing impaired waters is "an important step in a State's process to prioritize and accelerate nutrient reduction efforts." Memorandum from Benita Best-Wong, EPA, to Water Division Directors, Regions 1 – 10, *Re: Information*

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[2] *Available at* https://www.epa.gov/sites/default/files/2015-10/documents/final_2014_memo_document.pdf (last accessed March 28, 2022).

Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions (Aug. 13, 2015) at 10.[3]

EPA has encouraged states to develop TMDLs and wasteload allocations to address excess nutrients since at least 1990. *See* EPA, *Technical Guidance Manual for Performing Waste Load Allocations, Book III Estuaries, Part 1 Estuaries and Waste Load Allocation Models* (March 1990)[57]; EPA, *Technical Guidance Manual for Developing Total Maximum Daily Loads Book II: Streams and Rivers, Part 1: Biochemical Oxygen Demand/Dissolved Oxygen and Nutrients/Eutrophication* (Sept. 1995).[4] As EPA pointed out at the end of that decade, TMDLs play a key role in addressing nutrient-related water quality impairments where,

> [s]ome point sources need more controls, and many nonpoint source impacts (from agriculture, forestry, development activities, urban runoff, and so forth) cause or contribute to impairments in water quality. To address the combined, cumulative impacts of both point and nonpoint sources, EPA has adopted a watershed approach, of which TMDLs are a part.

EPA, *Protocol for Developing Nutrient TMDLs, First Edition* (Nov. 1999) at Forward.[5] Like the later 303(d) listing guidance memos, this EPA document too explained how the legal definition of a water quality standard applies to nutrients. *Id.* at 4-1, 4-13.

More recently, EPA has renewed its exhortation to states to "address the substantial and growing threat of nutrient pollution[.]" Memorandum from Joel Beauvais, EPA, to State Environmental Commissioners, State Water Directors, Re: *Renewed Call to Action to Reduce Nutrient Pollution and Support for Incremental Actions to Protect Water Quality and Public Health* (Sept. 22, 2016). EPA urged states to keep the focus on both point and nonpoint sources; asked states to prioritize watersheds for nutrient load reductions; requested that they provide for accountability and public reporting in nutrient load reduction program; and urged the use of the "important tool" of NPDES permits to "limit nutrient discharges into priority waters." *Id*. at 3, 4. An initial finding that the middle segment Gallatin is impaired by nutrients would support all of these goals and more.

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[3] *Available at* https://www.epa.gov/sites/default/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf (last accessed March 28, 2022).

[4] *Available online: https://www.epa.gov/nutrient-policy-data/technical-guidance-manual-performing-waste-load-allocations-book-3* (last accessed March 28, 2022).

[5] Available online: https://nepis.epa.gov/Exe/ZyNET.exe/20004PB2.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1995+Thru+1999&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C95thru99%5CTxt%5C00000016%5C20004PB2.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL (last accessed March 28, 2022).

IV. Conclusion

This petition, in conjunction with all credible, 5-years old or less evidence already available to the agency, demonstrates that the middle segment Gallatin River has experienced recurrent, filamentous algal blooms whose severity and prevalence constitute "overwhelming evidence of impairment" and require an impairment designation on the state's 303(d) List. Metadata contained within this petition and declarations from river-based businesses demonstrate that the middle segment Gallatin River has experienced widespread and persistent algal blooms in 2018 and 2020 that clearly fulfill DEQ's impairment criteria.

Moreover, DEQ has acknowledged that nutrient pollution is a leading cause of non-attainment for more than 20% of assessed waters in the State; that there are multiple sources of nutrients, including both point and non point source; and that the Gallatin has experienced nuisance algal blooms in recent summers indicating potential failure to attain its beneficial uses. DEQ should now use best available science[6] and follow its rules and EPA guidance to find the middle segment Gallatin is not fully attaining its designated uses and list the river segment as nutrient impaired on its 303(d) List.

DEQ is well aware of its own expert science showing how algal blooms and nuisance conditions can affect not only recreational uses, but so too cause ecological harm to aquatic life. All of these facts, much less the prospect of another season of middle segment Gallatin River algal blooms, point to the need to declare the middle segment Gallatin impaired for nutrients and in so doing trigger the requisite pollution allocation and river restoration process.

