



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director

VWP Individual Permit Number 23-2801

Effective Date: Date
Expiration Date: Date

VIRGINIA WATER PROTECTION PERMIT ISSUED PURSUANT TO THE STATE WATER CONTROL LAW AND SECTION 401 OF THE CLEAN WATER ACT

In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the department has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources.

- Permittee: Kyanite Mining Corporation
Facility: Kyanite Mining Co.- Water Withdrawal
Facility Address: 30 Willis Mountain Plan Lane, Dillwyn, VA 23936
Activity Location: The project is located approximately 4.3 miles southeast of the intersection of Route 60 (East James Anderson Highway) and Route 15 (South James Madison Highway) in Buckingham County, Virginia.

Activity Description: The permit authorizes the continued operation of an existing intake in Ski Pond and construction of a new intake in Chesapeake Pond for industrial mining use. Permitted activities shall be conducted as described in the Joint Permit Application, supplemental materials, revisions, and clarifications.

The Permittee's authorized water withdrawal shall not exceed:

Table with 4 columns: Withdrawal Limits, Cumulative Demand Request, Chesapeake Pond Demand Request, Ski Pond Demand Request. Rows include Max Annual (Mgal), Max Monthly (Mgal), and Max Daily (Mgal) with values 262.5, 21.88, 1.26 and N/A, 0.72, 0.54.

The permitted withdrawal will be used to provide water for industrial use. Other uses are not authorized by this permit.

Authorized Surface Water Impacts

This permit authorizes the total permanent impact of 318 square feet (sq. ft.) (0.007 acre) of wetlands. Permanent impacts to 0.001 acres (60 sq. ft.) of palustrine forested (PFO) wetland, 0.003 acres (120 sq. ft.) of palustrine emergent (PEM) wetland, and 0.003 acres (138 sq. ft.) of lacustrine unconsolidated bottom (L1UB). Authorized surface water impacts shall be as depicted on the impacts map entitled *Jurisdictional Waters Impacts Over Aerial Imagery and Topography*.

The permitted activity shall be in accordance with this Permit Cover Page, Part I - Special Conditions, and Part II - General Conditions.

Scott Morris, DBA, P.E.
Director, Water Division

Date

Part I – Special Conditions

A. Authorized Activities

1. This permit authorizes surface water withdrawals from onsite ponds (Ski Pond and Chesapeake Pond) for industrial mineral extraction and processing, and permanent impact to 0.007 acres (318 square feet) of wetlands related to installation activities of a new surface water intake structure in Chesapeake Pond.
 - a. Permanent impacts consist of no more than 318 square feet (0.007 acre) of wetlands.
 - b. Authorized surface water impacts described under this condition shall be as depicted on the impacts map entitled *Jurisdictional Waters Impacts Over Aerial Imagery and Topography* (Attachment E) and the *Authorized Impacts* table below.

Authorized Impacts	Impact Site 1	Impact Site 2	Impact Site 3
Type of Impact	Permanent	Permanent	Permanent
Cowardin Classification	L1UB	PEM	PFO
Area of Impact (sq. ft./acres)	138/0.003	120/0.003	60/0.001

2. The permittee shall conduct authorized activities as described in the Joint Permit Application and supplemental materials, revisions, and clarifications. Any changes to the authorized activities or impacts map that affect permitted areas shall be submitted to the Department immediately upon determination that changes are necessary, and Department approval shall be required prior to implementing the changes.
3. The permit authorizes the temporary use of mechanical equipment in surface waters in accordance with all applicable permit conditions.
4. The permittee shall notify the Department of any changes in authorized impacts to surface waters, of any modifications of the intake structure, or any changes to the design or type of construction activities in surface waters authorized by this permit. Department approval shall be required prior to implementing the changes. Any additional impacts, modifications, or changes shall be subject to individual permit review or modification of this permit.

B. Permit Term

1. This permit is valid for fifteen (15) years from the date of issuance. A new permit may be necessary for the continuance of the authorized activities, including water withdrawals, or any permit requirement that has not been completed, including compensation provisions.

2. The permittee shall submit a new permit application at least 270 calendar days prior to the expiration of this permit if reissuance will be requested. A complete permit application is due by **DATE**, in accordance with 9VAC25-210-65.

C. Standard Project Conditions

1. This permit does not constitute, convey, or imply authority to any permittee to unlawfully or incidentally take any threatened or endangered species that is protected by Virginia laws or regulations, pursuant to § 3.2-1000 through -1011; § 29.1-563 through -570; and 4VAC15-20 *et seq.*
2. The activities authorized by this permit shall be executed in such a manner that any impacts to beneficial uses are minimized. As defined in § 62.1-44.3 of the Code of Virginia, "beneficial use" means both instream and offstream uses. Instream beneficial uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values. The preservation of instream flows for purposes of the protection of navigation, maintenance of waste assimilation capacity, the protection of fish and wildlife resources and habitat, recreation, cultural and aesthetic values is an instream beneficial use of Virginia's waters. Offstream beneficial uses include, but are not limited to, domestic (including public water supply), agricultural uses, electric power generation, commercial, and industrial uses.
3. No activity shall substantially disrupt the movement of aquatic life indigenous to the water body, including those species which normally migrate through the area, unless the primary purpose of the activity is to impound water.
4. Flows downstream of the project area shall be maintained to protect all uses.
5. No activity shall cause more than minimal adverse effect on navigation, and no activity shall block more than half of the width of the stream at any given time.
6. The activity shall not impede the passage of normal or expected high flows, and any associated structure shall withstand expected high flows.
7. All required notifications, reports, and submittals shall include project name and permit number and be submitted electronically to withdrawal.permitting@deq.virginia.gov. Alternatively, they can be mailed to the office stated below, unless otherwise directed in writing by the Department subsequent to the issuance of this permit: Department of Environmental Quality, Attn: Compliance Program Manager, Office of Water Withdrawal Permitting, P.O. Box 1105, Richmond VA 23218.
8. All reports required by this permit and other information requested by the Department shall be signed by the permittee or a person acting in the permittee's behalf, with the authority to bind the permittee. A person is a duly authorized representative only if *both* criteria below are met. If a representative authorization is no longer valid because of a change in responsibility for the overall operation of the facility, a new authorization shall be immediately submitted to the Department.
 - a. The authorization is made in writing by the permittee.

- b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

9. All submittals shall contain the following signed certification statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

10. Any fish kills or spills of fuels or oils shall be reported to the Department immediately upon discovery at (804) 527-5020 or <https://portal.deq.virginia.gov/v2/prep/search>. If the Department cannot be reached, the spill or fish kill shall be reported to the Virginia Department of Emergency Management (VDEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802. Any spill of oil as defined in § 62.1-44.34:14 of the Code of Virginia that is less than 25 gallons and that reaches, or that is expected to reach, land only is not reportable, if recorded per § 62.1-44.34:19.2 of the Code of Virginia and if properly cleaned up.
11. The Department shall be notified in writing within 24 hours or as soon as possible on the next business day when potential environmentally threatening conditions are encountered which require debris removal or involve potentially toxic substances. Measures to remove the obstruction, material, or toxic substance or to change the location of any structure are prohibited until approved by the Department.
12. Virginia Water Quality Standards shall not be violated in any surface waters as a result of the project activities.
13. All excavation, dredging, or filling in surface waters shall be accomplished in a manner that minimizes bottom disturbance and turbidity.
14. Erosion and sedimentation controls shall be designed in accordance with the Virginia Erosion and Sediment Control Handbook, Third Edition, 1992. These controls shall be placed prior to clearing and grading and maintained in good working order to minimize impacts to state waters. These controls shall remain in place until the area is stabilized and shall then be removed.
15. All construction, construction access, and demolition activities associated with this project shall be accomplished in a manner that minimizes construction materials or waste materials from entering surface waters, unless authorized by this permit. Wet, excess, or waste concrete shall be prohibited from entering surface waters.
16. Measures shall be employed at all times to prevent and contain spills of fuels, lubricants, or other pollutants into surface waters.

17. Machinery or heavy equipment in temporarily impacted wetlands shall be placed on mats or geotextile fabric, or other suitable means shall be implemented, to minimize soil disturbance to the maximum extent practical. Mats, fabrics, or other measures shall be removed as soon as the work is complete in the temporarily impacted wetland.
18. Temporary disturbances to wetlands, stream channels, and/or stream banks during project construction activities shall be avoided and minimized to the maximum extent practicable.
19. All temporarily disturbed wetland areas shall be restored to preconstruction conditions within 30 calendar days of completing work in the areas, which shall include re-establishing pre-construction contours, and planting or seeding with appropriate wetland vegetation according to cover type (emergent, scrub/shrub, or forested), except for invasive species identified on the Department of Conservation and Recreation's (DCR's) Virginia Invasive Plant Species List. The permittee shall take all appropriate measures to promote and maintain the revegetation of temporarily disturbed surface waters through the second-year post-disturbance.
20. All temporarily impacted streams and stream banks shall be restored to their original elevations and contours within 30 calendar days following the construction at that stream segment, and the banks shall be seeded or planted with the same vegetative cover type originally present along the banks, including supplemental erosion control grasses if necessary but not including invasive species identified on DCR's Virginia Invasive Plant Species List.
21. All materials (including fill, construction debris, excavated materials, and woody materials, that are temporarily placed in wetlands, in stream channels or on stream banks) shall be placed on mats or geotextile fabric, shall be immediately stabilized to prevent the material or leachate from entering surface waters, and shall be entirely removed within 30 calendar days following completion of that construction activity. After removal, disturbed areas shall be returned to original contours, shall be stabilized, and shall be restored to the original vegetated state within 30 calendar days.
22. All non-impacted surface waters that are within the project or right-of-way limits, and that are within fifty feet of any project activities, shall be clearly flagged or demarcated for the life of the construction activity within that area. The permittee shall notify all contractors and subcontractors that no activities are to occur in these marked areas.

D. Surface Water Withdrawals

1. Surface water withdrawn from Ski Pond and Chesapeake Pond authorized under this permit are to be used for industrial mineral extraction and processing.
2. The withdrawal of water from the onsite ponds shall not exceed the following and shall meet the requirements in Part I D 4 & 5 below:

	Ski Pond	Chesapeake Pond	Combined Withdrawal
Maximum Day	0.54 Mgal	0.72 Mgal	1.26 Mgal
Maximum Month	N/A	N/A	21.88 Mgal
Maximum Year	N/A	N/A	262.5 Mgal

3. The permittee shall install intake screens on the intake in Chesapeake Pond with openings no larger than 1 millimeter in width and height for mesh screens. The permittee shall ensure that the maximum screen face approach velocity does not exceed 0.25 feet per second.
4. Withdrawals from Ski Pond must cease if less than 40% of the mean annual flow (equivalent to 0.8 cfs) is discharging to Mountain Creek (formerly “Unnamed Tributary to Whispering Creek”).
5. Drawdown of Chesapeake Pond shall not exceed 6 inches per day, nor shall the minimum pool level be withdrawn below 342.5 feet elevation.
6. The permittee shall submit a Drought Management Plan to the Department for review within 180 days (DATE) of permit issuance. Any revisions to the approved plan shall be submitted to the Department for review prior to implementing the change. The plan shall include, at a minimum, the following:
 - a. Development of drought stages including when and how each stage will be implemented.,
 - b. Description of the conservation measures to be implemented during each drought stage.
7. When a drought is declared by the Commonwealth of Virginia in the Middle James Drought Evaluation Region or by Buckingham County in accordance with the County’s (or Locality’s) Drought Management Ordinance, the permittee shall implement either the provisions directed by the Commonwealth, the Drought Management Ordinance or the mandatory conservation measures as detailed in Attachment B of this permit, whichever is the most restrictive. The permittee shall be responsible for determining when drought emergencies are declared. The permittee shall retain records documenting that mandatory conservation measures were implemented during declared drought emergencies.

E. Water Withdrawal Monitoring, Recordation and Reporting Conditions

1. Within 120 days (DATE) of the issuance of this permit, the Permittee shall submit a Monitoring and Operations Plan for Department review. The Plan should specifically address the following:
 - a. Procedures for operating the intakes to ensure compliance with all water withdrawal conditions of this permit,
 - b. Procedures for recording withdrawals, releases from each pond, and all other monitoring and reporting requirements in Part I, including a sample of the reporting form or table that will be used.
2. On each day that pumping occurs, the permittee must monitor and record the following, for each intake:
 - a. Date and time; and
 - b. Total amount of water withdrawn each day from each pond.
 - c. The amount of water released from Ski Pond in cfs.
 - d. The pool level of Chesapeake Pond prior to beginning withdrawals.

- e. The pool level of Chesapeake Pond within 3 hours of ceasing withdrawals.
 - f. Dates and rationale if withdrawals were ceased due to conditions set forth in Part I D 4 & 5.
3. The permittee shall monitor withdrawals from Chesapeake and Ski Ponds on a daily basis using flow totalizer technology to confirm that the withdrawals are in compliance with this permit. Such meters shall produce volume determinations within plus or minus 10% of actual flows. A defective meter or other device must be repaired or replaced within 60 days. A defective meter is not grounds for not reporting the withdrawals. During any period when a meter is defective, generally accepted engineering practice shall be used to estimate withdrawals and the period during which the meter was defective must be clearly identified in the report.
 4. The permittee shall coordinate with the Peter Francisco Soil and Water Conservation District if the permittee becomes aware of any malfunction with the Chesapeake Pond monitoring equipment.
 5. The permittee shall report any withdrawal not in compliance with Parts I D 2 and I D 4 by the fifth (5th) day of the month following the month in which the withdrawal or release occurred. Failure to report may result in compliance or enforcement activities.
 6. The permittee shall submit a water withdrawal monitoring report to the Department semi-annually. The semi-annual monitoring period shall be as follows: January through June and July through December. The daily records shall be tabulated by month. The report shall be submitted to the Department by February 10th and August 10th of every year within the permit term. Submittal of the report may be reported electronically reporting, or another form determined to be acceptable by the Department. The report shall include the following information:
 - a. The permittee's name and address;
 - b. The permit number (23-2801);
 - c. The source(s) from which water is withdrawn;
 - d. The location (latitude and longitude) of each point of water withdrawal;
 - e. Information listed in Part I E 2;
 - f. The cumulative volume (million gallons) of water withdrawn each month
 - g. The cumulative volume (million gallons) of water withdrawn for each pond and the total combined withdrawal for the calendar year;
 - h. The maximum daily volume (million gallons per day) of water withdrawn from each pond as calculated on the last day of the monitoring period.
 - i. In the last report for the calendar year, the largest single day withdrawal volume (million gallons) from each pond that occurred in the year, and the month in which it occurred;
 - j. The method of measuring withdrawals and minimum release;
 - k. If during a semi-annual reporting period a drought emergency is declared, the report shall include a summary of mandatory conservation measures implemented during the drought event.
 7. Water withdrawal monitoring and reporting activities shall comply with this section, Part I C, and Part II. All records and information that result from the monitoring and reporting activities required by this permit, including any records of maintenance activities to the withdrawal system, shall be retained for the life of the permit. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or as requested by the Department.

F. Stream Modifications, Including Intake/Outfall Structures

1. Redistribution of existing stream substrate for erosion control purposes is prohibited.
2. Material removed from the stream bottom shall not be deposited into surface waters unless otherwise authorized in this permit.
3. For streambank protection activities, structures and backfill shall be placed as close to the streambank as practical, while still avoiding and minimizing impacts to surface waters to the maximum extent practical. No material shall be placed in excess of the minimum necessary for erosion protection.

G. Installation of Utilities

1. All utility line work in surface waters shall be performed in a manner that minimizes disturbance in each area. Temporarily disturbed surface waters shall be restored in accordance with Part I C 18, C 19, and C 20, unless otherwise authorized by this permit.
2. Material resulting from trench excavation may be temporarily sidecast into wetlands not to exceed a total of 90 calendar days, provided the material is not placed in a manner such that it is dispersed by currents or other forces.
3. The trench for a utility line cannot be constructed in a manner that drains wetlands (e.g., backfilling with extensive gravel layers creating a French drain effect).

H. Project Construction Monitoring and Submittals (Impact Sites)

1. The permittee shall submit written notification at least **ten (10) calendar days** prior to the initiation of land disturbance or construction activities in permitted areas. The notification shall include preconstruction photographs, projected schedule for initiating and completing work at each permitted impact area.
 - a. Preconstruction photographs shall be taken at each impact area prior to initiation of activities within impact areas.
 - b. Photographs shall depict the impact area and the nonimpacted surface waters immediately adjacent to and downgradient of each impact area.
 - c. Each photograph shall be labeled to include the following information: permit number, impact area number, date and time of the photograph, name of the person taking the photograph, photograph orientation, and photograph subject description.
2. Site inspections shall be conducted **once every calendar month** and recorded on the *Monthly VWP Permit Inspection Checklist* (Attachment C) by the permittee or the permittee's qualified designee during active construction within authorized surface water impact areas. Monthly inspections shall be conducted in the following areas: all authorized permanent and temporary impact areas; all avoided surface waters, including wetlands, stream channels, and open water; surface water areas within 50 feet of any land disturbing activity; and all on-site areas designated for permanent

preservation. The *Monthly VWP Permit Inspection Checklist (Attachment C)* shall be completed in its entirety for each monthly inspection and shall be kept on-site and made available for review by Department staff upon request during normal business hours.

