OLT-23-000534
OLT-23-000939
OLT-23-000940

ONTARIO LAND TRIBUNAL

PROCEEDING COMMENCED UNDER subsection 22(7) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended.

Applicant and Appellant:	Caivan (Perth GC) Limited
Subject:	Request to amend the Official Plan – Failure to adopt the requested amendment
Description:	To permit 940 single detached dwellings and townhomes, a nine-hole golf course, park and open space areas
Reference Number:	OPA-01-2023
Property Address:	141 Peter Street, Part of Lots 26 & 27, Concession 1, Part Lots 25, 26 & 27, Concession 2, Geographic Township of Bathurst, and Part Lot 1 in Southeast Half Lot 1, Concession 1, Part Lot 1 in Southwest Half Lot 1, Concession 2, Geographic Township of Drummond, now in the Town of Perth, County of Lanark
Municipality/UT:	Town of Perth / County of Lanark
OLT Case No.:	OLT-23-000939
OLT Lead Case No.:	OLT-23-000534

PROCEEDING COMMENCED UNDER subsection 34(11) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended.

Applicant and Appellant:	Caivan (Perth GC) Limited
Subject:	Application to amend the Zoning By-law – Refusal or neglect to make a decision
Description:	To permit 940 single detached dwellings and townhomes, a nine-hole golf course, park and open space areas
Reference Number:	ZBL-03-2023
Property Address:	141 Peter Street, Part of Lots 26 & 27, Concession 1, Part Lots 25, 26 & 27, Concession 2, Geographic Township of Bathurst, and Part Lot 1 in Southeast Half Lot 1, Concession 1, Part Lot 1 in Southwest Half Lot 1, Concession 2, Geographic Township of Drummond, now in the Town of Perth, County of Lanark
Municipality/UT:	Town of Perth / County of Lanark
OLT Case No.:	OLT-23-000940

PROCEEDING COMMENCED UNDER subsection 51(34) of the *Planning Act,* R.S.O. 1990, c. P.13, as amended.

Applicant and Appellant:	Caivan (Perth GC) Limited
Subject:	Proposed Plan of Subdivision – Failure of Approval Authority to make a decision
Description:	To permit 940 single detached dwellings and townhomes, a nine-hole golf course, park and open space areas
Reference Number:	09-T-22001

OLT-23-000534
OLT-23-000939
OLT-23-000940

Property Address:	141 Peter Street, Part of Lots 26 & 27, Concession 1, Part Lots 25, 26 & 27, Concession 2, Geographic Township of Bathurst, and Part Lot 1 in Southeast Half Lot 1, Concession 1, Part Lot 1 in Southwest Half Lot 1, Concession 2, Geographic Township of Drummond, now in the Town of Perth, County of Lanark
Municipality/UT:	Town of Perth / County of Lanark
OLT Case No.:	OLT-23-000534
OLT Lead Case No.:	OLT-23-000534
OLT Case Name:	Caivan (Perth GC) v Lanark County

Witness Statement of Jean-Francois Sabourin, M.Eng., P. Eng.

Engineer, Director of Water Resources

JFSA Canada Inc.

Qualifications

1. I am the founder and president of J.F. Sabourin and Associates Inc., now JFSA Canada Inc. (JFSA). JFSA has offered specialized engineering and technical services in water resources and other related disciplines in Ontario for over 30 years.

2. I have 40 years of experience in providing engineering services to public and private clients within Eastern Ontario and the Greater Toronto Area, as well as across the Province of Québec. I have undertaken, managed and directed numerous water resources-related studies, such as detailed conceptual drainage designs for new developments, rehabilitation of municipal projects related to drainage systems, low impact development (LID) research studies, flood mapping studies, watershed studies, rainfall/flow/snowmelt monitoring studies, hydrologic model calibration, master drainage plans, and development and programming of several hydrologic software that are distributed across Canada, such as SWMHYMO.

3. I am currently registered as a Professional Engineer in the Provinces of Ontario and Quebec.

4. My curriculum vitae is attached to this witness statement as **Appendix "A"**. A copy of my Acknowledgement of Expert Duty is attached as **Appendix "B"**.

Retainer

5. JFSA was retained by Caivan (Perth GC) Limited (Caivan) through the office of David Scheaffer Engineering Limited (DSEL) in December 2021 to provide technical guidance related to the stormwater and water resource-related components of the proposed development.

6. As part of this retainer, I provided senior engineering direction and guidance with respect to the establishment of existing hydraulic and hydrologic conditions of the site. This included an update to the current floodplain mapping and input to the preliminary Storm Water Management (SWM) design for the proposed development.

7. JFSA staff have been on-site on numerous occasions since 2021 completing field monitoring and topographic survey work.

8. JFSA has authored and/or contributed to the following:

    - Perth Golf Course Floodplain Alterations Memo – March 2022, JFSA (contained within the Caivan Perth Development - Hydrologic and Hydraulic Conditions Report).

    - Caivan Perth Development - Hydrologic and Hydraulic Conditions Report, February 2023, JFSA.

    - Grants Creek Wetland Integrated Hydrologic Impact Assessment - Perth Golf Course - February 2023, JFSA, GEMTEC, Kilgore & Associates, David Scheaffer Engineering Ltd.

    - Response to RVCA comments: Western Annex Lands Memo, Town of Perth, April 9, 2024, JFSA.

    - Perth Golf Course – Proposed Floodplain Mapping Amendment Memo, May 31, 2024, JFSA.

9. A copy of the "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report" is attached to this witness statement as **Appendix "C"**.

10. A copy of the "Perth Golf Course – Proposed Floodplain Mapping Amendment Memo" is attached to this witness statement as **Appendix "D"**.

Documents Reviewed

11. As part of this retainer and in preparation for my evidence, I reviewed the following documents:

    a. Technical Guide – River & Stream systems: Flooding Hazard Limit, Ontario Ministry of Natural Resources, 2002.

b. Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003.

c. Ottawa Sewer Design Guidelines, City of Ottawa, October 2012.

d. Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, February 5, 2014.

e. Technical Bulletin PIEDTB-2016-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, September 6, 2016.

f. Technical Bulletin ISTB-2018-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, March 21, 2018.

g. Technical Bulletin ISTB-2018-03, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, March 21, 2018.

h. Technical Bulletin ISTB-2019-01, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, January 2019.

i. Technical Bulletin ISTB-2019-02, Revisions to Ottawa Design Guidelines – Sewer, City of Ottawa, July 8, 2019.

j. Flooding Hazards: Data Survey and Mapping Specifications bulletin, Ministry of Natural Resources and Forestry, December 2023.

k. Height Reference System Modernization, Natural Resources Canada, October 2020.

l. Interim Policy for the Administration and Implementation of Ontario Regulation 41/24, RVCA, April 2024.

m. SWMHYMO User manual, J.F Sabourin and Associates Inc, April 2005.

n. HEC-RAS Hydraulic Reference Manual, US Army Corps of Engineers, December 2020.

o. Western Annex Lands, Town of Perth Floodplain Modification, RVCA June 22, 2023.

p. Western Annex Lands, Town of Perth – Response to JFSA Comments Floodplain Modification, RVCA, April 30, 2024.

q. Functional Servicing Report for Caivan (Perth GC) Limited - Proposed Residential Subdivision, David Schaeffer Engineering Ltd., Feb 2023.

12. As part of the consulting team supporting the proposed development, I am also aware of and have reviewed the water resource related policies of the Provincial Policy Statement, the County of Lanark Official Plan and the Town of Perth Official Plan. However, I rely on the opinions of other experts with respect to the interpretation and application of those policies from a land use planning perspective.

Issues

13. The issues that I will address in this witness statement include the following:

Issue 5a ix. *Does the Application conform to the policies, purpose and intent of the Town of Perth Official Plan… Storm Water Management and Drainage?*

Issue 10. *Can the proposed development be accommodated with appropriately sized and located stormwater infrastructure that avoids potential impacts on the Tay River and Grant's Creek floodplains?*

Issue 11. *Has the floodplain been properly delineated to allow an assessment of possible natural hazard constraints on the proposed development?*

Issue 12. *Have the potential impacts of the Tay River and Grant's Creek floodplains been adequately addressed for the proposed subdivision?*

Summary Intended Expert Evidence

Issue 5a *Does the Application conform to the policies, purpose and intent of the Town of Perth Official Plan (the "Official Plan")?*

a. The application of the conformity test will consider, but not be limited to the following policies of the Town of Perth Official Plan:

ix. 5.3 Storm Water Management and Drainage;

C) The principles which Council intends to utilize in its approach to storm-water management are enumerated as follows:

1. That natural hydrological characteristics are maintained, and where possible, enhanced as the means to protecting the base flow of watercourses.

14. In my opinion, the pre-development drainage area to both the Tay River and Grants Creek has been delineated based on the latest available topographic data. The delineation of the existing drainage divide was provided to DSEL to guide the stormwater management design of the subject development and to ensure that the post-development drainage area will match the existing drainage divide to the greatest extent possible. Having reviewed the stormwater management design being proposed by DSEL, I am satisfied that the proposed design will achieve the intent of the above-noted policy.

15. JFSA in association with Kilgour & Associates Ltd, GEMTEC Consulting Engineers & Scientists and DSEL, in March 2023, collectively authored the "Grants Creek Wetland Integrated Hydrologic Impact Assessment" Report, which investigated the proposed development impacts on the Grants Creek Wetland from a servicing, surface water, groundwater and biological perspective. This report outlined potential impacts and mitigating measures and included considerations for the site's stormwater management. It was concluded that:

> *SWM and LID measures will be designed to closely reflect pre-development inflow locations and SWM outlets will be designed to replicate outflow locations under pre-development conditions.*

16. I continue to support the above-noted conclusion.

Issue 5a *Does the Application conform to the policies, purpose and intent of the Town of Perth Official Plan (the "Official Plan")?*

a. The application of the conformity test will consider, but not be limited to the following policies of the Town of Perth Official Plan:

ix. 5.3 Storm Water Management and Drainage;

C) The principles which Council intends to utilize in its approach to storm-water management are enumerated as follows:

- That proposed development will not result in increased downstream flooding or erosion or cause adverse effects on receiving waters by appropriate management of storm-water volumes and contaminant loading.

- That a sustainable environmental approach is utilized in protecting water resources

…

D) It is the intent of Council to incorporate storm water management controls into the development review and approval process. Proponents of development projects will be required to plan for and undertake storm water management which complies with the above principles as well as any master drainage plan. This may require a sub-watershed management plan for large tracts of land or a storm water site management plan. Proponents may utilize best management practices where they are consistent with and will achieve the Town's water quality and quantity targets.

17. As part of the JFSA February 2023 report titled "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report", detailed existing and post-development hydrologic models were developed.

18. The stormwater management ponds (or "SWM" ponds) for the proposed development were sized to ensure no increases in peak flows to either Grants Creek or the Tay River for the various return periods. Tables 6.3A and 6.3B of the JFSA "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report" outline the peak flows and required storage volumes for each of the SWM facilities. The peak flows and storage volumes are based on detailed hydrologic model simulations (SWMHYMO), which are outlined in Appendix E of the same report. This method of hydrologic modelling is commonly used throughout Canada for preliminary SWM pond sizing and has consistently demonstrated its reliability in determining required volumes.

19. The proposed SWM ponds were also sized to provide quality treatment (per the MECP's Stormwater Planning and Design Manual) to ensure that there will be no effect on contaminate loading to the receiving water courses. Section 6.11 of the JFSA "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report" outlines the active storage volumes required for the three (3) SWM ponds to meet MECP quality control requirements. The SWM pond permanent pool volume configurations will be determined at the detailed design stage to ensure that an 80% Total Suspended Solids (TSS) Removal rate or greater will be achieved per MECP design guidelines. I defer to the evidence of DSEL on the required details of the intended design.

20. JFSA's analysis also considered two portions of land within the development where runoff peak flows would not be attenuated via SWM facilities and will instead be treated by proposed oil and grit separator (OGS) units. These areas will incorporate a runoff treatment train approach, which will consist of roof leaders to grassed areas, dry swales, catch basin shields and perforated pipe CB infiltration systems leading to an OGS unit before discharging to local surface water features. This treatment train system will provide quality treatment in excess of 80% of total suspended solid removal, which is the highest level of total suspended solid removal specified in the MECP guidelines. Once again, I defer to the evidence of DSEL on the required details of the intended design.

21. At present, I am not aware of a similar treatment train approach that is already approved or implemented in the town of Perth or Lanark County, but similar treatment train designs have been approved and are currently in construction in the City of Ottawa. In my opinion, the proposed treatment train approach is consistent with MECP's current policies and approaches to stormwater management.

22. Based on the foregoing, it is my opinion that the deployment of the SWM strategy developed by DSEL will result in a development that meets the requirements of the above-noted policies in terms of stormwater quantity and quality requirements. It is also my opinion that a sustainable environmental approach, in accordance with MECP Design Manual guidance, was utilized in the design of the subject project to ensure the protection of relevant water resources.

Issue 10 *Can the proposed development be accommodated with appropriately sized and located stormwater infrastructure that avoids potential impacts on the Tay River and Grant's Creek floodplains?*

23. Tables 6.3A and 6.3B from the JFSA "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report" outline the required volumes for each of the respective SWM facilities proposed and the associated peak flows to each watercourse. These required volumes were provided to DSEL to determine the block sizes required to ensure the necessary onsite storage volumes are achieved.

24. Tables 6.3A and 6.3B from the JFSA "Caivan Perth Development - Hydrologic and Hydraulic Conditions Report" also show that the total peak flows from the proposed development to both the Tay River and Grants Creek will either match or be less than pre-development conditions for 2-year to 100-year rainfall events .

25. As peak flows will either match or be less than pre-development conditions, it is my opinion that the runoff from the development will not negatively impact the Tay River or Grants Creek floodplains.

26. The proposed locations of the SWM facilities were developed in coordination with DSEL to ensure that the proposed development drainage areas and SWM facility locations closely reflect the existing drainage patterns of the site. It is accordingly recommended that three small SWM ponds be implemented across the site instead of one large SWM pond to better respect the drainage divide between the two watercourses.

27. I am aware that the proposed draft plan of subdivision has been modified since the date of JFSA's original reports. I have reviewed these modifications in conjunction with DSEL. While the modifications will affect the amount of drainage captured by individual SWM facilities located on the site, these changes are not, in my opinion, of significant magnitude to affect the conclusions reached by JFSA as outlined in our original reports. Updating memoranda to confirm this opinion can be prepared and submitted to the municipal authority as a condition of draft approval if formalized updates are desired to be on file.

Issue 11. *Has the floodplain been properly delineated to allow an assessment of possible natural hazard constraints on the proposed development?*

28. On May 30, 2024, JFSA issued a new memo titled “Perth Golf Course – Proposed Floodplain Mapping Amendment”, which mapped the floodplain extents based on the latest available topographic data from 2022 using GIS software. JFSA field staff also went on-site on May 9th, 2024, with an RTK GPS unit to take topographic survey points around the site to ground-truth the latest LiDAR and confirmed that the topographic data used for this mapping met the accuracy requirements for floodplain mapping as specified by the MNRF.

29. The floodplain mapping of the proposed development area has been re-delineated based on the latest available (field-verified) topographic data and outlined in the JFSA memo titled “Perth Golf Course – Proposed Floodplain Mapping Amendment Memo” attached to this witness statement as Appendix “D”.

30. Maps outlining the JFSA 2024 and the RVCA regulatory floodplain extents have been provided in Figures 1 and 2 of the JFSA May 31, 2024, Perth Golf Course – Proposed Floodplain Mapping Amendment Memo

31. The update in floodplain mapping results in a 2.8% reduction in floodplain area on the subject lands. The RVCA Regulatory Boundary occupies 79.21 ha of the site while the JFSA 2024 updated mapping occupies 76.99 ha of the site.

32. At the time of drafting this witness statement, RVCA has not provided feedback on JFSA’s Proposed Floodplain Mapping Amendment Memo.

33. It is my opinion, based on the work undertaken by JFSA in support of the Proposed Floodplain Mapping Amendment Memo, that the floodplain as delineated by JFSA accurately reflects the limits of the floodplain and accordingly identifies the limits of the natural hazard for the purposes of development.

34. I defer to the evidence of Ms. Chandler, a qualified land use planner, with respect to the interplay between the RVCA’s process for updating the floodplain and issuing permits for on-site floodplain alterations (i.e. cut/fill) pursuant to the *Conservation Authorities Act* and the *Planning Act* instruments that are now before the Tribunal on this appeal.

Issue 12*. Have the potential impacts of the Tay River and Grant's Creek floodplains been adequately addressed for the proposed subdivision?*

35. In my opinion, the on-site Grants Creek and Tay River floodplain limits have been accurately delineated by JFSA. However, in order to proceed with lot creation as contemplated by the currently proposed draft plan, a balanced cut-fill is being proposed to regularize the boundary between the lot fabric and constraint lands.

36. DSEL is preparing a detailed grading plan of the proposed cut-fill that balances the placement and removal of fill in accordance with the local conservation authorities' regulatory policies. A detailed hydraulic analysis of the proposed balanced cut-fill grading will also be completed by JFSA, to ensure that the proposed cut-fill work for the site will not adversely impact either Grants Creek or the Tay River's floodplain elevations or riparian storage volumes.

37. The above-summarized work will be submitted to RVCA under O. Reg 41/24 and will be evaluated by RVCA against their local regulatory policies. No work within the regulatory floodplain can or will be undertaken unless and until such work is approved by the RVCA under the *Conservation Authorities Act*.

38. As noted above, I defer to the evidence of Ms. Chandler with respect to how the above-summarized cut/fill process can be accounted for and/or secured through the *Planning Act* instruments now before the Tribunal

Conclusions and Recommendations to the Tribunal

39. The proposed development can be accommodated with appropriately sized and located stormwater infrastructure that avoids potential impacts on the Tay River and Grant's Creek floodplains.

40. Stormwater quantity attenuation and quality treatment can be achieved for the site with the use of SWM ponds and a treatment train approach. I defer to the expertise of DSEL with respect to the on-site design details for these SWM facilities.

41. An updated floodplain delineation has been undertaken for this site based on the latest available topographic information to ensure an accurate assessment of the natural hazard limits and accordant constraint lines for the proposed development. Updates to the

floodplain delineation will ultimately be determined by the RVCA outside of the current *Planning Act* appeals.

42. A detailed cut-fill grading design will be completed to ensure all proposed development lands will be out of the floodplain prior to lot creation and development. A detailed hydraulic analysis will also be completed to ensure that the proposed cut/fill will not have an adverse impact on existing flood elevations on both the Tay River and Grants Creek. I defer to the expertise of Ms. Chandler with respect to how best to implement/secure this process in the context of the current *Planning Act* appeals.

43. The recent changes to the draft plan do not affect the fundamental conclusions regarding stormwater management outlined in this witness statement.

44. I will be in attendance before the Tribunal to answer any relevant questions concerning the above-mentioned Reports drafted by JFSA, the contents of this WS and the contents of any WS or other evidence filed by parties opposite

Jean-Francois Sabourin, M.Eng., P.Eng. June 12, 2024

APPENDIX A

Jean François Sabourin, M.Eng, P.Eng., ing.

President, Senior Water Resource Engineer

EDUCATION

- Bachelor in Applied Sciences (B.A.Sc.Eng.), University of Ottawa,1979-83
- Masters in Engineering (M.Eng., Water Resources) University of Ottawa, 1987-1992 (part time)

MEMBERSHIPS

- Professional Engineer, Professional Engineers of Ontario
- Ingénieur, Ordre des ingénieurs du Québec

LANGUAGES

- English
- French

EMPLOYMENT

• 2024-present, JFSA Canada Inc.	Director of Water Resources Projects
• 1993-2024, J.F. Sabourin and Associates Inc.	Director of Water Resources Projects
• 1987-1993, Paul Wisner & Associates - Water Resources	Associate & Senior project manager
• 1986-1987, University of Ottawa - IMPSWM Research Group	Research assistant coordinator
• 1984-1986, W.Rourke Ltd - General Construction Division	Project manager and Field Supervisor
• 1983, University of Ottawa - IMPSWM Research Group	Research assistant
• 1982, (Co-op term) Ontario Hydro - Transmission Line Div.	Co-op student
• 1981, (Co-op term) Parks Canada - Prof. Services Division	Co-op student

PROFILE

Mr. Sabourin graduated in 1983 from the University of Ottawa where he obtained both a Bachelor of Applied Science degree in Civil Engineering and a Master's degree in Engineering (Water Resources). With his numerous years and depth of experience, Mr. Sabourin is considered to be an expert in various aspects of water resources, such as urban hydrology, sewer and river hydraulics, flood plain and flood line mapping, development of computer models, and planning / design of stormwater management systems. As President and Director of Water Resources Projects for JFSA, Mr. Sabourin has participated / coordinated / undertaken over 1500 environmental related projects, with a primary focus on water resources. Mr. Sabourin's practical experience, combined with his research capabilities, exceptional communication and relationship building abilities are the basis for his frequent involvement in the development of policy and guidelines in the water resource arena, as well as regular appointment as a reviewer of reports and documents prepared in support of national, provincial and local initiatives/development. Mr. Sabourin oversees the work of more than 30 employees at JFSA's offices located in Ontario and Quebec, ranging in disciplines including water resources engineers, hydrologists, hydrogeologists, biologists, land planners and technical support staff.

WORK EXPERIENCE:

DEVELOPMENT/ REVIEW OF GUIDELINES AND REPORTS

- **Project manager and main author of a computerized "Selection Tool" for the assessment of urban drainage systems**. Developed with and for The Toronto and Region Conservation Authority, (1999), Toronto, Ontario.
- **Contributor to Impacts and Adaptation of Drainage Systems, Design Methods and Policies** - investigated and quantified the potential effects of climate change on drainage infrastructure and performance of existing stormwater management ponds. Study by Kije Sipi Ltd. in partnership with City of Edmonton, Regional Municipality of Ottawa-Carleton and the Mississippi Valley Conservation

Authority. For Natural Resources Canada, Climate Change Action Fund, 2000 - 2001.

- **Contributor to a Climate Change Action Fund research project**; investigated and quantified the potential effects of climate change on drainage infrastructure and performance of existing stormwater management ponds.
- **Project manager and coordinator of an updated research study on the use of grass swales and perforated pipe drainage systems**. Undertaken in partnership with RMOC, MOEE/SWAMP, City of Ottawa, City of Gloucester, City of Nepean, City of Kanata, and four pipe manufacturers, Ottawa, Ontario.
- **Development of a Hydrologic Model Calibration Guideline**, for the City of Ottawa, Ontario.
- **Guidance for the Evaluation of Water Monitoring Networks for Climate Change Adaptation**, CCME. The project resulted in a reference document (Selected Tools to Evaluate Water Monitoring Networks for Climate Change Adaptation) for non-specialist water managers and climate change adaptation planners. The document was developed to help Canadian federal, provincial and territorial governments determine the suitability of their water monitoring networks to provide the data needed to plan for and to adapt to a changing climate. The document describes proven and practical ways for jurisdictions to set priorities for water monitoring networks for climate change adaptation, and then evaluate the ability of these networks to provide the data needed to support climate change adaptation needs. (August 2010 to January 2011)
- **Updated and developed a Design Guideline and oversaw the development of the GSPP Design Tool for the design and construction of Grass-Swale-Perforated-Pipe-Drainage systems** for the City of Ottawa, Ontario.
- **Update to City of Ottawa SWM Guidelines** to address key issues associated with stormwater management and conveyance in new development projects within the City of Ottawa including: developing flat lands where major system capacity is limited; the impact of increasing imperviousness (due to intensification) and changing design standards on existing and proposed infrastructure and overland flow routes; and the need to plan for climate change. To help visualize how the proposed standard changes, City of Ottawa, Ontario. (May 2017)
- **Initiated an Analysis of Rainfall Drying Time on Common Urban Materials** with RiverLabs in Cornwall, Ontario. Purpose of these investigations was to improve estimates of evaporation by quantitatively measuring the drying time of common anthropogenic surfaces. The project took into consideration temperature, wind speed and relatively humidity, all of which impact the rates of evaporation of water on anthropogenic surfaces. (March 2017)
- **Climate Change Adaptation – Water Monitoring Data Requirements and Indicators**, Canadian Council of Ministers of the Environment (CCME). Study which identified the hydrologic parameters that should be measured by water monitoring networks in Canada for climate vulnerability assessment and climate change adaptation planning.
- **National Floodplain Mapping Assessment contributor and reviewer** for report establishing framework for Canadian Government development of floodplain management supporting national documents and guidelines. (2015/16)
- **Review of PIEVC Protocols that deal with stormwater related public infrastructure**, Infrastructure Canada. The purpose of this study was to assess if the current PIEVC protocols can adequately assist a city with the evaluation of the vulnerability of their storm water infrastructure to climate change.
- **Review of Low Impact Development Stormwater Management Guidance Manual** for Ministry of Environment and Climate Change Low (2017/18)
- Designer, Project Manager and Coordinator of development and delivery of **Flood Preparation and Response** Tool for City of Ottawa (2018/19)
- Reviewer of **Risk Return on Investment Tool Technical Manual** for Credit Valley Conservation Authority and Risk Sciences International (2019 ongoing).
- Review of **Floodplain Mapping Policies for Future Developments** for the City of Ottawa (2019

ongoing).

FLOOD PLAIN MANAGEMENT / WATERSHED ANALYSIS / URBAN STORMWATER MANAGEMENT

- **Conducted or was senior technical advisor on numerous flood plain, flood line and fill line delineation studies** on numerous watercourses: Cataraqui Creek; Highgate Creek; Grand Canal, La Drize and La Jogne Rivers, Switzerland; Shirley's Brook; Sixteen Mile Creek; Taylor Creek; Upper Thames River; Garry River; Ottawa River near Britannia; Ottawa River near Moussette Beach, Gatineau (formerly Hull), Québec; Gatineau River at Lac Leamy, Gatineau (formerly Hull), Québec; Ottawa River near Clarence Island; Ottawa River near Hamilton Island , Hawkesbury, Ontario; Rideau River at City Hall, Ottawa, Ontario; Tributaries C and D, Brampton, Ontario; Daigneault Creek , Brossard, Québec; Moore Creek, Gatineau, Québec; Humber River within the City of Toronto, Ontario; Jock River, Ontario; Ottawa River near Rockland, Ontario; Village of Richmond Flood Plain Mapping, City of Ottawa, Ontario; Gatineau River Floodplain Mapping between Ottawa River and Farmer Rapids Power Dam, Gatineau, Québec, (March 2012 to June 2013); Marcoux Municipal Drain, North Glengarry; Castor River Tributary preliminary floodplain mapping.
- **Conducted or senior technical advisor to numerous technical reviews and peer reviews of flood plain mapping reports and related work**, including hydrologic and hydraulic analyses and modelling, including: Technical Review of 2015/2016 and 2018-2020 (ongoing) Conservation Authority Flood Plain Mapping Reports for City of Ottawa; Ottawa River Flood Risk Mapping, City of Ottawa; John Boyce and Osgoode Garden Cedar Acres Municipal Drain, South Nation Conservation; Glen Meadows Estates, Town of Arnprior (stormwater management plan, flooding issues); Rideau River (Hogs Back Falls to Ottawa River; Kars to Hogs Back Falls, and Buritts Rapids to Kars); Constance Creek;
- **Senior investigator and one of the authors for a National Floodplain Mapping Assessment**, conducted for Public Safely Canada, Ottawa with MMM Group (lead), to assess the current status of flood plain mapping in Canada (2013/2014).
- Participated in several **watershed analyses and Master Drainage Plans** (MDP): Ingleside; Area 1A, Markham; Barcelona (for 1992 Olympics), Spain; Riviere Milette, Trois-Riviere; Le Grand Canal, Switzerland; La Drize, Switzerland; Bath Creek, Bath; Relief sewer analysis, Hawkesbury; Riverbend Road Neighborhoods, Edmonton; Exhibition Creek, Markham; MGS Lands, Markham; Garry River, Alexandria; Moore Creek, Aylmer-Hull; Moose Creek, Casselman; Daigneault Creek, Brossard; Moreau Creek, Gatineau; Jock River, Ottawa; Moore Creek, Gatineau.
- **Designed Stormwater Management Plans** for various types of development: Aldermac Orphan Mine Site, Val d'Or; Cardinal Trail 2, Ottawa; Scugog Island Casino, Scugog; Zellers Property, Hawkesbury; Cardinal Trail 3, Ottawa; Le Plateau de la Capitale, Hull; Lazyboy, Innes Road, Ottawa; Secteur C, Ville de Brossard; Cardinal Trail 6, Ottawa; Vales of Castlemoore South Subdivision, Brampton; Tumbridge Subdivision Phase 1, Brampton; Forest Ridge Infill Development, Ottawa; Hull Armories, Gatineau; Morris Village, Rockland; Moodie Drive Townhouse Infill Development, Ottawa; Cambrian Heights Phase V, Ottawa; Corvenelli Development, Russell; Shomberg Subdivision, King Township.
- **Designed and built a physical river and town model** to determine flood water levels in conjunction with a mathematical river model. Both models were verified against measured flood data and alternatives to reduce risks of flooding were determined, St. Mary's, Ontario.
- **Dispersion and assimilative studies** undertaken for a proposed causeway on the Ottawa River: Clarence Island, Clarence-Thurso; for a proposed sewage treatment outfall on the St-Lawrence River: Ingleside, Ontario.
- **Developed Infiltration / Inflow models** for the analysis of sanitary sewer systems: RMOC, Ottawa; City of St.Therese, Québec; City of Edmonton, Alberta.
- **Developed Stormwater Management (SWM) design criteria** for on-site detention in Markham, Ontario.

- **Water budget analyses** prepared for Summerside Wetland in London, Ontario; Mattamy Staines Subdivision Morningside Heights Community, Toronto, Ontario.
- **Overseeing surface water component of water budget analysis** for East Urban Community Mixed Use Development and watercourse assessment and feature specific water budget analysis for the proposed Fernbank Quarry, Ottawa, Ontario
- **Conducted flood damage estimations** from high river water levels and wind effects (wave + setup). Potential flood damage reduction measures were also identified. Lac Deschenes, Ottawa, Ontario.
- **Senior technical advisor for Hydrologic and Hydraulic Assessment**, Chamberland Street, City of Clarence-Rockland: assessment of flooding potential.
- **Collaboration with fluvial geomorphologist** on the Greens Creek Watershed: Integrated Fluvial Geomorphology and Hydrological Study in which data on the watershed's existing conditions were gathered from background information, field investigations, and hydrological analysis and used with the geomorphological assessment to advance understanding of the hydrological functioning of the watershed and subwatersheds, for National Capital Commission, Ottawa, Ontario
- Participated to the **development of the Stomwater Management Strategy**, Phase 1 - Understanding the System, for the City of Ottawa, Ontario.
- **Undertook subwatershed analysis** to evaluate the SWM needs for the development of a site by the Department of National Defence, in the Ottawa, Ontario.
- **Stormwater Management Planning and Design** for Hunt Club Road Extension from Hawthorne Road to new MTO Interchange on Hwy 417, City of Ottawa, Ontario.
- **Hydrology/hydraulic components** of Pinecrest Creek Restoration Plan: Integrating Fluvial Geomophology, Hydrology and Ecology, for National Capital Commission, Ottawa, Ontario
- **Pinecrest Creek/Westboro Stormwater Management Retrofit Study, Pinecrest/Centerpointe Stormwater Management Criteria Study, and SWM Guidelines for Pinecrest Creek/Westboro Area (in progress), and the Feasibility Study** for the Implementation of SWM Retrofit Measures on City Owned Properties using LID measures, for City of Ottawa, Ontario.
- **Preliminary SWM plan, pond design, floodplain analysis and channel realignment** for Richmond Village Development (in progress), for DSEL, City of Ottawa., Ontario.
- Westboro **Lot Level Pilot Project**, provision of technical assistance to Carleton University engineering students preparing preliminary modelling to design and assess lot level SWM retrofit project, for City of Ottawa, Ontario
- **SWM Facility Feasibility Study** for a Surface Stormwater Management Facility on NCC Lands at Baseline Road and Woodroffe Ave, for City of Ottawa, Ontario.
- Monahan Drain Constructed Wetland, **preparation of Design Brief for the Reconstruction of the Monahan Drain Constructed Wetland** and associated studies and retrofit, for DSEL, Ottawa, Ontario.
- Monahan Drain Constructed **Wetland, Cell 1 model update**, for the City of Ottawa, Ontario.
- Feedmill Creek **SWM Criteria Study**, for City of Ottawa, Ontario
- **Pinecrest Creek Cumulative Impacts Study** (Morrison Hershfield Ltd. for City of Ottawa, Ontario)
- **Technical advisor in the design of a retrofit SWM pond** at the head of Pinecrest Creek, with Morrison Hershfield Ltd. for the City of Ottawa.
- **Hydrodynamic Analysis** of the Lower Reach of the Jock River, for Caivan Properties, in Ottawa, Ontario (2017 to 2019).
- **Lead engineer in a 2D Hydraulic analysis** of McKinnons Creek floodplain analysis, in Ottawa, Ontario (September 2017).
- Technical advisor for the **functional designs for permeable pavement demonstration projects**, LIDs for the City of Ottawa. (2018-2019)
- **Lead engineer and designer of a Flood Preparedness 3D Visual Tool** to manage emergency

responses during flood periods on the Ottawa River and Rideau River, City of Ottawa, 2019. The tool was effectively used by the City and the Canadian military during the 2019 flood.

- **Lead water resources engineer** for the proposed Tewin development project in the east end of Ottawa. The work covered, review of watershed modelling and floodplain analysis, water budget/ balance analysis, rainfall and flow monitoring, preliminary evaluation of quantity/ quality and erosion control requirements, and evaluation of LIDs, (project is ongoing).

CONCEPTUAL DESIGN

- **Prepared preliminary and detailed designs of stormwater quantity /quality pond**: JML Subdivision, Alexandria, Ontario; Secteur C (5 ponds), Brossard, Québec; Ruisseau Leamy, Hull, Québec; Rollin Subdivision, Vars; Cambrian Heights Phase V, Ottawa; Le Breton Flats Development, Ottawa; Morris Village, Rockland; Mayfield West Community (11 ponds),Town of Caledon; Quartier des Bois Subdivision, Casselman; Tranquility West Subdivision, Town of Richmond Hill; Mattamy on Rouge Subdivision, City of Toronto; Timber Trails Phase II, City of Pickering; Laflèche Environmental Landfill Site (200 ha), Casselman; Deglos Landfill Site (60 ha), St.Lucia (UK); Le Plateau de la Capitale (4 ponds), Gatineau;
- **Participated in several trunk sewer designs**: Lynnwood Village, Ottawa; Hawskbury, Ontario; Markham, Ontario; Brossard, Québec.
- **Developed a model for the design of Grass Swale Perforated Pipe drainage systems**: MOE research study.
- **Designed strip marshes within an existing drainage system** to reduce nutrient levels in contaminated stormwater: Maitland, Ontario.
- **Prepared preliminary and detailed design of new storm sewers** for Crestview Road: Ottawa, Ontario.
- **Analysed the initial and prepared final drainage design** for the Earl Armstrong Park and Ride facility in Ottawa, Ontario; in order to meet previously set target flows rates, the use of underground storage and surface storage had to be incorporated in the design requiring extensive hydraulic analyses; in Ottawa, Ontario.
- **Oversaw the hydrologic and hydraulic analyses** required to design the necessary underground storage and surface storage for the stormwater management for the Woodroffe Ave. (Chapman Hills) Park and Ride facility in Ottawa, Ontario.
- **Conceptual Drainage Design**, Cardinal Creek Village, for DSEL, in Ottawa, Ontario.
- Participated to the **design of a permeable pavement demonstration project** for parking rehabilitee projects with the City of Ottawa, 2019-21.

SEWER INFRASTRUCTURE ANALYSES AND UPGRADE / I-I ANALYSES / MODEL DEVELOPMENT & CALIBRATION / CSO ANALYSES

- **Infiltration/Inflow analyses** in sanitary sewers using measured data and calibrated mathematical models: Alta-Vista, Ottawa; Bathurst & Wilson, North York; RMOC, Ottawa, Ontario
- Undertook an **Infiltration/Inflow and CSO Modelling Study** for the upgrade of a treatment plant, Ste-Thérèse and Blainville, North of Montréal, Québec.
- **CSO Modelling and Infiltration/Inflow Study** for the upgrade of a treatment plant, Ste-Thérèse and Blainville, North of Montréal, Québec.
- **Analyses of flow monitoring data and calibration: of a complex hydrologic/hydraulic I/I model**, RMOC; of a partially and combined sewer system in the North Rosedale and Moore Park districts, City of Toronto, Ontario.
- **Sewer Rehabilitation and Sewer Hydraulic study**, Town of Hawkesbury; Crestview Road, Ottawa;

Fallowfield Road, Ottawa.

- **Development of a Variable Diurnal DWF model**, City of Edmonton, Alberta. This model has been used successfully for the City of Toronto, and in the Ottawa area.
- **Infiltration/Inflow Analysis, Sewer Hydraulic, Model Calibration, and Sewer Rehabilitation Study** to identify feasible and cost-effective solutions to reduce the occurrence of basement flooding, City of Gatineau, Québec.
- **Analysis of flow data and combined sewer overflows to calibrate a hydrologic model** which was then used to evaluate the effects of various flow reduction measures: City of Toronto, Ontario.
- **Servicing study** for the Sector C in Brossard, Québec.
- **Sewer Rehabilitation, CSO Reduction and Sewer Hydraulic study** for the Old Ottawa East area, Ottawa, Ontario.
- **Estimation of sewer flows (sanitary and storm) for new storm sewers** and partially separated sewers for Argyle Street and Park Avenue Sewer Rehabilitation, Ottawa, Ontario.
- **SWMHYMO model calibration and validation, as well as PCSWMM model validation for the drainage area to the Beaver Pond in the Kanata Lakes subdivision (2018-2020)**.
- **SWMHYMO model calibration for the Shirley's Brook subwatershed in Kanata, (2021)**

WATER QUALITY & EROSION CONTROL

- **Development of a methodology for the assessment of chloride impacts** on receiving waters from several alternative snow dump sites in the City of Ottawa (formerly Ottawa-Carleton Regional Municipality), Ontario. The method is based on a regional analysis of monthly low flows and background concentrations. Based on snowmelt runoff rates from snow dumps and potential for dilution in the receiving water bodies, impact indices were determined.
- **Undertook flow/velocity/quality measurements and dispersion analyses** for the design of a treatment plant outfall in the St Lawrence River, Ingleside, Ontario.
- **Conducted erosion protection studies and analyses of the effects of urbanization on erosion**: Caledon, Ontario; Taylor Creek, Cumberland; Shirley's Brook, Kanata, Ontario.
- **Undertook flow/velocity measurements and shear stress analyses** for the design of a beach protection scheme: Hull, Québec.
- **Undertook field measurements and conducted a detailed water budget analysis** of Lac Leamy to investigate the possibility of opening it to the Gatineau and Ottawa rivers: Hull, Québec.
- **Undertook a water budget analysis of an existing wetland** to identify impacts of a proposed future development where a portion of the future drainage area would be diverted: London, Ontario.
- **Developed a stormwater quality management plan for an industrial site** where high levels of nitrogen-based compounds are contaminating nearby surface water bodies: Maitland, Ontario.
- **Participated to various Source Protection Surface Water Vulnerability Assessment studies** for the towns/cities of Hawkesbury, Rockland, Plantagenet, Wendover, Perth, Smiths Falls, Carleton Place, Ontario.
- **Hydrologic and hydraulic assessment along Mud Creek to support a Fluvial Geomorphic assessment** for the Mud Creek Slope Stability Study, with Golder Associates for City of Ottawa, Ontario.

CONSTRUCTION, FIELD WORK AND MONITORING

- **In charge of the construction supervision of a sewage lagoon** for the Department of National Defence. Carp, Ontario.

- **In charge of the construction supervision of an underground helicopter garage** at a Department of National Defence base (Defenbunker), Carp, Ontario.
- **Project engineer and general site manager of a $ 2 million construction project** for the City of Ottawa. Work included quantity estimates, orders, dealings with architects, engineers, unions and all subtrades. All aspects of work, schedules and meetings were coordinated and progress billings, invoicing, time sheets, etc. were also accounted for City of Ottawa, Ontario.
- **Coordinated and participated in field investigations to obtain water quality and flow measurement quantities**: St.Lawrence River, Ingleside; Ottawa River, Moussette Beach-Hull; Jock River, Goulbourn Township, Ontario
- **Coordinated and participated in various sewer flow and water quality measurements**: Amberwood sub-division, Nepean; Bravard subdivision, Manotick; Pineglen subdivision, Nepean; Heart's Desire subdivision, Nepean; Landfill site, Casselman, Ontario..
- **Coordinated and participated in infiltration capacities and groundwater monitoring**: Pineglen subdivision, Nepean; Heart's Desire subdivision, Nepean.
- **Coordinated and participated in a GPS survey of approximately 2 km of a creek to be modelled with HEC-RAS**, Ruisseau Moore, Hull, Québec.
- **Coordinated and oversaw the gathering of ADCP flow and continuous water level monitoring on**: Poole Creek (2008-2009) at the Amberwood Golf Course in Stittsville, Ontario; Dickinson Creek (2009) at the Nation Golf Club, in Curran, Ontario; and Greens Creek (2008), in Ottawa, Ontario.
- **Coordinated and oversaw the gathering of ADCP flow measurements on**: Pinecrest Creek (2009), in Ottawa, Ontario.; Carp River (2008-2009) at the Kinburn Gauge, in Ottawa, Ontario; Cardinal Creek (2012-2013) in Ottawa, Ontario; Jock River (2017), in Ottawa, Ontario.
- **Coordinated and oversaw the gathering of continuous rainfall, storm sewer flow and pond water level data** in and around the Kanata Lakes subdivision and Kanata Lakes Golf Course. The data was used to calibrate and validate hydrologic models (2018-19).
- **Coordinated and oversaw the undertaking of surface infiltration tests at various locations**; Amberwood Village (Ottawa, Ontario), Westport (Ontario), Barrhaven (Ottawa, Ontario), Stittsville wetland (Ottawa, Ontario), 2018-21.

EXPERT WITNESS, REVIEW and OMB/ OLT HEARINGS

Mr. Sabourin has conducted several reviews, analyses and acted as an expert witness in several project of legal cases with water resources and hydrological components.

- July 1987 storm and flooding in the City of Montréal, Québec (analysis of rainfall and modelling analysis)
- April 1994 flooding on the Lapèche River, Québec (analysis of rainfall and modelling analysis)
- August 1996 storm and flooding in the Ottawa region, Ontario (analysis of rainfall and radar data, and modelling)
- August 1996 storm and flooding in the City of Gatineau, Québec (analysis of rainfall and radar data, and modelling)
- June 1997 flooding in the Village of l'Orignal, Ontario (modelling analysis)
- July 1997 storm and flooding in the City of St-Hubert, Québec (analysis of rainfall and radar data)
- July 1997 storm and flooding in the City of Chambly, Québec (analysis of rainfall and radar data)
- June 1998 storm and flooding in the City of Gatineau, Québec (sewer modelling analysis)
- January 1999 flooding on the Salmon River, New York (interpretation of data)
- June 2000 storm and flooding in the City of Gatineau, Québec (analysis of rainfall and radar data, and sewer modelling analysis)

- June 2001 storm in the City of St-Hubert, Québec (analysis of rainfall and radar data)
- 2001 to 2003 rainfall events in St. Lucia, UK (analysis of rainfall data)
- January 2003 flooding event at the Hull Casino, Québec (analysis and interpretation of event)
- December 2003; served as expert witness in drainage related matters in an OMB hearing for FrancoScenie.
- July 2004 storm and flooding in the City of Saint-Hyacinthe, Québec (analysis of rainfall and radar data)
- July 2004 storm in the City of Gatineau - Buckingham, Québec (interpretation of rainfall intensities and radar data).
- April 2005 of well contamination in the Town of l'Orignal, Ontario (analysis and interpretation of event)
- June 2005 storm and flooding event in the City of Shawinigan, Québec (analysis and interpretation of rainfall event using radar data).
- September 2005 storm and flooding event in the City of Québec, Québec (analysis and interpretation of rainfall event).
- August 2006 storm and flooding event in the Cities of Saint-Eustache and des Deux Montagnes, Québec (analysis and interpretation of rainfall event using radar data).
- August 2006 storm and flooding event in the Town of Saintes-Annes-des-Plaines, Québec (analysis and interpretation of rainfall event using radar data).
- June and July 2007 storm and flooding event in the City of Levis, Québec (analysis and interpretation of rainfall event using radar data).
- August 2, 2008, storm and flooding event in City of Montréal, Québec (analysis and interpretation of rainfall event using radar data, liaison with insurance companies and legal representatives). November 2009 onward,
- Progressive flooding of lands in the City of Terrebonne, Québec, following the construction of Highway 640 (continuous hydrologic and hydraulic simulations to determine if changes in drainage patterns caused by the construction of Highway 640 can explain the increase flooding frequency and duration of subject lands, and the presence of anthropic wetlands). Court appearance in the fall of 2014.
- September 2010 storm event in the Cities of Saint-Eustache and Rosemère, Québec (analysis and interpretation of rainfall event using radar data).
- June 23-24, 2012, storm and flooding event in City of Gatineau, Québec (analysis and interpretation of rainfall event using radar data - in progress).
- October 2014, expert witness report for the August 22, 2013, storm event in the City of Drummondville, Québec (analysis and interpretation of rainfall event using radar data).
- April 2015, served as expert witness in drainage related matters in an OMB hearing for the development of the Chenier Lands, in Ottawa.
- October 2015, served as expert witness in drainage related matters in an OMB hearing for the development of the Bronte Green Lands, in Oakville, Ontario. Summer of 2016 acted as key hydrologic and hydraulic engineer in dealings to settle the case.
- February 2017, retained by both City of Ottawa and homeowner to assess and resolve a perceived drainage problem with the Emerald Estate subdivision, in Ottawa.
- December 2019, second trial (previous one was in 2014) on the impacts of improper design and maintenance of Highway 640 drainage which created wetlands on adjacent private properties in Terrebonne (Qc). Judgment prescribed what drainage infrastructure had to be replaced and constructed within 18 months.
- January, February 2022, Ontario Land Tribunal (OLT), ClubLink Corporation ULC, to permit the redevelopment of the lands (Golf Course) for residential and open space uses.
- September 2022, third trial (previous one was in 2019), as the works that were prescribed in the

previous judgment were not completed, this judgment imposed temporary works that are to be in place before the Spring of 2023 to allow for the drainage of the subject lands around Highway 640.

- January 2023-June 2023, preparation for Ontario Land Tribunal (OLT), retained by Southwest Georgetown Landowners Group Inc., Proposed Official Plan Amendment No. OPA 32. (in progress)
- April 2023-June 2023, retained by the City of Gatineau (Qc), for prepare an expert opinion on presence (natural or anthropogenic) of wetlands within the Forêt Boucher. (in progress)

USE OF APPLIED HYDRAULIC AND HYDROLOGIC MODELS

- **OTTHYMO**: An improved version of HYMO (HYdrologic MOdel) which generates runoff from not only large non-urban basins, but also from urban basins.
- **INTERHYMO/OTTHYMO-89**: The newly expanded version of OTTHYMO.
- **SWMHYMO**: A single event and continuous model based on the principles of HYMO and OTTHYMO. Latest version of model also incorporates the Infiltration / Inflow capabilities of SEWHYMO.
- **QUALHYMO**: Is a unit hydrograph based hydrologic model used to predict the long-term quantity and quality of runoff from rural and urban watersheds. The model can also produce exceedance curves for overflows and pollutants in ponds.
- **SEWHYMO**: A single event and continuous model for the analysis of Infiltration / Inflow and combined sewer overflows
- **HEC-2 / HEC-RAS**: A mathematical river model used to determine water surface profiles for sub-critical and super-critical flow conditions.
- **IMPRAM**: A program for the Improved Rational Method used for sizing storm sewers.
- **CFA_3.1**: Is the Consolidated Frequency Analysis Package from Environment Canada used to generate flood frequency curves fitted to a series of annual floods or levels.
- **STORM**: Is the Storage Treatment Overflow Runoff Model used to predict the long-term quantity and quality of runoff from urban basins.
- **STORMS 2000 and STORM 2010**: A program used for the frequency of observed rainfall events
- **OTTSWMM and DDSWMM**: Is the University of Ottawa's improved version of SWMM (Storm Water Management Model from EPA) which generates runoff from urban basins by analysing both minor (pipes) and major (street) flows.
- **EXTRAN**: Is the EXtended TRANsport model distributed by EPA and used to dynamically analyse flow routing and surcharges in complex sewer systems.
- **HYSTEM/EXTRAN**: is the German version of EXTRAN.
- **SWMM / PC-SWMM / XP-SWMM / XP-STORM**: EPA's Stormwater Management Model.
- **MIDUSS**: Microcomputer Interactive Design of Urban Stormwater Systems, developed by A. Smith et al.

SOFTWARE DEVELOPMENT

Mr. Sabourin has over 30 years of programming experience including the development of numerous in-house programs to improve the company's and client's efficiency. Those programs and/or applications include:

- **IMPRAM**: The Improved Rational Method.
- **TRAINHYD**: A training hydrologic software.
- **FASTHYMO, MINI-OTTHYMO, LUMPHYD, ULTRA**: User friendly versions of the hydrograph commands from OTTHYMO
- **SEWHYMO**: A single event and continuous model for the analysis of Infiltration / Inflow and combined

sewer overflows

- **OTTHYMO-89**: An improved version of the original OTTHYMO hydrologic model
- **SWMHYMO**: A single event and continuous model based on the principles of HYMO, OTTHYMO and QUALHYMO. Latest version of model also incorporates the Infiltration / Inflow capabilities of SEWHYMO.
- **STORMS, STORMS 2000 and STORMS 2010**: Programs to generate design storms, plot hyetographs, generate IDF curves and analyse the return period of an observed rainfall event.
- **PLOTHYD**: A program used to plot hydrographs generated by OTTHYMO-89 or SWMHYMO
- **DVMS for SEWER VIDEOS**: A digital video management system to accelerate the review and improve the use of sewer videos
- **DIG-VT**: Digital-Virtual Tour; a system that integrates the use of digital photos and GPS to allow users to conduct a virtual tour of, for instance a creek, from their computer.
- **Drainage System Selection Tool**: Designed the concept and directed the development of an EXCEL spreadsheet program that allows user to identify drainage system components that are compatible with specific site characteristics, development characteristics and SWM objectives. Based on user selected components, the tool provides approximate capital and operational costs for the drainage system.
- **GSPP**: Directed the development of a software integrated within an EXCEL spreadsheet that allows users to design grass swale and perforated pipe drainage systems.
- **Daily Water Budget Model**: Developed a new computational method to undertake daily computations of water budget based on daily temperature, precipitation, snow accumulation, and daily computed heat index, frost depth, snowmelt, interception, potential evapotranspiration, adjusted evapotranspiration based on daylight hours, infiltration, transpiration, and runoff.

RESEARCH CONTRIBUTIONS

- Was research associate of the IMPSWM program at the University of Ottawa.
- Developed several user friendly micro-computer programs: IMPRAM (Improved Rational Method), TRAINHYD (used to learn hydrologic principles), FASTHYMO, MINI-OTTHYMO, LUMPHYD, ULTRA.
- Contributed to the calibration of OTTHYMO on several watersheds using observed rainfall and runoff measurements.
- Tested, debugged and improved the QUALHYMO model.
- Tested and debugged the EXTRAN model.
- Developed and was main author of the INTERHYMO/OTTHYMO-89 hydrologic model.
- Analysed of real storms and determination of new design storms for the Town of Markham, Ontario.
- Compared of real storms with design storms for the City of Laval, Québec.
- Project manager of an MOE funded research study on the potential use of grass swales and perforated pipe storm drainage systems to control and reduce urban stormwater pollutant loadings, (1991-92).
- Developed and main author of the SEWHYMO infiltration/inflow model for sanitary sewers, (1993-94).
- Conducted a detailed analysis to determine the use of design storms in infiltration/inflow modeling. (M.Eng. Thesis) Developed and main author of the SWMHYMO model, an improved version of the popular OTTHYMO-89 hydrologic model, (1995-99).· Project manager and main researcher for a study entitled
- “Evaluation of Roadside Ditches and Other Related Stormwater Management Practices” (1997) conducted for Toronto and Region Conservation Authority, Toronto, Ontario.
- Project manager and principal investigator for a demonstration project, Keep the Rain Out of the Drain, using alternative drainage methods for the City of Toronto, Moore-Park & Rosedale areas (1997-98),

Toronto, Ontario.

- Project manager of an investigative study to measure the drying time of several types of surfaces / materials such as asphalt, concrete, roof singles, pavers, etc. (2017).
- Developed a methodology and managed the continuous monitoring of rainfall precipitation in a forest setting to determine / observe the process of wetting losses caused by trees and their leaves (2018 and 2019).
- Developed a methodology and managed the field work for the continuous monitoring of rainfall precipitation, wetting losses, retention, and evaporation of various soils, materials, and plants (2020).

LECTURES, PUBLICATIONS AND PAPERS

Mr. Sabourin has lectured at several Urban Hydrology short courses in Markham, Ontario; Mississauga, Ontario; London, Ontario; Edmonton, Alberta; Calgary, Alberta; Laval, Québec; Vancouver, British Columbia; Toronto, Ontario. He is also the author/co-author of several published papers which were presented at conferences across Canada and abroad:

- "Comparison of the IMPRAM Model (Improved Rational Method) with other Hydrologic Models."
- "Rule of Simplified Micro-Computer Models as Parts of Multi-level Hydrological Packages," Stormwater and Water Quality Management Modelling and SWM Users Group Meeting, Toronto, Sept. 17-18, 1986.
- "Teaching Models for Simulation and Real Time Control Operation of Urban Drainage Systems."
- "Use of Physical and Mathematical Modelling for Bridge Hydraulics," XXII Congress IAHR, Lausanne, Switzerland, 1987.
- "Development of a Multi-Level Package of Stormwater Management Models."
- "Design of Windpower Pumped Water Storage Reservoirs by Microcomputers," Microcomputers and Civil Engineering, Orlando, Florida, November, 1987.
- "Joint Use of the HEC-2 Model and a Physical Model for Floodline Delineation Upstream of a Bridge," Can. J. Civ. Eng., Vol 16 No 1, 1989.
- "The Use of Grass Swales and Perforated Pipes as a Stormwater Quality Control Alternative," Good Roads Conference, Penticton, B.C. (1991) and Toronto, Ont. (1993).
- "Mechanics of Scour in the Vicinity of Bridge Piers", Working paper, University of Ottawa, December, 1987.
- "Performance Review of Grass Swale Perforated Storm Sewer Systems", Annual Conference - Water Environment Association of Ontario, Windsor, Ontario, April 1994.
- “SEWHYMO-4, A Model for the Analysis of Infiltration / Inflow in Sanitary Sewer Systems”, unpublished.
- “Mathematical Simulation of Wet Weather Processes in a Sewerage System”, WEFTEC ‘94, Water Environment Federation 67th Annual Conference & Exposition, Chicago, Illinois, October 15-16, 1994.
- “Developing and Using a Dry Weather Flow Model for Sewerage Systems Analysis”, 1995 Annual Conference of the Canadian Society for Civil Engineering, June 1-3, 1995, Ottawa, Ontario.
- “The use of Design Storms for Infiltration / Inflow Modelling”, 1995 Annual Conference of the Canadian Society for Civil Engineering, June 1-3, 1995, Ottawa, Ontario.
- “Evaluation of Roadside Ditches and Other Related Stormwater Management Practices”, Controlling Stormwater: 2001 and Beyond, October 16-17, 1996, Burlington, Ontario.
- “Selection of an Optimum Road Drainage System”, SWAMP, Stormwater/CSO Technology Transfer Conference, February 23-24, 1998, Toronto, Ontario.
- Taught the 4th university course CVG 45114 “Hydraulics of Water Supply and Sewer Systems” at the University of Ottawa, 2005.

- “Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation”; Credit Valley Conservation Workshop on “Lessons Learned from Impacting LID in Northern U.S. and Canada”, Oct. 7th 2008.
- “Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation”; Water2010 International Conference, Québec City, July 2010.
- “Grass Swale and Perforated Pipe Drainage Systems a 20 year Performance Evaluation”; WEFTEC 2011. 84th Annual Water Environment Federation Technical Exhibition and Conference, Los Angeles, USA, October 2011.
- “Measurement of rainfall interception of tree canopies – how we have it wrong, all these years”, Unpublished, June 2020.

APPENDIX B

Ontario
Ontario Land Tribunal
Tribunal ontarien de l'aménagement du territoire

Acknowledgment Of Expert's Duty

OLT Case Numbers	Municipality
OLT-23-000534 **OLT-23-000939** **OLT-23-000940**	**County of Lanark** **Town of Perth**

1. My name is **(Jean-Francois Sabourin)**

   I live at the **(Ottawa)**

   in the **(n/a)**

   in the Province of Ontario.

2. I have been engaged by or on behalf of **Caivan (Perth GC) Limited** to provide evidence in relation to the above-noted Ontario Land Tribunal (`Tribunal`) proceedings.

3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:

   a. to provide opinion evidence that is fair, objective and non-partisan;

   b. to provide opinion evidence that is related only to matters that are within my area of expertise;

   c. to provide such additional assistance as the Tribunal may reasonably require, to determine a matter in issue; and

   d. not to seek or receive assistance or communication, except technical support, while under cross examination, through any means including any electronic means, from any third party, including but not limited to legal counsel or client.

4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date...June 12, 2014..... .....
Signature

APPENDIX C

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

CAIVAN PERTH DEVELOPMENT - HYDROLOGIC AND HYDRAULIC CONDITIONS REPORT

FEBRUARY 2023

Prepared For:

Caivan Communities
3713 Borrisokane Road
Nepean, ON
<Postal Code>
<Phone Number>

Prepared By:

J.F. Sabourin and Associates Inc.
52 Springbrook Drive,
Ottawa, ON
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T 613-836-3884 F 613-836-0332

Project Ref #: 2118

CAIVAN PERTH DEVELOPMENT - HYDROLOGIC AND HYDRAULIC CONDITIONS REPORT

In Perth, Ontario

FEBRUARY 2023

Prepared for:

Caivan Communities

Prepared by:

Jonathon Burnett, B.Eng, P.Eng
(*J.F. Sabourin and Associates Inc.*)

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1 Introduction

This Report has been prepared to provide a comprehensive understanding of the current hydrologic and hydraulic conditions of the future residential development site located at 141 Peter Street, Perth, Ontario, referred here on as the “Perth GC development”. The report is intended to serve as a baseline for future studies and design work related to water resources management, floodplain management, and other hydrologic and hydraulic analyses.

Figure 1 below outlines the development site, major watercourses and the Grants Creek wetland. As shown in this figure the development is located between the Tay River and Grants Creek, with the Grants Creek wetland located to the south of the site, additional details regarding the development and drainage areas have been outlined in Section 2 below. The report also covers a range of hydrologic and hydraulic characteristics, which includes an overview of surface water monitoring completed by JFSA in 2022, an updated existing floodplain delineation, a conceptual existing conditions water budget based on continuous hydrologic modelling and preliminary SWM pond sizing for the future development.

Each of the key items addressed in the report has been laid out in individual sections to ensure that the report provides a comprehensive and easy-to-understand overview of each of the components of the hydrologic and hydraulic conditions in the study area.

Figure 1. Site Overview

2 Existing Drainage Area

The following section provides an overview of the various drainage areas surrounding and within the development study area and outlines the land use compositions of each of the major watersheds.

2.1 Development Site

As outlined in **Figure 1** above the site is bound by the Tay River to the north and east of the site and by Grants Creek to the south. Under existing conditions, the Perth development site has a total drainage area of approximately **44.86 ha**, with **22.85 ha** currently draining north to the Tay River and the remaining **22.01 ha** draining south to the nearby wetland and Grants Creek. Currently, the development site is approximately split 50-50 between Grants Creek and the Tay River. The site under existing conditions consists primarily of a golf course with well-maintained lawns, surrounded by irregular forest patches. Refer to **Figure A1** in **Appendix A**, for a visual overview of the study area's pre-development drainage divide.

Under proposed conditions, the Perth development has a total drainage area of approximately **44.86 ha**, with **28.54 ha** draining north to the Tay River with the remaining **16.32 ha** draining south to the nearby wetland and Grants Creek. This is a drainage area adjustment between the two watersheds of **5.69 ha.** Note that efforts have been made to maintain the existing drainage areas within the development site as much as possible with consideration for grading and servicing limitations. Refer to **Figure A2** in **Appendix A**, for a visual overview of the study area's post-development drainage divide.

2.2 Grants Creek

The total existing drainage area of Grants Creek (upstream and surrounding lands - minus the development site) is approximately **9351.78 ha**. A land use summary in **Table 2.1** below shows that land cover within the drainage area is primarily natural features (**60.8%**), agricultural lands (**23.4%**), and open water (**9.3%**). The remainder of the land cover within the watershed is bedrock (**4.8%**) and community/infrastructure (**1.7%**).

Table 2.1 – Grant's Creek - Land Use Summary

Land Cover	Area (ha)	Total Area (ha)	Percentage of Total
Natural (Forest/Meadows/Swamps)	5689.8	9351.78	60.8%
Agricultural	2189.1	9351.78	23.4%
Water	868.3	9351.78	9.3%
Bedrock	447.2	9351.78	4.8%
Community/Infrastructure	157.3	9351.78	1.7%

Under post-developed conditions, the Perth GC Development would decrease the total area of the Grants Creek watershed by around **5.69 ha**, a change of **0.06%. Figure A3** provides an overview of the various Grants Creek drainage areas and land use.

Table 2.2 - Grants Creek Wetland Drainage Area Change

Development Conditions	Upstream and Surrounding Area (ha)	Perth GC Development (ha)	Total Area (ha)	Difference	
				(ha)	(%)
Pre-Dev	9351.78	22.01	9373.8	-	-
Post-Dev	9351.78	16.32	9368.1	**-5.69**	**0.06%**

2.3 Tay River

The total drainage area of the Tay River watersheds (upstream and surrounding lands – minus the development site) is around **58,382.7 ha**. A land use summary in **Table 2.3** below shows that land cover within the drainage area is primarily natural features (**64.7%),** agricultural lands (**14.3%**), and open water (**13.9%**). The remainder is bedrock (**6.2%**), and community/infrastructure (**0.9%**).

Table 2.3 – Tay River - Land Use Summary

Land Cover	Area (ha)	Total Area (ha)	Percentage of Total
Natural (Forest/Meadows/Swamps)	37799.6	58382.7	64.70%
Agriculture	8325.8	58382.7	14.30%
Water	8131.2	58382.7	13.90%
Bedrock/Sand/Gravel	3594.9	58382.7	6.20%
Community/Infrastructure	531.2	58382.7	0.90%

As shown in **Table 2.4** below, the post-developed Perth GC site would result in an increase of **5.69 ha** to the Tay River Watershed, representing a change in the total drainage area of **0.009%. Figure A4** outlines the total drainage area and land use types within the watershed.

Table 2.4 - Tay River Wetland Drainage Area Change

Conditions	Upstream and Surrounding Area (ha)	Perth GC Development (ha)	Total Area (ha)	Difference	
				(ha)	(%)
Pre-Dev	58382.7	22.85	58405.5	-	-
Post-Dev	58382.7	28.54	58411.2	**5.69**	**0.009%**

2.4 Summary

This section provided an overview of the various drainage areas around and within the development study area. As discussed above, under existing conditions the Perth development has a total drainage area of approximately **44.86 ha**, with **22.86 ha** currently draining north, while the remaining **22.01 ha** draining south to the nearby wetland and Grants Creek. The development is approximately split 50-50 draining to Grants Creek and the Tay River. The primary land cover of the Grants Creek and Tay River watersheds are natural features, agriculture, and open water.

Under proposed conditions, the Perth GC development has a total drainage area of approximately **44.86 ha**, with **28.54 ha** draining north to the Tay River and **16.32** ha draining south to the nearby wetland and Grants Creek. The total existing drainage area upstream of and surrounding Grants Creek is **9351.8 ha**. The proposed development would result in an overall decrease of **5.69 ha**, or **0.06%** to the total Grants Creek watershed. The Tay River drainage area would receive an increase of **5.69 ha**, an increase of **0.009%** to the Tay River watershed. Given the size of these watersheds, and the location of the drainage area change (at the confluence of the two watersheds) it is unlikely that this change under post-development conditions will have a quantifiable impact on the hydraulic and hydrologic conditions of the surrounding watercourses.

3 Surface Water Monitoring (2022)

As a part of the Perth GC development, J.F. Sabourin & Associates (JFSA) has been commissioned by Caivan Communities to complete surface water monitoring throughout the subject area. These works are intended to develop a strong understanding of how the watercourses react to various environmental conditions, and how flows and water levels are related at key locations within the surrounding lands. This work included surface water monitoring and precipitation monitoring in the study area from June 2022 to November 2022. The following section briefly outlines the data obtained and conclusions drawn from this 2022 monitoring window.

3.1 Overview

The 2022 monitoring program consisted of 2 level loggers, 1 barometric logger, and 1 rain gauge implemented on and around the site. A level logger was installed on Grants Creek at Glen Tay Road, on the upstream side of the road crossing, to monitor the flow contributions from the upstream drainage area to the Grants Creek wetland. A secondary level logger was installed within the Grants Creek Wetland near the confluence with the Tay River to monitor water levels within the wetland itself. Both the Barometric logger and rain gauge were located within the existing Perth Golf Course site. Refer to **Figure B1** for the monitoring locations from 2022.

3.2 Rainfall

A tipping bucket rain gauge was installed on-site on **June 10, 2022,** until **November 2, 2022**, providing **152 days** of rainfall data. The gauge was placed in a flat, open area on a platform to avoid any interference from nearby vegetation and trees and to withstand large rainstorms and wind without shifting. The gauge was calibrated before installation, and the lip of the funnel was installed level with the surrounding ground. The rain gauge was inspected monthly to ensure that it was level and functioning properly, and the data recorded during that month was downloaded.

Throughout the monitoring period of **June 10, 2022,** until **November 2, 2022,** there was a total of **325.3 mm** of rainfall. Based on the rainfall data acquired during this window ‘significant’ rainfall events were then identified. For this study, a ‘Significant Rainfall Event’ was defined as a single event if the total rainfall volume was greater than 5 mm and was followed by at least 12 hours without any additional rainfall. A total of **18** significant rainfall events took place in 2022. The largest event recorded over this duration occurred on July 18, from 09:40 AM to 21:20 PM (duration of 11:40) and had a total rainfall volume of **38.3 mm. Table 3.1** provides a full summary of these significant events.

Table 3.1: Significant Rainfall Events, 2022
(Events with more than 5 mm and separated by at least 12 hours of no rain)

Event	Start Date/Time	Finish Date/Time	Duration (Hr : Min)	Total Rainfall (mm)
1	2022-06-21 10:00	2022-06-21 14:40	4:40	6.1
2	2022-06-29 12:10	2022-06-29 17:50	5:40	6.2
3	2022-07-12 13:50	2022-07-12 14:35	0:45	13.1
4	2022-07-18 09:40	2022-07-18 21:20	11:40	38.3
5	2022-07-22 17:10	2022-07-22 17:40	0:30	13.9
6	2022-07-24 21:15	2022-07-25 00:35	3:20	8.4
7	2022-08-07 20:55	2022-08-08 02:10	5:15	17.9
8	2022-08-21 12:20	2022-08-21 17:15	4:55	8.9
9	2022-08-22 14:55	2022-08-22 16:35	1:40	7.4
10	2022-08-22 23:10	2022-08-23 00:30	1:20	21.6
11	2022-08-29 17:25	2022-08-29 18:35	1:10	20.9
12	2022-08-30 13:20	2022-08-30 18:45	5:25	7.1
13	2022-09-03 20:45	2022-09-03 23:00	2:15	10.1
14	2022-09-13 12:00	2022-09-14 06:05	18:05	18.3
15	2022-09-18 11:00	2022-09-19 01:20	14:20	16.8
16	2022-09-19 06:35	2022-09-20 07:50	1:15	24
17	2022-10-13 08:00	2022-10-13 21:15	13:15	8.6
18	2022-10-17 05:20	2022-10-17 19:00	13:40	10.8

The Rainfall-Duration Max Intensity summary for the 2022 collected rainfall has been compared to the IDF curves for Perth (**Table 6.1)** and assessed for various rainfall intervals, with the summary outlined below in **Table 3.2** for this study period. Based on this analysis it was seen that the rainfall intensities observed in 2022 equate to either less than a 2-Year or 5-Year event, depending on the duration observed.