The undersigned therefore petition the Montana Department of Environmental Protection to:

(1) Perform a beneficial use assessment of the middle segment Gallatin River and examine all best available data, including that submitted with this petition and that within the agency's control;

(2) Determine that the Gallatin River has experienced nuisance level, severe algal blooms that negatively affect beneficial uses;

(3) Determine that the middle segment Gallatin River is failing to fully attain its recreational and/or aquatic life beneficial uses;

(4) List the middle segment Gallatin River as impaired by nutrient pollutants on its 303(d) List;

(5) Prioritize the development of necessary Total Maximum Daily Loads for the middle segment Gallatin River.

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[6] This petition explicitly incorporates by reference the totality of water quality sampling and monitoring data presently available to DEQ, including that from its own assessments of the middle segment Gallatin, data from partner agencies such as the Montana Bureau of Mines and Geology and its pending Big Sky Canyon Area Groundwater Investigation, and data provided by the Gallatin River Task Force.

Respectfully submitted-

Guy Alsentzer
Executive Director
Upper Missouri Waterkeeper

Kristin Gardner, PhD
Chief Executive & Science Officer
Gallatin River Task Force

David Brooks
Executive Director
Montana Trout Unlimited

Scott Bosse
Director, Northern Rockies
American Rivers

Charles Wolf Drimal
Deputy Director Conservation
Greater Yellowstone Coalition

CC:

Tina Laidlaw, Nutrient Coordinator, Region 8 EPA - laidlaw.tina@epa.gov
Darcy O'Connor, Director, Water Division, Region 8 EPA - oconnor.darcy@epa.gov

EXHIBIT A

Metadata in support of Petition to List the Middle Segment Gallatin as Impaired for Nutrients
(hyperlink to Google Drive)

Petitioners have assembled a variety of metadata showing the scope and prevalence of recurrent nuisance algal blooms on the mainstem Gallatin River from summer seasons 2018 to 2021. This metadata has been organized into a Google Drive cloud folder with permissions granted to view data for all. As requested by DEQ monitoring staff all metadata contains necessary documentation to assure compliance with DEQ "credible evidence" criteria.

Metadata is organized within a root folder entitled "Middle Segment Gallatin River TMDL Petition"

Within this root folder there are 5 particular sub-folders:

- 2018 Metadata
- 2019 Metadata
- 2020 Metadata
- 2021 Metadata
- Comprehensive Spreadsheet entitled "Middle Segment Gallatin River TMDL Campaign – Media" containing
    - Photo/Video evidence with embedded hyperlink to metadata hosted in applicable year folder;
    - Date image taken
    - Time of day
    - GPS way points of visual documentation
    - Narrative notes summarizing visual documentation

In addition to hosting evidentiary materials in support of the Petition and making available to DEQ by electronic means as described above, petitioners have mailed a hardcopy of the Petition, supporting River Based Business Declarations, and a thumb drive with all metadata.

EXHIBIT B

Declarations of Gallatin River Businesses Characterizing Recurrent Nuisance Algal Blooms on the Middle Segment Gallatin River & Requesting That DEQ Grant the Petition to Determine This Segment is Impaired By Nutrient Pollution

March 30, 2022
Montana Department of Environmental Quality

To Whom it May Concern;

I am writing to express our business's support for designating the Upper Gallatin River as impaired after four consecutive summer seasons of excessive nutrient pollution-driven noxious, neon-green algal blooms and implementing a pollution diet to protect this valued resource and world-class section of the Gallatin River. The river, the trophy blue-ribbon trout fishery, and world-class recreational opportunities it supports are more at risk than ever before and are all worth protecting.

As the Department of Environmental Quality (DEQ), Upper Missouri Waterkeeper, and the Gallatin River Task Force have already documented, the middle segment of the Gallatin River has been plagued by seasonal algal blooms for the last four years, with 2018 and 2020 algal blooms extending river-wide and up to ten miles below the confluence of the West Fork. Being a river-based business, myself and my staff are 'on the water' within this same stretch of the Gallatin River multiple times daily from May 15 - September 15, which equates to about 130 days each year.