3. The *VWP Permit Construction Status Update Form (Attachment D)* enclosed with this permit shall be completed in June and December of every year for the duration of this permit and must be received by the Department no later than January 10 and July 10 of every year. The *VWP Permit Construction Status Update Form* shall include reference to the VWP permit authorization number and one of the following statements for each authorized surface water impact location:
 - a. Construction activities not yet started;
 - b. Construction activities started;
 - c. Construction activities started but are currently inactive, or;
 - d. Construction activities complete.
4. The permittee shall notify the Department within 24 hours of discovering impacts to surface waters including wetlands, stream channels, and open water that are not authorized by this permit. The notification shall include photographs, estimated acreage and/or linear footage of impacts, and a description of the impacts.
5. The permittee shall submit written notification of completion within 30 calendar days after the completion of all activities in all permitted impact areas authorized under this permit.

Part II – General Conditions

A. Duty to Comply

The permittee shall comply with all conditions and limitations of the VWP permit. Nothing in this chapter shall be construed to relieve the permittee of the duty to comply with all applicable federal and state statutes, regulations, toxic standards, and prohibitions. Any VWP permit violation or noncompliance is a violation of the Clean Water Act and State Water Control Law and is grounds for enforcement action, VWP permit termination, VWP permit revocation, VWP permit modification, or denial of an application for a VWP permit extension or reissuance.

Nothing in this VWP permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

B. Duty to Cease or Confine Activity

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the activity for which a VWP permit has been granted in order to maintain compliance with the conditions of the VWP permit.

C. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any impacts in violation of the VWP permit that may have a reasonable likelihood of adversely affecting human health or the environment.

D. VWP Permit Actions

A VWP permit may be modified in whole or in part, revoked and reissued, extended, transferred, or terminated in accordance with 9VAC25-210-180 of the Virginia Administrative Code.

1. During the drafting and authorization of a permit modification, only those conditions to be modified shall be addressed with preparing a draft modified permit. VWP permit terms and conditions of the existing permit shall remain in full force and effect during the modification of the permit.
2. This VWP permit may be modified upon the request of the permittee or upon department initiative when any of the following developments occur:
 - a. When new information becomes available about the project or activity covered by the VWP permit, including project additions or alterations, that was not available at VWP permit issuance and would have justified the application of different VWP permit conditions at the time of VWP permit issuance,
 - b. When a change is made in the promulgated standards or regulations on which the VWP permit was based,
 - c. When changes occur that are subject to "reopener clauses" in the VWP permit, or

- d. When developments applicable to surface water withdrawals occur as specified in 9VAC25-210-380 of the Virginia Administrative Code.
3. When this VWP permit authorizes surface water withdrawals, it may be modified when any of the following developments occur:
 - a. When the department determines that minimum instream flow levels resulting directly from the permittee's withdrawal of surface water are detrimental to the instream beneficial use, existing at the time of permit issuance, and the withdrawal of surface water should be subject to further net limitations or when an area is declared a surface water management area pursuant to §§ 62.1-242 through 62.1-253 of the Code of Virginia, during the term of the VWP permit.
 - b. Significant changes to the location of the surface water withdrawal system are proposed such that the Department of Environmental Quality determines a new review is warranted due to the potential effect of the surface water withdrawal to existing beneficial uses of the new location.
 - c. Changes to the permitted project or the surface water withdrawal, including increasing the storage capacity for the surface water withdrawal, that propose an increase in the maximum permitted withdrawal volumes or rate of withdrawal or that cause more than a minimal change to the instream flow requirements with potential to result in a detrimental effect to existing beneficial uses.
 - d. A revision to the purpose of the surface water withdrawal that proposes to include a new use or uses that were not identified in the permit application or a modification of the existing authorized use or uses such that the use description in the permit application and permit is no longer applicable. Examples of uses include, but are not limited to agricultural irrigation, golf course irrigation, public water supply, manufacturing, and electricity generation.
 4. When the permittee has submitted a timely and complete application for reissuance of an existing VWP individual permit, but through no fault of the permittee, the department does not reissue or reissue with conditions a VWP individual permit or the department does not provide notice of its tentative decision to deny the application before an existing VWP individual permit expires, the conditions of the expiring VWP individual permit shall be administratively continued in full force and effect until the effective date of a reissued permit or the date on which the department denies the application. Timely application shall be a minimum of 180 days for an individual permit or a minimum of 270 days for an individual permit for a surface water withdrawal, unless otherwise specified in the existing permit.
 5. Any permittee desiring to continue a previously permitted activity after the expiration date of this VWP permit shall apply for and obtain a new permit or, if applicable, shall request an extension in accordance with 9VAC25-210-180 of the Virginia Administrative Code. Any permittee with an effective VWP permit for an activity that is expected to continue after the expiration date of the VWP permit, without any change in the activity authorized by the VWP permit other than as may be allowed under 9VAC25-210-180, shall submit written notification requesting an extension. The permittee must file the request 90 days prior to the expiration date of the VWP permit. VWP permit modifications shall not be used to extend the term of a VWP permit beyond 15 years from the date of original issuance. When a permit term, other than that of an Emergency Virginia Water Protection Permit, is less than 15 years, an extension of the permit terms and conditions may be

granted in accordance with 9VAC25-210-180. Emergency Virginia Water Protection Permits shall not exceed a duration of one year or shall expire upon the issuance of a regular Virginia Water Protection Permit, whichever comes first.

6. This VWP permit may be transferred to a new permittee only by modification to reflect the transfer, by revoking and reissuing the permit, or by automatic transfer. Automatic transfer to a new permittee shall occur if the current permittee: a) Notifies the department of the proposed transfer of the permit and provides a written agreement between the current and proposed permittees containing the date of transfer of VWP permit responsibility, authorization, and liability to the new permittee; and b) the department does not within 15 days notify the existing permittee of its intent to modify the VWP permit.
7. After notice and opportunity for a formal hearing pursuant to § 62.1-44.15:02 of the Code of Virginia, a VWP permit can be terminated for cause. Reasons for termination for cause are as follows:
 - a. Noncompliance by the permittee with any condition of the VWP permit,
 - b. The permittee's failure in the application or during the VWP permit process to disclose fully all relevant facts or the permittee's misrepresentation of any relevant facts at any time,
 - c. The permittee's violation of a special or judicial order,
 - d. A determination by the department that the permitted activity endangers human health or the environment and can be regulated to acceptable levels by VWP permit modification or termination,
 - e. A change in any condition that requires either a temporary or permanent reduction or elimination of any activity controlled by the VWP permit, and
 - f. A determination that the permitted activity has ceased and that the compensation for unavoidable adverse impacts has been successfully completed.
8. The department may terminate this permit without cause when the permittee is no longer a legal entity due to death, dissolution, or when a company is no longer authorized to conduct business in the Commonwealth. The termination shall be effective 30 days after notice of the proposed termination is sent to the last known address of the permittee or registered agent unless the permittee objects within that time. If the permittee does object during that period, the department shall follow the applicable procedures for termination under § 62.1-44.15:25 of the Code of Virginia and 9VAC25-230 of the Virginia Administrative Code.
9. This VWP permit may be terminated by consent, as initiated by the permittee. The permittee shall submit a request for termination by consent within 30 days of completing or canceling all permitted activities and all required compensatory mitigation requirements. When submitted for project completion, the request for termination by consent shall constitute a notice of project completion. The director may accept this termination on behalf of the department. The permittee shall submit the following information:
 - a. Name, mailing address, and telephone number,
 - b. Name and location of the activity,

- c. The VWP permit number, and
- d. One of the following certifications:
 - i. For project completion: "I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."
 - ii. For project cancellation: "I certify under penalty of law that the activities and any required compensatory mitigation authorized by this VWP permit will not occur. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit."
 - iii. For events beyond permittee control, the permittee shall provide a detailed explanation of the events, to be approved by DEQ, and the following certification statement: "I certify under penalty of law that the activities or the required compensatory mitigation authorized by this VWP permit have changed as the result of events beyond my control (see attached). I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit."

E. Inspection and Entry

Upon presentation of credentials, the permittee shall allow the department or any duly authorized agent of the department, at reasonable times and under reasonable circumstances, to conduct the actions listed in this section. For the purpose of this section, the time for inspection shall be deemed reasonable during regular business hours. Nothing contained herein shall make an inspection time unreasonable during an emergency.

1. Enter upon any permittee's property, public or private, and have access to, inspect and copy any records that must be kept as part of the VWP permit conditions,
2. Inspect any facilities, operations or practices (including monitoring and control equipment) regulated or required under the VWP permit, and
3. Sample or monitor any substance, parameter, or activity for the purpose of ensuring compliance with the conditions of the VWP permit or as otherwise authorized by law.

F. Duty to Provide Information

The department may request (i) such plans, specifications, and other pertinent information as may be necessary to determine the effect of an applicant's discharge on the quality of state waters or (ii) such other information as may be necessary to accomplish the purposes of this chapter. Any owner, permittee, or person applying for a VWP permit or general permit coverage shall provide the information requested by the department.

G. Monitoring and Records Requirements

1. Monitoring of parameters, other than pollutants, shall be conducted according to approved analytical methods as specified in the VWP permit. Analysis of pollutants will be conducted according to 40 CFR Part 136 (2017), Guidelines Establishing Test Procedures for the Analysis of Pollutants.
2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart or electronic recordings for continuous monitoring instrumentation, copies of all reports required by the VWP permit, and records of all data used to complete the application for the VWP permit, for a period of at least three years from the date of permit expiration. This period may be extended by request of the department at any time.
4. Records of monitoring information shall include:
 - a. The date, exact place and time of sampling or measurements,
 - b. The name of the individuals who performed the sampling or measurements,
 - c. The date and time the analyses were performed,
 - d. The name of the individuals who performed the analyses,
 - e. The analytical techniques or methods supporting the information such as observations, readings, calculations, and bench data used,
 - f. The results of such analyses, and
 - g. Chain of custody documentation.

H. Property rights

The issuance of a VWP permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize injury to private property or any invasion of personal rights or any infringement of federal, state or local laws or regulations.

I. Reopener

This VWP permit may be reopened for the purpose of modifying the conditions of the VWP permit to meet new regulatory standards duly adopted by the board. Cause for reopening VWP permits includes but is not limited to when the circumstances on which the previous VWP permit was based have

materially and substantially changed, or special studies conducted by the board or the permittee show material and substantial change, since the time the VWP permit was issued and thereby constitute cause for VWP permit modification or revocation and reissuance.

J. Compliance with State and Federal Law

As to the permitted activity(ies), compliance with a VWP permit constitutes compliance with the VWP permit requirements of the Law and regulations.

K. Severability

The provisions of this VWP permit are severable.

L. Oil and Hazardous Substance Liability

Nothing in this VWP permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under § 311 of the Clean Water Act or §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

M. Unauthorized Discharge of Pollutants

Except in compliance with a VWP permit, unless the activity is otherwise exempted or excluded, no person shall dredge, fill, or discharge any pollutant into, or adjacent to surface waters; withdraw surface water; otherwise alter the physical, chemical, or biological properties of state waters regulated under this chapter and make them detrimental to the public health, to animal or aquatic life, or to the uses of such waters for domestic or industrial consumption, for recreation, or for other uses; excavate in wetlands; or on or after October 1, 2001, conduct the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions,
2. Filling or dumping, or
3. Permanent flooding or impounding.

PERMIT DECISION RATIONALE

Virginia Water Protection Individual Permit No. 23-2801

Kyanite Mining Co.- Water Withdrawal, Buckingham County, Virginia

This document provides the pertinent information concerning the legal basis, scientific rationale and justification for the reissuance and modification of the VWP permit listed below. The Department of Environmental Quality (Department) has reviewed the application for the Virginia Water Protection (VWP) Individual Permit Number 10-1938 and has determined that the project qualifies for an individual permit. Based on the information provided in the application and in compliance with § 401 of the Clean Water Act as amended (33 USC 1341 et seq.) the State Water Control Law and regulations, the Department has determined that there is a reasonable assurance that the activity authorized by this permit will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to significant impairment of state waters or fish and wildlife resources, provided the permittee complies with all permit conditions. Surface water impacts have been avoided and minimized to the maximum extent practicable.

Approved:

Scott Morris, DBA, P.E.
Director, Water Division

Date

The following details the application review process and summarizes relevant information for developing the Part I - Special Conditions for permit issuance.

1. Contact Information:

Permittee/Legal Responsible Party

Kyanite Mining Corporation
c/o John Snoddy
30 Willis Mountain Plant Lane
Dillwyn, VA 23936
jsnoddy@kyanite.com

Facility

Willis Mountain Plant
30 Willis Mountain Plant Lane
Dillwyn, VA 23936

Agent

Luke DuPont
Ecometrics LLC
605 Page Street
Scottsville, VA 24590
luke.dupont@gmail.com

2. JPA Processing Dates:

Pre-Application Meeting Held:	January 2023
Received Application:	December 28, 2023
Application Complete:	February 15, 2024
Local Government Notice of Application:	February 14, 2024
Coordination with VDH, VDWR, VDCR, VMRC:	February 7, 2024
Tribal Nations Notice of Application:	February 14, 2024
Letters sent to Riparian Landowners:	February 14, 2024
1 st Request for Additional Information Sent:	January 11, 2024
Response to 1 st Request for Additional Information Received:	January 25, 2024
Permit Fee Deposited by Accounting:	February 12, 2024
2 nd Request for Additional Information Sent:	February 5, 2024
Response to 2 nd Request for Additional Information Received:	February 12, 2024
Initial Draft Permit Package Issued:	July 10, 2024
Version 2 Draft Permit Package Issued:	September 11, 2024
Version 3 Draft Permit Package Issued:	October 28, 2024
Public Notice Published:	Date
End of 30-Day Public Comment Period:	Date
Received Verification of Publication:	Date
Public Meeting or Hearing:	Date

3. Project Location:

The project is located approximately 4.3 miles southeast of the intersection of Route 60 (East James Anderson Highway) and Route 15 (South James Madison Highway) in Buckingham County, Virginia.

County: Buckingham
Waterbody: Whispering Creek
Basin: James River
Subbasin: Middle James-Willis
Section: 10
Class: III
Special Standards:
HUC: 020802050202
Latitude & Longitude:
Ski Pond: 37°29'53"N 78°27'23.52"W
Chesapeake Pond: 37°29'20"N 78°25'47"W
U.S.G.S. Quadrangle: Willis Mountain

4. Project Description:

Project Purpose/Description

KMC mines kyanite from Willis Mountain and the East Ridge, in Buckingham County, Va. The property includes two quarries, and the four plants in support of mineral extraction and processing. From these Buckingham County operations, KMC supplies over 100,000 tons per year of the industrial minerals kyanite and mullite into the world economy, the only source of kyanite in North America. The kyanite ore mined at Willis Mountain and the East Ridge is processed at the East Ridge Plant, where it is refined using a multi-step method which includes water intensive froth floatation. KMC proposes to modify the existing Ski Pond water withdrawal permit (10-1938), which authorizes a maximum of 375 gallons per minute (GPM), 0.54 million gallons per day (MGD), and an average withdrawal of 0.36 MGD from the Ski Pond intake, to include an additional withdrawal of 500 GPM of surface water from the proposed Chesapeake Pond intake. The Chesapeake Pond is located downstream of the Ski Pond within the same watershed. Withdrawals occur on an as needed basis but would not exceed a total of 5,000 hours per year at the rate of 875 GPM (including both intakes).

Existing Water Supply System

The existing water supply system includes two onsite ponds, Ski Pond and Chesapeake Pond, both constructed on an unnamed tributary of Whispering Creek. Ski Pond was built in the 1960's and has a surface area of approximately 46 acres. The existing Ski Pond intake is fitted with 3/8-inch screen mesh and can withdraw water up to 5.67 feet per second. A 6-inch diameter pipe extends from the Ski Pond to the East Ridge Plant to supply water for use in the mineral extraction process. The Ski Pond dam is approximately 1,572 feet long, 25 feet wide at the top, and 50 feet tall from the bottom of the stream outfall to the dam crest. The outfall consists of a 72-inch corrugated metal pipe that is offline from the dam and discharges into the unnamed tributary. Water released from Ski Pond passively flows over a concrete weir and out to Mountain Creek, (formerly "Unnamed Tributary of Whispering Creek") a tributary of Whispering Creek.

Chesapeake Pond lies on property owned by Kyanite Mining Corp. but water releases from the pond is managed by the Peter Francisco Soil & Water Conservation District. It is downstream from Ski Pond and has a surface area of approximately 33 acres. The Chesapeake Pond dam is approximately 595 feet long, 244 feet wide from the upstream to downstream toe of slope, and 41 feet tall. The principal spillway has a riser crest elevation of 367.3 feet at which elevation the pond is approximately 32.8 acres. The spillway is a drop inlet structure consisting of a two-way reinforced concrete riser, 30-inch diameter reinforced concrete water pipe, and a rapped plunge pool at the outlet end of the conduit. The water control gate is

an F-type wall thimble 12” deep round crank-operated lift pedestal base opening. The invert opening at the top of the outfall structure is 353.7 feet elevation (normal pool), at which the pond has approximately 12.6 acres of surface area. The outfall pipe has an upstream invert elevation of 342.5 feet elevation at the bottom of the drop inlet and a downstream invert elevation of 341.5 feet elevation at the outfall.

5. Project Purpose & Need:

Purpose of Water Uses and Basis of Need

Pursuant to 9VAC25-210-360, the applicant shall demonstrate to the satisfaction of DEQ that the project meets an established need for water to meet the project purpose. The purpose of the water withdrawal is to support commercial mineral extraction and processing and increased efficiency of mineral extraction. The applicant justified the requested demand by calculating the raw water need based on the maximum duration and timing of plant operations annually. Plant operations fluctuate annually based on mineral prices and economic need. Therefore, the applicant estimated the maximum annual plant operating duration to be approximately 5,000 hours per year.