Table 3.2: Rainfall Duration/Max Intensity Summary, 2022

	Duration	Maximum Measured Rainfall Intensity (mm/hr)	Return Periods Based on Ottawa Airport IDF (Years)
2022	5 Minute	93.60	<2-Year
	10 Minute	76.20	<5-Year
	15 Minute	62.00	<5-Year
	30 Minute	31.80	<2-Year
	60 Minute	21.10	<5-Year
	2 Hour	10.80	<2-Year
	6 Hour	4.65	<2-Year
	12 Hour	3.19	<2-Year
	24 Hour	1.60	<2-Year

3.3 Glen Tay Road Crossing

A level logger was placed at the upstream side of Glen Tay Road on Grants Creek. The minimum, maximum and average for both water temperature and depth, as well as the number of days with zero depth readings, are provided in **Table 3.3**. Graphs showing continuous water depth vs. rainfall events are available in **Appendix B**.

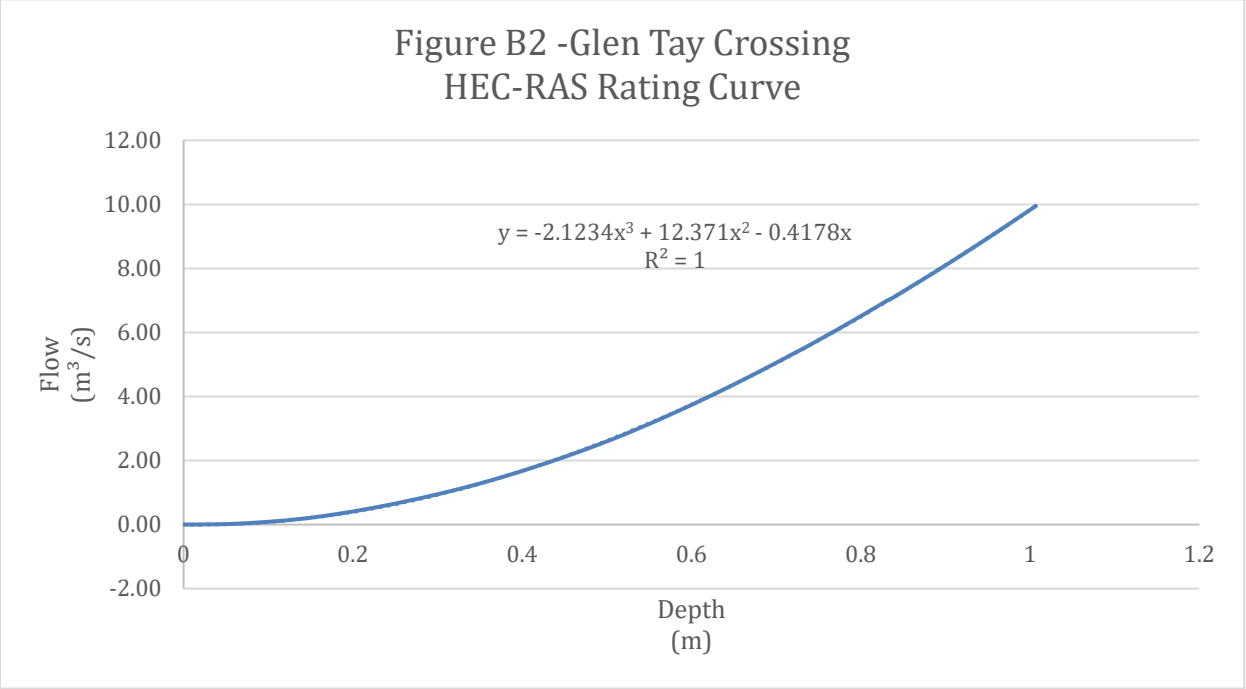
Table 3.3: Glen Tay Road Level Logger Monitoring Summary, 2022

Site	Monitoring Duration (days)		Water Temperature (˚C)	Water Depth (m)	Duration of measured zero depth
Glen Tay Road	152	Min	5.3	0.07	0 days / 0%
		Max	30.9	0.38	
		Avg	18.6	0.18	

Based on the above results the average water depth at this location was **18 cm**, and only fluctuated by **31 cm** over the full monitoring period. While the average water temperature was **18.6 °C** varied by **25.6 °C** over the monitoring period. Note that there was a constant based flow at this location and the channel never went dry during the monitoring period.

3.4 Glen Tay Road Rating Curve / Flow Derivation

A detailed survey of the bridge crossing under Glen Tay Road was completed by JFSA field staff, and the crossing details were incorporated into a simple HEC-RAS model to derive a rating curve (Depth vs Flow) relationship at this location (refer to **Figure B2**), to allow for the continuous water level depths measured at this location to be converted to flows. This analysis assumes that the crossing operates under inlet control the entire time and that downstream/tailwater conditions have no impact on the flows through this crossing.



Based on the rating curve derived by HEC-RAS the total flow through this crossing was **49,759,017 m³.** There was a total rainfall volume of **325.3 mm** recorded by the gauge for this duration and the total drainage area to this location is approximately **7,986.2 ha**. Based on the above the upstream area has a runoff coefficient of **1.92,** which is not possible. As such the assumption that this crossing operates under inlet control may not always be valid and future monitoring will require a level logger both upstream and downstream of this crossing to accurately capture the impacts that the tailwater has on flows through this crossing and to the wetland.

3.5 Grants Creek Wetland

A level logger was placed at the downstream extent of the Grants Creek wetland near the confluence with the Tay River. The minimum, maximum and average for both water temperature and depth, as well as the number of days with zero depth readings, are provided in **Table 3.4**. Graphs showing continuous water depth vs. rainfall events are available in **Appendix B**.

Table 3.4: Grants Creek Wetland Level Logger Monitoring Summary, 2022

Site	Monitoring Duration (days)		Water Temperature (˚C)	Water Depth (m)	Duration of measured zero depth
Grants Creek Wetland	152	Min	7.0	0.320	0 days / 0%
		Max	26.8	0.558	
		Avg	18.8	0.411	

Based on the above results the average water depth at this location was **41 cm**, and only fluctuated by **24 cm** over the full monitoring period. While the average water temperature was **18.8 °C** and varied by **19.8 °C** over the monitoring period. Note that there was a constant based flow at this location and the channel never went dry during the monitoring period.

3.6 Tay River (WSC Gauge)

Water Survey Canada (WSC) has an active gauge on the Tay River approximately 500 m downstream of the Perth GC development site which reports both water levels and flows at this location. This location includes contributions from both the Tay River and Grants Creek. The flow and level data recorded at the gauge have been overlaid with the rainfall data collected by JFSA from the subject site to give an overview of the response of the Tay River and to approximate a runoff coefficient. Full figures for this location have been provided in **Appendix B.**

Based on the JFSA rain gauge a total rainfall volume of **325.3 mm** fell over the window from June 10th to November 2nd, 2022. Water Survey Canada indicates that the gauge at this location has a total drainage area of approximately **66,100 ha** with a total flow volume of **54,152,004 m³** over this duration. Based on the above the Tay River at this location has a runoff coefficient of approximately **0.25,** which is in line with the land use for this area.

3.7 Summary

Rainfall and surface water monitoring was completed on the site from June 2022 to November 2022. The rainfall monitoring recorded **18** significant events (with volumes greater than 5mm) but all rainfall events recorded this year had return periods less than the 5-year event. Water level monitoring at the Glen Tay Road crossing indicated that tailwater impacts at this location may affect the flows through the crossing and to the wetland, as such additional loggers are advised for future monitoring to capture these impacts. The level logger in the Glen Tay wetland showed that the wetland water levels fluctuated by only **24 cm** over the full monitoring period. Combining the rainfall data with the flows recorded at the water survey Canada gauge, it was found that the Tay River at this location (which includes both the Tay River and Grants Creek) has a runoff coefficient of approximately **0.25**. As no significant rainfall events were observed in this year of monitoring it is advised that the surface water monitoring program is to be continued in the following years.

4 Floodplain Mapping Update

Accurate floodplain mapping is required for the future Perth GC development. Upon review of the floodplain mapping based on the 2013 model of the Tay River provided by the Rideau Valley Conservation Authority (RVCA), J.F Sabourin & Associates (JFSA) determined that additional topographic data would improve/refine the floodplain boundaries affecting the subject property. This included acquiring higher resolution site-specific LiDAR of the area and completing field checks to determine culvert locations and elevations. This resulted in a site-specific refinement of the floodplain extent on the subject lands. Note that no modifications have been made to the existing hydraulic model produced by RVCA in 2013, simply the topography that the flood elevations have been mapped on has been updated using the latest available LiDAR and onsite topographic survey of existing culverts through the existing golf course.

4.1 Updated Analysis

Site-specific imagery was collected by First Base Solutions Inc. retained by David Schaeffer Engineering Ltd (DSEL)., on November 7th, 2021 at a ground sample distance of 6 cm and controlled with Airborne Kinematic GPS and Surveyed Ground Control points. The resulting mapping was compiled with a DTM capable of producing 0.25m contours and map accuracies of +/- 12cm at a 95% confidence level on well-defined, easily visible objects within the imagery. Note that this LiDAR has been used in other analyses outlined in this report such as section 2.1-Development Site. This site-specific data is at a much higher resolution than the 1m contour data used in the RVCA model. **Figure C1** outlines the regulatory floodplain boundary based on the work completed by RVCA as a part of the “Tay River Flood Risk Mapping Report, Glen Tay Road to Lower Rideau Lake, 2013”, and is the current official floodplain extent for this location. JFSA used the newer LiDAR to run the original HECRAS model with updated terrain to delineate a refined floodplain extent shown in **Figure C2**. It is important to note that no model parameters have been changed from the RVCA model of record for the Tay River. The floodplain extents produced by this model have simply been remapped using the latest available topographic data.

4.2 Field Verification

To further the accuracy of the results obtained through the updated topographic data, staff from J.D Barnes Limited (JDB) surveyed culvert locations on the golf course. Several key locations were identified as potentially having a direct impact on the floodplain extent outcome, as they would allow the Tay River floodplain to connect to Grant’s Creek through the subject property. JDB field staff surveyed the culvert invert and obvert elevations to determine whether floodwaters would be permitted to pass through. Results from the survey can be seen in **Figure C3**. All culverts surveyed were determined to be below their adjacent floodplain elevation, which means that they would allow floodwaters to spill onto the proposed development site between the Tay River and Grant’s Creek.

4.3 Summary

Based on the compiled data and completed field checks, JFSA is confident in the accuracy of the floodplain extent generated using the updated topographic data. The refined boundaries produced by JFSA are georeferenced and have been provided to JDB and Caivan (Perth GC) Ltd. in support of the development of the proposed draft plan of subdivision and used in the balance cut fill analysis completed by DSEL. Note that no modifications have been made to the existing hydraulic model produced by RVCA in 2013, simply the topography that the flood elevations have been mapped on has been updated.

5 Existing Water Budget Modelling

A continuous SWMHYMO hydrologic model has been developed to assess the site's pre-development water budget. The model makes use of the pre-development water budget analysis completed by GEMTEC for this site. Model parameters have been adaptively adjusted as a part of this analysis to ensure the continuous simulation results are in line with the static MOE-style water budget completed by GEMTEC.

5.1 Continuous Simulation Modelling

The continuous SWMHYMO model was run using 36 years of hourly rainfall data from the Ottawa International Airport from 1967 to 2003 (excluding missing 2001 rainfall data), and the average annual evaporation, infiltration and runoff volumes from the subject site were computed and compared. Note that this rain gauge is generally only operational for the months of April-November. Outside of this window precipitation is more likely to be in the form of snowfall and the soils are also more likely to be frozen, making it difficult to simulate such conditions with a hydrologic model using conventional parameters, as such, this period has not been considered in the analysis. Note that GEMTEC's water budget analysis considered the full year, while the JFSA analysis only considered April to November. To resolve this disconnect the total percentage of rainfall that evaporates infiltrates and runs off each year has been matched as an alternative to matching annual volumes, which is not possible due to the difference in analysis windows.

5.2 Model Parameters

As a part of this analysis the Initial Abstraction (IA) value and Curve Number (CN) values have been iteratively adjusted to calibrate the model to produce similar results to the GEMTEC water budget. It is justifiable to adjust the IA value as it is known that the typical initial abstraction/wetting loss that occurs throughout the year fluctuates with the seasons and amount of vegetation present. Additionally, although CN can be derived empirically by simply looking at the land use and soil type alone, for natural lands again the volume of runoff that infiltrates varies throughout the year depending on the soil conditions (High runoff in the winter-freshet when the soils are either frozen or saturated and very little runoff in the summer when the soils are dry) and the degree of vegetation present throughout the year.

Based on this analysis the typical average annual Initial Abstraction value for the site was found to be 8.75 mm. Although this is relatively high compared to typical IA values assumed for grassed lands (5 mm), it is within the range outlined in the Design & Construction of Urban Stormwater Management Systems, ASCE, (1992) for vegetated areas which range from 2.5 mm to 12.7mm depending on the extent and type of vegetation present. Based on this analysis the typical average CN value for the site is 90 and 92 for the Grants Creek and Tay River drainage areas respectively. Again, these values are higher than what is typically assumed for design storms due to two factors; the water budget analysis considers winter /spring freshet months when the soils are frozen and little infiltration will occur, where CN values of 95-99 are typically assumed for these conditions. Additionally, a large portion of the site is currently bedrock at the surface or with very shallow overburden, as such these areas are treated as impervious (CN 99).

It is important to note that the model parameters adopted above are an annual average representation of the site and will fluctuate throughout the year with various seasonal changes. As such the typical Textbook IA and CN values have been adopted for the preliminary SWM ponding sizing completed in Section 6 below, as the design storms assumed for that analysis area based on summer rainfall events.

5.3 Model Results

The complete SWMHYMO modelling input and summary files have been provided in **Appendix D**. **Table D.1 and D.2** provide a full summary of the SWMHYMO modelling, based on the 39 years of data, and outline the maximum, minimum and average volumes and percentages of precipitation that evaporate infiltrate and runs off for the Grants Creek and Tay River portions of the development site respectively. **Table 5.1** below is an excerpt from this summary.

Table 5.3: Pre-Development Water Budget based on Continuous Simulations

Location	Precipitation (mm)	Total Evaporation (mm)		Total Infiltration (mm)		Total Runoff (mm)	
Grants Creek	589.1	361.2	**62%**	85.2	**15%**	142.8	**24%**
Tay River	589.1	361.2	**62%**	93.9	**16%**	134.0	**22%**

Based on the continuous simulations using 39 years of historical rainfall data it was determined that for the total development site, approximately **22-24%** of the annual rainfall will result in runoff, **62%** will evaporate and **15-16%** will infiltrate.

5.4 Summary

Continuous hydrologic modelling has been completed which has made use of the water budget modelling completed by GEMTEC. Based on this analysis it was determined that under pre-development conditions for the total development site, approximately **22-24%** of the annual rainfall will result in runoff, **62%** will evaporate and **15-16%** will infiltrate.

6 Preliminary SWM Facility Sizing

The following section details the preliminary stormwater management (SWM) facility sizing for the development site based on a post-development concept plan. The various SWM facilities throughout the site will provide water quality treatment, peak flow attenuation, and flood control for the project site and have been sized to ensure that total peak flows to both Grants Creek and the Tay River match Pre-Development conditions. This analysis has been completed using SWMHYMO hydrologic modelling software, as it is well suited to simulating large undeveloped lands as well as lumped conceptual future development lands. Note that this analysis has simply been completed to provide an order of magnitude of the required storage volume of the various possible SWM facilities throughout the site, and does not give any directive on exactly where or how this volume should be provided, which will be addressed during detailed design. The primary intention of this study is to ensure that sufficient land is set aside under post-development conditions to ensure that there is adequate room for SWM facilities to meet the objectives specified above.

6.1 Design Storms

Design storms for the development were derived using historical rainfall data outlined in the MTO IDF Curve lookup tool for the exact site locations. Full details of this tool and IDF data for this location can be found using the link below.
http://www.eng.uwaterloo.ca/~dprincz/mto_site/results_out.shtml?coords=44.892975,-76.275126

Table 6.1 below outlines the rainfall intensity provided in the MTO tool. These intensities were then fit to the formula below to derive A, B and C values which were then used to derive synthetic designs storms. For this analysis, the 3-hour Chicago and 24-Hour SCS design storms were used for both pre and post-development.

$$Rainfall\ Intensity\ \left(\frac{mm}{hr}\right) = \frac{A}{(t_c + B)^C}$$

Table 6.1: Rainfall Intensity – Perth – MTO IDF Tool

Return Period (Yr)	5 mins	10 mins	15 mins	30 mins	60 mins	2 hrs	6 hrs	12 hrs	24 hrs	A	B	C
2	115.9	71.4	53.8	33.1	20.4	12.6	5.8	3.6	2.2	**362.018**	**0.102**	**0.702**
5	153.4	94.5	71.2	43.8	27.0	16.6	7.7	4.8	2.9	**478.921**	**0.106**	**0.701**
10	178.9	110.2	83.0	51.1	31.5	19.4	9.0	5.5	3.4	**559.506**	**0.102**	**0.702**
25	210.2	129.5	97.5	60.1	37	22.8	10.6	6.5	4.0	**655.462**	**0.104**	**0.701**
50	233.4	143.8	108.3	66.7	41.1	25.3	11.7	7.2	4.5	**723.892**	**0.087**	**0.700**
100	256.7	158.1	119.1	73.4	45.2	27.8	12.9	8.0	4.9	**796.709**	**0.078**	**0.700**

6.2 Drainage Areas

Figure E1 provides an overview of the development area under pre-development conditions. For this analysis under pre-development conditions, the site has simply been broken into two subcatchments, one that represented the development area contributions to the Tay River and one that represented the development area contribution to Grants Creek. As outlined above in

section 2.1 the site under existing conditions is essentially a 50-50 split to Grants Creek and the Tay River.

6.3 Land Use

Under pre-development conditions, the site primarily consists of a mix of manicured grass (golf course) surrounded by forest. Land use data has been taken from Southern Ontario Land Resource Information System (SOLRIS) v3.0 Land Use Data, publicly available through Land Information Ontario (LIO). **Figure E2** in **Appendix E** provides a visual overview of the respective land use data for each of the subcatchments within the study area.

6.4 Soil/Infiltration Data

Soil data within the study area has been taken from Soil Survey Complex Data publicly available from Land Information Ontario (LIO). **Figure E3** in **Appendix E** provides a visual overview of the respective soil type data for each of the subcatchments within the study area. From this data the site primarily consists of Monteagle and Monteagle Sandy Loam soils, which are considered a Type B SCS soil group. The site also consists of Muck and North Gower soils, which are considered a Type D SCS soil group.

6.5 Curve Number (CN)

Curve Numbers (CN) were calculated, based on underlying Land Use Type and Soil Classification at each location within the subcatchments based on values outlined in Tables A2 and A3 in the SWMHYMO Manual. Each Curve Number was then weighted based on the total area within a given subcatchment to determine the weighted CN for that subcatchment. Full CN derivation Tables have been provided in **Table E1** in **Appendix E**.

6.6 Time to Peak

Flow paths have been discretized based on the topographic data using GIS tools and the longest major flow path within each subcatchment identified; refer to **Figure E4** in **Appendix E** for the flow paths discretized for each subcatchment. The upstream and downstream topographic elevations and flow lengths were identified for each subcatchment and used in the calculations. For these natural subcatchments, the Federal Aviation Administration (FFA) method was determined to be the most appropriate method to calculate the Time to Peak. Full details of these calculations have been provided in **Table E2** in **Appendix E**, along with other time-to-peak values using alternative tp calculation methods.

6.7 Initial Abstraction

For undeveloped lands, an initial abstraction value of 5 mm has been assumed which is typical for undeveloped lands commonly used throughout Ontario (parameters are in line with typical rates per City of Ottawa Storm Sewer Design Guidelines). Full SWMHYMO modelling input and summary files for pre-development conditions have been provided in **Appendix E**

6.8 Pre-Development Results

As outlined above the model has been run using both the 3-hour Chicago and 24-hour SCS design storms, for the 2-, 5-, 10-, 25-, 50- and 100-Year events as well as the 25mm event. **Table 6.2** below outlines the peak flows from the development site to both Grants Creek and the Tay River under pre-development conditions. Note that although the drainage area to Grants Creek is

slightly smaller than that to the Tay River, the Grants Creek drainage area is producing slightly larger peak flows for most events. This is due to the fact that the Grants Creek drainage areas are slightly steeper, which results in higher peak flows for an equivalent area.

Table 6.2 – Pre-Development Peak Flow Summary

Event	Grants Creek (22.01 ha) Peak Outflow (m^3/s)	Tay River (22.86 ha) Peak Outflow (m^3/s)
25MMC3H	0.125	0.126
2YRCHI3HR	0.149	0.150
5YRCHI3HR	0.288	0.285
10YRCHI3HR	0.399	0.393
25YRCHI3HR	0.559	0.546
50YRCHI3HR	0.688	0.669
100YRCHI3HR	0.830	0.804
2YRSCS24HR	0.463	0.444
5YRSCS24HR	0.790	0.750
10YRSCS24HR	1.044	0.986
25YRSCS24HR	1.382	1.298
50YRSCS24HR	1.653	1.545
100YRSCS24HR	1.932	1.800

6.9 Post-Development Drainage Area and Imperviousness

To assist in the post-development SWM facility sizing a conceptual site servicing plan has been developed by DSEL. Based on this plan the site will have 3 SWM ponds and 2 uncontrolled areas that will provide water quality and quantity control through LIDs and OGS units. **Figure E5** in **Appendix E** provides an overview of the conceptual development plan. Based on this plan approximately **16.32 ha** will drain to Grants Creek and the remaining **28.54 ha** to the Tay River. Note that efforts have been made to maintain the existing drainage areas within the development as much as possible with consideration for grading and servicing limitations.

Based on this conceptual plan there will be two SWM ponds (Ponds 1 & 3) that will discharge to the Tay River and a small segment (**1.35 ha**) that will have an OGS and LIDs. There will be one SWM Pond (Pond 2) that will discharge to Grants Creek and a small segment (**1.75 ha**) of development that will have an OGS and LIDs. To simplify this analysis while also being conservative it was assumed that the whole development would have a runoff coefficient of 0.7 (66% imperviousness) and it was assumed that 90% of the impervious area will be directly connected to the storm sewer infrastructure, which is a conservative assumption.

To ensure sufficient storage volume is provided for the lands treated by the OGS units, these drainage areas have been lumped with the areas treated by the SWM pond. This allows flexibility at the detailed design stage to allow for adjustment of drainage areas (controlled and uncontrolled) while ensuring sufficient storage volume is provided to the site.

6.10 Soil Infiltration

To represent the proposed developed land infiltration rates, Horton's infiltration has been used. For these lands, the following Horton's Infiltration parameters have been applied: Fo=76.2 mm/hr, Fc=13.2 mm/hr, DCAY=4.14 /hr, F=0 mm. These Horton infiltration rates are typical for urban grassed areas and are commonly used throughout Ontario (infiltration parameters are in line with typical rates per City of Ottawa Storm Sewer Design Guidelines)

6.11 Quality Control Volumes

Quality control active storage volumes for each of the facilities have been calculated as per MOE guidelines, based on the required 40 m³/ha. There is a total of **28.54 ha** of land that will drain to the Tay River and as such will require **1,142 m³** of quality control storage. There is a total of **16.32 ha** of land that will drain to Grants Creek and as such will require **653 m³** of quality control storage. Note that the SWM pond preliminary sizing has considered this quality control volume to drain over 48 hours, and this active quality control volume has been included in the preliminary facility sizing.

6.12 Quantity Control Volumes

As mentioned above the SWM Facilities will be designed to meet pre-development peak flows at the two respective watercourses/receivers. **Tables 6.3A** and **6.3B** below outline the pre-and post-development flows and the associated required SWM Facility storage volumes to ensure that the proposed development meets these pre-development rates. Note that the total peak flow to Grants Creek and the Tay River are either equal to or less than that specified under pre-development conditions for all events. Full SWMHYMO modelling input and summary files for post-development conditions have been provided in **Appendix E**.

From **Table 6.3A** below it is seen that the development area draining south to Grants Creek will need a total of approximately **6,343 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. From **Table 6.3B** below it is seen that the development area draining north to the Tay River will need a total of approximately **13,662 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. Note that the required unitary storage volumes (m³/ha) are higher for the area draining to the Tay River due to the increase in total drainage area when compared to pre-development conditions.

Table 6.3A: Grants Creek - Preliminary SWM Pond Sizing

Event	Pre Development 22.01 Peak Outflow (m^3/s)	Post Development					
		SWM Pond 2 + OGS2 16.32 ha		OGS2 1.75 ha		SWM Pond 2 14.57 ha	
		Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)	Required Volume (m^3)
Quality Control*	-	0.002	653	0.0002	70	0.002	583
25MMC3H	0.125	0.125	1,723	0.013	185	0.112	1,538
2YRCHI3HR	0.149	0.149	1,974	0.016	212	0.133	1,762
5YRCHI3HR	0.288	0.288	2,684	0.031	288	0.257	2,396
10YRCHI3HR	0.399	0.399	3,151	0.043	339	0.356	2,812
25YRCHI3HR	0.559	0.559	3,773	0.060	406	0.499	3,367
50YRCHI3HR	0.688	0.688	4,223	0.074	454	0.614	3,769
100YRCHI3HR	0.830	0.830	4,678	0.089	503	0.741	4,175
2YRSCS24HR	0.463	0.408	3,184	0.044	342	0.364	2,842
5YRSCS24HR	0.790	0.672	4,167	0.072	448	0.600	3,719
10YRSCS24HR	1.044	0.918	4,795	0.099	515	0.819	4,280
25YRSCS24HR	1.382	1.382	5,409	0.149	581	1.233	4,828
50YRSCS24HR	1.653	1.652	5,874	0.178	631	1.474	5,243
100YRSCS24HR	1.932	1.930	6,343	0.207	682	1.723	5,661

Quality control volume (40 m^3/ha) released over 48 hours

Table 6.3B: Tay River - Preliminary SWM Facility Sizing

Event	Pre Development 22.86 Peak Outflow (m^3/s)	Post Development								
		SWM Pond 1 11.26 ha		SWM 3 + OGS 17.28 ha		OGS1 1.353 ha		SWM Pond 3 15.93 ha		Tay Total 28.54
		Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)	Required Volume (m^3)	Peak Outflow (m^3/s)
Quality Control*	-	0.001	450	0.002	691	0.000	54	0.002	637	-
25MMC3H	0.126	0.050	1,318	0.076	2,025	0.006	159	0.070	1,866	0.126
2YRCHI3HR	0.150	0.059	1,540	0.091	2,363	0.007	185	0.084	2,178	0.150
5YRCHI3HR	0.285	0.112	2,089	0.173	3,204	0.014	251	0.159	2,953	0.285
10YRCHI3HR	0.393	0.155	2,452	0.238	3,759	0.019	294	0.219	3,465	0.393
25YRCHI3HR	0.546	0.215	2,943	0.331	4,510	0.026	353	0.305	4,157	0.546
50YRCHI3HR	0.669	0.264	3,325	0.405	5,097	0.032	399	0.373	4,698	0.669
100YRCHI3HR	0.804	0.317	3,695	0.487	5,664	0.038	443	0.449	5,221	0.804
2YRSCS24HR	0.444	0.175	2,502	0.269	3,831	0.021	300	0.248	3,531	0.444
5YRSCS24HR	0.750	0.296	3,342	0.454	5,116	0.036	400	0.419	4,716	0.749
10YRSCS24HR	0.986	0.389	3,871	0.597	5,931	0.047	464	0.550	5,467	0.986
25YRSCS24HR	1.298	0.512	4,481	0.786	6,869	0.062	538	0.724	6,331	1.298
50YRSCS24HR	1.545	0.609	4,940	0.936	7,560	0.073	592	0.862	6,968	1.545
100YRSCS24HR	1.800	0.710	5,397	1.090	8,265	0.085	647	1.005	7,618	1.800

Quality control volume (40 m^3/ha) released over 48 hours

6.13 Summary

A preliminary SWM Facility sizing has been completed for the proposed development site. The SWM Facility release rates have been determined based on the pre-development conditions modelling outlined above. Based on this analysis it was found that the development area draining north to the Tay River will need a total of approximately **13,662 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. The development area draining south to Grants Creek will need a total of approximately **6,343 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. Note that the primary intention of this analysis is to guarantee that sufficient land is set aside under post-development conditions to ensure that there is adequate room for SWM facilities to meet the objectives specified above.

7 CONCLUSION

This report has provided an overview of the various existing hydraulic and hydrologic conditions of the site. A drainage area analysis has been completed for the Tay River and Grants Creek. Based on post-development plans there will be a drainage area boundary revision of approximately **5.69 ha** from existing conditions. This results in an increase of +**0.009%** to the Tay River watershed and a decrease of -**0.06%** to the total Grants Creek watershed. Given the size of these watersheds, and the location of the drainage area change (at the confluence of the two watersheds) it is unlikely that this change under post-development conditions will have a quantifiable impact on the hydraulic and hydrologic of the surrounding watercourses.

Rainfall and surface water monitoring was completed on the site from June 2022 to November 2022. The rainfall monitoring recorded **18** significant events (with volumes greater than 5mm) and all rainfall events recorded had return periods less than the 5-year event. Water level monitoring at the Glen Tay Road crossing indicated that tailwater impacts at this location may affect the flows through the crossing and to the wetland, as such additional loggers are advised for future monitoring to capture these impacts. The level logger in the Glen Tay wetland showed that the wetland water levels fluctuated by only **24 cm** over the full monitoring period. Combining the rainfall data with the flows recorded at the water survey Canada gauge, it was found that the Tay River at this location (which includes both the Tay River and Grants Creek) has a runoff coefficient of approximately **0.25**.

The RVCA floodplain mapping boundaries surrounding the subject area have been updated based on the latest available data to ensure accurate delineation supporting the balance cut fill analysis completed by DSEL. No modifications have been made to the existing hydraulic model produced by RVCA in 2013, simply the topography that the flood elevations have been mapped on has been updated.

Continuous hydrologic modelling has been completed which has made use of the water budget modelling completed by GEMTEC. IA and CN values were iteratively adjusted to align with GEMTEC's pre-development annual water budget. Based on this analysis it was determined that under pre-development conditions for the total development site, approximately **22-24%** of the annual rainfall will result in runoff, **62%** will evaporate and **15-16%** will infiltrate.

A preliminary SWM Facility sizing has been completed for the proposed development site. The SWM Facility release rates have been determined based on the pre-development conditions. Based on this analysis it was found that the development area draining north to the Tay River will need a total of approximately **13,662 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. The development area draining south to Grants Creek will need a total of approximately **6,343 m³** of active storage to attenuate post-development flows to pre-development conditions up to and including the 100-year event. Note that this analysis is simply a conceptual analysis, with the primary intention to ensure that sufficient land is set aside under post-development conditions to ensure that there is adequate room for SWM facilities to meet the objectives specified above.

8 JFSA STATEMENT OF LIMITATIONS

J.F. Sabourin and Associates Inc. (JFSA) has prepared this report and performed the services described in this report, in a manner consistent with the level of care and skill normally exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and financial and physical constraints applicable to the services. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of the client representative, for the specific site, objective, and purpose described to JFSA by the client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and do not apply to any other project or site location. Any change in site conditions, purpose and/or development plans may alter the validity of the report. The report, which specifically includes all tables, figures and appendices, is based on data and information assembled by JFSA and is based on the conditions at the site and study area at the time of the work and on the information provided by others. JFSA has relied in good faith on all information provided and does not accept responsibility for any deficiencies, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation and data. Any use that a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. JFSA accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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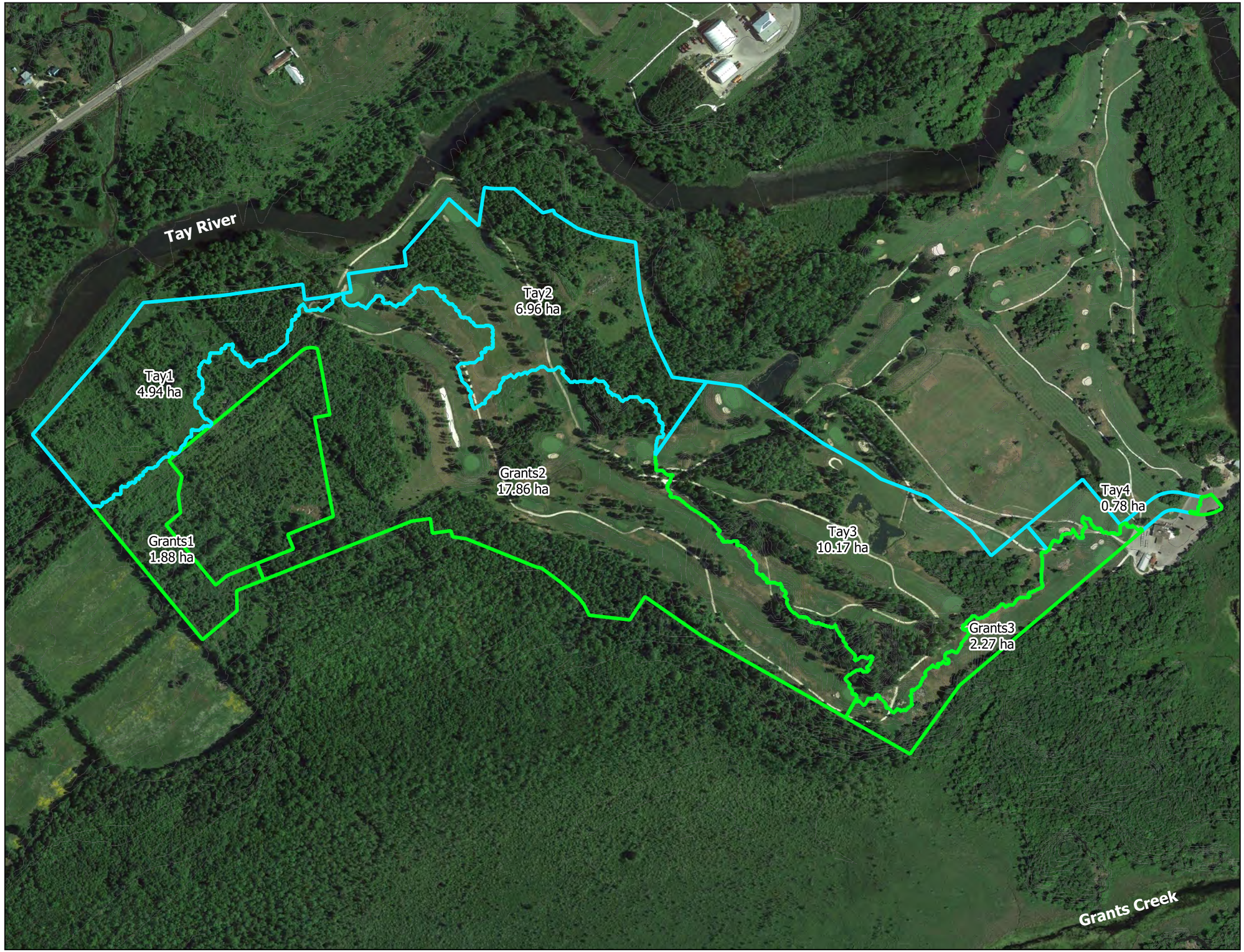
Appendix A

Existing Drainage



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Legend

Drainage Area
[Name]
[Area]
Drains to Tay River
Drains to Grants Creek
Contours (m)
0.5

SCALE: 1:5000

0 100 200 m

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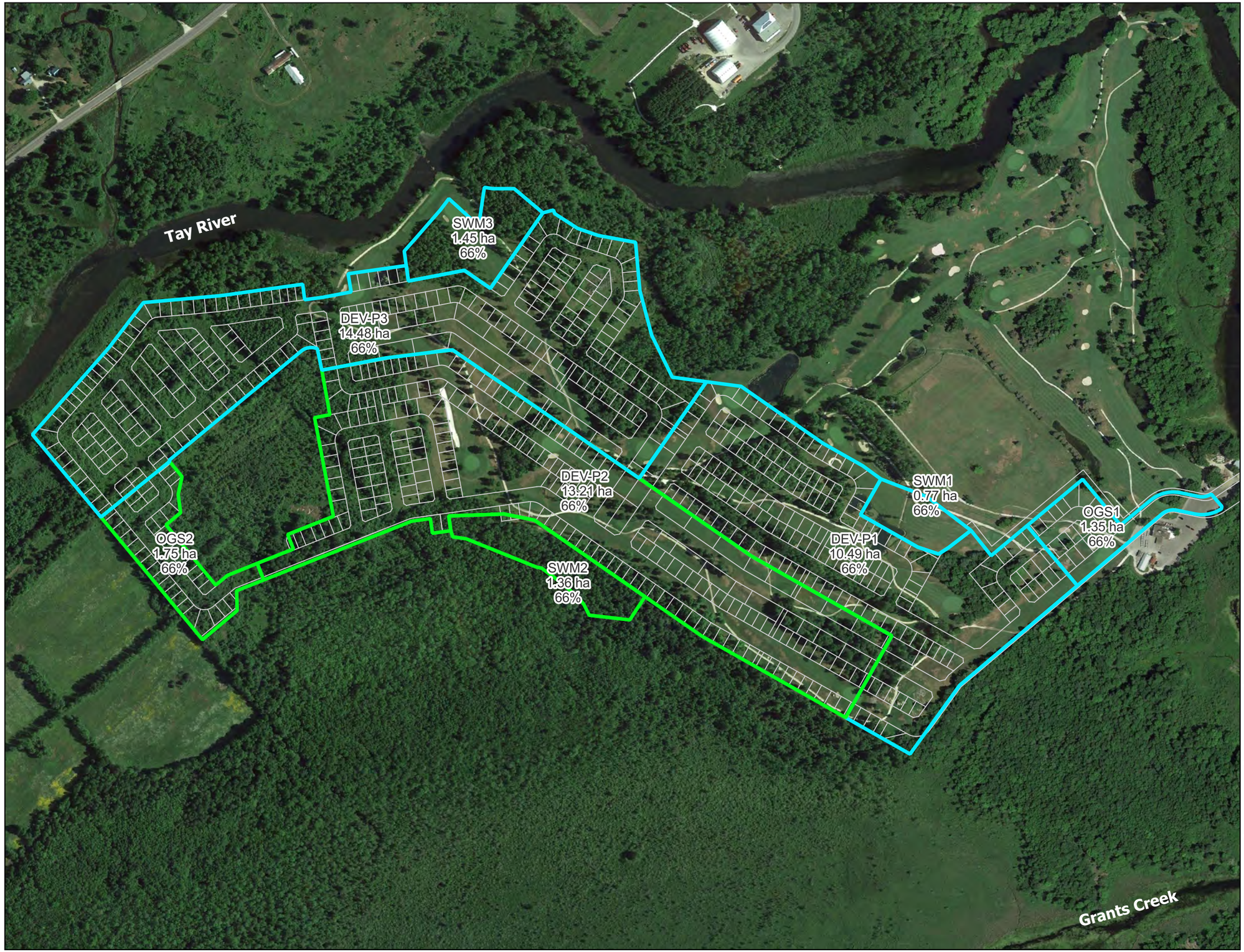
Figure A1: Existing Drainage Conditions

PROJECT	2118-21
DRAWN	BT
DATE	February 2023



N

Legend

Drainage Area
[Name]
[Area]
[% Imp]
Drains to Tay River
Drains to Grants Creek
Proposed Development Plan

SCALE: 1:5000

0 100 200 m

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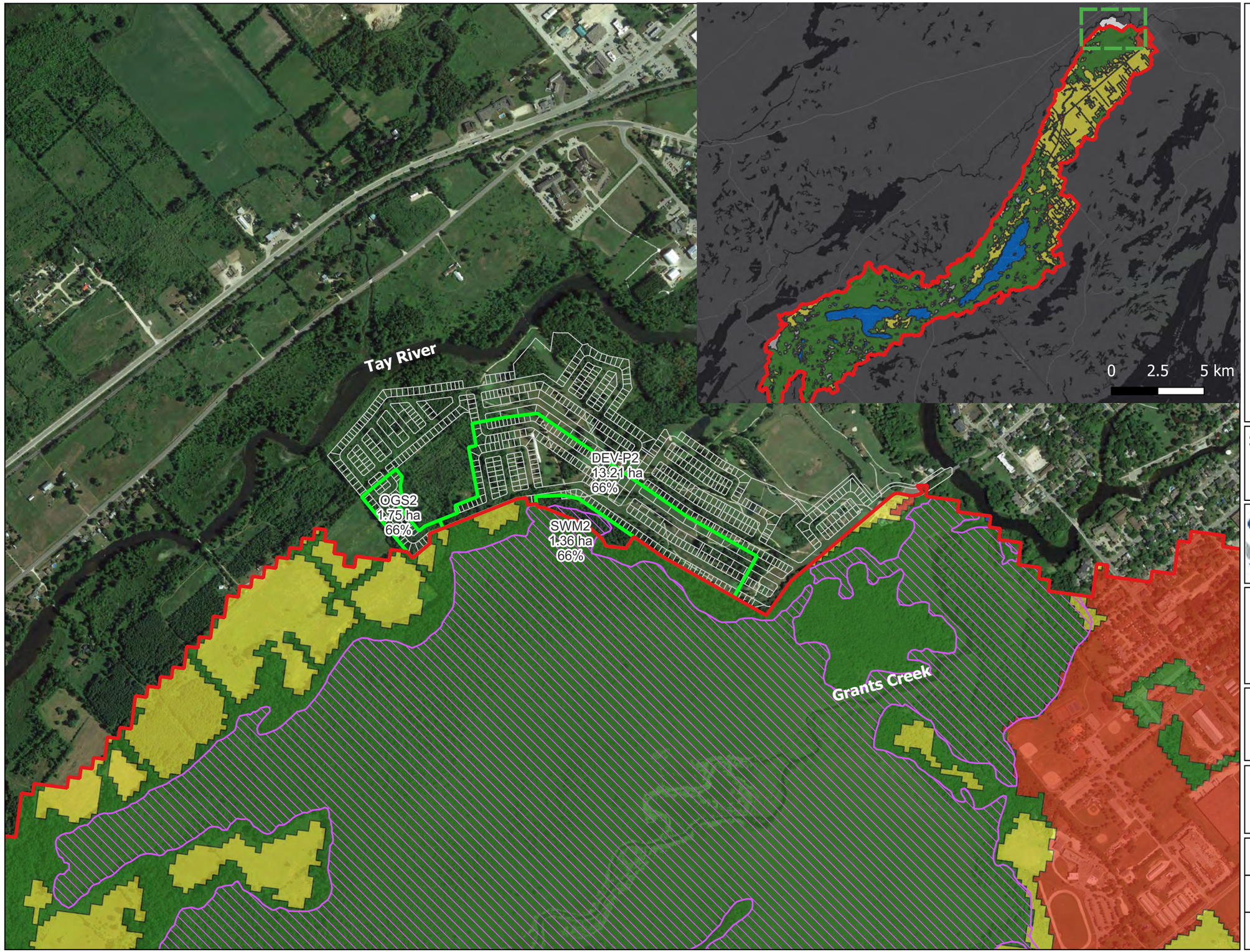
Figure A2: Post-Development Drainage Area

PROJECT	2118-21
DRAWN	BT
DATE	February 2023



N

Legend

- Grant's Creek Watershed (9,351.78 ha)
- RVCA Significant Wetland
- Study Area

Post-Development Drainage Area

- Grants Creek
- Proposed Development Plan

Land Cover

- Agriculture
- Bedrock
- Community/Infrastructure
- Natural
- Water

SCALE: 1:10000

0 200 400 m

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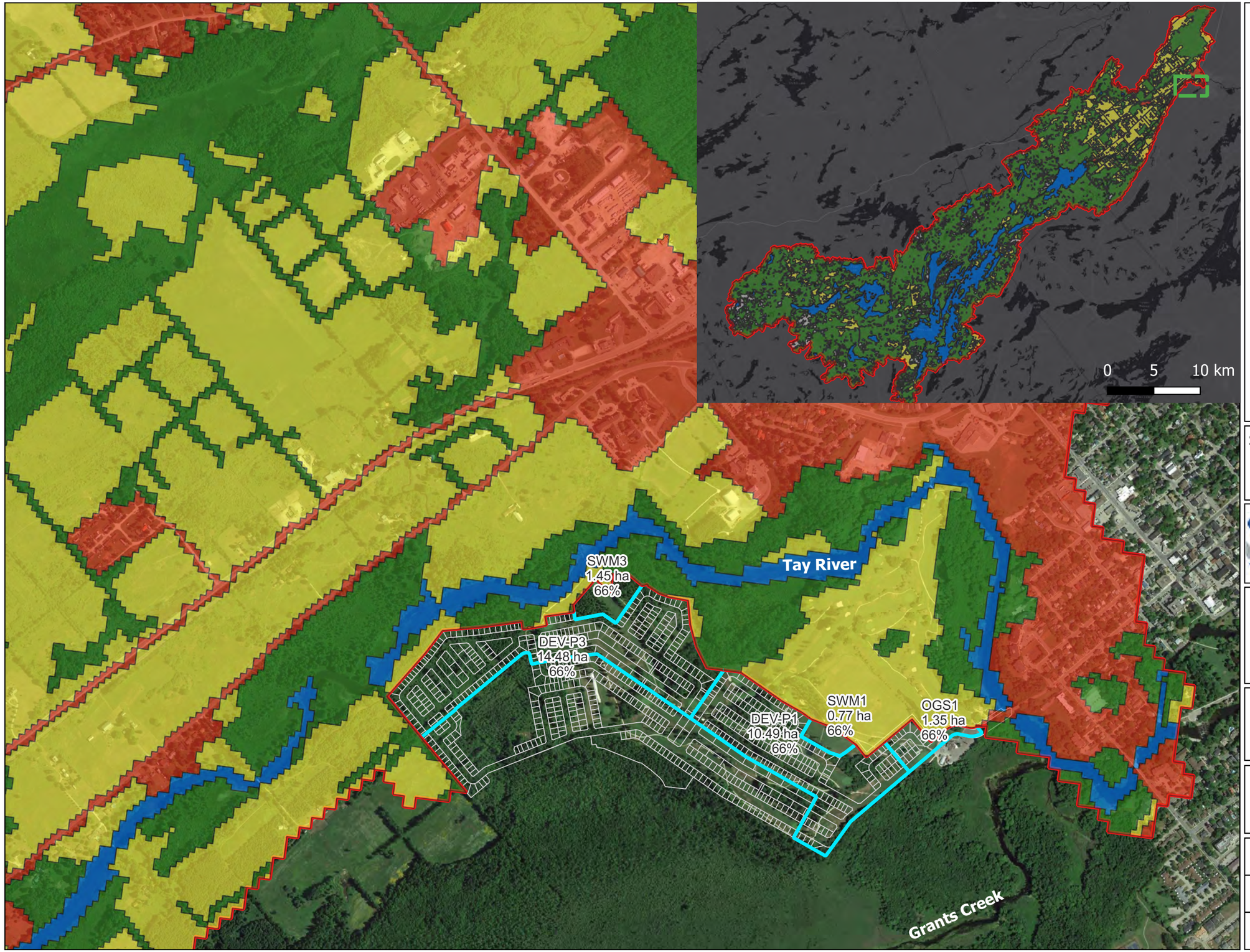
Figure A3: Grants Creek Watershed

PROJECT	2118-21
DRAWN	BT
DATE	February 2023



N

Legend

- Tay River WSC Watershed (58,382.67 ha)
- Study Area

Post Development Drainage Area

- Tay River
- Proposed Development Plan

MNRF Land Cover

- Agriculture
- Bedrock
- Community/Infrastructure
- Natural
- Water

SCALE: 1:10000

0 200 400 m

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Figure A4: Tay River WSC Watershed

PROJECT	2118-21
DRAWN	BT
DATE	February 2023

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Gatineau. QC
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Québec. QC

Appendix B

Surface Water Monitoring

N

Legend

- Rain Gauge Site
- WSC Site
- Grant's Creek Logger Site
- Glen Tay Road Logger Site
- Watercourses

SCALE: 1:15000

0 250 500 m

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Figure B1:
2022 Monitoring Locations

PROJECT	2118(01)-21
DRAWN	MP
DATE	FEB 2023

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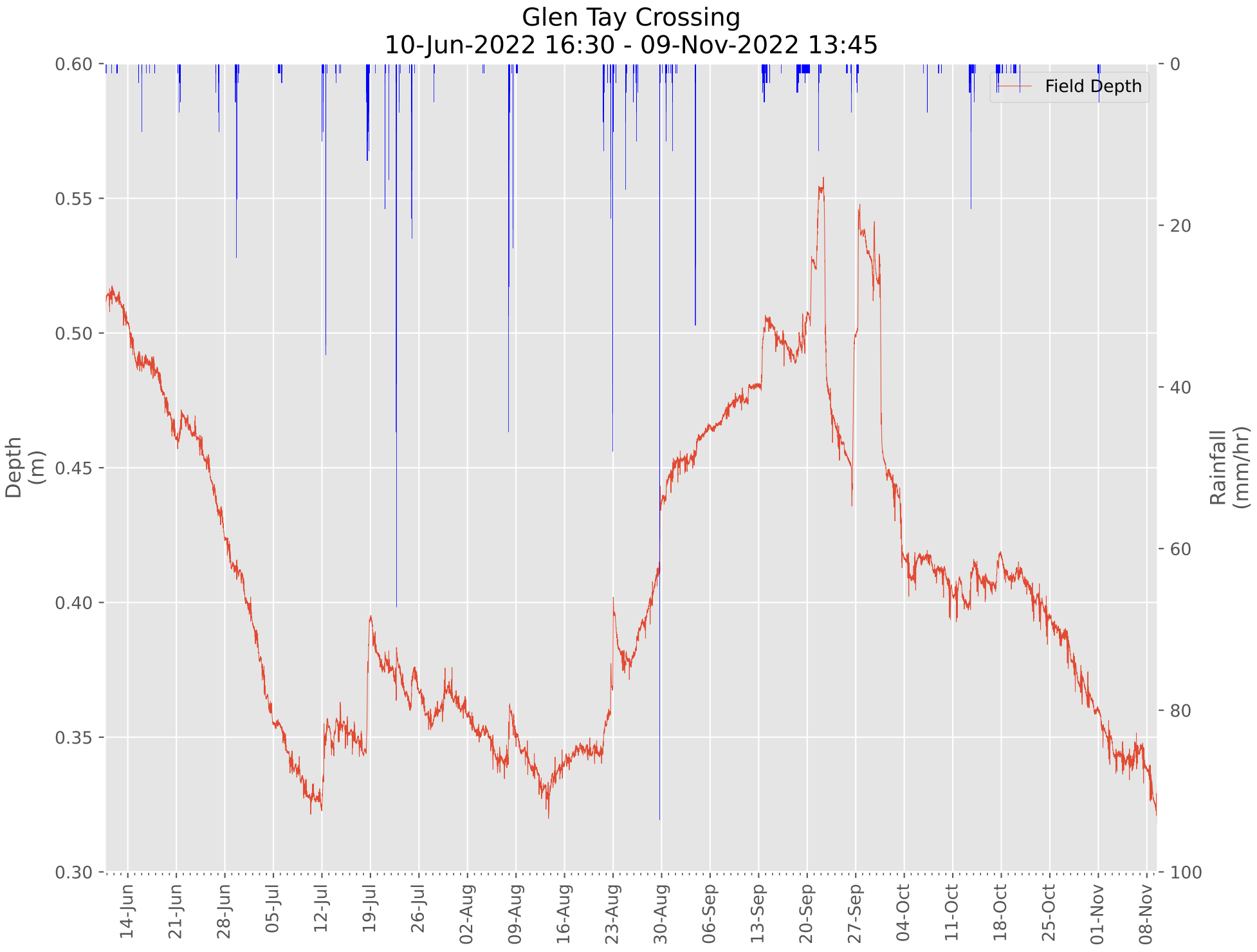
Glen Tay Crossing
10-Jun-2022 16:30 - 09-Nov-2022 13:45
Field Depth
Depth (m)
Rainfall (mm/hr)
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
14-Jun
21-Jun
28-Jun
05-Jul
12-Jul
19-Jul
26-Jul
02-Aug
09-Aug
16-Aug
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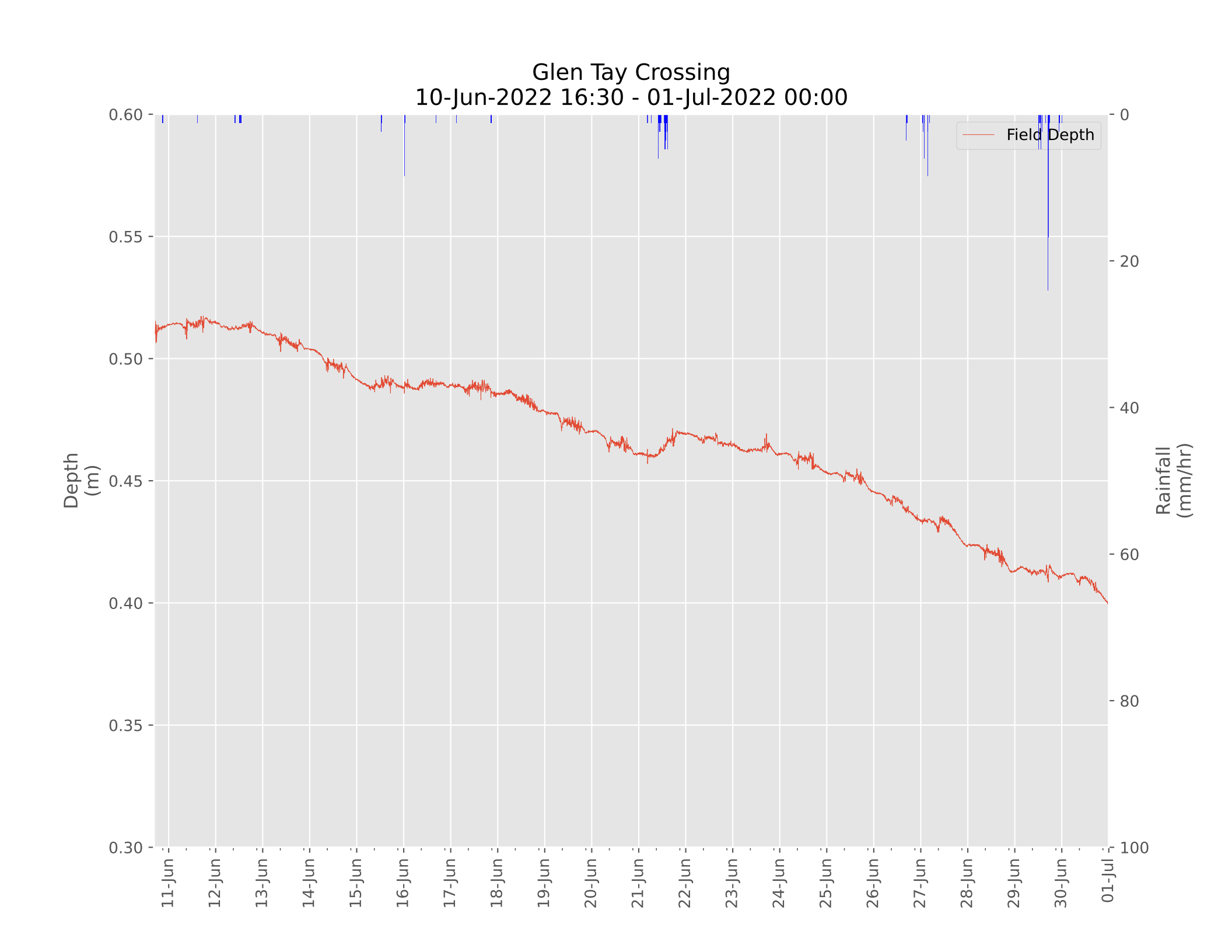
04-Oct
11-Oct
18-Oct
25-Oct
01-Nov
08-Nov


Glen Tay Crossing
10-Jun-2022 16:30 - 01-Jul-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
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0.55
0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
11-Jun
12-Jun
13-Jun
14-Jun
15-Jun
16-Jun
17-Jun
18-Jun
19-Jun
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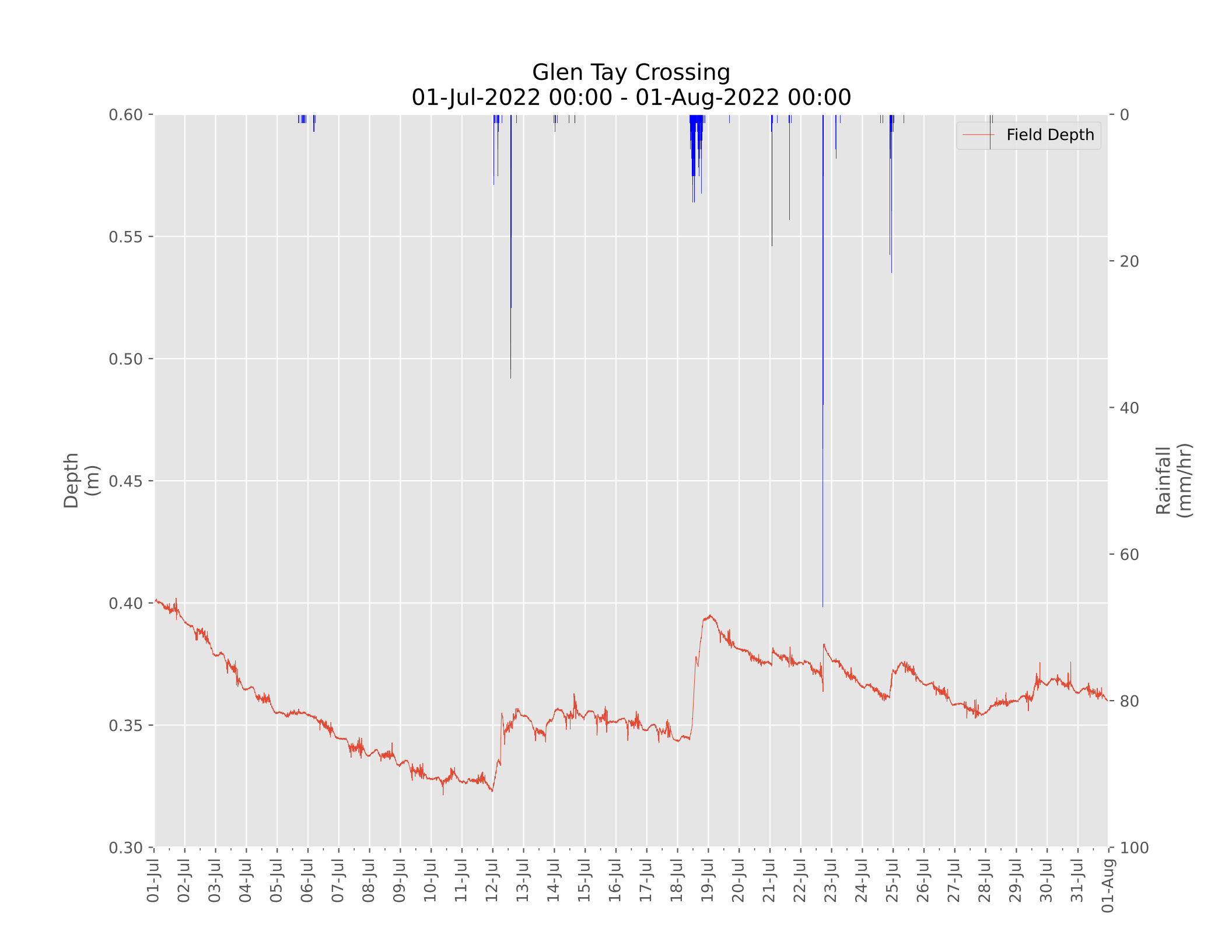
26-Jun
27-Jun
28-Jun
29-Jun
30-Jun
01-Jul