Myself and my staff personally saw neon-green, filamentous algal growth covering the entirety of the middle segment Gallatin River's bottom and stretching several miles downstream in the 2018 and 2020 seasons. After seeing these severe algal blooms in 2018, it was very clear that the algal blooms were both persistent and pervasive, with algal blooms in 2020 being comparative to the 2018 bloom. When driving upstream from our office below the Gallatin's Mad Mile, the algal blooms in 2018 and 2020 were very noticeable even from the road, and especially to those of us literally on the river. Based on Montana Whitewater's time on the river during 2018 and 2020 there is no doubt that the mainstem Gallatin downstream of Big Sky and past Portal Creek experienced algal blooms that coated bank to bank and reached at least 10 miles if not longer.

The middle segment Gallatin's seasonal, widespread algal blooms are deeply concerning to me because it's aesthetically displeasing and an eyesore for recreation. When I or my staff take clients on the river, they are here in large part due to the highly pristine nature of the Gallatin and the clear, cool water and excellent recreational opportunities. They are looking for "The River Runs Through It" scenery, and a neon green algal bloom is not that pristine experience. Severe and pervasive algal blooms significantly diminish the aesthetic and recreational value of the Gallatin River and can degrade, if not destroy, a client's experience and their likelihood to return to my business for another day on the river. Those clients who see Gallatin algal blooms may even decide not to return to an area at all, feeling that despite promises of pristine wild-ness the river and region does not have the ability to provide it. The aesthetic and recreational impacts of the middle segment Gallatin's algal blooms are tangible and real to my business.

I am also concerned by the middle segment of the Gallatin's severe and widespread algal blooms because they can negatively affect macroinvertebrate life and aquatic communities, decrease oxygen concentrations in the river, and create unnaturally warm temperatures, which in turn adversely affects cold-water fish populations. Clients utilize my business to experience the outdoors and river in the ecosystem of the first National Park in the country. That carries an expectation of a certain level of beauty and aesthetic that should be surrounding them on the entirety of their visit. One experience of that expectation not being met, can bring their entire trip down, and our entire area down. Jeopardizing our reputation as the Last Best Place, and as an extension of the wild and wonderful Yellowstone Area and the nation's first National Park. We, and they, expect and deserve better.

Additionally, I am aware that science has shown that severe and widespread algal blooms have the potential to cause lasting harm to the physical, chemical, and biological integrity of the Gallatin River, the consequences of which could impact not just my business, but the regional outdoor economy and downstream drinking water supplies, ranching and agriculture businesses, and wildlife. All of these impacts and potential consequences directly affect me and my business and should be squarely addressed by our government proactively.

The recurrent years of wide-spread algal growth and blooms in the middle segment Gallatin downstream of Big Sky point to a large problem and an unhealthy stretch of river that has severe consequences. As a business owner that provides jobs in our community and relies on clean, cold-water for me and my family's livelihood, we respectfully ask the DEQ to weigh the overwhelming evidence and make an impairment designation to address and limit pollution degrading our river.

Montana's strong and growing outdoor economy generates $7.1 billion in economic activity and supports 71,000 jobs, with fishing accounting for over $900 million of the economic activity alone. To say Montana's outdoors are vital to our economy and way of life is an understatement. And, the middle segment Gallatin River is an integral part of the regional economy, attracting visitors from around the world that recreate in and around the river. We can and should do more to protect this valued resource.

The DEQ has an opportunity to be proactive in addressing excessive pollution flowing into the middle segment Gallatin River and stop recurrent nuisance algal blooms from getting worse by ensuring a science-based pollution diet is created, implemented, and enforced. I support and encourage the DEQ to list the middle segment Gallatin River as an imparied waterway in order to protect it now and for future generations.

Sincerely,

Melanie West
Business Operations Manager

Montana Whitewater,Yellowstone Zipline & Madison River Tubing
PO Box 1552
Bozeman, MT 59771

March 30, 2022

Director Dorrington
Administrator Steinmetz
Bureau Chief Steffens
Monitoring & Assessment Supervisor Kron
Montana Dept. of Environmental Quality
1520 E Sixth Avenue
Helena, MT 59601