Water Need: Demand Projection

The Department permits water withdrawals to meet the justified water demands over the 15-year permit term. DEQ evaluated the applicant’s demand projections from the JPA and supplemental information. The applicant justified the requested demand (Table 1) based on the established need through the permit term.

Table 1: Requested Demand	Cumulative Demand Request	Chesapeake Pond Demand Request	Ski Pond Demand Request
Max Annual (Mgal)	262.5	N/A	N/A
Max Monthly (Mgal)	21.88	N/A	N/A
Max Daily (Mgal)	1.26	0.72	0.54

The volumes in Table 2: DEQ Withdrawal Limits below are based on the permit term and will be used to set limits in the permit.

Table 2: DEQ Withdrawal Limits	Cumulative Demand Request	Chesapeake Pond Demand Request	Ski Pond Demand Request
Max Annual (Mgal)	262.5	N/A	N/A
Max Monthly (Mgal)	21.88	N/A	N/A
Max Daily (Mgal)	1.26	0.72	0.54

6. Alternatives Evaluated to Meet the Water Need (Least Environmentally Damaging Practicable Alternative):

Pursuant to 9VAC25-210-360 3 C, the applicant is required to evaluate each alternative for the purpose of establishing the least environmentally damaging practicable alternative. Alternatives were not identified in Buckingham County and Town of Dillwyn Water Supply Plan for Kyanite Mining Corp water withdrawal. Therefore, the applicant considered four alternatives as part of their application. The applicant considered use of groundwater, water recycling, other surface water sources, and a no action alternative. Groundwater resources in that region are insufficient due to low production of existing wells.

Water recycling is already utilized at the plant and would be unable to fully support mineral production on its own. Other nearby surface water sources are not feasible and would require significant infrastructure investments. The plant could continue to operate with the no action alternative. However, the extraction process would not be as efficient at the volume needed during the extraction process.

7. Evaluating Water Withdrawal Volumes Based on Beneficial Use Impacts and Flow-by/Release Requirements:

§ 62.1-11 E establishes that the “right to the use of water or to the flow of water in or from any natural stream, lake or other watercourse in this Commonwealth is and shall be limited to such water as may reasonably be required for the beneficial use of the public to be served.” The Department is directed by § 62.1-44.15:22 to establish limits that preserve instream flow “to the volume of water that may be withdrawn as a part of the permitted activity and conditions necessary to protect beneficial uses.” Pursuant to 9VAC25-210-370 B 3, the Department shall take into consideration the combined effect on the hydrologic regime of the surface water within an affected stream reach due to consumptive water uses in the development of instream flow conditions for new withdrawals. Further, 9VAC25-210-370 D 1 requires a determination that the amount of the surface water withdrawal is limited to the amount of water that can be put to beneficial use.

Department Recommended Withdrawal Limitations

The permit limits surface water withdrawals to the volume justified based upon the application materials submitted and modeling analyses. DEQ concluded that the water demand and statement of need is reasonable and has been adequately justified by the application through the information submitted in the VWP permit application process. Based upon this information, the permit proposes the following limits on the withdrawal volumes:

Ski Pond:

- Maximum Daily: 0.54 Mgal/day

Chesapeake Pond:

- Maximum Daily: 0.72 Mgal/day

Total Combined Withdrawal from Ski and Chesapeake Ponds:

- Maximum Daily: 1.26 Mgal/day
- Maximum Month: 21.88 Mgal/day
- Maximum Year: 262.5 Mgal/day

Based on the material provided in the JPA, as supplemented by the applicant, and the applicable permit term for the proposed withdrawal to be put to beneficial use, DEQ has determined the proposed withdrawal volumes for the project, as limited in the permit, complies with applicable standards identified in 9VAC25-210-370 D 1.

Return Flow / Consumptive Use

Consumptive use is limited due to extensive water capture and recycling methods utilized at the plant along with a series of filtration ponds which discharge water back to the watershed through permitted outfalls.

Cumulative Impact Analysis (CIA)

A cumulative impact analysis was conducted (Attachment A) by DEQ on the withdrawal volumes requested, possible flow-by requirements, the current water supply system, and cumulative impacts to existing beneficial uses and existing water users. Based upon the results of the analysis, DEQ determined the proposed project as limited in the permit, will protect existing beneficial uses while meeting the applicant's purpose and need.

Flow-by and Inflow Release Requirements

Through the analysis conducted by DEQ a minimum release of 40 percent of the mean annual flow was determined to be acceptable for Ski Pond. No minimum release is set for Chesapeake Pond because it is managed by the Peter Francisco Soil & Water Conservation District (District) and the permittee does not control the release from that pond. DEQ coordinated with the District and drawdown of Chesapeake Pond is limited to a maximum of 6 inches per day in order to protect the integrity of the dam structure.

8. Water Supply Plan Review:

The Department is required by § 62.1-44.15:20 C to give full consideration to any relevant information contained in the state water supply plan described in Subsection A of § 62.1-44.38:1. The Buckingham County and Town of Dillwyn Water Supply Plan, submitted for Buckingham County, was developed in accordance with the Water Supply Planning Regulation [9VAC25-780](#). These plans provided the basis of review for the proposed project.

The proposed project alternatives were not included in the Buckingham County and Town of Dillwyn Water Supply Plan. The applicable sections of the plan were considered in DEQ's evaluation of the proposed project.

9. Surface Water Impacts:

Permanent impacts consist of no more than 318 square feet (sq. ft.) (0.007 acre) of wetlands. Permanent impacts are to 0.001 acres (60 sq. ft.) of palustrine forested (PFO) wetland, 0.003 acres (120 sq. ft.) of palustrine emergent (PEM) wetland, and 0.003 acres (138 sq. ft.) of lacustrine unconsolidated bottom (L1UB). A table of the final authorized impacts is below.

Impacts	Impact Site 1	Impact Site 2	Impact Site 3
Type of Impact	Permanent	Permanent	Permanent
Cowardin Classification	L1UB	PEM	PFO
Area of Impact (sq. ft./acres)	138/0.003	120/0.003	60/0.001

Water quality impacts are expected to be temporary and minimal provided the permittee abides by the conditions of the permit. A loss of state waters shall occur. However, the impacts have been avoided and minimized to the greatest extent practicable. **This project qualifies for a U.S. Army Corps of Engineers (USACE) non-reporting nationwide permit (NWP) 58.**

10. Compensation for Unavoidable Impacts:

Compensation for impacts is not required as the total amount of impacts are under the threshold of general permit limits and no tree clearing will occur.

11. Site Inspection:

A site visit was conducted on November 3, 2022 and January 31, 2023. Coordinating agencies attended one of the joint site visits and all parties discussed best options for placement of the proposed intake and best practices for application development.

12. Relevant Regulatory Agency Comments:

As required by [§ 62.1-44.15:20 C](#) and the joint permit application review process, DEQ consulted the appropriate state regulatory agencies and coordinated with various federal regulatory agencies, including the Department of Wildlife Resources, the Department of Conservation and Recreation, the Virginia Marine Resources Commission, the Department of Health, and the U.S. Army Corps of Engineers (USACE). Agencies had 45 days to submit written comments on the proposed permit application after notification by the Department. All written agency comments received were given full consideration and addressed in the VWP individual permit Part I - Special Conditions.

Summary of State Agency Comments and Actions

Comments were requested from the following state agencies via email dated February 7, 2024: Virginia Department of Wildlife Resources (DWR), Virginia Department of Conservation and Recreation (DCR), Virginia Marine Resources Commission (VMRC), the Virginia Soils and Water Conservation District (SWCD), and the Virginia Department of Health (VDH). Failure to provide comments within 45 calendar days of the DEQ request for comments infers that the agency has no comments on the project activities. Comments were received from VDH, DCR, and DWR and are summarized below.

VDH

VDH provided comments on March 4, 2024, which are summarized below:

VDH listed the locations of wells within a 1-mile radius of the project, the only one being a KMC owned well. No public drinking water surface water intakes are located within a 5-mile radius of the project.

Agency comments were forwarded to the applicant.

DCR

DCR provided comments on March 15, 2024, which are summarized below:

No State Natural Area Preserves are in the project vicinity. Natural heritage resources have not been documented in the project area and does not intersect models identifying potential habitat for natural heritage resources. DCR also represents the Virginia Department of Agriculture and Consumer Sciences (VDACS) in comments regarding potential impacts on state-listed threatened and endangered plants and insect species; none will be affected by the project. Additionally, DCR provided floodplain management information.

Agency comments were forwarded to the applicant.

DWR

DWR provided the following comments via email on April 17, 2024 stating they do not anticipate significant adverse impacts to listed species or designated resources as a result of the proposed withdrawal. They recommended 1mm mesh screens and in intake velocity of 0.25 fps be installed on the intake, and that no more than 10% of instantaneous flow be withdrawn. Additionally, because the project is located within 2 miles of documented occurrence of state or federal threatened, or other Natural Heritage coordination species, they recommend coordination with VDCR-DNH.

Agency comments were forwarded to the applicant. DEQ agrees with DWR's recommendation that screens should be meet the current standards to ensure protection of aquatic species. Therefore, Part I special condition D 3 was included to ensure that protection.

Summary of Federal Agency Comments and Actions

The project qualifies for a U.S. Army Corps of Engineers (USACE) **non-reporting nationwide permit (NWP) 58**.

13. Public Involvement during Application Process:

Pre-Application

In accordance with 9VAC25-210-320 B of the VWP Permit Program regulations, for new or expanded surface water withdrawals requiring an individual VWP permit and proposing to withdraw 90 million gallons a month or greater, a potential applicant shall provide an opportunity for public comment on the proposed project. Kyanite Mining Corp. is not proposing to withdraw 90 million gallons a month or greater. Therefore, they were not required to provide an opportunity for public comment prior to application submission.

Riparian/Adjacent Landowner Notification and Local Government

DEQ notified riparian landowners located adjacent to the impact area and within one-half mile downstream of each distinct impact area by letter dated February 14, 2024. No responses were received.

Notifications of riparian and adjacent landowners were conducted in accordance with DEQ's Guidance Memorandum No. 11-2005 (Revised Local Government, Riparian Property Owner, Adjacent Property Owner or Resident, and General Public Notification Procedures for VPDES, VPSA and VWP Permit Applications and Draft Permits).

14. Changes in Permit Part I - Special Conditions Due to Public Comments:

The public notice was published in **The Farmville Herald** on **DATE**. The public comment period was open from **DATE** to **DATE**.

15. Special Conditions:

The following conditions were developed to protect instream beneficial uses, to ensure compliance with applicable water quality standards, to prevent significant impairment of state waters or fish and wildlife resources, and to provide for no net loss of wetland acreage and function through compensatory mitigation and success monitoring and reporting.

Section A *Authorized Activities*

No. 1 addresses the activities authorized by this permit, including impact types and limits.

No. 2 states that the authorized activities shall be conducted in accordance with the application materials and any subsequent materials received during the application process.

No. 3 states that the temporary use of mechanical equipment must be in accordance with this permit and all applicable conditions.

No. 4 requires the applicant to notify DEQ of any changes to the authorized activities or of new activities which require a VWP permit.

Section B Permit Term

Nos. 1 and 2 addresses the permit term and re-issuance process to ensure that all permit conditions are completed.

Section C Standard Project Conditions

No. 1 ensures no unlawful or incidental take of any threatened or endangered species.

No. 2 addresses the requirement for the minimization of adverse impacts to instream beneficial uses.

No. 3 ensures that the project will be executed in a manner that limits the disruption of the movement of aquatic life.

No. 4 ensures that downstream flows will be maintained to protect both instream and off-stream beneficial uses.

No. 5 ensures the minimization of adverse effects on navigation.

No. 6 ensures the passage of expected high flows.

Nos. 7 through 11 set forth all reporting requirements concerning construction, monitoring, compensation, and restoration as required by current law and regulations.

No. 12 prohibits the violation of Water Quality Standards in surface waters as a result of project activities.

No. 13 ensures that dredging and filling operations will minimize stream bottom disturbances and turbidity.

Nos. 14 through 16 provide requirements and limitations on the entry of various materials (including concrete, fill, construction and waste material, fuels, lubricants, and untreated stormwater runoff) into state waters.

No. 17 limits the use of machinery and equipment in surface waters to protect beneficial uses.

Nos. 18 through 21 require temporary disturbances to surface waters during construction to be avoided and minimized to the maximum extent practicable and the restoration of such temporary disturbances.

No. 22 requires the identification of all non-impacted surface waters in the vicinity of the proposed activity to prevent unpermitted impacts.

Section D Surface Water Withdrawals

No. 1 states the use of the water withdrawal is for industrial mining use.

No. 2 establishes the water withdrawal limit for the intakes in Ski and Chesapeake Pond.

No. 3 ensures that intake structure specifications protect aquatic wildlife resources.

No. 4 establishes the minimum release requirements for **Ski Pond**.

No. 5 establishes safe drawdown parameters of Chesapeake Pond.

No. 6 requires submission of a drought management plan within 180 days of issuance.

No. 7 requires conservation measures to protect instream flows during drought events.

Section E Water Withdrawal Monitoring, Recordation and Reporting Conditions

No. 1 requires submission of a Monitoring and Operations Plan within 120 days of permit issuance.

Nos. 2 through 7 establish monitoring and reporting activities and procedures.

Section F Stream Modifications, Including Intake/Outfall Structures

No. 1 prohibits the use of stream substrate for erosion control to avoid additional impacts to state waters.

No. 2 requires upland disposal of material removed from stream substrate to avoid unpermitted impacts to surface waters.

No. 3 direct the placement and contents of materials for the construction of submerged structures, and on-bank storage and staging of materials, to protect water quality and fish and wildlife resources.

Section G Installation of Utilities

No. 1 requires the minimization of disturbance to surface waters and restoration to preconstruction conditions following utility line installation.

No. 2 sets a 90-day time limit for temporary sidecasting during trench excavation to minimize impacts to surface waters.

No. 3 provides the requirements for trench construction to avoid the drainage of surface waters.

Section H Project Construction Monitoring and Submittals (Impact Site)

Nos. 1 through 5 addresses monitoring, submittals and notifications required for monitoring construction activities within authorized impact areas.

16. General Conditions:

General Conditions are applied to all VWP individual permits, as stated in the VWP Permit Program regulation.

17. General Standard:

This project may result in minimal, temporary impacts to beneficial uses related to the propagation and growth of aquatic life as defined in the General Standard. Provided the permittee abides by the conditions of the permit, no substances shall enter state waters in concentrations, amounts or combinations that would contravene established standards or interfere with beneficial uses or are inimical or harmful to human, animal, plant, or aquatic life.

18. DEQ Finds That:

- The proposed activity is consistent with the provisions of the Clean Water Act and State Water Control Law and will protect beneficial uses.
- The amount of the surface water withdrawal is limited to the amount of water that can be put to beneficial use.
- The proposed permit addresses avoidance and minimization of surface water impacts to the maximum extent practicable.
- Based on the size and location of the surface water withdrawal, the withdrawal is not likely to have a detrimental impact on existing instream or offstream uses.
- The effect of the impact will not cause or contribute to a significant impairment of state waters or fish and wildlife resources; adverse impacts on other existing beneficial users; or a violation of water quality standards.
- The proposed permit conditions address no net loss of wetland acreage and function through compensatory mitigation.
- This permit is intended to prevent unpermitted impacts.
- The permit reflects the required consultation with and full consideration of the written recommendations of VMRC, VDH, VDACS, DCR and DWR.

DEQ recommends VWP Individual Permit Number 23-2801 be issued as proposed.