Glen Tay Crossing
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Field Depth
Depth (m)
Rainfall (mm/hr)
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0.55
0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
01-Jul
02-Jul
03-Jul
04-Jul
05-Jul
06-Jul
07-Jul
08-Jul
09-Jul
10-Jul
11-Jul
12-Jul
13-Jul
14-Jul
15-Jul
16-Jul
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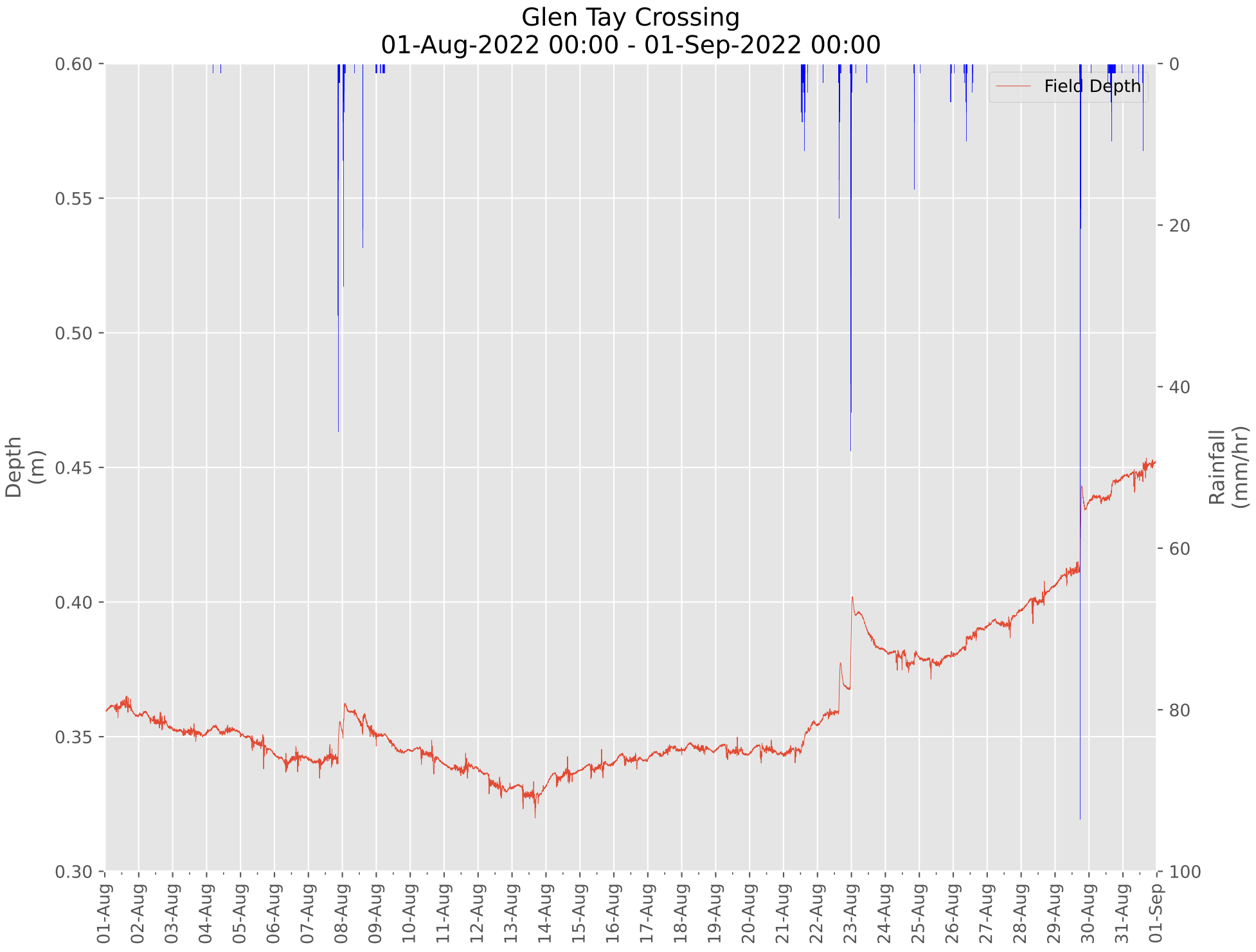
01-Aug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Field Depth
Depth (m)
Rainfall (mm/hr)
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0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
01-Aug
02-Aug
03-Aug
04-Aug
05-Aug
06-Aug
07-Aug
08-Aug
09-Aug
10-Aug
11-Aug
12-Aug
13-Aug
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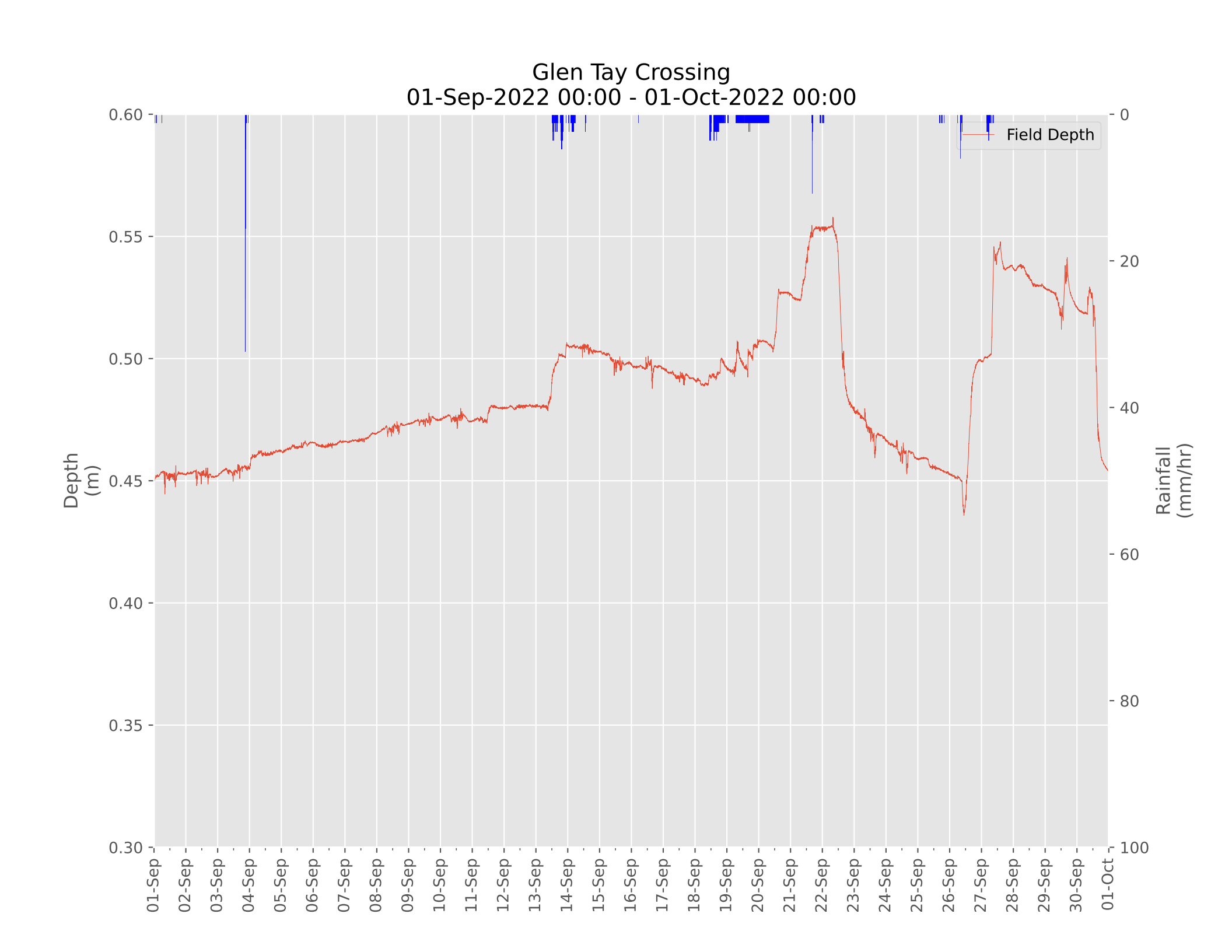
01-Sep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Field Depth
Depth (m)
Rainfall (mm/hr)
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0.55
0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
01-Sep
02-Sep
03-Sep
04-Sep
05-Sep
06-Sep
07-Sep
08-Sep
09-Sep
10-Sep
11-Sep
12-Sep
13-Sep
14-Sep
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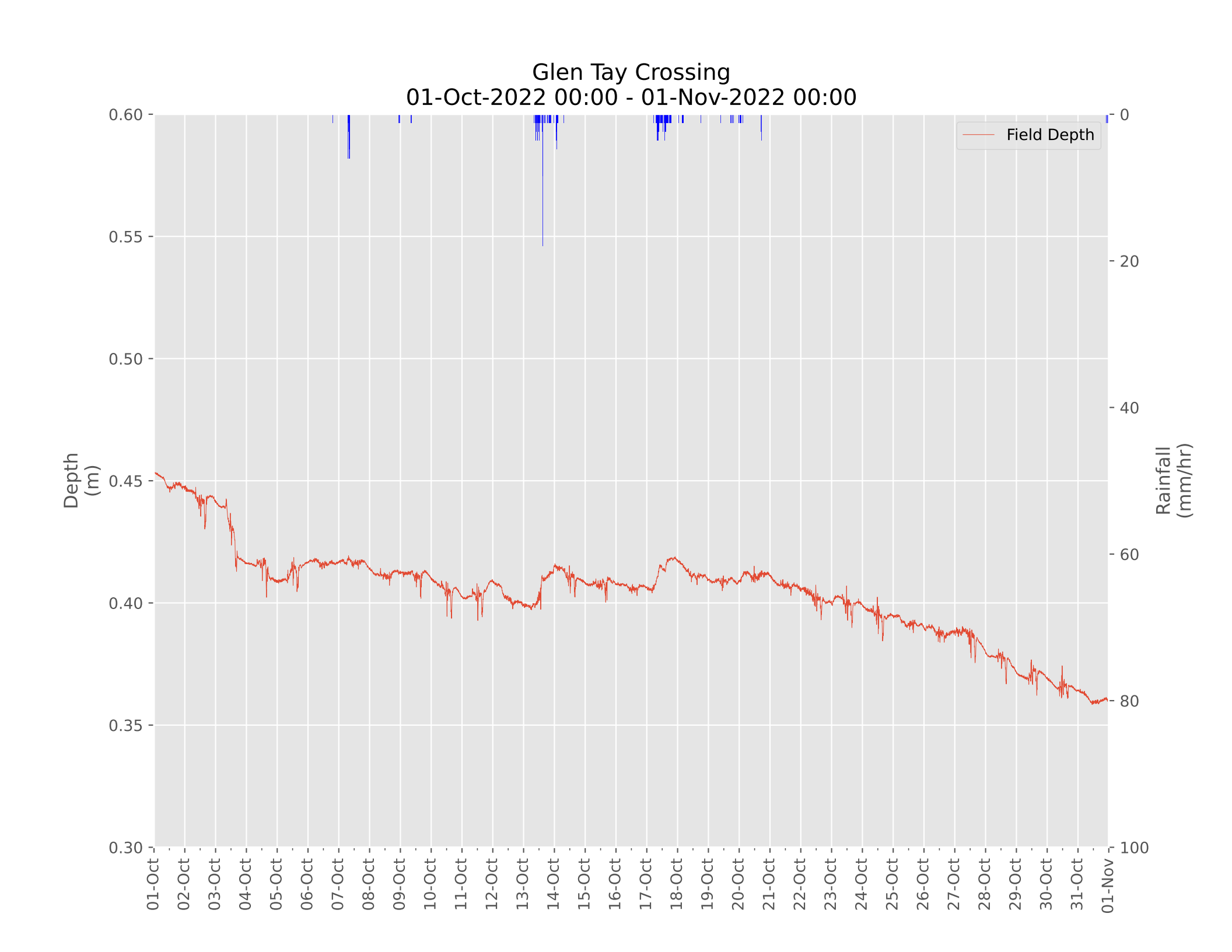
29-Sep
30-Sep
01-Oct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Field Depth
Depth (m)
Rainfall (mm/hr)
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0.55
0.50
0.45
0.40
0.35
0.30
0
20
40
60
80
100
01-Oct
02-Oct
03-Oct
04-Oct
05-Oct
06-Oct
07-Oct
08-Oct
09-Oct
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11-Oct
12-Oct
13-Oct
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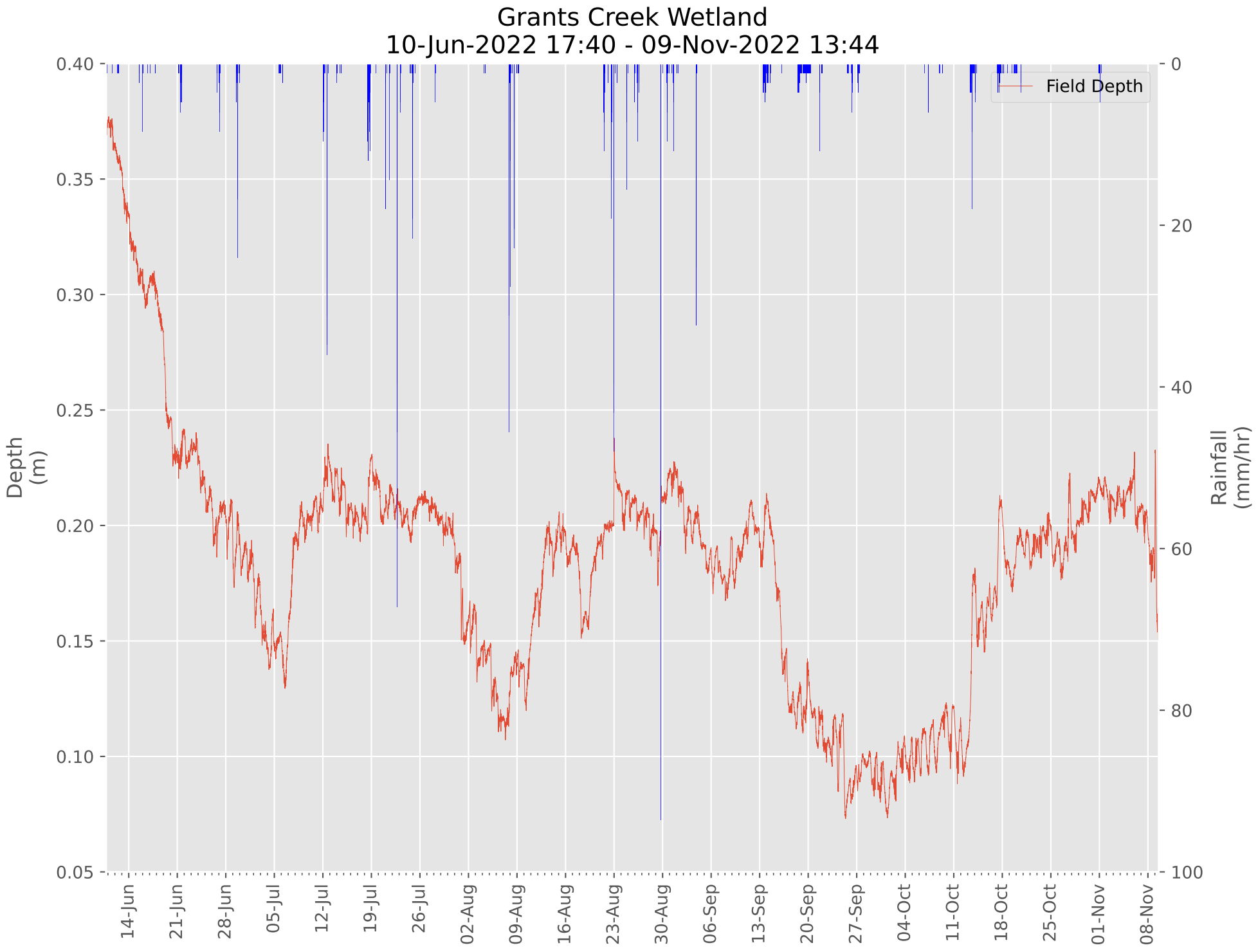
01-Nov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Field Depth
Depth (m)
Rainfall (mm/hr)
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0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
14-Jun
21-Jun
28-Jun
05-Jul
12-Jul
19-Jul
26-Jul
02-Aug
09-Aug
16-Aug
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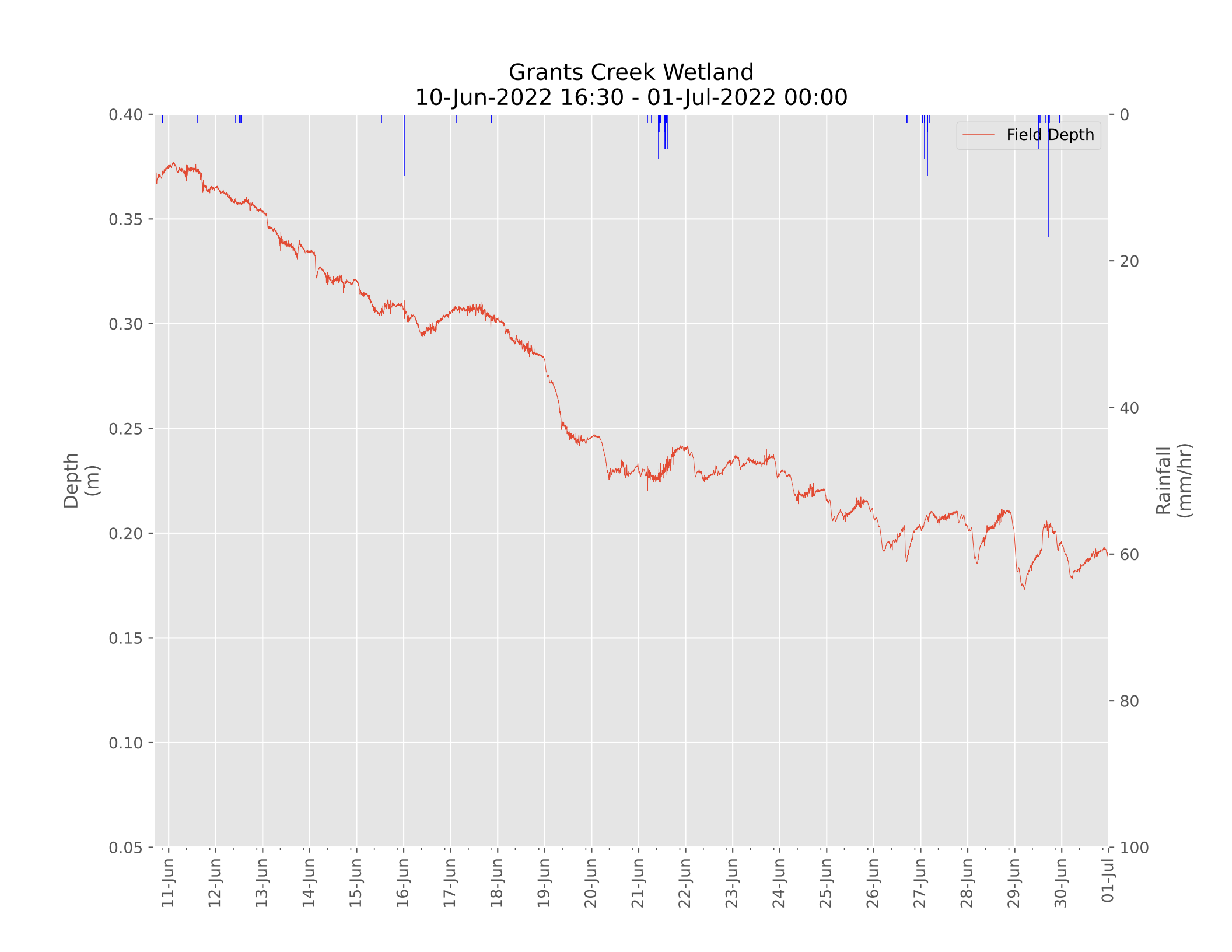
04-Oct
11-Oct
18-Oct
25-Oct
01-Nov
08-Nov


Grants Creek Wetland
10-Jun-2022 16:30 - 01-Jul-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
11-Jun
12-Jun
13-Jun
14-Jun
15-Jun
16-Jun
17-Jun
18-Jun
19-Jun
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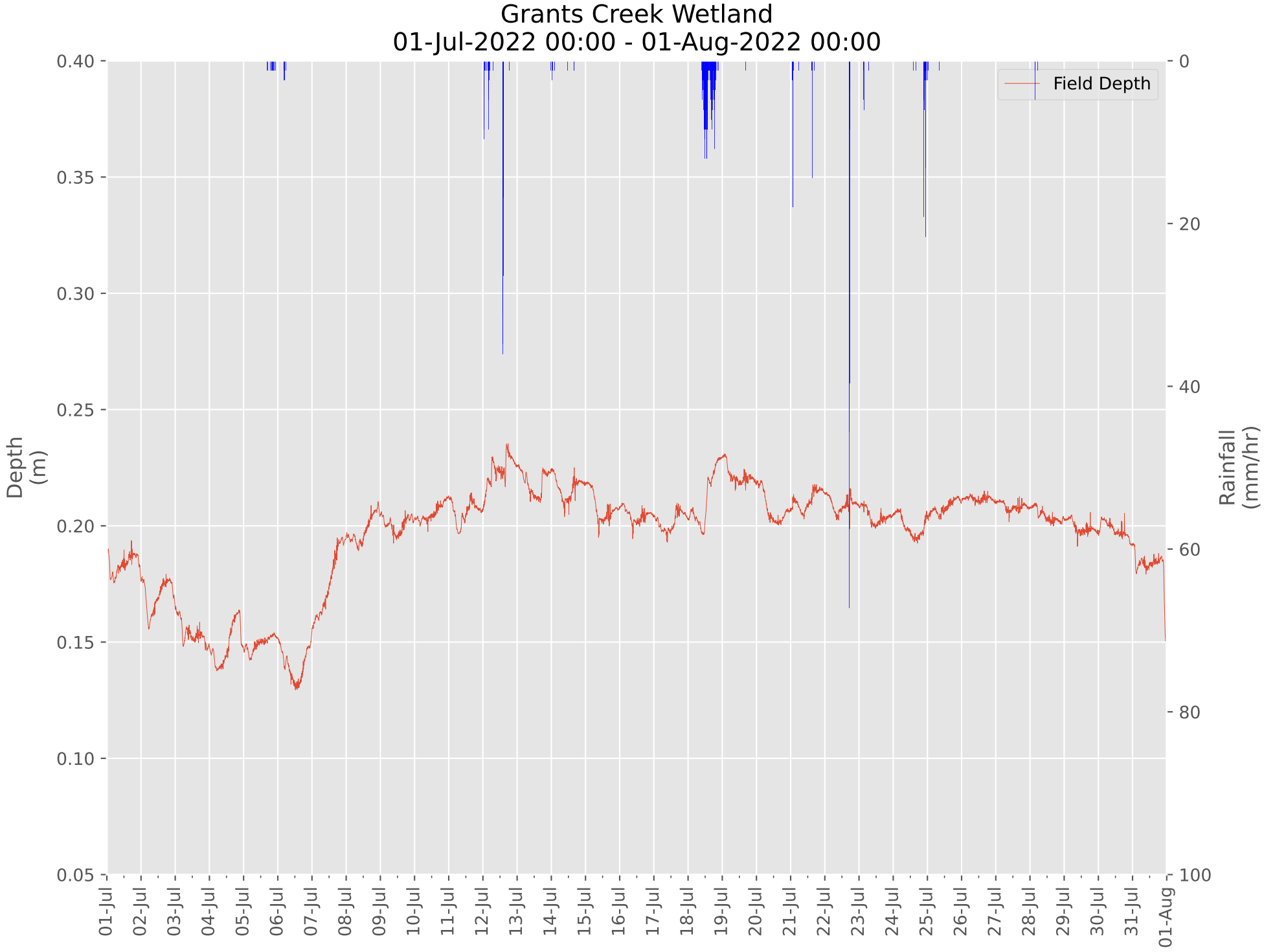
30-Jun
01-Jul


Grants Creek Wetland
01-Jul-2022 00:00 - 01-Aug-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
01-Jul
02-Jul
03-Jul
04-Jul
05-Jul
06-Jul
07-Jul
08-Jul
09-Jul
10-Jul
11-Jul
12-Jul
13-Jul
14-Jul
15-Jul
16-Jul
17-Jul
18-Jul
19-Jul
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21-Jul
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24-Jul
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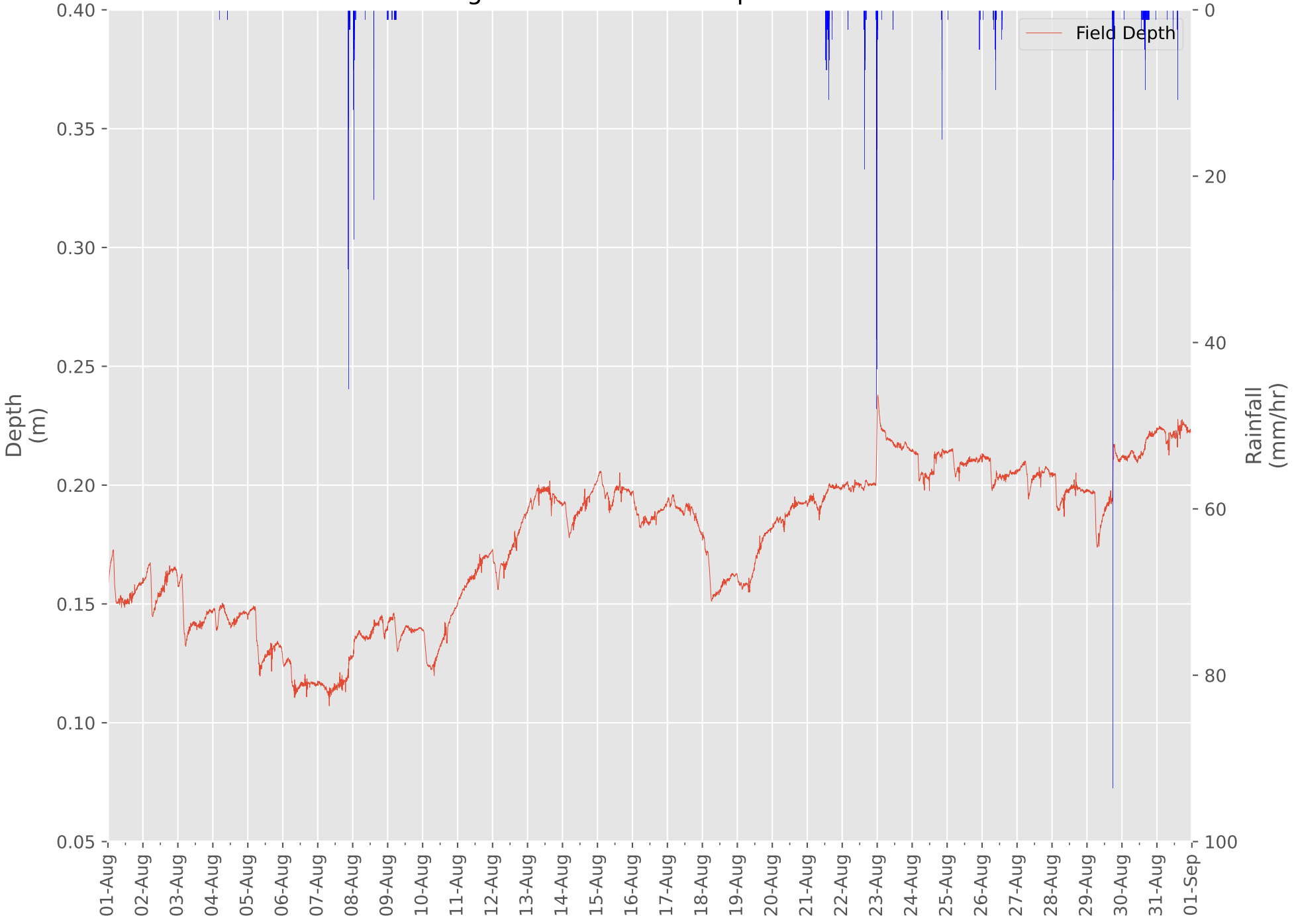
26-Jul
27-Jul
28-Jul
29-Jul
30-Jul
31-Jul
01-Aug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01-Aug-2022 00:00 - 01-Sep-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
01-Aug
02-Aug
03-Aug
04-Aug
05-Aug
06-Aug
07-Aug
08-Aug
09-Aug
10-Aug
11-Aug
12-Aug
13-Aug
14-Aug
15-Aug
16-Aug
17-Aug
18-Aug
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20-Aug
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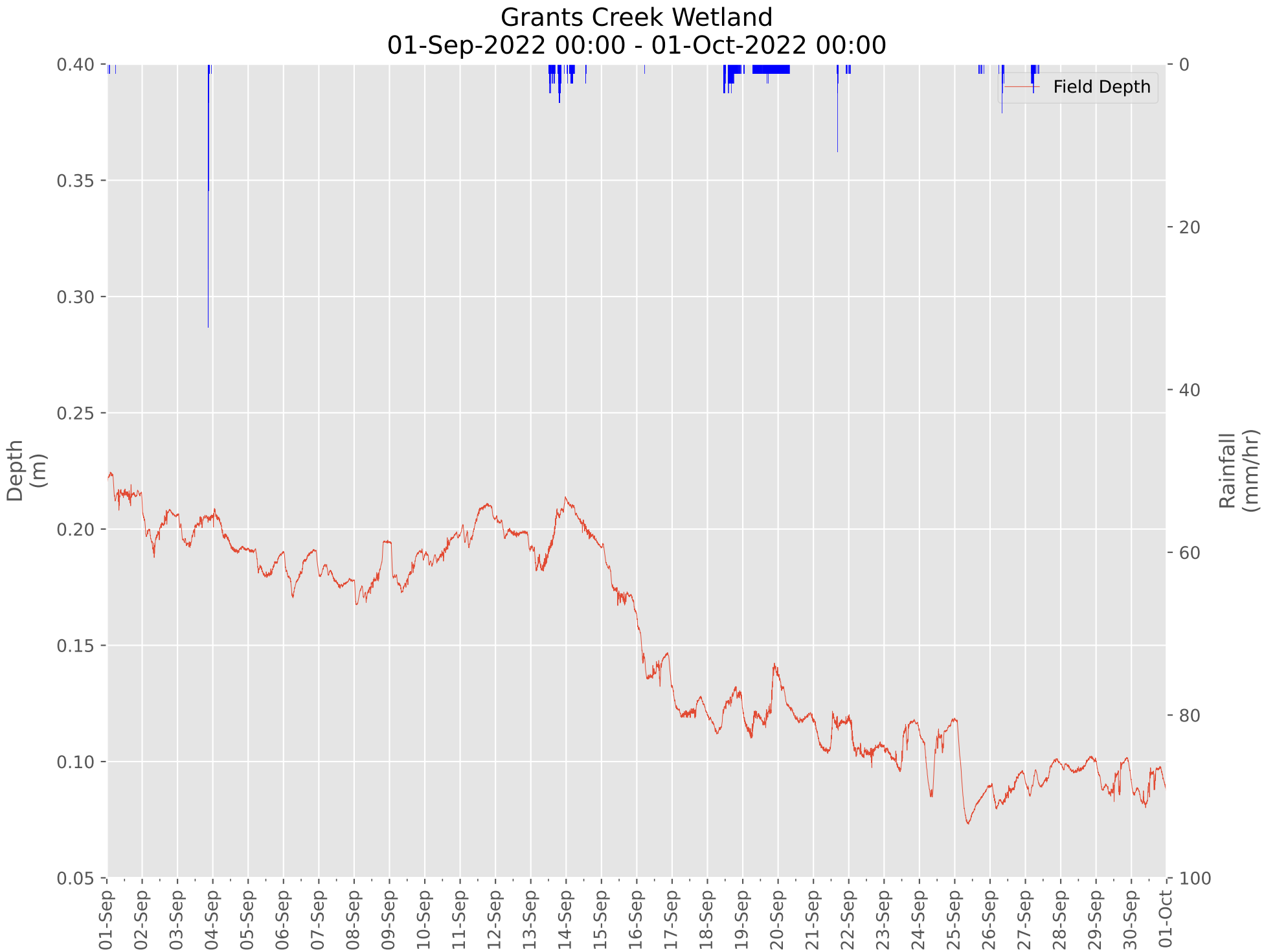
26-Aug
27-Aug
28-Aug
29-Aug
30-Aug
31-Aug
01-Sep


Grants Creek Wetland
01-Sep-2022 00:00 - 01-Oct-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
01-Sep
02-Sep
03-Sep
04-Sep
05-Sep
06-Sep
07-Sep
08-Sep
09-Sep
10-Sep
11-Sep
12-Sep
13-Sep
14-Sep
15-Sep
16-Sep
17-Sep
18-Sep
19-Sep
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26-Sep
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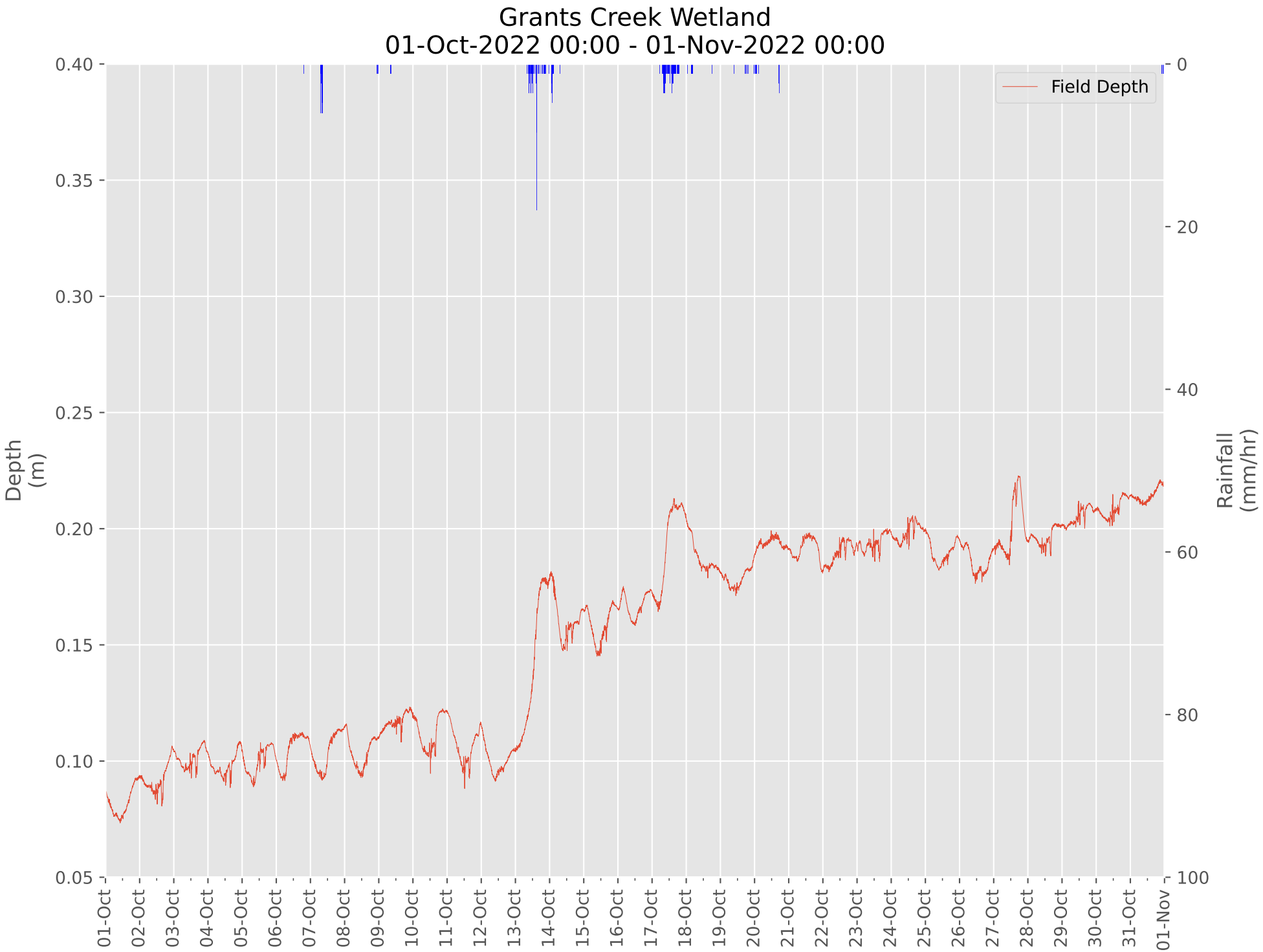
28-Sep
29-Sep
30-Sep
01-Oct


Grants Creek Wetland
01-Oct-2022 00:00 - 01-Nov-2022 00:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
01-Oct
02-Oct
03-Oct
04-Oct
05-Oct
06-Oct
07-Oct
08-Oct
09-Oct
10-Oct
11-Oct
12-Oct
13-Oct
14-Oct
15-Oct
16-Oct
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18-Oct
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26-Oct
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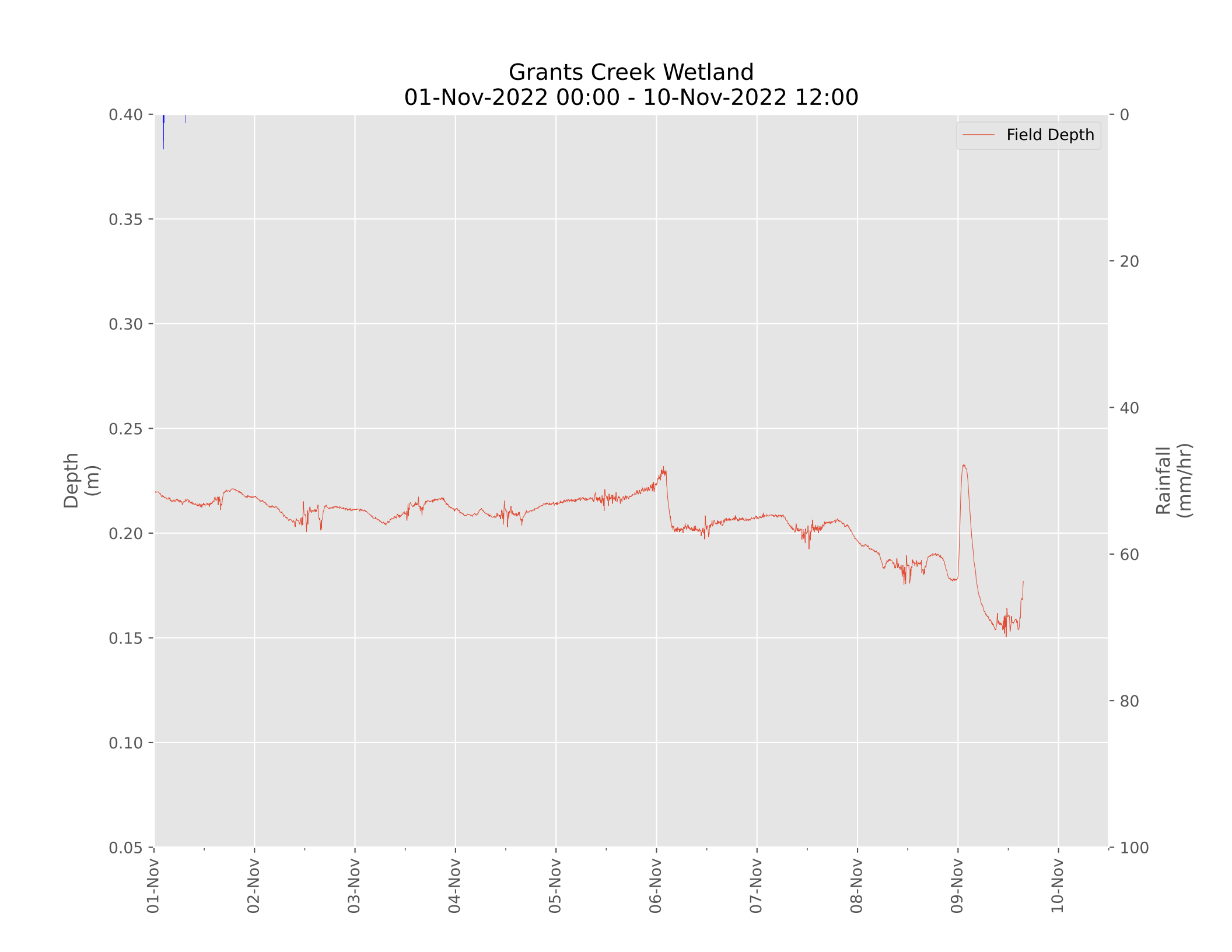
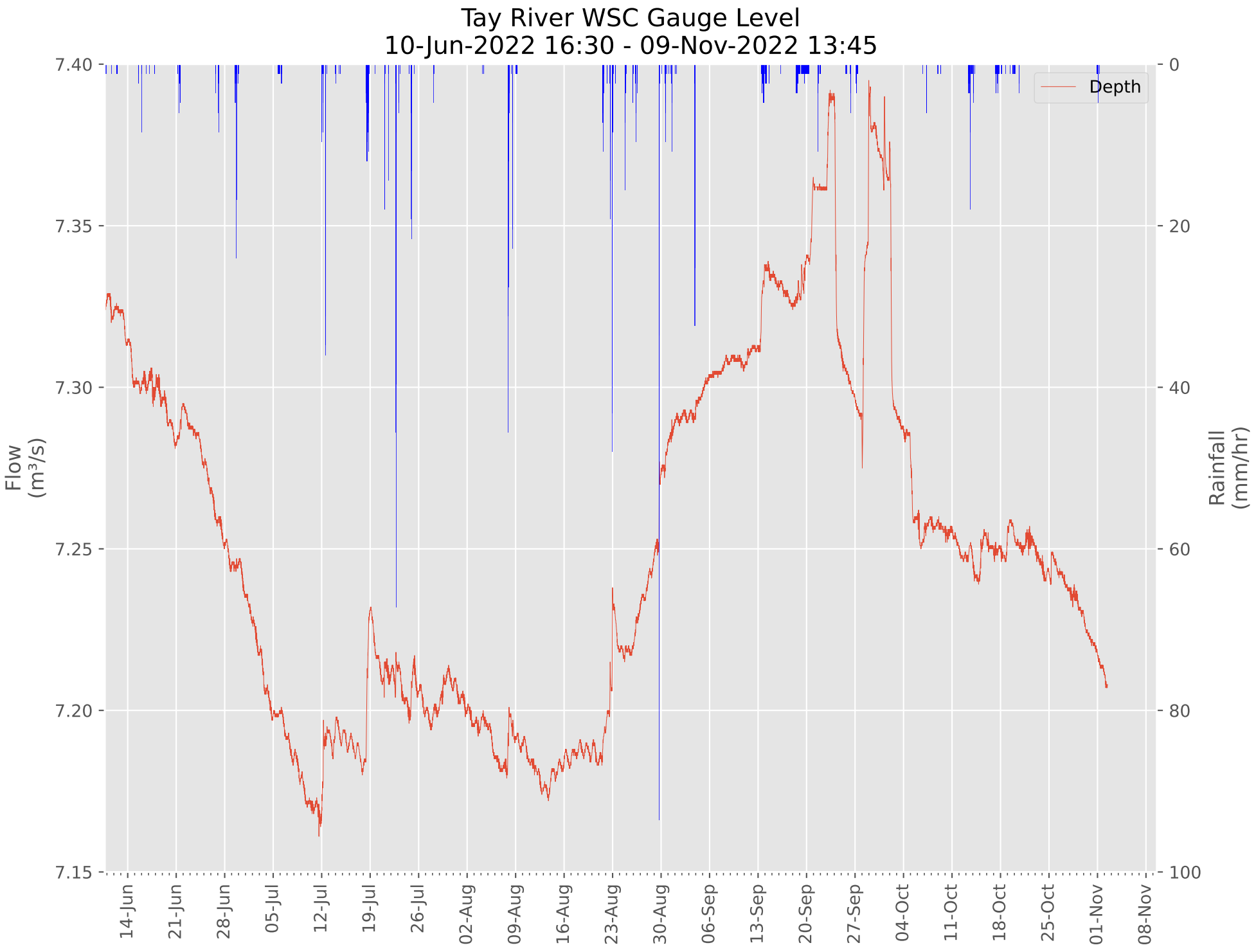
30-Oct
31-Oct
01-Nov


Grants Creek Wetland
01-Nov-2022 00:00 - 10-Nov-2022 12:00
Field Depth
Depth (m)
Rainfall (mm/hr)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
20
40
60
80
100
01-Nov
02-Nov
03-Nov
04-Nov
05-Nov
06-Nov
07-Nov
08-Nov
09-Nov
10-Nov


Tay River WSC Gauge Level
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Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
14-Jun
21-Jun
28-Jun
05-Jul
12-Jul
19-Jul
26-Jul
02-Aug
09-Aug
16-Aug
23-Aug
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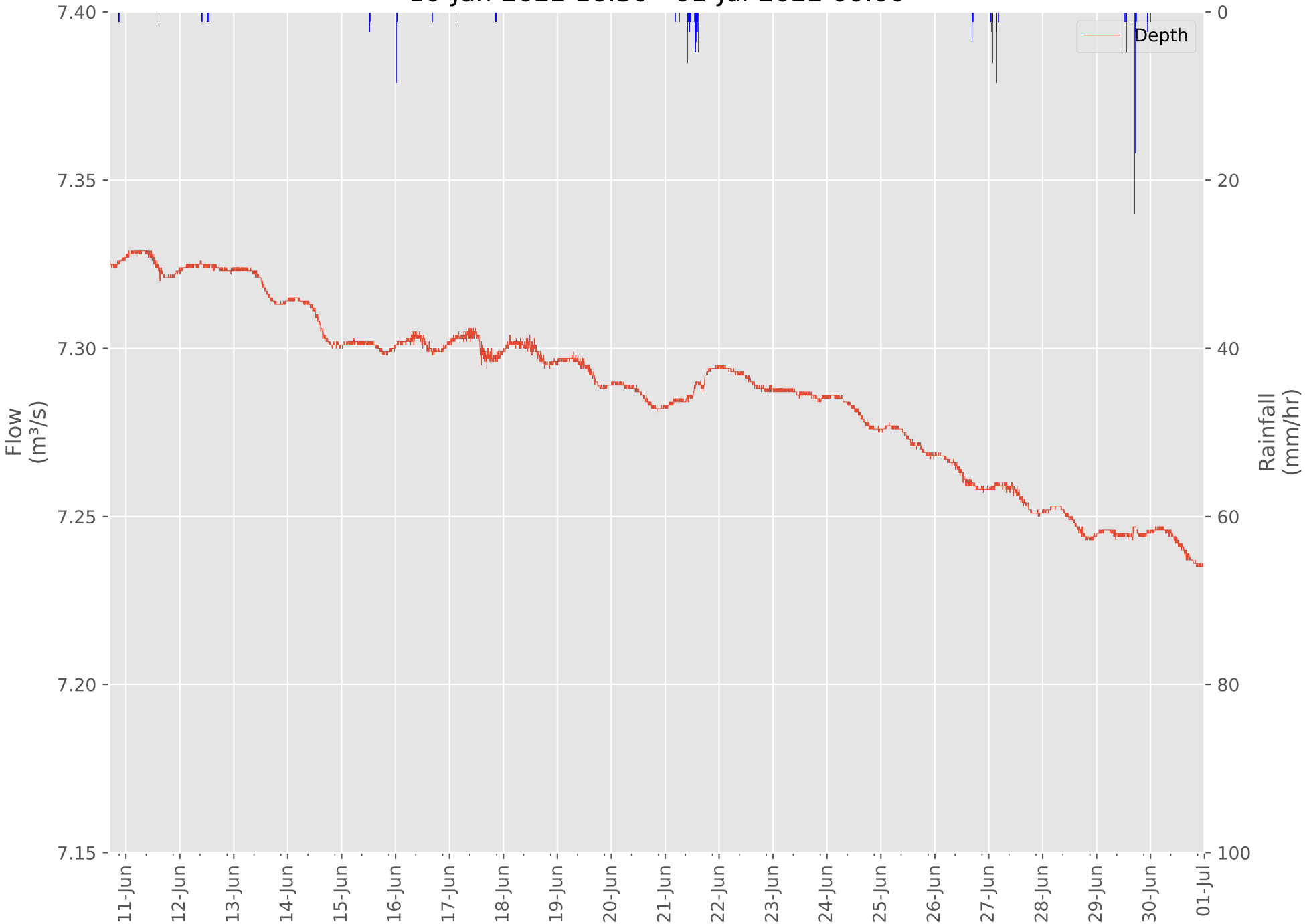
04-Oct
11-Oct
18-Oct
25-Oct
01-Nov
08-Nov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Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
11-Jun
12-Jun
13-Jun
14-Jun
15-Jun
16-Jun
17-Jun
18-Jun
19-Jun
20-Jun
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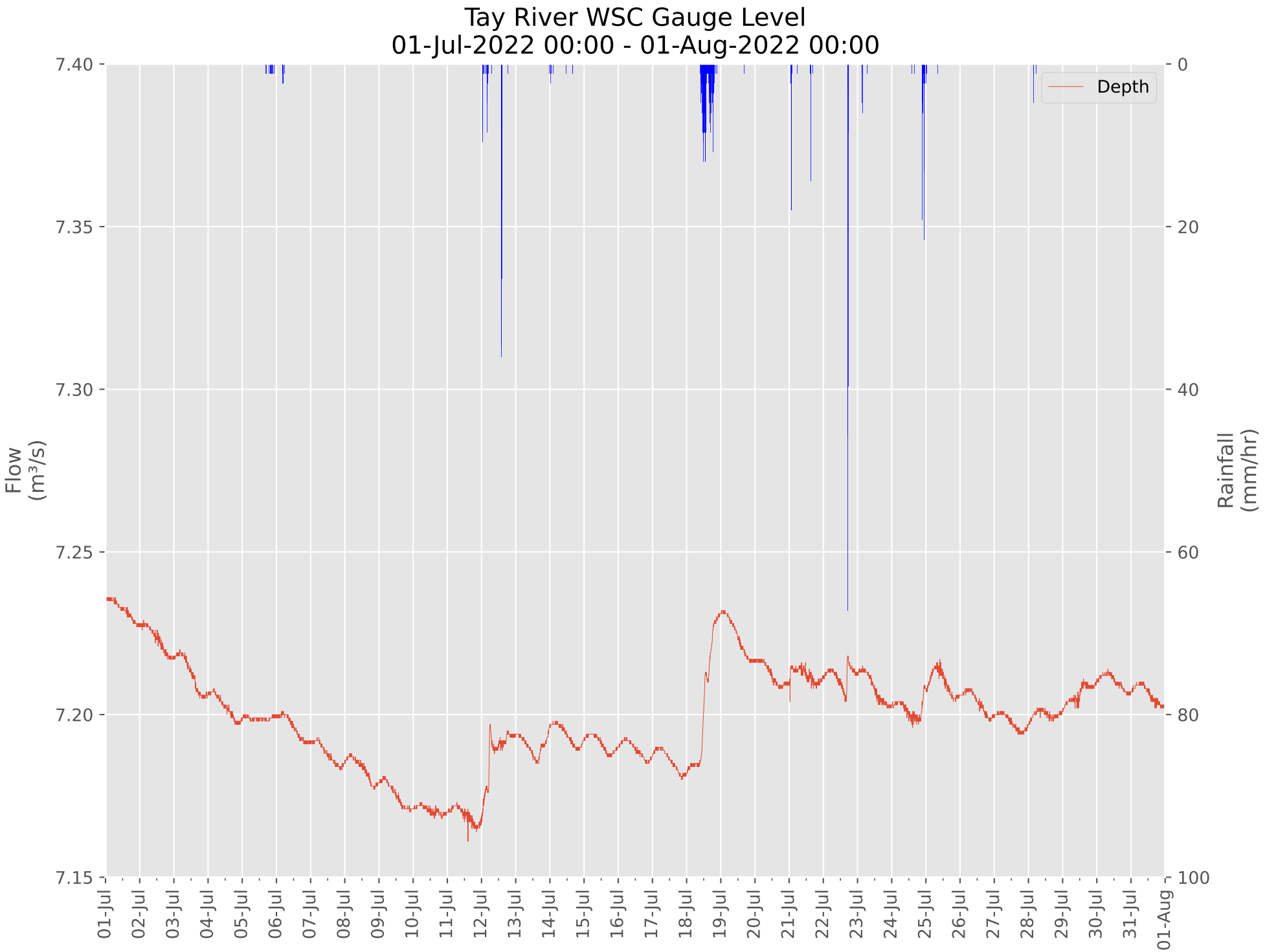
26-Jun
27-Jun
28-Jun
29-Jun
30-Jun
01-Jul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Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
01-Jul
02-Jul
03-Jul
04-Jul
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12-Jul
13-Jul
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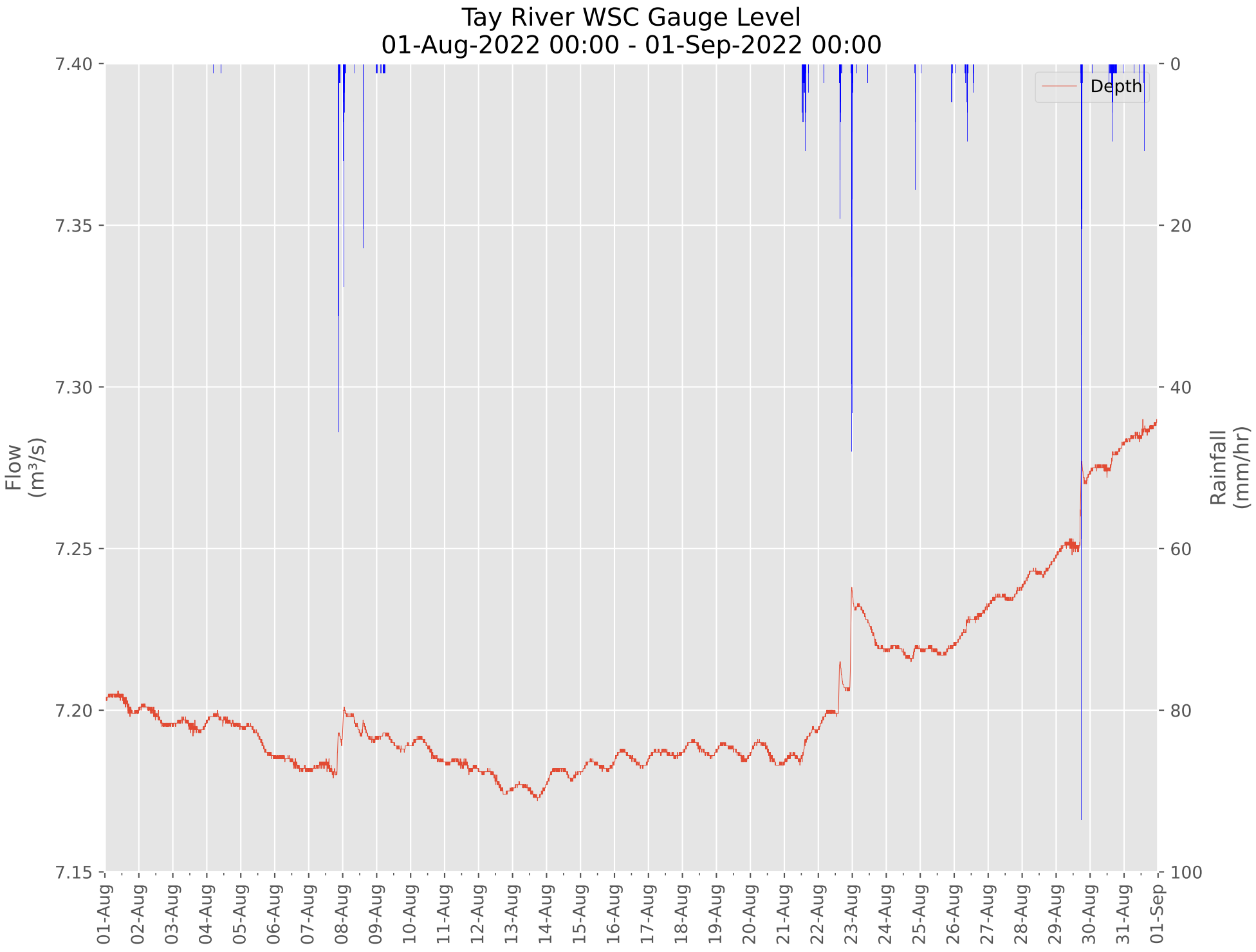
30-Jul
31-Jul
01-Aug


Tay River WSC Gauge Level
01-Aug-2022 00:00 - 01-Sep-2022 00:00
Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
01-Aug
02-Aug
03-Aug
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12-Aug
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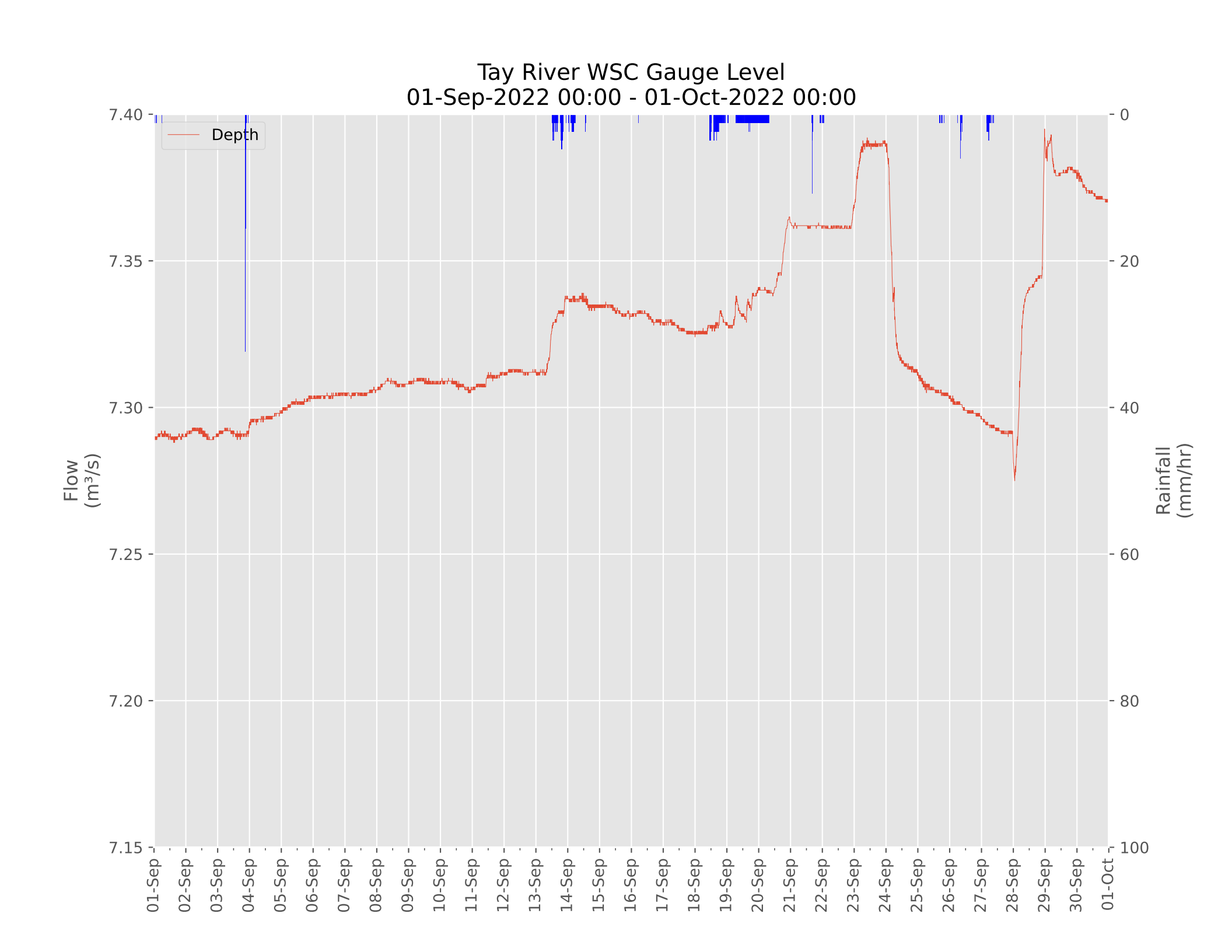
29-Aug
30-Aug
31-Aug
01-Sep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Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
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40
60
80
100
01-Sep
02-Sep
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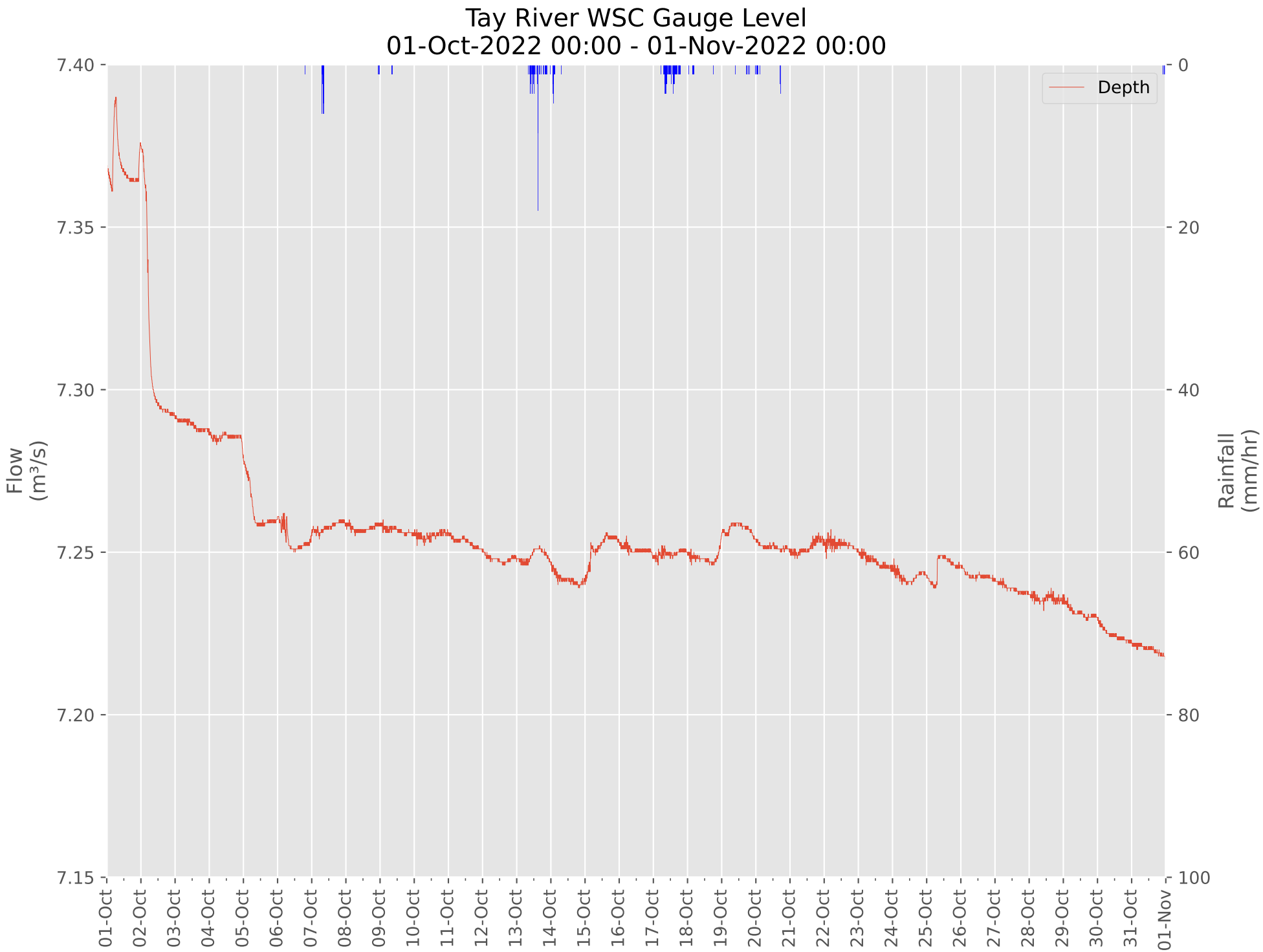
29-Sep
30-Sep
01-Oct


Tay River WSC Gauge Level
01-Oct-2022 00:00 - 01-Nov-2022 00:00
Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
01-Oct
02-Oct
03-Oct
04-Oct
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11-Oct
12-Oct
13-Oct
14-Oct
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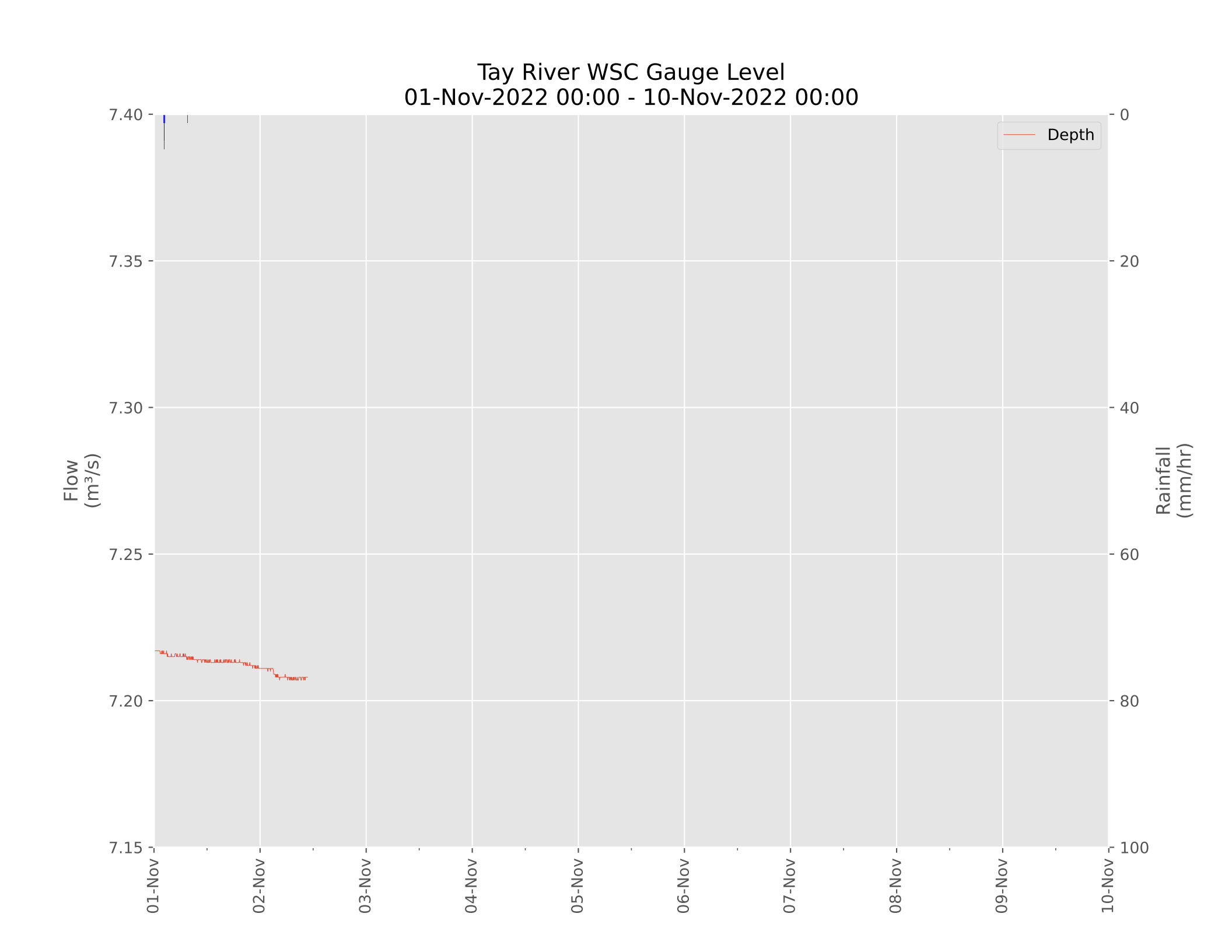
31-Oct
01-Nov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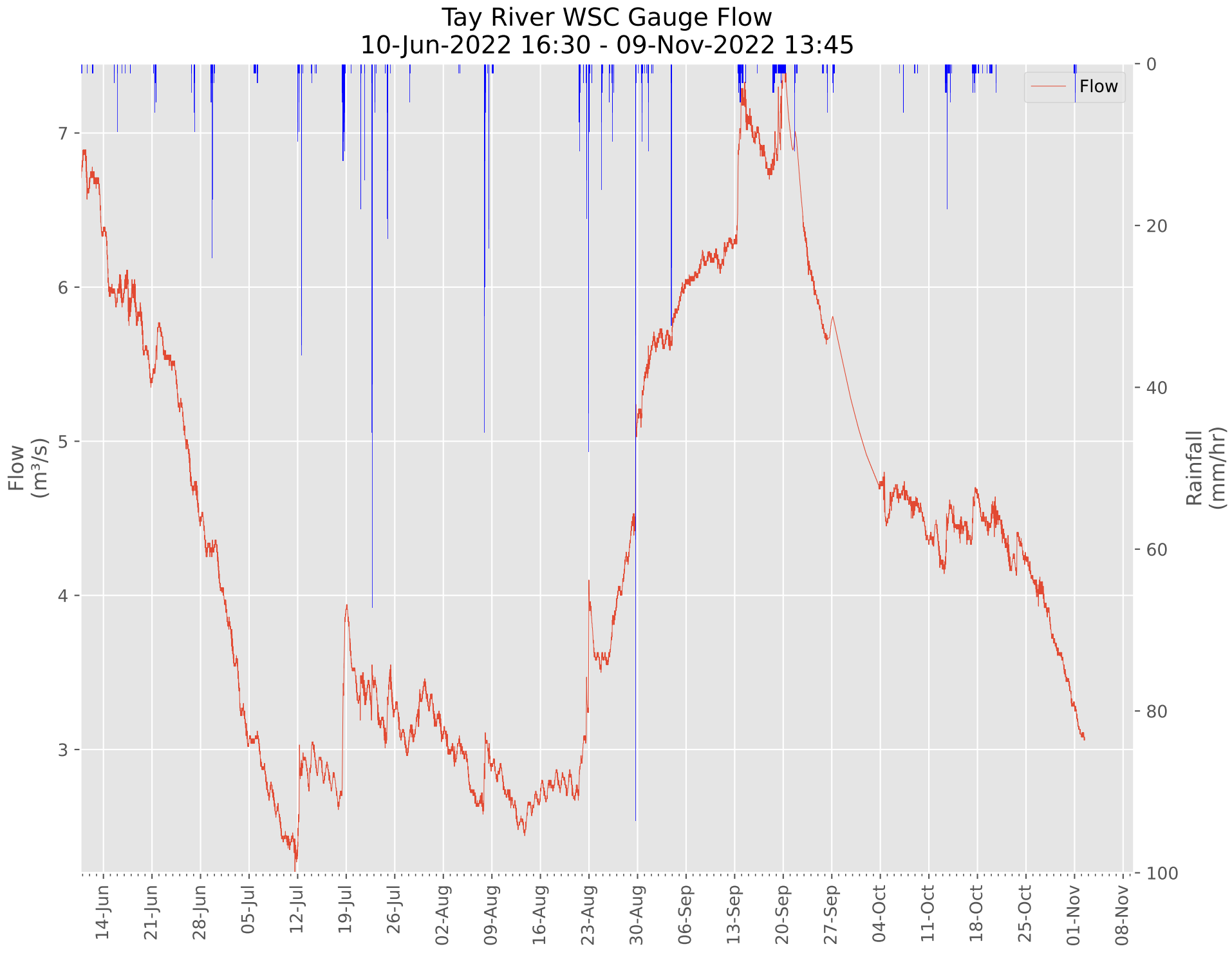
01-Nov-2022 00:00 - 10-Nov-2022 00:00
Depth
Flow (m³/s)
Rainfall (mm/hr)
7.40
7.35
7.30
7.25
7.20
7.15
0
20
40
60
80
100
01-Nov
02-Nov
03-Nov
04-Nov
05-Nov
06-Nov
07-Nov
08-Nov
09-Nov
10-Nov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10-Jun-2022 16:30 - 09-Nov-2022 13:45
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
0
20
40
60
80
100
14-Jun
21-Jun
28-Jun
05-Jul
12-Jul
19-Jul
26-Jul
02-Aug
09-Aug
16-Aug
23-Aug
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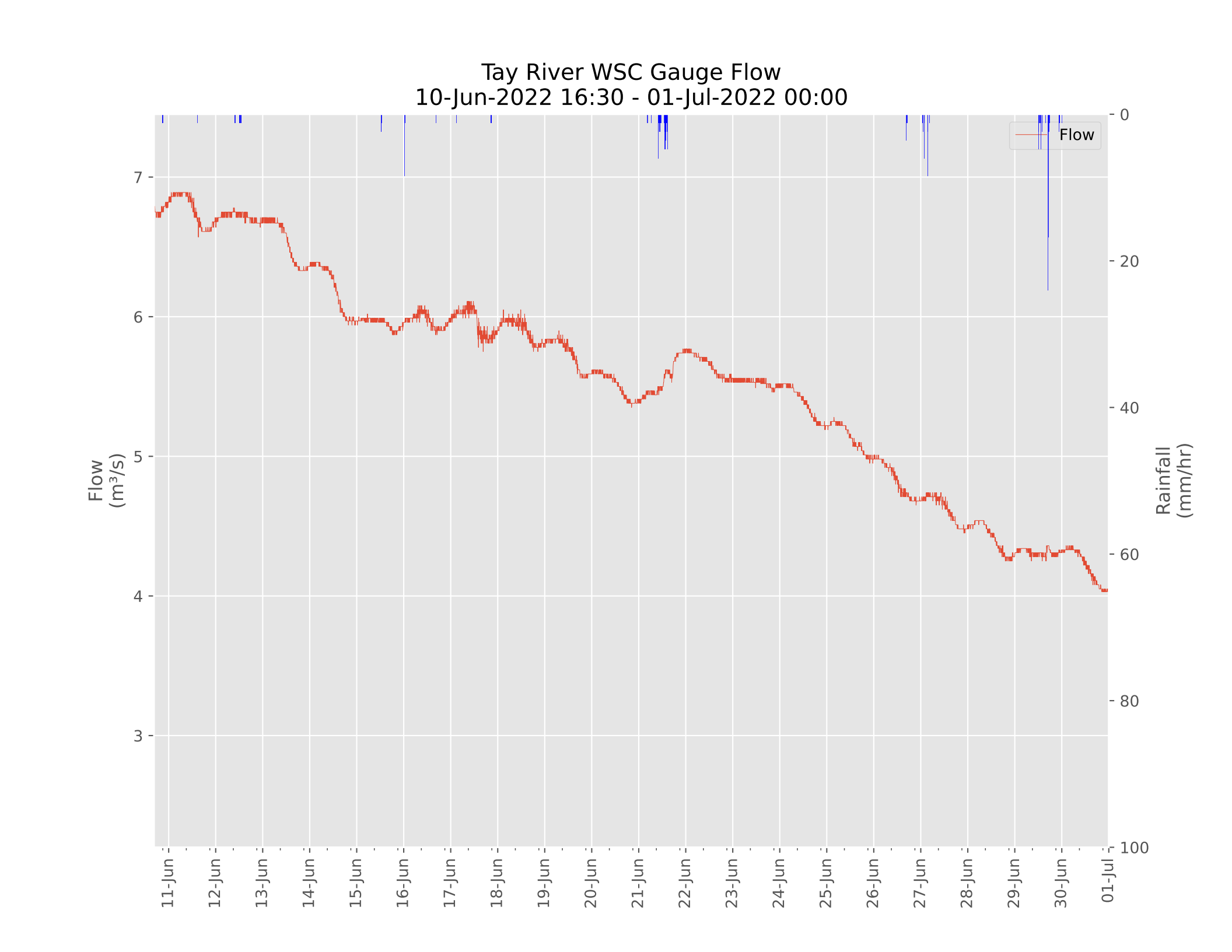
04-Oct
11-Oct
18-Oct
25-Oct
01-Nov
08-Nov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10-Jun-2022 16:30 - 01-Jul-2022 00:00
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
0
20
40
60
80
100
11-Jun
12-Jun
13-Jun
14-Jun
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16-Jun
17-Jun
18-Jun
19-Jun
20-Jun
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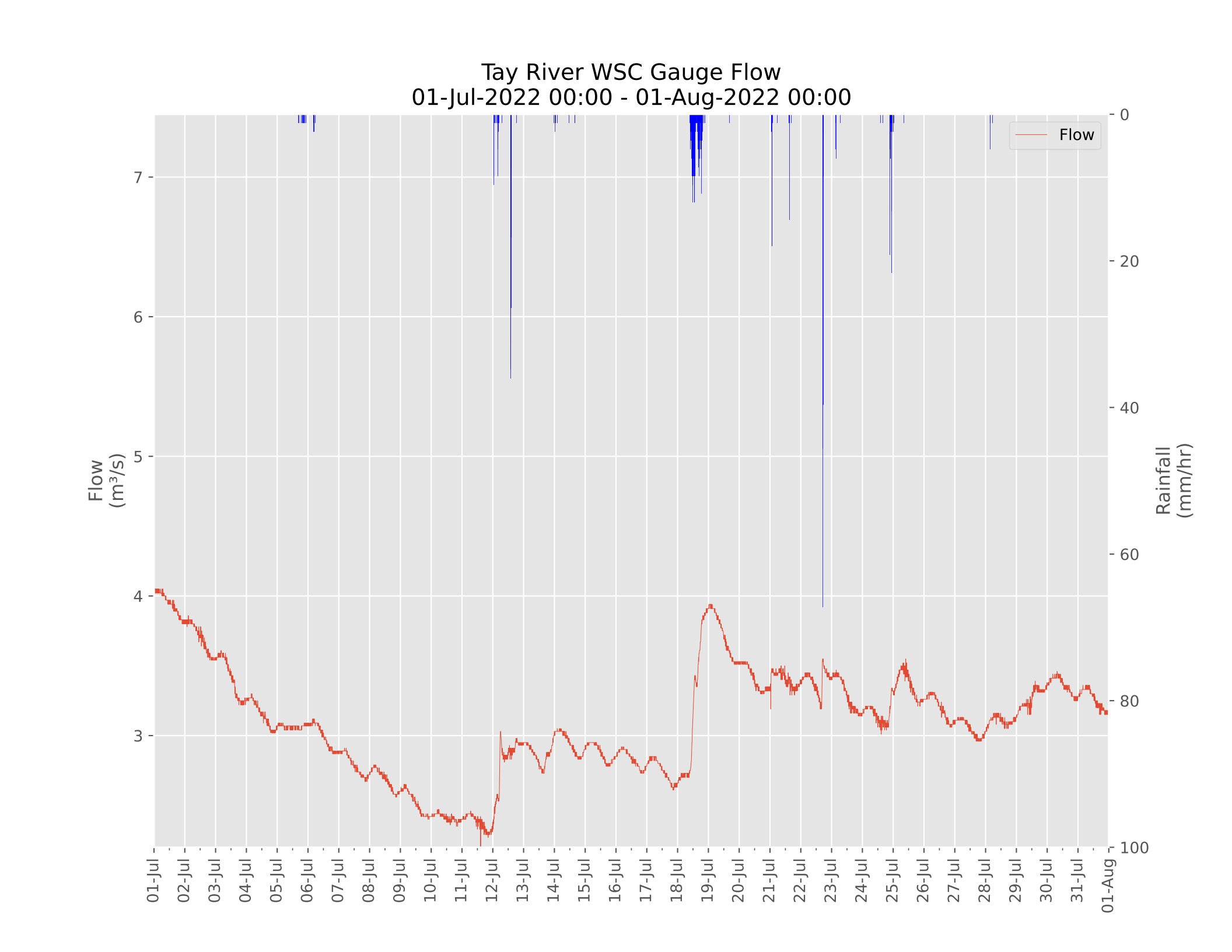
26-Jun
27-Jun
28-Jun
29-Jun
30-Jun
01-Jul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01-Jul-2022 00:00 - 01-Aug-2022 00:00
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
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01-Jul
02-Jul
03-Jul
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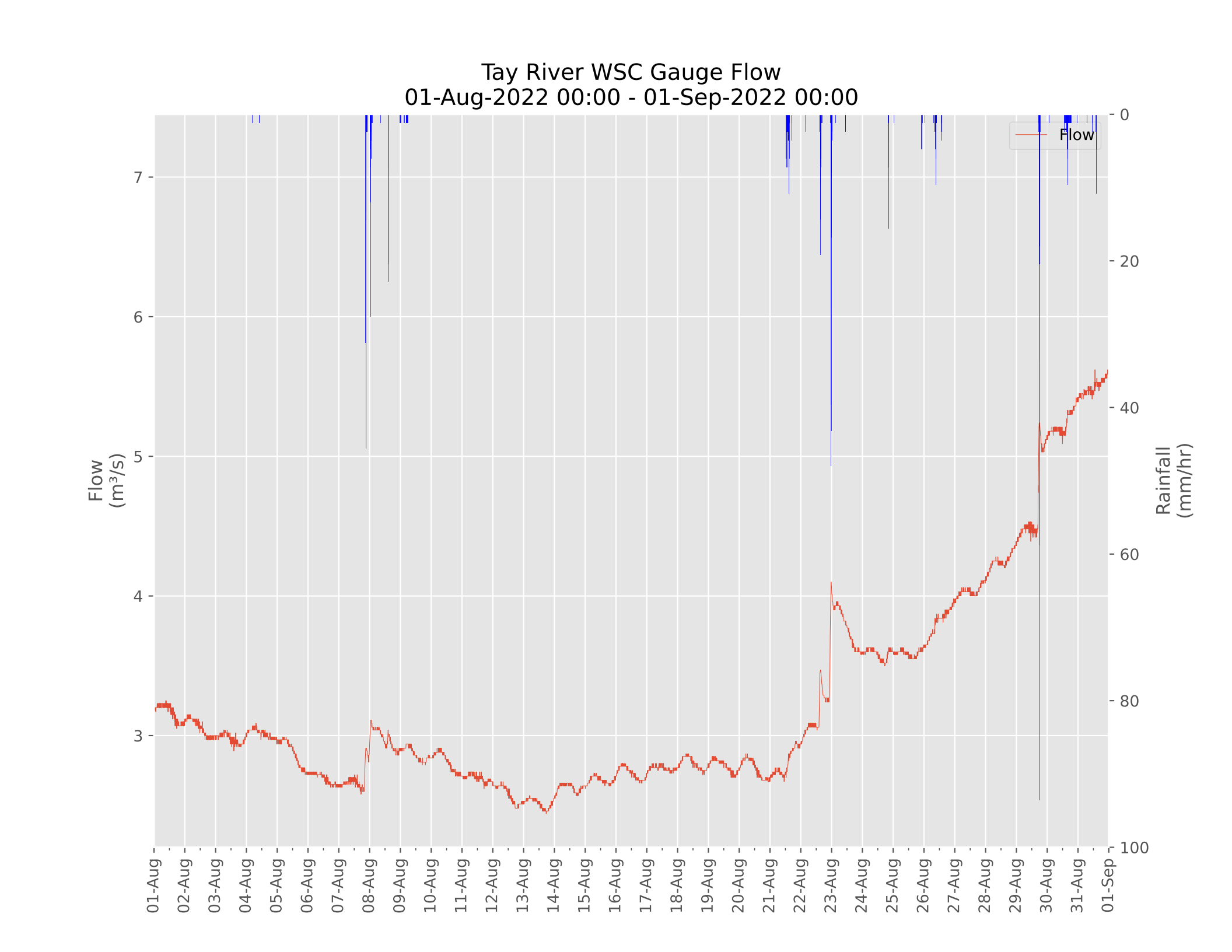
31-Jul
01-Aug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01-Aug-2022 00:00 - 01-Sep-2022 00:00
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
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20
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01-Aug
02-Aug
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13-Aug
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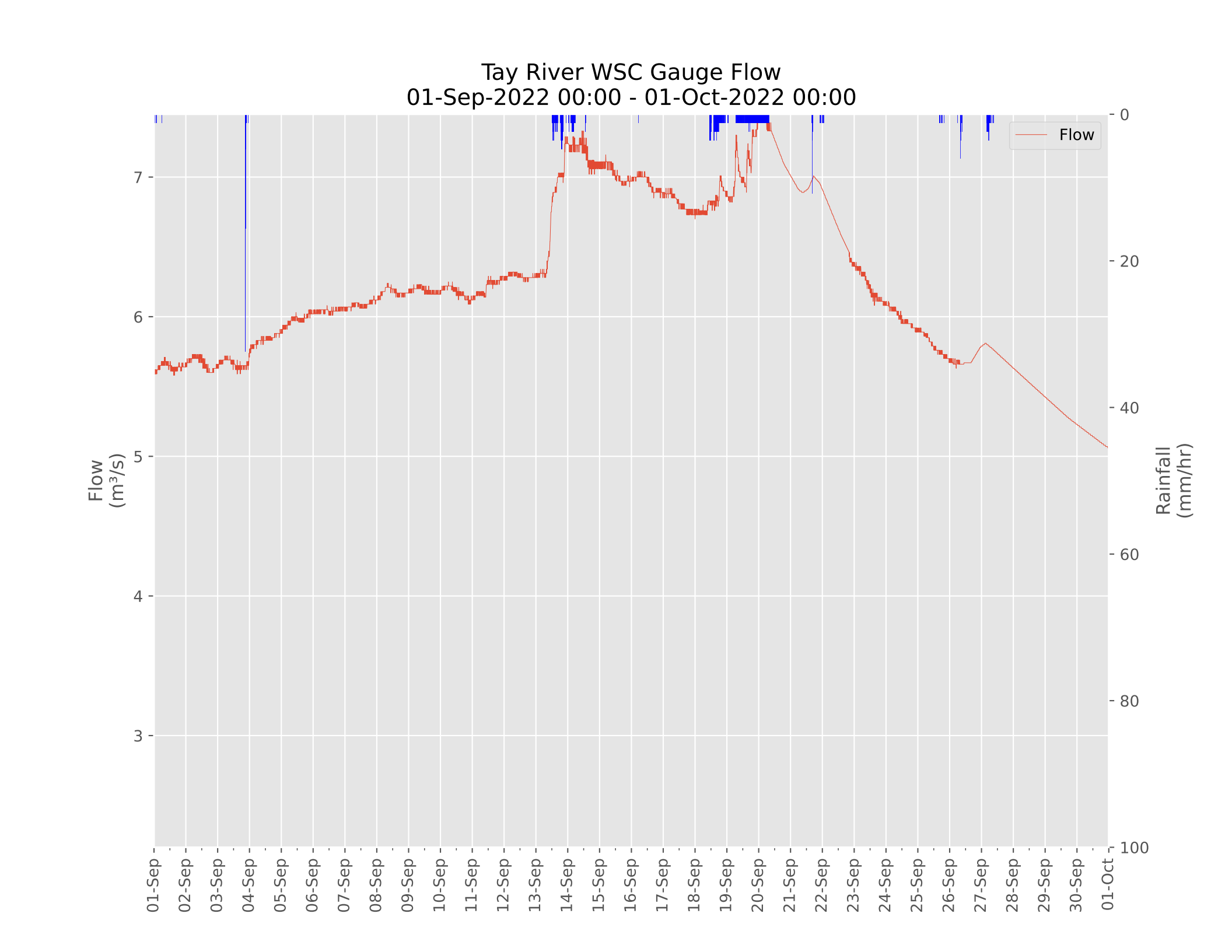
01-Sep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01-Sep-2022 00:00 - 01-Oct-2022 00:00
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
0
20
40
60
80
100
01-Sep
02-Sep
03-Sep
04-Sep
05-Sep
06-Sep
07-Sep
08-Sep
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11-Sep
12-Sep
13-Sep
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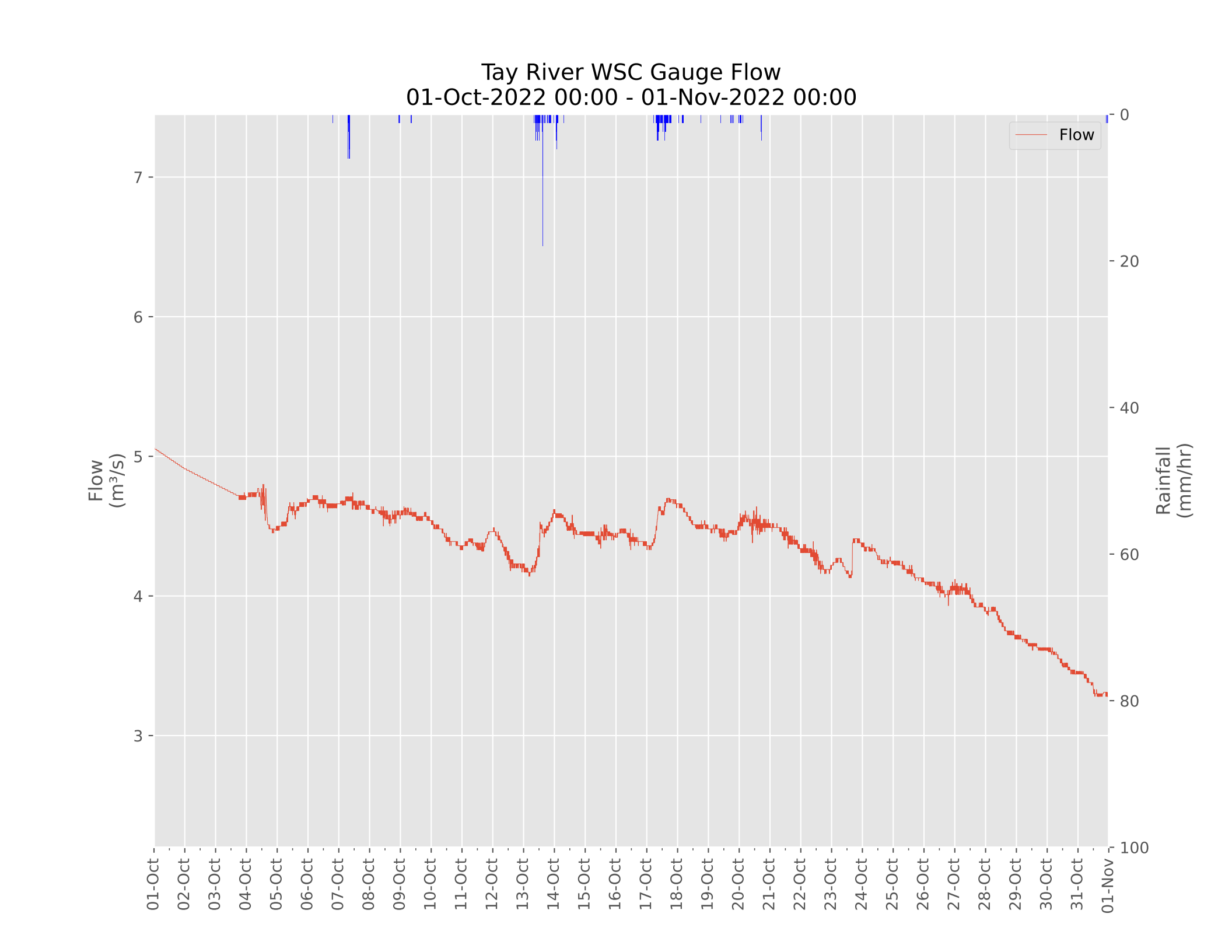
28-Sep
29-Sep
30-Sep
01-Oct