Dear Director Dorrington,

I am writing to express our business's support for designating the Upper Gallatin River as impaired after multiple years of severe algae blooms. The river and the trophy blue-ribbon trout fishery and world-class recreational opportunities it supports are more at risk than ever before and worth protecting. As the Department of Environmental Quality (DEQ), Gallatin River Task Force, and the Upper Missouri Waterkeeper, I have already documented, the middle segment of the Gallatin River from the Yellowstone National Park boundary downstream for up to ten miles below the West Fork has been plagued by seasonal algal blooms in 2018 and 2020. As a river-based business owner, myself and my staff are on the water within this same stretch of the Gallatin River for more than 150 days each year. In the 2018 and 2020 summer seasons, I personally saw neon-green, filamentous algal growth covering the entirety of the Gallatin River's bottom and stretching several miles downstream. There can be no doubt that the algal blooms in these summer seasons were persistent and widespread. The middle segment Gallatin's seasonal, widespread algal blooms are deeply concerning to me because it's a blight and nuisance for recreation. When I or my staff take clients on the river, they are here in large part due to the highly aesthetic nature of the Gallatin and the clear, cool water and excellent recreational opportunities. Severe and pervasive algal blooms significantly diminish the aesthetic value of the Gallatin River and can degrade, if not destroy, a client's experience and their likelihood to return to my business for another day on the river. The aesthetic and recreational impacts of the middle segment Gallatin's algal blooms are tangible and real to my business. I am also concerned by the middle segment Gallatin's severe and widespread algal blooms because they can negatively affect macroinvertebrate life and aquatic communities, decrease oxygen concentrations in the river, and create unnaturally warm temperatures, which in turn adversely affect cold-water fish populations. Clients come to my business to experience world-class outdoors; degraded habitat and ecological conditions negatively affect my client's experiences and my businesses' ability to retain and attract new clients. Additionally, I am aware that science has shown that severe and widespread algal blooms have the potential to cause

lasting harm to the physical, chemical, and biological integrity of the Gallatin River, the consequences of which could impact not just my business, but the regional outdoor economy and downstream drinking water supplies, ranching and agriculture businesses, and wildlife. All of these impacts and potential consequences directly affect me and my business and should be squarely addressed by our government. Montana's strong and growing outdoor economy generates $7.1 billion in economic activity and supports 71,000 jobs, with fishing accounting for over $900 million of the economic activity alone. To say Montana's outdoors are vital to our economy and way of life is an understatement. And, the middle segment Gallatin River is an integral part of the regional economy, attracting visitors from around the world that recreate in and around the river. We can and should do more to protect this valued resource. The DEQ has an opportunity to be proactive in addressing excessive pollution flowing into the middle segment Gallatin River and stop recurrent nuisance algal blooms from getting worse by ensuring a science-based pollution diet is created, implemented, and enforced. I support and encourage the DEQ to list the middle segment Gallatin River as an impaired waterway in order to protect it now and for future generations.

Sincerely,
Eric Becker
President,
Geyser Whitewater Expeditions, Inc.
46651 Gallatin Road
Gallatin Gateway, MT 59730
406

March 29, 2022

Director Dorrington
Administrator Steinmetz
Bureau Chief Steffens
Monitoring & Assessment Supervisor Kron
Montana Department of Environmental Quality
1520 E Sixth Avenue
Helena, MT 59601

Dear MT DEQ Leadership,

As a local resident and business owner in Big Sky, and as a result of multiple years of severe algae blooms on the Gallatin River, I am writing to urge the DEQ to be proactive in addressing excessive pollution flowing into the middle segment Gallatin River and to list the middle segment Gallatin River as an impaired waterway. Our staff and our guides combined spend more than 250 days a year on the Gallatin River; conducting guided fishing trips, providing youth fishing programs, conducting training schools for future fishing guides, and offering women specific flyfishing schools.

In addition, I personally reside year-round on the Gallatin River, approximately 6 miles South of the confluence with the West Fork of the Gallatin. During the 2018 and 2020 summer seasons, myself and our guides and our clients saw substantial amounts of neon-green, filamentous algal growth covering the entirety of the Gallatin River's bottom, starting from the Yellowstone Park Boundary and continuing for over 10 miles past the confluence with the West Fork of the Gallatin. All of us were deeply concerned about these algae blooms on the Gallatin River, not only because it was a blight and a nuisance for recreation, but also because these widespread algal blooms could cause lasting harm to the physical, chemical, and biological integrity of the Gallatin River. We are also concerned about how these algae blooms will affect cold-water fish populations, since invariably algae blooms decrease oxygen concentrations in the water and create unnaturally warm temperatures.