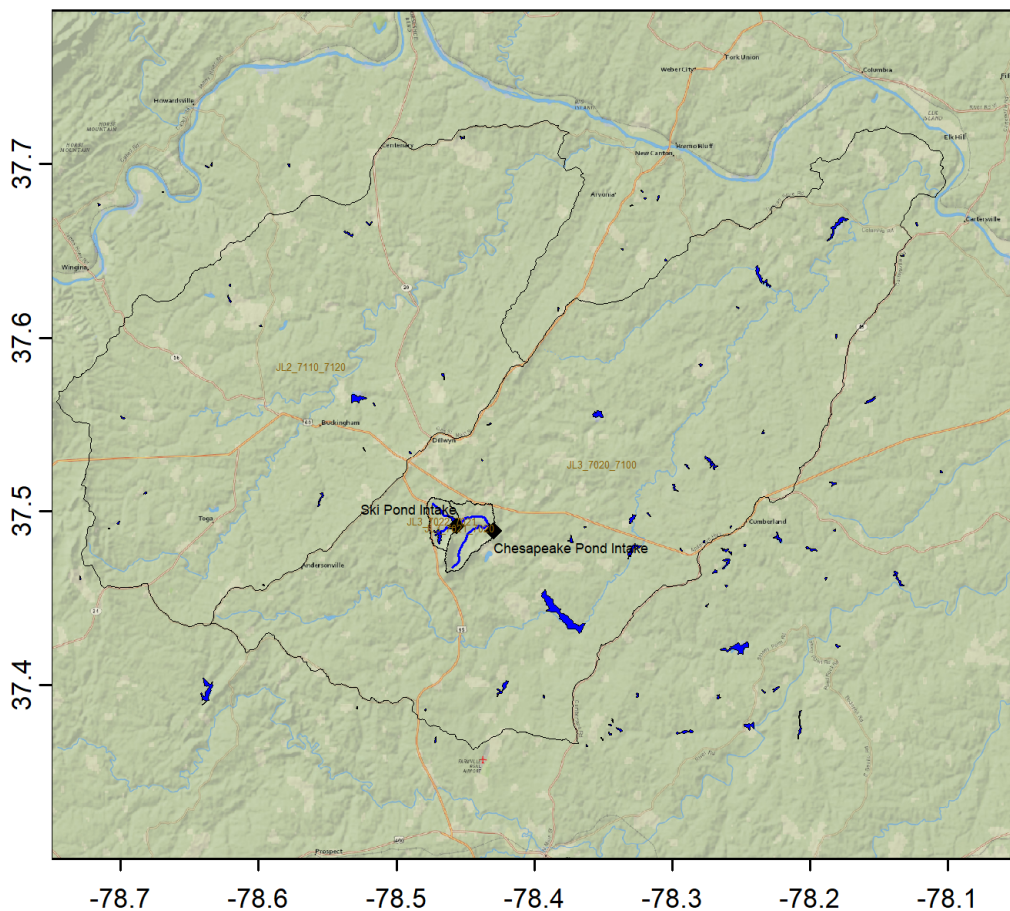
Technical Evaluation – Kyanite Mining Corp. VWP 23-2801

06/25/2024

1. Project Introduction

The Kyanite Mining Corporation operates an intake on the lower Ski Pond reservoir and has proposed a second intake on the Chesapeake Pond further downstream. Kyanite will withdraw water from both reservoirs to satisfy their needs on the mine. The discharge of this water is at least partially covered by VPDES VAG840125 and was assumed to be released into the Willis River. Both reservoirs are on Mountain Creek, a tributary that confluent with Whispering Creek approximately 2000 ft downstream of the Chesapeake Pond. Whispering Creek later joins the Willis River about 5 miles downstream of the confluence with Whispering Creek.

1.1. Location Map



2. Model Overview and Scenario Descriptions

River Model Description This model describes the Willis River above the confluence with the James River. The watershed drainage area is 278 square miles. This segment contains USGS Gage 02034500 Willis River at Lakeside Village, VA which has a drainage area of 262 square miles and was used in the Phase 6 Chesapeake Bay Watershed model calibration. This gage was active between 1984 and 1987, ensuring a comparison can be performed between model data from the same period and the corresponding gage data. Model predictions are fairly close to the gage values. Low flows may be slightly underpredicted and median flows may be a little larger than gaged values. Model performance was generally consistent across all four years, although the largest errors in low flows was noted in 1984 (which may be due to model warm-up). The Willis River is largely free-flowing but the headwater channel Mountain Creek is impounded by two reservoirs on the property of the Kyanite Mining Corporations. Mountain Creek has a drainage area of just 5.29 square miles, just 2% of the watershed drainage area of the Willis River. In the proposed scenario, both impoundments have a minimum release of 40% of the annual average flow in Mountain Creek (the current permit only sets a minimum release for the Ski Pond). The impact of these reservoirs is applied to the Willis River prior to any direct withdraw from the river. Point source from Kyanite is returned to the Willis River directly.

Facility & Intake Model Description This model was set-up to examine the scenario proposed by Kyanite Mining Corp. in VWP 23-2801. In the previous permit and model, Kyanite maintained only a single intake withdrawing a maximum 0.54 MGD from the lower Ski Pond (average permitted withdraw rate of 0.36 MGD). This was modeled originally using by simulating the Kyanite withdraw from the lower Ski Pond, which formed a distinct subwatershed of the Willis River. This allowed for accurate accounting of flows into and out of the reservoir and allowed for the evaluation of minimum releases from the Ski Pond. The upper ski pond was not modeled and was assumed to have minimal impact on overall storage (e.g. it was treated as a run-of-river impoundment). The lower Ski Pond intake is roughly two miles upstream of the confluence to Whispering Creek, a tributary of the Willis River north of Farmville. The dimensions of the Ski Pond were carried forward from the previous modeling effort, with maximum storage maintained at 675.4 ac-ft and a maximum surface area of 20 acres (the current JPA states that GIS estimates of the Ski Pond may be closer to 46 acres, but this will minimally impact available storage). The entire storage of this reservoir was assumed available for withdrawal by Kyanite i.e. there is 0 ac-ft of unusable storage in the Ski Pond. Kyanite has proposed a new intake to withdraw an additional 0.72 MGD from the Chesapeake Pond, a reservoir that is approximately 2000 ft upstream of the confluence with Whispering Creek and nearly 1.5 miles downstream of the lower Ski Pond and the existing intake. Bathymetry and outlet configurations for the Chesapeake Pond were provided in the JPA submitted by the applicant. At normal storage, the Chesapeake Pond maintains approximately 61 ac-ft of storage. Additional storage capacity in the pond is reserved for stormwater control and was not considered in this modeling evaluation. The outlet that controls the normal pool (12.6 ac) is set 10.2 ft from the bottom of the reservoir. It was assumed that 10% of the normal storage was unavailable for withdraw such that Kyanite can only access 54.8 ac-ft of storage from the Chesapeake Pond. The Chesapeake Pond was modeled as a distinct watershed of the Willis River. Flow from the Ski Pond was routed through the Chesapeake Pond model, which discharges water to the larger Willis River. Return water from the Kyanite facility

was approximated to be 75% of the withdraw, which was estimated as a flow of 0.16 MGD for this scenario. This was returned to the Willis River past the watershed outlet of the Chesapeake Pond. The “natural outflow” from each pond–i.e., the outflow that would occur if no withdrawals were occurring–is a function of modeled unit area flow (cfs/square mile) multiplied by pond contributing area. These natural flow values are used in permit simulations to calculate required releases based on permit rules.

To maintain model framework consistency, the entire Kyanite withdrawal (a combined 1.3 MGD) was pulled from the Ski Pond. The Ski Pond was allowed to refill by simulating a pumping of 0.72 MGD (the withdrawal from the Chesapeake Pond) from the Chesapeake Pond. This may slightly oversimulate withdraw from the Kyanite facility, perhaps leading to less available water in the model during critical periods.

The following model scenarios were simulated in order to determine the most effective means of meeting the project need and all other in-stream beneficial uses:

- **Current Permit VWP 10-1938 0.54 MGD Withdrawal from Ski Pond** (VWP 10-1938) - This simulates a maximum 0.54 MGD withdrawal from the lower Ski Pond on Mountain Creek to offset increased Kyanite Demand. The Ski Pond is simulated as a distinct watershed and passes flow to the Chesapeake Pond watershed, which discharges to the Willis River model. The Ski Pond maintains a minimum release equal to 40% of the mean annual flow of Mountain Creek. Total annual withdraw is not to exceed 131.4 MGY. Point source from the Kyanite mine is assumed to be returned to the Willis River, downstream of the Chesapeake Pond. In this scenario, there is no withdraw from the Chesapeake Pond nor is there a minimum release set for the Chesapeake Pond.
- **Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond** (Proposed VWP 23-2801) - This simulates a 1.3 MGD withdrawal from the reservoirs on Mountain Creek to offset increased Kyanite demand. A maximum of 0.72 MGD is withdrawn from the Chesapeake Pond and the remainder of the 1.3 MGD total withdrawal is taken from the upstream lower Ski Pond. Both reservoirs are simulated as distinct watersheds and maintain a minimum release that 40% of the mean annual flow of Mountain Creek at their intake. Total annual withdraw is not to exceed 262.5 MG. Point source from the Kyanite mine is assumed to be returned to the Willis River, downstream of the Chesapeake Pond.

2.1. Table of Modeled Demand Limits:

Description	VWP 10-1938	Proposed VWP 23-2801
Average Daily Volume (MGD)	0.36	0.72
Peak Day Volume (MGD)	0.54	1.30
Maximum Annual Volume (MG)	131.40	262.50

Historical Intake Flows and Drought Flow Indicators

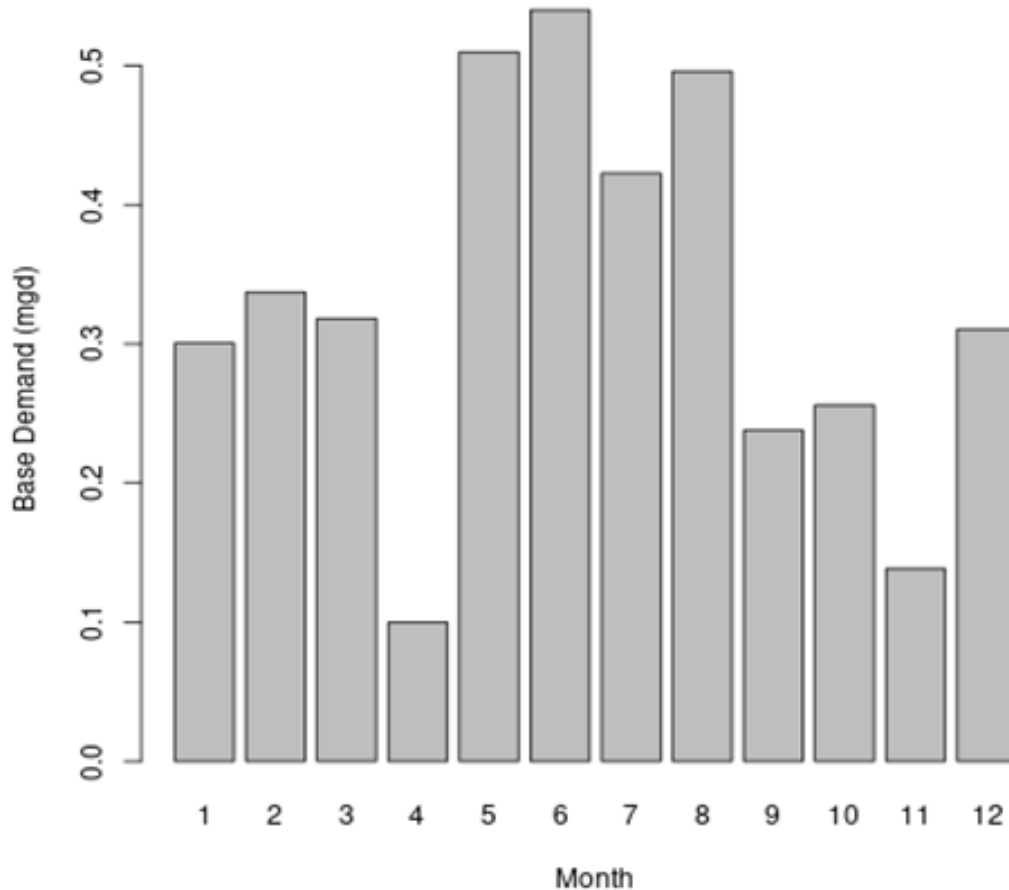
The VAHydro model is used to estimate flows at the project intake, including the impact of all cumulative withdrawals and discharges upstream of the intake location and are presented in Table 1. The Virginia Drought Assessment and Response Plan¹ employs non-exceedance flow percentiles as indicators of drought conditions at particular stream-gaging stations used to monitor drought conditions. Representative daily streamflows above the 25th percentile for return flow frequency represent normal conditions with respect to drought. Representative daily streamflows between the 10th and 25th percentiles represent drought watch conditions. Representative daily streamflows between the 5th and 10th percentiles represent drought warning conditions. Representative daily streamflows below the 5th percentile indicate drought emergency conditions.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan	24.0	72.1	89.4	147.7	167.1	233.4	393.9
Feb	48.4	93.5	115.4	172.9	188.2	268.8	421.4
Mar	30.1	87.9	111.4	167.5	187.0	273.9	475.0
Apr	21.3	60.1	77.5	127.6	141.3	208.9	337.1
May	19.4	49.3	61.4	101.8	116.7	177.4	318.7
Jun	13.2	27.7	35.7	56.2	62.5	93.8	154.2
Jul	9.3	17.0	22.8	35.9	39.7	54.9	107.6
Aug	8.2	14.1	20.6	34.8	38.3	52.9	90.7
Sep	6.1	14.5	18.6	29.3	34.4	61.7	209.9
Oct	3.2	11.2	20.3	40.9	46.8	98.9	230.3
Nov	2.6	15.9	26.8	58.2	66.5	132.6	324.4
Dec	7.4	32.3	50.3	115.4	133.0	218.1	369.2

Table 1: Modeled monthly current flow statistics for Ski Pond Intake (feature ID 442478), Chesapeake Pond Intake (feature ID 616787) in cubic feet per second (cfs). Columns show the minimum (Min) and average (Mean) modeled flow, and a range of non-exceedance flow percentiles, that is, the percent of flows that do *not* exceed the given value. For example, the “10%” states that only 10% of flows in the given month are expected to be less than the indicated value, and therefore, 90% of the flows in that month are expected to be greater than the given value. For example, in the table below the 10% column states that 10% of flows within the month of January would be less than 89 cfs.

¹ [Virginia Drought Assessment and Response Plan](#), developed by the Drought Response Technical Advisory Committee in response to Executive Order #39, March 28, 2003.

2.2. Current Facility Base Demand Before Conservation: Current Permit VWP 10-1938 0.54 MGD Withdrawal from Ski Pond



3. Results

3.1. Summary

Presented below are 2 scenarios to examine the alternatives for this permit re-issuance. A summary of how permit rules affect available water for this permit, and how this operation may impact instream beneficial uses, and other downstream water withdrawals is presented.

- **Current Permit VWP 10-1938 0.54 MGD Withdrawal from Ski Pond** - Under the current permit conditions, Kyanite is allowed a 0.54 MGD withdraw from the lower Ski Pond. Kyanite's full demand was met during the majority of the model simulation under this scenario. Unmet demand occurred during the critical 2001 - 2002 drought period (282 days) and briefly in 2009 (a 6-day period) and totaled 96 MG throughout the entire simulation. The reservoir volume in the Ski Pond was generally maintained at about 15 - 25% of its normal pool volume or

greater but was fully drawn down during the 2001 - 2002 drought period and again briefly in 2009. The Kyanite withdrawal had minor impacts on the Willis River, with slight increases noted in low flows. Higher flows (like mean flow) slightly decreased due to the recharge period on the Ski Pond following drawdown. The increase in low flows on the Willis River are likely a result of the return flow associated with the Kyanite withdraw. The minimum release from the Ski Pond was on average around 0.79 cfs. This fell during periods of lower inflow but remained above zero for more than 99% of the model simulation ensuring that Mountain Creek remained active. There was flow in Mountain Creek downstream of the Chesapeake Pond for 99% of the simulation, although the Creek was dry during the dry 2001 Fall and once in 2017.

- **Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond** - The proposed increase in withdrawal and the second intake on the Chesapeake Pond (simulated via the pump-store in the lower Ski Pond) results in Kyanite achieving an average withdraw of 1.09 MGD. During the majority of the simulation, Kyanite withdrew sufficient water to meet their increased demand even during moderately dry periods. However, during extreme dry periods, the model showed that Kyanite will be unable to pull their requested 1.3 MGD. To maintain flow in Mountain Creek, this model has carried forward the minimum release set in the Ski Pond in the previous permit to both ponds such that each impoundment is required to release at least 40% of the mean annual flow of Mountain Creek at their intakes at all times. During dry periods, this can result in both the Ski and Chesapeake Ponds fully drawing down as their storage is depleted by Kyanite's withdraw and the mandatory minimum release. For instance, during the critical drought period in 2002, the proposed withdraw would result in 213 days of unmet demand, primarily occurring over the summer months. This is a slight reduction in unmet demand from the previous permit rules, likely due to the withdraw distribution across both ponds. Other periods of unmet demand were noted in the summer of 1985, the late fall of 1986, the summer of 1999, throughout 2008, the fall of 2009, and finally in the winter of 2013. There were days in which the reservoirs were depleted such that no water could be withdrawn. A total of 322 MGD of unmet demand occurred throughout the simulation, with approximately half of this unmet demand occurring during the 2002 extreme drought (163 MGD). The minimum release from the Ski and Chesapeake Ponds ensure that additional water is available during periods of lower flow on Mountain Creek. During this simulation, there was always at least some flow in Mountain Creek, although it fell below 0.1 cfs at its lowest point. The increased demand from the facility has little impact on the Willis River downstream due to this balance. Low flows on the Willis River increased slightly, which is likely due to the increase in expected water return from the facility (which increased from about 0.08 MGD to about 0.17 MGD) and the minimum release of the Chesapeake Pond (approximately 2.22 cfs). Median flows decreased by at most 2%, which is likely attributable to the refill demand of the two impoundments on Mountain Creek. The Chesapeake Pond has a relatively small volume (61 ac-ft or less than 10% of storage of the two ponds) during at the normal pool compared to the proposed withdraw (0.72 MGD). This resulted in fluctuation of the Chesapeake Pond level, causing the pond to frequently have little volume to refill the Ski Pond. Storage in the two ponds was generally

maintained at 15% of their normal capacity, although this fell further during the 2002 critical drought. The proposed increase in demand from the Kyanite Mining Corporation overall appears to be viable and the minimum releases set at the impoundments will prevent negative impacts to low flows on the Willis River. Some unmet demand may occur during drier due to the large, proposed demand on the smaller Chesapeake Pond and the required minimum releases at each impoundment, which help to maintain flow in Mountain Creek even during critical drought periods.