Tay River WSC Gauge Flow
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Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
0
20
40
60
80
100
01-Oct
02-Oct
03-Oct
04-Oct
05-Oct
06-Oct
07-Oct
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10-Oct
11-Oct
12-Oct
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14-Oct
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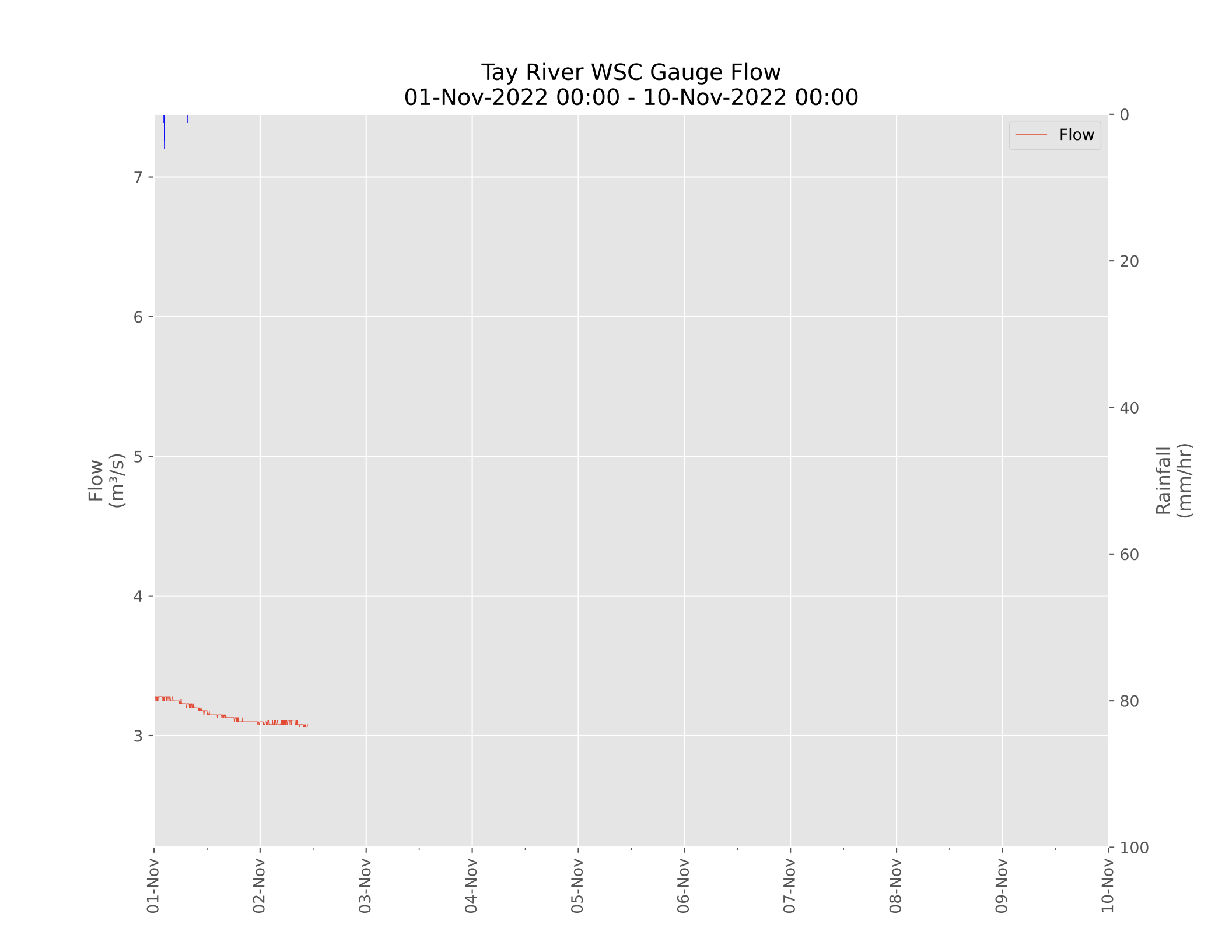
30-Oct
31-Oct
01-Nov


Tay River WSC Gauge Flow
01-Nov-2022 00:00 - 10-Nov-2022 00:00
Flow
Flow (m³/s)
Rainfall (mm/hr)
7
6
5
4
3
0
20
40
60
80
100
01-Nov
02-Nov
03-Nov
04-Nov
05-Nov
06-Nov
07-Nov
08-Nov
09-Nov
10-Nov

JFSA
WATER RESOURCES AND
ENVIRONMENTAL CONSULTANTS

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Appendix C

Floodplain Mapping

N

Legend

RVCA Floodplain

SCALE: 1:8000

0 200 400 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

CAIVAN COMMUNITIES

Perth Golf Course

Figure C1: RVCA Floodplain Boundary

PROJECT	2118-21
DRAWN	MP
DATE	MAR 2022

N

Legend

2022 JFSA Floodplain

SCALE: 1:8000

0 200 400 m

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52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

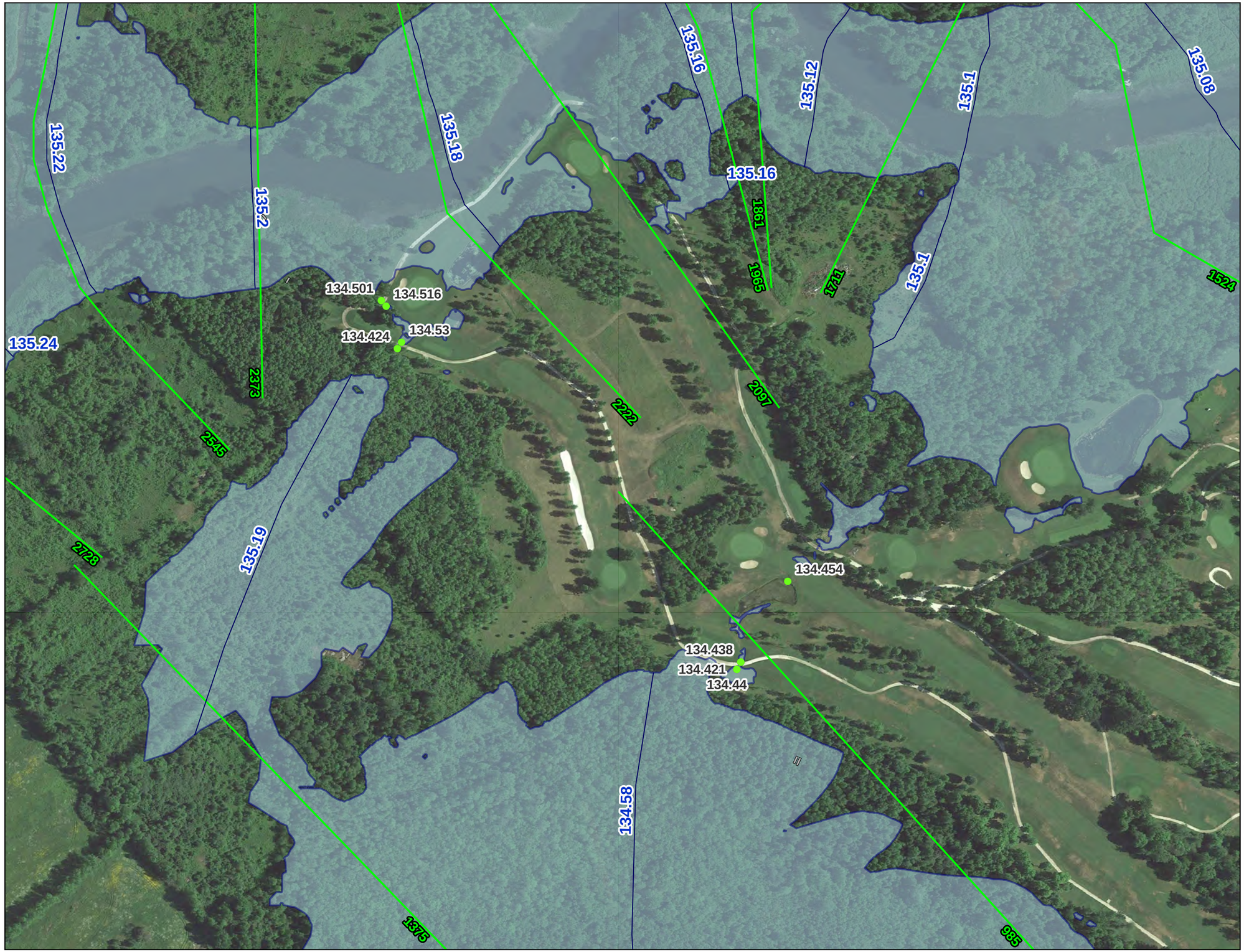
CAIVAN COMMUNITIES

Perth Golf Course

Figure C2: JFSA Floodplain Boundary

PROJECT	2118-21
DRAWN	MP
DATE	MAR 2022

C:\OneDrive\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2118-21\JFSA ENGINEERING\DESIGN\GIS\20220112-Updated Floodplain Map Replication



N

Legend

- 2022 JFSA Floodplain
- 2 cm Contours (m)
- RVCA Cross Sections
- Culvert Invert Elevation (m)

SCALE: 1:3000

0 50 100 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

CAIVAN COMMUNITIES

Perth Golf Course

Figure C3: JFSA Flood Plain
and Culvert Invert Elevations

PROJECT	2118-21
DRAWN	MP
DATE	MAR 2022

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Montréal. QC
Québec. QC

Appendix D

Existing Water Budget

Table D1 - Grants Creek - Pre Development Water Budget

Year	[1] Precipitation (mm)	[1]-[2]-[4] Total Evaporation (mm)	(%)	[2] Total Infiltration (mm)	(%)	[3] Total Runoff (mm)	(%)
1967	386.9	200.9	52%	54.3	14%	131.8	34%
1968	592.8	355.2	60%	85.9	14%	151.7	26%
1969	569.8	343.6	60%	84.4	15%	141.9	25%
1970	558.9	348.8	62%	82.1	15%	128.0	23%
1971	522.1	357.3	68%	72.4	14%	92.4	18%
1972	784.3	423.7	54%	118.1	15%	242.6	31%
1973	744.9	424.3	57%	113.8	15%	206.9	28%
1974	386.2	276.8	72%	48.5	13%	60.9	16%
1975	535.5	339.0	63%	78.1	15%	118.3	22%
1976	492.4	332.9	68%	65.6	13%	93.9	19%
1977	677.6	418.9	62%	99.9	15%	158.8	23%
1978	638.8	400.5	63%	110.6	17%	127.7	20%
1979	866.5	454.5	52%	136.8	16%	275.2	32%
1980	622	395.7	64%	91.6	15%	134.7	22%
1981	936.4	525.2	56%	120.4	13%	290.8	31%
1982	596.1	408.4	69%	83.3	14%	104.5	18%
1983	587.3	401.7	68%	73.4	13%	112.2	19%
1984	459.4	262.8	57%	76.5	17%	120.1	26%
1985	559.9	332.9	59%	105.9	19%	121.1	22%
1986	849.4	478.6	56%	117.8	14%	252.9	30%
1987	639.9	418.9	65%	79.1	12%	141.9	22%
1988	643.2	404.0	63%	87.4	14%	151.8	24%
1989	522.5	351.1	67%	70.9	14%	100.6	19%
1990	727.8	455.5	63%	98.7	14%	173.6	24%
1991	555.8	388.9	70%	62.8	11%	104.2	19%
1992	730.2	446.8	61%	103.3	14%	180.1	25%
1993	721.1	469.7	65%	97.4	14%	154.0	21%
1994	527	312.4	59%	81.8	16%	132.8	25%
1995	321.6	161.3	50%	48.6	15%	111.7	35%
1996	512.2	333.2	65%	66.4	13%	112.7	22%
1997	433.2	283.4	65%	72.0	17%	77.8	18%
1998	440.3	287.8	65%	66.9	15%	85.6	19%
1999	424.4	267.4	63%	71.6	17%	85.4	20%
2000	535.9	336.4	63%	76.1	14%	123.5	23%
2002	551.5	273.2	50%	86.7	16%	191.6	35%
2003	554.6	331.3	60%	76.9	14%	146.4	26%
Average	**589.1**	**361.2**	**62%**	**85.2**	**15%**	**142.8**	**24%**
Min	321.6	161.3	50%	48.5	11%	60.9	16%
Max	936.4	525.2	72%	136.8	19%	290.8	35%

Table D2 - Tay River - Pre Development Water Budget

Year	[1] Precipitation (mm)	[1]-[2]-[4] Total Evaporation (mm)	(%)	[2] Total Infiltration (mm)	(%)	[3] Total Runoff (mm)	(%)
1967	386.9	200.9	52%	60.6	16%	125.4	32%
1968	592.8	355.2	60%	95.2	16%	142.5	24%
1969	569.8	343.6	60%	93.4	16%	132.8	23%
1970	558.9	348.8	62%	90.5	16%	119.7	21%
1971	522.1	357.3	68%	78.9	15%	85.9	16%
1972	784.3	423.7	54%	131.3	17%	229.4	29%
1973	744.9	424.3	57%	126.5	17%	194.1	26%
1974	386.2	276.8	72%	52.8	14%	56.6	15%
1975	535.5	339.0	63%	85.8	16%	110.7	21%
1976	492.4	332.9	68%	72.0	15%	87.5	18%
1977	677.6	418.9	62%	109.9	16%	148.8	22%
1978	638.8	400.5	63%	120.6	19%	117.7	18%
1979	866.5	454.5	52%	152.2	18%	259.8	30%
1980	622	395.7	64%	100.3	16%	126.0	20%
1981	936.4	525.2	56%	134.0	14%	277.1	30%
1982	596.1	408.4	69%	90.7	15%	97.1	16%
1983	587.3	401.7	68%	80.7	14%	105.0	18%
1984	459.4	262.8	57%	84.3	18%	112.3	24%
1985	559.9	332.9	59%	115.6	21%	111.4	20%
1986	849.4	478.6	56%	130.7	15%	240.1	28%
1987	639.9	418.9	65%	87.2	14%	133.8	21%
1988	643.2	404.0	63%	96.8	15%	142.4	22%
1989	522.5	351.1	67%	77.8	15%	93.6	18%
1990	727.8	455.5	63%	109.2	15%	163.1	22%
1991	555.8	388.9	70%	69.3	12%	97.6	18%
1992	730.2	446.8	61%	114.3	16%	169.1	23%
1993	721.1	469.7	65%	107.2	15%	144.2	20%
1994	527	312.4	59%	90.7	17%	123.9	24%
1995	321.6	161.3	50%	53.8	17%	106.5	33%
1996	512.2	333.2	65%	73.2	14%	105.9	21%
1997	433.2	283.4	65%	78.2	18%	71.6	17%
1998	440.3	287.8	65%	73.2	17%	79.4	18%
1999	424.4	267.4	63%	78.3	18%	78.7	19%
2000	535.9	336.4	63%	83.8	16%	115.7	22%
2002	551.5	273.2	50%	96.3	17%	182.0	33%
2003	554.6	331.3	60%	85.0	15%	138.3	25%
Average	**589.1**	**361.2**	**62%**	**93.9**	**16%**	**134.0**	**22%**
Min	321.6	161.3	50%	52.8	12%	56.6	15%
Max	936.4	525.2	72%	152.2	21%	277.1	33%

```
20     Metric units / ID Numbers OFF
*#*************************************************************************
*#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
*#*************************************************************************
*#  Project Name  : [Caivan Perth properties]
*#  Project Number: [2118]
*#  Date          : [2023 JAN 26]
*#  Modeller      : [JB]
*#  Company       : J.F. Sabourin and Associates
*#  License #     : 2549237
*#*************************************************************************
*#*****************************************************************************************
***********
*# Model developed to simulate pre-development water budget
*#*****************************************************************************************
***********
START               TZERO=[1967.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[67]
*%                   [""] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*# Ottawa International Airport (1967 - 2003)
READ AES DATA       AES_FILENAME=["6106000.123"],
                    IELEM=[123], START_DATE=[0], END_DATE=[-364]
*%-----------------|-------------------------------------------------------|
COMPUTE API         APII=[50], APIK=[0.90]/day
*##########################################################################
*# Pre Development Condition - Using NASHHYD and CN
*##########################################################################
CONTINUOUS NASHYD   NHYD=["GrantsPre"], DT=[5]min, AREA=[22.01](ha),
                    DWF=[0](cms), CN/C=[92],IA=[8.75](mm),
                    N=[3], TP=[0.24]hrs,
                    Continuous simulation parameters:
                      IaRECper=[24](hrs),SMIN=[ -1 ](mm),  SMAX=[ -1 ](mm),
                      SK=[0.3]/(mm), InterEventTime=[ 12 ](hrs)
                    END=-1
*%-----------------|-------------------------------------------------------|

CONTINUOUS NASHYD   NHYD=["TayPre"], DT=[5]min, AREA=[22.86](ha),
                    DWF=[0](cms), CN/C=[90], IA=[8.75](mm),
                    N=[3], TP=[0.36]hrs,
                    Continuous simulation parameters:
                      IaRECper=[24](hrs),SMIN=[ -1 ](mm),  SMAX=[ -1 ](mm),
                      SK=[0.3]/(mm), InterEventTime=[ 12 ](hrs)
                    END=-1
*%-----------------|-------------------------------------------------------|
*ADD HYD             NHYDsum=["Pre"], NHYDs to add=["GrantsPre"+"TayPre"]
*##########################################################################
*# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
*##########################################################################
CONTINUOUS NASHYD   NHYD=["InfGrantsPre"], DT=[5]min, AREA=[22.01](ha),
                    DWF=[0](cms), CN/C=[99.99],IA=[8.75](mm),
                    N=[3], TP=[0.24]hrs,
                    Continuous simulation parameters:
                    IaRECper=[24](hrs),SMIN=[ 0 ](mm),  SMAX=[ 0 ](mm), SK=[0.3]/(mm),
                    InterEventTime=[ 12 ](hrs)
                    END=-1
*%-----------------|-------------------------------------------------------|
CONTINUOUS NASHYD   NHYD=["InfTayPre"], DT=[5]min, AREA=[22.86](ha),
                    DWF=[0](cms), CN/C=[99.99], IA=[8.75](mm),
                    N=[3], TP=[0.36]hrs,
                    Continuous simulation parameters:
                    IaRECper=[24](hrs),SMIN=[ 0 ](mm),  SMAX=[ 0 ](mm), SK=[0.3]/(mm),
                    InterEventTime=[ 12 ](hrs)
                    END=-1
*%-----------------|-------------------------------------------------------|
*ADD HYD             NHYDsum=["InfPre"], NHYDs to add=["InfGrantsPre"+"InfTayPre"]
*%-----------------|-------------------------------------------------------|
*##########################################################################
*# STORMS
*##########################################################################
```

```
START                TZERO=[1968.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[68]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1969.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[69]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1970.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[70]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1971.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[71]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1972.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[72]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1973.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[73]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1974.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[74]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1975.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[75]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1976.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[76]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1977.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[77]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1978.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[78]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1979.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[79]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1980.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[80]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1981.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[81]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1982.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[82]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1983.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[83]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1984.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[84]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1985.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[85]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1986.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[86]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1987.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[87]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1988.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[88]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1989.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[89]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1990.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[90]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1991.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[91]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1992.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[92]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1993.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[93]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1994.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[94]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1995.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[95]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1996.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[96]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1997.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[97]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1998.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[98]
*%-----------------|-------------------------------------------------------|
START                TZERO=[1999.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[99]
*%-----------------|-------------------------------------------------------|
START                TZERO=[2000.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[100]
*%-----------------|-------------------------------------------------------|
*% MISSING FROM AES RAINFALL DATA
*%START               TZERO=[2001.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[101]
*%-----------------|-------------------------------------------------------|
```

```
START               TZERO=[2002.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[102]
*%-----------------|-------------------------------------------------------|
START               TZERO=[2003.0101],  METOUT=[2],  NSTORM=[0],  NRUN=[103]
*%-----------------|-------------------------------------------------------|
FINISH
```

```
=========================================================================================

SSSSS   W   W   M   M   H   H   Y   Y   M   M    OOO        222     000    11   5555  =========
S       W W W   MM MM   H   H    Y Y    MM MM   O   O         2    0   0   11   5
SSSSS   W W W   M M M   HHHHH     Y     M M M   O   O         2    0   0   11   5     Ver 5.500
    S    W W    M   M   H   H     Y     M   M   O   O       222    0   0   11   555   FEB  2015
SSSSS    W W    M   M   H   H     Y     M   M    OOO        2      0   0   11     5   =========
                                                            2      0   0   11     5   # 2549237
      StormWater Management HYdrologic Model                222     000    11   555   =========

*****************************************************************************************
**************************************  SWMHYMO Ver 5.500  ******************************
******************  A single event and continuous hydrologic simulation model  ***********
******************     based on the principles of HYMO and its successors      **********
******************                OTTHYMO-83 and OTTHYMO-89.                   **********
*****************************************************************************************
****************** Distributed by:  J.F. Sabourin and Associates Inc.          **********
******************                  Ottawa,  Ontario: (613) 836-3884           **********
******************                  Gatineau, Quebec: (819) 243-6858           **********
******************                  E-Mail: swmhymo@jfsa.Com                   **********
*****************************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++ Licensed user: JFSAinc.                                ++++++++++++++
++++++++++++++++++                Ottawa              SERIAL#:2549237     ++++++++++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*****************************************************************************************
******************          ++++++ PROGRAM ARRAY DIMENSIONS ++++++        ***************
******************          Maximum value for ID numbers  :     11        ***************
******************          Max. number of rainfall points: 105408        ***************
******************          Max. number of flow points    : 105408        ***************
*****************************************************************************************


********************************   S U M M A R Y   O U T P U T   ************************
*****************************************************************************************
*                 RUN DATE: 2023-02-14     TIME: 17:43:51     RUN COUNTER: 001213       *
*****************************************************************************************
* Input   file: C:\Temp\2118\20230126-Pre Dev WB\Perth-Pre_v01.3-WB.dat                 *
* Output  file: C:\Temp\2118\20230126-Pre Dev WB\Perth-Pre_v01.3-WB.out                 *
* Summary file: C:\Temp\2118\20230126-Pre Dev WB\Perth-Pre_v01.3-WB.sum                 *
* User comments:                                                                        *
* 1:____________________________________________________________________________________*
* 2:____________________________________________________________________________________*
* 3:____________________________________________________________________________________*
*****************************************************************************************


#*************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#*************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#*************************************************************************
#****************************************************************************************
# Model developed to simulate pre-development water budget
#****************************************************************************************
  ** END OF RUN :   66

*****************************************************************************************





 RUN#:COMMAND#
R0067:C00001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on 19670101]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   0 ]
      [NRUN  = 0067 ]
#*************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#*************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#*************************************************************************
#****************************************************************************************
# Model developed to simulate pre-development water budget
#****************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0067:C00002-----------------------------------------------------------------------------
  *  READ AES DATA
      [Filename  = 6106000.123                                                 ]
      [Start_date= 1967.0101: End_date= 1967.1231]
      {DT= 60.min: Length= 3984.hrs: WetHrs=  257: DryHrs= 3727: PTOT= 386.90}
      Maximum average rainfall intensities over
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
       24.60    17.65    13.20     7.25     3.83     2.36     1.73     1.32      .90    mm/hr
       24.60    35.30    39.60    43.50    46.00    56.60    62.30    63.20    64.90    mm
      19670921 19670921 19670921 19670921 19670921 19670922 19670922 19670923 19670924  date
      Number of rainfall events per following interevent time
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
          80       65       56       40       32       29       24       20       18
      Number of events with at least the following durations
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
          79       42       29       14        3        0        0        0        0
R0067:C00003-----------------------------------------------------------------------------
     COMPUTE API
      [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
      {APImax= 76.77: APIavg= 24.81: APImin=  3.06}
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN
#########################################################################################
R0067:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.090 1967.0921_17:05  131.78 .341     .000
      [CN= 92.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
      [InterEventTime=  12.00]
R0067:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .876 1967.0921_17:15  125.39 .324     .000
      [CN= 90.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
#########################################################################################
R0067:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.444 1967.0921_17:00  186.03 .481     .000
      [CN=100.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
R0067:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.288 1967.0921_17:10  186.03 .481     .000
      [CN=100.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# STORMS
#########################################################################################
  ** END OF RUN :   67

*****************************************************************************************





 RUN#:COMMAND#
R0068:C00001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on 19680101]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   0 ]
      [NRUN  = 0068 ]
#*************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#*************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#*************************************************************************
#****************************************************************************************
# Model developed to simulate pre-development water budget
#****************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0068:C00002-----------------------------------------------------------------------------
  *  READ AES DATA
      [Filename  = 6106000.123                                                 ]
      [Start_date= 1968.0101: End_date= 1968.1230]
      {DT= 60.min: Length= 8784.hrs: WetHrs=  413: DryHrs= 8371: PTOT= 592.80}
      Maximum average rainfall intensities over
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
       33.30    17.05    11.37     6.23     3.74     1.87     1.26      .95      .70    mm/hr
       33.30    34.10    34.10    37.40    44.90    44.90    45.40    45.40    50.20    mm
      19680817 19680817 19680817 19680808 19680817 19680818 19680817 19680808 19680820  date
      Number of rainfall events per following interevent time
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         137      105       93       84       72       63       48       43       36
      Number of events with at least the following durations
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         136       76       49       18        5        0        0        0        0
R0068:C00003-----------------------------------------------------------------------------
     COMPUTE API
      [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
      {APImax= 67.52: APIavg= 16.69: APImin=   .27}
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN
#########################################################################################
R0068:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.566 1968.0818_ 5:00  151.71 .256     .000
      [CN= 92.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
      [InterEventTime=  12.00]
R0068:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.226 1968.0818_ 5:05  142.46 .240     .000
      [CN= 90.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
#########################################################################################
R0068:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.960 1968.0818_ 5:00  237.63 .401     .000
      [CN=100.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
R0068:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.728 1968.0818_ 5:05  237.63 .401     .000
      [CN=100.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# STORMS
#########################################################################################
  ** END OF RUN :   68

*****************************************************************************************





 RUN#:COMMAND#
R0069:C00001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on 19690101]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   0 ]
      [NRUN  = 0069 ]
#*************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#*************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#*************************************************************************
#****************************************************************************************
# Model developed to simulate pre-development water budget
#****************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0069:C00002-----------------------------------------------------------------------------
  *  READ AES DATA
      [Filename  = 6106000.123                                                 ]
      [Start_date= 1969.0101: End_date= 1969.1231]
      {DT= 60.min: Length= 8760.hrs: WetHrs=  469: DryHrs= 8291: PTOT= 569.80}
      Maximum average rainfall intensities over
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
       21.10    16.25    10.83     7.78     3.93     2.10     1.40     1.09      .75    mm/hr
       21.10    32.50    32.50    46.70    47.20    50.30    50.30    52.10    54.00    mm
      19690818 19690818 19690818 19690819 19690819 19690819 19690819 19690819 19690819  date
      Number of rainfall events per following interevent time
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         157      119      107       92       72       58       49       43       32
      Number of events with at least the following durations
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         156       84       58       21        5        0        0        0        0
R0069:C00003-----------------------------------------------------------------------------
     COMPUTE API
      [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
      {APImax= 56.77: APIavg= 16.04: APImin=   .06}
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN
#########################################################################################
R0069:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.080 1969.0818_22:00  141.88 .249     .000
      [CN= 92.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
      [InterEventTime=  12.00]
R0069:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .939 1969.0818_22:05  132.80 .233     .000
      [CN= 90.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
#########################################################################################
R0069:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.284 1969.0818_22:00  226.24 .397     .000
      [CN=100.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
R0069:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.259 1969.0818_22:00  226.24 .397     .000
      [CN=100.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# STORMS
#########################################################################################
  ** END OF RUN :   69

*****************************************************************************************





 RUN#:COMMAND#
R0070:C00001-----------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on 19700101]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   0 ]
      [NRUN  = 0070 ]
#*************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#*************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#*************************************************************************
#****************************************************************************************
# Model developed to simulate pre-development water budget
#****************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0070:C00002-----------------------------------------------------------------------------
  *  READ AES DATA
      [Filename  = 6106000.123                                                 ]
      [Start_date= 1970.0101: End_date= 1970.1231]
      {DT= 60.min: Length= 8016.hrs: WetHrs=  373: DryHrs= 7643: PTOT= 558.90}
      Maximum average rainfall intensities over
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
       35.30    18.30    12.20     6.10     3.63     1.81     1.21     1.46      .99    mm/hr
       35.30    36.60    36.60    36.60    43.50    43.50    43.50    69.90    71.20    mm
      19700926 19700926 19700926 19700927 19700817 19700817 19700818 19700926 19700927  date
      Number of rainfall events per following interevent time
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         148      127      109       84       72       60       53       40       29
      Number of events with at least the following durations
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         147       79       40       15        3        0        0        0        0
R0070:C00003-----------------------------------------------------------------------------
     COMPUTE API
      [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
      {APImax= 76.00: APIavg= 17.31: APImin=   .23}
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN
#########################################################################################
R0070:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.671 1970.0926_21:00  128.02 .229     .000
      [CN= 92.0: N= 3.00: Tp=  .24]
      [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
      [InterEventTime=  12.00]
R0070:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.310 1970.0926_21:05  119.65 .214     .000
      [CN= 90.0: N= 3.00: Tp=  .38]
      [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
      [InterEventTime=  12.00]
#########################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
```

```
00361> ##############################################################################
00362> R0070:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00363>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    2.074 1970.0926_21:00  210.12 .376     .000
00364>       [CN=100.0: N= 3.00: Tp=  .24]
00365>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00366>       [InterEventTime=  12.00]
00367> R0070:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00368>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.824 1970.0926_21:05  210.12 .376     .000
00369>       [CN=100.0: N= 3.00: Tp=  .38]
00370>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00371>       [InterEventTime=  12.00]
00372> ##############################################################################
00373> # STORMS
00374> ##############################################################################
00375>   ** END OF RUN :   70
00376>
00377> ******************************************************************************************************
00378>
00379>
00380>
00381>
00382>
00383>  RUN#:COMMAND#
00384> R0071:C00001------------------------------------------------------------------------------------------
00385>      START
00386>       [TZERO =    .00 hrs on 19710101]
00387>       [METOUT=   2    (1=imperial, 2=metric output)]
00388>       [NSTORM=   0 ]
00389>       [NRUN  = 0071 ]
00390> #*****************************************************************************
00391> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00392> #*****************************************************************************
00393> #  Project Name  : [Caivan Perth properties]
00394> #  Project Number: [2118]
00395> #  Date          : [2023 JAN 26]
00396> #  Modeller      : [JB]
00397> #  Company       : J.F. Sabourin and Associates
00398> #  License #     : 2549237
00399> #*****************************************************************************
00400> ******************************************************************************************************
00401> # Model developed to simulate pre-development water budget
00402> #*****************************************************************************************************
00403> # Ottawa International Airport (1967 - 2003)
00404> R0071:C00002------------------------------------------------------------------------------------------
00405>   *  READ AES DATA
00406>       [Filename  = 6106000.123                                                    ]
00407>       [Start_date= 1971.0101: End_date= 1971.1231]
00408>       {DT= 60.min: Length= 8760.hrs: WetHrs=  412: DryHrs= 8348: PTOT= 522.10}
00409>       Maximum average rainfall intensities over
00410>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00411>        24.60    16.60    11.67     6.13     3.09     1.56     1.06      .79      .54    mm/hr
00412>        24.60    33.20    35.00    36.80    37.10    37.40    38.00    38.00    38.90    mm
00413>      19710810 19710810 19710810 19710810 19710810 19710810 19710810 19710811 19710812 19710830  date
00414>      Number of rainfall events per following interevent time
00415>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00416>          156      123      113       93       72       61       52       42       33
00417>      Number of events with at least the following durations
00418>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00419>          155       81       59       21        2        0        0        0        0
00420> R0071:C00003------------------------------------------------------------------------------------------
00421>      COMPUTE API
00422>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
00423>       {APImax= 62.22: APIavg= 14.84: APImin=   .36}
00424> ##############################################################################
00425> # Pre Development Condition - Using NASHHYD and CN
00426> ##############################################################################
00427> R0071:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00428>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.094 1971.0810_15:05   92.41 .177     .000
00429>       [CN= 92.0: N= 3.00: Tp=  .24]
00430>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
00431>       [InterEventTime=  12.00]
00432> R0071:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00433>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .890 1971.0810_15:10   85.91 .165     .000
00434>       [CN= 90.0: N= 3.00: Tp=  .38]
00435>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
00436>       [InterEventTime=  12.00]
00437> ##############################################################################
00438> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
00439> ##############################################################################
00440> R0071:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00441>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.456 1971.0810_15:00  164.77 .316     .000
00442>       [CN=100.0: N= 3.00: Tp=  .24]
00443>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00444>       [InterEventTime=  12.00]
00445> R0071:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00446>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.314 1971.0810_15:05  164.77 .316     .000
00447>       [CN=100.0: N= 3.00: Tp=  .38]
00448>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00449>       [InterEventTime=  12.00]
00450> ##############################################################################
00451> # STORMS
00452> ##############################################################################
00453>   ** END OF RUN :   71
00454>
00455> ******************************************************************************************************
00456>
00457>
00458>
00459>
00460>
00461>  RUN#:COMMAND#
00462> R0072:C00001------------------------------------------------------------------------------------------
00463>      START
00464>       [TZERO =    .00 hrs on 19720101]
00465>       [METOUT=   2    (1=imperial, 2=metric output)]
00466>       [NSTORM=   0 ]
00467>       [NRUN  = 0072 ]
00468> #*****************************************************************************
00469> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00470> #*****************************************************************************
00471> #  Project Name  : [Caivan Perth properties]
00472> #  Project Number: [2118]
00473> #  Date          : [2023 JAN 26]
00474> #  Modeller      : [JB]
00475> #  Company       : J.F. Sabourin and Associates
00476> #  License #     : 2549237
00477> #*****************************************************************************
00478> ******************************************************************************************************
00479> # Model developed to simulate pre-development water budget
00480> #*****************************************************************************************************
00481> # Ottawa International Airport (1967 - 2003)
00482> R0072:C00002------------------------------------------------------------------------------------------
00483>   *  READ AES DATA
00484>       [Filename  = 6106000.123                                                    ]
00485>       [Start_date= 1972.0101: End_date= 1972.1230]
00486>       {DT= 60.min: Length= 8760.hrs: WetHrs=  489: DryHrs= 8271: PTOT= 784.30}
00487>       Maximum average rainfall intensities over
00488>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00489>        37.30    19.15    12.97     8.15     4.50     2.53     2.00     1.71     1.17    mm/hr
00490>        37.30    38.30    38.90    48.90    54.00    60.70    72.10    82.20    84.20    mm
00491>      19720712 19720712 19720807 19720808 19720808 19720808 19720713 19720714 19720715  date
00492>      Number of rainfall events per following interevent time
00493>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00494>          170      133      122       86       76       60       45       41       31
00495>      Number of events with at least the following durations
00496>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00497>          169       96       58       21        5        0        0        0        0
00498> R0072:C00003------------------------------------------------------------------------------------------
00499>      COMPUTE API
00500>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
00501>       {APImax=108.88: APIavg= 21.70: APImin=   .00}
00502> ##############################################################################
00503> # Pre Development Condition - Using NASHHYD and CN
00504> ##############################################################################
00505> R0072:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00506>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.807 1972.0712_ 4:00  242.59 .309     .000
00507>       [CN= 92.0: N= 3.00: Tp=  .24]
00508>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
00509>       [InterEventTime=  12.00]
00510> R0072:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00511>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.431 1972.0712_ 4:05  229.36 .292     .000
00512>       [CN= 90.0: N= 3.00: Tp=  .38]
00513>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
00514>       [InterEventTime=  12.00]
00515> ##############################################################################
00516> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
00517> ##############################################################################
00518> R0072:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00519>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    2.197 1972.0712_ 4:00  360.64 .460     .000
00520>       [CN=100.0: N= 3.00: Tp=  .24]
00521>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00522>       [InterEventTime=  12.00]
00523> R0072:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00524>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.942 1972.0712_ 4:05  360.64 .460     .000
00525>       [CN=100.0: N= 3.00: Tp=  .38]
00526>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00527>       [InterEventTime=  12.00]
00528> ##############################################################################
00529> # STORMS
00530> ##############################################################################
00531>   ** END OF RUN :   72
00532>
00533> ******************************************************************************************************
00534>
00535>
00536>
00537>
00538>
00539>  RUN#:COMMAND#
00540> R0073:C00001------------------------------------------------------------------------------------------
00541>      START
00542>       [TZERO =    .00 hrs on 19730101]
00543>       [METOUT=   2    (1=imperial, 2=metric output)]
00544>       [NSTORM=   0 ]
00545>       [NRUN  = 0073 ]
00546> #*****************************************************************************
00547> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00548> #*****************************************************************************
00549> #  Project Name  : [Caivan Perth properties]
00550> #  Project Number: [2118]
00551> #  Date          : [2023 JAN 26]
00552> #  Modeller      : [JB]
00553> #  Company       : J.F. Sabourin and Associates
00554> #  License #     : 2549237
00555> #*****************************************************************************
00556> ******************************************************************************************************
00557> # Model developed to simulate pre-development water budget
00558> #*****************************************************************************************************
00559> # Ottawa International Airport (1967 - 2003)
00560> R0073:C00002------------------------------------------------------------------------------------------
00561>   *  READ AES DATA
00562>       [Filename  = 6106000.123                                                    ]
00563>       [Start_date= 1973.0101: End_date= 1973.1231]
00564>       {DT= 60.min: Length= 8760.hrs: WetHrs=  549: DryHrs= 8211: PTOT= 744.90}
00565>       Maximum average rainfall intensities over
00566>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00567>        30.00    17.25    12.33     7.10     3.63     1.89     1.28      .96      .96    mm/hr
00568>        30.00    34.50    37.00    42.60    43.60    45.40    46.00    46.00    69.20    mm
00569>      19730611 19730808 19730808 19730808 19730808 19730808 19730616 19730616 19730616 19731005  date
00570>      Number of rainfall events per following interevent time
00571>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00572>          200      164      130      108       79       61       54       43       37
00573>      Number of events with at least the following durations
00574>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00575>          200      102       66       20        4        0        0        0        0
00576> R0073:C00003------------------------------------------------------------------------------------------
00577>      COMPUTE API
00578>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
00579>       {APImax= 78.26: APIavg= 20.56: APImin=   .06}
00580> ##############################################################################
00581> # Pre Development Condition - Using NASHHYD and CN
00582> ##############################################################################
00583> R0073:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00584>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.431 1973.0808_20:00  206.87 .278     .000
00585>       [CN= 92.0: N= 3.00: Tp=  .24]
00586>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
00587>       [InterEventTime=  12.00]
00588> R0073:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00589>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.309 1973.0808_20:05  194.10 .261     .000
00590>       [CN= 90.0: N= 3.00: Tp=  .38]
00591>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
00592>       [InterEventTime=  12.00]
00593> ##############################################################################
00594> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
00595> ##############################################################################
00596> R0073:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00597>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.738 1973.0611_17:00  320.63 .430     .000
00598>       [CN=100.0: N= 3.00: Tp=  .24]
00599>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00600>       [InterEventTime=  12.00]
00601> R0073:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00602>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.547 1973.0808_20:00  320.63 .430     .000
00603>       [CN=100.0: N= 3.00: Tp=  .38]
00604>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00605>       [InterEventTime=  12.00]
00606> ##############################################################################
00607> # STORMS
00608> ##############################################################################
00609>   ** END OF RUN :   73
00610>
00611> ******************************************************************************************************
00612>
00613>
00614>
00615>
00616>
00617>  RUN#:COMMAND#
00618> R0074:C00001------------------------------------------------------------------------------------------
00619>      START
00620>       [TZERO =    .00 hrs on 19740101]
00621>       [METOUT=   2    (1=imperial, 2=metric output)]
00622>       [NSTORM=   0 ]
00623>       [NRUN  = 0074 ]
00624> #*****************************************************************************
00625> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00626> #*****************************************************************************
00627> #  Project Name  : [Caivan Perth properties]
00628> #  Project Number: [2118]
00629> #  Date          : [2023 JAN 26]
00630> #  Modeller      : [JB]
00631> #  Company       : J.F. Sabourin and Associates
00632> #  License #     : 2549237
00633> #*****************************************************************************
00634> ******************************************************************************************************
00635> # Model developed to simulate pre-development water budget
00636> #*****************************************************************************************************
00637> # Ottawa International Airport (1967 - 2003)
00638> R0074:C00002------------------------------------------------------------------------------------------
00639>   *  READ AES DATA
00640>       [Filename  = 6106000.123                                                    ]
00641>       [Start_date= 1974.0101: End_date= 1974.1231]
00642>       {DT= 60.min: Length= 8760.hrs: WetHrs=  320: DryHrs= 8440: PTOT= 386.20}
00643>       Maximum average rainfall intensities over
00644>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00645>        20.60    15.40    10.37     5.18     2.98     1.63     1.08      .81      .54    mm/hr
00646>        20.60    30.80    31.10    31.10    35.70    39.00    39.00    39.00    39.00    mm
00647>      19740718 19740719 19740719 19740719 19740305 19740305 19740306 19740306 19740307  date
00648>      Number of rainfall events per following interevent time
00649>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00650>          129      105       93       77       63       50       38       33       23
00651>      Number of events with at least the following durations
00652>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
00653>          128       66       32       10        3        0        0        0        0
00654> R0074:C00003------------------------------------------------------------------------------------------
00655>      COMPUTE API
00656>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
00657>       {APImax= 52.93: APIavg= 11.36: APImin=   .00}
00658> ##############################################################################
00659> # Pre Development Condition - Using NASHHYD and CN
00660> ##############################################################################
00661> R0074:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00662>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .790 1974.0719_ 0:10   60.86 .158     .000
00663>       [CN= 92.0: N= 3.00: Tp=  .24]
00664>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
00665>       [InterEventTime=  12.00]
00666> R0074:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00667>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .611 1974.0719_ 0:25   56.58 .147     .000
00668>       [CN= 90.0: N= 3.00: Tp=  .38]
00669>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
00670>       [InterEventTime=  12.00]
00671> ##############################################################################
00672> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
00673> ##############################################################################
00674> R0074:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00675>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.128 1974.0719_ 0:00  109.40 .283     .000
00676>       [CN=100.0: N= 3.00: Tp=  .24]
00677>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00678>       [InterEventTime=  12.00]
00679> R0074:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00680>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .970 1974.0719_ 0:15  109.40 .283     .000
00681>       [CN=100.0: N= 3.00: Tp=  .38]
00682>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
00683>       [InterEventTime=  12.00]
00684> ##############################################################################
00685> # STORMS
00686> ##############################################################################
00687>   ** END OF RUN :   74
00688>
00689> ******************************************************************************************************
00690>
00691>
00692>
00693>
00694>
00695>  RUN#:COMMAND#
00696> R0075:C00001------------------------------------------------------------------------------------------
00697>      START
00698>       [TZERO =    .00 hrs on 19750101]
00699>       [METOUT=   2    (1=imperial, 2=metric output)]
00700>       [NSTORM=   0 ]
00701>       [NRUN  = 0075 ]
00702> #*****************************************************************************
00703> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00704> #*****************************************************************************
00705> #  Project Name  : [Caivan Perth properties]
00706> #  Project Number: [2118]
00707> #  Date          : [2023 JAN 26]
00708> #  Modeller      : [JB]
00709> #  Company       : J.F. Sabourin and Associates
00710> #  License #     : 2549237
00711> #*****************************************************************************
00712> ******************************************************************************************************
00713> # Model developed to simulate pre-development water budget
00714> #*****************************************************************************************************
00715> # Ottawa International Airport (1967 - 2003)
00716> R0075:C00002------------------------------------------------------------------------------------------
00717>   *  READ AES DATA
00718>       [Filename  = 6106000.123                                                    ]
00719>       [Start_date= 1975.0101: End_date= 1975.1231]
00720>       {DT= 60.min: Length= 8760.hrs: WetHrs=  344: DryHrs= 8416: PTOT= 535.50}
```

```
      Maximum average rainfall intensities over
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
       34.80    18.40    12.53     6.32     3.33     1.73     1.15      .87      .62    mm/hr
       34.80    36.80    37.60    37.90    40.00    41.50    41.50    41.80    44.40    mm
    19750708 19750720 19750720 19750720 19750721 19750721 19750721 19750721 19750928  date
    Number of rainfall events per following interevent time
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         136      118       99       78       61       49       40       33       25
    Number of events with at least the following durations
        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
         135       70       40       17        1        0        0        0        0
R0075:C00003------------------------------------------------------------------------------------------
    COMPUTE API
    [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
    {APImax= 73.23: APIavg= 15.16: APImin=   .00}
################################################################################
# Pre Development Condition - Using NASHHYD and CN
################################################################################
R0075:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:GrantsPre     22.01     1.764 1975.0708_17:05  118.33 .221     .000
    [CN= 92.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
    [InterEventTime=  12.00]
R0075:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:TayPre        22.86     1.313 1975.0708_17:10  110.68 .207     .000
    [CN= 90.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
################################################################################
R0075:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfGrantsP    22.01     2.042 1975.0708_17:00  196.46 .367     .000
    [CN=100.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
R0075:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfTayPre     22.86     1.792 1975.0708_17:05  196.46 .367     .000
    [CN=100.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# STORMS
################################################################################
  ** END OF RUN :   75

**************************************************************************************************

 RUN#:COMMAND#
R0076:C00001------------------------------------------------------------------------------------------
     START
     [TZERO =    .00 hrs on 19760101]
     [METOUT=   2   (1=imperial, 2=metric output)]
     [NSTORM=   0 ]
     [NRUN  = 0076 ]
#**********************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#**********************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#**********************************************************************************
#**************************************************************************************************
# Model developed to simulate pre-development water budget
#**************************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0078:C00002------------------------------------------------------------------------------------------
  *  READ AES DATA
     [Filename  = 6106000.123                                                    ]
     [Start_date= 1976.0101: End_date= 1976.1230]
     {DT= 60.min: Length= 8064.hrs: WetHrs=  389: DryHrs= 7675: PTOT= 492.40}
     Maximum average rainfall intensities over
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
      14.00     8.90     6.43     4.65     2.35     1.39      .97      .97      .80    mm/hr
      14.00    17.80    19.30    27.90    28.20    33.30    35.10    46.60    57.50    mm
    19760828 19760828 19760828 19760828 19760828 19760828 19760920 19760519 19760520 19760921  date
    Number of rainfall events per following interevent time
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        173      139      123       96       76       50       44       38       28
    Number of events with at least the following durations
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        172       80       46       13        1        0        0        0        0
R0076:C00003------------------------------------------------------------------------------------------
    COMPUTE API
    [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
    {APImax= 59.67: APIavg= 15.32: APImin=   .02}
################################################################################
# Pre Development Condition - Using NASHHYD and CN
################################################################################
R0076:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:GrantsPre     22.01      .270 1976.0828_19:10   93.86 .191     .000
    [CN= 92.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
    [InterEventTime=  12.00]
R0076:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:TayPre        22.86      .246 1976.0828_22:05   87.52 .178     .000
    [CN= 90.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
################################################################################
R0076:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfGrantsP    22.01      .652 1976.0828_19:05   159.47 .324     .000
    [CN=100.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
R0076:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfTayPre     22.86      .506 1976.0828_19:15   159.47 .324     .000
    [CN=100.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# STORMS
################################################################################
  ** END OF RUN :   76

**************************************************************************************************

 RUN#:COMMAND#
R0077:C00001------------------------------------------------------------------------------------------
     START
     [TZERO =    .00 hrs on 19770101]
     [METOUT=   2   (1=imperial, 2=metric output)]
     [NSTORM=   0 ]
     [NRUN  = 0077 ]
#**********************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#**********************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#**********************************************************************************
#**************************************************************************************************
# Model developed to simulate pre-development water budget
#**************************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0077:C00002------------------------------------------------------------------------------------------
  *  READ AES DATA
     [Filename  = 6106000.123                                                    ]
     [Start_date= 1977.0101: End_date= 1977.1231]
     {DT= 60.min: Length= 8016.hrs: WetHrs=  511: DryHrs= 7505: PTOT= 677.60}
     Maximum average rainfall intensities over
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
      21.30    15.20    10.40     6.53     3.30     1.65     1.38     1.06      .73    mm/hr
      21.30    30.40    31.20    39.20    39.60    49.60    51.00    52.40    mm
    19770717 19770717 19770717 19770901 19770902 19770902 19770314 19770315 19770718  date
    Number of rainfall events per following interevent time
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        188      156      139      107       82       61       52       41       28
    Number of events with at least the following durations
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        187       89       58       21        5        1        0        0        0
R0077:C00003------------------------------------------------------------------------------------------
    COMPUTE API
    [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
    {APImax= 74.28: APIavg= 20.62: APImin=  1.62}
################################################################################
# Pre Development Condition - Using NASHHYD and CN
################################################################################
R0077:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:GrantsPre     22.01     1.041 1977.0901_23:00  158.78 .234     .000
    [CN= 92.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
    [InterEventTime=  12.00]
R0077:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:TayPre        22.86     .955 1977.0901_23:05  148.78 .220     .000
    [CN= 90.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
################################################################################
R0077:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfGrantsP    22.01    1.191 1977.0717_16:00  258.68 .382     .000
    [CN=100.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
R0077:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfTayPre     22.86    1.114 1977.0901_23:00  258.68 .382     .000
    [CN=100.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# STORMS
################################################################################
  ** END OF RUN :   77

**************************************************************************************************



 RUN#:COMMAND#
R0078:C00001------------------------------------------------------------------------------------------
     START
     [TZERO =    .00 hrs on 19790101]
     [METOUT=   2   (1=imperial, 2=metric output)]
     [NSTORM=   0 ]
     [NRUN  = 0078 ]
#**********************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#**********************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#**********************************************************************************
#**************************************************************************************************
# Model developed to simulate pre-development water budget
#**************************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0078:C00002------------------------------------------------------------------------------------------
  *  READ AES DATA
     [Filename  = 6106000.123                                                    ]
     [Start_date= 1978.0101: End_date= 1978.1231]
     {DT= 60.min: Length= 8040.hrs: WetHrs=  407: DryHrs= 7633: PTOT= 638.80}
     Maximum average rainfall intensities over
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
      36.00    18.15    12.10     6.05     3.04     1.62     1.13      .87      .58    mm/hr
      36.00    36.30    36.30    36.30    36.30    36.50    38.80    40.60    41.60    mm
    19780618 19780618 19780618 19780618 19780618 19780619 19780619 19780412 19780620 19780621  date
    Number of rainfall events per following interevent time
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        167      135      126      103       76       60       53       45       31
    Number of events with at least the following durations
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        166       78       48       17        1        0        0        0        0
R0078:C00003------------------------------------------------------------------------------------------
    COMPUTE API
    [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
    {APImax= 65.36: APIavg= 19.25: APImin=   .25}
################################################################################
# Pre Development Condition - Using NASHHYD and CN
################################################################################
R0078:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:GrantsPre     22.01     1.719 1978.0618_17:00  127.68 .200     .000
    [CN= 92.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
    [InterEventTime=  12.00]
R0078:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:TayPre        22.86     1.351 1978.0618_17:05  117.69 .184     .000
    [CN= 90.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
################################################################################
R0078:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfGrantsP    22.01     2.117 1978.0618_17:00  238.27 .373     .000
    [CN=100.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
R0078:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfTayPre     22.86     1.864 1978.0618_17:05  238.27 .373     .000
    [CN=100.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# STORMS
################################################################################
  ** END OF RUN :   78

**************************************************************************************************

 RUN#:COMMAND#
R0079:C00001------------------------------------------------------------------------------------------
     START
     [TZERO =    .00 hrs on 19790101]
     [METOUT=   2   (1=imperial, 2=metric output)]
     [NSTORM=   0 ]
     [NRUN  = 0079 ]
#**********************************************************************************
#  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
#**********************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#**********************************************************************************
#**************************************************************************************************
# Model developed to simulate pre-development water budget
#**************************************************************************************************
# Ottawa International Airport (1967 - 2003)
R0079:C00002------------------------------------------------------------------------------------------
  *  READ AES DATA
     [Filename  = 6106000.123                                                    ]
     [Start_date= 1979.0101: End_date= 1979.1231]
     {DT= 60.min: Length= 8760.hrs: WetHrs=  546: DryHrs= 8214: PTOT= 866.50}
     Maximum average rainfall intensities over
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
      34.90    22.00    14.67     7.33     5.14     2.63     1.75     1.31      .88    mm/hr
      34.90    44.00    44.00    44.00    61.70    63.00    63.00    63.00    63.00    mm
    19790616 19790616 19790616 19790616 19790914 19790915 19790915 19790915 19790917  date
    Number of rainfall events per following interevent time
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        205      160      140      114       92       61       52       43       35
    Number of events with at least the following durations
       1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
        204       98       68       23        4        0        0        0        0
R0079:C00003------------------------------------------------------------------------------------------
    COMPUTE API
    [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
    {APImax= 78.45: APIavg= 23.13: APImin=   .13}
################################################################################
# Pre Development Condition - Using NASHHYD and CN
################################################################################
R0079:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:GrantsPre     22.01    1.886 1979.0616_14:00  275.16 .318     .000
    [CN= 92.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
    [InterEventTime=  12.00]
R0079:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:TayPre        22.86    1.645 1979.0616_14:05  259.82 .300     .000
    [CN= 90.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
################################################################################
R0079:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfGrantsP    22.01    2.118 1979.0616_14:00  411.97 .475     .000
    [CN=100.0: N= 3.00: Tp=  .24]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
R0079:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
    CONTINUOUS NASHYD    5.0 01:InfTayPre     22.86    2.026 1979.0616_14:00  411.97 .475     .000
    [CN=100.0: N= 3.00: Tp=  .38]
    [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
    [InterEventTime=  12.00]
################################################################################
# STORMS
################################################################################
  ** END OF RUN :   79

**************************************************************************************************
```