It is our view that the Gallatin River is a vital asset to the community of Big Sky and to the State of Montana. It's a trophy blue-ribbon trout fishery that provides world-class recreational opportunities for thousands of visitors to Montana area each year. The middle segment of the Gallatin River is also an integral part of the Big Sky regional economy, providing jobs and attracting visitors from around the world that recreate in and around the river.
We all need to do our part to protect this valuable resource now and for future generations. The DEQ can help by listing the middle segment Gallatin River as an impaired waterway.

Sincerely,

Rick Donaldson
Gallatin River Guides
PO Box 160212
Big Sky, Montana 59716

Fins n Feathers of Bozeman

March 29, 2022
Montana Department of Environmental Quality

Dear DEQ:

I am writing on behalf of my business, Fins n Feathers, a river and fishing outfitter based in Four Corners MT, to support the petition requesting that DEQ assess the middle segment Gallatin River and determine whether it requires an impairment designation to address consecutive years of nuisance algal blooms. In my opinion the Gallatin River, its trophy blue-ribbon trout fishery, and the world-class recreational opportunities it supports are threatened by recurrent algal blooms and DEQ should follow best available science to protect this river from further degradation.

As the Department of Environmental Quality (DEQ), Upper Missouri Waterkeeper, and the Gallatin River Task Force have already documented, the middle segment of the Gallatin River has been plagued by seasonal algal blooms for the last four years, with 2018 and 2020 algal blooms extending river-wide and up to ten miles below the confluence of the West Fork. Being a river-based business owner, I myself and my staff are 'on the water' within this same stretch of the Gallatin River for more than 50 days each year.

During the 2018 and 2020 summer seasons I personally saw neon-green, filamentous algal growth covering the entirety of the Gallatin River's bottom and stretching several miles downstream. In both years I found this algal bloom reaching consistently miles downstream from Big Sky's Canyon Area. In my mind there can be no doubt that the algal blooms in these summer seasons were persistent and widespread. I also saw persistent algal blooms originating from the Taylor Fork, reaching down the mainstem Gallatin, and becoming pervasive across the river bottom at Big Sky downstream to the mouth of Gallatin canyon; in sum, there were miles and miles of green algae mats throughout the mainstem river in both 2018 and 2020.

The middle segment Gallatin's seasonal, widespread algal blooms are deeply concerning to me because it's a blight and nuisance for recreation. When I or my staff take clients on the river, they are here in large part due to the highly aesthetic nature of the Gallatin and the clear, cool water and excellent recreational opportunities. Severe and pervasive algal blooms significantly diminish the aesthetic value of the Gallatin River and can degrade, if not destroy, a client's experience and their likelihood to return to my business for another day on the river. The aesthetic and recreational impacts of the middle segment Gallatin's algal blooms are tangible and real to my business.

I am also concerned by the middle segment Gallatin's severe and widespread algal blooms because they can negatively affect macroinvertebrate life and aquatic communities, decrease oxygen concentrations in the river, and create unnaturally warm temperatures, which in turn adversely affects cold-water fish populations. Clients come to my business to experience world-class outdoors; degraded habitat and ecological conditions negatively affect my client's

experiences and my businesses' ability to retain and attract new clients. Additionally, I am aware that science has shown that severe and widespread algal blooms have the potential to cause lasting harm to the physical, chemical, and biological integrity of the Gallatin River, the consequences of which could impact not just my business, but the regional outdoor economy and downstream drinking water supplies, ranching and agriculture businesses, and wildlife. All of these impacts and potential consequences directly affect me and my business and should be squarely addressed by our government.

The recurrent years of wide-spread algal growth and blooms in the middle segment Gallatin downstream of Big Sky point to a large problem and an unhealthy stretch of river that has real world consequences. As a business owner that provides jobs in our community and relies on this clean, cold-water river for my family's livelihood, I respectfully ask the DEQ to weigh the overwhelming evidence and make an impairment designation for the middle segment Gallatin to address and limit nutrient pollution degrading our river.

Montana's strong and growing outdoor economy generates $7.1 billion in economic activity and supports 71,000 jobs, with fishing accounting for over $900 million of the economic activity alone. To say Montana's outdoors are vital to our economy and way of life is an understatement. And, the middle segment Gallatin River is an integral part of the regional economy, attracting visitors from around the world that recreate in and around the river. We can and should do more to protect this valued resource.