3.2. Conclusion

- **Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond** - This analysis was primarily concerned with general water availability and low flow impacts to the Willis River. The increase in demand from the Kyanite Mining Corp. proposed in VWP 23-2801 can be mostly offset through the existing intake on the lower Ski Pond and the proposed intake on the Chesapeake Pond. These model simulations indicated that the increased demand had little impact on the Willis River downstream when coupled with a minimum release from both the Ski (0.8 cfs) and Chesapeake Ponds (2.22 cfs). Low flows in the Willis River increased slightly due to the higher volume of water returned from Kyanite and the new minimum release from the Chesapeake Pond. Mean and median flows decreased slightly as flow in Mountain Creek decreased during refill periods for both reservoirs but overall impacts to the Willis River were fairly minor. During extreme droughts (such as the 2002 drought), the model showed that Kyanite may experience prolonged periods during which at least some of their demand is unmet as storage in both ponds are fully drawn down. The unmet demand during the 2002 drought decreased slightly due to the added storage in the Chesapeake Pond; however, the model simulation showed that the proposed rules will result in increased unmet demand during dry summer and fall periods due to the larger demand and the minimum releases set at each pond. Both ponds were fully drawn down several times during the simulation but maintained at least 15% of their combined storage for 90% of the simulation. The proposed permit is thus the preferred scenario as it reflects Kyanite's updated needs, imparts only minor impacts to low flows in the Willis River, and increases water flow in Mountain Creek during periods of low flow. The drawdown in both ponds was often a result of the minimum release set in the model. This is required to maintain the uses of Mountain Creek but is restrictive during dry periods. If inflow to the impoundments can be accurately monitored and the release from the ponds can be regulated, these rules could be updated in a future permit to account for periods of low flow, perhaps setting the minimum release to the lower of 90% of pond inflow or 40% of mean flow. This will likely increase storage in the ponds during drier periods and result in fewer days of unmet demand.

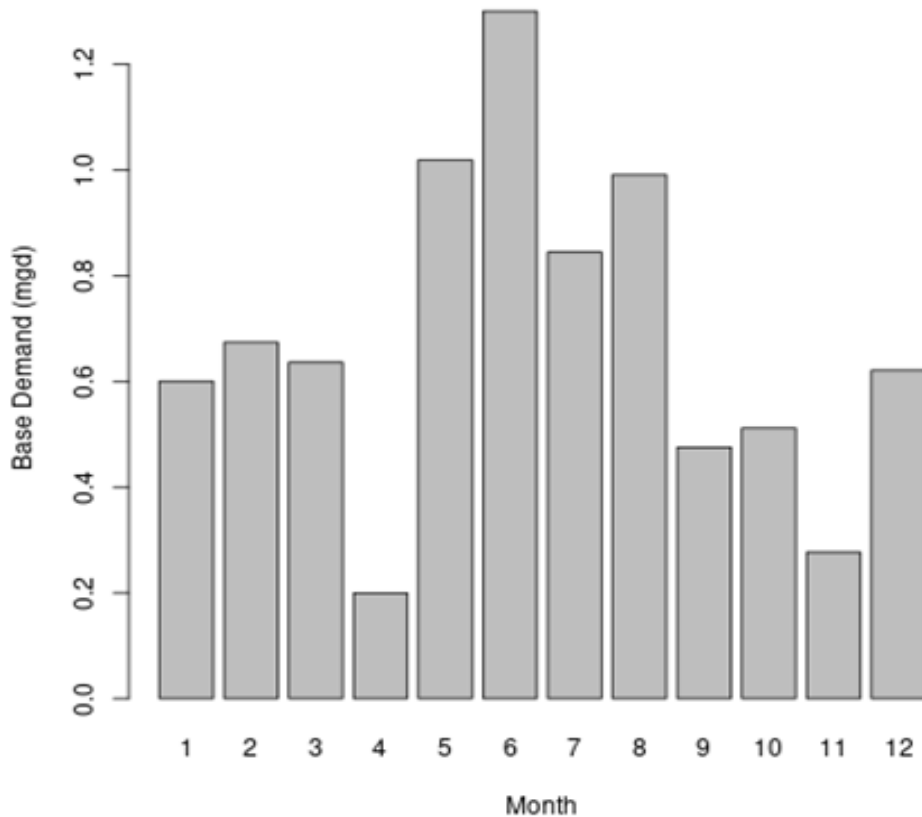
3.2.1. Consumptive Use Table for Proposed Scenario

Modeled monthly consumptive use statistics in the Willis River in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the consumptive user % due to cumulative demands for Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond. Simulated demands include all up-stream demands and demands at Ski Pond Intake (feature ID 442478), Chesapeake

Pond Intake (feature ID 616787) and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	24.1 (+3%)	72.4 (+1%)	89.7 (+0%)	147.4 (-0%)	166.3 (-1%)	232 (-2%)	393.1 (-0%)
Feb (Feb%)	48.5 (+0%)	93.7 (+0%)	115.7 (+0%)	172.2 (-1%)	187.4 (-1%)	267.9 (-1%)	420.6 (+0%)
Mar (Mar%)	30.1 (+2%)	88.1 (+0%)	111.3 (+0%)	166.8 (-1%)	186.4 (-1%)	273.7 (-1%)	474.3 (+0%)
Apr (Apr%)	21.4 (+3%)	60.6 (+1%)	77.9 (+1%)	127.3 (-1%)	141.1 (+0%)	208.8 (+0%)	336.6 (+0%)
May (May%)	19.4 (+3%)	49.4 (+1%)	61.8 (+1%)	101.5 (+0%)	116.7 (-1%)	176.7 (-1%)	318.1 (+0%)
Jun (Jun%)	13.3 (+5%)	27.8 (+2%)	35.8 (+1%)	56.5 (+1%)	62.9 (+1%)	94 (+0%)	154 (+0%)
Jul (Jul%)	9.4 (+8%)	17.1 (+4%)	22.8 (+3%)	36 (+2%)	39.8 (+1%)	55.1 (+1%)	107.5 (+0%)
Aug (Aug%)	7.9 (+3%)	14.1 (+2%)	20.6 (+2%)	34.9 (+2%)	38.4 (+2%)	53 (+1%)	90.5 (+0%)
Sep (Sep%)	6.2 (+12%)	14.5 (+5%)	18.7 (+3%)	29.3 (+2%)	34.5 (+1%)	61.9 (+1%)	209.5 (+0%)
Oct (Oct%)	3.2 (+26%)	11.2 (+6%)	20.4 (+3%)	40.9 (+1%)	46.9 (+1%)	99.3 (+1%)	229.8 (+0%)
Nov (Nov%)	3.2 (+26%)	15.9 (+5%)	26.8 (+2%)	58.5 (+1%)	66.7 (+1%)	132.1 (-1%)	323.9 (+0%)
Dec (Dec%)	7.4 (+10%)	32.3 (+2%)	50.5 (+1%)	115 (+0%)	132.4 (-1%)	216.6 (-1%)	368.4 (+0%)

3.2.2. Demand Chart for Preferred Scenario



3.3. Detailed Cumulative Impact Analysis

The following “Summary of Results” table summarizes the cumulative impacts to flows, aquatic life, and off-stream demand for the project. The section entitled “River Segment Model Statistics” contains mean flows (Flow Out), and drought flows (30- and 90-Day Low Flow), as well as an estimated Consumptive Use Fraction (See description below) as a result of all withdrawals (Cumulative Withdrawal) and discharges (Cumulative Point Source) in the watershed. Minimum Days of Storage Remaining describes the number of days of remaining storage available during the driest period of the model simulation (applicable to impoundment models only). Total Number of Days with Storage < 50% describes the number of days in the simulation in which reservoir levels fall below 50% of full storage. The section entitled “Facility Model Statistics” shows the withdrawals, return flows (Point Source), and the model estimate for potential conservation-required/unmet-demand due to demands exceeding the allowable withdrawal at the intake, or drought triggers based on the cumulative conditions in the watershed and the flow-by rules in effect. There will be one or more columns in this table representing each scenario considered for this analysis.

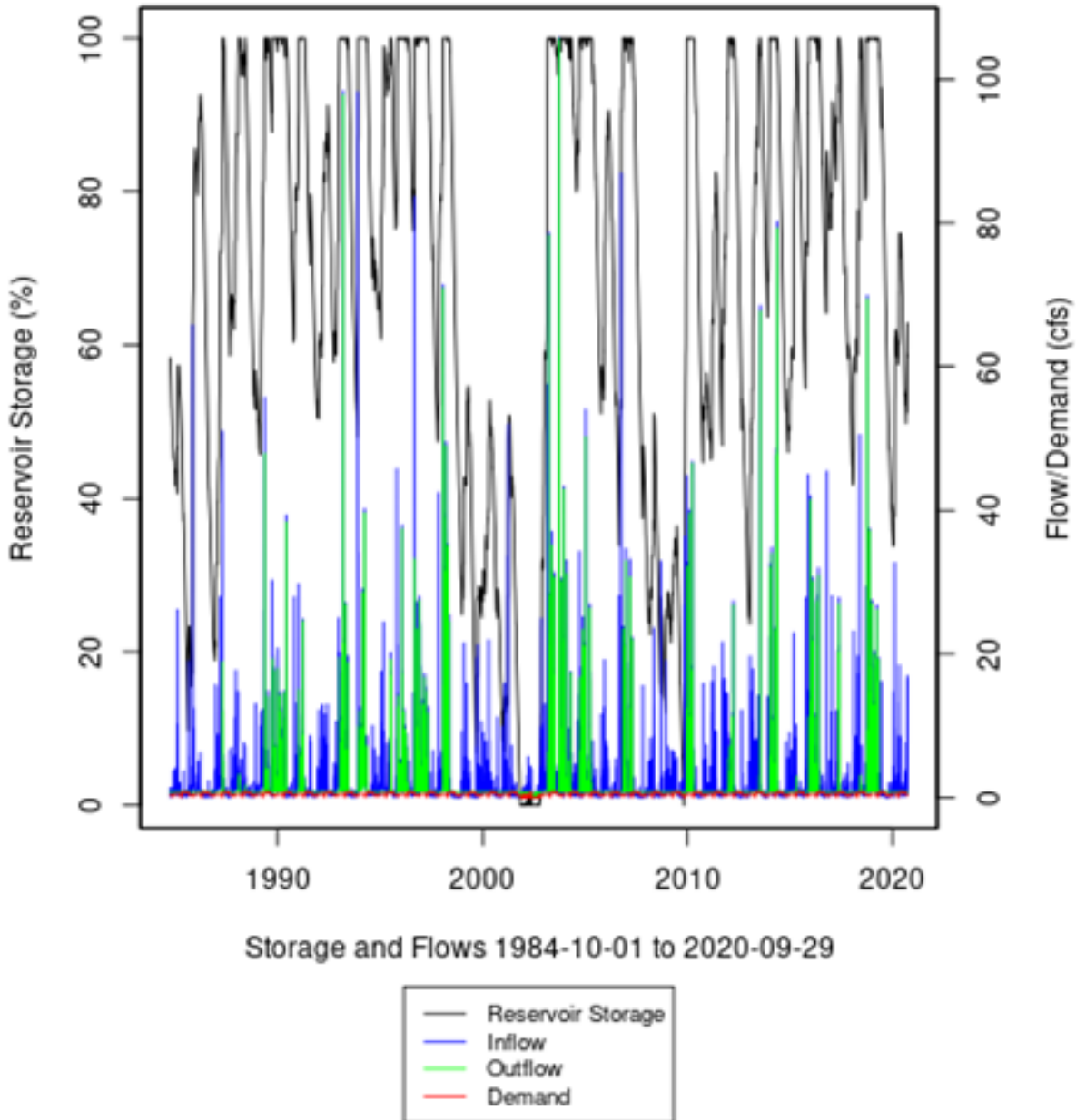
3.3.1. Summary of Results:

Description	VWP 10-1938	Proposed VWP 23-2801
River Segment Model Statistics:	Willis River	Willis River
Flow Out (cfs) - (i.e mean flow)	285.29	284.8
Minimum Days of Storage Remaining	NA	NA
30 Day Low Flow (cfs) (i.e drought flow)	5.66	6.06
90 Day Low Flow (cfs) (i.e drought flow)	14.92	15.21
Consumptive Use Fraction	0	0.01
Cumulative Withdrawal (MGD)	0.32	1.09
Cumulative Point Source (MGD)	0	0
Withdrawal (MGD)	0	0
Point Source (MGD)	0	0
Facility Model Statistics:	Willis Mountain Mining Complex:Mountain Creek	Willis Mountain Mining Complex:Mountain Creek
Base Demand (MGY)	120.97	248.29
Withdrawal (MGY)	118.29	239.36
Conservation/Unmet Demand (MGY)	2.68	8.93
Requested Demand (MGD)	0.33	0.68
Withdrawal Met (MGD)	0.32	0.66
Point Source (MGD)	0.08	0.16
Groundwater Demand (MGD)	0	0
Maximum 30-day conservation/unmet demand (MGD)	0.54	1.3

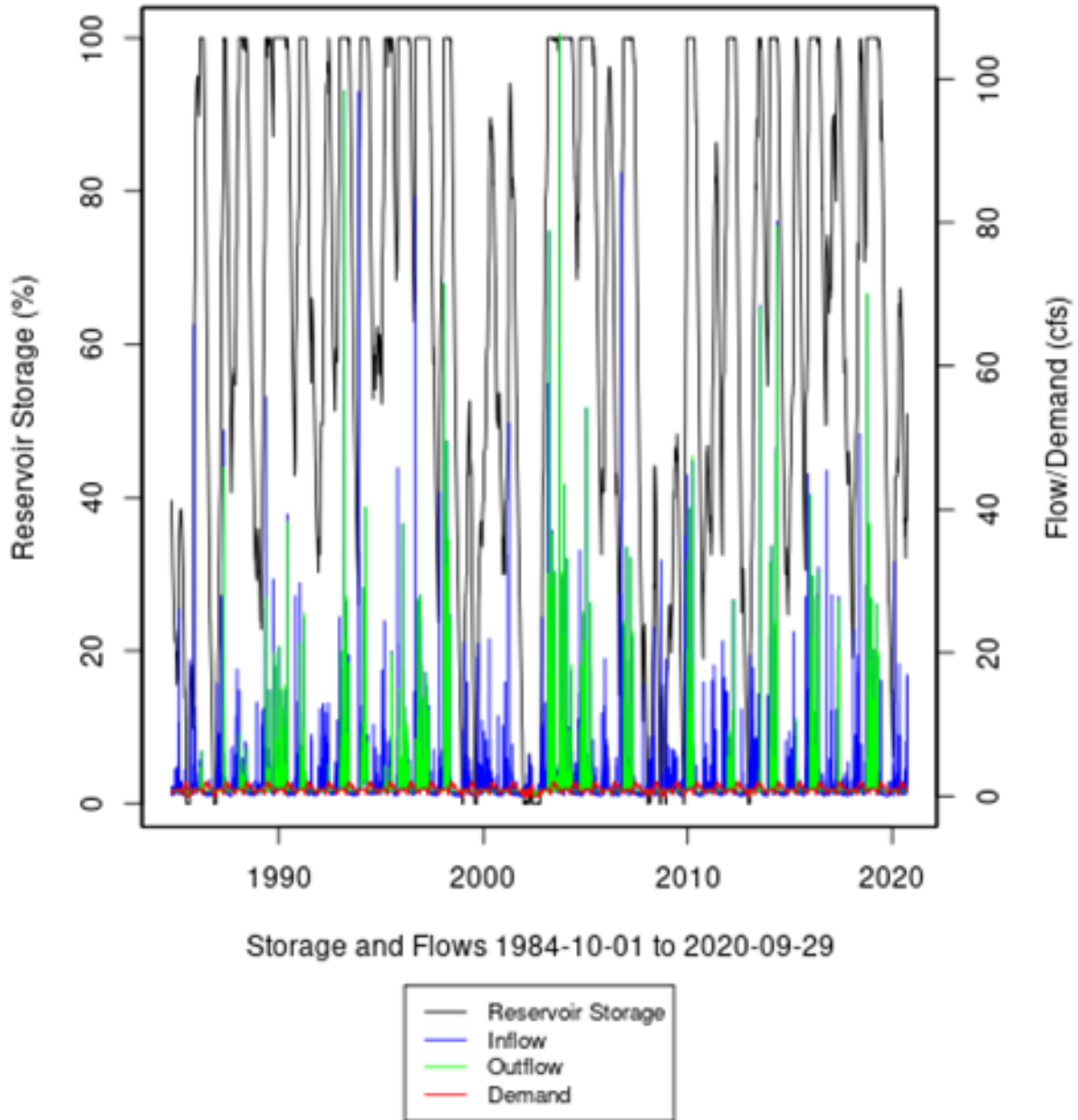
3.3.2. Analysis of Reservoir Storage:

The following reservoir storage plots depict changes in reservoir storage under each scenario (indicated in black), as well as simulated inflow to the reservoir (blue), simulated outflow from the reservoir (green), and system demand for the given scenario (red). For water supply reservoirs, a minimum of 60 days of remaining storage over the course of the simulation is recommended. System demand varies seasonally.