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01081>
01082>
01083>
01084>
01085>  RUN#:COMMAND#
01086> R0080:C00001-------------------------------------------------------------------------------
01087>       START
01088>       [TZERO =    .00 hrs on 19800101]
01089>       [METOUT=   2   (1=imperial, 2=metric output)]
01090>       [NSTORM=   0 ]
01091>       [NRUN  = 0080 ]
01092> #*******************************************************************************
01093> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01094> #*******************************************************************************
01095> #  Project Name  : [Caivan Perth properties]
01096> #  Project Number: [2118]
01097> #  Date          : [2023 JAN 26]
01098> #  Modeller      : [JB]
01099> #  Company       : J.F. Sabourin and Associates
01100> #  License #     : 2549237
01101> #*******************************************************************************
01102> #*********************************************************************************************
01103> # Model developed to simulate pre-development water budget
01104> #*********************************************************************************************
01105> # Ottawa International Airport (1967 - 2003)
01106> R0080:C00002-------------------------------------------------------------------------------
01107>   *  READ AES DATA
01108>       [Filename  = 6106000.123                                                    ]
01109>       [Start_date= 1980.0101: End_date= 1980.1230]
01110>       {DT= 60.min: Length= 8760.hrs: WetHrs=  427: DryHrs= 8333: PTOT= 622.00}
01111>       Maximum average rainfall intensities over
01112>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01113>       15.00     9.20     6.50     4.72     3.23     1.83     1.35     1.01      .86    mm/hr
01114>       15.00    18.40    19.50    28.30    38.00    43.80    48.60    48.60    62.00    mm
01115>       19800830 19800830 19801025 19801025 19800321 19800322 19801026 19801027 19800902  date
01116>       Number of rainfall events per following interevent time
01117>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01118>          175      141      129      107       91       64       47       42       25
01119>       Number of events with at least the following durations
01120>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01121>          174       88       50       13        3        0        0        0        0
01122> R0080:C00003-------------------------------------------------------------------------------
01123>       COMPUTE API
01124>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01125>       {APImax= 68.74: APIavg= 17.50: APImin=   .06}
01126> #*******************************************************************************
01127> # Pre Development Condition - Using NASHHYD and CN
01128> #*******************************************************************************
01129> R0080:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01130>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .536 1980.0901_20:00  134.72 .217     .000
01131>       [CN= 92.0: N= 3.00: Tp=  .24]
01132>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01133>       [InterEventTime=  12.00]
01134> R0080:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01135>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .482 1980.0901_20:05  125.97 .203     .000
01136>       [CN= 90.0: N= 3.00: Tp=  .38]
01137>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01138>       [InterEventTime=  12.00]
01139> #*******************************************************************************
01140> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01141> #*******************************************************************************
01142> R0080:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01143>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .763 1980.0831_16:00  226.29 .364     .000
01144>       [CN=100.0: N= 3.00: Tp=  .24]
01145>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01146>       [InterEventTime=  12.00]
01147> R0080:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01148>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .705 1980.0831_16:05  226.29 .364     .000
01149>       [CN=100.0: N= 3.00: Tp=  .38]
01150>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01151>       [InterEventTime=  12.00]
01152> #*******************************************************************************
01153> # STORMS
01154> #*******************************************************************************
01155>   ** END OF RUN :   80
01156>
01157> *********************************************************************************************
01158>
01159>
01160>
01161>
01162>
01163>  RUN#:COMMAND#
01164> R0081:C00001-------------------------------------------------------------------------------
01165>       START
01166>       [TZERO =    .00 hrs on 19810101]
01167>       [METOUT=   2   (1=imperial, 2=metric output)]
01168>       [NSTORM=   0 ]
01169>       [NRUN  = 0081 ]
01170> #*******************************************************************************
01171> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01172> #*******************************************************************************
01173> #  Project Name  : [Caivan Perth properties]
01174> #  Project Number: [2118]
01175> #  Date          : [2023 JAN 26]
01176> #  Modeller      : [JB]
01177> #  Company       : J.F. Sabourin and Associates
01178> #  License #     : 2549237
01179> #*******************************************************************************
01180> #*********************************************************************************************
01181> # Model developed to simulate pre-development water budget
01182> #*********************************************************************************************
01183> # Ottawa International Airport (1967 - 2003)
01184> R0081:C00002-------------------------------------------------------------------------------
01185>   *  READ AES DATA
01186>       [Filename  = 6106000.123                                                    ]
01187>       [Start_date= 1981.0101: End_date= 1981.1231]
01188>       {DT= 60.min: Length= 8760.hrs: WetHrs=  641: DryHrs= 8119: PTOT= 936.40}
01189>       Maximum average rainfall intensities over
01190>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01191>       35.30    31.85    25.23    15.70     8.03     4.58     3.22     2.41     1.61    mm/hr
01192>       35.30    63.70    75.70    94.20    96.40   110.00   115.90   115.90   115.90    mm
01193>       19810805 19810805 19810805 19810805 19810805 19810805 19810806 19810806 19810807  date
01194>       Number of rainfall events per following interevent time
01195>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01196>          242      188      156      122       93       70       57       45       27
01197>       Number of events with at least the following durations
01198>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01199>          241      129       79       29        4        0        0        0        0
01200> R0081:C00003-------------------------------------------------------------------------------
01201>       COMPUTE API
01202>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01203>       {APImax=116.15: APIavg= 25.69: APImin=   .26}
01204> #*******************************************************************************
01205> # Pre Development Condition - Using NASHHYD and CN
01206> #*******************************************************************************
01207> R0081:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01208>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    2.081 1981.0805_ 2:00  290.80 .311     .000
01209>       [CN= 92.0: N= 3.00: Tp=  .24]
01210>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01211>       [InterEventTime=  12.00]
01212> R0081:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01213>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86    2.055 1981.0805_ 2:00  277.13 .296     .000
01214>       [CN= 90.0: N= 3.00: Tp=  .38]
01215>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01216>       [InterEventTime=  12.00]
01217> #*******************************************************************************
01218> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01219> #*******************************************************************************
01220> R0081:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01221>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    2.155 1981.0805_ 2:00  411.16 .439     .000
01222>       [CN=100.0: N= 3.00: Tp=  .24]
01223>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01224>       [InterEventTime=  12.00]
01225> R0081:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01226>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    2.199 1981.0805_ 2:00  411.16 .439     .000
01227>       [CN=100.0: N= 3.00: Tp=  .38]
01228>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01229>       [InterEventTime=  12.00]
01230> #*******************************************************************************
01231> # STORMS
01232> #*******************************************************************************
01233>   ** END OF RUN :   81
01234>
01235> *********************************************************************************************
01236>
01237>
01238>
01239>
01240>
01241>  RUN#:COMMAND#
01242> R0082:C00001-------------------------------------------------------------------------------
01243>       START
01244>       [TZERO =    .00 hrs on 19820101]
01245>       [METOUT=   2   (1=imperial, 2=metric output)]
01246>       [NSTORM=   0 ]
01247>       [NRUN  = 0082 ]
01248> #*******************************************************************************
01249> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01250> #*******************************************************************************
01251> #  Project Name  : [Caivan Perth properties]
01252> #  Project Number: [2118]
01253> #  Date          : [2023 JAN 26]
01254> #  Modeller      : [JB]
01255> #  Company       : J.F. Sabourin and Associates
01256> #  License #     : 2549237
01257> #*******************************************************************************
01258> #*********************************************************************************************
01259> # Model developed to simulate pre-development water budget
01260> #*********************************************************************************************
01261> # Ottawa International Airport (1967 - 2003)
01262> R0082:C00002-------------------------------------------------------------------------------
01263>   *  READ AES DATA
01264>       [Filename  = 6106000.123                                                    ]
01265>       [Start_date= 1982.0101: End_date= 1982.1231]
01266>       {DT= 60.min: Length= 8760.hrs: WetHrs=  436: DryHrs= 8324: PTOT= 596.10}
01267>       Maximum average rainfall intensities over
01268>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01269>       19.80    10.75     7.60     5.83     3.36     1.68     1.12     1.01      .80    mm/hr
01270>       19.80    21.50    22.80    35.00    40.30    40.30    40.30    48.70    57.30    mm
01271>       19820801 19820901 19820825 19820825 19820825 19820826 19820826 19820825 19820825  date
01272>       Number of rainfall events per following interevent time
01273>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01274>          154      122      112       89       74       58       47       41       32
01275>       Number of events with at least the following durations
01276>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01277>          153       84       59       16        4        1        0        0        0
01278> R0082:C00003-------------------------------------------------------------------------------
01279>       COMPUTE API
01280>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01281>       {APImax= 56.86: APIavg= 16.78: APImin=   .03}
01282> #*******************************************************************************
01283> # Pre Development Condition - Using NASHHYD and CN
01284> #*******************************************************************************
01285> R0082:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01286>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .606 1982.0801_19:05  104.50 .175     .000
01287>       [CN= 92.0: N= 3.00: Tp=  .24]
01288>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01289>       [InterEventTime=  12.00]
01290> R0082:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01291>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .486 1982.0825_11:00   97.07 .163     .000
01292>       [CN= 90.0: N= 3.00: Tp=  .38]
01293>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01294>       [InterEventTime=  12.00]
01295> #*******************************************************************************
01296> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01297> #*******************************************************************************
01298> R0082:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01299>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.057 1982.0801_19:00  187.75 .315     .000
01300>       [CN=100.0: N= 3.00: Tp=  .24]
01301>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01302>       [InterEventTime=  12.00]
01303> R0082:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01304>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .849 1982.0801_19:10  187.75 .315     .000
01305>       [CN=100.0: N= 3.00: Tp=  .38]
01306>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01307>       [InterEventTime=  12.00]
01308> #*******************************************************************************
01309> # STORMS
01310> #*******************************************************************************
01311>   ** END OF RUN :   82
01312>
01313> *********************************************************************************************
01314>
01315>
01316>
01317>
01318>
01319>  RUN#:COMMAND#
01320> R0083:C00001-------------------------------------------------------------------------------
01321>       START
01322>       [TZERO =    .00 hrs on 19830101]
01323>       [METOUT=   2   (1=imperial, 2=metric output)]
01324>       [NSTORM=   0 ]
01325>       [NRUN  = 0083 ]
01326> #*******************************************************************************
01327> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01328> #*******************************************************************************
01329> #  Project Name  : [Caivan Perth properties]
01330> #  Project Number: [2118]
01331> #  Date          : [2023 JAN 26]
01332> #  Modeller      : [JB]
01333> #  Company       : J.F. Sabourin and Associates
01334> #  License #     : 2549237
01335> #*******************************************************************************
01336> #*********************************************************************************************
01337> # Model developed to simulate pre-development water budget
01338> #*********************************************************************************************
01339> # Ottawa International Airport (1967 - 2003)
01340> R0083:C00002-------------------------------------------------------------------------------
01341>   *  READ AES DATA
01342>       [Filename  = 6106000.123                                                    ]
01343>       [Start_date= 1983.0101: End_date= 1983.1231]
01344>       {DT= 60.min: Length= 8760.hrs: WetHrs=  461: DryHrs= 8299: PTOT= 587.30}
01345>       Maximum average rainfall intensities over
01346>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01347>       10.40     9.70     7.53     5.43     3.27     2.32     1.67     1.32      .92    mm/hr
01348>       10.40    19.40    22.60    32.60    39.20    55.70    60.00    63.20    66.30    mm
01349>       19831004 19830921 19830921 19831005 19831005 19831005 19831006 19831006 19831008  date
01350>       Number of rainfall events per following interevent time
01351>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01352>          169      130      114       97       78       53       48       44       34
01353>       Number of events with at least the following durations
01354>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01355>          168       88       54       24        4        0        0        0        0
01356> R0083:C00003-------------------------------------------------------------------------------
01357>       COMPUTE API
01358>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01359>       {APImax= 79.30: APIavg= 16.56: APImin=   .05}
01360> #*******************************************************************************
01361> # Pre Development Condition - Using NASHHYD and CN
01362> #*******************************************************************************
01363> R0083:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01364>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .563 1983.1005_15:00  112.19 .191     .000
01365>       [CN= 92.0: N= 3.00: Tp=  .24]
01366>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01367>       [InterEventTime=  12.00]
01368> R0083:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01369>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .545 1983.1005_15:00  104.95 .179     .000
01370>       [CN= 90.0: N= 3.00: Tp=  .38]
01371>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01372>       [InterEventTime=  12.00]
01373> #*******************************************************************************
01374> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01375> #*******************************************************************************
01376> R0083:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01377>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .616 1983.1005_15:00  185.61 .316     .000
01378>       [CN=100.0: N= 3.00: Tp=  .24]
01379>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01380>       [InterEventTime=  12.00]
01381> R0083:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01382>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .623 1983.1005_15:00  185.61 .316     .000
01383>       [CN=100.0: N= 3.00: Tp=  .38]
01384>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
01385>       [InterEventTime=  12.00]
01386> #*******************************************************************************
01387> # STORMS
01388> #*******************************************************************************
01389>   ** END OF RUN :   83
01390>
01391> *********************************************************************************************
01392>
01393>
01394>
01395>
01396>
01397>  RUN#:COMMAND#
01398> R0084:C00001-------------------------------------------------------------------------------
01399>       START
01400>       [TZERO =    .00 hrs on 19840101]
01401>       [METOUT=   2   (1=imperial, 2=metric output)]
01402>       [NSTORM=   0 ]
01403>       [NRUN  = 0084 ]
01404> #*******************************************************************************
01405> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01406> #*******************************************************************************
01407> #  Project Name  : [Caivan Perth properties]
01408> #  Project Number: [2118]
01409> #  Date          : [2023 JAN 26]
01410> #  Modeller      : [JB]
01411> #  Company       : J.F. Sabourin and Associates
01412> #  License #     : 2549237
01413> #*******************************************************************************
01414> #*********************************************************************************************
01415> # Model developed to simulate pre-development water budget
01416> #*********************************************************************************************
01417> # Ottawa International Airport (1967 - 2003)
01418> R0084:C00002-------------------------------------------------------------------------------
01419>   *  READ AES DATA
01420>       [Filename  = 6106000.123                                                    ]
01421>       [Start_date= 1984.0101: End_date= 1984.1230]
01422>       {DT= 60.min: Length= 8760.hrs: WetHrs=  308: DryHrs= 8452: PTOT= 459.40}
01423>       Maximum average rainfall intensities over
01424>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01425>       17.00     9.70     7.57     4.33     3.01     1.84     1.58     1.19     1.00    mm/hr
01426>       17.80    19.40    22.70    26.00    36.10    44.10    56.80    57.00    72.00    mm
01427>       19840812 19840812 19840812 19840806 19840812 19840813 19840813 19840814 19840813  date
01428>       Number of rainfall events per following interevent time
01429>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01430>          108       87       81       68       59       46       39       34       26
01431>       Number of events with at least the following durations
01432>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01433>          107       60       39       11        4        0        0        0        0
01434> R0084:C00003-------------------------------------------------------------------------------
01435>       COMPUTE API
01436>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01437>       {APImax= 86.65: APIavg= 13.22: APImin=   .00}
01438> #*******************************************************************************
01439> # Pre Development Condition - Using NASHHYD and CN
01440> #*******************************************************************************
```

```
01441> R0084:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01442>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .724 1984.0812_ 7:00  120.12 .261     .000
01443>       [CN= 92.0: N= 3.00: Tp=  .24]
01444>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01445>       [InterEventTime=  12.00]
01446> R0084:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01447>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .590 1984.0812_16:05  112.33 .245     .000
01448>       [CN= 90.0: N= 3.00: Tp=  .38]
01449>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01450>       [InterEventTime=  12.00]
01451> ##############################################################################
01452> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01453> ##############################################################################
01454> R0084:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01455>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.059 1984.0812_ 7:00  196.65 .428     .000
01456>       [CN=100.0: N= 3.00: Tp=  .24]
01457>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01458>       [InterEventTime=  12.00]
01459> R0084:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01460>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .954 1984.0812_ 7:05  196.65 .428     .000
01461>       [CN=100.0: N= 3.00: Tp=  .38]
01462>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01463>       [InterEventTime=  12.00]
01464> ##############################################################################
01465> # STORMS
01466> ##############################################################################
01467>   ** END OF RUN :   84
01468>
01469> ******************************************************************************************************
01470>
01471>
01472>
01473>
01474>
01475>  RUN#:COMMAND#
01476> R0085:C00001------------------------------------------------------------------------------------------
01477>      START
01478>       [TZERO =    .00 hrs on 19850101]
01479>       [METOUT=  2    (1=imperial, 2=metric output)]
01480>       [NSTORM=  0 ]
01481>       [NRUN  = 0085 ]
01482> ******************************************************************************
01483> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01484> ******************************************************************************
01485> #  Project Name  : [Caivan Perth properties]
01486> #  Project Number: [2118]
01487> #  Date          : [2023 JAN 26]
01488> #  Modeller      : [JB]
01489> #  Company       : J.F. Sabourin and Associates
01490> #  License #     : 2549237
01491> ******************************************************************************
01492> ******************************************************************************************************
01493> # Model developed to simulate pre-development water budget
01494> ******************************************************************************************************
01495> # Ottawa International Airport (1967 - 2003)
01496> R0085:C00002------------------------------------------------------------------------------------------
01497>  *  READ AES DATA
01498>       [Filename  = 6106000.123                                                    ]
01499>       [Start_date= 1985.0101: End_date= 1985.1231]
01500>       {DT= 60.min: Length= 8760.hrs: WetHrs=  354: DryHrs= 8406: PTOT= 559.90}
01501>       Maximum average rainfall intensities over
01502>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01503>        19.00    13.60     9.07     5.27     2.63     1.35     1.10      .82      .60    mm/hr
01504>        19.00    27.20    27.20    31.60    31.60    32.30    39.60    39.60    43.10    mm
01505>       19850716 19850617 19850617 19850618 19850618 19850224 19850619 19850619 19850225  date
01506>       Number of rainfall events per following interevent time
01507>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01508>          124       99       96       85       77       57       49       41       31
01509>       Number of events with at least the following durations
01510>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01511>          123       70       40       14        5        0        0        0        0
01512> R0085:C00003------------------------------------------------------------------------------------------
01513>      COMPUTE API
01514>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01515>       {APImax= 52.83: APIavg= 15.86: APImin=  .20}
01516> ##############################################################################
01517> # Pre Development Condition - Using NASHHYD and CN
01518> ##############################################################################
01519> R0085:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01520>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .719 1985.0617_23:00  121.13 .216     .000
01521>       [CN= 92.0: N= 3.00: Tp=  .24]
01522>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01523>       [InterEventTime=  12.00]
01524> R0085:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01525>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .628 1985.0617_23:05  111.44 .199     .000
01526>       [CN= 90.0: N= 3.00: Tp=  .38]
01527>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01528>       [InterEventTime=  12.00]
01529> ##############################################################################
01530> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01531> ##############################################################################
01532> R0085:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01533>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.026 1985.0716_14:00  227.04 .406     .000
01534>       [CN=100.0: N= 3.00: Tp=  .24]
01535>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01536>       [InterEventTime=  12.00]
01537> R0085:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01538>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .899 1985.0617_23:00  227.04 .406     .000
01539>       [CN=100.0: N= 3.00: Tp=  .38]
01540>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01541>       [InterEventTime=  12.00]
01542> ##############################################################################
01543> # STORMS
01544> ##############################################################################
01545>   ** END OF RUN :   85
01546>
01547> ******************************************************************************************************
01548>
01549>
01550>
01551>
01552>
01553>  RUN#:COMMAND#
01554> R0086:C00001------------------------------------------------------------------------------------------
01555>      START
01556>       [TZERO =    .00 hrs on 19860101]
01557>       [METOUT=  2    (1=imperial, 2=metric output)]
01558>       [NSTORM=  0 ]
01559>       [NRUN  = 0086 ]
01560> ******************************************************************************
01561> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01562> ******************************************************************************
01563> #  Project Name  : [Caivan Perth properties]
01564> #  Project Number: [2118]
01565> #  Date          : [2023 JAN 26]
01566> #  Modeller      : [JB]
01567> #  Company       : J.F. Sabourin and Associates
01568> #  License #     : 2549237
01569> ******************************************************************************
01570> ******************************************************************************************************
01571> # Model developed to simulate pre-development water budget
01572> ******************************************************************************************************
01573> # Ottawa International Airport (1967 - 2003)
01574> R0086:C00002------------------------------------------------------------------------------------------
01575>  *  READ AES DATA
01576>       [Filename  = 6106000.123                                                    ]
01577>       [Start_date= 1986.0101: End_date= 1986.1231]
01578>       {DT= 60.min: Length= 8040.hrs: WetHrs=  520: DryHrs= 7520: PTOT= 849.40}
01579>       Maximum average rainfall intensities over
01580>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01581>        18.30    17.80    13.57     7.07     4.93     2.32     1.82     1.31    mm/hr
01582>        18.30    35.60    40.70    42.40    59.20    70.40    83.50    87.20    94.40    mm
01583>       19860729 19860729 19860729 19860729 19860912 19860912 19860912 19860912 19860913  date
01584>       Number of rainfall events per following interevent time
01585>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01586>          201      161      149      118       88       61       51       47       30
01587>       Number of events with at least the following durations
01588>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01589>          200      107       73       22        1        0        0        0        0
01590> R0086:C00003------------------------------------------------------------------------------------------
01591>      COMPUTE API
01592>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01593>       {APImax= 97.05: APIavg= 25.30: APImin=  .17}
01594> ##############################################################################
01595> # Pre Development Condition - Using NASHHYD and CN
01596> ##############################################################################
01597> R0086:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01598>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .994 1986.0729_15:00  252.94 .298     .000
01599>       [CN= 92.0: N= 3.00: Tp=  .24]
01600>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01601>       [InterEventTime=  12.00]
01602> R0086:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01603>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .932 1986.0729_15:05  240.11 .283     .000
01604>       [CN= 90.0: N= 3.00: Tp=  .38]
01605>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01606>       [InterEventTime=  12.00]
01607> ##############################################################################
01608> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01609> ##############################################################################
01610> R0086:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01611>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.118 1986.0729_15:00  370.77 .437     .000
01612>       [CN=100.0: N= 3.00: Tp=  .24]
01613>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01614>       [InterEventTime=  12.00]
01615> R0086:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01616>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.146 1986.0729_15:00  370.77 .437     .000
01617>       [CN=100.0: N= 3.00: Tp=  .38]
01618>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01619>       [InterEventTime=  12.00]
01620> ##############################################################################
01621> # STORMS
01622> ##############################################################################
01623>   ** END OF RUN :   86
01624>
01625> ******************************************************************************************************
01626>
01627>
01628>
01629>
01630>
01631>  RUN#:COMMAND#
01632> R0087:C00001------------------------------------------------------------------------------------------
01633>      START
01634>       [TZERO =    .00 hrs on 19870101]
01635>       [METOUT=  2    (1=imperial, 2=metric output)]
01636>       [NSTORM=  0 ]
01637>       [NRUN  = 0087 ]
01638> ******************************************************************************
01639> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01640> ******************************************************************************
01641> #  Project Name  : [Caivan Perth properties]
01642> #  Project Number: [2118]
01643> #  Date          : [2023 JAN 26]
01644> #  Modeller      : [JB]
01645> #  Company       : J.F. Sabourin and Associates
01646> #  License #     : 2549237
01647> ******************************************************************************
01648> ******************************************************************************************************
01649> # Model developed to simulate pre-development water budget
01650> ******************************************************************************************************
01651> # Ottawa International Airport (1967 - 2003)
01652> R0087:C00002------------------------------------------------------------------------------------------
01653>  *  READ AES DATA
01654>       [Filename  = 6106000.123                                                    ]
01655>       [Start_date= 1987.0101: End_date= 1987.1231]
01656>       {DT= 60.min: Length= 7344.hrs: WetHrs=  491: DryHrs= 6853: PTOT= 639.90}
01657>       Maximum average rainfall intensities over
01658>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01659>        20.00    13.90    14.03     7.05     4.83     2.44     1.77     1.34      .93    mm/hr
01660>        20.00    27.80    42.10    42.30    58.00    58.60    63.60    64.20    67.00    mm
01661>       19870724 19870724 19870724 19870724 19870724 19870724 19870725 19870725 19870726 19870727  date
01662>       Number of rainfall events per following interevent time
01663>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01664>          207      163      145      107       85       58       46       36       27
01665>       Number of events with at least the following durations
01666>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01667>          206      100       59       16        2        0        0        0        0
01668> R0087:C00003------------------------------------------------------------------------------------------
01669>      COMPUTE API
01670>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01671>       {APImax= 75.38: APIavg= 21.40: APImin=  1.18}
01672> ##############################################################################
01673> # Pre Development Condition - Using NASHHYD and CN
01674> ##############################################################################
01675> R0087:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01676>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .808 1987.0724_15:00  141.86 .222     .000
01677>       [CN= 92.0: N= 3.00: Tp=  .24]
01678>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01679>       [InterEventTime=  12.00]
01680> R0087:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01681>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .777 1987.0724_15:00  133.80 .209     .000
01682>       [CN= 90.0: N= 3.00: Tp=  .38]
01683>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01684>       [InterEventTime=  12.00]
01685> ##############################################################################
01686> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01687> ##############################################################################
01688> R0087:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01689>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.072 1987.0724_13:00  221.00 .345     .000
01690>       [CN=100.0: N= 3.00: Tp=  .24]
01691>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01692>       [InterEventTime=  12.00]
01693> R0087:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01694>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .902 1987.0724_13:10  221.00 .345     .000
01695>       [CN=100.0: N= 3.00: Tp=  .38]
01696>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01697>       [InterEventTime=  12.00]
01698> ##############################################################################
01699> # STORMS
01700> ##############################################################################
01701>   ** END OF RUN :   87
01702>
01703> ******************************************************************************************************
01704>
01705>
01706>
01707>
01708>
01709>  RUN#:COMMAND#
01710> R0088:C00001------------------------------------------------------------------------------------------
01711>      START
01712>       [TZERO =    .00 hrs on 19880101]
01713>       [METOUT=  2    (1=imperial, 2=metric output)]
01714>       [NSTORM=  0 ]
01715>       [NRUN  = 0088 ]
01716> ******************************************************************************
01717> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01718> ******************************************************************************
01719> #  Project Name  : [Caivan Perth properties]
01720> #  Project Number: [2118]
01721> #  Date          : [2023 JAN 26]
01722> #  Modeller      : [JB]
01723> #  Company       : J.F. Sabourin and Associates
01724> #  License #     : 2549237
01725> ******************************************************************************
01726> ******************************************************************************************************
01727> # Model developed to simulate pre-development water budget
01728> ******************************************************************************************************
01729> # Ottawa International Airport (1967 - 2003)
01730> R0088:C00002------------------------------------------------------------------------------------------
01731>  *  READ AES DATA
01732>       [Filename  = 6106000.123                                                    ]
01733>       [Start_date= 1988.0101: End_date= 1988.1230]
01734>       {DT= 60.min: Length= 8760.hrs: WetHrs=  486: DryHrs= 8274: PTOT= 643.20}
01735>       Maximum average rainfall intensities over
01736>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01737>        25.50    18.20    12.77     7.37     3.78     1.91     1.27      .95      .94    mm/hr
01738>        25.50    36.40    38.30    44.20    45.40    45.80    45.80    45.80    67.40    mm
01739>       19880917 19880726 19880625 19880625 19880625 19880625 19880625 19880626 19880625  date
01740>       Number of rainfall events per following interevent time
01741>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01742>          183      141      121       85       68       56       48       41       25
01743>       Number of events with at least the following durations
01744>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01745>          182      101       70       19        3        0        0        0        0
01746> R0088:C00003------------------------------------------------------------------------------------------
01747>      COMPUTE API
01748>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01749>       {APImax= 66.19: APIavg= 18.05: APImin=  .03}
01750> ##############################################################################
01751> # Pre Development Condition - Using NASHHYD and CN
01752> ##############################################################################
01753> R0088:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01754>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.065 1988.0625_13:00  151.79 .236     .000
01755>       [CN= 92.0: N= 3.00: Tp=  .24]
01756>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
01757>       [InterEventTime=  12.00]
01758> R0088:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01759>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.030 1988.0625_13:00  142.35 .221     .000
01760>       [CN= 90.0: N= 3.00: Tp=  .38]
01761>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
01762>       [InterEventTime=  12.00]
01763> ##############################################################################
01764> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01765> ##############################################################################
01766> R0088:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01767>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.449 1988.0917_19:00  239.17 .372     .000
01768>       [CN=100.0: N= 3.00: Tp=  .24]
01769>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01770>       [InterEventTime=  12.00]
01771> R0088:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01772>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.259 1988.0726_13:10  239.17 .372     .000
01773>       [CN=100.0: N= 3.00: Tp=  .38]
01774>       [IaREC=24.00: SMIN=   .00: SMAX=  .00: SK= .300]
01775>       [InterEventTime=  12.00]
01776> ##############################################################################
01777> # STORMS
01778> ##############################################################################
01779>   ** END OF RUN :   88
01780>
01781> ******************************************************************************************************
01782>
01783>
01784>
01785>
01786>
01787>  RUN#:COMMAND#
01788> R0089:C00001------------------------------------------------------------------------------------------
01789>      START
01790>       [TZERO =    .00 hrs on 19890101]
01791>       [METOUT=  2    (1=imperial, 2=metric output)]
01792>       [NSTORM=  0 ]
01793>       [NRUN  = 0089 ]
01794> ******************************************************************************
01795> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01796> ******************************************************************************
01797> #  Project Name  : [Caivan Perth properties]
01798> #  Project Number: [2118]
01799> #  Date          : [2023 JAN 26]
01800> #  Modeller      : [JB]
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01801> #  Company       : J.F. Sabourin and Associates
01802> #  License #     : 2549237
01803> #*************************************************************************
01804> #*************************************************************************************************
01805> # Model developed to simulate pre-development water budget
01806> #*************************************************************************************************
01807> # Ottawa International Airport (1967 - 2003)
01808> R0089:C00002-----------------------------------------------------------------------------------
01809>  *  READ AES DATA
01810>       [Filename  = 6106000.123                                                    ]
01811>       [Start_date= 1989.0101: End_date= 1989.1231]
01812>       {DT= 60.min: Length= 8040.hrs: WetHrs=  421: DryHrs= 7619: PTOT= 522.50}
01813>       Maximum average rainfall intensities over
01814>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01815>        22.70    12.60     8.93     5.75     3.03     1.67     1.14     .86     .59    mm/hr
01816>        22.70    25.20    26.80    34.50    36.30    40.20    40.90    41.50    42.50   mm
01817>      19890727 19890727 19890727 19890727 19890727 19891020 19891021 19891022 19891022  date
01818>       Number of rainfall events per following interevent time
01819>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01820>          170      137      120      101       71       52       40       36       29
01821>       Number of events with at least the following durations
01822>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01823>          169       81       49       17        4        0        0        0        0
01824> R0089:C00003-----------------------------------------------------------------------------------
01825>      COMPUTE API
01826>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01827>       {APImax= 54.64: APIavg= 16.01: APImin=  .02}
01828> #************************************************************************
01829> # Pre Development Condition - Using NASHHYD and CN
01830> #************************************************************************
01831> R0089:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01832>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.123 1989.0727_15:00  100.55 .192     .000
01833>       [CN= 92.0: N= 3.00: Tp=  .24]
01834>       [IaREC=24.00: SMIN= 10.51: SMAx= 70.09: SK= .300]
01835>       [InterEventTime=  12.00]
01836> R0089:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01837>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .943 1989.0727_15:05   93.64 .179     .000
01838>       [CN= 90.0: N= 3.00: Tp=  .38]
01839>       [IaREC=24.00: SMIN= 12.64: SMAx= 84.28: SK= .300]
01840>       [InterEventTime=  12.00]
01841> #************************************************************************
01842> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01843> #************************************************************************
01844> R0089:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01845>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.374 1989.0727_15:00  171.43 .328     .000
01846>       [CN=100.0: N= 3.00: Tp=  .24]
01847>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
01848>       [InterEventTime=  12.00]
01849> R0089:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01850>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.300 1989.0727_15:05  171.43 .328     .000
01851>       [CN=100.0: N= 3.00: Tp=  .38]
01852>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
01853>       [InterEventTime=  12.00]
01854> #************************************************************************
01855> # STORMS
01856> #************************************************************************
01857>   ** END OF RUN :   89
01858>
01859> *************************************************************************************************
01860>
01861>
01862>
01863>
01864>
01865>  RUN#:COMMAND#
01866> R0090:C00001-----------------------------------------------------------------------------------
01867>      START
01868>       [TZERO =    .00 hrs on 19900101]
01869>       [METOUT=   2   (1=imperial, 2=metric output)]
01870>       [NSTORM=   0 ]
01871>       [NRUN  = 0090 ]
01872> #************************************************************************
01873> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01874> #************************************************************************
01875> #  Project Name  : [Caivan Perth properties]
01876> #  Project Number: [2118]
01877> #  Date          : [2023 JAN 26]
01878> #  Modeller      : [JB]
01879> #  Company       : J.F. Sabourin and Associates
01880> #  License #     : 2549237
01881> #*************************************************************************
01882> #*************************************************************************************************
01883> # Model developed to simulate pre-development water budget
01884> #*************************************************************************************************
01885> # Ottawa International Airport (1967 - 2003)
01886> R0090:C00002-----------------------------------------------------------------------------------
01887>  *  READ AES DATA
01888>       [Filename  = 6106000.123                                                    ]
01889>       [Start_date= 1990.0101: End_date= 1990.1231]
01890>       {DT= 60.min: Length= 7344.hrs: WetHrs=  618: DryHrs= 6726: PTOT= 727.80}
01891>       Maximum average rainfall intensities over
01892>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01893>        20.60    12.25     9.00     5.55     4.43     2.25     1.50     1.21     1.06    mm/hr
01894>        20.60    24.50    28.80    33.30    53.20    54.00    54.00    58.30    76.10    mm
01895>      19900720 19900720 19900828 19900828 19900720 19900720 19900720 19900720 19900722 19900723  date
01896>       Number of rainfall events per following interevent time
01897>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01898>          225      170      153      121       94       68       55       47       33
01899>       Number of events with at least the following durations
01900>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01901>          224      116       72       30        6        0        0        0        0
01902> R0090:C00003-----------------------------------------------------------------------------------
01903>      COMPUTE API
01904>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01905>       {APImax= 74.68: APIavg= 23.47: APImin=  3.11}
01906> #************************************************************************
01907> # Pre Development Condition - Using NASHHYD and CN
01908> #************************************************************************
01909> R0090:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01910>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .908 1990.0720_ 5:00  173.57 .238     .000
01911>       [CN= 92.0: N= 3.00: Tp=  .24]
01912>       [IaREC=24.00: SMIN= 10.51: SMAx= 70.09: SK= .300]
01913>       [InterEventTime=  12.00]
01914> R0090:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01915>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .726 1990.0720_ 5:10  163.06 .224     .000
01916>       [CN= 90.0: N= 3.00: Tp=  .38]
01917>       [IaREC=24.00: SMIN= 12.64: SMAx= 84.28: SK= .300]
01918>       [InterEventTime=  12.00]
01919> #************************************************************************
01920> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01921> #************************************************************************
01922> R0090:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01923>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.233 1990.0720_ 5:00  272.27 .374     .000
01924>       [CN=100.0: N= 3.00: Tp=  .24]
01925>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
01926>       [InterEventTime=  12.00]
01927> R0090:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01928>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.129 1990.0720_ 5:05  272.28 .374     .000
01929>       [CN=100.0: N= 3.00: Tp=  .38]
01930>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
01931>       [InterEventTime=  12.00]
01932> #************************************************************************
01933> # STORMS
01934> #************************************************************************
01935>   ** END OF RUN :   90
01936>
01937> *************************************************************************************************
01938>
01939>
01940>
01941>
01942>
01943>  RUN#:COMMAND#
01944> R0091:C00001-----------------------------------------------------------------------------------
01945>      START
01946>       [TZERO =    .00 hrs on 19910101]
01947>       [METOUT=   2   (1=imperial, 2=metric output)]
01948>       [NSTORM=   0 ]
01949>       [NRUN  = 0091 ]
01950> #************************************************************************
01951> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
01952> #************************************************************************
01953> #  Project Name  : [Caivan Perth properties]
01954> #  Project Number: [2118]
01955> #  Date          : [2023 JAN 26]
01956> #  Modeller      : [JB]
01957> #  Company       : J.F. Sabourin and Associates
01958> #  License #     : 2549237
01959> #*************************************************************************
01960> #*************************************************************************************************
01961> # Model developed to simulate pre-development water budget
01962> #*************************************************************************************************
01963> # Ottawa International Airport (1967 - 2003)
01964> R0091:C00002-----------------------------------------------------------------------------------
01965>  *  READ AES DATA
01966>       [Filename  = 6106000.123                                                    ]
01967>       [Start_date= 1991.0101: End_date= 1991.1231]
01968>       {DT= 60.min: Length= 8040.hrs: WetHrs=  485: DryHrs= 7555: PTOT= 555.80}
01969>       Maximum average rainfall intensities over
01970>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01971>        11.30     6.05     4.40     3.77     2.32     1.59     1.28     1.08      .79    mm/hr
01972>        11.30    12.10    13.20    22.60    27.80    38.20    46.00    51.60    56.80    mm
01973>      19910409 19910409 19910409 19910410 19911016 19910422 19910410 19910410 19910423  date
01974>       Number of rainfall events per following interevent time
01975>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01976>          192      153      142      113       90       60       51       44       34
01977>       Number of events with at least the following durations
01978>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
01979>          191       92       57       19        4        0        0        0        0
01980> R0091:C00003-----------------------------------------------------------------------------------
01981>      COMPUTE API
01982>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
01983>       {APImax= 71.51: APIavg= 16.87: APImin=  .26}
01984> #************************************************************************
01985> # Pre Development Condition - Using NASHHYD and CN
01986> #************************************************************************
01987> R0091:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01988>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .607 1991.0410_ 3:00  104.19 .187     .000
01989>       [CN= 92.0: N= 3.00: Tp=  .24]
01990>       [IaREC=24.00: SMIN= 10.51: SMAx= 70.09: SK= .300]
01991>       [InterEventTime=  12.00]
01992> R0091:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01993>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .560 1991.0410_ 3:05   97.64 .176     .000
01994>       [CN= 90.0: N= 3.00: Tp=  .38]
01995>       [IaREC=24.00: SMIN= 12.64: SMAx= 84.28: SK= .300]
01996>       [InterEventTime=  12.00]
01997> #************************************************************************
01998> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
01999> #************************************************************************
02000> R0091:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02001>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .654 1991.0410_ 3:00  166.94 .300     .000
02002>       [CN=100.0: N= 3.00: Tp=  .24]
02003>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
02004>       [InterEventTime=  12.00]
02005> R0091:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02006>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .622 1991.0410_ 3:05  166.94 .300     .000
02007>       [CN=100.0: N= 3.00: Tp=  .38]
02008>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
02009>       [InterEventTime=  12.00]
02010> #************************************************************************
02011> # STORMS
02012> #************************************************************************
02013>   ** END OF RUN :   91
02014>
02015> *************************************************************************************************
02016>
02017>
02018>
02019>
02020>
02021>  RUN#:COMMAND#
02022> R0092:C00001-----------------------------------------------------------------------------------
02023>      START
02024>       [TZERO =    .00 hrs on 19920101]
02025>       [METOUT=   2   (1=imperial, 2=metric output)]
02026>       [NSTORM=   0 ]
02027>       [NRUN  = 0092 ]
02028> #************************************************************************
02029> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02030> #************************************************************************
02031> #  Project Name  : [Caivan Perth properties]
02032> #  Project Number: [2118]
02033> #  Date          : [2023 JAN 26]
02034> #  Modeller      : [JB]
02035> #  Company       : J.F. Sabourin and Associates
02036> #  License #     : 2549237
02037> #*************************************************************************
02038> #*************************************************************************************************
02039> # Model developed to simulate pre-development water budget
02040> #*************************************************************************************************
02041> # Ottawa International Airport (1967 - 2003)
02042> R0092:C00002-----------------------------------------------------------------------------------
02043>  *  READ AES DATA
02044>       [Filename  = 6106000.123                                                    ]
02045>       [Start_date= 1992.0101: End_date= 1992.1230]
02046>       {DT= 60.min: Length= 8760.hrs: WetHrs=  550: DryHrs= 8210: PTOT= 730.20}
02047>       Maximum average rainfall intensities over
02048>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02049>        31.50    18.00    13.30     7.22     4.14     2.26     1.51     1.51     1.02    mm/hr
02050>        31.50    36.00    39.90    43.30    49.70    54.20    54.20    72.60    73.60    mm
02051>      19920804 19920804 19920804 19920804 19920804 19920717 19920718 19920718 19920719 19920720  date
02052>       Number of rainfall events per following interevent time
02053>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02054>          221      171      154      116       95       69       52       45       36
02055>       Number of events with at least the following durations
02056>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02057>          220      113       73       18        4        0        0        0        0
02058> R0092:C00003-----------------------------------------------------------------------------------
02059>      COMPUTE API
02060>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02061>       {APImax= 97.88: APIavg= 20.27: APImin=  1.07}
02062> #************************************************************************
02063> # Pre Development Condition - Using NASHHYD and CN
02064> #************************************************************************
02065> R0092:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02066>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01    1.603 1992.0804_14:00  180.05 .247     .000
02067>       [CN= 92.0: N= 3.00: Tp=  .24]
02068>       [IaREC=24.00: SMIN= 10.51: SMAx= 70.09: SK= .300]
02069>       [InterEventTime=  12.00]
02070> R0092:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02071>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86    1.340 1992.0804_14:05  169.09 .232     .000
02072>       [CN= 90.0: N= 3.00: Tp=  .38]
02073>       [IaREC=24.00: SMIN= 12.64: SMAx= 84.28: SK= .300]
02074>       [InterEventTime=  12.00]
02075> #************************************************************************
02076> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02077> #************************************************************************
02078> R0092:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02079>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01    1.897 1992.0804_14:00  283.36 .388     .000
02080>       [CN=100.0: N= 3.00: Tp=  .24]
02081>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
02082>       [InterEventTime=  12.00]
02083> R0092:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02084>     CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86    1.765 1992.0804_14:05  283.36 .388     .000
02085>       [CN=100.0: N= 3.00: Tp=  .38]
02086>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
02087>       [InterEventTime=  12.00]
02088> #************************************************************************
02089> # STORMS
02090> #************************************************************************
02091>   ** END OF RUN :   92
02092>
02093> *************************************************************************************************
02094>
02095>
02096>
02097>
02098>
02099>  RUN#:COMMAND#
02100> R0093:C00001-----------------------------------------------------------------------------------
02101>      START
02102>       [TZERO =    .00 hrs on 19930101]
02103>       [METOUT=   2   (1=imperial, 2=metric output)]
02104>       [NSTORM=   0 ]
02105>       [NRUN  = 0093 ]
02106> #************************************************************************
02107> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02108> #************************************************************************
02109> #  Project Name  : [Caivan Perth properties]
02110> #  Project Number: [2118]
02111> #  Date          : [2023 JAN 26]
02112> #  Modeller      : [JB]
02113> #  Company       : J.F. Sabourin and Associates
02114> #  License #     : 2549237
02115> #*************************************************************************
02116> #*************************************************************************************************
02117> # Model developed to simulate pre-development water budget
02118> #*************************************************************************************************
02119> # Ottawa International Airport (1967 - 2003)
02120> R0093:C00002-----------------------------------------------------------------------------------
02121>  *  READ AES DATA
02122>       [Filename  = 6106000.123                                                    ]
02123>       [Start_date= 1993.0101: End_date= 1993.1231]
02124>       {DT= 60.min: Length= 8760.hrs: WetHrs=  584: DryHrs= 8176: PTOT= 721.10}
02125>       Maximum average rainfall intensities over
02126>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02127>        12.60     6.60     4.83     3.72     3.58     2.31     1.61     1.21      .81    mm/hr
02128>        12.60    13.20    14.50    22.30    43.00    55.50    58.10    58.10    58.10    mm
02129>      19930703 19930703 19931127 19931128 19931128 19931128 19931128 19931128 19931129  date
02130>       Number of rainfall events per following interevent time
02131>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02132>          190      154      137      111       91       73       57       48       34
02133>       Number of events with at least the following durations
02134>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02135>          189      110       66       27        7        2        0        0        0
02136> R0093:C00003-----------------------------------------------------------------------------------
02137>      COMPUTE API
02138>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02139>       {APImax= 66.42: APIavg= 20.01: APImin=  .11}
02140> #************************************************************************
02141> # Pre Development Condition - Using NASHHYD and CN
02142> #************************************************************************
02143> R0093:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02144>     CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .351 1993.0903_16:00  154.03 .214     .000
02145>       [CN= 92.0: N= 3.00: Tp=  .24]
02146>       [IaREC=24.00: SMIN= 10.51: SMAx= 70.09: SK= .300]
02147>       [InterEventTime=  12.00]
02148> R0093:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02149>     CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .291 1993.0903_16:05  144.15 .200     .000
02150>       [CN= 90.0: N= 3.00: Tp=  .38]
02151>       [IaREC=24.00: SMIN= 12.64: SMAx= 84.28: SK= .300]
02152>       [InterEventTime=  12.00]
02153> #************************************************************************
02154> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02155> #************************************************************************
02156> R0093:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02157>     CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .559 1993.0621_ 0:00  251.38 .349     .000
02158>       [CN=100.0: N= 3.00: Tp=  .24]
02159>       [IaREC=24.00: SMIN=   .00: SMAx=   .00: SK= .300]
02160>       [InterEventTime=  12.00]
```

```
02161> R0093:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02162>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86      .521 1993.0903_16:00  251.38 .349     .000
02163>        [CN=100.0: N= 3.00: Tp=  .38]
02164>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02165>        [InterEventTime=  12.00]
02166> ################################################################################
02167> # STORMS
02168> ################################################################################
02169>   ** END OF RUN :   93
02170>
02171> ********************************************************************************************************
02172>
02173>
02174>
02175>
02176>
02177>  RUN#:COMMAND#
02178> R0094:C00001-----------------------------------------------------------------------------------------
02179>      START
02180>        [TZERO =    .00 hrs on 19940101]
02181>        [METOUT=   2   (1=imperial, 2=metric output)]
02182>        [NSTORM=   0 ]
02183>        [NRUN  = 0094 ]
02184> #*****************************************************************************
02185> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02186> #*****************************************************************************
02187> #  Project Name  : [Caivan Perth properties]
02188> #  Project Number: [2118]
02189> #  Date          : [2023 JAN 26]
02190> #  Modeller      : [JB]
02191> #  Company       : J.F. Sabourin and Associates
02192> #  License #     : 2549237
02193> #*****************************************************************************
02194> #*****************************************************************************************************
02195> # Model developed to simulate pre-development water budget
02196> #*****************************************************************************************************
02197> # Ottawa International Airport (1967 - 2003)
02198> R0094:C00002-----------------------------------------------------------------------------------------
02199>   *  READ AES DATA
02200>        [Filename  = 6106000.123                                                  ]
02201>        [Start_date= 1994.0101: End_date= 1994.1231]
02202>        {DT= 60.min: Length= 6576.hrs: WetHrs=  328: DryHrs= 6248: PTOT= 527.00}
02203>        Maximum average rainfall intensities over
02204>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02205>         22.60    11.90     8.43     5.42     2.92     1.79     1.19      .89     1.15    mm/hr
02206>         22.60    23.80    25.30    32.50    35.00    42.90    42.90    42.90    82.60    mm
02207>       19940629 19940629 19940627 19940625 19940625 19940625 19940626 19940626 19940628  date
02208>        Number of rainfall events per following interevent time
02209>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02210>           131      110       96       75       60       46       37       32       23
02211>        Number of events with at least the following durations
02212>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02213>           130       70       46       12        1        0        0        0        0
02214> R0094:C00003-----------------------------------------------------------------------------------------
02215>      COMPUTE API
02216>        [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02217>        {APImax= 97.84: APIavg= 19.15: APImin=   .02}
02218> ################################################################################
02219> # Pre Development Condition - Using NASHHYD and CN
02220> ################################################################################
02221> R0094:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02222>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01      .793 1994.0629_14:05  132.76 .252     .000
02223>        [CN= 92.0: N= 3.00: Tp=  .24]
02224>        [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02225>        [InterEventTime=  12.00]
02226> R0094:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02227>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86      .577 1994.0629_14:10  123.87 .235     .000
02228>        [CN= 90.0: N= 3.00: Tp=  .38]
02229>        [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02230>        [InterEventTime=  12.00]
02231> ################################################################################
02232> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02233> ################################################################################
02234> R0094:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02235>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     1.254 1994.0629_14:00  214.59 .407     .000
02236>        [CN=100.0: N= 3.00: Tp=  .24]
02237>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02238>        [InterEventTime=  12.00]
02239> R0094:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02240>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     1.030 1994.0629_14:05  214.59 .407     .000
02241>        [CN=100.0: N= 3.00: Tp=  .38]
02242>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02243>        [InterEventTime=  12.00]
02244> ################################################################################
02245> # STORMS
02246> ################################################################################
02247>   ** END OF RUN :   94
02248>
02249> ********************************************************************************************************
02250>
02251>
02252>
02253>
02254>
02255>  RUN#:COMMAND#
02256> R0095:C00001-----------------------------------------------------------------------------------------
02257>      START
02258>        [TZERO =    .00 hrs on 19950101]
02259>        [METOUT=   2   (1=imperial, 2=metric output)]
02260>        [NSTORM=   0 ]
02261>        [NRUN  = 0095 ]
02262> #*****************************************************************************
02263> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02264> #*****************************************************************************
02265> #  Project Name  : [Caivan Perth properties]
02266> #  Project Number: [2118]
02267> #  Date          : [2023 JAN 26]
02268> #  Modeller      : [JB]
02269> #  Company       : J.F. Sabourin and Associates
02270> #  License #     : 2549237
02271> #*****************************************************************************
02272> #*****************************************************************************************************
02273> # Model developed to simulate pre-development water budget
02274> #*****************************************************************************************************
02275> # Ottawa International Airport (1967 - 2003)
02276> R0095:C00002-----------------------------------------------------------------------------------------
02277>   *  READ AES DATA
02278>        [Filename  = 6106000.123                                                  ]
02279>        [Start_date= 1995.0101: End_date= 1995.1231]
02280>        {DT= 60.min: Length= 5112.hrs: WetHrs=  228: DryHrs= 4884: PTOT= 321.60}
02281>        Maximum average rainfall intensities over
02282>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02283>         16.90    13.25    10.27     7.70     6.32     3.31     2.21     1.65     1.10    mm/hr
02284>         16.90    26.50    30.80    46.20    75.80    79.40    79.40    79.40    79.40    mm
02285>       19950603 19950603 19950603 19950603 19950603 19950603 19950603 19950603 19950604  date
02286>        Number of rainfall events per following interevent time
02287>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02288>            67       38       35       29       24       22       18
02289>        Number of events with at least the following durations
02290>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02291>            66       37       23       10        5        1        0        0        0
02292> R0095:C00003-----------------------------------------------------------------------------------------
02293>      COMPUTE API
02294>        [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02295>        {APImax= 95.54: APIavg= 16.52: APImin=   .49}
02296> ################################################################################
02297> # Pre Development Condition - Using NASHHYD and CN
02298> ################################################################################
02299> R0095:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02300>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01      .848 1995.0603_ 2:00  111.68 .347     .000
02301>        [CN= 92.0: N= 3.00: Tp=  .24]
02302>        [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02303>        [InterEventTime=  12.00]
02304> R0095:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02305>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86      .761 1995.0603_ 8:05  106.54 .331     .000
02306>        [CN= 90.0: N= 3.00: Tp=  .38]
02307>        [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02308>        [InterEventTime=  12.00]
02309> ################################################################################
02310> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02311> ################################################################################
02312> R0095:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02313>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     1.029 1995.0603_ 2:00  160.31 .498     .000
02314>        [CN=100.0: N= 3.00: Tp=  .24]
02315>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02316>        [InterEventTime=  12.00]
02317> R0095:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02318>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     1.021 1995.0603_ 2:00  160.31 .498     .000
02319>        [CN=100.0: N= 3.00: Tp=  .38]
02320>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02321>        [InterEventTime=  12.00]
02322> ################################################################################
02323> # STORMS
02324> ################################################################################
02325>   ** END OF RUN :   95
02326>
02327> ********************************************************************************************************
02328>
02329>
02330>
02331>
02332>
02333>  RUN#:COMMAND#
02334> R0096:C00001-----------------------------------------------------------------------------------------
02335>      START
02336>        [TZERO =    .00 hrs on 19960101]
02337>        [METOUT=   2   (1=imperial, 2=metric output)]
02338>        [NSTORM=   0 ]
02339>        [NRUN  = 0096 ]
02340> #*****************************************************************************
02341> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02342> #*****************************************************************************
02343> #  Project Name  : [Caivan Perth properties]
02344> #  Project Number: [2118]
02345> #  Date          : [2023 JAN 26]
02346> #  Modeller      : [JB]
02347> #  Company       : J.F. Sabourin and Associates
02348> #  License #     : 2549237
02349> #*****************************************************************************
02350> #*****************************************************************************************************
02351> # Model developed to simulate pre-development water budget
02352> #*****************************************************************************************************
02353> # Ottawa International Airport (1967 - 2003)
02354> R0096:C00002-----------------------------------------------------------------------------------------
02355>   *  READ AES DATA
02356>        [Filename  = 6106000.123                                                  ]
02357>        [Start_date= 1996.0101: End_date= 1996.1230]
02358>        {DT= 60.min: Length= 6552.hrs: WetHrs=  387: DryHrs= 6165: PTOT= 512.20}
02359>        Maximum average rainfall intensities over
02360>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02361>         18.50    13.55     9.03     5.42     2.93     1.84     1.32     1.02      .70    mm/hr
02362>         18.50    27.10    27.10    32.50    35.10    44.10    47.50    49.00    50.30    mm
02363>       19960731 19960731 19960731 19960731 19960731 19960731 19961109 19961109 19961109  date
02364>        Number of rainfall events per following interevent time
02365>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02366>           132      104       93       71       59       43       36       31       24
02367>        Number of events with at least the following durations
02368>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02369>           131       72        1        0        0        0        0        0        0
02370> R0096:C00003-----------------------------------------------------------------------------------------
02371>      COMPUTE API
02372>        [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02373>        {APImax= 63.22: APIavg= 19.39: APImin=   .71}
02374> ################################################################################
02375> # Pre Development Condition - Using NASHHYD and CN
02376> ################################################################################
02377> R0096:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02378>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01      .811 1996.0731_15:05  112.69 .220     .000
02379>        [CN= 92.0: N= 3.00: Tp=  .24]
02380>        [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02381>        [InterEventTime=  12.00]
02382> R0096:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02383>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86      .676 1996.0731_15:10  105.87 .207     .000
02384>        [CN= 90.0: N= 3.00: Tp=  .38]
02385>        [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02386>        [InterEventTime=  12.00]
02387> ################################################################################
02388> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02389> ################################################################################
02390> R0096:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02391>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     1.110 1996.0731_15:00  179.05 .350     .000
02392>        [CN=100.0: N= 3.00: Tp=  .24]
02393>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02394>        [InterEventTime=  12.00]
02395> R0096:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02396>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     1.034 1996.0731_15:05  179.05 .350     .000
02397>        [CN=100.0: N= 3.00: Tp=  .38]
02398>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02399>        [InterEventTime=  12.00]
02400> ################################################################################
02401> # STORMS
02402> ################################################################################
02403>   ** END OF RUN :   96
02404>
02405> ********************************************************************************************************
02406>
02407>
02408>
02409>
02410>
02411>  RUN#:COMMAND#
02412> R0097:C00001-----------------------------------------------------------------------------------------
02413>      START
02414>        [TZERO =    .00 hrs on 19970101]
02415>        [METOUT=   2   (1=imperial, 2=metric output)]
02416>        [NSTORM=   0 ]
02417>        [NRUN  = 0097 ]
02418> #*****************************************************************************
02419> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02420> #*****************************************************************************
02421> #  Project Name  : [Caivan Perth properties]
02422> #  Project Number: [2118]
02423> #  Date          : [2023 JAN 26]
02424> #  Modeller      : [JB]
02425> #  Company       : J.F. Sabourin and Associates
02426> #  License #     : 2549237
02427> #*****************************************************************************
02428> #*****************************************************************************************************
02429> # Model developed to simulate pre-development water budget
02430> #*****************************************************************************************************
02431> # Ottawa International Airport (1967 - 2003)
02432> R0097:C00002-----------------------------------------------------------------------------------------
02433>   *  READ AES DATA
02434>        [Filename  = 6106000.123                                                  ]
02435>        [Start_date= 1997.0101: End_date= 1997.1231]
02436>        {DT= 60.min: Length= 8040.hrs: WetHrs=  379: DryHrs= 7661: PTOT= 433.20}
02437>        Maximum average rainfall intensities over
02438>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02439>         12.50     7.60     5.07     4.43     2.91     1.68     1.12      .84      .63    mm/hr
02440>         12.50    15.20    17.00    26.60    34.90    40.40    40.40    40.40    45.30    mm
02441>       19970622 19970622 19970622 19970221 19970222 19970222 19970222 19970222 19970222  date
02442>        Number of rainfall events per following interevent time
02443>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02444>           113       92       83       67       61       55       48       43       30
02445>        Number of events with at least the following durations
02446>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02447>           112       70       46       20        4        0        0        0        0
02448> R0097:C00003-----------------------------------------------------------------------------------------
02449>      COMPUTE API
02450>        [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02451>        {APImax= 50.00: APIavg= 13.66: APImin=   .27}
02452> ################################################################################
02453> # Pre Development Condition - Using NASHHYD and CN
02454> ################################################################################
02455> R0097:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02456>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01      .410 1997.0622_ 4:00   77.80 .180     .000
02457>        [CN= 92.0: N= 3.00: Tp=  .24]
02458>        [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02459>        [InterEventTime=  12.00]
02460> R0097:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02461>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86      .312 1997.0221_21:00   71.63 .165     .000
02462>        [CN= 90.0: N= 3.00: Tp=  .38]
02463>        [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02464>        [InterEventTime=  12.00]
02465> ################################################################################
02466> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02467> ################################################################################
02468> R0097:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02469>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01      .735 1997.0622_ 4:00  149.79 .346     .000
02470>        [CN=100.0: N= 3.00: Tp=  .24]
02471>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02472>        [InterEventTime=  12.00]
02473> R0097:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02474>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86      .648 1997.0622_ 4:05  149.79 .346     .000
02475>        [CN=100.0: N= 3.00: Tp=  .38]
02476>        [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02477>        [InterEventTime=  12.00]
02478> ################################################################################
02479> # STORMS
02480> ################################################################################
02481>   ** END OF RUN :   97
02482>
02483> ********************************************************************************************************
02484>
02485>
02486>
02487>
02488>
02489>  RUN#:COMMAND#
02490> R0098:C00001-----------------------------------------------------------------------------------------
02491>      START
02492>        [TZERO =    .00 hrs on 19980101]
02493>        [METOUT=   2   (1=imperial, 2=metric output)]
02494>        [NSTORM=   0 ]
02495>        [NRUN  = 0098 ]
02496> #*****************************************************************************
02497> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02498> #*****************************************************************************
02499> #  Project Name  : [Caivan Perth properties]
02500> #  Project Number: [2118]
02501> #  Date          : [2023 JAN 26]
02502> #  Modeller      : [JB]
02503> #  Company       : J.F. Sabourin and Associates
02504> #  License #     : 2549237
02505> #*****************************************************************************
02506> #*****************************************************************************************************
02507> # Model developed to simulate pre-development water budget
02508> #*****************************************************************************************************
02509> # Ottawa International Airport (1967 - 2003)
02510> R0098:C00002-----------------------------------------------------------------------------------------
02511>   *  READ AES DATA
02512>        [Filename  = 6106000.123                                                  ]
02513>        [Start_date= 1998.0101: End_date= 1998.1231]
02514>        {DT= 60.min: Length= 5088.hrs: WetHrs=  291: DryHrs= 4797: PTOT= 440.30}
02515>        Maximum average rainfall intensities over
02516>          1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02517>         15.80     8.90     7.60     4.00     2.54     1.82     1.27      .95      .76    mm/hr
02518>         15.80    17.80    22.80    24.00    30.50    43.60    45.80    45.80    54.60    mm
02519>       19980716 19980627 19980927 19980927 19980927 19980927 19980927 19980928 19980615  date
02520>        Number of rainfall events per following interevent time
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```
02521>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02522>         126      104       95       78       63       42       37       32       21
02523>       Number of events with at least the following durations
02524>        1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02525>         125       64       43        8        1        0        0        0        0
02526> R0098:C00003------------------------------------------------------------------------------
02527>      COMPUTE API
02528>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02529>       [APImax= 57.22: APIavg= 21.28: APImin=  1.69]
02530> ##############################################################################
02531> # Pre Development Condition - Using NASHHYD and CN
02532> ##############################################################################
02533> R0098:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02534>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .626 1998.0927_14:00   85.62 .194     .000
02535>       [CN= 92.0: N= 3.00: Tp=  .24]
02536>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02537>       [InterEventTime=  12.00]
02538> R0098:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02539>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .544 1998.0927_14:05   79.35 .180     .000
02540>       [CN= 90.0: N= 3.00: Tp=  .38]
02541>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02542>       [InterEventTime=  12.00]
02543> ##############################################################################
02544> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02545> ##############################################################################
02546> R0098:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02547>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .917 1998.0627_ 1:00  152.52 .346     .000
02548>       [CN=100.0: N= 3.00: Tp=  .24]
02549>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02550>       [InterEventTime=  12.00]
02551> R0098:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02552>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .794 1998.0627_ 1:05  152.52 .346     .000
02553>       [CN=100.0: N= 3.00: Tp=  .38]
02554>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02555>       [InterEventTime=  12.00]
02556> ##############################################################################
02557> # STORMS
02558> ##############################################################################
02559>  ** END OF RUN :   98
02560>
02561> ******************************************************************************************************
02562>
02563>
02564>
02565>
02566>
02567>  RUN#:COMMAND#
02568> R0099:C00001------------------------------------------------------------------------------
02569>      START
02570>       [TZERO =    .00 hrs on 19990101]
02571>       [METOUT=   2   (1=imperial, 2=metric output)]
02572>       [NSTORM=   0 ]
02573>       [NRUN  = 0099 ]
02574> #******************************************************************************
02575> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02576> #******************************************************************************
02577> #  Project Name  : [Caivan Perth properties]
02578> #  Project Number: [2118]
02579> #  Date          : [2023 JAN 26]
02580> #  Modeller      : [JB]
02581> #  Company       : J.F. Sabourin and Associates
02582> #  License #     : 2549237
02583> #******************************************************************************
02584> #*************************************************************************************************
02585> # Model developed to simulate pre-development water budget
02586> #*************************************************************************************************
02587> # Ottawa International Airport (1967 - 2003)
02588> R0099:C00002------------------------------------------------------------------------------
02589>  *  READ AES DATA
02590>       [Filename  = 6106000.123                                                 ]
02591>       [Start_date= 1999.0101: End_date= 1999.1231]
02592>       {DT= 60.min: Length= 4440.hrs: WetHrs=  247: DryHrs= 4193: PTOT= 424.40}
02593>       Maximum average rainfall intensities over
02594>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02595>        17.50    10.10     9.03     6.57     3.31     1.65     1.45     1.22      .97    mm/hr
02596>        17.50    20.20    27.10    39.40    39.70    39.70    52.20    58.60    69.50    mm
02597>  19990717 19990717 19990906 19990906 19990906 19990906 19990906 19990907 19990908 19990908  date
02598>       Number of rainfall events per following interevent time
02599>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02600>          102       80       70       63       56       39       31       28       18
02601>       Number of events with at least the following durations
02602>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02603>          101       57       31       10        1        0        0        0        0
02604> R0099:C00003------------------------------------------------------------------------------
02605>      COMPUTE API
02606>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02607>       [APImax= 69.51: APIavg= 23.97: APImin=  1.93]
02608> ##############################################################################
02609> # Pre Development Condition - Using NASHHYD and CN
02610> ##############################################################################
02611> R0099:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02612>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .582 1999.0717_15:05   85.38 .201     .000
02613>       [CN= 92.0: N= 3.00: Tp=  .24]
02614>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02615>       [InterEventTime=  12.00]
02616> R0099:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02617>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .517 1999.0906_ 8:05   78.74 .186     .000
02618>       [CN= 90.0: N= 3.00: Tp=  .38]
02619>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02620>       [InterEventTime=  12.00]
02621> ##############################################################################
02622> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02623> ##############################################################################
02624> R0099:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02625>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .993 1999.0717_15:00  157.02 .370     .000
02626>       [CN=100.0: N= 3.00: Tp=  .24]
02627>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02628>       [InterEventTime=  12.00]
02629> R0099:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02630>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .833 1999.0717_15:05  157.02 .370     .000
02631>       [CN=100.0: N= 3.00: Tp=  .38]
02632>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02633>       [InterEventTime=  12.00]
02634> ##############################################################################
02635> # STORMS
02636> ##############################################################################
02637>  ** END OF RUN :   99
02638>
02639> ******************************************************************************************************
02640>
02641>
02642>
02643>
02644>
02645>  RUN#:COMMAND#
02646> R0100:C00001------------------------------------------------------------------------------
02647>      START
02648>       [TZERO =    .00 hrs on 20000101]
02649>       [METOUT=   2   (1=imperial, 2=metric output)]
02650>       [NSTORM=   0 ]
02651>       [NRUN  = 0100 ]
02652> #******************************************************************************
02653> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02654> #******************************************************************************
02655> #  Project Name  : [Caivan Perth properties]
02656> #  Project Number: [2118]
02657> #  Date          : [2023 JAN 26]
02658> #  Modeller      : [JB]
02659> #  Company       : J.F. Sabourin and Associates
02660> #  License #     : 2549237
02661> #******************************************************************************
02662> #*************************************************************************************************
02663> # Model developed to simulate pre-development water budget
02664> #*************************************************************************************************
02665> # Ottawa International Airport (1967 - 2003)
02666> R0100:C00002------------------------------------------------------------------------------
02667>  *  READ AES DATA
02668>       [Filename  = 6106000.123                                                 ]
02669>       [Start_date= 2000.0101: End_date= 2000.1230]
02670>       {DT= 60.min: Length= 5160.hrs: WetHrs=  401: DryHrs= 4759: PTOT= 535.90}
02671>       Maximum average rainfall intensities over
02672>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02673>        14.70     9.60     8.03     6.43     3.89     1.95     1.30     1.03      .84    mm/hr
02674>        14.70    19.20    24.10    38.60    46.70    46.70    46.80    49.30    60.40    mm
02675>  20000625 20000625 20000625 20000625 20000625 20000625 20000625 20000626 20000510 20000511  date
02676>       Number of rainfall events per following interevent time
02677>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02678>          156      125      110       86       67       46       34       30       23
02679>       Number of events with at least the following durations
02680>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02681>          155       82       49       16        2        0        0        0        0
02682> R0100:C00003------------------------------------------------------------------------------
02683>      COMPUTE API
02684>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02685>       [APImax= 76.65: APIavg= 25.66: APImin=  5.70]
02686> ##############################################################################
02687> # Pre Development Condition - Using NASHHYD and CN
02688> ##############################################################################
02689> R0100:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02690>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .840 2000.0625_10:00  123.46 .230     .000
02691>       [CN= 92.0: N= 3.00: Tp=  .24]
02692>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02693>       [InterEventTime=  12.00]
02694> R0100:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02695>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .798 2000.0625_10:00  115.73 .216     .000
02696>       [CN= 90.0: N= 3.00: Tp=  .38]
02697>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02698>       [InterEventTime=  12.00]
02699> ##############################################################################
02700> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02701> ##############################################################################
02702> R0100:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02703>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .894 2000.0625_10:00  199.52 .372     .000
02704>       [CN=100.0: N= 3.00: Tp=  .24]
02705>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02706>       [InterEventTime=  12.00]
02707> R0100:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02708>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .876 2000.0625_10:00  199.52 .372     .000
02709>       [CN=100.0: N= 3.00: Tp=  .38]
02710>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02711>       [InterEventTime=  12.00]
02712> ##############################################################################
02713> # STORMS
02714> ##############################################################################
02715>  ** END OF RUN :  101
02716>
02717> ******************************************************************************************************
02718>
02719>
02720>
02721>
02722>
02723>  RUN#:COMMAND#
02724> R0102:C00001------------------------------------------------------------------------------
02725>      START
02726>       [TZERO =    .00 hrs on 20020101]
02727>       [METOUT=   2   (1=imperial, 2=metric output)]
02728>       [NSTORM=   0 ]
02729>       [NRUN  = 0102 ]
02730> #******************************************************************************
02731> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02732> #******************************************************************************
02733> #  Project Name  : [Caivan Perth properties]
02734> #  Project Number: [2118]
02735> #  Date          : [2023 JAN 26]
02736> #  Modeller      : [JB]
02737> #  Company       : J.F. Sabourin and Associates
02738> #  License #     : 2549237
02739> #******************************************************************************
02740> #*************************************************************************************************
02741> # Model developed to simulate pre-development water budget
02742> #*************************************************************************************************
02743> # Ottawa International Airport (1967 - 2003)
02744> R0102:C00002------------------------------------------------------------------------------
02745>  *  READ AES DATA
02746>       [Filename  = 6106000.123                                                 ]
02747>       [Start_date= 2002.0101: End_date= 2002.1231]
02748>       {DT= 60.min: Length= 5008.hrs: WetHrs=  304: DryHrs= 4784: PTOT= 551.50}
02749>       Maximum average rainfall intensities over
02750>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02751>        45.00    26.75    18.00     9.48     4.74     2.40     2.08     1.56     1.04    mm/hr
02752>        45.00    53.50    55.20    56.90    56.90    59.50    74.90    74.90    74.90    mm
02753>  20020627 20020627 20020627 20020627 20020627 20020627 20020627 20020627 20020628 20020629  date
02754>       Number of rainfall events per following interevent time
02755>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02756>          100       83       78       56       47       41       36       34       25
02757>       Number of events with at least the following durations
02758>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02759>          100       59       33       13        5        0        0        0        0
02760> R0102:C00003------------------------------------------------------------------------------
02761>      COMPUTE API
02762>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02763>       [APImax=114.06: APIavg= 26.37: APImin=  4.40]
02764> ##############################################################################
02765> # Pre Development Condition - Using NASHHYD and CN
02766> ##############################################################################
02767> R0102:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02768>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     2.551 2002.0627_14:00  191.61 .347     .000
02769>       [CN= 92.0: N= 3.00: Tp=  .24]
02770>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02771>       [InterEventTime=  12.00]
02772> R0102:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02773>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     2.306 2002.0627_14:05  182.04 .330     .000
02774>       [CN= 90.0: N= 3.00: Tp=  .38]
02775>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02776>       [InterEventTime=  12.00]
02777> ##############################################################################
02778> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02779> ##############################################################################
02780> R0102:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02781>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     2.733 2002.0627_14:00  278.30 .505     .000
02782>       [CN=100.0: N= 3.00: Tp=  .24]
02783>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02784>       [InterEventTime=  12.00]
02785> R0102:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02786>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     2.642 2002.0627_14:00  278.30 .505     .000
02787>       [CN=100.0: N= 3.00: Tp=  .38]
02788>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02789>       [InterEventTime=  12.00]
02790> ##############################################################################
02791> # STORMS
02792> ##############################################################################
02793>  ** END OF RUN :  102
02794>
02795> ******************************************************************************************************
02796>
02797>
02798>
02799>
02800>
02801>  RUN#:COMMAND#
02802> R0103:C00001------------------------------------------------------------------------------
02803>      START
02804>       [TZERO =    .00 hrs on 20030101]
02805>       [METOUT=   2   (1=imperial, 2=metric output)]
02806>       [NSTORM=   0 ]
02807>       [NRUN  = 0103 ]
02808> #******************************************************************************
02809> #  SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
02810> #******************************************************************************
02811> #  Project Name  : [Caivan Perth properties]
02812> #  Project Number: [2118]
02813> #  Date          : [2023 JAN 26]
02814> #  Modeller      : [JB]
02815> #  Company       : J.F. Sabourin and Associates
02816> #  License #     : 2549237
02817> #******************************************************************************
02818> #*************************************************************************************************
02819> # Model developed to simulate pre-development water budget
02820> #*************************************************************************************************
02821> # Ottawa International Airport (1967 - 2003)
02822> R0103:C00002------------------------------------------------------------------------------
02823>  *  READ AES DATA
02824>       [Filename  = 6106000.123                                                 ]
02825>       [Start_date= 2003.0101: End_date= 2003.1231]
02826>       {DT= 60.min: Length= 4440.hrs: WetHrs=  406: DryHrs= 4034: PTOT= 554.60}
02827>       Maximum average rainfall intensities over
02828>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02829>        15.10    10.00     7.13     4.28     3.18     1.86     1.25      .94      .81    mm/hr
02830>        15.10    20.00    21.40    25.70    38.20    44.60    44.90    45.10    58.30    mm
02831>  20030711 20030711 20030711 20030711 20030711 20031021 20031015 20030525 20030526 20030527  date
02832>       Number of rainfall events per following interevent time
02833>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02834>          145      127      109       86       64       45       38       25       15
02835>       Number of events with at least the following durations
02836>         1 hr    2 hrs    3 hrs    6 hrs   12 hrs   24 hrs   36 hrs   48 hrs   72 hrs
02837>          124       80       43       13        5        1        0        0        0
02838> R0103:C00003------------------------------------------------------------------------------
02839>      COMPUTE API
02840>       [APIini= 50.00: APIkdy= .9000: APIkdt= .9956]
02841>       [APImax= 72.10: APIavg= 28.54: APImin=  4.70]
02842> ##############################################################################
02843> # Pre Development Condition - Using NASHHYD and CN
02844> ##############################################################################
02845> R0103:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02846>      CONTINUOUS NASHYD     5.0 01:GrantsPre     22.01     .849 2003.0711_17:00  146.39 .264     .000
02847>       [CN= 92.0: N= 3.00: Tp=  .24]
02848>       [IaREC=24.00: SMIN= 10.51: SMAX= 70.09: SK= .300]
02849>       [InterEventTime=  12.00]
02850> R0103:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02851>      CONTINUOUS NASHYD     5.0 01:TayPre        22.86     .801 2003.0711_17:00  138.30 .249     .000
02852>       [CN= 90.0: N= 3.00: Tp=  .38]
02853>       [IaREC=24.00: SMIN= 12.64: SMAX= 84.28: SK= .300]
02854>       [InterEventTime=  12.00]
02855> ##############################################################################
02856> # Pre Development Condition - Using NASHHYD and CN - No INFILTRATION
02857> ##############################################################################
02858> R0103:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02859>      CONTINUOUS NASHYD     5.0 01:InfGrantsP    22.01     .918 2003.0711_17:00  223.32 .403     .000
02860>       [CN=100.0: N= 3.00: Tp=  .24]
02861>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02862>       [InterEventTime=  12.00]
02863> R0103:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
02864>      CONTINUOUS NASHYD     5.0 01:InfTayPre     22.86     .901 2003.0711_17:00  223.32 .403     .000
02865>       [CN=100.0: N= 3.00: Tp=  .38]
02866>       [IaREC=24.00: SMIN=   .00: SMAX=   .00: SK= .300]
02867>       [InterEventTime=  12.00]
02868> ##############################################################################
02869> # STORMS
02870> ##############################################################################
02871> R0103:C00002------------------------------------------------------------------------------
02872>      FINISH
02873> ------------------------------------------------------------------------------
02874> ******************************************************************************************************
02875>      WARNINGS / ERRORS / NOTES
02876>      -------------------------
02877> R0067:C00002  READ AES DATA
02878> *** WARNING: Requested start date is less than start date in file.
02879> *** WARNING: Missing rainfall increments were set to 0.
02880> *** WARNING: Missing rainfall increments were set to 0.
```