The DEQ has an opportunity to be proactive in addressing excessive pollution flowing into the middle segment Gallatin River and stop recurrent nuisance algal blooms from getting worse by ensuring a science-based pollution diet is created, implemented, and enforced. I support and encourage the DEQ to list the middle segment Gallatin River as an imparied waterway in order to protect it now and for future generations.

Sincerely,
/s/ Toby Swank
Fins and Feathers of Bozeman
81801 Gallatin Road
Bozeman, MT. 59718

March 28, 2022

Director Dorrington
Administrator Steinmetz
Bureau Chief Steffens
Monitoring & Assessment Supervisor Kron
Montana Dept. of Environmental Quality
1520 E Sixth Avenue
Helena, MT 59601

Dear Director Dorrington,

I am writing to express our business's support for designating the Upper Gallatin River as impaired after multiple years of severe algae blooms. The river and the trophy blue-ribbon trout fishery and world-class recreational opportunities it supports are more at risk than ever before and worth protecting.

As the Department of Environmental Quality (DEQ), Gallatin River Task Force, and the Upper Missouri Waterkeeper, I have already documented, the middle segment of the Gallatin River from the Yellowstone National Park boundary downstream for up to ten miles below the West Fork, has been plagued by seasonal algal blooms in 2018 and 2020.

As a river-based business owner myself and my staff are on the water within this same stretch of the Gallatin River for more than 100 days each year. While guiding the river in 2018 and 2020 summer seasons I personally saw neon-green, filamentous algal growth covering the entirety of the Gallatin River's bottom and stretching several miles downstream. There can be no doubt that the algal blooms in these summer seasons were persistent and widespread. The large amounts of algae impacted trout habitat and food sources. The algae uses up important oxygen in the river which impacts trout health. It is very important to put all resources to this issue.

The middle segment Gallatin's seasonal, widespread algal blooms are deeply concerning to me because it's a blight and nuisance for recreation. When I or my staff take clients on the river, they are here in large part due to the highly aesthetic nature of the Gallatin and the clear, cool water and excellent recreational opportunities. Severe and pervasive algal blooms significantly diminish the aesthetic value of the Gallatin River and can degrade, if not destroy, a client's experience and their likelihood to return to my business for another day on the river. The aesthetic and recreational impacts of the middle segment Gallatin's algal blooms are tangible and real to my business.

I am also concerned by the middle segment Gallatin's severe and widespread algal blooms because they can negatively affect macroinvertebrate life and aquatic communities, decrease oxygen concentrations in the river, and create unnaturally warm temperatures, which in turn

adversely affects cold-water fish populations. Clients come to my business to experience world-class outdoors; degraded habitat and ecological conditions negatively affect my client's experiences and my businesses' ability to retain and attract new clients.

Additionally, I am aware that science has shown that severe and widespread algal blooms have the potential to cause lasting harm to the physical, chemical, and biological integrity of the Gallatin River, the consequences of which could impact not just my business, but the regional outdoor economy and downstream drinking water supplies, ranching and agriculture businesses, and wildlife. All of these impacts and potential consequences directly affect me and my business and should be squarely addressed by our government.

Montana's strong and growing outdoor economy generates $7.1 billion in economic activity and supports 71,000 jobs, with fishing accounting for over $900 million of the economic activity alone. To say Montana's outdoors are vital to our economy and way of life is an understatement. And, the middle segment Gallatin River is an integral part of the regional economy, attracting visitors from around the world that recreate in and around the river. We can and should do more to protect this valued resource.

The DEQ has an opportunity to be proactive in addressing excessive pollution flowing into the middle segment Gallatin River and stop recurrent nuisance algal blooms from getting worse by ensuring a science-based pollution diet is created, implemented, and enforced. I support and encourage the DEQ to list the middle segment Gallatin River as an impaired waterway in order to protect it now and for future generations.