3.3.2.1. Reservoir Storage: VWP 10-1938



3.3.2.2. Reservoir Storage: Proposed VWP 23-2801



3.3.3. Cumulative Consumptive Use Plots:

3.3.3.1. Cumulative use for Current Permit VWP 10-1938 0.54 MGD Withdrawal from Ski Pond

Modeled monthly consumptive use statistics in the Willis River in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the consumptive use % due to cumulative demands for Current Permit VWP 10-1938 0.54 MGD Withdrawal from Ski Pond . Simulated demands include demands at Ski Pond Intake (feature ID 442478), Chesapeake Pond Intake (feature ID 616787) , including all up-stream demands and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	24 (+3%)	72.1 (+0%)	89.4 (+0%)	147.7 (-0%)	167.1 (-0%)	233.4 (-1%)	393.9 (-0%)
Feb (Feb%)	48.4 (+0%)	93.5 (+0%)	115.4 (+0%)	172.9 (-1%)	188.2 (+0%)	268.8 (+0%)	421.4 (+0%)
Mar (Mar%)	30.1 (+2%)	87.9 (+0%)	111.4 (+0%)	167.5 (-1%)	187 (+0%)	273.9 (+0%)	475 (+0%)
Apr (Apr%)	21.3 (+3%)	60.1 (+0%)	77.5 (+0%)	127.6 (+0%)	141.3 (+0%)	208.9 (+0%)	337.1 (+0%)
May (May%)	19.4 (+3%)	49.3 (+1%)	61.4 (+1%)	101.8 (+0%)	116.7 (-1%)	177.4 (+0%)	318.7 (+0%)
Jun (Jun%)	13.2 (+4%)	27.7 (+2%)	35.7 (+1%)	56.2 (+1%)	62.5 (+0%)	93.8 (+0%)	154.2 (+0%)
Jul (Jul%)	9.3 (+7%)	17 (+3%)	22.8 (+2%)	35.9 (+1%)	39.7 (+1%)	54.9 (+1%)	107.6 (+0%)
Aug (Aug%)	8.2 (+8%)	14.1 (+3%)	20.6 (+2%)	34.8 (+1%)	38.3 (+2%)	52.9 (+1%)	90.7 (+0%)
Sep (Sep%)	6.1 (+11%)	14.5 (+4%)	18.6 (+3%)	29.3 (+2%)	34.4 (+1%)	61.7 (+1%)	209.9 (+0%)
Oct (Oct%)	3.2 (+25%)	11.2 (+6%)	20.3 (+3%)	40.9 (+1%)	46.8 (+1%)	98.9 (+0%)	230.3 (+0%)
Nov (Nov%)	2.6 (+1%)	15.9 (+4%)	26.8 (+2%)	58.2 (+1%)	66.5 (+0%)	132.6 (+0%)	324.4 (+0%)
Dec (Dec%)	7.4 (+10%)	32.3 (+2%)	50.3 (+1%)	115.4 (+0%)	133 (-1%)	218.1 (-1%)	369.2 (+0%)

3.3.3.2. Cumulative use for Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond

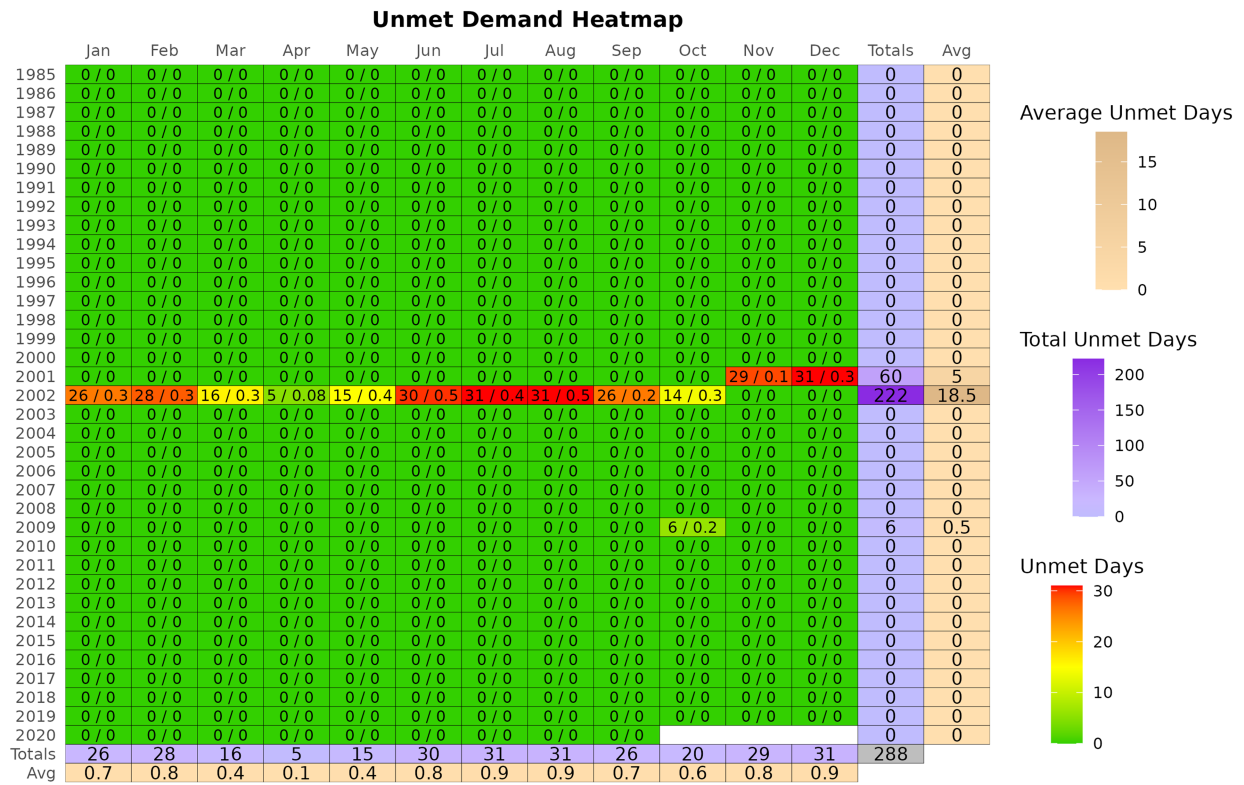
Modeled monthly consumptive use statistics in the Willis River in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the consumptive use % due to cumulative demands for Proposed Conditions for VWP 23-2801, 1.3 MGD total withdrawal from Ski Pond and Chesapeake Pond . Simulated demands include demands at Ski Pond Intake (feature ID 442478), Chesapeake Pond Intake (feature ID 616787) , including all up-stream demands and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	24.1 (+3%)	72.4 (+1%)	89.7 (+0%)	147.4 (-0%)	166.3 (-1%)	232 (-2%)	393.1 (-0%)
Feb (Feb%)	48.5 (+0%)	93.7 (+0%)	115.7 (+0%)	172.2 (-1%)	187.4 (-1%)	267.9 (-1%)	420.6 (+0%)
Mar (Mar%)	30.1 (+2%)	88.1 (+0%)	111.3 (+0%)	166.8 (-1%)	186.4 (-1%)	273.7 (-1%)	474.3 (+0%)
Apr (Apr%)	21.4 (+3%)	60.6 (+1%)	77.9 (+1%)	127.3 (-1%)	141.1 (+0%)	208.8 (+0%)	336.6 (+0%)
May (May%)	19.4 (+3%)	49.4 (+1%)	61.8 (+1%)	101.5 (+0%)	116.7 (-1%)	176.7 (-1%)	318.1 (+0%)
Jun (Jun%)	13.3 (+5%)	27.8 (+2%)	35.8 (+1%)	56.5 (+1%)	62.9 (+1%)	94 (+0%)	154 (+0%)
Jul (Jul%)	9.4 (+8%)	17.1 (+4%)	22.8 (+3%)	36 (+2%)	39.8 (+1%)	55.1 (+1%)	107.5 (+0%)
Aug (Aug%)	7.9 (+3%)	14.1 (+2%)	20.6 (+2%)	34.9 (+2%)	38.4 (+2%)	53 (+1%)	90.5 (+0%)
Sep (Sep%)	6.2 (+12%)	14.5 (+5%)	18.7 (+3%)	29.3 (+2%)	34.5 (+1%)	61.9 (+1%)	209.5 (+0%)
Oct (Oct%)	3.2 (+26%)	11.2 (+6%)	20.4 (+3%)	40.9 (+1%)	46.9 (+1%)	99.3 (+1%)	229.8 (+0%)
Nov (Nov%)	3.2 (+26%)	15.9 (+5%)	26.8 (+2%)	58.5 (+1%)	66.7 (+1%)	132.1 (-1%)	323.9 (+0%)
Dec (Dec%)	7.4 (+10%)	32.3 (+2%)	50.5 (+1%)	115 (+0%)	132.4 (-1%)	216.6 (-1%)	368.4 (+0%)

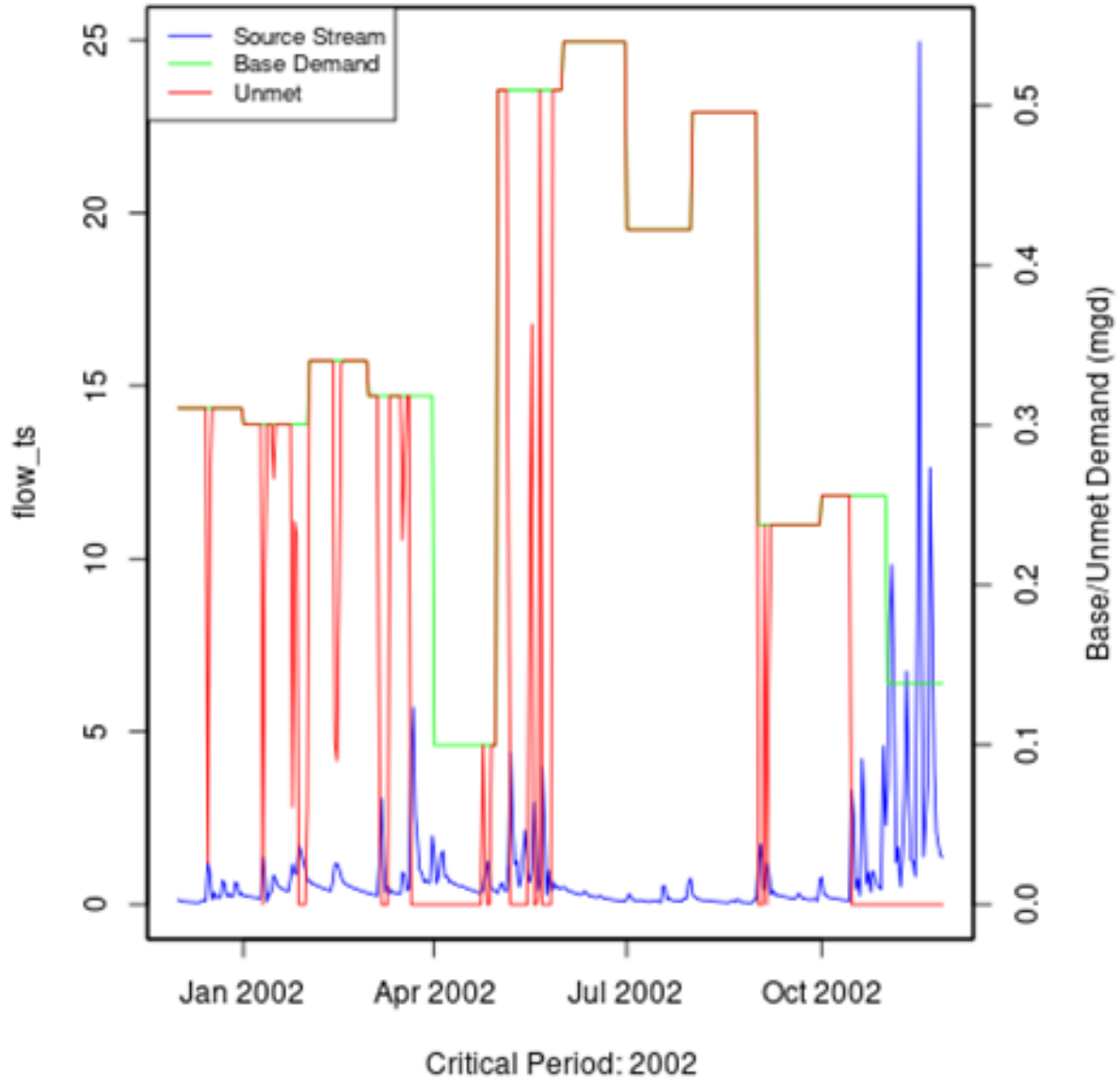
3.3.4. Analysis of Potential Conservation/Unmet Demand at the River Intake:

The following grids are data plotting tools that help visualize data as magnitudes of color intensity. These depict the number of days with required conservation demand reductions or unmet demands for each month of the simulation (due to drought triggers or demands exceeding allowable withdrawal at the intake based on the cumulative conditions in the watershed and the flow-by rules in effect). The cells show the amount of reductions/unmet demand for each month [Number of Unmet Days & Amount (MGD)]. Hydrographs are shown for the period of the simulation with greatest reduction/unmet demand.

3.3.4.1. Drought reduction/Unmet Demand: VWP 10-1938



3.3.4.2. Hydrograph: VWP 10-1938



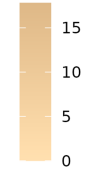
[1] "No local facility impoundment for VWP 10-1938"

3.3.4.3. Drought reduction/Unmet Demand: Proposed VWP 23-2801

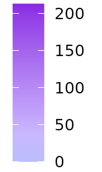
Unmet Demand Heatmap

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg
1985	0/0	0/0	0/0	0/0	0/0	6/1	31/0.8	21/1	0/0	0/0	0/0	0/0	58	4.8
1986	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	5/0.5	30/0.3	5/0.6	40	3.3
1987	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1988	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1989	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1990	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1991	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1992	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1993	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1994	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1995	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1996	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1997	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
1998	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	7/0.6	7	0.6
1999	6/0.6	0/0	0/0	0/0	0/0	0/0	0/0	27/1	8/0.5	0/0	0/0	0/0	41	3.4
2000	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2001	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	12/0.6	12	1
2002	28/0.5	28/0.7	17/0.6	0/0	5/0.7	30/1	31/0.8	31/1	29/0.5	14/0.5	0/0	0/0	213	17.8
2003	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2004	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2005	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2006	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2007	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2008	14/0.6	4/0.7	1/0.3	0/0	0/0	0/0	0/0	13/1	7/0.4	0/0	0/0	5/0.6	44	3.7
2009	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	13/0.5	0/0	0/0	13	1.1
2010	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2011	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2012	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	15/0.6	15	1.2
2013	2/0.4	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	2	0.2
2014	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2015	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2016	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2017	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2018	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2019	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
2020	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0	0
Totals	50	32	18	0	5	36	62	92	44	32	30	44	445	
Avg	1.4	0.9	0.5	0	0.1	1	1.7	2.6	1.2	0.9	0.8	1.2		