```
02881> *** WARNING: Missing rainfall increments were set to 0.
02882> *** WARNING: Requested start date is less than start date in file.
02883> *** WARNING: Missing rainfall increments were set to 0.
02884> *** WARNING: Missing rainfall increments were set to 0.
02885> *** WARNING: Missing rainfall increments were set to 0.
02886> *** WARNING: Missing rainfall increments were set to 0.
02887> *** WARNING: Missing rainfall increments were set to 0.
02888> *** WARNING: Missing rainfall increments were set to 0.
02889> *** WARNING: Missing rainfall increments were set to 0.
02890> *** WARNING: Requested start date is less than start date in file.
02891> *** WARNING: Missing rainfall increments were set to 0.
02892> *** WARNING: Missing rainfall increments were set to 0.
02893> *** WARNING: Missing rainfall increments were set to 0.
02894> *** WARNING: Missing rainfall increments were set to 0.
02895> *** WARNING: Missing rainfall increments were set to 0.
02896> *** WARNING: Missing rainfall increments were set to 0.
02897> *** WARNING: Missing rainfall increments were set to 0.
02898> *** WARNING: Missing rainfall increments were set to 0.
02899> *** WARNING: Missing rainfall increments were set to 0.
02900> *** WARNING: Missing rainfall increments were set to 0.
02901> *** WARNING: Requested start date is less than start date in file.
02902> *** WARNING: Missing rainfall increments were set to 0.
02903> *** WARNING: Missing rainfall increments were set to 0.
02904> *** WARNING: Missing rainfall increments were set to 0.
02905> *** WARNING: Requested start date is less than start date in file.
02906> *** WARNING: Missing rainfall increments were set to 0.
02907> *** WARNING: Missing rainfall increments were set to 0.
02908> *** WARNING: Missing rainfall increments were set to 0.
02909> *** WARNING: Missing rainfall increments were set to 0.
02910> *** WARNING: Missing rainfall increments were set to 0.
02911> *** WARNING: Missing rainfall increments were set to 0.
02912> *** WARNING: Requested start date is less than start date in file.
02913> *** WARNING: Missing rainfall increments were set to 0.
02914> *** WARNING: Missing rainfall increments were set to 0.
02915> *** WARNING: Requested start date is less than start date in file.
02916> *** WARNING: Missing rainfall increments were set to 0.
02917> *** WARNING: Requested start date is less than start date in file.
02918> *** WARNING: Missing rainfall increments were set to 0.
02919> *** WARNING: Requested start date is less than start date in file.
02920> *** WARNING: Missing rainfall increments were set to 0.
02921> *** WARNING: Requested start date is less than start date in file.
02922> *** WARNING: Missing rainfall increments were set to 0.
02923> *** WARNING: Requested start date is less than start date in file.
02924> *** WARNING: Specified end date is beyond the end date in file.
02925> *** WARNING: Missing rainfall increments were set to 0.
02926>    Simulation ended on 2023-02-14      at 17:44:01
02927> ================================================================================================
02928>
```

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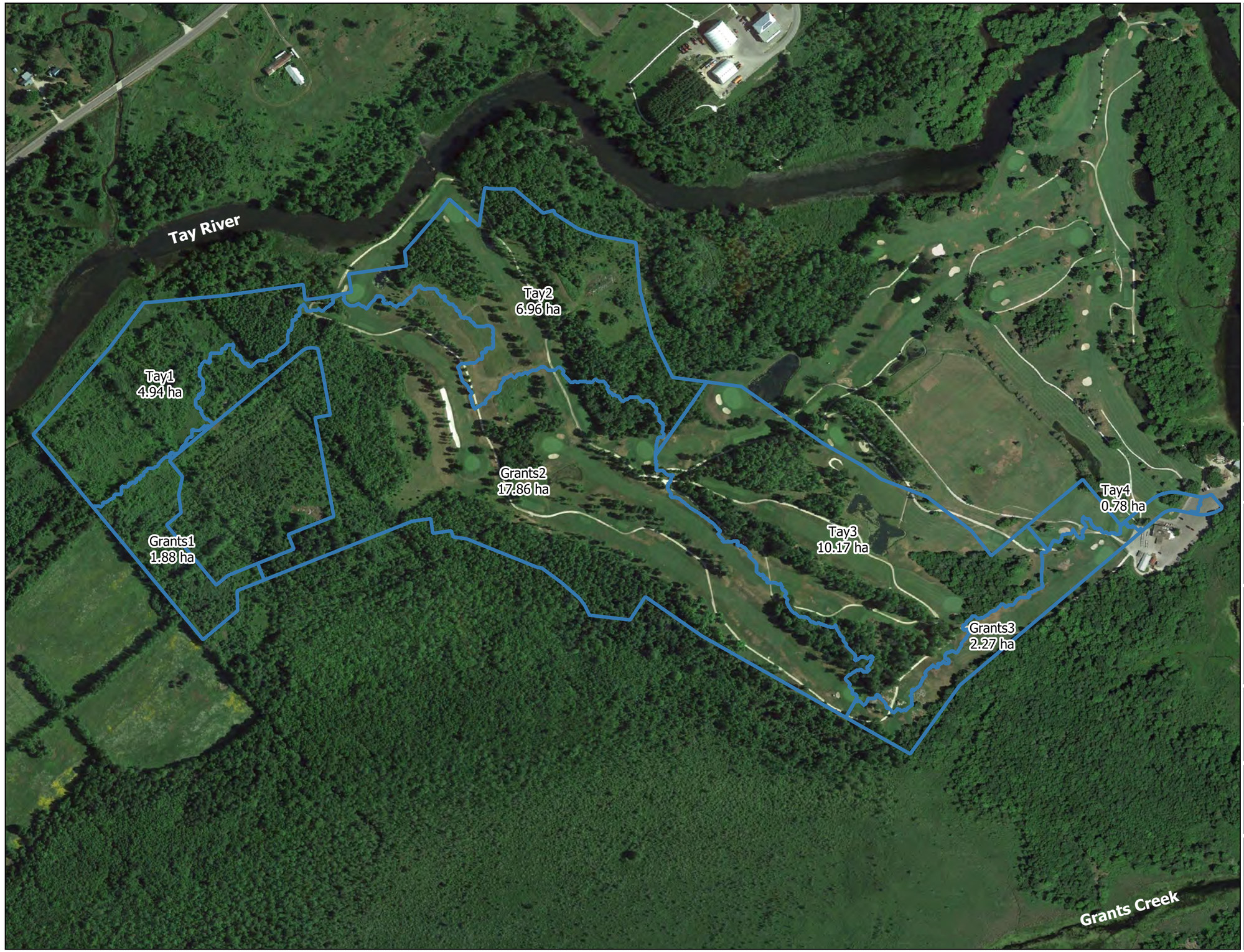
Appendix E

Preliminary SWM Pond Sizing



N

Legend

Drainage Area
[Name]
[Area]

SCALE: 1:5000

0 100 200 m

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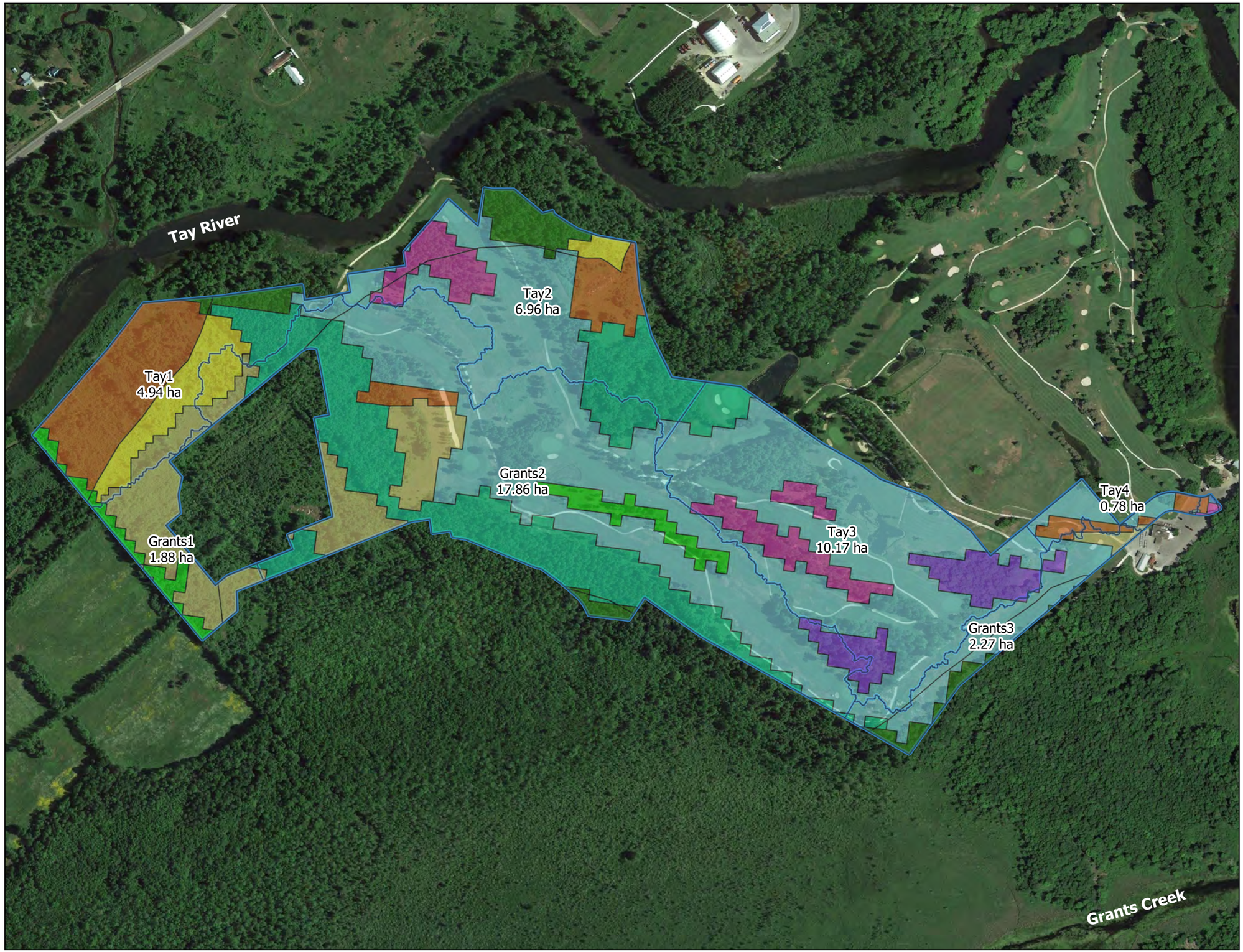
Figure E1: Pre-Development Drainage Area

PROJECT	2118-21
DRAWN	BT
DATE	February 2023



N

Legend

- Drainage Area
  - [Name]
  - [Area]

Land Use

- Built Up Area - Pervious
- Deciduous Forest
- Fallow
- Forest
- Hedge Rows
- Mixed Forest
- Plantation
- Tilled
- Transportation
- Treed Swamp

SCALE: 1:5000

0 100 200 m

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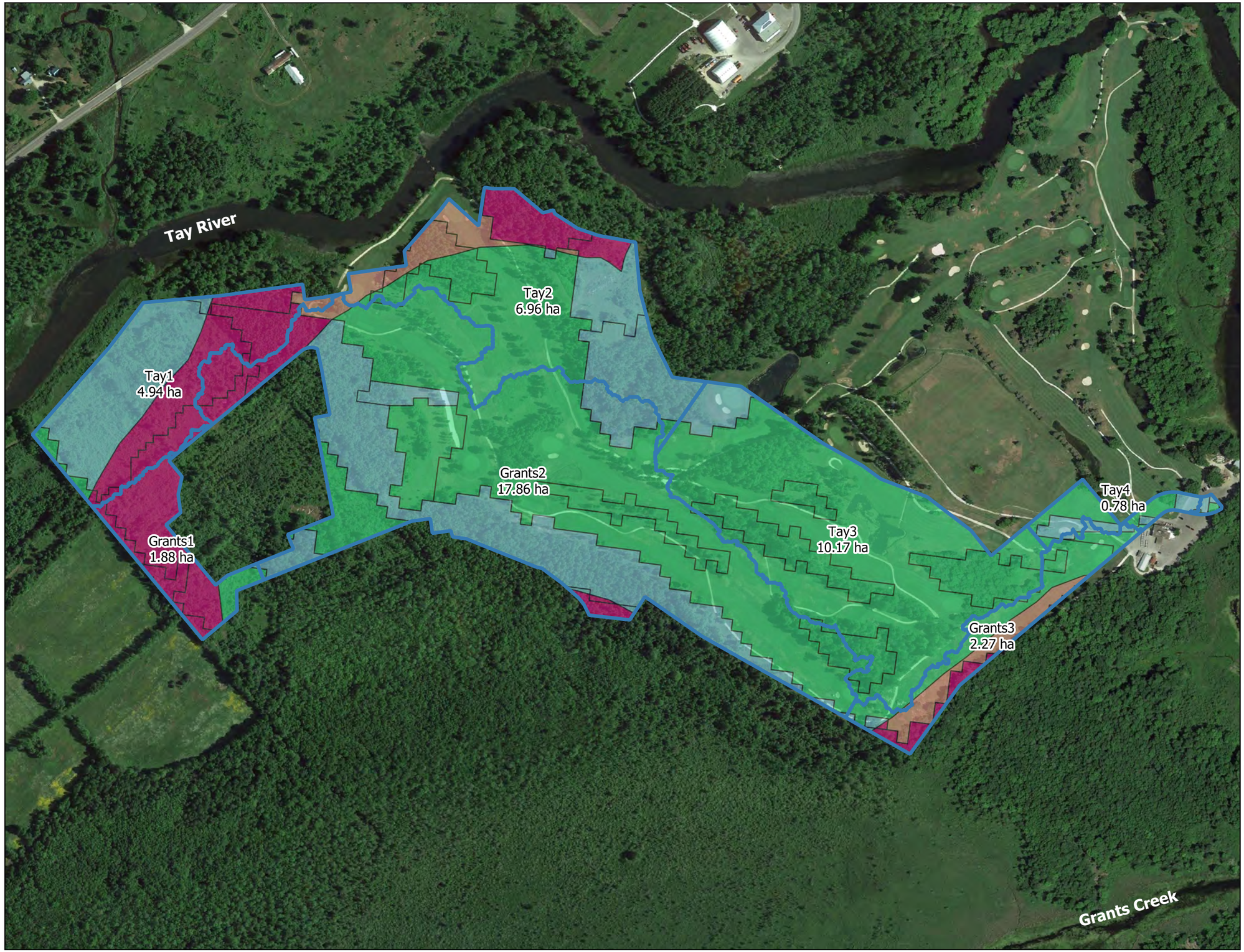
Figure E2: Pre-Development Land Use

PROJECT	2118-21
DRAWN	BT
DATE	February 2023



N

Legend

- Drainage Area
  - [Name]
  - [Area]

Soil Types

- Monteagle (SCS Type B)
- Monteagle Sandy Loam (SCS Type B)
- Muck (SCS Type D)
- North Gower (SCS Type D)
- Water (N)

SCALE: 1:5000

0 100 200 m

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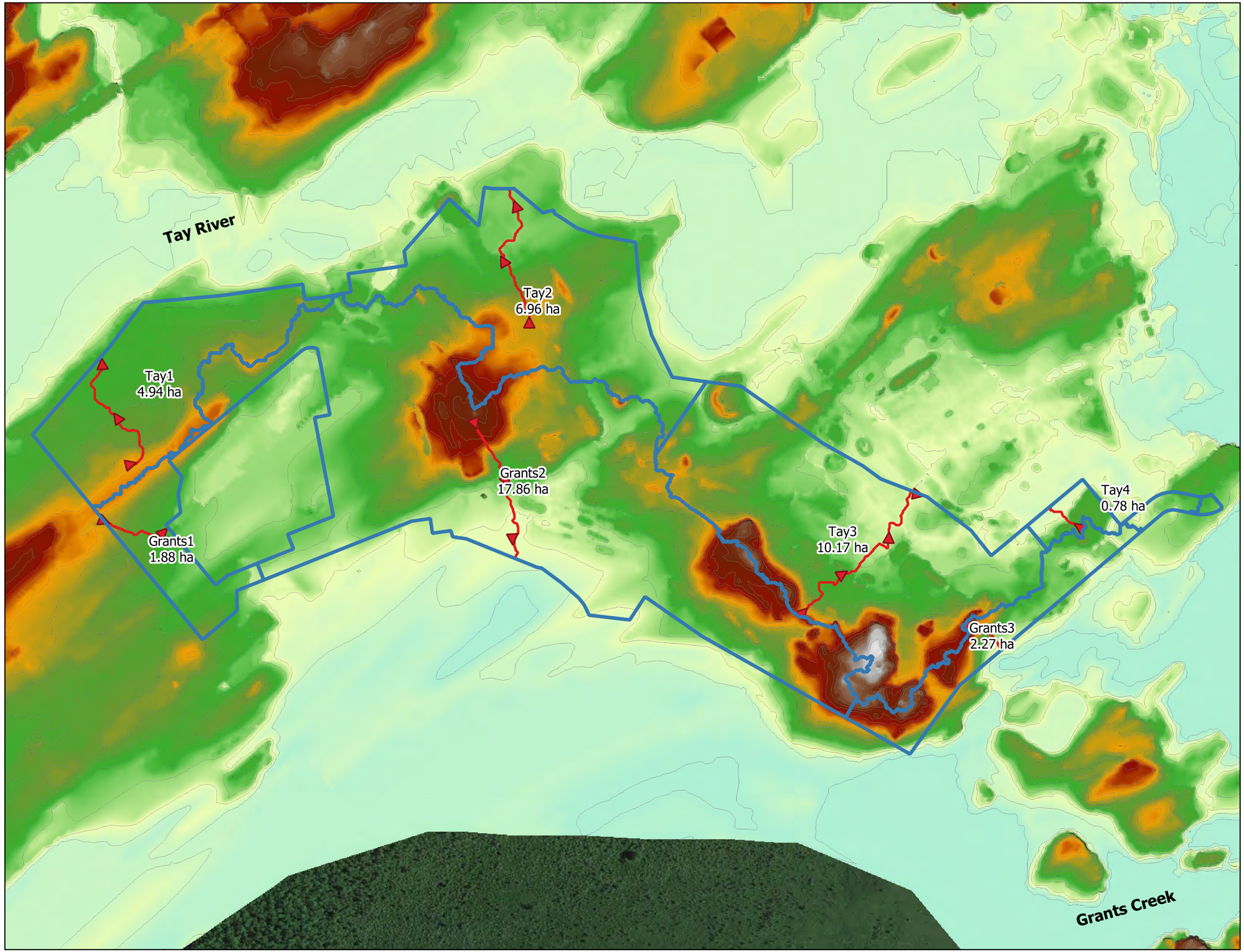
Figure E3: Pre-Development Soils

PROJECT	2118-21
DRAWN	BT
DATE	February 2023

C:\OneDrive\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2118(01)-21\JFSA ENGINEERING\DESIGN\GIS\20230126 - Post Dev Areas



N

Legend

- Drainage Area
  - [Name]
  - [Ares]
- Flow Lengths

Terrain

133.5

142.5

SCALE: 1:5000

0 100 200 m

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Figure E4: Pre-Development Flow Paths

PROJECT	2118-21
DRAWN	BT
DATE	February 2023

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Table E1: Calculation of SCS Curve Number (CN)

Tay River

Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.608	Built Up Area - Pervious	NORTH GOWER	D	Fair	84	2.7%	2.2
0.407	Plantation	MUCK	D	Fair	79	1.8%	1.4
0.138	Hedge Rows	MONTEAGLE	B	Fair	56	0.6%	0.3
1.266	Fallow	MUCK	D	Fair	94	5.5%	5.2
0.023	Hedge Rows	MUCK	D	Fair	77	0.1%	0.1
0.468	Deciduous Forest	MUCK	D	Fair	79	2.0%	1.6
0.056	Treed Swamp	MONTEAGLE SANDY LOAM	B	Fair	50	0.2%	0.1
3.558	Tilled	MONTEAGLE SANDY LOAM	B	Fair	78	15.6%	12.1
0.943	Treed Swamp	MUCK	D	Fair	50	4.1%	2.1
1.626	Forest	MONTEAGLE	B	Fair	60	7.1%	4.3
0.344	Forest	NORTH GOWER	D	Fair	79	1.5%	1.2
1.640	Deciduous Forest	MONTEAGLE SANDY LOAM	B	Fair	60	7.2%	4.3
10.611	Built Up Area - Pervious	MONTEAGLE	B	Fair	69	46.4%	32.0
1.143	Mixed Forest	MONTEAGLE	B	Fair	60	5.0%	3.0
0.025	Plantation	MONTEAGLE	B	Fair	60	0.1%	0.1
						CN	**70**

Grants Creek

Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
1.550	Plantation	MUCK	D	Fair	79	7.0%	5.6
2.093	Plantation	MONTEAGLE	B	Fair	60	9.5%	5.7
0.322	Fallow	MUCK	D	Fair	94	1.5%	1.4
0.354	Hedge Rows	MUCK	D	Fair	77	1.6%	1.2
5.266	Deciduous Forest	MONTEAGLE SANDY LOAM	B	Fair	60	23.9%	14.4
0.041	Forest	MONTEAGLE	B	Fair	60	0.2%	0.1
0.781	Built Up Area - Pervious	NORTH GOWER	D	Fair	84	3.5%	3.0
0.341	Mixed Forest	MONTEAGLE	B	Fair	60	1.5%	0.9
0.631	Hedge Rows	MONTEAGLE	B	Fair	56	2.9%	1.6
0.375	Deciduous Forest	MUCK	D	Fair	79	1.7%	1.3
0.032	Treed Swamp	MONTEAGLE SANDY LOAM	B	Fair	50	0.1%	0.1
0.384	Tilled	MONTEAGLE SANDY LOAM	B	Fair	78	1.7%	1.4
9.425	Built Up Area - Pervious	MONTEAGLE	B	Fair	69	42.8%	29.5
0.403	Treed Swamp	MUCK	D	Fair	50	1.8%	0.9
0.002	Forest	WATER	N	Fair	98	0.0%	0.0
0.008	Transportation	MONTEAGLE SANDY LOAM	B	Fair	98	0.0%	0.0
						CN	**67**

Table E2: Time to Peak Calculations

Parameter	Units	Grants	Tay
Area	ha	22.01	22.86
CN	-	67	70
Ptotal to calc C from CN, use 2 yr 3 hr Chicago stom	P(mm)	31.9	31.9
	Ia(mm)	5.00	5.00
	RV(mm)	4.75	5.3
Ptotal to calc C from CN, use 2 yr 24 hr SCS stom	P(mm)	48.46	48.46
	RV(mm)	11.2	12.4
C (From Chicago storm)	-	0.149	0.167
C (From SCS storm)	-	0.231	0.256
Length of Channel	m	231	304
	ft	758	996
Elevation of Head Water	m	139.35	139.46
	ft	457	458
Elevation of Outlet	m	134.30	135.42
	ft	441	444
Average Slope	m/m	2.18%	1.33%
	ft/ft	2.18%	1.33%
Kirpich			
Time of Concentration	mins	6	8
Time to Peak	min	4	6
Time to Peak	Hours	0.06	0.09
FAA (From Chicago storm)			
Time of Concentration	mins	36	48
Time to Peak	mins	24	32
Time to Peak	Hours	0.40	0.54
FAA (From SCS storm)			
Time of Concentration	mins	33	44
Time to Peak	mins	22	29
Time to Peak	Hours	0.37	0.48
Barnsby Williams			
Time of Concentration	mins	8	12
Time to Peak	mins	6	8
Time to Peak	Hours	0.09	0.13
SCS			
Time of Concentration	mins	25	37
Time to Peak	mins	17	24
Time to Peak	Hours	0.28	0.41
Selected Method			
FAA (From SCS storm)			
Time to Peak	min	22	29
Time to Peak	Hours	0.37	0.48

Note:

All methods calculated as per Appendix A of the SWMHYMO manual

Time to Peak calculated as 2/3 Time of concentration

```
20    Metric units / ID numbers OFF
*#*************************************************************************************************
*#  SWMHYMO  / INPUT DATA FILE
*#*************************************************************************************************
*#  Project Name  : [Caivan Perth properties]
*#  Project Number: [2118]
*#  Date          : [2023 JAN 26]
*#  Modeller      : [JB]
*#  Company       : J.F. Sabourin and Associates
*#  License #     : 2549237
*#*************************************************************************************************
*# Model developed to simulate runoff from subcatchments under pre development conditions
*#*************************************************************************************************
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
                  ["25MMC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
READ STORM         STORM_FILENAME=["STORM.001"]
*%-----------------|-------------------------------------------------------------|
*#*************************************************************************************************
*# Grants Creek
*#*************************************************************************************************
CALIB NASHYD       NHYD=["Grants"], DT=[1]min, AREA=[22.01](ha),
                   DWF=[0](cms), CN/C=[67],IA=[5.0](mm),
                   N=[3], TP=[0.37]hrs,
                   RAINFALL[ , , -1]
*#*************************************************************************************************
*# TAY RIVER
*#*************************************************************************************************
CALIB NASHYD       NHYD=["Tay"], DT=[1]min, AREA=[22.86](ha),
                   DWF=[0](cms), CN/C=[70], IA=[5.0](mm),
                   N=[3], TP=[0.48]hrs,
                   RAINFALL[ , , -1]

*%-----------------|-------------------------------------------------------------|
ADD HYD            NHYDsum=["Total"], NHYDs to add=["Grants"+"Tay"]
*##########################################################################
*# STORMS
*##########################################################################
*%  25 mm Storm based on 2-Year, 3-Hour Chicago Storm
*%START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*%                  ["25MMC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  2-Year, 3-Hour Chicago Storm
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                  ["002YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  5-Year, 3-Hour Chicago Storm
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                  ["005YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  10-Year, 3-Hour Chicago Storm
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                  ["010YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  25-Year, 3-Hour Chicago Storm
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                  ["025YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  50-Year, 3-Hour Chicago Storm
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                  ["050YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
```

```
*%-----------------|---------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[099]
                   ["100YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  2-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[102]
                   ["002YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  5-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[105]
                   ["005YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  10-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[110]
                   ["010YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  25-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
                   ["025YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  50-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[150]
                   ["050YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[199]
                   ["100YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm + 20%
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[998]
*%                   ["SC24100x+.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm + 20%
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[999]
*                   ["100YRCHI3HR+.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|---------------------------------------------------------|
FINISH
```

```
00001>  ================================================================================
00002>
00003>  SSSSS   W   W   M   M   H   H   Y   Y   M   M    OOO          222     000    11   5555   =========
00004>  S       W W W   MM MM   H   H    Y Y    MM MM   O   O           2   0   0  111   5
00005>  SSSSS   W W W   M M M   HHHHH     Y     M M M   O   O           2   0   0   11   5       Ver 5.500
00006>      S   W W     M   M   H   H     Y     M   M   O   O         222   0   0   11   555     FEB  2015
00007>  SSSSS    W W     M   M   H   H     Y     M   M    OOO          2     0   0   11     5    =========
00008>                                                                 2     0   0   11     5    # 2549237
00009>         StormWater Management HYdrologic Model                  222     000    11   555    =========
00010>
00011>  ***********************************************  SWMHYMO Ver 5.500  ***********************************
00012>  ***********************  A single event and continuous hydrologic simulation model  ***********************
00013>  ***********************     based on the principles of HYMO and its successors      ***********************
00014>  ***********************                                                             ***********************
00015>  ***********************                 OTTHYMO-83 and OTTHYMO-89.                  ***********************
00016>  ********************************************************************************************************
00017>  ********************* Distributed by:  J.F. Sabourin and Associates Inc.           ***********************
00018>  ***********************                 Ottawa,  Ontario: (613) 836-3884            ***********************
00019>  ***********************                 Gatineau, Quebec: (819) 243-6858            ***********************
00020>  ***********************                 E-Mail: swmhymo@jfsa.com                    ***********************
00021>  ********************************************************************************************************
00022>
00023>  ********************************************************************************************************
00024>  ****************** Licensed user: JFSAinc.                                        ***********************
00025>  ***********************                 Ottawa                  SERIAL#:2549237     ***********************
00026>  ********************************************************************************************************
00027>
00028>  ********************************************************************************************************
00029>  ***********************          ****** PROGRAM ARRAY DIMENSIONS ******          ***********************
00030>  ***********************          Maximum value for ID numbers  :     11          ***********************
00031>  ***********************          Max. number of rainfall points: 105408          ***********************
00032>  ***********************          Max. number of flow points    : 105408          ***********************
00033>  ********************************************************************************************************
00034>
00035>
00036>  ********************************  S U M M A R Y   O U T P U T  ********************************************
00037>  ********************************************************************************************************
00038>  *                    RUN DATE: 2023-02-15     TIME: 16:23:15     RUN COUNTER: 002587                     *
00039>  ********************************************************************************************************
00040>  * Input   file: C:\Temp\2118\20230126-PreDev\PERTH-Pre_v01.4.dat                                         *
00041>  * Output  file: C:\Temp\2118\20230126-PreDev\PERTH-Pre_v01.4.out                                         *
00042>  * Summary file: C:\Temp\2118\20230126-PreDev\PERTH-Pre_v01.4.sum                                         *
00043>  * User comments:                                                                                        *
00044>  * 1:_____________________________________________________________________________________________________*
00045>  * 2:_____________________________________________________________________________________________________*
00046>  * 3:_____________________________________________________________________________________________________*
00047>  ********************************************************************************************************
00048>
00049>
00050> #*******************************************************************************************************
00051> #  SWMHYMO  / INPUT DATA FILE
00052> #*******************************************************************************************************
00053> #  Project Name  : [Caivan Perth properties]
00054> #  Project Number: [2118]
00055> #  Date          : [2023 JAN 26]
00056> #  Modeller      : [JB]
00057> #  Company       : J.F. Sabourin and Associates
00058> #  License #     : 2549237
00059> #*******************************************************************************************************
00060> # Model developed to simulate runoff from subcatchments under pre development conditions
00061> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00062> # for summer design storms. Note TP per FAA method is directly determined by CN
00063> #*******************************************************************************************************
00064>  RUN#:COMMAND#
00065> R0001:C00001-------------------------------------------------------------------------------------------
00066>      START
00067>       [TZERO =    .00 hrs on       0]
00068>       [METOUT=   2   (1=imperial, 2=metric output)]
00069>       [NSTORM=   1 ]
00070>       [NRUN  = 0001 ]
00071> R0001:C00002-------------------------------------------------------------------------------------------
00072>      READ STORM
00073>       Filename = STORM.001
00074>       Comment  = 25 MM BASED ON CHICAGO STORM 2 Year, 3 Hours
00075>       [SDT=10.00:SDUR=   3.00:PTOT=  25.00]
00076> #*******************************************************************************************************
00077> # Grants Creek
00078> #*******************************************************************************************************
00079> R0001:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00080>      CALIB NASHYD           1.0 01:Grants        22.01     .125 No_date    1:31    2.76 .110     .000
00081>       [CN= 67.0: N= 3.00: Tp=  .37]
00082> #*******************************************************************************************************
00083> # TAY RIVER
00084> #*******************************************************************************************************
00085> R0001:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00086>      CALIB NASHYD           1.0 01:Tay           22.86     .126 No_date    1:41    3.10 .124     .000
00087>       [CN= 70.0: N= 3.00: Tp=  .48]
00088> R0001:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00089>      ADD HYD                1.0 02:Grants        22.01     .125 No_date    1:31    2.76  n/a     .000
00090>                           +     1.0 02:Tay       22.86     .126 No_date    1:41    3.10  n/a     .000
00091>                         SUM=    1.0 01:Total     44.87     .247 No_date    1:35    2.93  n/a     .000
00092> ###############################################################################
00093> # STORMS
00094> ###############################################################################
00095>   ** END OF RUN :    1
00096>
00097> ********************************************************************************************************
00098>
00099>
00100>
00101>
00102>
00103>  RUN#:COMMAND#
00104> R0002:C00001-------------------------------------------------------------------------------------------
00105>      START
00106>       [TZERO =    .00 hrs on       0]
00107>       [METOUT=   2   (1=imperial, 2=metric output)]
00108>       [NSTORM=   1 ]
00109>       [NRUN  = 0002 ]
00110> #*******************************************************************************************************
00111> #  SWMHYMO  / INPUT DATA FILE
00112> #*******************************************************************************************************
00113> #  Project Name  : [Caivan Perth properties]
00114> #  Project Number: [2118]
00115> #  Date          : [2023 JAN 26]
00116> #  Modeller      : [JB]
00117> #  Company       : J.F. Sabourin and Associates
00118> #  License #     : 2549237
00119> #*******************************************************************************************************
00120> # Model developed to simulate runoff from subcatchments under pre development conditions
00121> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00122> # for summer design storms. Note TP per FAA method is directly determined by CN
00123> #*******************************************************************************************************
00124> R0002:C00002-------------------------------------------------------------------------------------------
00125>      READ STORM
00126>       Filename = STORM.001
00127>       Comment  = 002YRCHI3HR-Perth MTO IDF
00128>       [SDT=10.00:SDUR=   3.00:PTOT=  28.33]
00129> #*******************************************************************************************************
00130> # Grants Creek
00131> #*******************************************************************************************************
00132> R0002:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00133>      CALIB NASHYD           1.0 01:Grants        22.01     .149 No_date    1:29    3.67 .129     .000
00134>       [CN= 67.0: N= 3.00: Tp=  .37]
00135> #*******************************************************************************************************
00136> # TAY RIVER
00137> #*******************************************************************************************************
00138> R0002:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00139>      CALIB NASHYD           1.0 01:Tay           22.86     .150 No_date    1:40    4.12 .145     .000
00140>       [CN= 70.0: N= 3.00: Tp=  .48]
00141> R0002:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00142>      ADD HYD                1.0 02:Grants        22.01     .149 No_date    1:29    3.67  n/a     .000
00143>                           +     1.0 02:Tay       22.86     .150 No_date    1:40    4.12  n/a     .000
00144>                         SUM=    1.0 01:Total     44.87     .295 No_date    1:34    3.90  n/a     .000
00145> ###############################################################################
00146> # STORMS
00147> ###############################################################################
00148>   ** END OF RUN :    4
00149>
00150> ********************************************************************************************************
00151>
00152>
00153>
00154>
00155>
00156>  RUN#:COMMAND#
00157> R0005:C00001-------------------------------------------------------------------------------------------
00158>      START
00159>       [TZERO =    .00 hrs on       0]
00160>       [METOUT=   2   (1=imperial, 2=metric output)]
00161>       [NSTORM=   1 ]
00162>       [NRUN  = 0005 ]
00163> #*******************************************************************************************************
00164> #  SWMHYMO  / INPUT DATA FILE
00165> #*******************************************************************************************************
00166> #  Project Name  : [Caivan Perth properties]
00167> #  Project Number: [2118]
00168> #  Date          : [2023 JAN 26]
00169> #  Modeller      : [JB]
00170> #  Company       : J.F. Sabourin and Associates
00171> #  License #     : 2549237
00172> #*******************************************************************************************************
00173> # Model developed to simulate runoff from subcatchments under pre development conditions
00174> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00175> # for summer design storms. Note TP per FAA method is directly determined by CN
00176> #*******************************************************************************************************
00177> R0005:C00002-------------------------------------------------------------------------------------------
00178>      READ STORM
00179>       Filename = STORM.001
00180>       Comment  = 005YRCHI3HR-Perth MTO IDF
00181>       [SDT=10.00:SDUR=   3.00:PTOT=  37.67]
00182> #*******************************************************************************************************
00183> # Grants Creek
00184> #*******************************************************************************************************
00185> R0005:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00186>      CALIB NASHYD           1.0 01:Grants        22.01     .288 No_date    1:28    6.77 .180     .000
00187>       [CN= 67.0: N= 3.00: Tp=  .37]
00188> #*******************************************************************************************************
00189> # TAY RIVER
00190> #*******************************************************************************************************
00191> R0005:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00192>      CALIB NASHYD           1.0 01:Tay           22.86     .285 No_date    1:38    7.54 .200     .000
00193>       [CN= 70.0: N= 3.00: Tp=  .48]
00194> R0005:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00195>      ADD HYD                1.0 02:Grants        22.01     .288 No_date    1:28    6.77  n/a     .000
00196>                           +     1.0 02:Tay       22.86     .285 No_date    1:38    7.54  n/a     .000
00197>                         SUM=    1.0 01:Total     44.87     .564 No_date    1:32    7.16  n/a     .000
00198> ###############################################################################
00199> # STORMS
00200> ###############################################################################
00201>   ** END OF RUN :    9
00202>
00203> ********************************************************************************************************
00204>
00205>
00206>
00207>
00208>
00209>  RUN#:COMMAND#
00210> R0010:C00001-------------------------------------------------------------------------------------------
00211>      START
00212>       [TZERO =    .00 hrs on       0]
00213>       [METOUT=   2   (1=imperial, 2=metric output)]
00214>       [NSTORM=   1 ]
00215>       [NRUN  = 0010 ]
00216> #*******************************************************************************************************
00217> #  SWMHYMO  / INPUT DATA FILE
00218> #*******************************************************************************************************
00219> #  Project Name  : [Caivan Perth properties]
00220> #  Project Number: [2118]
00221> #  Date          : [2023 JAN 26]
00222> #  Modeller      : [JB]
00223> #  Company       : J.F. Sabourin and Associates
00224> #  License #     : 2549237
00225> #*******************************************************************************************************
00226> # Model developed to simulate runoff from subcatchments under pre development conditions
00227> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00228> # for summer design storms. Note TP per FAA method is directly determined by CN
00229> #*******************************************************************************************************
00230> R0010:C00002-------------------------------------------------------------------------------------------
00231>      READ STORM
00232>       Filename = STORM.001
00233>       Comment  = 010YRCHI3HR-Perth MTO IDF
00234>       [SDT=10.00:SDUR=   3.00:PTOT=  43.78]
00235> #*******************************************************************************************************
00236> # Grants Creek
00237> #*******************************************************************************************************
00238> R0010:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00239>      CALIB NASHYD           1.0 01:Grants        22.01     .399 No_date    1:27    9.18 .210     .000
00240>       [CN= 67.0: N= 3.00: Tp=  .37]
00241> #*******************************************************************************************************
00242> # TAY RIVER
00243> #*******************************************************************************************************
00244> R0010:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00245>      CALIB NASHYD           1.0 01:Tay           22.86     .393 No_date    1:37   10.19 .233     .000
00246>       [CN= 70.0: N= 3.00: Tp=  .48]
00247> R0010:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00248>      ADD HYD                1.0 02:Grants        22.01     .399 No_date    1:27    9.18  n/a     .000
00249>                           +     1.0 02:Tay       22.86     .393 No_date    1:37   10.19  n/a     .000
00250>                         SUM=    1.0 01:Total     44.87     .779 No_date    1:31    9.69  n/a     .000
00251> ###############################################################################
00252> # STORMS
00253> ###############################################################################
00254>   ** END OF RUN :   24
00255>
00256> ********************************************************************************************************
00257>
00258>
00259>
00260>
00261>
00262>  RUN#:COMMAND#
00263> R0025:C00001-------------------------------------------------------------------------------------------
00264>      START
00265>       [TZERO =    .00 hrs on       0]
00266>       [METOUT=   2   (1=imperial, 2=metric output)]
00267>       [NSTORM=   1 ]
00268>       [NRUN  = 0025 ]
00269> #*******************************************************************************************************
00270> #  SWMHYMO  / INPUT DATA FILE
00271> #*******************************************************************************************************
00272> #  Project Name  : [Caivan Perth properties]
00273> #  Project Number: [2118]
00274> #  Date          : [2023 JAN 26]
00275> #  Modeller      : [JB]
00276> #  Company       : J.F. Sabourin and Associates
00277> #  License #     : 2549237
00278> #*******************************************************************************************************
00279> # Model developed to simulate runoff from subcatchments under pre development conditions
00280> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00281> # for summer design storms. Note TP per FAA method is directly determined by CN
00282> #*******************************************************************************************************
00283> R0025:C00002-------------------------------------------------------------------------------------------
00284>      READ STORM
00285>       Filename = STORM.001
00286>       Comment  = 025YRCHI3HR-Perth MTO IDF
00287>       [SDT=10.00:SDUR=   3.00:PTOT=  51.56]
00288> #*******************************************************************************************************
00289> # Grants Creek
00290> #*******************************************************************************************************
00291> R0025:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00292>      CALIB NASHYD           1.0 01:Grants        22.01     .559 No_date    1:26   12.63 .245     .000
00293>       [CN= 67.0: N= 3.00: Tp=  .37]
00294> #*******************************************************************************************************
00295> # TAY RIVER
00296> #*******************************************************************************************************
00297> R0025:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00298>      CALIB NASHYD           1.0 01:Tay           22.86     .546 No_date    1:36   13.95 .271     .000
00299>       [CN= 70.0: N= 3.00: Tp=  .48]
00300> R0025:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00301>      ADD HYD                1.0 02:Grants        22.01     .559 No_date    1:26   12.63  n/a     .000
00302>                           +     1.0 02:Tay       22.86     .546 No_date    1:36   13.95  n/a     .000
00303>                         SUM=    1.0 01:Total     44.87    1.088 No_date    1:31   13.30  n/a     .000
00304> ###############################################################################
00305> # STORMS
00306> ###############################################################################
00307>   ** END OF RUN :   49
00308>
00309> ********************************************************************************************************
00310>
00311>
00312>
00313>
00314>
00315>  RUN#:COMMAND#
00316> R0050:C00001-------------------------------------------------------------------------------------------
00317>      START
00318>       [TZERO =    .00 hrs on       0]
00319>       [METOUT=   2   (1=imperial, 2=metric output)]
00320>       [NSTORM=   1 ]
00321>       [NRUN  = 0050 ]
00322> #*******************************************************************************************************
00323> #  SWMHYMO  / INPUT DATA FILE
00324> #*******************************************************************************************************
00325> #  Project Name  : [Caivan Perth properties]
00326> #  Project Number: [2118]
00327> #  Date          : [2023 JAN 26]
00328> #  Modeller      : [JB]
00329> #  Company       : J.F. Sabourin and Associates
00330> #  License #     : 2549237
00331> #*******************************************************************************************************
00332> # Model developed to simulate runoff from subcatchments under pre development conditions
00333> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00334> # for summer design storms. Note TP per FAA method is directly determined by CN
00335> #*******************************************************************************************************
00336> R0050:C00002-------------------------------------------------------------------------------------------
00337>      READ STORM
00338>       Filename = STORM.001
00339>       Comment  = 050YRCHI3HR-Perth MTO IDF
00340>       [SDT=10.00:SDUR=   3.00:PTOT=  57.24]
00341> #*******************************************************************************************************
00342> # Grants Creek
00343> #*******************************************************************************************************
00344> R0050:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00345>      CALIB NASHYD           1.0 01:Grants        22.01     .688 No_date    1:26   15.39 .269     .000
00346>       [CN= 67.0: N= 3.00: Tp=  .37]
00347> #*******************************************************************************************************
00348> # TAY RIVER
00349> #*******************************************************************************************************
00350> R0050:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00351>      CALIB NASHYD           1.0 01:Tay           22.86     .669 No_date    1:36   16.94 .296     .000
00352>       [CN= 70.0: N= 3.00: Tp=  .48]
00353> R0050:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00354>      ADD HYD                1.0 02:Grants        22.01     .688 No_date    1:26   15.39  n/a     .000
00355>                           +     1.0 02:Tay       22.86     .669 No_date    1:36   16.94  n/a     .000
00356>                         SUM=    1.0 01:Total     44.87    1.336 No_date    1:30   16.18  n/a     .000
00357> ###############################################################################
00358> # STORMS
00359> ###############################################################################
00360>   ** END OF RUN :   98
```

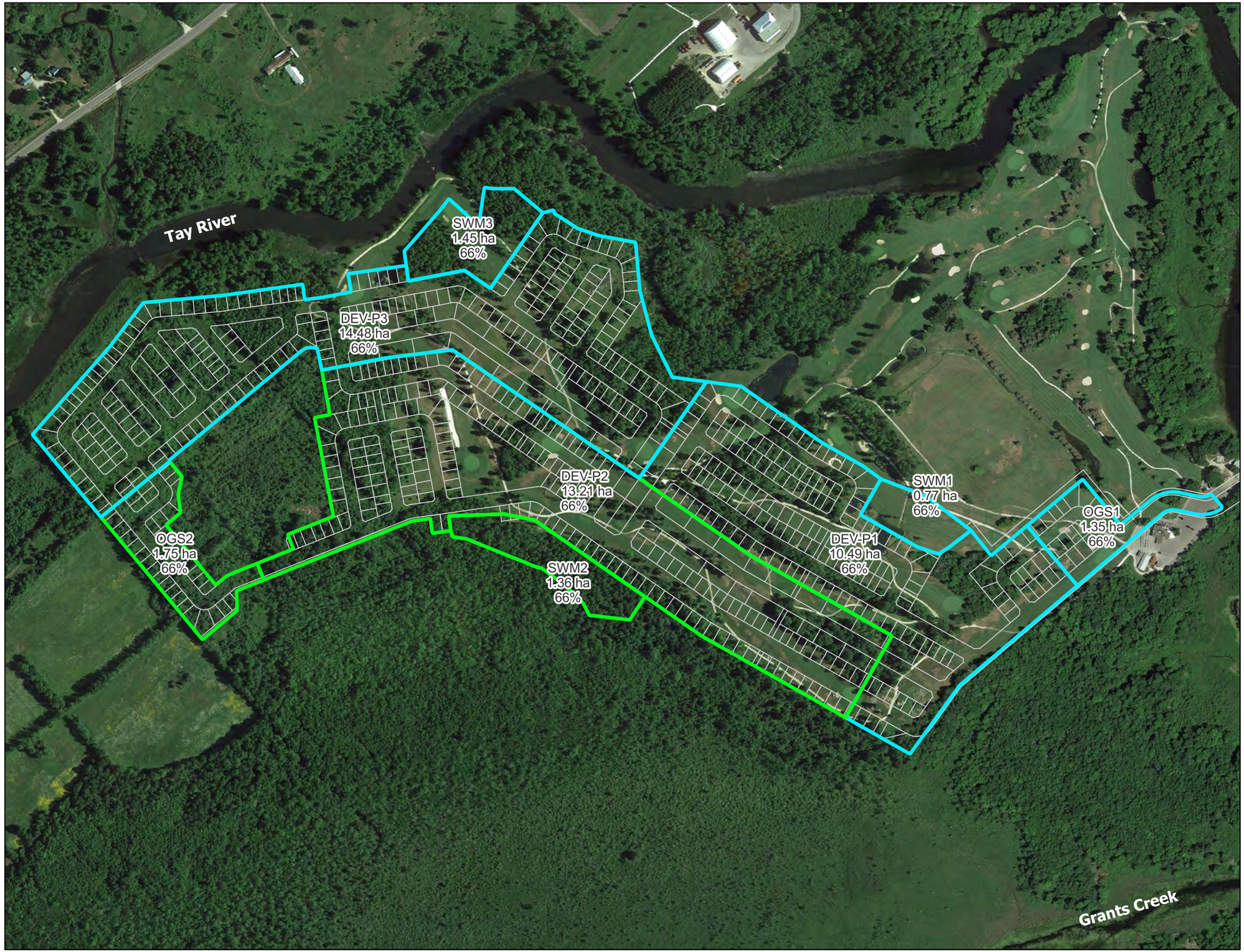
```
00361>
00362> ********************************************************************************************************
00363>
00364>
00365>
00366>
00367>
00368>  RUN#:COMMAND#
00369> R0099:C00001-------------------------------------------------------------------------------------------
00370>      START
00371>       [TZERO =    .00 hrs on       0]
00372>       [METOUT=   2   (1=imperial, 2=metric output)]
00373>       [NSTORM=   1 ]
00374>       [NRUN  = 0099 ]
00375> #*******************************************************************************************************
00376> #  SWMHYMO  / INPUT DATA FILE
00377> #*******************************************************************************************************
00378> #  Project Name  : [Caivan Perth properties]
00379> #  Project Number: [2118]
00380> #  Date          : [2023 JAN 26]
00381> #  Modeller      : [JB]
00382> #  Company       : J.F. Sabourin and Associates
00383> #  License #     : 2549237
00384> #*******************************************************************************************************
00385> # Model developed to simulate runoff from subcatchments under pre development conditions
00386> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00387> # for summer design storms. Note TP per FAA method is directly determined by CN
00388> #*******************************************************************************************************
00389> R0099:C00002-------------------------------------------------------------------------------------------
00390>      READ STORM
00391>       Filename = STORM.001
00392>       Comment  = 100YRCHI3HR-Perth MTO IDF
00393>       [SDT=10.00:SDUR=   3.00:PTOT=  63.00]
00394> #*******************************************************************************************************
00395> # Grants Creek
00396> #*******************************************************************************************************
00397> R0099:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00398>     CALIB NASHYD             1.0 01:Grants        22.01     .830 No_date    1:26   18.37 .292     .000
00399>       [CN= 67.0: N= 3.00: Tp=  .37]
00400> #*******************************************************************************************************
00401> # TAY RIVER
00402> #*******************************************************************************************************
00403> R0099:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00404>     CALIB NASHYD             1.0 01:Tay           22.86     .804 No_date    1:35   20.16 .320     .000
00405>       [CN= 70.0: N= 3.00: Tp=  .48]
00406> R0099:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00407>     ADD HYD                  1.0 02:Grants        22.01     .830 No_date    1:26   18.37  n/a     .000
00408>                        +     1.0 02:Tay           22.86     .804 No_date    1:35   20.16  n/a     .000
00409>                      SUM=    1.0 01:Total         44.87    1.609 No_date    1:30   19.28  n/a     .000
00410> ########################################################################
00411> # STORMS
00412> ########################################################################
00413>   ** END OF RUN :  101
00414>
00415> ********************************************************************************************************
00416>
00417>
00418>
00419>
00420>
00421>  RUN#:COMMAND#
00422> R0102:C00001-------------------------------------------------------------------------------------------
00423>      START
00424>       [TZERO =    .00 hrs on       0]
00425>       [METOUT=   2   (1=imperial, 2=metric output)]
00426>       [NSTORM=   1 ]
00427>       [NRUN  = 0102 ]
00428> #*******************************************************************************************************
00429> #  SWMHYMO  / INPUT DATA FILE
00430> #*******************************************************************************************************
00431> #  Project Name  : [Caivan Perth properties]
00432> #  Project Number: [2118]
00433> #  Date          : [2023 JAN 26]
00434> #  Modeller      : [JB]
00435> #  Company       : J.F. Sabourin and Associates
00436> #  License #     : 2549237
00437> #*******************************************************************************************************
00438> # Model developed to simulate runoff from subcatchments under pre development conditions
00439> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00440> # for summer design storms. Note TP per FAA method is directly determined by CN
00441> #*******************************************************************************************************
00442> R0102:C00002-------------------------------------------------------------------------------------------
00443>      READ STORM
00444>       Filename = STORM.001
00445>       Comment  = 002YRSCS24HR-Perth MTO IDF
00446>       [SDT=10.00:SDUR=  24.00:PTOT=  53.12]
00447> #*******************************************************************************************************
00448> # Grants Creek
00449> #*******************************************************************************************************
00450> R0102:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00451>     CALIB NASHYD             1.0 01:Grants        22.01     .463 No_date   12:17   13.37 .252     .000
00452>       [CN= 67.0: N= 3.00: Tp=  .37]
00453> #*******************************************************************************************************
00454> # TAY RIVER
00455> #*******************************************************************************************************
00456> R0102:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00457>     CALIB NASHYD             1.0 01:Tay           22.86     .444 No_date   12:25   14.75 .278     .000
00458>       [CN= 70.0: N= 3.00: Tp=  .48]
00459> R0102:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00460>     ADD HYD                  1.0 02:Grants        22.01     .463 No_date   12:17   13.37  n/a     .000
00461>                        +     1.0 02:Tay           22.86     .444 No_date   12:25   14.75  n/a     .000
00462>                      SUM=    1.0 01:Total         44.87     .894 No_date   12:20   14.07  n/a     .000
00463> ########################################################################
00464> # STORMS
00465> ########################################################################
00466>   ** END OF RUN :  104
00467>
00468> ********************************************************************************************************
00469>
00470>
00471>
00472>
00473>
00474>  RUN#:COMMAND#
00475> R0105:C00001-------------------------------------------------------------------------------------------
00476>      START
00477>       [TZERO =    .00 hrs on       0]
00478>       [METOUT=   2   (1=imperial, 2=metric output)]
00479>       [NSTORM=   1 ]
00480>       [NRUN  = 0105 ]
00481> #*******************************************************************************************************
00482> #  SWMHYMO  / INPUT DATA FILE
00483> #*******************************************************************************************************
00484> #  Project Name  : [Caivan Perth properties]
00485> #  Project Number: [2118]
00486> #  Date          : [2023 JAN 26]
00487> #  Modeller      : [JB]
00488> #  Company       : J.F. Sabourin and Associates
00489> #  License #     : 2549237
00490> #*******************************************************************************************************
00491> # Model developed to simulate runoff from subcatchments under pre development conditions
00492> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00493> # for summer design storms. Note TP per FAA method is directly determined by CN
00494> #*******************************************************************************************************
00495> R0105:C00002-------------------------------------------------------------------------------------------
00496>      READ STORM
00497>       Filename = STORM.001
00498>       Comment  = 005YRSCS24HR-Perth MTO IDF
00499>       [SDT=10.00:SDUR=  24.00:PTOT=  70.29]
00500> #*******************************************************************************************************
00501> # Grants Creek
00502> #*******************************************************************************************************
00503> R0105:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00504>     CALIB NASHYD             1.0 01:Grants        22.01     .790 No_date   12:17   22.39 .319     .000
00505>       [CN= 67.0: N= 3.00: Tp=  .37]
00506> #*******************************************************************************************************
00507> # TAY RIVER
00508> #*******************************************************************************************************
00509> R0105:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00510>     CALIB NASHYD             1.0 01:Tay           22.86     .750 No_date   12:24   24.48 .348     .000
00511>       [CN= 70.0: N= 3.00: Tp=  .48]
00512> R0105:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00513>     ADD HYD                  1.0 02:Grants        22.01     .790 No_date   12:17   22.39  n/a     .000
00514>                        +     1.0 02:Tay           22.86     .750 No_date   12:24   24.48  n/a     .000
00515>                      SUM=    1.0 01:Total         44.87    1.519 No_date   12:20   23.45  n/a     .000
00516> ########################################################################
00517> # STORMS
00518> ########################################################################
00519>   ** END OF RUN :  109
00520>
00521> ********************************************************************************************************
00522>
00523>
00524>
00525>
00526>
00527>  RUN#:COMMAND#
00528> R0110:C00001-------------------------------------------------------------------------------------------
00529>      START
00530>       [TZERO =    .00 hrs on       0]
00531>       [METOUT=   2   (1=imperial, 2=metric output)]
00532>       [NSTORM=   1 ]
00533>       [NRUN  = 0110 ]
00534> #*******************************************************************************************************
00535> #  SWMHYMO  / INPUT DATA FILE
00536> #*******************************************************************************************************
00537> #  Project Name  : [Caivan Perth properties]
00538> #  Project Number: [2118]
00539> #  Date          : [2023 JAN 26]
00540> #  Modeller      : [JB]
00541> #  Company       : J.F. Sabourin and Associates
00542> #  License #     : 2549237
00543> #*******************************************************************************************************
00544> # Model developed to simulate runoff from subcatchments under pre development conditions
00545> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00546> # for summer design storms. Note TP per FAA method is directly determined by CN
00547> #*******************************************************************************************************
00548> R0110:C00002-------------------------------------------------------------------------------------------
00549>      READ STORM
00550>       Filename = STORM.001
00551>       Comment  = 010YRSCS24HR-Perth MTO IDF
00552>       [SDT=10.00:SDUR=  24.00:PTOT=  81.99]
00553> #*******************************************************************************************************
00554> # Grants Creek
00555> #*******************************************************************************************************
00556> R0110:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00557>     CALIB NASHYD             1.0 01:Grants        22.01    1.044 No_date   12:16   29.33 .358     .000
00558>       [CN= 67.0: N= 3.00: Tp=  .37]
00559> #*******************************************************************************************************
00560> # TAY RIVER
00561> #*******************************************************************************************************
00562> R0110:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00563>     CALIB NASHYD             1.0 01:Tay           22.86     .986 No_date   12:24   31.90 .389     .000
00564>       [CN= 70.0: N= 3.00: Tp=  .48]
00565> R0110:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00566>     ADD HYD                  1.0 02:Grants        22.01    1.044 No_date   12:16   29.33  n/a     .000
00567>                        +     1.0 02:Tay           22.86     .986 No_date   12:24   31.90  n/a     .000
00568>                      SUM=    1.0 01:Total         44.87    2.003 No_date   12:20   30.64  n/a     .000
00569> ########################################################################
00570> # STORMS
00571> ########################################################################
00572>   ** END OF RUN :  124
00573>
00574> ********************************************************************************************************
00575>
00576>
00577>
00578>
00579>
00580>  RUN#:COMMAND#
00581> R0125:C00001-------------------------------------------------------------------------------------------
00582>      START
00583>       [TZERO =    .00 hrs on       0]
00584>       [METOUT=   2   (1=imperial, 2=metric output)]
00585>       [NSTORM=   1 ]
00586>       [NRUN  = 0125 ]
00587> #*******************************************************************************************************
00588> #  SWMHYMO  / INPUT DATA FILE
00589> #*******************************************************************************************************
00590> #  Project Name  : [Caivan Perth properties]
00591> #  Project Number: [2118]
00592> #  Date          : [2023 JAN 26]
00593> #  Modeller      : [JB]
00594> #  Company       : J.F. Sabourin and Associates
00595> #  License #     : 2549237
00596> #*******************************************************************************************************
00597> # Model developed to simulate runoff from subcatchments under pre development conditions
00598> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00599> # for summer design storms. Note TP per FAA method is directly determined by CN
00600> #*******************************************************************************************************
00601> R0125:C00002-------------------------------------------------------------------------------------------
00602>      READ STORM
00603>       Filename = STORM.001
00604>       Comment  = 025YRSCS24HR-Perth MTO IDF
00605>       [SDT=10.00:SDUR=  24.00:PTOT=  96.30]
00606> #*******************************************************************************************************
00607> # Grants Creek
00608> #*******************************************************************************************************
00609> R0125:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00610>     CALIB NASHYD             1.0 01:Grants        22.01    1.382 No_date   12:16   38.52 .400     .000
00611>       [CN= 67.0: N= 3.00: Tp=  .37]
00612> #*******************************************************************************************************
00613> # TAY RIVER
00614> #*******************************************************************************************************
00615> R0125:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00616>     CALIB NASHYD             1.0 01:Tay           22.86    1.298 No_date   12:24   41.64 .432     .000
00617>       [CN= 70.0: N= 3.00: Tp=  .48]
00618> R0125:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00619>     ADD HYD                  1.0 02:Grants        22.01    1.382 No_date   12:16   38.52  n/a     .000
00620>                        +     1.0 02:Tay           22.86    1.298 No_date   12:24   41.64  n/a     .000
00621>                      SUM=    1.0 01:Total         44.87    2.645 No_date   12:19   40.11  n/a     .000
00622> ########################################################################
00623> # STORMS
00624> ########################################################################
00625>   ** END OF RUN :  149
00626>
00627> ********************************************************************************************************
00628>
00629>
00630>
00631>
00632>
00633>  RUN#:COMMAND#
00634> R0150:C00001-------------------------------------------------------------------------------------------
00635>      START
00636>       [TZERO =    .00 hrs on       0]
00637>       [METOUT=   2   (1=imperial, 2=metric output)]
00638>       [NSTORM=   1 ]
00639>       [NRUN  = 0150 ]
00640> #*******************************************************************************************************
00641> #  SWMHYMO  / INPUT DATA FILE
00642> #*******************************************************************************************************
00643> #  Project Name  : [Caivan Perth properties]
00644> #  Project Number: [2118]
00645> #  Date          : [2023 JAN 26]
00646> #  Modeller      : [JB]
00647> #  Company       : J.F. Sabourin and Associates
00648> #  License #     : 2549237
00649> #*******************************************************************************************************
00650> # Model developed to simulate runoff from subcatchments under pre development conditions
00651> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00652> # for summer design storms. Note TP per FAA method is directly determined by CN
00653> #*******************************************************************************************************
00654> R0150:C00002-------------------------------------------------------------------------------------------
00655>      READ STORM
00656>       Filename = STORM.001
00657>       Comment  = 050YRSCS24HR-Perth MTO IDF
00658>       [SDT=10.00:SDUR=  24.00:PTOT= 107.00]
00659> #*******************************************************************************************************
00660> # Grants Creek
00661> #*******************************************************************************************************
00662> R0150:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00663>     CALIB NASHYD             1.0 01:Grants        22.01    1.653 No_date   12:16   45.81 .428     .000
00664>       [CN= 67.0: N= 3.00: Tp=  .37]
00665> #*******************************************************************************************************
00666> # TAY RIVER
00667> #*******************************************************************************************************
00668> R0150:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00669>     CALIB NASHYD             1.0 01:Tay           22.86    1.545 No_date   12:24   49.34 .461     .000
00670>       [CN= 70.0: N= 3.00: Tp=  .48]
00671> R0150:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00672>     ADD HYD                  1.0 02:Grants        22.01    1.653 No_date   12:16   45.81  n/a     .000
00673>                        +     1.0 02:Tay           22.86    1.545 No_date   12:24   49.34  n/a     .000
00674>                      SUM=    1.0 01:Total         44.87    3.156 No_date   12:19   47.61  n/a     .000
00675> ########################################################################
00676> # STORMS
00677> ########################################################################
00678>   ** END OF RUN :  198
00679>
00680> ********************************************************************************************************
00681>
00682>
00683>
00684>
00685>
00686>  RUN#:COMMAND#
00687> R0199:C00001-------------------------------------------------------------------------------------------
00688>      START
00689>       [TZERO =    .00 hrs on       0]
00690>       [METOUT=   2   (1=imperial, 2=metric output)]
00691>       [NSTORM=   1 ]
00692>       [NRUN  = 0199 ]
00693> #*******************************************************************************************************
00694> #  SWMHYMO  / INPUT DATA FILE
00695> #*******************************************************************************************************
00696> #  Project Name  : [Caivan Perth properties]
00697> #  Project Number: [2118]
00698> #  Date          : [2023 JAN 26]
00699> #  Modeller      : [JB]
00700> #  Company       : J.F. Sabourin and Associates
00701> #  License #     : 2549237
00702> #*******************************************************************************************************
00703> # Model developed to simulate runoff from subcatchments under pre development conditions
00704> # CN based on continuous simulation results with CN from water budget converted from AMCIII to AMCII
00705> # for summer design storms. Note TP per FAA method is directly determined by CN
00706> #*******************************************************************************************************
00707> R0199:C00002-------------------------------------------------------------------------------------------
00708>      READ STORM
00709>       Filename = STORM.001
00710>       Comment  = 100YRSCS24HR-Perth MTO IDF
00711>       [SDT=10.00:SDUR=  24.00:PTOT= 117.60]
00712> #*******************************************************************************************************
00713> # Grants Creek
00714> #*******************************************************************************************************
00715> R0199:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00716>     CALIB NASHYD             1.0 01:Grants        22.01    1.932 No_date   12:16   53.34 .454     .000
00717>       [CN= 67.0: N= 3.00: Tp=  .37]
00718> #*******************************************************************************************************
00719> # TAY RIVER
00720> #*******************************************************************************************************
```