Sincerely,

Ennion Williams
Big Sky Trout Guide Service
PO Box 161161
Big Sky, Montana 59716

EXHIBIT C

Ecologist Report Characterizing 2018 Middle Segment Gallatin River Algal Blooms At Nuisance Level and Supporting A Determination of Impairment

Gallatin River Algae Observations Performed August 10, 2018

Jeff Dunn, Trout Unlimited **January 15, 2019**

On August 10, 2018, Trout Unlimited performed a qualitative visual assessment and photo documentation of algae conditions along the Gallatin River in the Gallatin canyon. Photo documentation was performed at five sites along an 18-mile stretch of the Gallatin River extending from the Porcupine Bridge upstream of Big Sky downstream to the Storm Castle river access site (**Table 1** and **Figure 1**). Monitoring sites were located at riffles and generally spaced about five miles apart. Visual observations included "good" when no algae growth was observed, "moderate" when some algae growth was observed, and "poor" when excessive algae growth was observed. These observations were then coded as green for "good", yellow for "moderate", and red for "poor" to conceptually depict how this information might be presented in a "Watershed Status and Trends Dashboard" as recommended in the *Big Sky Area Sustainable Watershed Stewardship Plan*. Monitoring photos are presented in **Figures 3** through **7**, with excessive algae growth observed between Deer Creek (MM51) and Portal Creek (MM53) (**Figures 4** and **5**). Algae growth was observed to be "spotty" with periodic reaches with high levels of growth interspersed between areas with lesser algae growth.

Table 1. Gallatin River Algae Monitoring Sites, August 10, 2018

Monitoring Site	Mile Marker (MM)	Visual Observation	Dashboard
Porcupine	45	moderate	yellow
West Fork	48	moderate	yellow
Portal Creek	53	poor	red
Greek Creek	58	moderate	yellow
Storm Castle	63	good	green

In discussions with Dr. Vicki Watson at the University of Montana, who has been studying algae growth in the Clark Fork River for over 35 years, potential explanations for increased algae growth include:

1) Increased sources of phosphorus and/or nitrogen
2) Reduced dilution due to decreased streamflows in the Gallatin or in its low nutrient tributaries
3) Increased inputs of nutrient enriched groundwater
4) Less frequent scouring high flows (and ice scour), shorter duration high flows, and longer duration low flows
5) Some change in the assemblage of algae grazers

Given the high flows in 2018, it would be expected that extensive scouring would occur, which would reduce algae concentrations. However, this was not the case and potential reasons for the 2018 algae bloom on the Gallatin River discussed by local stakeholders include:

1) Increased nutrient inputs from wastewater sources due to increased visitation in the Big Sky area
2) Changes in the amount, intensity, timing, duration, and location of summer irrigation with treated wastewater effluent on the Big Sky Golf Course and pasture area

3) Increased nutrient contributions from groundwater sources due to recently failing septic systems, malfunctioning wastewater treatment systems, and leaking pipelines
4) Increased groundwater elevations due to a deep snowpack provided increased transport of nutrients from septic systems into shallow groundwater
5) Impacts of high snowpack on groundwater infiltration and inflow (I/I) into the sewer system
6) Increased nutrient inputs due to extensive ground disturbance associated with ongoing development activities in the Big Sky area
7) Reduced streambed scour due to stormwater delivered fine sediment and traction sand inputs "locking" the streambed into place and reducing streambed mobility
8) Natural geologic inputs of additional phosphorus due to undocumented landslides and streambank erosion during high spring streamflows
9) Changes in growing season length, the amount of sunlight, and water temperatures
10) Increased nutrient inputs from animal waste due to increasing numbers and use of horses in the watershed

Future monitoring recommendations include:

1) Monitoring of these five sites monthly during the summer season (July, August, September, October) using standard DEQ monitoring protocols modified for larger river conditions. Monitoring should focus on riffle habitats where algae growth is typically observed.
2) Additional monitoring extending upstream including sites across from Elkhorn Creek (MM40), downstream of Taylor Fork (MM35), and upstream of Taylor Fork (MM33) and building on existing Gallatin River Task Force monitoring sites.
3) Expanded drone monitoring performed at Portal Creek and Taylor Fork in 2018 to cover the Gallatin canyon from the Taylor Fork downstream to Portal Creek (potentially expanding to cover from the Yellowstone National Park boundary downstream to Spanish Creek as warranted) and including the Taylor Fork.
4) Topobathy LIDAR data from periods of the year when algal growth is limited and periods when it is in full bloom to evaluate changes in the density of algae over time.
5) Additional research to further quantify nutrient sources and nutrient transport dynamics within the upper Gallatin watershed, including:
    a. the relationship between nutrients and sediment inputs/transport,
    b. the relationship between algae growth and areas with groundwater upwelling, and
    c. potential changes in macroinvertebrate assemblages due to elevated nutrient and sediment inputs.