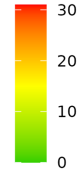
Average Unmet Days



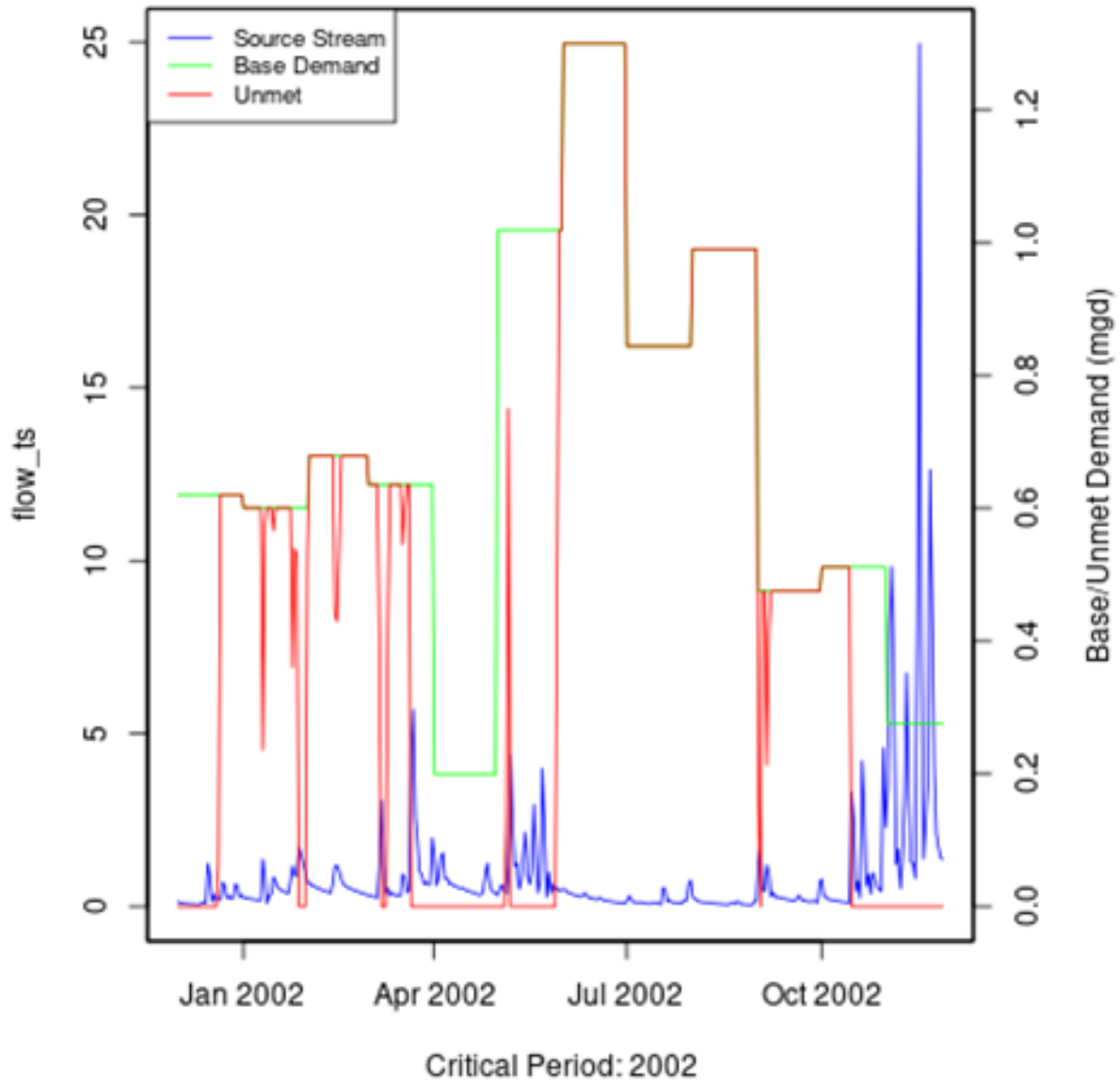
Total Unmet Days



Unmet Days



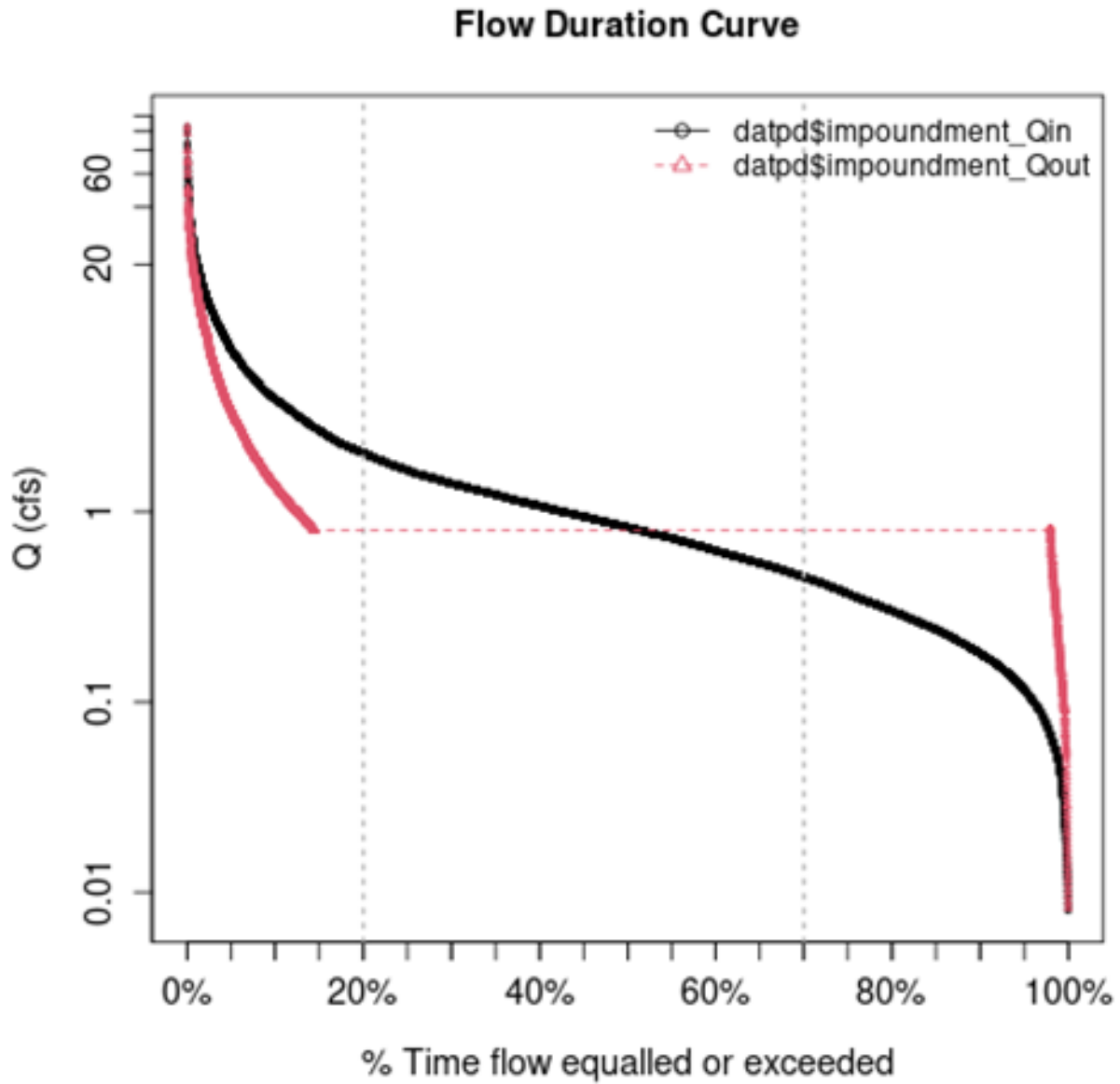
3.3.4.4. Hydrograph: Proposed VWP 23-2801



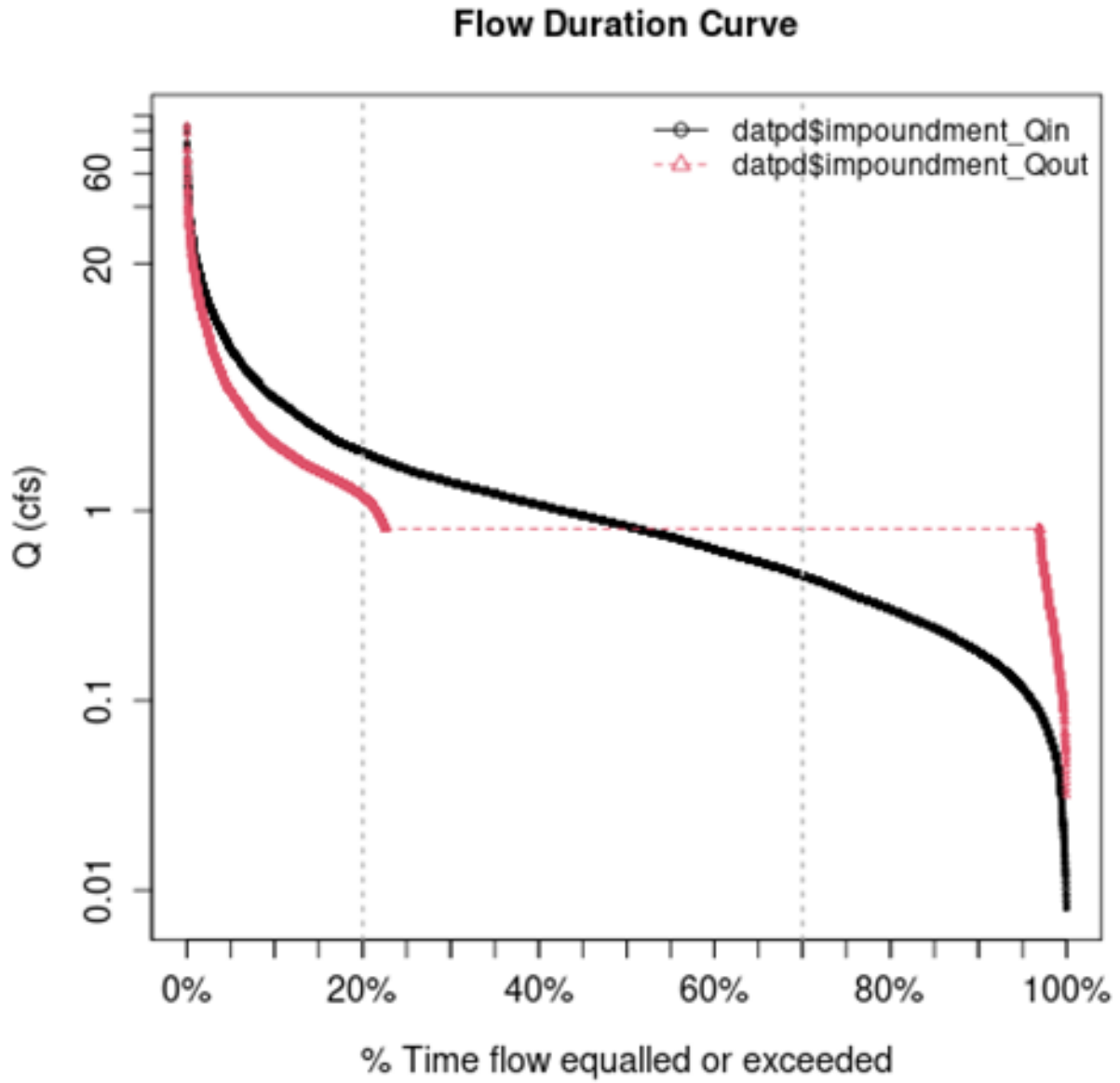
[1] "No local facility impoundment for Proposed VWP 23-2801"

3.3.5. Additional Model Flow Plots:

3.3.5.1. VWP 10-1938 :



3.3.5.2. Proposed VWP 23-2801 :



4. VAHydro Model:

4.1. Appendix B - VAHydro

The comprehensive VAHydro hydrologic model is used by the DEQ Office of Water Supply to evaluate instream and off-stream beneficial uses for non-tidal surface water withdrawals throughout Virginia. This model also simulates streamflow with inputs such as precipitation, climate, land use, and topography, as well as local data collected through DEQ water supply planning and reporting programs, which includes all known withdrawals and discharges, as well as operational rules of Virginia Water Protection (VWP) permits and major hydrologic features such as reservoirs.

The VAHydro model is built on the rainfall-evaporation-runoff (RER) time-series from the Chesapeake Bay Model Phase 6². The VAHydro model simulates conditions from 1984-2014 in the Chesapeake Bay watershed drainage, and 1984-2005 in the rivers flowing outside of the Chesapeake Bay watershed. The VAHydro model features high-resolution hydrologic subsections called “river segments” (over 600 river segments in total), roughly the size of HUC 10 hydrologic units, with additional high-resolution segments added for VWP modeling projects as needed.

4.2. Cumulative Impact Analysis (CIA)

DEQ assesses water supply sustainability through Cumulative Impact Analysis (CIA). CIA is a modeling and analysis approach that takes into account the varied hydrologic processes occurring throughout a river network (including meteorological and human water use). By simulating a daily water balance for every individual river segment within a watershed, DEQ is able to evaluate the potential “cumulative impact” of all streamflow changes occurring upstream and downstream of any location within the river system, as well as the downstream impact of a specific proposed or permitted surface water withdrawal.

The goal of the following analysis is to estimate the potential impacts of the proposed water withdrawal upon existing beneficial uses, including both in-stream and off-stream uses. In addition, cumulative impacts from all existing withdrawals are included in the evaluation.

4.2.1. Glossary of Cumulative Impact Modeling Terms

- 30 Day Low Flow (130): Describes the lowest consecutive 30-day average daily streamflow over the simulation period. This metric is a representation of a short-term, or acute drought.
- 90 Day Low Flow (190): Represents the lowest consecutive 90-day average daily streamflow over the simulation period. This would represent a prolonged drought.
- Base Demand / Requested Demand: The demand simulated for a facility/intake prior to any reductions due to conservation, depleted storage, or adherence to

² Chesapeake Bay Program Phase 6 Model.

Minimum Instream Flow operational rules (MIF). In this document, *Base Demand* is expressed as *MGY*, and Requested Demand is given in *MGD*.

- CFS: Cubic Feet Per Second, a common unit of measuring stream flow.
- Consumptive Use Fraction (CU): This is calculated as a fraction of modeled Flow, so it is $CU = 1.0 - (\text{Flow} / \text{Flow_Baseline})$, where $\text{Flow_Baseline} = (\text{Flow} + \text{WD} - \text{PS})$, and WD and PS are the total cumulative withdrawals and point source discharges above the point in the stream. In other words, for calculating baseline flow, we take modeled outflow from the river, add the withdrawals back in, and subtract the point source in order to estimate a baseline flow balance. This almost always ends up being a higher number than the modeled Flow out, so it tells us the fraction of baseline flow that is consumed. Occasionally there are water transfers and point sources from groundwater or point sources that cross watershed boundaries that can make the CU fraction in some watersheds negative, i.e. $\text{Flow} > \text{Flow_Baseline}$.
- Cumulative Withdrawal: The amount of water withdrawn by all intakes in a given river segment sub-watershed, and all upstream sub-watersheds. See also: *Cumulative Withdrawal*.
- Days of Storage Remaining: For reservoir models, the quotient of the volume of water in a reservoir divided by the daily rate of withdrawal, calculated at each time step of the entire simulation period.
- Maximum 30-day potential drought reduction/Unmet Demand (MGD): The largest difference between *Requested Demand* and *Withdrawal Met* that results during a continuous 30-day simulation period.
- MGD: Millions of Gallons per Day, a common unit of measuring withdrawal and discharge.
- MGY: Millions of Gallons per Year, a common unit for expressing annual facility demand.
- Minimum Days of Storage Remaining: The minimum simulated *Days of Storage Remaining* in a reservoir.
- Point Source: Water returned to the stream as treated wastewater.
- Withdrawal: The amount of water withdrawn by a single facility, or the total amount of water withdrawn within a single simulated river segment sub-watershed. See also: *Cumulative Withdrawal*.
- Withdrawal Met: The amount of requested demand that was met, on average, throughout the entire simulation period.
- Drought Reduction/Unmet Demand: The difference between *Base Demand* and *Withdrawal Met*, on average, throughout the entire simulation period.

5. Appendix A - Ecological Impacts Assessment:

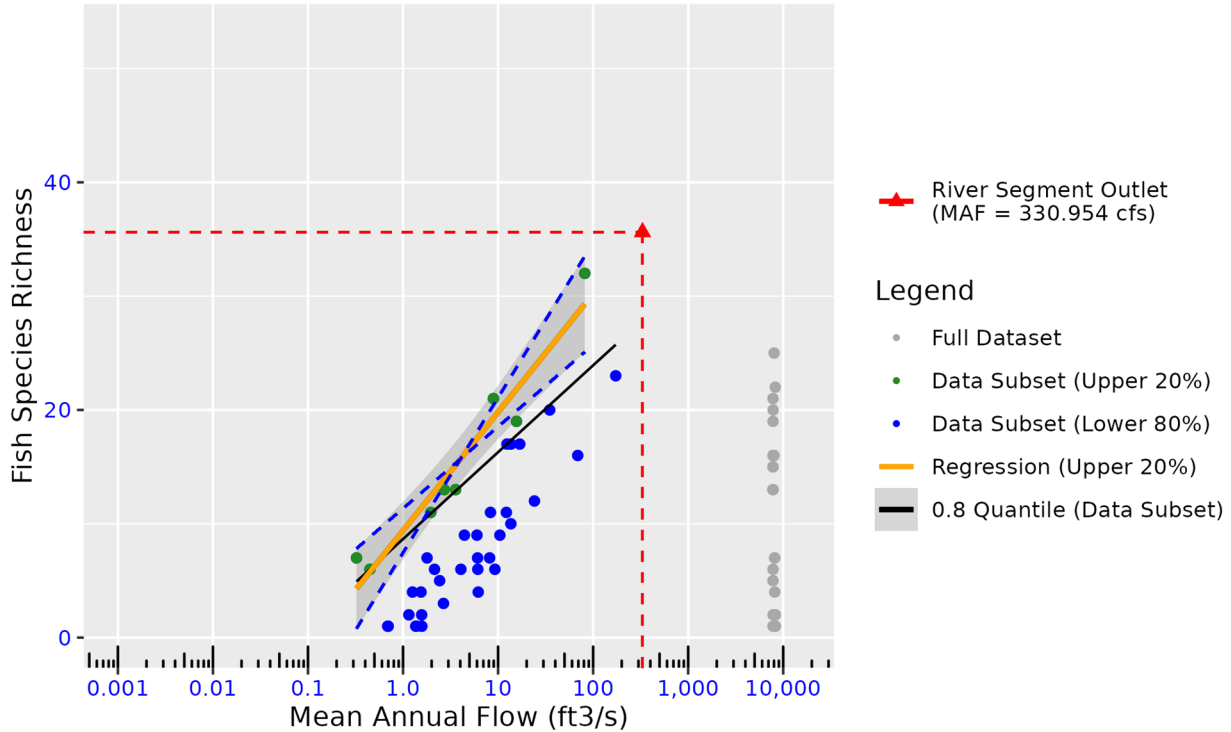
5.1. Elfgen:

In response to a need for better environmental flow metrics, DEQ has developed a new framework for characterizing relations between streamflow and aquatic organism species richness. Part of an evolving approach to managing environmental flows for maintaining aquatic life; this methodology builds on existing minimum instream flow approaches, allowable withdrawals as a percentage of flow, and extensive flow-habitat studies. For the first time this new framework may allow quantification of potential species loss resulting from flow change and may offer an improved understanding of aquatic life risk variability due to geographic location, stream size and local scale.

This new flow-ecology framework referred to as “elfgen” (*pronounced elf-jen*) derives its name from Ecological Limit Function (ELF) generation (*ELF-gen*). In order to calculate river segment-level richness change, elfgen is first used to produce ELFs, or relations between stream flow and species richness at the HUC 8 scale (See plot below). This is achieved using long term datasets for both ecological and hydrologic data. Ecological data (Fish species richness) is sourced from the VAHydro-EDAS dataset. Hydrologic data (Average Annual Flow) is sourced from the National Hydrography Dataset Plus. The Richness Change values presented in the table below are derived from this flow-ecology relation.