```
00721> R0199:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00722>     CALIB NASHYD           1.0 01:Tay           22.86    1.800 No_date   12:23   57.25 .487     .000
00723>       [CN= 70.0: N= 3.00: Tp=    48]
00724> R0199:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00725>     ADD HYD                1.0 02:Grants        22.01    1.932 No_date   12:16   53.34  n/a     .000
00726>                       +    1.0 02:Tay           22.86    1.800 No_date   12:23   57.25  n/a     .000
00727>                   SUM=     1.0 01:Total         44.87    3.684 No_date   12:19   55.33  n/a     .000
00728> ##############################################################################
00729> # STORMS
00730> ##############################################################################
00731> R0199:C00002-----------------------------------------------------------------------------------------
00732>     FINISH
00733> -----------------------------------------------------------------------------------------------------
00734> *****************************************************************************************************
00735>       WARNINGS / ERRORS / NOTES
00736>       -------------------------
00737>    Simulation ended on 2023-02-15     at 16:23:19
00738> =====================================================================================================
00739>
```

```
20    Metric units / ID numbers OFF
*#*************************************************************************************************
*#  SWMHYMO  / INPUT DATA FILE
*#*************************************************************************************************
*#  Project Name  : [Caivan Perth properties]
*#  Project Number: [2118]
*#  Date          : [2023 JAN 26]
*#  Modeller      : [JB]
*#  Company       : J.F. Sabourin and Associates
*#  License #     : 2549237
*#*************************************************************************************************
*# Model developed to simulate runoff from subcatchments under post development
conditions and to size SWM ponds
*#*************************************************************************************************
START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
                  ["25MMC3H.stm"] <--storm filename, one per line for NSTORM time
*                   ["100YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*                   ["100YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time

*%-----------------|-------------------------------------------------------------|
READ STORM         STORM_FILENAME=["STORM.001"]
*%-----------------|-------------------------------------------------------------------------------
*#*************************************************************************************************
*# TAY RIVER
*#*************************************************************************************************
CALIB STANDHYD     NHYD=["Dev-P1"], DT=[1](min), AREA=[10.493](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                   LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                   DCAY=[4.14](/hr), F=[0.00](mm),
                   Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                   MNP=[0.25], SCP=[0](min),
                   Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[264](m),
                   MNI=[0.013], SCI=[0](min),
                   RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
CALIB STANDHYD     NHYD=["SWM1"], DT=[1](min), AREA=[0.767](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                   LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                   DCAY=[4.14](/hr), F=[0.00](mm),
                   Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                   MNP=[0.25], SCP=[0](min),*
                   Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[71](m),
                   MNI=[0.013], SCI=[0](min),
                   RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
CALIB STANDHYD     NHYD=["OGS1"], DT=[1](min), AREA=[1.353](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                   LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                   DCAY=[4.14](/hr), F=[0.00](mm),
                   Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                   MNP=[0.25], SCP=[0](min),
                   Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[95](m),
                   MNI=[0.013], SCI=[0](min),
                   RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
ADD HYD            NHYDsum=["Pond1-In"], NHYDs to add=["Dev-P1"+"SWM1"+"OGS1"]
*%-----------------|-------------------------------------------------------------------------------
ROUTE RESERVOIR    NHYDout=["Pond1-Out"], NHYDin=["Pond1-In"], RDT=[1](min),
```

```
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [   0.0 ,  0.0 ]
                                  [   0.001 , 0.0505   ]
                                  [   0.056  ,  0.14763  ]
                                  [   0.066  ,  0.17252  ]
                                  [   0.126  ,  0.23392  ]
                                  [   0.174  ,  0.27454  ]
                                  [   0.196  ,  0.2805  ]
                                  [   0.241  ,  0.3297  ]
                                  [   0.296  ,  0.3725  ]
                                  [   0.331  ,  0.3745  ]
                                  [   0.355  ,  0.41417  ]
                                  [   0.436  ,  0.43417  ]
                                  [   0.574  ,  0.50267  ]
                                  [   0.683  ,  0.55377  ]
                                  [   0.795  ,  0.6051  ]
                                  [   -1  ,  -1  ]
                                 NHYDovf=["Pond1-Over"],
*%-----------------|-------------------------------------------------------------------------------|
CALIB STANDHYD      NHYD=["Dev-P3"], DT=[1](min), AREA=[14.479](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[311](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------|
CALIB STANDHYD      NHYD=["SWM3"], DT=[1](min), AREA=[1.452](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[98](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------|
ADD HYD             NHYDsum=["Pond3-In"], NHYDs to add=["Dev-P3"+"SWM3"]
*%-----------------|-------------------------------------------------------------------------------|
ROUTE RESERVOIR     NHYDout=["Pond3-Out"], NHYDin=["Pond3-In"], RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [   0.0 ,  0.0 ]
                                  [   0.002 , 0.0637   ]
                                  [   0.07  ,  0.18661  ]
                                  [   0.084  ,  0.2178  ]
                                  [   0.159  ,  0.2954  ]
                                  [   0.219  ,  0.3466  ]
                                  [   0.248  ,  0.3528  ]
                                  [   0.305  ,  0.4156  ]
                                  [   0.373  ,  0.470  ]
                                  [   0.419  ,  0.4712  ]
                                  [   0.449  ,  0.5221  ]
                                  [   0.55  ,  0.54615  ]
                                  [   0.724  ,  0.6326  ]
                                  [   0.862  ,  0.69617  ]
                                  [   1.005  ,  0.761  ]
                                  [   -1  ,  -1  ]
                                 NHYDovf=["Pond1-Over"],
*%-----------------|-------------------------------------------------------------------------------|
*ADD HYD             NHYDsum=["Tay"], NHYDs to
```



N

Legend

Drainage Area
[Name]
[Area]
[% Imp]
Drains to Tay River
Drains to Grants Creek

SCALE: 1:5000

0 100 200 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-3884
www.jfsa.com

CAIVAN
COMMUNITIES

Perth Golf Course

Figure E5: Post-Development Drainage Area

PROJECT	2118-21
DRAWN	BT
DATE	February 2023

```
add=["Pond1-Out"+"Pond1-Over"+"Pond3-Out"+"Pond3-Over"]
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
*#*******************************************************************************
***********
*# GRANTS CREEK
*#*******************************************************************************
***********
CALIB STANDHYD      NHYD=["DEV-P2"], DT=[1](min), AREA=[13.211](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[297](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
CALIB STANDHYD      NHYD=["SWM2"], DT=[1](min), AREA=[1.355](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[95](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
CALIB STANDHYD      NHYD=["OGS2"], DT=[1](min), AREA=[1.754](ha), XIMP=[0.56],
TIMP=[0.66], DWF=[0](cms),
                    LOSS=[1] Horton Equ: Fo=[76.2](mm/hr), Fc=[13.2](mm/hr),
                    DCAY=[4.14](/hr), F=[0.00](mm),
                    Pervious   areas: IAper=[4.67](mm), SLPP=[2.0](%), LGP=[40](m),
                    MNP=[0.25], SCP=[0](min),
                    Impervious areas: IAimp=[1.57](mm), SLPI=[0.5](%), LGI=[108](m),
                    MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  -1](mm/hr)
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
ADD HYD             NHYDsum=["Pond2-In"], NHYDs to add=["DEV-P2"+"SWM2"+"OGS2"]
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
ROUTE RESERVOIR     NHYDout=["Pond2-Out"], NHYDin=["Pond2-In"], RDT=[1](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                   (cms) - (ha-m)
                                   [   0 ,  0 ]
                                 [   0.002 ,  0.0653 ]
                                 [   0.125 ,  0.1723 ]
                                 [   0.149  ,  0.1974  ]
                                 [   0.288  ,  0.26845  ]
                                 [   0.399  ,  0.3151  ]
                                 [   0.559  ,  0.3773  ]
                                 [   0.688  ,  0.4223  ]
                                 [   0.83  ,  0.4678  ]
                                 [   1.382  ,  0.54086  ]
                                 [   1.653  ,  0.5874  ]
                                 [   1.932  ,  0.6343  ]
                                 [   -1  ,  -1  ]
                                NHYDovf=["Pond2-Over"],
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
*SAVE HYD            NHYD=["OGSGrant"],  # OF PCYCLES=[-1],  ICASEsh=[1]
*                    HYD_COMMENT=["Overflows to Grants Creek from uncontrolled"]
*%-----------------|-------------------------------------------------------------------------------
-----------------------------|
*ADD HYD             NHYDsum=["Grant"], NHYDs to add=["Pond2-Out"+"Pond2-Over"]
*%-----------------|-------------------------------------------------------------------------------
```

```
   ------------------------------|
*ADD HYD             NHYDsum=["Total"], NHYDs to add=["Tay"+"Grant"]
*%-----------------|-------------------------------------------------------------------
   ------------------------------|
*#############################################################################
*# STORMS
*#############################################################################
*%  25 mm Storm based on 2-Year, 3-Hour Chicago Storm
*%START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[001]
*%                   ["25MMC3H.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  2-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    ["002YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  5-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    ["005YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  10-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    ["010YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  25-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    ["025YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  50-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    ["050YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[099]
                    ["100YRCHI3HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  2-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[102]
                    ["002YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  5-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[105]
                    ["005YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  10-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[110]
                    ["010YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  25-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
                    ["025YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  50-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[150]
                    ["050YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[199]
                    ["100YRSCS24HR.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  100-Year, 24-Hour SCS Storm + 20%
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[998]
*%                   ["SC24100x+.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
*%  100-Year, 3-Hour Chicago Storm + 20%
*START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[999]
*                   ["100YRCHI3HR+.stm"] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------------|
FINISH
```

```
 ===============================================================================================
 SSSSS   W   W   M   M   H   H   Y   Y   M   M    OOO         222     000    11   5555   =========
 S       W W W   MM MM   H   H    Y Y    MM MM   O   O          2    0   0   11   5
 SSSSS   W W W   M M M   HHHHH     Y     M M M   O   O          2    0   0   11   5      Ver 5.500
     S    W W    M   M   H   H     Y     M   M   O   O        222    0   0   11   555    FEB  2015
 SSSSS    W W    M   M   H   H     Y     M   M    OOO         2      0   0   11     5    =========
                                                              2      0   0   11     5    # 2549237
       StormWater Management HYdrologic Model                  222     000    11   555    =========
 ***********************************************************************************************
 ************************************** SWMHYMO Ver 5.500 **************************************
 ******************  A single event and continuous hydrologic simulation model  ****************
 ******************     based on the principles of HYMO and its successors      ****************
 ******************                OTTHYMO-83 and OTTHYMO-89.                   ****************
 ***********************************************************************************************
 ****************** Distributed by:  J.F. Sabourin and Associates Inc.          ****************
 ******************                  Ottawa,  Ontario: (613) 836-3884           ****************
 ******************                  Gatineau, Quebec: (819) 243-6858           ****************
 ******************                  E-Mail: swmhymo@jfsa.Com                   ****************
 ***********************************************************************************************
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 ++++++++++++++++++ Licensed user: JFSAinc.                                     +++++++++++++++++++
 ++++++++++++++++++                Ottawa                 SERIAL#:2549237       +++++++++++++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 ***********************************************************************************************
 ******************          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             ****************
 ******************          Maximum value for ID numbers  :     11             ****************
 ******************          Max. number of rainfall points: 105408             ****************
 ******************          Max. number of flow points    : 105408             ****************
 ***********************************************************************************************
 ********************************   S U M M A R Y   O U T P U T   *****************************
 ***********************************************************************************************
 *                  RUN DATE: 2023-02-16     TIME: 15:31:27     RUN COUNTER: 004651            *
 ***********************************************************************************************
 * Input   file: C:\Temp\2118\20230126-PostDev\PERTH-Post_v01.3.dat                            *
 * Output  file: C:\Temp\2118\20230126-PostDev\PERTH-Post_v01.3.out                            *
 * Summary file: C:\Temp\2118\20230126-PostDev\PERTH-Post_v01.3.sum                            *
 * User comments:                                                                              *
 * 1:__________________________________________________________________________________________*
 * 2:__________________________________________________________________________________________*
 * 3:__________________________________________________________________________________________*
 ***********************************************************************************************
#***********************************************************************************************
#  SWMHYMO  / INPUT DATA FILE
#***********************************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#***********************************************************************************************
# Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
#***********************************************************************************************
 RUN#:COMMAND#
R0001:C00001------------------------------------------------------------------------------------
     START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 0001 ]
R0001:C00002------------------------------------------------------------------------------------
     READ STORM
       Filename = STORM.001
       Comment  = 25 MM BASED ON CHICAGO STORM 2 Year, 3 Hours
       [SDT=10.00:SDUR=   3.00:PTOT=  25.00]
#***********************************************************************************************
# TAY RIVER
#***********************************************************************************************
R0001:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P1        10.49     .743 No_date    1:03   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
R0001:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM1            .77     .070 No_date    1:00   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
R0001:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:OGS1           1.35     .118 No_date    1:00   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
R0001:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P1        10.49     .743 No_date    1:03   14.43  n/a     .000
                    +     1.0 02:SWM1            .77     .070 No_date    1:00   14.43  n/a     .000
                    +     1.0 02:OGS1           1.35     .118 No_date    1:00   14.43  n/a     .000
                 SUM=     1.0 01:Pond1-In      12.61     .910 No_date    1:02   14.43  n/a     .000
R0001:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond1-In      12.61     .910 No_date    1:02   14.43  n/a     .000
                out <=    1.0 01:Pond1-Out     12.61     .056 No_date    2:25   14.43  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.1477E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
R0001:C00008-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P3        14.48     .978 No_date    1:04   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
R0001:C00009-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM3           1.45     .126 No_date    1:00   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
R0001:C00010-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P3        14.48     .978 No_date    1:04   14.43  n/a     .000
                    +     1.0 02:SWM3           1.45     .126 No_date    1:00   14.43  n/a     .000
                 SUM=     1.0 01:Pond3-In      15.93    1.082 No_date    1:03   14.43  n/a     .000
R0001:C00011-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond3-In      15.93    1.082 No_date    1:03   14.43  n/a     .000
                out <=    1.0 01:Pond3-Out     15.93     .070 No_date    2:28   14.43  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.1866E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
#***********************************************************************************************
# GRANTS CREEK
#***********************************************************************************************
R0001:C00012-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:DEV-P2        13.21     .912 No_date    1:03   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
R0001:C00013-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM2           1.36     .118 No_date    1:00   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
R0001:C00014-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:OGS2           1.75     .150 No_date    1:00   14.43 .577     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
R0001:C00015-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:DEV-P2        13.21     .912 No_date    1:03   14.43  n/a     .000
                    +     1.0 02:SWM2           1.36     .118 No_date    1:00   14.43  n/a     .000
                    +     1.0 02:OGS2           1.75     .150 No_date    1:00   14.43  n/a     .000
                 SUM=     1.0 01:Pond2-In      16.32    1.158 No_date    1:02   14.43  n/a     .000
R0001:C00016-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond2-In      16.32    1.158 No_date    1:02   14.43  n/a     .000
                out <=    1.0 01:Pond2-Out     16.32     .125 No_date    1:56   14.43  n/a     .000
           overflow <=    1.0 03:Pond2-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.1723E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
###############################################################################
# STORMS
###############################################################################
  ** END OF RUN :    1
***********************************************************************************************
 RUN#:COMMAND#
R0002:C00001------------------------------------------------------------------------------------
     START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 0002 ]
#***********************************************************************************************
#  SWMHYMO  / INPUT DATA FILE
#***********************************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#***********************************************************************************************
# Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
#***********************************************************************************************
R0002:C00002------------------------------------------------------------------------------------
     READ STORM
       Filename = STORM.001
       Comment  = 002YRCHI3HR-Perth MTO IDF
       [SDT=10.00:SDUR=   3.00:PTOT=  28.33]
#***********************************************************************************************
# TAY RIVER
#***********************************************************************************************
R0002:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P1        10.49     .916 No_date    1:02   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
R0002:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM1            .77     .086 No_date    1:00   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
R0002:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:OGS1           1.35     .146 No_date    1:00   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
R0002:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P1        10.49     .916 No_date    1:02   17.17  n/a     .000
                    +     1.0 02:SWM1            .77     .086 No_date    1:00   17.17  n/a     .000
                    +     1.0 02:OGS1           1.35     .146 No_date    1:00   17.17  n/a     .000
                 SUM=     1.0 01:Pond1-In      12.61    1.125 No_date    1:01   17.17  n/a     .000
R0002:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond1-In      12.61    1.125 No_date    1:01   17.17  n/a     .000
                out <=    1.0 01:Pond1-Out     12.61     .066 No_date    2:40   17.16  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.1725E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
R0002:C00008-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P3        14.48    1.202 No_date    1:03   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
R0002:C00009-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM3           1.45     .154 No_date    1:00   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
R0002:C00010-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P3        14.48    1.202 No_date    1:03   17.17  n/a     .000
                    +     1.0 02:SWM3           1.45     .154 No_date    1:00   17.17  n/a     .000
                 SUM=     1.0 01:Pond3-In      15.93    1.336 No_date    1:02   17.17  n/a     .000
R0002:C00011-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond3-In      15.93    1.336 No_date    1:02   17.17  n/a     .000
                out <=    1.0 01:Pond3-Out     15.93     .084 No_date    2:42   17.17  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.2178E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
#***********************************************************************************************
# GRANTS CREEK
#***********************************************************************************************
R0002:C00012-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:DEV-P2        13.21    1.107 No_date    1:03   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
R0002:C00013-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM2           1.36     .147 No_date    1:00   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
R0002:C00014-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:OGS2           1.75     .184 No_date    1:00   17.17 .606     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
R0002:C00015-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:DEV-P2        13.21    1.107 No_date    1:03   17.17  n/a     .000
                    +     1.0 02:SWM2           1.36     .147 No_date    1:00   17.17  n/a     .000
                    +     1.0 02:OGS2           1.75     .184 No_date    1:00   17.17  n/a     .000
                 SUM=     1.0 01:Pond2-In      16.32    1.403 No_date    1:02   17.17  n/a     .000
R0002:C00016-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond2-In      16.32    1.403 No_date    1:02   17.17  n/a     .000
                out <=    1.0 01:Pond2-Out     16.32     .149 No_date    1:58   17.17  n/a     .000
           overflow <=    1.0 03:Pond2-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.1974E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
###############################################################################
# STORMS
###############################################################################
  ** END OF RUN :    4
***********************************************************************************************
 RUN#:COMMAND#
R0005:C00001------------------------------------------------------------------------------------
     START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  = 0005 ]
#***********************************************************************************************
#  SWMHYMO  / INPUT DATA FILE
#***********************************************************************************************
#  Project Name  : [Caivan Perth properties]
#  Project Number: [2118]
#  Date          : [2023 JAN 26]
#  Modeller      : [JB]
#  Company       : J.F. Sabourin and Associates
#  License #     : 2549237
#***********************************************************************************************
# Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
#***********************************************************************************************
R0005:C00002------------------------------------------------------------------------------------
     READ STORM
       Filename = STORM.001
       Comment  = 005YRCHI3HR-Perth MTO IDF
       [SDT=10.00:SDUR=   3.00:PTOT=  37.67]
#***********************************************************************************************
# TAY RIVER
#***********************************************************************************************
R0005:C00003-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P1        10.49    1.356 No_date    1:02   24.40 .648     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
R0005:C00004-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM1            .77     .125 No_date    1:00   24.40 .648     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
R0005:C00005-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:OGS1           1.35     .213 No_date    1:00   24.40 .648     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
R0005:C00006-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P1        10.49    1.356 No_date    1:02   24.40  n/a     .000
                    +     1.0 02:SWM1            .77     .125 No_date    1:00   24.40  n/a     .000
                    +     1.0 02:OGS1           1.35     .213 No_date    1:00   24.40  n/a     .000
                 SUM=     1.0 01:Pond1-In      12.61    1.659 No_date    1:02   24.40  n/a     .000
R0005:C00007-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond1-In      12.61    1.659 No_date    1:02   24.40  n/a     .000
                out <=    1.0 01:Pond1-Out     12.61     .126 No_date    2:05   24.40  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
      {MxStoUsed=.2339E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
R0005:C00008-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:Dev-P3        14.48    1.795 No_date    1:03   24.40 .648     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
R0005:C00009-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     CALIB STANDHYD       1.0 01:SWM3           1.45     .227 No_date    1:00   24.40 .648     .000
       [XIMP=.56:TIMP=.66]
       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
R0005:C00010-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ADD HYD              1.0 02:Dev-P3        14.48    1.795 No_date    1:03   24.40  n/a     .000
                    +     1.0 02:SWM3           1.45     .227 No_date    1:00   24.40  n/a     .000
                 SUM=     1.0 01:Pond3-In      15.93    2.000 No_date    1:02   24.40  n/a     .000
R0005:C00011-----------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
     ROUTE RESERVOIR ->   1.0 02:Pond3-In      15.93    2.000 No_date    1:02   24.40  n/a     .000
                out <=    1.0 01:Pond3-Out     15.93     .159 No_date    2:07   24.40  n/a     .000
           overflow <=    1.0 03:Pond1-Over      .00     .000 No_date    0:00     .00  n/a     .000
```

```
00361>      {MxStoUsed=.2954E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00362> #*******************************************************************************
00363> # GRANTS CREEK
00364> #*******************************************************************************
00365> R0005:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00366>      CALIB STANDHYD         1.0 01:DEV-P2        13.21    1.652 No_date    1:02   24.40 .648     .000
00367>        [XIMP=.56:TIMP=.66]
00368>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00369>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00370>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00371> R0005:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00372>      CALIB STANDHYD         1.0 01:SWM2          1.36     .213 No_date    1:00   24.40 .648     .000
00373>        [XIMP=.56:TIMP=.66]
00374>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00375>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00376>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00377> R0005:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00378>      CALIB STANDHYD         1.0 01:OGS2          1.75     .272 No_date    1:00   24.40 .648     .000
00379>        [XIMP=.56:TIMP=.66]
00380>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00381>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00382>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
00383> R0005:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00384>      ADD HYD                1.0 02:DEV-P2        13.21    1.652 No_date    1:02   24.40  n/a     .000
00385>                         +    1.0 02:SWM2          1.36     .213 No_date    1:00   24.40  n/a     .000
00386>                         +    1.0 02:OGS2          1.75     .272 No_date    1:00   24.40  n/a     .000
00387>                       SUM=   1.0 01:Pond2-In      16.32    2.094 No_date    1:02   24.40  n/a     .000
00388> R0005:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00389>      ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    2.094 No_date    1:02   24.40  n/a     .000
00390>                       out <=   1.0 01:Pond2-Out   16.32     .288 No_date    1:41   24.40  n/a     .000
00391>              overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
00392>      {MxStoUsed=.2604E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00393> ###############################################################################
00394> # STORMS
00395> ###############################################################################
00396>   ** END OF RUN :    9
00397>
00398> *******************************************************************************
00399>
00400>
00401>
00402>
00403>
00404>  RUN#:COMMAND#
00405> R0010:C00001------------------------------------------------------------------------
00406>      START
00407>        [TZERO =     .00 hrs on       0]
00408>        [METOUT=   2   (1=imperial, 2=metric output)]
00409>        [NSTORM=   1 ]
00410>        [NRUN  = 0010 ]
00411> #*******************************************************************************
00412> #  SWMHYMO  / INPUT DATA FILE
00413> #*******************************************************************************
00414> #  Project Name  : [Caivan Perth properties]
00415> #  Project Number: [2118]
00416> #  Date          : [2023 JAN 26]
00417> #  Modeller      : [JB]
00418> #  Company       : J.F. Sabourin and Associates
00419> #  License #     : 2549237
00420> #*******************************************************************************
00421> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
00422> #*******************************************************************************
00423> R0010:C00002------------------------------------------------------------------------
00424>      READ STORM
00425>        Filename = STORM.001
00426>        Comment  = 010YRCHI3HR-Perth MTO IDF
00427>        [SDT=10.00:SDUR=   3.00:PTOT=  43.78]
00428> #*******************************************************************************
00429> # TAY RIVER
00430> #*******************************************************************************
00431> R0010:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00432>      CALIB STANDHYD         1.0 01:Dev-P1        10.49    1.708 No_date    1:02   29.24 .668     .000
00433>        [XIMP=.56:TIMP=.66]
00434>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00435>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00436>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
00437> R0010:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00438>      CALIB STANDHYD         1.0 01:SWM1           .77     .155 No_date    1:00   29.24 .668     .000
00439>        [XIMP=.56:TIMP=.66]
00440>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00441>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00442>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
00443> R0010:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00444>      CALIB STANDHYD         1.0 01:OGS1          1.35     .266 No_date    1:00   29.24 .668     .000
00445>        [XIMP=.56:TIMP=.66]
00446>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00447>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00448>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00449> R0010:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00450>      ADD HYD                1.0 02:Dev-P1        10.49    1.708 No_date    1:02   29.24  n/a     .000
00451>                         +    1.0 02:SWM1           .77     .155 No_date    1:00   29.24  n/a     .000
00452>                         +    1.0 02:OGS1          1.35     .266 No_date    1:00   29.24  n/a     .000
00453>                       SUM=   1.0 01:Pond1-In      12.61    2.097 No_date    1:01   29.24  n/a     .000
00454> R0010:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00455>      ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    2.097 No_date    1:01   29.24  n/a     .000
00456>                       out <=   1.0 01:Pond1-Out   12.61     .174 No_date    1:53   29.23  n/a     .000
00457>              overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
00458>      {MxStoUsed=.2745E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00459> R0010:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00460>      CALIB STANDHYD         1.0 01:Dev-P3        14.48    2.244 No_date    1:03   29.24 .668     .000
00461>        [XIMP=.56:TIMP=.66]
00462>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00463>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00464>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
00465> R0010:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00466>      CALIB STANDHYD         1.0 01:SWM3          1.45     .285 No_date    1:00   29.24 .668     .000
00467>        [XIMP=.56:TIMP=.66]
00468>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00469>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00470>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
00471> R0010:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00472>      ADD HYD                1.0 02:Dev-P3        14.48    2.244 No_date    1:03   29.24  n/a     .000
00473>                         +    1.0 02:SWM3          1.45     .285 No_date    1:00   29.24  n/a     .000
00474>                       SUM=   1.0 01:Pond3-In      15.93    2.495 No_date    1:02   29.24  n/a     .000
00475> R0010:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00476>      ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    2.495 No_date    1:02   29.24  n/a     .000
00477>                       out <=   1.0 01:Pond3-Out   15.93     .219 No_date    1:55   29.24  n/a     .000
00478>              overflow <=     1.0 03:Pond3-Over     .00     .000 No_date    0:00     .00  n/a     .000
00479>      {MxStoUsed=.3466E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00480> #*******************************************************************************
00481> # GRANTS CREEK
00482> #*******************************************************************************
00483> R0010:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00484>      CALIB STANDHYD         1.0 01:DEV-P2        13.21    2.063 No_date    1:03   29.24 .668     .000
00485>        [XIMP=.56:TIMP=.66]
00486>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00487>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00488>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00489> R0010:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00490>      CALIB STANDHYD         1.0 01:SWM2          1.36     .267 No_date    1:00   29.24 .668     .000
00491>        [XIMP=.56:TIMP=.66]
00492>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00493>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00494>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00495> R0010:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00496>      CALIB STANDHYD         1.0 01:OGS2          1.75     .341 No_date    1:00   29.24 .668     .000
00497>        [XIMP=.56:TIMP=.66]
00498>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00499>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00500>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
00501> R0010:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00502>      ADD HYD                1.0 02:DEV-P2        13.21    2.063 No_date    1:03   29.24  n/a     .000
00503>                         +    1.0 02:SWM2          1.36     .267 No_date    1:00   29.24  n/a     .000
00504>                         +    1.0 02:OGS2          1.75     .341 No_date    1:00   29.24  n/a     .000
00505>                       SUM=   1.0 01:Pond2-In      16.32    2.614 No_date    1:02   29.24  n/a     .000
00506> R0010:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00507>      ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    2.614 No_date    1:02   29.24  n/a     .000
00508>                       out <=   1.0 01:Pond2-Out   16.32     .399 No_date    1:34   29.24  n/a     .000
00509>              overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
00510>      {MxStoUsed=.3151E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00511> ###############################################################################
00512> # STORMS
00513> ###############################################################################
00514>   ** END OF RUN :   24
00515>
00516> *******************************************************************************
00517>
00518>
00519>
00520>
00521>
00522>  RUN#:COMMAND#
00523> R0025:C00001------------------------------------------------------------------------
00524>      START
00525>        [TZERO =     .00 hrs on       0]
00526>        [METOUT=   2   (1=imperial, 2=metric output)]
00527>        [NSTORM=   1 ]
00528>        [NRUN  = 0025 ]
00529> #*******************************************************************************
00530> #  SWMHYMO  / INPUT DATA FILE
00531> #*******************************************************************************
00532> #  Project Name  : [Caivan Perth properties]
00533> #  Project Number: [2118]
00534> #  Date          : [2023 JAN 26]
00535> #  Modeller      : [JB]
00536> #  Company       : J.F. Sabourin and Associates
00537> #  License #     : 2549237
00538> #*******************************************************************************
00539> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
00540> #*******************************************************************************
00541> R0025:C00002------------------------------------------------------------------------
00542>      READ STORM
00543>        Filename = STORM.001
00544>        Comment  = 025YRCHI3HR-Perth MTO IDF
00545>        [SDT=10.00:SDUR=   3.00:PTOT=  51.56]
00546> #*******************************************************************************
00547> # TAY RIVER
00548> #*******************************************************************************
00549> R0025:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00550>      CALIB STANDHYD         1.0 01:Dev-P1        10.49    2.142 No_date    1:02   35.82 .695     .000
00551>        [XIMP=.56:TIMP=.66]
00552>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00553>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00554>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
00555> R0025:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00556>      CALIB STANDHYD         1.0 01:SWM1           .77     .192 No_date    1:00   35.82 .695     .000
00557>        [XIMP=.56:TIMP=.66]
00558>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00559>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00560>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
00561> R0025:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00562>      CALIB STANDHYD         1.0 01:OGS1          1.35     .332 No_date    1:00   35.82 .695     .000
00563>        [XIMP=.56:TIMP=.66]
00564>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00565>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00566>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00567> R0025:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00568>      ADD HYD                1.0 02:Dev-P1        10.49    2.142 No_date    1:02   35.82  n/a     .000
00569>                         +    1.0 02:SWM1           .77     .192 No_date    1:00   35.82  n/a     .000
00570>                         +    1.0 02:OGS1          1.35     .332 No_date    1:00   35.82  n/a     .000
00571>                       SUM=   1.0 01:Pond1-In      12.61    2.619 No_date    1:01   35.82  n/a     .000
00572> R0025:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00573>      ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    2.619 No_date    1:01   35.82  n/a     .000
00574>                       out <=   1.0 01:Pond1-Out   12.61     .241 No_date    1:46   35.81  n/a     .000
00575>              overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
00576>      {MxStoUsed=.3297E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00577> R0025:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00578>      CALIB STANDHYD         1.0 01:Dev-P3        14.48    2.816 No_date    1:03   35.82 .695     .000
00579>        [XIMP=.56:TIMP=.66]
00580>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00581>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00582>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
00583> R0025:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00584>      CALIB STANDHYD         1.0 01:SWM3          1.45     .355 No_date    1:00   35.82 .695     .000
00585>        [XIMP=.56:TIMP=.66]
00586>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00587>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00588>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
00589> R0025:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00590>      ADD HYD                1.0 02:Dev-P3        14.48    2.816 No_date    1:03   35.82  n/a     .000
00591>                         +    1.0 02:SWM3          1.45     .355 No_date    1:00   35.82  n/a     .000
00592>                       SUM=   1.0 01:Pond3-In      15.93    3.121 No_date    1:02   35.82  n/a     .000
00593> R0025:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00594>      ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    3.121 No_date    1:02   35.82  n/a     .000
00595>                       out <=   1.0 01:Pond3-Out   15.93     .305 No_date    1:48   35.81  n/a     .000
00596>              overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
00597>      {MxStoUsed=.4156E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00598> #*******************************************************************************
00599> # GRANTS CREEK
00600> #*******************************************************************************
00601> R0025:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00602>      CALIB STANDHYD         1.0 01:DEV-P2        13.21    2.648 No_date    1:02   35.82 .695     .000
00603>        [XIMP=.56:TIMP=.66]
00604>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00605>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00606>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00607> R0025:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00608>      CALIB STANDHYD         1.0 01:SWM2          1.36     .332 No_date    1:00   35.82 .695     .000
00609>        [XIMP=.56:TIMP=.66]
00610>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00611>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00612>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00613> R0025:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00614>      CALIB STANDHYD         1.0 01:OGS2          1.75     .425 No_date    1:00   35.82 .695     .000
00615>        [XIMP=.56:TIMP=.66]
00616>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00617>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00618>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
00619> R0025:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00620>      ADD HYD                1.0 02:DEV-P2        13.21    2.648 No_date    1:02   35.82  n/a     .000
00621>                         +    1.0 02:SWM2          1.36     .332 No_date    1:00   35.82  n/a     .000
00622>                         +    1.0 02:OGS2          1.75     .425 No_date    1:00   35.82  n/a     .000
00623>                       SUM=   1.0 01:Pond2-In      16.32    3.350 No_date    1:01   35.82  n/a     .000
00624> R0025:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00625>      ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    3.350 No_date    1:01   35.82  n/a     .000
00626>                       out <=   1.0 01:Pond2-Out   16.32     .559 No_date    1:30   35.81  n/a     .000
00627>              overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
00628>      {MxStoUsed=.3773E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00629> ###############################################################################
00630> # STORMS
00631> ###############################################################################
00632>   ** END OF RUN :   49
00633>
00634> *******************************************************************************
00635>
00636>
00637>
00638>
00639>
00640>  RUN#:COMMAND#
00641> R0050:C00001------------------------------------------------------------------------
00642>      START
00643>        [TZERO =     .00 hrs on       0]
00644>        [METOUT=   2   (1=imperial, 2=metric output)]
00645>        [NSTORM=   1 ]
00646>        [NRUN  = 0050 ]
00647> #*******************************************************************************
00648> #  SWMHYMO  / INPUT DATA FILE
00649> #*******************************************************************************
00650> #  Project Name  : [Caivan Perth properties]
00651> #  Project Number: [2118]
00652> #  Date          : [2023 JAN 26]
00653> #  Modeller      : [JB]
00654> #  Company       : J.F. Sabourin and Associates
00655> #  License #     : 2549237
00656> #*******************************************************************************
00657> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
00658> #*******************************************************************************
00659> R0050:C00002------------------------------------------------------------------------
00660>      READ STORM
00661>        Filename = STORM.001
00662>        Comment  = 050YRCHI3HR-Perth MTO IDF
00663>        [SDT=10.00:SDUR=   3.00:PTOT=  57.24]
00664> #*******************************************************************************
00665> # TAY RIVER
00666> #*******************************************************************************
00667> R0050:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00668>      CALIB STANDHYD         1.0 01:Dev-P1        10.49    2.495 No_date    1:02   40.85 .714     .000
00669>        [XIMP=.56:TIMP=.66]
00670>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00671>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00672>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
00673> R0050:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00674>      CALIB STANDHYD         1.0 01:SWM1           .77     .222 No_date    1:00   40.85 .714     .000
00675>        [XIMP=.56:TIMP=.66]
00676>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00677>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00678>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
00679> R0050:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00680>      CALIB STANDHYD         1.0 01:OGS1          1.35     .376 No_date    1:00   40.85 .714     .000
00681>        [XIMP=.56:TIMP=.66]
00682>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00683>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00684>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00685> R0050:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00686>      ADD HYD                1.0 02:Dev-P1        10.49    2.495 No_date    1:02   40.85  n/a     .000
00687>                         +    1.0 02:SWM1           .77     .222 No_date    1:00   40.85  n/a     .000
00688>                         +    1.0 02:OGS1          1.35     .376 No_date    1:00   40.85  n/a     .000
00689>                       SUM=   1.0 01:Pond1-In      12.61    3.043 No_date    1:01   40.85  n/a     .000
00690> R0050:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00691>      ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    3.043 No_date    1:01   40.85  n/a     .000
00692>                       out <=   1.0 01:Pond1-Out   12.61     .296 No_date    1:44   40.84  n/a     .000
00693>              overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
00694>      {MxStoUsed=.3725E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00695> R0050:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00696>      CALIB STANDHYD         1.0 01:Dev-P3        14.48    3.282 No_date    1:02   40.85 .714     .000
00697>        [XIMP=.56:TIMP=.66]
00698>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00699>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00700>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
00701> R0050:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00702>      CALIB STANDHYD         1.0 01:SWM3          1.45     .403 No_date    1:00   40.85 .714     .000
00703>        [XIMP=.56:TIMP=.66]
00704>        [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
00705>        [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00706>        [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
00707> R0050:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00708>      ADD HYD                1.0 02:Dev-P3        14.48    3.282 No_date    1:02   40.85  n/a     .000
00709>                         +    1.0 02:SWM3          1.45     .403 No_date    1:00   40.85  n/a     .000
00710>                       SUM=   1.0 01:Pond3-In      15.93    3.649 No_date    1:02   40.85  n/a     .000
00711> R0050:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00712>      ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    3.649 No_date    1:02   40.85  n/a     .000
00713>                       out <=   1.0 01:Pond3-Out   15.93     .373 No_date    1:45   40.84  n/a     .000
00714>              overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
00715>      {MxStoUsed=.4698E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00716> #*******************************************************************************
00717> # GRANTS CREEK
00718> #*******************************************************************************
00719> R0050:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00720>      CALIB STANDHYD         1.0 01:DEV-P2        13.21    3.017 No_date    1:02   40.85 .714     .000
```

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00721>       [XIMP=.56:TIMP=.66]
00722>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00723>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00724>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00725> R0050:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00726>     CALIB STANDHYD         1.0 01:SWM2          1.36     .377 No_date   1:00   40.85 .714     .000
00727>       [XIMP=.56:TIMP=.66]
00728>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00729>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00730>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00731> R0050:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00732>     CALIB STANDHYD         1.0 01:OGS2          1.75     .483 No_date   1:00   40.85 .714     .000
00733>       [XIMP=.56:TIMP=.66]
00734>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00735>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00736>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 100.:MNI=.013:SCI=   .0]
00737> R0050:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00738>     ADD HYD                1.0 02:DEV-P2       13.21    3.017 No_date   1:02   40.85  n/a     .000
00739>                        +   1.0 02:SWM2          1.36     .377 No_date   1:00   40.85  n/a     .000
00740>                        +   1.0 02:OGS2          1.75     .483 No_date   1:00   40.85  n/a     .000
00741>                    SUM=    1.0 01:Pond2-In      16.32    3.812 No_date   1:01   40.85  n/a     .000
00742> R0050:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00743>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    3.812 No_date   1:01   40.85  n/a     .000
00744>                    out <=  1.0 01:Pond2-Out     16.32     .688 No_date   1:29   40.84  n/a     .000
00745>              overflow <=   1.0 03:Pond2-Over      .00     .000 No_date   0:00    .00  n/a     .000
00746>     {MxStoUsed=.4223E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00747> ###########################################################################
00748> # STORMS
00749> ###########################################################################
00750>   ** END OF RUN :   98
00751>
00752> ************************************************************************************************
00753>
00754>
00755>
00756>
00757>
00758>  RUN#:COMMAND#
00759> R0099:C00001------------------------------------------------------------------------------------
00760>       START
00761>       [TZERO =    .00 hrs on       0]
00762>       [METOUT=   2   (1=imperial, 2=metric output)]
00763>       [NSTORM=   1 ]
00764>       [NRUN  = 0099 ]
00765> ************************************************************************************************
00766> #  SWMHYMO  / INPUT DATA FILE
00767> ************************************************************************************************
00768> #  Project Name  : [Caivan Perth properties]
00769> #  Project Number: [2118]
00770> #  Date          : [2023 JAN 26]
00771> #  Modeller      : [JB]
00772> #  Company       : J.F. Sabourin and Associates
00773> #  License #     : 2549237
00774> ************************************************************************************************
00775> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
00776> ************************************************************************************************
00777> R0099:C00002------------------------------------------------------------------------------------
00778>       READ STORM
00779>        Filename = STORM.001
00780>        Comment  = 100YRCHI3HR-Perth MTO IDF
00781>        [SDT=10.00:SDUR=  1.00:PTOT=  83.00]
00782> ************************************************************************************************
00783> # TAY RIVER
00784> ************************************************************************************************
00785> R0099:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00786>     CALIB STANDHYD         1.0 01:Dev-P1        10.49    2.815 No_date   1:02   46.06 .731     .000
00787>       [XIMP=.56:TIMP=.66]
00788>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00789>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00790>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
00791> R0099:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00792>     CALIB STANDHYD         1.0 01:SWM1           .77     .250 No_date   1:00   46.06 .731     .000
00793>       [XIMP=.56:TIMP=.66]
00794>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00795>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00796>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
00797> R0099:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00798>     CALIB STANDHYD         1.0 01:OGS1          1.35     .432 No_date   1:00   46.06 .731     .000
00799>       [XIMP=.56:TIMP=.66]
00800>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00801>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00802>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00803> R0099:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00804>     ADD HYD                1.0 02:Dev-P1        10.49    2.815 No_date   1:02   46.06  n/a     .000
00805>                        +   1.0 02:SWM1           .77     .250 No_date   1:00   46.06  n/a     .000
00806>                        +   1.0 02:OGS1          1.35     .432 No_date   1:00   46.06  n/a     .000
00807>                    SUM=    1.0 01:Pond1-In      12.61    3.439 No_date   1:01   46.06  n/a     .000
00808> R0099:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00809>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    3.439 No_date   1:01   46.06  n/a     .000
00810>                    out <=  1.0 01:Pond1-Out     12.61     .355 No_date   1:43   46.05  n/a     .000
00811>              overflow <=   1.0 03:Pond1-Over      .00     .000 No_date   0:00    .00  n/a     .000
00812>     {MxStoUsed=.4141E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00813> R0099:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00814>     CALIB STANDHYD         1.0 01:Dev-P3        14.48    3.792 No_date   1:02   46.06 .731     .000
00815>       [XIMP=.56:TIMP=.66]
00816>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00817>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00818>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
00819> R0099:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00820>     CALIB STANDHYD         1.0 01:SWM3          1.45     .462 No_date   1:00   46.06 .731     .000
00821>       [XIMP=.56:TIMP=.66]
00822>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00823>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00824>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
00825> R0099:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00826>     ADD HYD                1.0 02:Dev-P3        14.48    3.792 No_date   1:02   46.06  n/a     .000
00827>                        +   1.0 02:SWM3          1.45     .462 No_date   1:00   46.06  n/a     .000
00828>                    SUM=    1.0 01:Pond3-In      15.93    4.211 No_date   1:02   46.06  n/a     .000
00829> R0099:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00830>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    4.211 No_date   1:02   46.06  n/a     .000
00831>                    out <=  1.0 01:Pond3-Out     15.93     .449 No_date   1:44   46.05  n/a     .000
00832>              overflow <=   1.0 03:Pond3-Over      .00     .000 No_date   0:00    .00  n/a     .000
00833>     {MxStoUsed=.5221E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00834> ************************************************************************************************
00835> # GRANTS CREEK
00836> ************************************************************************************************
00837> R0099:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00838>     CALIB STANDHYD         1.0 01:DEV-P2        13.21    3.485 No_date   1:02   46.06 .731     .000
00839>       [XIMP=.56:TIMP=.66]
00840>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00841>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00842>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00843> R0099:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00844>     CALIB STANDHYD         1.0 01:SWM2          1.36     .432 No_date   1:00   46.06 .731     .000
00845>       [XIMP=.56:TIMP=.66]
00846>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00847>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00848>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00849> R0099:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00850>     CALIB STANDHYD         1.0 01:OGS2          1.75     .554 No_date   1:00   46.06 .731     .000
00851>       [XIMP=.56:TIMP=.66]
00852>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00853>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00854>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 100.:MNI=.013:SCI=   .0]
00855> R0099:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00856>     ADD HYD                1.0 02:DEV-P2        13.21    3.485 No_date   1:02   46.06  n/a     .000
00857>                        +   1.0 02:SWM2          1.36     .432 No_date   1:00   46.06  n/a     .000
00858>                        +   1.0 02:OGS2          1.75     .554 No_date   1:00   46.06  n/a     .000
00859>                    SUM=    1.0 01:Pond2-In      16.32    4.404 No_date   1:01   46.06  n/a     .000
00860> R0099:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00861>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    4.404 No_date   1:01   46.06  n/a     .000
00862>                    out <=  1.0 01:Pond2-Out     16.32     .830 No_date   1:27   46.05  n/a     .000
00863>              overflow <=   1.0 03:Pond2-Over      .00     .000 No_date   0:00    .00  n/a     .000
00864>     {MxStoUsed=.4678E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00865> ###########################################################################
00866> # STORMS
00867> ###########################################################################
00868>   ** END OF RUN :  101
00869>
00870> ************************************************************************************************
00871>
00872>
00873>
00874>
00875>
00876>  RUN#:COMMAND#
00877> R0102:C00001------------------------------------------------------------------------------------
00878>       START
00879>       [TZERO =    .00 hrs on       0]
00880>       [METOUT=   2   (1=imperial, 2=metric output)]
00881>       [NSTORM=   1 ]
00882>       [NRUN  = 0102 ]
00883> ************************************************************************************************
00884> #  SWMHYMO  / INPUT DATA FILE
00885> ************************************************************************************************
00886> #  Project Name  : [Caivan Perth properties]
00887> #  Project Number: [2118]
00888> #  Date          : [2023 JAN 26]
00889> #  Modeller      : [JB]
00890> #  Company       : J.F. Sabourin and Associates
00891> #  License #     : 2549237
00892> ************************************************************************************************
00893> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
00894> ************************************************************************************************
00895> R0102:C00002------------------------------------------------------------------------------------
00896>       READ STORM
00897>        Filename = STORM.001
00898>        Comment  = 002YRSCS24HR-Perth MTO IDF
00899>        [SDT=10.00:SDUR=  24.00:PTOT=  53.12]
00900> ************************************************************************************************

00901> # TAY RIVER
00902> ************************************************************************************************
00903> R0102:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00904>     CALIB STANDHYD         1.0 01:Dev-P1        10.49    1.127 No_date   12:02   34.58 .651     .000
00905>       [XIMP=.56:TIMP=.66]
00906>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00907>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00908>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
00909> R0102:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00910>     CALIB STANDHYD         1.0 01:SWM1           .77     .099 No_date   12:00   34.58 .651     .000
00911>       [XIMP=.56:TIMP=.66]
00912>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00913>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00914>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
00915> R0102:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00916>     CALIB STANDHYD         1.0 01:OGS1          1.35     .170 No_date   12:00   34.58 .651     .000
00917>       [XIMP=.56:TIMP=.66]
00918>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00919>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00920>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00921> R0102:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00922>     ADD HYD                1.0 02:Dev-P1        10.49    1.127 No_date   12:02   34.58  n/a     .000
00923>                        +   1.0 02:SWM1           .77     .099 No_date   12:00   34.58  n/a     .000
00924>                        +   1.0 02:OGS1          1.35     .170 No_date   12:00   34.58  n/a     .000
00925>                    SUM=    1.0 01:Pond1-In      12.61    1.379 No_date   12:01   34.58  n/a     .000
00926> R0102:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00927>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    1.379 No_date   12:01   34.58  n/a     .000
00928>                    out <=  1.0 01:Pond1-Out     12.61     .196 No_date   12:37   34.57  n/a     .000
00929>              overflow <=   1.0 03:Pond1-Over      .00     .000 No_date   0:00    .00  n/a     .000
00930>     {MxStoUsed=.2805E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00931> R0102:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00932>     CALIB STANDHYD         1.0 01:Dev-P3        14.48    1.519 No_date   12:02   34.58 .651     .000
00933>       [XIMP=.56:TIMP=.66]
00934>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00935>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00936>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
00937> R0102:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00938>     CALIB STANDHYD         1.0 01:SWM3          1.45     .182 No_date   12:00   34.58 .651     .000
00939>       [XIMP=.56:TIMP=.66]
00940>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00941>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00942>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
00943> R0102:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00944>     ADD HYD                1.0 02:Dev-P3        14.48    1.519 No_date   12:02   34.58  n/a     .000
00945>                        +   1.0 02:SWM3          1.45     .182 No_date   12:00   34.58  n/a     .000
00946>                    SUM=    1.0 01:Pond3-In      15.93    1.694 No_date   12:02   34.58  n/a     .000
00947> R0102:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00948>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    1.694 No_date   12:02   34.58  n/a     .000
00949>                    out <=  1.0 01:Pond3-Out     15.93     .248 No_date   12:38   34.58  n/a     .000
00950>              overflow <=   1.0 03:Pond3-Over      .00     .000 No_date   0:00    .00  n/a     .000
00951>     {MxStoUsed=.3528E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00952> ************************************************************************************************
00953> # GRANTS CREEK
00954> ************************************************************************************************
00955> R0102:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00956>     CALIB STANDHYD         1.0 01:DEV-P2        13.21    1.396 No_date   12:02   34.58 .651     .000
00957>       [XIMP=.56:TIMP=.66]
00958>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00959>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00960>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
00961> R0102:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00962>     CALIB STANDHYD         1.0 01:SWM2          1.36     .171 No_date   12:00   34.58 .651     .000
00963>       [XIMP=.56:TIMP=.66]
00964>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00965>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00966>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
00967> R0102:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00968>     CALIB STANDHYD         1.0 01:OGS2          1.75     .216 No_date   12:00   34.58 .651     .000
00969>       [XIMP=.56:TIMP=.66]
00970>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
00971>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
00972>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
00973> R0102:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00974>     ADD HYD                1.0 02:DEV-P2        13.21    1.396 No_date   12:02   34.58  n/a     .000
00975>                        +   1.0 02:SWM2          1.36     .171 No_date   12:00   34.58  n/a     .000
00976>                        +   1.0 02:OGS2          1.75     .216 No_date   12:00   34.58  n/a     .000
00977>                    SUM=    1.0 01:Pond2-In      16.32    1.765 No_date   12:02   34.58  n/a     .000
00978> R0102:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
00979>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    1.765 No_date   12:02   34.58  n/a     .000
00980>                    out <=  1.0 01:Pond2-Out     16.32     .408 No_date   12:28   34.58  n/a     .000
00981>              overflow <=   1.0 03:Pond2-Over      .00     .000 No_date   0:00    .00  n/a     .000
00982>     {MxStoUsed=.3184E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
00983> ###########################################################################
00984> # STORMS
00985> ###########################################################################
00986>   ** END OF RUN :  104
00987>
00988> ************************************************************************************************
00989>
00990>
00991>
00992>
00993>
00994>  RUN#:COMMAND#
00995> R0105:C00001------------------------------------------------------------------------------------
00996>       START
00997>       [TZERO =    .00 hrs on       0]
00998>       [METOUT=   2   (1=imperial, 2=metric output)]
00999>       [NSTORM=   1 ]
01000>       [NRUN  = 0105 ]
01001> ************************************************************************************************
01002> #  SWMHYMO  / INPUT DATA FILE
01003> ************************************************************************************************
01004> #  Project Name  : [Caivan Perth properties]
01005> #  Project Number: [2118]
01006> #  Date          : [2023 JAN 26]
01007> #  Modeller      : [JB]
01008> #  Company       : J.F. Sabourin and Associates
01009> #  License #     : 2549237
01010> ************************************************************************************************
01011> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
01012> ************************************************************************************************
01013> R0105:C00002------------------------------------------------------------------------------------
01014>       READ STORM
01015>        Filename = STORM.001
01016>        Comment  = 005YRSCS24HR-Perth MTO IDF
01017>        [SDT=10.00:SDUR=  24.00:PTOT=  70.29]
01018> ************************************************************************************************
01019> # TAY RIVER
01020> ************************************************************************************************
01021> R0105:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01022>     CALIB STANDHYD         1.0 01:Dev-P1        10.49    1.684 No_date   12:02   47.59 .677     .000
01023>       [XIMP=.56:TIMP=.66]
01024>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01025>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01026>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
01027> R0105:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01028>     CALIB STANDHYD         1.0 01:SWM1           .77     .144 No_date   12:00   47.59 .677     .000
01029>       [XIMP=.56:TIMP=.66]
01030>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01031>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01032>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
01033> R0105:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01034>     CALIB STANDHYD         1.0 01:OGS1          1.35     .250 No_date   12:00   47.59 .677     .000
01035>       [XIMP=.56:TIMP=.66]
01036>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01037>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01038>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
01039> R0105:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01040>     ADD HYD                1.0 02:Dev-P1        10.49    1.684 No_date   12:02   47.59  n/a     .000
01041>                        +   1.0 02:SWM1           .77     .144 No_date   12:00   47.59  n/a     .000
01042>                        +   1.0 02:OGS1          1.35     .250 No_date   12:00   47.59  n/a     .000
01043>                    SUM=    1.0 01:Pond1-In      12.61    2.063 No_date   12:01   47.59  n/a     .000
01044> R0105:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01045>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    2.063 No_date   12:01   47.59  n/a     .000
01046>                    out <=  1.0 01:Pond1-Out     12.61     .331 No_date   12:31   47.58  n/a     .000
01047>              overflow <=   1.0 03:Pond1-Over      .00     .000 No_date   0:00    .00  n/a     .000
01048>     {MxStoUsed=.3745E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01049> R0105:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01050>     CALIB STANDHYD         1.0 01:Dev-P3        14.48    2.242 No_date   12:02   47.59 .677     .000
01051>       [XIMP=.56:TIMP=.66]
01052>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01053>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01054>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
01055> R0105:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01056>     CALIB STANDHYD         1.0 01:SWM3          1.45     .268 No_date   12:00   47.59 .677     .000
01057>       [XIMP=.56:TIMP=.66]
01058>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01059>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01060>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
01061> R0105:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01062>     ADD HYD                1.0 02:Dev-P3        14.48    2.242 No_date   12:02   47.59  n/a     .000
01063>                        +   1.0 02:SWM3          1.45     .268 No_date   12:00   47.59  n/a     .000
01064>                    SUM=    1.0 01:Pond3-In      15.93    2.484 No_date   12:02   47.59  n/a     .000
01065> R0105:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01066>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    2.484 No_date   12:02   47.59  n/a     .000
01067>                    out <=  1.0 01:Pond3-Out     15.93     .419 No_date   12:33   47.58  n/a     .000
01068>              overflow <=   1.0 03:Pond3-Over      .00     .000 No_date   0:00    .00  n/a     .000
01069>     {MxStoUsed=.4713E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01070> ************************************************************************************************
01071> # GRANTS CREEK
01072> ************************************************************************************************
01073> R0105:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01074>     CALIB STANDHYD         1.0 01:DEV-P2        13.21    2.065 No_date   12:02   47.59 .677     .000
01075>       [XIMP=.56:TIMP=.66]
01076>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01077>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01078>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
01079> R0105:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01080>     CALIB STANDHYD         1.0 01:SWM2          1.36     .250 No_date   12:00   47.59 .677     .000
```

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01081>       [XIMP=.56:TIMP=.66]
01082>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01083>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01084>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01085> R0105:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01086>     CALIB STANDHYD         1.0 01:OGS2          1.75     .317 No_date   12:00   47.59 .677     .000
01087>       [XIMP=.56:TIMP=.66]
01088>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01089>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01090>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 100.:MNI=.013:SCI=   .0]
01091> R0105:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01092>     ADD HYD                1.0 02:DEV-P2       13.21    2.065 No_date   12:02   47.59  n/a     .000
01093>                      +     1.0 02:SWM2          1.36     .250 No_date   12:00   47.59  n/a     .000
01094>                      +     1.0 02:OGS2          1.75     .317 No_date   12:00   47.59  n/a     .000
01095>                    SUM=    1.0 01:Pond2-In      16.32    2.611 No_date   12:01   47.59  n/a     .000
01096> R0105:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01097>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    2.611 No_date   12:01   47.59  n/a     .000
01098>                  out <=    1.0 01:Pond2-Out     16.32     .672 No_date   12:22   47.58  n/a     .000
01099>            overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
01100>     {MxStoUsed=.4167E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01101> ##############################################################################
01102> # STORMS
01103> ##############################################################################
01104>   ** END OF RUN :  109
01105>
01106> ****************************************************************************************************
01107>
01108>
01109>
01110>
01111>
01112>  RUN#:COMMAND#
01113> R0110:C00001------------------------------------------------------------------------------------------
01114>      START
01115>       [TZERO =    .00 hrs on       0]
01116>       [METOUT=   2   (1=imperial, 2=metric output)]
01117>       [NSTORM=   1 ]
01118>       [NRUN  = 0110 ]
01119> #*****************************************************************************************************
01120> #  SWMHYMO  / INPUT DATA FILE
01121> #*****************************************************************************************************
01122> #  Project Name  : [Caivan Perth properties]
01123> #  Project Number: [2118]
01124> #  Date          : [2023 JAN 26]
01125> #  Modeller      : [JB]
01126> #  Company       : J.F. Sabourin and Associates
01127> #  License #     : 2549237
01128> #*****************************************************************************************************
01129> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
01130> #*****************************************************************************************************
01131> R0110:C00002------------------------------------------------------------------------------------------
01132>      READ STORM
01133>       Filename = STORM.001
01134>       Comment  = 010YRSCS24HR-Perth MTO IDF
01135>       [SDT=10.00:SDUR=  24.00:PTOT=  81.99]
01136> #*****************************************************************************************************
01137> # TAY RIVER
01138> #*****************************************************************************************************
01139> R0110:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01140>     CALIB STANDHYD         1.0 01:Dev-P1       10.49    2.030 No_date   12:02   56.67 .691     .000
01141>       [XIMP=.56:TIMP=.66]
01142>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01143>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01144>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 264.:MNI=.013:SCI=   .0]
01145> R0110:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01146>     CALIB STANDHYD         1.0 01:SWM1          .77     .174 No_date   12:00   56.67 .691     .000
01147>       [XIMP=.56:TIMP=.66]
01148>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01149>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01150>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  71.:MNI=.013:SCI=   .0]
01151> R0110:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01152>     CALIB STANDHYD         1.0 01:OGS1          1.35     .300 No_date   12:00   56.67 .691     .000
01153>       [XIMP=.56:TIMP=.66]
01154>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01155>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01156>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01157> R0110:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01158>     ADD HYD                1.0 02:Dev-P1       10.49    2.030 No_date   12:02   56.67  n/a     .000
01159>                      +     1.0 02:SWM1          .77     .174 No_date   12:00   56.67  n/a     .000
01160>                      +     1.0 02:OGS1          1.35     .300 No_date   12:00   56.67  n/a     .000
01161>                    SUM=    1.0 01:Pond1-In      12.61    2.487 No_date   12:01   56.67  n/a     .000
01162> R0110:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01163>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    2.487 No_date   12:01   56.67  n/a     .000
01164>                  out <=    1.0 01:Pond1-Out     12.61     .436 No_date   12:28   56.65  n/a     .000
01165>            overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
01166>     {MxStoUsed=.4341E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01167> R0110:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01168>     CALIB STANDHYD         1.0 01:Dev-P3       14.48    2.751 No_date   12:02   56.67 .691     .000
01169>       [XIMP=.56:TIMP=.66]
01170>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01171>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01172>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 311.:MNI=.013:SCI=   .0]
01173> R0110:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01174>     CALIB STANDHYD         1.0 01:SWM3          1.45     .321 No_date   12:00   56.67 .691     .000
01175>       [XIMP=.56:TIMP=.66]
01176>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01177>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01178>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  98.:MNI=.013:SCI=   .0]
01179> R0110:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01180>     ADD HYD                1.0 02:Dev-P3       14.48    2.751 No_date   12:02   56.67  n/a     .000
01181>                      +     1.0 02:SWM3          1.45     .321 No_date   12:00   56.67  n/a     .000
01182>                    SUM=    1.0 01:Pond3-In      15.93    3.053 No_date   12:01   56.67  n/a     .000
01183> R0110:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01184>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    3.053 No_date   12:01   56.67  n/a     .000
01185>                  out <=    1.0 01:Pond3-Out     15.93     .550 No_date   12:30   56.66  n/a     .000
01186>            overflow <=     1.0 03:Pond3-Over     .00     .000 No_date    0:00     .00  n/a     .000
01187>     {MxStoUsed=.5462E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01188> #*****************************************************************************************************
01189> # GRANTS CREEK
01190> #*****************************************************************************************************
01191> R0110:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01192>     CALIB STANDHYD         1.0 01:DEV-P2       13.21    2.523 No_date   12:02   56.67 .691     .000
01193>       [XIMP=.56:TIMP=.66]
01194>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01195>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01196>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 297.:MNI=.013:SCI=   .0]
01197> R0110:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01198>     CALIB STANDHYD         1.0 01:SWM2          1.36     .300 No_date   12:00   56.67 .691     .000
01199>       [XIMP=.56:TIMP=.66]
01200>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01201>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01202>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01203> R0110:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01204>     CALIB STANDHYD         1.0 01:OGS2          1.75     .386 No_date   12:00   56.67 .691     .000
01205>       [XIMP=.56:TIMP=.66]
01206>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01207>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01208>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 108.:MNI=.013:SCI=   .0]
01209> R0110:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01210>     ADD HYD                1.0 02:DEV-P2       13.21    2.523 No_date   12:02   56.67  n/a     .000
01211>                      +     1.0 02:SWM2          1.36     .300 No_date   12:00   56.67  n/a     .000
01212>                      +     1.0 02:OGS2          1.75     .386 No_date   12:00   56.67  n/a     .000
01213>                    SUM=    1.0 01:Pond2-In      16.32    3.184 No_date   12:01   56.67  n/a     .000
01214> R0110:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01215>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    3.184 No_date   12:01   56.67  n/a     .000
01216>                  out <=    1.0 01:Pond2-Out     16.32     .918 No_date   12:19   56.66  n/a     .000
01217>            overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
01218>     {MxStoUsed=.4795E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01219> ##############################################################################
01220> # STORMS
01221> ##############################################################################
01222>   ** END OF RUN :  124
01223>
01224> ****************************************************************************************************
01225>
01226>
01227>
01228>
01229>
01230>  RUN#:COMMAND#
01231> R0125:C00001------------------------------------------------------------------------------------------
01232>      START
01233>       [TZERO =    .00 hrs on       0]
01234>       [METOUT=   2   (1=imperial, 2=metric output)]
01235>       [NSTORM=   1 ]
01236>       [NRUN  = 0125 ]
01237> #*****************************************************************************************************
01238> #  SWMHYMO  / INPUT DATA FILE
01239> #*****************************************************************************************************
01240> #  Project Name  : [Caivan Perth properties]
01241> #  Project Number: [2118]
01242> #  Date          : [2023 JAN 26]
01243> #  Modeller      : [JB]
01244> #  Company       : J.F. Sabourin and Associates
01245> #  License #     : 2549237
01246> #*****************************************************************************************************
01247> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
01248> #*****************************************************************************************************
01249> R0125:C00002------------------------------------------------------------------------------------------
01250>      READ STORM
01251>       Filename = STORM.001
01252>       Comment  = 025YRSCS24HR-Perth MTO IDF
01253>       [SDT=10.00:SDUR=  24.00:PTOT=  96.30]
01254> #*****************************************************************************************************
01255> # TAY RIVER
01256> #*****************************************************************************************************
01257> R0125:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01258>     CALIB STANDHYD         1.0 01:Dev-P1       10.49    2.496 No_date   12:01   67.66 .703     .000
01259>       [XIMP=.56:TIMP=.66]
01260>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01261>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01262>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 264.:MNI=.013:SCI=   .0]
01263> R0125:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01264>     CALIB STANDHYD         1.0 01:SWM1          .77     .209 No_date   12:00   67.66 .703     .000
01265>       [XIMP=.56:TIMP=.66]
01266>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01267>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01268>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  71.:MNI=.013:SCI=   .0]
01269> R0125:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01270>     CALIB STANDHYD         1.0 01:OGS1          1.35     .364 No_date   12:00   67.66 .703     .000
01271>       [XIMP=.56:TIMP=.66]
01272>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01273>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01274>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01275> R0125:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01276>     ADD HYD                1.0 02:Dev-P1       10.49    2.496 No_date   12:01   67.66  n/a     .000
01277>                      +     1.0 02:SWM1          .77     .209 No_date   12:00   67.66  n/a     .000
01278>                      +     1.0 02:OGS1          1.35     .364 No_date   12:00   67.66  n/a     .000
01279>                    SUM=    1.0 01:Pond1-In      12.61    3.043 No_date   12:01   67.66  n/a     .000
01280> R0125:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01281>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    3.043 No_date   12:01   67.66  n/a     .000
01282>                  out <=    1.0 01:Pond1-Out     12.61     .574 No_date   12:25   67.64  n/a     .000
01283>            overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
01284>     {MxStoUsed=.5026E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01285> R0125:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01286>     CALIB STANDHYD         1.0 01:Dev-P3       14.48    3.369 No_date   12:02   67.66 .703     .000
01287>       [XIMP=.56:TIMP=.66]
01288>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01289>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01290>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 311.:MNI=.013:SCI=   .0]
01291> R0125:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01292>     CALIB STANDHYD         1.0 01:SWM3          1.45     .390 No_date   12:00   67.66 .703     .000
01293>       [XIMP=.56:TIMP=.66]
01294>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01295>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01296>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  98.:MNI=.013:SCI=   .0]
01297> R0125:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01298>     ADD HYD                1.0 02:Dev-P3       14.48    3.369 No_date   12:02   67.66  n/a     .000
01299>                      +     1.0 02:SWM3          1.45     .390 No_date   12:00   67.66  n/a     .000
01300>                    SUM=    1.0 01:Pond3-In      15.93    3.739 No_date   12:01   67.66  n/a     .000
01301> R0125:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01302>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    3.739 No_date   12:01   67.66  n/a     .000
01303>                  out <=    1.0 01:Pond3-Out     15.93     .724 No_date   12:26   67.65  n/a     .000
01304>            overflow <=     1.0 03:Pond3-Over     .00     .000 No_date    0:00     .00  n/a     .000
01305>     {MxStoUsed=.6326E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01306> #*****************************************************************************************************
01307> # GRANTS CREEK
01308> #*****************************************************************************************************
01309> R0125:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01310>     CALIB STANDHYD         1.0 01:DEV-P2       13.21    3.089 No_date   12:02   67.66 .703     .000
01311>       [XIMP=.56:TIMP=.66]
01312>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01313>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01314>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 297.:MNI=.013:SCI=   .0]
01315> R0125:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01316>     CALIB STANDHYD         1.0 01:SWM2          1.36     .365 No_date   12:00   67.66 .703     .000
01317>       [XIMP=.56:TIMP=.66]
01318>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01319>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01320>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01321> R0125:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01322>     CALIB STANDHYD         1.0 01:OGS2          1.75     .469 No_date   12:00   67.66 .703     .000
01323>       [XIMP=.56:TIMP=.66]
01324>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01325>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01326>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 108.:MNI=.013:SCI=   .0]
01327> R0125:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01328>     ADD HYD                1.0 02:DEV-P2       13.21    3.089 No_date   12:02   67.66  n/a     .000
01329>                      +     1.0 02:SWM2          1.36     .365 No_date   12:00   67.66  n/a     .000
01330>                      +     1.0 02:OGS2          1.75     .469 No_date   12:00   67.66  n/a     .000
01331>                    SUM=    1.0 01:Pond2-In      16.32    3.893 No_date   12:01   67.66  n/a     .000
01332> R0125:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01333>     ROUTE RESERVOIR ->     1.0 02:Pond2-In      16.32    3.893 No_date   12:01   67.66  n/a     .000
01334>                  out <=    1.0 01:Pond2-Out     16.32    1.382 No_date   12:15   67.65  n/a     .000
01335>            overflow <=     1.0 03:Pond2-Over     .00     .000 No_date    0:00     .00  n/a     .000
01336>     {MxStoUsed=.5409E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01337> ##############################################################################
01338> # STORMS
01339> ##############################################################################
01340>   ** END OF RUN :  149
01341>
01342> ****************************************************************************************************
01343>
01344>
01345>
01346>
01347>
01348>  RUN#:COMMAND#
01349> R0150:C00001------------------------------------------------------------------------------------------
01350>      START
01351>       [TZERO =    .00 hrs on       0]
01352>       [METOUT=   2   (1=imperial, 2=metric output)]
01353>       [NSTORM=   1 ]
01354>       [NRUN  = 0150 ]
01355> #*****************************************************************************************************
01356> #  SWMHYMO  / INPUT DATA FILE
01357> #*****************************************************************************************************
01358> #  Project Name  : [Caivan Perth properties]
01359> #  Project Number: [2118]
01360> #  Date          : [2023 JAN 26]
01361> #  Modeller      : [JB]
01362> #  Company       : J.F. Sabourin and Associates
01363> #  License #     : 2549237
01364> #*****************************************************************************************************
01365> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
01366> #*****************************************************************************************************
01367> R0150:C00002------------------------------------------------------------------------------------------
01368>      READ STORM
01369>       Filename = STORM.001
01370>       Comment  = 050YRSCS24HR-Perth MTO IDF
01371>       [SDT=10.00:SDUR=  24.00:PTOT= 107.00]
01372> #*****************************************************************************************************
01373> # TAY RIVER
01374> #*****************************************************************************************************
01375> R0150:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01376>     CALIB STANDHYD         1.0 01:Dev-P1       10.49    2.858 No_date   12:01   75.81 .709     .000
01377>       [XIMP=.56:TIMP=.66]
01378>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01379>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01380>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 264.:MNI=.013:SCI=   .0]
01381> R0150:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01382>     CALIB STANDHYD         1.0 01:SWM1          .77     .238 No_date   12:00   75.81 .709     .000
01383>       [XIMP=.56:TIMP=.66]
01384>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01385>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01386>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  71.:MNI=.013:SCI=   .0]
01387> R0150:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01388>     CALIB STANDHYD         1.0 01:OGS1          1.35     .409 No_date   12:00   75.81 .709     .000
01389>       [XIMP=.56:TIMP=.66]
01390>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01391>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01392>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01393> R0150:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01394>     ADD HYD                1.0 02:Dev-P1       10.49    2.858 No_date   12:01   75.81  n/a     .000
01395>                      +     1.0 02:SWM1          .77     .238 No_date   12:00   75.82  n/a     .000
01396>                      +     1.0 02:OGS1          1.35     .409 No_date   12:00   75.81  n/a     .000
01397>                    SUM=    1.0 01:Pond1-In      12.61    3.475 No_date   12:01   75.81  n/a     .000
01398> R0150:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01399>     ROUTE RESERVOIR ->     1.0 02:Pond1-In      12.61    3.475 No_date   12:01   75.81  n/a     .000
01400>                  out <=    1.0 01:Pond1-Out     12.61     .683 No_date   12:23   75.80  n/a     .000
01401>            overflow <=     1.0 03:Pond1-Over     .00     .000 No_date    0:00     .00  n/a     .000
01402>     {MxStoUsed=.553BE+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01403> R0150:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01404>     CALIB STANDHYD         1.0 01:Dev-P3       14.48    3.806 No_date   12:02   75.81 .709     .000
01405>       [XIMP=.56:TIMP=.66]
01406>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01407>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01408>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 311.:MNI=.013:SCI=   .0]
01409> R0150:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01410>     CALIB STANDHYD         1.0 01:SWM3          1.45     .439 No_date   12:00   75.81 .709     .000
01411>       [XIMP=.56:TIMP=.66]
01412>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01413>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01414>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  98.:MNI=.013:SCI=   .0]
01415> R0150:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01416>     ADD HYD                1.0 02:Dev-P3       14.48    3.806 No_date   12:02   75.82  n/a     .000
01417>                      +     1.0 02:SWM3          1.45     .439 No_date   12:00   75.81  n/a     .000
01418>                    SUM=    1.0 01:Pond3-In      15.93    4.225 No_date   12:01   75.81  n/a     .000
01419> R0150:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01420>     ROUTE RESERVOIR ->     1.0 02:Pond3-In      15.93    4.225 No_date   12:01   75.81  n/a     .000
01421>                  out <=    1.0 01:Pond3-Out     15.93     .862 No_date   12:25   75.80  n/a     .000
01422>            overflow <=     1.0 03:Pond3-Over     .00     .000 No_date    0:00     .00  n/a     .000
01423>     {MxStoUsed=.6962E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01424> #*****************************************************************************************************
01425> # GRANTS CREEK
01426> #*****************************************************************************************************
01427> R0150:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01428>     CALIB STANDHYD         1.0 01:DEV-P2       13.21    3.554 No_date   12:01   75.81 .709     .000
01429>       [XIMP=.56:TIMP=.66]
01430>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01431>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01432>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI= 297.:MNI=.013:SCI=   .0]
01433> R0150:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01434>     CALIB STANDHYD         1.0 01:SWM2          1.36     .410 No_date   12:00   75.81 .709     .000
01435>       [XIMP=.56:TIMP=.66]
01436>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F=  .00]
01437>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01438>       [Impervious   area: IAimp= 1.57:SLPI=  .50:LGI=  95.:MNI=.013:SCI=   .0]
01439> R0150:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01440>     CALIB STANDHYD         1.0 01:OGS2          1.75     .527 No_date   12:00   75.81 .709     .000
```