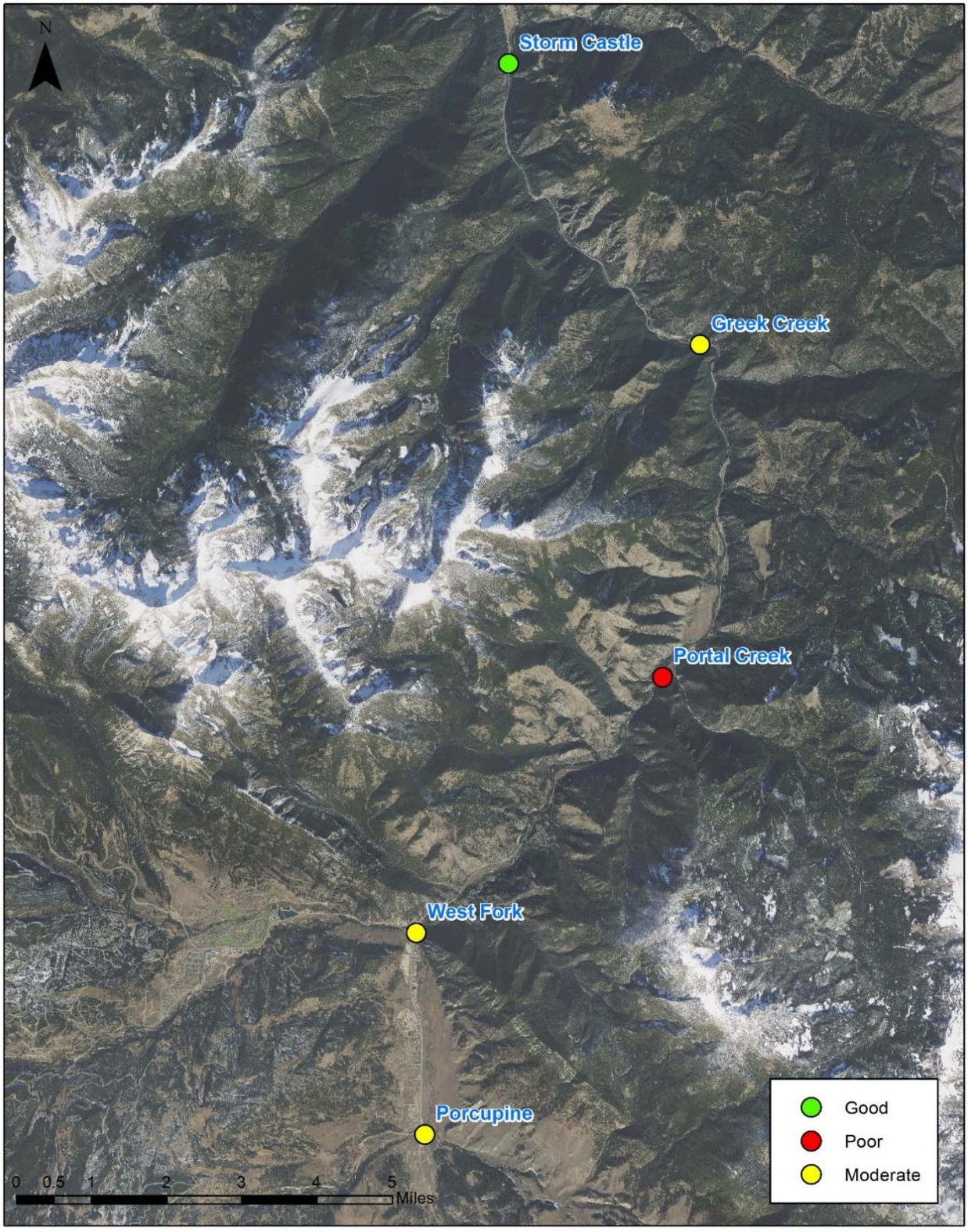

Figure 1. Gallatin River Algae Conditions based on Visual Observations, August 10, 2018

Figure 2. Porcupine

Figure 3. West Fork

Figure 4. Portal Creek – Upstream View

Figure 5. Portal Creek – Downstream View

Figure 6. Greek Creek

Figure 7. Storm Castle