Containing Hydrologic Unit: nhd_huc8_02080205

River Segment: Willis River



m: 4.52 b: 9.399 r²: 0.935 adj r²: 0.924 p: 0
 Upper 20% n: 8 Data Subset n: 40 Full Dataset n: 64
 Breakpoint: 530 cfs

Estimates for richness change are presented both as an absolute number of species (Richness Change (abs)) and as a percentage of the total number of species present (Richness Change (%)). Richness change calculations are derived from the estimated percent total consumptive use³. Note: elfgen methodology only applicable for watersheds < 800 cfs mean annual flow.

Description	VWP 10-1938	Proposed VWP 23-2801
Consumptive Use (%)	0	1
Cumulative Withdrawal (MGD)	0.32	1.09
Richness Change (abs)	-0.01	-0.03
Richness Change (%)	-0.02	-0.08

³ Kleiner et al: <https://onlinelibrary.wiley.com/doi/full/10.1111/1752-1688.12876> & Rapp et al: <https://onlinelibrary.wiley.com/doi/full/10.1111/1752-1688.12877>

6. Appendix C - Nearby Users Table:

	Location	Sub-Watershed	MP Type	MP Name	MP Status	MP 5-yr Avg Use (MGY)	Facility Name	Facility 5-yr Avg Use (MGY)	Facility 2040 Use (MGY)	Proposed VWP 23-2801: base_demand_mgy
1	-	Willis River	intake	Ski Pond Withdrawal	active	9.67	Kyanite Mining Corporation Willis Mountain Plant	9.67	5.5	248.29
2	-	Willis River	intake	Chesapeake Pond Intake	proposed	0.00	Kyanite Mining Corporation Willis Mountain Plant	9.67	5.5	248.29

Attachment B – Water Conservation

Mandatory Non-essential Water Use Restrictions Virginia Drought Assessment and Response Plan

The following non-essential water uses will be prohibited during periods of declared drought emergencies. Please note the exceptions that follow each prohibited use. These prohibitions and exceptions will apply to uses from all sources of water and will only be effective when the Governor of Virginia or the Virginia Drought coordinator declares a Drought Emergency. Water use restrictions shall not apply to the agricultural production of food or fiber, the maintenance of livestock including poultry, nor the commercial production of plant materials, *provided that best management practices are applied to assure the minimum amount of water is utilized.*

1. *Unrestricted irrigation of lawns is prohibited.*

- Newly sodded and seeded areas may be irrigated to establish cover on bare ground at the minimum rate necessary for no more than a period of 60 days. Irrigation rates may not exceed one inch of applied water in any 7-day period.
- Gardens, bedding plants, trees, shrubs and other landscape materials may be watered with handheld containers, handheld hoses equipped with an automatic shutoff device, sprinklers or other automated watering devices at the minimum rate necessary but in no case more frequently than twice per week. Irrigation should not occur during the heat of the day.
- All allowed lawn irrigation must be applied in a manner to assure that no runoff, puddling, or excessive watering occurs.
- Irrigation systems may be tested after installation, routine maintenance, or repair for no more than ten minutes per zone.

2. *Unrestricted irrigation of golf courses is prohibited.*

- Tees and greens may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary.
- Localized dry areas may be irrigated with a handheld container or handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
- Greens may be cooled by syringing or by the application of water with a handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
- Fairways may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary not to exceed one inch of applied water in any ten-day period.
- Fairways, tees and greens may be irrigated during necessary overseeding or resodding operations in September and October at the minimum rate necessary. Irrigation rates during this restoration period may not exceed one inch of applied water in any seven-day period.

- Newly constructed fairways, tees and greens and areas that are re-established by sprigging or sodding may be irrigated at the minimum rate necessary not to exceed one inch of applied water in any seven-day period for a total period that does not exceed 60 days.
- Fairways, tees and greens may be irrigated without regard to the restrictions listed above so long as:
 - The only water sources utilized are water features whose primary purpose is stormwater management;
 - Any water features utilized do not impound permanent streams;
 - During declared Drought Emergencies these water features receive no recharge from other water sources such as ground water wells, surface water intakes, or sources of public water supply; and,
 - All irrigation occurs between 9:00 p.m. and 10:00 a.m.
- All allowed golf course irrigation must be applied in a manner to assure that no runoff, puddling or excessive watering occurs.
- Rough areas may not be irrigated.

3. ***Unrestricted irrigation of athletic fields is prohibited.***

- Athletic fields may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at a rate not to exceed one inch per application or more than a total of one inch in multiple applications during any ten-day period. All irrigation water must fall on playing surfaces with no outlying areas receiving irrigation water directly from irrigation heads.
- Localized dry areas that show signs of drought stress and wilt (curled leaves, foot-printing, purpling) may be syringed by the application of water for a cumulative time not to exceed fifteen minutes during any twenty-four-hour period. Syringing may be accomplished with an automated irrigation system or with a handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
- Athletic fields may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. during necessary overseeding, sprigging or resodding operations at the minimum rate necessary for a period that does not exceed 60 days. Irrigation rates during this restoration period may not exceed one inch of applied water in any seven-day period. Syringing is permitted during signs of drought stress and wilt (curled leaves, foot-printing, purpling).
- All allowed athletic field irrigation must be applied in a manner to assure that no runoff, puddling or excessive watering occurs.
- Irrigation is prohibited on athletic fields that are not scheduled for use within the next 120-day period.

- Water may be used for the daily maintenance of pitching mounds, home plate areas and base areas with the use of handheld containers or handheld hoses equipped with an automatic shutoff device at the minimum rate necessary.
 - Skinned infield areas may utilize water to control dust and improve playing surface conditions utilizing handheld containers or handheld hoses equipped with an automatic shutoff device at the minimum rate necessary no earlier than two hours prior to official game time.
4. ***Washing paved surfaces such as streets, roads, sidewalks, driveways, garages, parking areas, tennis courts, and patios is prohibited.***
- Driveways and roadways may be pre-washed in preparation for recoating and sealing.
 - Tennis courts composed of clay or similar materials may be wetted by means of a hand-held hose equipped with an automatic shutoff device at the minimum rate necessary for maintenance. Automatic wetting systems may be used between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary.
 - Public eating and drinking areas may be washed using the minimum amount of water required to assure sanitation and public health.
 - Water may be used at the minimum rate necessary to maintain effective dust control during the construction of highways and roads.
5. ***Use of water for washing or cleaning of mobile equipment including automobiles, trucks, trailers and boats is prohibited.***
- Mobile equipment may be washed using handheld containers or handheld hoses equipped with automatic shutoff devices provided that no mobile equipment is washed more than once per calendar month and the minimum amount of water is utilized.
 - Construction, emergency or public transportation vehicles may be washed as necessary to preserve the proper functioning and safe operation of the vehicle.
 - Mobile equipment may be washed at car washes that utilize reclaimed water as part of the wash process or reduce water consumption by at least 10% when compared to a similar period when water use restrictions were not in effect.
 - Automobile dealers may wash cars that are in inventory no more than once per week utilizing handheld containers and hoses equipped with automatic shutoff devices, automated equipment that utilizes reclaimed water as part of the wash process, or automated equipment where water consumption is reduced by at least 10% when compared to a similar period when water use restrictions were not in effect.

- Automobile rental agencies may wash cars no more than once per week utilizing handheld containers and hoses equipped with automatic shutoff devices, automated equipment that utilizes reclaimed water as part of the wash process, or automated equipment where water consumption is reduced by at least 10% when compared to a similar period when water use restrictions were not in effect.
 - Marine engines may be flushed with water for a period that does not exceed 5 minutes after each use.
6. ***Use of water for the operation of ornamental fountains, artificial waterfalls, misting machines, and reflecting pools is prohibited.***
- Fountains and other means of aeration necessary to support aquatic life are permitted.
7. ***Use of water to fill and top off outdoor swimming pools is prohibited.***
- Newly built or repaired pools may be filled to protect their structural integrity.
 - Outdoor pools operated by commercial ventures, community associations, recreation associations, and similar institutions open to the public may be refilled as long as:
 - Levels are maintained at mid-skimmer depth or lower;
 - Any visible leaks are immediately repaired;
 - Backwashing occurs only when necessary to assure proper filter operation;
 - Deck areas are washed no more than once per calendar month (except where chemical spills or other health hazards occur);
 - All water features (other than slides) that increase losses due to evaporation are eliminated; and
 - Slides are turned off when the pool is not in operation.
 - Swimming pools operated by health care facilities used in relation to patient care and rehabilitation may be filled or topped off.
 - Indoor pools may be filled or topped off.
 - Residential swimming pools may be filled only to protect structural integrity, public welfare, safety and health, and may not be filled to allow the continued operation of such pools.
8. ***Water may be served in restaurants, clubs, or eating-places only at the request of customers.***

Attachment C: MONTHLY VWP PERMIT INSPECTION CHECKLIST

An inspection of all permitted impact areas, avoided waters and wetlands, and permanently preserved waters, wetlands and upland areas must be conducted at least once every month during active construction activities. Maintain this record on-site and available for inspection by DEQ staff.

Project Name Kyanite Mining Co. – surface water withdrawal	VWP Permit # 23-2801	Inspection Date
Inspector Name & Affiliation	Phone # & Email Address	

I certify that the information contained in this report is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Inspector

Date

PERMIT REQUIREMENT	In Compliance?			Location, Description, Notes & Corrective Action Taken (use additional note space below if needed)	Date Completed
	Yes	No	Not Applicable		
Surface water impacts are limited to the size and locations specified by the permit. No sedimentation impacts and no impacts to upland preservation areas have occurred ¹ .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Within 50 feet of authorized activities, all remaining surface waters and mitigation (preservation) areas that are inside the project area are clearly flagged or marked to prevent unpermitted impacts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Authorized temporary impact areas have been restored to original contours, stabilized, and planted or seeded with original wetland vegetation type within 30 days of completing work in each area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
E&S controls consistent with the Virginia ESC Handbook are present and maintained in good working order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Exposed slopes/stream banks have been stabilized immediately upon completion of work in each impact area, in accordance with the Virginia ESC Handbook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Heavy equipment is placed on mats/ geotextile fabric when working in temporary wetland impact areas. Equipment and materials removed immediately upon completion of work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Construction activities are not substantially disrupting the movement of aquatic life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
New instream pipes and culverts on <5% slope have been installed to maintain low flow conditions and are countersunk at both ends as follows: ≤ 24” diameter: countersunk 3” > 24” diameter: countersunk 6” or more. Any variations were approved in advance by DEQ.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Time-of-year restrictions are being adhered to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

¹ If unauthorized impacts have occurred, you **must** email a copy of this report to DEQ within 24 hours of discovery. Email: Bryan.Jones@DEQ.Virginia.gov.

PERMIT REQUIREMENT	In Compliance?			Location, Description, Notes & Corrective Action Taken (use additional note space below if needed)	Date Completed
	Yes	No	Not Applicable		
For stream channelization or relocation, work in surface waters is being performed in the dry, with all flows diverted until the new channel is stabilized.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Water quality monitoring is being conducted during permanent stream relocations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Streams and wetlands are free from any sheen or discoloration that may indicate a spill of oil, lubricants, concrete or other pollutants. ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Inspection Notes

² Any fish kills or spills of fuels or oils shall be reported to DEQ immediately upon discovery at [REGION PREP PHONE]. If DEQ cannot be reached, the spill or fish kill shall be reported to the Virginia Department of Emergency Management (VDEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802. Any spill of oil as defined in § 62.1-44.34:14 of the Code of Virginia that is less than 25 gallons and that reaches, or that is expected to reach, land only is not reportable, if recorded per § 62.1-44.34:19.2 of the Code of Virginia and if properly cleaned up.



Attachment D: VWP PERMIT CONSTRUCTION STATUS UPDATE FORM

Attached to VWP 23-2801 – Kyanite Mining Co.

Issued: **DATE**

Date (check one):

June____, _____

December _____, _____

VWP Individual Permit Number: 23-2801

Project Name and Location: _____

Status within each authorized surface water impact location, as identified on Jurisdictional Waters Impacts Over Aerial Imagery and Topography (Attachment E), dated October 8, 2023: (check one of the following status options for each impact number/location. Attach additional sheet(s) if needed.)

Authorized impact number	Construction activities not started	Construction activities started	Construction activities started but currently not active	Does this impact involve culvert(s) ¹ ?	Construction activities complete ²

¹ Provide spot elevations of the stream bottom within the thalweg at the beginning and end of the pipe or culvert, extending to a minimum of 10 feet beyond the limits of the impact, with completion of all culvert installations.

² If all construction activities and compensatory mitigation requirements are complete, the permittee completes and signs the Termination Agreement section below within 30 days of last authorized activity and/or compensation completion. A completed and signed Agreement serves as Notice of Project Completion (9VAC25-210-180 H).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Authorized Signature: _____

Print Name: _____

Title: _____ Phone: _____

Date: _____ Email: _____

TERMINATION AGREEMENT BY CONSENT – PROJECT COMPLETION

Permittee Name: _____

Permittee Mailing Address: _____

Permittee Phone: _____

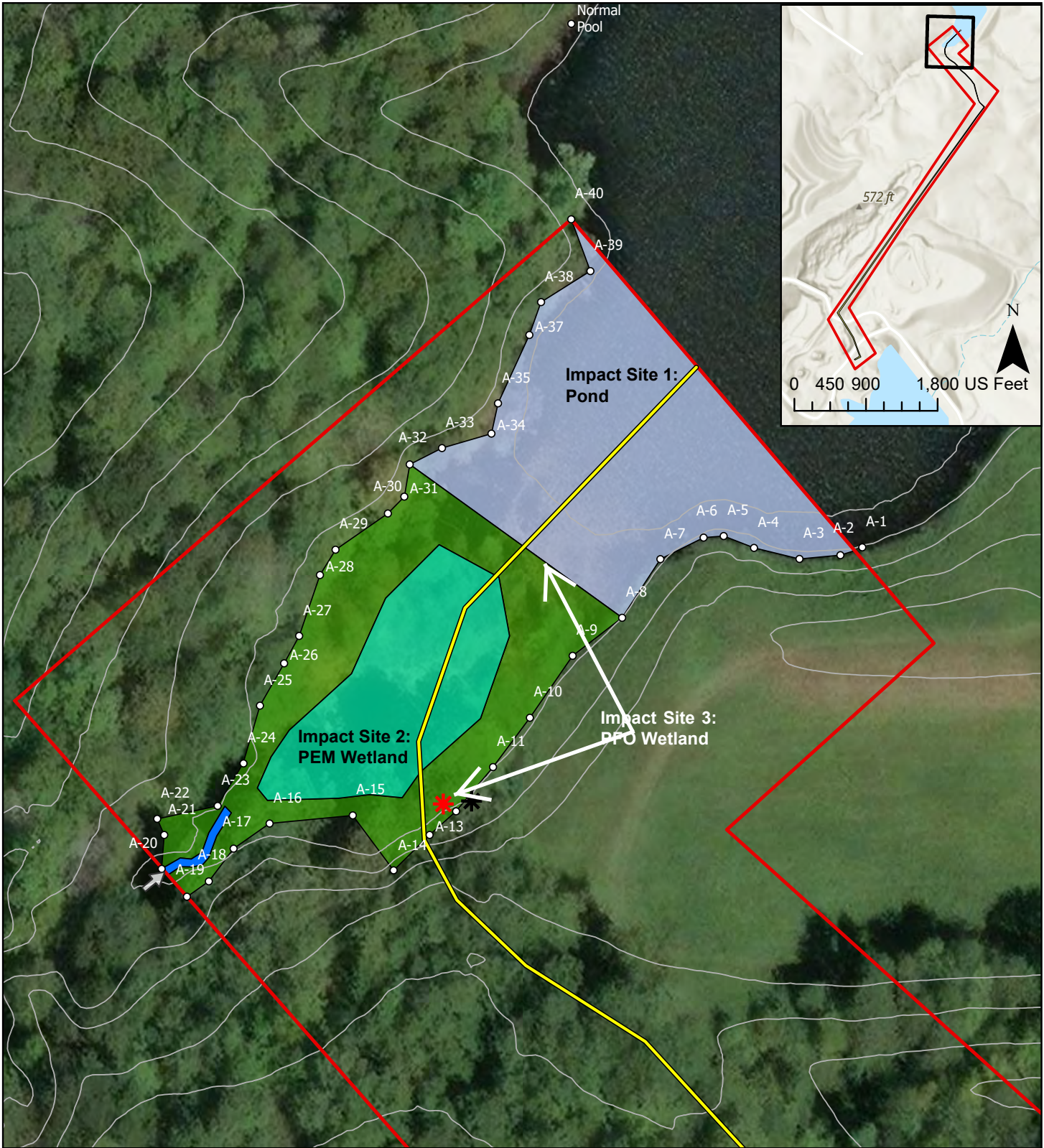
I hereby consent to the termination of coverage for VWP Individual Permit Number 23-2801.

"I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

Permittee Signature: _____

Impact Construction Status Table Continued (if needed)

Additional Page of					
Authorized impact number	Construction activities not started	Construction activities started	Construction activities started but currently not active	Does this impact involve culvert(s)¹?	Construction activities complete²



**Figure 3. Kyanite Mining Corporation Water Withdrawal Permit:
Jurisdictional Waters Impacts Over
Aerial Imagery and Topography**

<ul style="list-style-type: none"> Forested Wetland Emergent Wetland Perennial Stream Open Water Flow Arrow 2' Contour Interval 	<ul style="list-style-type: none"> Numbered Flags Data Point 2 - Upland Data Point 1 - Wetland Proposed Pipe Alignment Delineation Study Limits
<p>Current Time: 10/8/2023 5:28 PM</p>	