```
01441>       [XIMP=.56:TIMP=.66]
01442>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01443>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01444>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
01445> R0150:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01446>     ADD HYD                 1.0 02:DEV-P2        13.21    3.554 No_date   12:01   75.82  n/a     .000
01447>                         +     1.0 02:SWM2          1.36     .410 No_date   12:00   75.82  n/a     .000
01448>                         +     1.0 02:OGS2          1.75     .527 No_date   12:00   75.81  n/a     .000
01449>                       SUM=    1.0 01:Pond2-In      16.32    4.464 No_date   12:01   75.82  n/a     .000
01450> R0150:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01451>     ROUTE RESERVOIR ->    1.0 02:Pond2-In      16.32    4.464 No_date   12:01   75.82  n/a     .000
01452>                 out <=    1.0 01:Pond2-Out     16.32    1.652 No_date   12:13   75.80  n/a     .000
01453>              overflow <=  1.0 03:Pond2-Over     .00      .000 No_date   0:00     .00  n/a     .000
01454>       {MxStoUsed=.5874E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01455> ###############################################################################
01456> # STORMS
01457> ###############################################################################
01458>   ** END OF RUN :  198
01459>
01460> *******************************************************************************************************
01461>
01462>
01463>
01464>
01465>
01466>  RUN#:COMMAND#
01467> R0199:C00001-----------------------------------------------------------------------------------------------
01468>       START
01469>       [TZERO =     .00 hrs on        0]
01470>       [METOUT=   2    (1=imperial, 2=metric output)]
01471>       [NSTORM=   1 ]
01472>       [NRUN  = 8199 ]
01473> #*******************************************************************************************************
01474> #  SWMHYMO  / INPUT DATA FILE
01475> #*******************************************************************************************************
01476> #  Project Name  : [Caivan Perth properties]
01477> #  Project Number: [2118]
01478> #  Date          : [2023 JAN 26]
01479> #  Modeller      : [JB]
01480> #  Company       : J.F. Sabourin and Associates
01481> #  License #     : 2549237
01482> #*******************************************************************************************************
01483> # Model developed to simulate runoff from subcatchments under post development conditions and to size SWM ponds
01484> #*******************************************************************************************************
01485> R0199:C00002-----------------------------------------------------------------------------------------------
01486>       READ STORM
01487>       Filename = STORM.001
01488>       Comment  = 100YRSCS24HR-Perth MTO IDF
01489>       [SDT=10.00:SDUR=  24.00:PTOT= 117.60]
01490> #*******************************************************************************************************
01491> # TAY RIVER
01492> #*******************************************************************************************************
01493> R0199:C00003------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01494>     CALIB STANDHYD          1.0 01:Dev-P1        10.49    3.184 No_date   12:01   84.07 .715     .000
01495>       [XIMP=.56:TIMP=.66]
01496>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01497>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01498>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 264.:MNI=.013:SCI=   .0]
01499> R0199:C00004------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01500>     CALIB STANDHYD          1.0 01:SWM1           .77     .264 No_date   12:00   84.07 .715     .000
01501>       [XIMP=.56:TIMP=.66]
01502>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01503>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01504>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  71.:MNI=.013:SCI=   .0]
01505> R0199:C00005------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01506>     CALIB STANDHYD          1.0 01:OGS1          1.35     .460 No_date   12:00   84.07 .715     .000
01507>       [XIMP=.56:TIMP=.66]
01508>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01509>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01510>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
01511> R0199:C00006------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01512>     ADD HYD                 1.0 02:Dev-P1        10.49    3.184 No_date   12:01   84.06  n/a     .000
01513>                         +     1.0 02:SWM1           .77     .264 No_date   12:00   84.07  n/a     .000
01514>                         +     1.0 02:OGS1          1.35     .460 No_date   12:00   84.07  n/a     .000
01515>                       SUM=    1.0 01:Pond1-In      12.61    3.872 No_date   12:01   84.07  n/a     .000
01516> R0199:C00007------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01517>     ROUTE RESERVOIR ->    1.0 02:Pond1-In      12.61    3.872 No_date   12:01   84.07  n/a     .000
01518>                 out <=    1.0 01:Pond1-Out     12.61     .795 No_date   12:22   84.05  n/a     .000
01519>              overflow <=  1.0 03:Pond1-Over     .00      .000 No_date   0:00     .00  n/a     .000
01520>       {MxStoUsed=.6051E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01521> R0199:C00008------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01522>     CALIB STANDHYD          1.0 01:Dev-P3        14.48    4.320 No_date   12:01   84.07 .715     .000
01523>       [XIMP=.56:TIMP=.66]
01524>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01525>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01526>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 311.:MNI=.013:SCI=   .0]
01527> R0199:C00009------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01528>     CALIB STANDHYD          1.0 01:SWM3          1.45     .493 No_date   12:00   84.07 .715     .000
01529>       [XIMP=.56:TIMP=.66]
01530>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01531>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01532>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  98.:MNI=.013:SCI=   .0]
01533> R0199:C00010------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01534>     ADD HYD                 1.0 02:Dev-P3        14.48    4.320 No_date   12:01   84.07  n/a     .000
01535>                         +     1.0 02:SWM3          1.45     .493 No_date   12:00   84.06  n/a     .000
01536>                       SUM=    1.0 01:Pond3-In      15.93    4.797 No_date   12:01   84.07  n/a     .000
01537> R0199:C00011------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01538>     ROUTE RESERVOIR ->    1.0 02:Pond3-In      15.93    4.797 No_date   12:01   84.07  n/a     .000
01539>                 out <=    1.0 01:Pond3-Out     15.93    1.005 No_date   12:23   84.06  n/a     .000
01540>              overflow <=  1.0 03:Pond1-Over     .00      .000 No_date   0:00     .00  n/a     .000
01541>       {MxStoUsed=.7610E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01542> #*******************************************************************************************************
01543> # GRANTS CREEK
01544> #*******************************************************************************************************
01545> R0199:C00012------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01546>     CALIB STANDHYD          1.0 01:DEV-P2        13.21    3.962 No_date   12:01   84.07 .715     .000
01547>       [XIMP=.56:TIMP=.66]
01548>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01549>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01550>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 297.:MNI=.013:SCI=   .0]
01551> R0199:C00013------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01552>     CALIB STANDHYD          1.0 01:SWM2          1.36     .460 No_date   12:00   84.07 .715     .000
01553>       [XIMP=.56:TIMP=.66]
01554>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01555>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01556>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI=  95.:MNI=.013:SCI=   .0]
01557> R0199:C00014------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01558>     CALIB STANDHYD          1.0 01:OGS2          1.75     .586 No_date   12:00   84.07 .715     .000
01559>       [XIMP=.56:TIMP=.66]
01560>       [Horton parameters: Fo= 76.20:Fc= 13.20:DCAY=4.14:  F= .00]
01561>       [Pervious     area: IAper= 4.67:SLPP=2.00:LGP=  40.:MNP=.250:SCP=   .0]
01562>       [Impervious   area: IAimp= 1.57:SLPI= .50:LGI= 108.:MNI=.013:SCI=   .0]
01563> R0199:C00015------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01564>     ADD HYD                 1.0 02:DEV-P2        13.21    3.962 No_date   12:01   84.07  n/a     .000
01565>                         +     1.0 02:SWM2          1.36     .460 No_date   12:00   84.07  n/a     .000
01566>                         +     1.0 02:OGS2          1.75     .586 No_date   12:00   84.07  n/a     .000
01567>                       SUM=    1.0 01:Pond2-In      16.32    4.975 No_date   12:01   84.07  n/a     .000
01568> R0199:C00016------------DTmin-ID:NHYD---------AREAha-QPEAKcms-TpeakDate_hh:mm----RVmm-R.C.---DWFcms
01569>     ROUTE RESERVOIR ->    1.0 02:Pond2-In      16.32    4.975 No_date   12:01   84.07  n/a     .000
01570>                 out <=    1.0 01:Pond2-Out     16.32    1.930 No_date   12:13   84.06  n/a     .000
01571>              overflow <=  1.0 03:Pond2-Over     .00      .000 No_date   0:00     .00  n/a     .000
01572>       {MxStoUsed=.6343E+00  m3, TotOvfVol=.0000E+00  m3, N-Ovf=    0, TotDurOvf=    0.hrs}
01573> ###############################################################################
01574> # STORMS
01575> ###############################################################################
01576> R0199:C00002-----------------------------------------------------------------------------------------------
01577>       FINISH
01578> -----------------------------------------------------------------------------------------------
01579> *******************************************************************************************************
01580>       WARNINGS / ERRORS / NOTES
01581>       -------------------------
01582>    Simulation ended on 2023-02-16     at 15:31:37
01583> ===============================================================================================================
01584>
```

APPENDIX D

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May 31, 2024 Project Number: 2118

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
Manotick, ON
K4M 1A5

Attention: **Eric Lalande, MCIP, RPP**

Subject: **Perth Golf Course – Proposed Floodplain Mapping Amendment**

Introduction

As a part of the proposed Perth Golf Course development, it is important that accurate floodplain mapping is established to ensure that a reliable cut-fill analysis can be prepared for the site. The current official floodplain mapping for this area is based on the 2013 model of the Tay River produced by the Rideau Valley Conservation Authority (RVCA). According to the RVCA 2013 Tay River Floodplain Mapping report, the mapping was completed using data acquired as a part of Land Information Ontario's (LIO) Digital Raster Acquisition Project Eastern Ontario (DRAPE) conducted in the spring of 2008 and 2009 based on RGB orthophotography. There is now new topographic LiDAR data of a higher resolution and quality available that was obtained in 2022. In the interest of using the best available information, JFSA reviewed and amended the floodplain mapping extents for this site using the latest available topographic data, before any proposed cut-fill analysis is completed.

The following memo outlines the procedure for completing this mapping amendment. Note that no modifications have been made to the existing hydraulic model produced by RVCA in 2013, simply the flood elevations have been remapped using the latest available LiDAR. Additionally, the mapping updates outlined in this report are confined to the Perth Golf Course property, all mapping outside of this area has remained unaltered from the 2013 RVCA study.

2022 LiDAR

Airborne Imaging Inc. on behalf of the RVCA, conducted LiDAR acquisition flights over the subject lands between April 18 - 30th, 2022 as part of a broader data acquisition project coordinated between the various Eastern Ontario Conservation Authorities. The LiDAR acquired as a part of this project is publicly available to download from the Land Information Ontario's (LIO) Digital Terrain Model GIS interface[1] and has been provided at a 0.5 m cell resolution. An overview of the LiDAR for the subject area has been provided in **Figure A1** in **Attachment A**

Ground Truthing

To ensure that this LiDAR is sufficiently accurate at this location for floodplain mapping purposes, JFSA staff were on site on May 9th, 2024, with an RTK GPS unit to ground truth the LiDAR. The intention was to collect survey points to assess both the LiDAR's Non-Vegetated Vertical Accuracy (NVA) and Vegetated Vertical Accuracy (VVA). While on site JFSA staff recorded a total of **152** topographic points throughout the site, **59** points on hard surfaces and **93** points on vegetated surfaces. **Figure A2** in **Attachment A** provides a visual overview of the points collected.

[1] https://geohub.lio.gov.on.ca/maps/mnrf::ontario-digital-terrain-model-lidar-derived/

The elevations recorded for each topographic survey point were then compared with the corresponding LiDAR elevation at each specific location. A full summary of this comparison has been provided in Attachment A. A statistical analysis was then completed to assess the LiDAR's Non-Vegetated Vertical Accuracy (NVA) and Vegetated Vertical Accuracy (VVA). Based on this analysis, the NVA had a 95% confidence interval of **4.2 cm** and the VVA had a 95th percentile value of **11.5 cm**, both of which are within the acceptable range for Level 1 (highest) Flood Mapping Risk Level as specified in Table 3-1 of the MNRF Flooding Hazards: Data Survey and Mapping Specifications bulletin. Therefore, it is concluded that the 2022 LiDAR is appropriate for use for floodplain mapping in this area.

Vertical Datum Conversion

The LiDAR, acquired in 2022, uses the latest Canadian Geodetic Vertical Datum of 2013 (CGVD2013), which is now the new standard for elevations across Canada. The floodplain mapping completed by RVCA in 2013 used the older CGVD28:78 datum. Before completing the mapping update the LiDAR had to be converted to the older CGVD28:78 datum to match the elevations specified in the floodplain mapping model.

Natural Resources Canada (NRC) released a guide to the *Heights Reference System Modernization* (2020)[2] which provides guidance on how to approach systematic differences of the new vertical datum. Page 6 of this document states: "*Lastly, the third category represents those who transfer heights with precision of less than 2 cm over small regions (e.g. municipal infrastructure). For these users the difference between CGVD28 and CGVD2013 should be considered, but generally applying a constant offset will suffice."*

To establish an appropriate offset value to apply to the LiDAR data, existing survey benchmark data that is publicly available through the Ministry of Natural Resources and Forestry (MNRF) Control Survey Information Exchange (COSINE) GIS portal [3] was acquired. There was a total of 10 existing survey benchmarks surrounding the subject site that have established vertical datums using both CGVD28:78 and CGVD2013. From this analysis, it was found that the average offset between the two data was **0.324 m**, with a standard deviation of **1mm**. The small standard deviation indicates that applying a single vertical offset to this area is appropriate. **Figure A3** outlines the location of the benchmarks used in this analysis. Attachment A also includes the full COSINE benchmark reports and a summary of the elevation differences between the two data for the selected benchmarks.

Floodplain Mapping Amendment Process

The floodplain mapping amendment has been completed using GIS software, based on the regulatory elevations at each cross section from the RVCA model of record, underlaid with the 2022 LiDAR of the subject area. Note that only the floodplain within the Perth Golf Course property boundary has been updated, all other lands outside of this area remain unaltered from RVCA's original 2013 regulatory boundary.

The following describes the approach adopted for this floodplain mapping amendment, which was developed in part with consultation with RVCA:

1. The cross-sections have been extracted from the HEC-RAS model and the associated Energy Gradeline Elevations (EGL) - as presented in the RVCA 2013 Tay River Floodplain mapping Report – have been cross-referenced at each location.
2. A 100-year EGL surface was then created which linearly interpolated the EGL from each of the model cross-sections.

[2] https://natural-resources.canada.ca/sites/nrcan/files/files/pdf/Height_reference_system_modernization_(EN).pdf
[3] https://www.lioapplications.lrc.gov.on.ca/COSINE/index.html?viewer=COSINE.OntarioViewer&locale=en-CA

3. Using GIS processes the EGL surface was then compared with the latest topography, and only locations where the EGL was greater than the terrain returned.
4. The remaining areas of the surface were then converted to a polygon vector.
5. This polygon vector was visually inspected to remove low-lying areas identified as flooded that were not hydraulicly connected to the dominant floodplain.
6. This layer was then refined through JFSA's internal GIS Floodplain Cleaning Tool which was developed in consultation with RVCA's GIS technical staff. The cleaning tools included: the removal of any holes with areas less than 100 m², the removal of isolated island areas with an area less than 100 m², and the simplification of line work to remove any noise in the floodplain extents due to converting from a raster to a polygon.

The amended floodplain extents within the Perth Golf Course property have been provided in **Figure 1**. Digital copies of this floodplain extent have also been provided. To provide some context to the changes as a part of the addendum, the official RVCA floodplain extents for this area have also been provided in **Figure 2.**

Conclusion

In conclusion, this update to the floodplain mapping for the Perth Golf Course area using the latest available topographic data is a necessary and standard best practice to ensure a reliable cut-fill analysis for the proposed development site. By utilizing the latest available LiDAR data and ground truthing this data, the accuracy of the floodplain mapping within the subject site has been refined, providing a solid foundation for future development decisions.

Yours truly,
JFSA Canada Inc.

Jonathon Burnet, B.Eng, P.Eng
Senior Water Resources Engineer

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Figures
Figure 1: JFSA 2024 Amended Floodplain Mapping
Figure 2: RVCA Official Floodplain Mapping

Attachments
Attachment A: LiDAR Ground Truthing and Datum Conversion

N

Legend

- Proposed Floodplain Extents
- Property Boundary

NOTE: This mapping is not to be used as official floodplain mapping without RVCA written consent.

SCALE: 1:7500

0 100 200 300 400 m

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CAIVAN COMMUNITIES

Perth Golf Course

Figure 1: Perth Golf Course
JFSA 2024 Floodplain Amendment

PROJECT	2118-21
DRAWN	JB
DATE	May 2024

C:\Users\JonathonBurnett\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2118\2118(01)-21\JFSA ENGINEERING\DESIGN\GIS\20240513-Flooplain Mapping Update 2022 LiDAR

N

Legend

- RVCA Offical Floodplain
- Property Boundary

SCALE: 1:7500

0 100 200 300 400 m

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Perth Golf Course

Figure 2: Perth Golf Course
RVCA Offical Floodplain

PROJECT	2118-21
DRAWN	JB
DATE	May 2024

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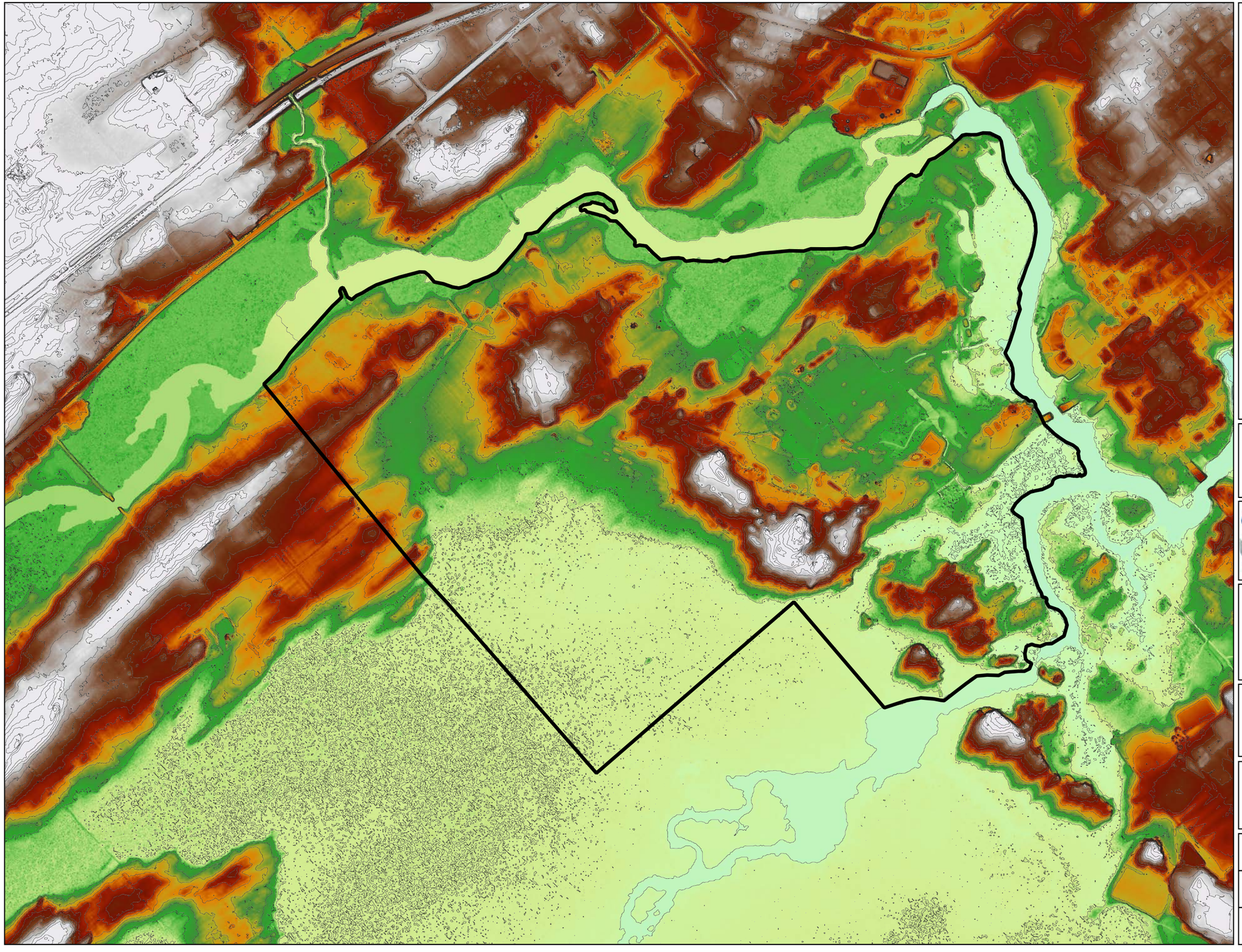
Attachment A

LiDAR Ground Truthing and Datum Conversion



Legend

- Property Boundary

Contours

- 0.5 m

LiDAR Elevations (m)

- 133.00
- 134.00
- 135.00
- 136.00
- 137.00
- 138.00
- 139.00

N

SCALE: 1:8000

0 200 400 m

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CAIVAN COMMUNITIES

Perth Golf Course

Figure A1: 2022 LiDAR

PROJECT	2118-21
DRAWN	JB
DATE	May 2024

N

Legend

Topographic Survey Points
- Hard Surface
- Vegetated Surface
- Property Boundary

SCALE: 1:8000

0 200 400 m

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Figure E2: LiDAR Ground Truthing

PROJECT	2118-21
DRAWN	JB
DATE	May 2024

C:\Users\JonathonBurnett\J.F. Sabourin and Associates Inc\JFSA-OTTAWA-SERVER - Documents\PROJ\2118\2118(01)-21\JFSA ENGINEERING\DESIGN\GIS\20240513-2022 LiDAR Ground Truthing

Table A1 - Hard Surface Ground Truthing

ID	X	Y	Z	CODE	DTM	Difference
1	400575.1	4972226.0	134.794	Hard	134.790	-0.004
2	400557.0	4972237.1	135.110	Hard	135.120	0.010
3	400553.1	4972279.3	135.508	Hard	135.480	-0.028
4	400509.5	4972332.4	133.819	Hard	133.840	0.021
5	400460.4	4972473.9	133.878	Hard	133.860	-0.018
6	400460.5	4972543.7	135.017	Hard	135.020	0.003
7	400436.0	4972605.9	134.069	Hard	134.090	0.021
8	400423.6	4972742.6	134.083	Hard	134.060	-0.023
9	400418.0	4972808.9	134.464	Hard	134.470	0.006
10	400405.6	4972747.1	134.252	Hard	134.250	-0.002
11	400325.8	4972608.9	136.185	Hard	136.200	0.015
12	400262.6	4972578.0	136.496	Hard	136.460	-0.036
13	400253.5	4972496.6	136.581	Hard	136.600	0.019
14	400281.5	4972467.5	135.949	Hard	135.980	0.031
15	400378.5	4972375.8	134.397	Hard	134.400	0.003
16	400451.3	4972296.9	134.041	Hard	134.040	-0.001
17	400538.9	4972193.1	134.573	Hard	134.590	0.017
18	400316.5	4972175.6	134.549	Hard	134.530	-0.019
19	400251.1	4972210.7	134.297	Hard	134.280	-0.017
20	400040.5	4972351.8	134.955	Hard	134.960	0.005
21	400124.7	4972419.8	134.730	Hard	134.770	0.040
22	399983.3	4972355.3	135.386	Hard	135.420	0.034
23	399937.0	4972318.1	135.578	Hard	135.590	0.012
24	399800.7	4972275.6	136.537	Hard	136.540	0.003
25	399699.5	4972373.3	136.111	Hard	136.130	0.019
26	399613.0	4972587.4	134.874	Hard	134.850	-0.024
27	399523.3	4972671.3	134.461	Hard	134.450	-0.011
28	399393.4	4972535.6	134.797	Hard	134.770	-0.027
29	399350.9	4972502.6	135.742	Hard	135.720	-0.022
30	399478.4	4972474.0	135.282	Hard	135.300	0.018
31	399518.4	4972459.5	136.165	Hard	136.210	0.045
32	399576.0	4972365.1	139.340	Hard	139.370	0.030
33	399613.9	4972261.9	134.760	Hard	134.750	-0.010
34	399633.6	4972230.1	134.335	Hard	134.350	0.015
35	399689.1	4972225.0	134.350	Hard	134.370	0.020
36	399754.5	4972206.2	134.836	Hard	134.860	0.024
37	399788.6	4972201.0	135.057	Hard	135.050	-0.007
38	399830.4	4972193.8	135.588	Hard	135.610	0.022
39	399970.9	4972130.5	138.806	Hard	138.800	-0.006
40	400077.1	4972202.7	134.541	Hard	134.530	-0.011
41	400101.3	4972170.8	134.496	Hard	134.440	-0.056
42	400134.6	4972151.8	134.841	Hard	134.850	0.009

Table A1 - Hard Surface Ground Truthing

ID	X	Y	Z	CODE	DTM	Difference
43	400163.3	4972112.6	135.303	Hard	135.310	0.007
44	400199.2	4972081.4	136.396	Hard	136.400	0.004
45	400163.7	4972077.0	136.181	Hard	136.200	0.019
46	400108.3	4972094.4	137.147	Hard	137.150	0.003
47	399975.1	4972110.3	138.523	Hard	138.510	-0.013
48	399912.8	4972072.2	135.713	Hard	135.690	-0.023
49	400003.3	4972001.0	136.950	Hard	136.950	0.000
50	400056.6	4971961.7	138.353	Hard	138.360	0.007
51	400142.7	4971969.8	140.771	Hard	140.740	-0.031
52	400149.0	4972000.4	137.131	Hard	137.160	0.029
53	400272.4	4972067.7	135.136	Hard	135.190	0.054
54	400316.7	4972067.3	134.357	Hard	134.380	0.023
55	400439.0	4972151.5	134.003	Hard	134.040	0.037
56	400469.1	4972177.8	134.390	Hard	134.390	0.000
57	400515.1	4972177.0	134.668	Hard	134.680	0.012
58	400531.7	4972188.4	134.662	Hard	134.670	0.008
59	400558.7	4972222.3	134.948	Hard	134.950	0.002

Statistical Summary - Hard Surfaces - Ground Truthing

Table A2: Elevation Difference Statistical Analysis

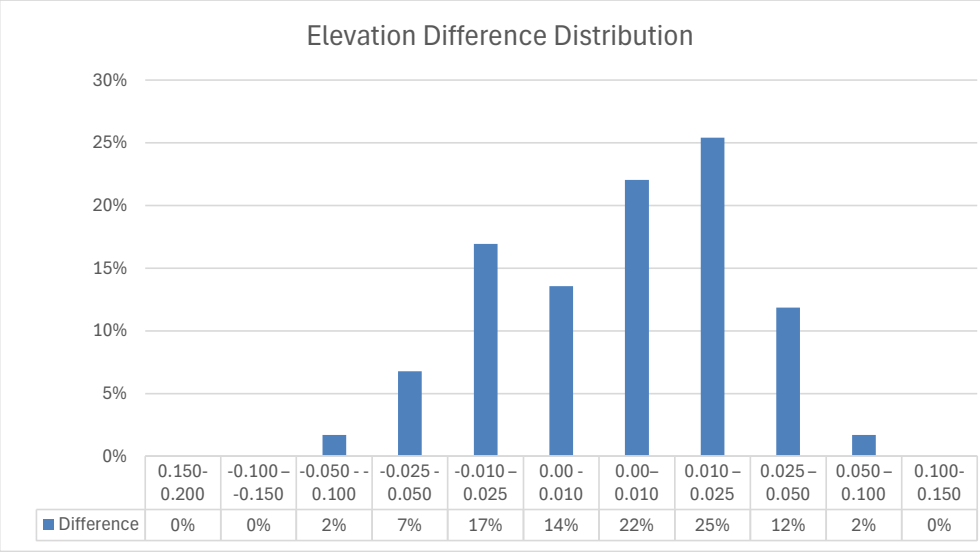
Statistical Analysis	Unit	Value
Mean	(m)	0.004
Standard Error	(m)	0.003
Median	(m)	0.005
Mode	(m)	0.021
Standard Deviation	(m)	0.022
Sample Variance	(m)	0.000
Kurtosis	-	0.123
Skewness	-	-0.238
Range	(m)	0.110
Minimum	(m)	-0.056
Maximum	(m)	0.054
Sum	(m)	0.258
Count	-	59
RMSE	(m)	0.022
95th Confidence interval (NVA)	(m)	0.042
95th Percentile (VVA)	(m)	0.037

Table A3: Elevation Difference Bins

Bins	Range	Count	Percent
-0.300	<-0.200	0	0%
-0.150	0.150-0.200	0	0%
-0.100	-0.100 – -0.150	0	0%
-0.050	-0.050 - -0.100	1	2%
-0.025	-0.025 -0.050	4	7%
-0.010	-0.010 – 0.025	10	17%
0.000	0.00 - 0.010	8	14%
0.010	0.00– 0.010	13	22%
0.025	0.010 – 0.025	15	25%
0.050	0.025 – 0.050	7	12%
0.100	0.050 – 0.100	1	2%
0.150	0.100-0.150	0	0%
0.300	0.150-0.200	0	0%
	Sum	**59**	**100.0%**

Table A4: Elevation

Distribution Summary	
± 1 cm	36%
± 2.5 cm	78%
± 5 cm	97%
± 10 cm	98%
± 15 cm	100%
± 30 cm	100%



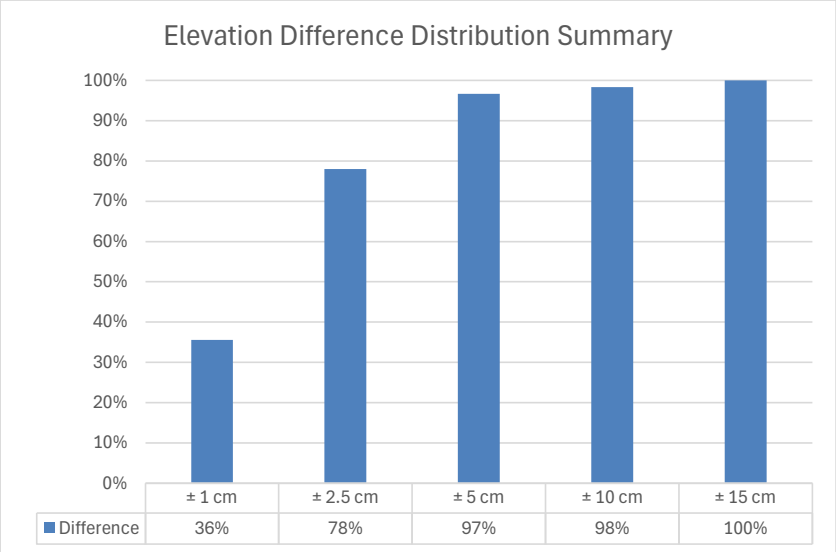


Table A5 -Veg Surface Ground Truthing

ID	X	Y	Z	CODE	DTM	Difference
1001	400457.7	4972614.4	133.835	Veg	133.840	0.005
1002	400406.1	4972632.5	136.794	Veg	136.810	0.016
1003	400406.7	4972659.8	134.654	Veg	134.660	0.006
1004	400445.6	4972793.9	134.542	Veg	134.580	0.038
1005	400465.0	4972832.7	134.328	Veg	134.350	0.022
1006	400487.1	4972876.2	134.691	Veg	134.710	0.019
1007	400465.0	4972887.6	134.489	Veg	134.480	-0.009
1008	400411.8	4972840.2	134.198	Veg	134.220	0.022
1009	400388.6	4972720.6	135.478	Veg	135.500	0.022
1010	400384.0	4972643.1	135.193	Veg	135.210	0.017
1011	400343.2	4972631.1	135.541	Veg	135.540	-0.001
1012	400260.4	4972563.3	136.453	Veg	136.480	0.027
1013	400234.4	4972533.3	136.575	Veg	136.600	0.025
1014	400292.4	4972469.3	136.047	Veg	136.050	0.003
1015	400345.9	4972429.8	134.472	Veg	134.490	0.018
1016	400466.4	4972287.8	134.252	Veg	134.250	-0.002
1017	400402.7	4972195.3	135.328	Veg	135.340	0.012
1018	400350.7	4972193.4	134.971	Veg	134.990	0.019
1019	400183.3	4972219.7	134.811	Veg	134.830	0.019
1020	400121.6	4972231.7	134.252	Veg	134.260	0.008
1021	400078.9	4972426.1	135.977	Veg	136.000	0.023
1022	400009.6	4972399.3	134.969	Veg	134.990	0.021
1023	399892.9	4972312.4	135.532	Veg	135.550	0.018
1024	399837.4	4972292.8	136.436	Veg	136.430	-0.006
1025	399678.9	4972442.6	136.364	Veg	136.420	0.056
1026	399690.8	4972525.3	137.460	Veg	137.470	0.010
1027	399482.3	4972589.8	134.542	Veg	134.560	0.018
1028	399427.8	4972573.7	134.560	Veg	134.600	0.040
2001	399328.1	4972486.8	136.229	Veg	136.300	0.071
2002	399288.8	4972472.7	136.315	Veg	136.400	0.085
2003	399211.0	4972470.7	135.451	Veg	135.490	0.039
2004	399202.2	4972467.6	135.472	Veg	135.560	0.088
2005	399161.4	4972451.9	135.263	Veg	135.330	0.067
2006	399124.3	4972453.8	135.117	Veg	135.200	0.083
2007	399115.1	4972443.2	135.151	Veg	135.220	0.069
2008	399085.4	4972403.3	135.162	Veg	135.230	0.068
2009	399046.6	4972374.0	135.178	Veg	135.210	0.032
2010	399022.6	4972357.4	135.518	Veg	135.540	0.022
2011	399024.5	4972290.2	135.716	Veg	135.770	0.054
2012	399064.8	4972261.7	136.665	Veg	136.730	0.065
2013	399112.0	4972211.6	135.814	Veg	135.870	0.056
2014	399138.6	4972167.5	135.378	Veg	135.400	0.022

Table A5 -Veg Surface Ground Truthing

ID	X	Y	Z	CODE	DTM	Difference
2015	399185.5	4972113.3	135.050	Veg	135.190	0.140
2016	399189.7	4972091.0	135.232	Veg	135.340	0.108
2017	399212.0	4972089.3	135.180	Veg	135.250	0.070
2018	399256.7	4972126.6	135.163	Veg	135.230	0.067
2019	399252.7	4972149.4	134.833	Veg	134.870	0.037
2020	399280.7	4972098.2	134.569	Veg	134.610	0.041
2021	399288.1	4972078.9	135.740	Veg	135.790	0.050
2022	399265.7	4972155.2	134.517	Veg	134.540	0.023
2023	399217.4	4972188.1	134.425	Veg	134.500	0.075
2024	399179.5	4972186.8	134.637	Veg	134.760	0.123
2025	399150.5	4972175.1	135.132	Veg	135.170	0.038
2026	399118.2	4972180.6	135.551	Veg	135.610	0.059
2027	399003.3	4972360.7	135.538	Veg	135.630	0.092
2028	399014.2	4972386.8	135.419	Veg	135.500	0.081
2029	399032.9	4972406.2	135.255	Veg	135.320	0.065
2030	399047.5	4972423.1	135.160	Veg	135.220	0.060
2031	399093.1	4972463.3	135.004	Veg	135.070	0.066
2032	399116.0	4972480.1	135.244	Veg	135.270	0.026
2033	399138.5	4972500.0	135.309	Veg	135.410	0.101
2034	399157.1	4972518.6	134.823	Veg	134.860	0.037
2035	399176.5	4972497.5	134.921	Veg	135.100	0.179
2036	399186.2	4972484.8	135.535	Veg	135.720	0.185
2037	399193.9	4972475.2	135.284	Veg	135.430	0.146
2038	399239.4	4972490.9	135.313	Veg	135.400	0.087
1029	399406.0	4972482.7	134.894	Veg	134.920	0.026
1030	399449.2	4972481.6	135.021	Veg	135.040	0.019
1031	399578.8	4972447.5	137.509	Veg	137.550	0.041
1032	399604.2	4972391.7	138.409	Veg	138.430	0.021
1033	399554.0	4972304.3	138.019	Veg	138.020	0.001
1034	399516.7	4972293.8	137.250	Veg	137.310	0.060
1035	399481.4	4972258.1	135.925	Veg	136.010	0.085
1036	399481.8	4972232.6	135.361	Veg	135.440	0.079
1037	399527.6	4972265.0	135.791	Veg	135.900	0.109
1038	399605.5	4972260.6	134.731	Veg	134.770	0.039
1039	399730.0	4972204.5	134.465	Veg	134.520	0.055
1040	399849.4	4972204.1	136.020	Veg	136.060	0.040
1041	399918.0	4972155.3	138.976	Veg	139.000	0.024
1042	399927.8	4972129.7	139.167	Veg	139.200	0.033
1043	399964.1	4972128.3	138.733	Veg	138.750	0.017
1044	400007.5	4972138.9	136.609	Veg	136.690	0.081
1045	400046.4	4972161.4	135.193	Veg	135.220	0.027
1046	400080.2	4972092.8	135.704	Veg	135.730	0.026

Table A5 -Veg Surface Ground Truthing

ID	X	Y	Z	CODE	DTM	Difference
1047	400025.1	4972107.9	136.263	Veg	136.260	-0.003
1048	399945.2	4972051.0	136.028	Veg	136.020	-0.008
1049	399989.9	4972030.4	136.039	Veg	136.060	0.021
1050	400097.5	4971951.8	138.318	Veg	138.370	0.052
1051	400136.1	4971932.6	137.873	Veg	137.910	0.037
1052	400181.0	4972007.5	137.307	Veg	137.370	0.063
1053	400231.1	4972038.6	138.117	Veg	138.140	0.023
1054	400341.4	4972092.6	134.822	Veg	134.860	0.038
1055	400402.8	4972133.4	134.059	Veg	134.110	0.051

Statistical Summary - Veg Surfaces - Ground Truthing

Table A6: Elevation Difference Statistical Analysis

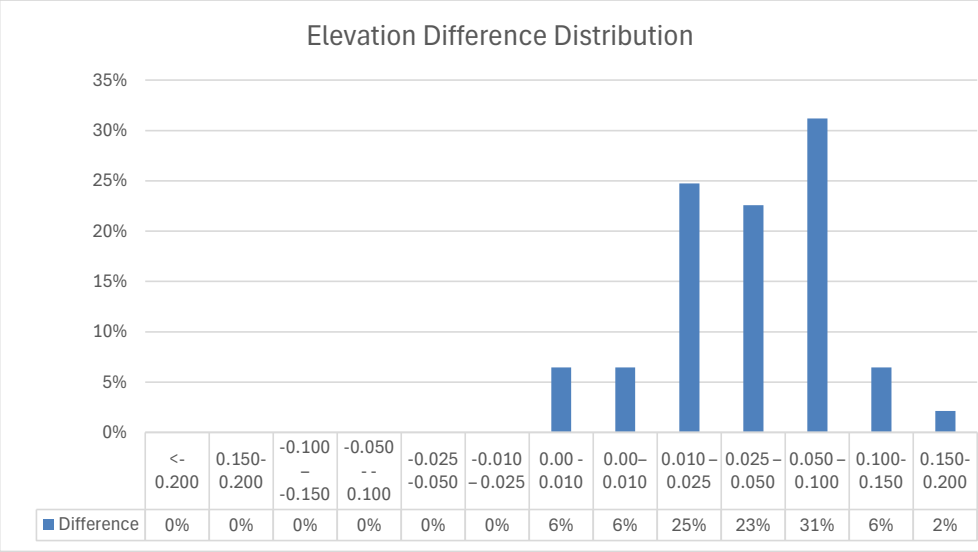
Statistical Analysis	Unit	Value
Mean	(m)	0.046
Standard Error	(m)	0.004
Median	(m)	0.038
Mode	(m)	0.037
Standard Deviation	(m)	0.039
Sample Variance	(m)	0.001
Kurtosis	-	2.263
Skewness	-	1.325
Range	(m)	0.194
Minimum	(m)	-0.009
Maximum	(m)	0.185
Sum	(m)	4.300
Count	-	93
RMSE	-	0.060
95th Confidence interval (NVA)	-	0.119
95th Percentile (VVA)	-	0.115

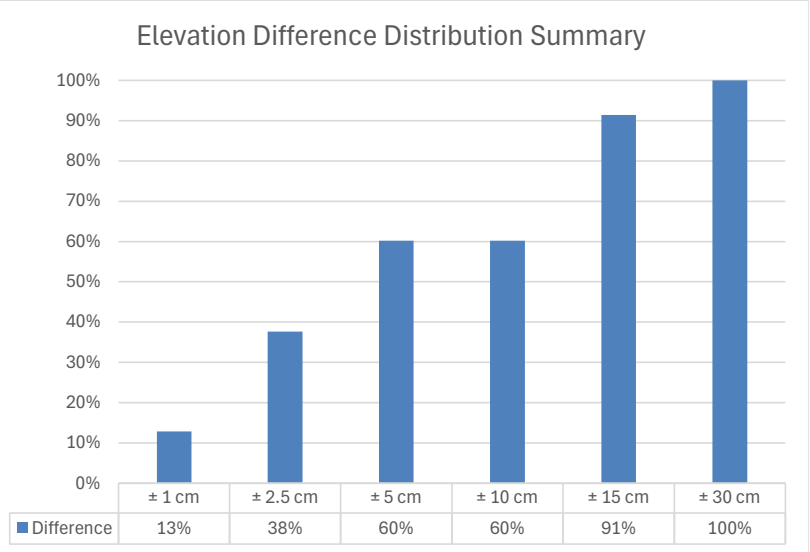
Table A7: Elevation Difference Bins

Bins	Range	Count	Percent
-0.300	<-0.200	0	0%
-0.150	0.150-0.200	0	0%
-0.100	-0.100 – -0.150	0	0%
-0.050	-0.050 - -0.100	0	0%
-0.025	-0.025 -0.050	0	0%
-0.010	-0.010 – 0.025	0	0%
0.000	0.00 - 0.010	6	6%
0.010	0.00– 0.010	6	6%
0.025	0.010 – 0.025	23	25%
0.050	0.025 – 0.050	21	23%
0.100	0.050 – 0.100	29	31%
0.150	0.100-0.150	6	6%
0.300	0.150-0.200	2	2%
	Sum	**93**	**100.0%**

Table A8: Elevation

Distribution Summary	
± 1 cm	13%
± 2.5 cm	38%
± 5 cm	60%
± 10 cm	60%
± 15 cm	91%
± 30 cm	100%





N

Legend

- Benchmark Points
- Property Boundary

SCALE: 1:25000

0 750 1,500 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
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Ottawa, ON, K2S 1B9
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CAIVAN COMMUNITIES

Perth Golf Course

Figure A3: Benchmarks

PROJECT	2118(01)-21
DRAWN	JZ
DATE	May 2024

Table A9 - Vertical Translation of CGVD 2013 to CGVD 28:78

Benchmark ID	CGVD 2013	CGVD 28:78	Difference
0011915U114G	133.958	134.282	-0.324
0011915U115G	134.118	134.443	-0.325
0011990U001	140.057	140.379	-0.322
0011990U002	136.304	136.627	-0.323
0011990U003	133.535	133.86	-0.325
0011990U004	139.672	139.997	-0.325
00819738524	144.008	144.333	-0.325
00819738525	141.133	141.457	-0.324
00819738526	140.827	141.149	-0.322
00819848111	138.63	138.951	-0.321
		Average	-0.324
		Std Dev	0.001

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 0011915U114G

AKA Names: 00115U114G, 114G, 15U114G, CP90208, V00115U114G

Number of Ref Sketches: 0

Networks [usage]: 0044V [FIX]

Known Status: Existing

Last Reported Visit:

Monument Type: CAP

Station Type: SPIR

Location Description:

Township: PERTH MCMILLAN BUILDING (FORMERLY PUBLIC LIBRARY), ALONG HIGHWAY NO. 43 (GORE STREET), 0.5 KM NORTHWEST OF JUNCTION WITH HIGHWAY NO. 43 HEADING EAST, 0.2 KM SOUTHEAST OF FOSTER STREET, BOLT IN SOUTHWEST STONE WALL, 10.4 M NORTHEAST OF CENTRE LINE OF HIGHWAY NO. 43 (GORE STREET), 13.0 M NORTHWEST OF CENTRE LINE OF BASIN STREET, 4.2 M NORTHWEST OF SOUTH CORNER OF BUILDING, 1.22 M SOUTHEAST OF CENTRE OF MAIN ENTRANCE, 35 CM ABOVE SIDEWALK, SLIGHTLY ABOVE HIGHWAY LEVEL.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified		**Ellipsoidal Order:** Unclassified	
Latitude: N44° 54′ 07.0xxxxx″	**Longitude:** W76° 15′ 21.0xxxxx″		**Ellipsoidal elev:** 135.xxx	
***UTM Zone:** 18	**E:** E400849.xxx	**N:** N4972607.xxx	**C. S. F.:** 0.99969972	**Mrdl Convg:** -0° 53′ 11.6″
***MTM Zone:** 9	**E:** E324083.xxx	**N:** N4973361.xxx	**C. S. F.:** 0.99988340	**Mrdl Convg:** 0° 10′ 20.5″

Datum: NAD-1983:ORIG	**Horiz Order:** Unclassified		**Ellipsoidal Order:**	
Latitude: N44° 54′ 10.0xxxxx″	**Longitude:** W76° 15′ 20.0xxxxx″		**Ellipsoidal elev:**	
***UTM Zone:** 18	**E:** E400875.xxx	**N:** N4972917.xxx	**C. S. F.:** 0.99972081	**Mrdl Convg:** -0° 53′ 11.0″
***MTM Zone:** 9	**E:** E324104.xxx	**N:** N4973671.xxx	**C. S. F.:** 0.99990458	**Mrdl Convg:** 0° 10′ 21.2″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 133.958	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 134.282	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011915U114G is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station:

0011915U115G

AKA Names: 00115U115G, 115G, 15U115G, CP90208, V00115U115G

Number of Ref Sketches: 0

Networks [usage]: 0044V [FIX]

Known Status: Existing

Last Reported Visit:

Monument Type: CAP

Station Type: SPIR

Location Description:

Township: PERTH TOWN HALL (1863) ALONG HIGHWAY NO. 43 (GORE STREET), 0.4 KM NORTHWEST OF JUNCTION WITH HIGHWAY NO. 43 HEADING EAST, 0.3 KM SOUTHEAST OF FOSTER STREET, 0.2 KM NORTHWEST OF HARVEY STREET, BOLT IN NORTHEAST STONE WALL, 13.0 M NORTHWEST OF CENTRE LINE OF MARKET STREET, 13.8 M SOUTHWEST OF CENTRE LINE OF HIGHWAY NO. 43 (GORE STREET), 3.4 M NORTHWEST OF EAST CORNER OF BUILDING, 9.1 M SOUTHEAST OF CENTRE OF MAIN ENTRANCE, 36 CM ABOVE SIDEWALK, SLIGHTLY ABOVE HIGHWAY LEVEL.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified		**Ellipsoidal Order:** Unclassified	
Latitude: N44° 54′ 00.0xxxxx″	**Longitude:** W76° 15′ 03.0xxxxx″		**Ellipsoidal elev:** 135.xxx	
***UTM Zone:** 18	**E:** E401240.xxx	**N:** N4972385.xxx	**C. S. F.:** 0.99969876	**Mrdl Convg:** -0° 52′ 58.8″
***MTM Zone:** 9	**E:** E324478.xxx	**N:** N4973146.xxx	**C. S. F.:** 0.99988359	**Mrdl Convg:** 0° 10′ 33.2″

Datum: NAD-1983:ORIG	**Horiz Order:** Unclassified		**Ellipsoidal Order:**	
Latitude: N44° 54′ 10.0xxxxx″	**Longitude:** W76° 15′ 10.0xxxxx″		**Ellipsoidal elev:**	
***UTM Zone:** 18	**E:** E401095.xxx	**N:** N4972913.xxx	**C. S. F.:** 0.99972028	**Mrdl Convg:** -0° 53′ 03.9″
***MTM Zone:** 9	**E:** E324323.xxx	**N:** N4973672.xxx	**C. S. F.:** 0.99990468	**Mrdl Convg:** 0° 10′ 28.3″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 134.118	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 134.443	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011915U115G is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 0011990U001

AKA Names: 00190U001, 90U001, CP90208

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: PERTH LARGE GREEN SHINGLED DOME STORAGE BUILDING IN GROUNDS OF COUNTY OF LANARK MAINTANANCE GARAGE NO. 1, ALONG HIGHWAY NO. 43 (WILSON STREET), 0.3 KM SOUTHEAST OF JUNCTION WITH HIGHWAY NO 7, 170 M NORTHWEST OF C.P.R. CROSSING, TABLET IN TOP OF CONCRETE SUPPORT PAD ON EASTERLY SIDE OF DOME, 112 M SOUTHWEST OF CENTRE LINE OF HIGHWAY NO. 43 (WILSON STREET), 8.6 M NORTHWEST OF CENTRE OF PAVED ACCESS ROAD NEAR BUILDING, 4.2 M SOUTHWEST OF PROJECTED SOUTHWEST FACE AND 21.0 M NORTHWEST OF PROJECTED NORTHWEST WALL OF LARGE GARAGE, 40 CM ABOVE PAVEMENT, SLIGHTLY ABOVE HIGHWAY LEVEL.

No Photo

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified	**Ellipsoidal Order:** Unclassified
Latitude: N44° 54′ 25.0xxxxx″	**Longitude:** W76° 15′ 43.0xxxxx″	**Ellipsoidal elev:** 141.xxx

***UTM Zone:** 18	**E:** E400375.xxx	**N:** N4973170.xxx	**C. S. F.:** 0.99969993	**Mrdl Convg:** -0° 53′ 27.4″
***MTM Zone:** 9	**E:** E323598.xxx	**N:** N4973915.xxx	**C. S. F.:** 0.99988223	**Mrdl Convg:** 0° 10′ 05.0″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 140.057	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 140.379	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011990U001 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 0011990U002

AKA Names: 00190U002, 90U002, CP90208

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: PERTH GROUND ROD UNDER ACCESS COVER IN GRASSED AREA IN FRONT OF STEWART SCHOOL ON SOUTHWEST SIDE OF HIGHWAY NO. 43 (WILSON STREET), 0.8 KM SOUTHEAST OF JUNCTION WITH HIGHWAY NO. 7, 350 M SOUTHEAST OF CANADIAN PACIFIC RAILWAY CROSSING, 0.6 KM NORTHWEST OF JUNCTION WITH FOSTER STREET, 39.5 M SOUTHWEST OF CENTRE LINE OF HIGHWAY NO 43 (WILSON STREET), 10.2 M NORTHWEST OF CENTRE OF MOST NORTHERLY PORTION OF "U" SHAPED BUS DRIVEWAY IN FRONT OF SCHOOL, 30.2 M SOUTH OF MOST NORTHEASTERLY CORNER OF SCHOOL, 4.0 M SOUTHEAST OF PROJECTION OF SOUTHEAST WALL OF TWO STORY (CIVIC NO. 77) ON OPPOSITE SIDE OF HIGHWAY, SLIGHTLY ABOVE HIGHWAY LEVEL.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified	**Ellipsoidal Order:** Unclassified
Latitude: N44° 54′ 14.0xxxxx″	**Longitude:** W76° 15′ 28.0xxxxx″	**Ellipsoidal elev:** 137.xxx

***UTM Zone:** 18	**E:** E400699.xxx	**N:** N4972826.xxx	**C. S. F.:** 0.99969977	**Mrdl Convg:** -0° 53′ 16.7″
***MTM Zone:** 9	**E:** E323929.xxx	**N:** N4973577.xxx	**C. S. F.:** 0.99988302	**Mrdl Convg:** 0° 10′ 15.6″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 136.304	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 136.627	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011990U002 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 0011990U003

AKA Names: 00190U003, 90U003, CP90208

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: PERTH WATER TOWER ALONG HARVEY STREET, 150 M NORTHWEST ALONG GORE STREET FROM INTERSECTION WITH HIGHWAY NO. 43 HEADING EAST, 110 M SOUTHWEST OF JUNCTION WITH GORE STREET, 29.5 M NORTHEAST OF CENTRE LINE OF WILSON STREET EAST, 18.5 M NORTHWEST OF CENTRE LINE OF HARVEY STREET, TABLET IN TOP AT SOUTHEAST CORNER OF CONCRETE BASE, 2.0 M NORTHWEST OF PROJECTION OF SOUTHEAST WALL AND 40 CM SOUTHWEST OF PROJECTION OF NORTHEAST WALL OF SMALL BRICK SHED AT BASE OF TOWER, 5 CM ABOVE GROUND LEVEL, SLIGHTLY BELOW ROAD LEVEL.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified	**Ellipsoidal Order:** Unclassified
Latitude: N44° 53′ 49.0xxxxx″	**Longitude:** W76° 14′ 52.0xxxxx″	**Ellipsoidal elev:** 134.xxx

***UTM Zone:** 18	**E:** E401476.xxx	**N:** N4972042.xxx	**C. S. F.:** 0.99969835	**Mrdl Convg:** -0° 52′ 50.9″
***MTM Zone:** 9	**E:** E324721.xxx	**N:** N4972808.xxx	**C. S. F.:** 0.99988387	**Mrdl Convg:** 0° 10′ 40.9″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 133.535	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 133.860	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011990U003 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 0011990U004

AKA Names: 00190U004, 90U004, CP90208

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: -

Station Type: SPIR

Location Description:

Township: PERTH QUEEN ELIZABETH SCHOOL ALONG WILSON STREET EAST, 0.4 KM SOUTHEAST ALONG GORE STREET FROM INTERSECTION WITH HIGHWAY NO. 43 HEADING EAST, 150 M SOUTHWEST ALONG HALTON STREET, 90 M NORTHWEST OF CENTRE LINE OF HALTON STREET, 50 M SOUTHWEST OF CENTRE LINE OF WILSON STREET EAST, TABLET IN NORTHEASTERLY FACE OF CONCRETE FOUNDATION WALL, 30 CM NORTHWEST OF JOG IN NORTHEAST FACE OF SCHOOL, 11.3 M SOUTH AND 3.3 M EAST OF FLAG POLE, 15 CM ABOVE PAVEMENT, SLIGHTLY ABOVE ROAD LEVEL.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified	**Ellipsoidal Order:** Unclassified
Latitude: N44° 53’ 31.0xxxxx”	**Longitude:** W76° 14’ 34.0xxxxx”	**Ellipsoidal elev:** 140.xxx

***UTM Zone:** 18	**E:** E401863.xxx	**N:** N4971481.xxx	**C. S. F.:** 0.99969647	**Mrdl Convg:** -0° 52’ 37.9”
***MTM Zone:** 9	**E:** E325117.xxx	**N:** N4972253.xxx	**C. S. F.:** 0.99988312	**Mrdl Convg:** 0° 10’ 53.5”

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 139.672	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 139.997	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	GSC; last inspected: 1990

Reference Sketches

Reference sketch for 0011990U004 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 00819738524

AKA Names: 738524, V008738524

Number of Ref Sketches: 0

Networks [usage]: 0044V [FIX]

Known Status: Existing

Last Reported Visit:

Monument Type: CAP

Station Type: SPIR

Location Description:

738524: SMALL FLAT ROCK OUTCROP ON SOUTH SIDE OF HWY 7, 3.5 KM WEST OF JCT OF HWYS 7 AND 43 IN THE TOWN OF PERTH, 1.2 KM EAST OF GLEN TAY RD, 49.1 M EAST OF ENTRANCE TO MOTOR VEHICLE REPAIR SHOP AND 50.6 M SOUTH OF CENTRELINE OF HWY 7. TABLET IS SET VERTICALLY IN TOP OF ROCK, 22.2 M SOUTH OF SOUTH RAIL OF CPR, 17.5 M SOUTH OF SOUTH RAILWAY RIGHT-OF-WAY FENCE, 17.1 M EAST OF PROPERTY LINE FENCE AND IS MARKED BY A MARKER PICKET SET 24 CM SOUTH OF BENCH MARK.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified			**Ellipsoidal Order:** Unclassified
Latitude: N44° 53′ 30.0xxxxx″	**Longitude:** W76° 18′ 00.0xxxxx″			**Ellipsoidal elev:** 144.xxx
***UTM Zone:** 18	**E:** E397344.xxx	**N:** N4971520.xxx	**C. S. F.:** 0.99970700	**Mrdl Convg:** -0° 55′ 03.3″
***MTM Zone:** 9	**E:** E320597.xxx	**N:** N4972210.xxx	**C. S. F.:** 0.99988049	**Mrdl Convg:** 0° 08′ 28.2″

Datum: NAD-1983:ORIG	**Horiz Order:** Unclassified			**Ellipsoidal Order:**
Latitude: N44° 53′ 30.0xxxxx″	**Longitude:** W76° 18′ 00.0xxxxx″			**Ellipsoidal elev:**
***UTM Zone:** 18	**E:** E397347.xxx	**N:** N4971738.xxx	**C. S. F.:** 0.99972957	**Mrdl Convg:** -0° 55′ 03.3″
***MTM Zone:** 9	**E:** E320597.xxx	**N:** N4972427.xxx	**C. S. F.:** 0.99990306	**Mrdl Convg:** 0° 08′ 28.2″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 144.008	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 144.333	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	MTO

Reference Sketches

Reference sketch for 00819738524 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 00819738525

AKA Names: 0011973D8525, 00173D8525, 6009738525, 738525, 73D8525, CP90208, V008738525

Number of Ref Sketches: 0

Networks [usage]: 0033V [FIX], 0044V [FIX]

Known Status: Existing

Last Reported Visit:

Monument Type: CAP

Station Type: SPIR

Location Description:

Township: PERTH SMALL FLAT ROCK OUTCROP ON NORTH SIDE OF HWY 7, 1.9 KM WEST OF JCT OF HWYS 7 AND 43 IN THE TOWN OF PERTH, 1.2 KM WEST OF LANARK CTY RD 1, 30 M EAST OF ENTRANCE TO MRS. NORA ROSE RESIDENCE AND 36.0 M NORTH OF CENTRELINE OF HWY 7. TABLET IS SET V ERTICALLY IN TOP OF ROCK, 17.7 M NORTH OF NORTH RIGHT-OF-WAY FENCE, 19.0 M EAST OF PROPERTY LINE FENCE AND IS MARKED BY A MARKER PICKET SET 21 CM NORTH OF BENCH MARK.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified		**Ellipsoidal Order:** Unclassified	
Latitude: N44° 54′ 00.0xxxxx″	**Longitude:** W76° 17′ 00.0xxxxx″		**Ellipsoidal elev:** 141.xxx	
***UTM Zone:** 18	**E:** E398674.xxx	**N:** N4972425.xxx	**C. S. F.:** 0.99970414	**Mrdl Convg:** -0° 54′ 21.4″
***MTM Zone:** 9	**E:** E321911.xxx	**N:** N4973139.xxx	**C. S. F.:** 0.99988149	**Mrdl Convg:** 0° 09′ 10.6″

Datum: NAD-1983:ORIG	**Horiz Order:** Unclassified		**Ellipsoidal Order:**	
Latitude: N44° 54′ 10.0xxxxx″	**Longitude:** W76° 17′ 10.0xxxxx″		**Ellipsoidal elev:**	
***UTM Zone:** 18	**E:** E398463.xxx	**N:** N4972954.xxx	**C. S. F.:** 0.99972677	**Mrdl Convg:** -0° 54′ 28.6″
***MTM Zone:** 9	**E:** E321691.xxx	**N:** N4973664.xxx	**C. S. F.:** 0.99990350	**Mrdl Convg:** 0° 09′ 03.5″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 141.133	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 141.457	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	MTO; GSC: last inspected: 1990

Reference Sketches

Reference sketch for 00819738525 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 00819738526

AKA Names: 0011973D8526, 00173D8526, 6009738526, 738526, 73D8526, V008738526, VA215

Number of Ref Sketches: 0

Networks [usage]: 0033V [FIX], 0044V [FIX]

Known Status: Existing

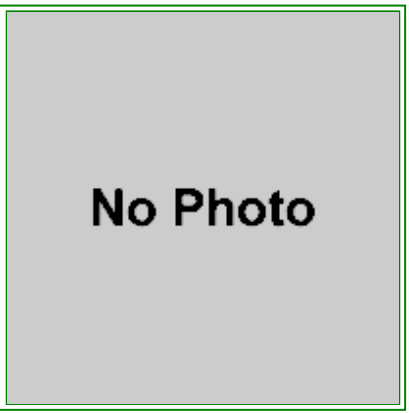
Last Reported Visit:

Monument Type: CAP

Station Type: SPIR

Location Description:

Township: PERTH LARGE CONCRETE BLOCK WORKSHOP ON SOUTH SIDE OF HWY 7, 31 M EAST OF JCT OF HWYS 7 AND 43 IN THE TOWN OF PERTH, 0.7 KM EAST OF LANARK CTY RD 1 AND 29.0 M SOUTH OF CENTRELINE OF HWY 7. TABLET IS SET HORIZONTALLY IN WEST FACE OF CONCRETE FOUNDATION ,4.6 M SOUTH OF N.W. CORNER, 15 CM ABOVE GROUND AND 15 CM BELOW BLOCKWORK.



Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified		**Ellipsoidal Order:** Unclassified	
Latitude: N44° 54′ 30.0xxxxx″	**Longitude:** W76° 15′ 48.0xxxxx″		**Ellipsoidal elev:** 141.xxx	
***UTM Zone:** 18	**E:** E400268.xxx	**N:** N4973326.xxx	**C. S. F.:** 0.99970020	**Mrdl Convg:** -0° 53′ 31.0″
***MTM Zone:** 9	**E:** E323488.xxx	**N:** N4974069.xxx	**C. S. F.:** 0.99988218	**Mrdl Convg:** 0° 10′ 01.5″

Datum: NAD-1983:ORIG	**Horiz Order:** Unclassified		**Ellipsoidal Order:**	
Latitude: N44° 54′ 40.0xxxxx″	**Longitude:** W76° 15′ 50.0xxxxx″		**Ellipsoidal elev:**	
***UTM Zone:** 18	**E:** E400232.xxx	**N:** N4973852.xxx	**C. S. F.:** 0.99972239	**Mrdl Convg:** -0° 53′ 32.6″
***MTM Zone:** 9	**E:** E323443.xxx	**N:** N4974595.xxx	**C. S. F.:** 0.99990427	**Mrdl Convg:** 0° 10′ 00.1″

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 140.827	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 141.149	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	MTO; GSC: last inspected: --

Reference Sketches

Reference sketch for 00819738526 is not available.

Ontario Ministry of Natural Resources and Forestry

Control Survey Information Exchange

COSINE Station Report

Retrieval Date: 2024-May-28

Station: 00819848111

AKA Names: 848111

Number of Ref Sketches: 0

Networks [usage]:

Known Status: Existing

Last Reported Visit:

Monument Type: BM

Station Type: SPIR

Location Description:

848111: CONCRETE BRIDGE CARRYING HWY 511 OVER BLUEBERRY MARSH, 1.00 KM NORTH OF JCT OF HWYS 7 AND 511 IN PERTH, 0.40 KM SOUTH OF BATHURST-DRUMMOND CON 4 RD. TABLET IS SET HORIZONTALLY IN THE EAST FACE OF COPING AT S.E. CORNER OF BRIDGE, 1.90 M NORTH OF THE S.E. CORNER, 10 CM BELOW TOP OF COPING, 16 CM ABOVE BOTTOM OF COPING AND 5.80 M EAST OF CENTRELINE OF HWY 511.

Horizontal (Ellipsoidal) Control Data

Datum: NAD-1927:SCAL	**Horiz Order:** Unclassified		**Ellipsoidal Order:** Unclassified	
Latitude: N44° 54’ 48.0xxxxx”	**Longitude:** W76° 16’ 42.0xxxxx”		**Ellipsoidal elev:** 139.xxx	
***UTM Zone:** 18	**E:** E399092.xxx	**N:** N4973900.xxx	**C. S. F.:** 0.99970341	**Mrdl Convg:** -0° 54’ 09.5”
***MTM Zone:** 9	**E:** E322302.xxx	**N:** N4974622.xxx	**C. S. F.:** 0.99988197	**Mrdl Convg:** 0° 09’ 23.4”

Vertical (Geoidal) Control Data

Datum: CGVD2013	**Vert Order:** First Order	**Elevation:** 138.630	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Datum: CGVD28:78	**Vert Order:** First Order	**Elevation:** 138.951	
Geoid:	**Meridional defl:**	**Prime vert defl:**	**Undulation:**

Maintenance / History

Date	Description
2019-Mar-20	MTO

Reference Sketches

Reference sketch for 00819848111 is not available.